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DESIGNED TO BE IN CONTEXT: NEW WORK OF EVANS WOOLLEN
SIX NURSE EDUCATION FACILITIES THAT BENEFIT FROM FEDERAL FUNDS
BUILDING TYPES STUDY: ARCHITECTURE FOR SELLING
FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

MAY 1967 **5** A MCGRAW-HILL PUBLICATION TWO DOLLARS PER COPY



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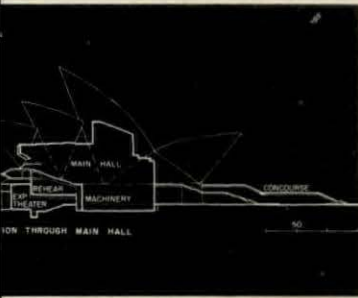
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OFFICE BUILDINGS: THE COST-QUALITY CONTEST

It would be easy and optimistic—but slightly oversimplified—to proclaim a long-overdue upswing in qualities of both design and materials in office buildings. Realistically, some buildings for some clients in some cities seem to be on the upgrade in quality. And quality is easier both to buy and to sell in today's market. The Building Types Study next month will consider some of these factors.

SEMI-ANNUAL INDEX TO RECORD CONTENTS

To make reference to published material—what we think of as the “second reading” of the RECORD—as easy as possible, an index (by architect, owner, author and subject) is published in the RECORD semi-annually—each June and December—to cover the content of the preceding six months. Next month's issue will include the index to “Volume 141”—January through June 1967.



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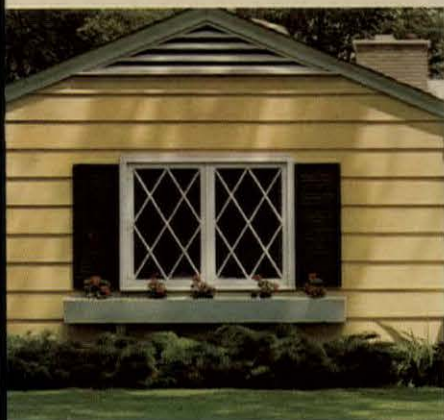
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For the better homes in any neighborhood it's wood windows.



Ralph Huszagh, Architect



Designed by Lee Blake



Designed by Ernest Blaylock, Southern Decorators



Why wood windows?

First, let's take condensation. When warm interior humidity hits a cold metal frame in winter, condensation takes place. Water drops form, drip over sills and down walls or wallpaper. Homeowners can't do anything about this problem. It's just the nature of metal—what heating engineers call excessive Thermal Conductivity. With quality wood windows, troublesome condensation cannot happen—the chart at right tells you why.

Then, take total home comfort. Cold metal surfaces conduct heat or cold from rooms faster than wood surfaces. Again, too much Thermal Conductivity. Wood simply is a better insulator against heat and cold. That's why wood windows help keep homes more comfortable in winter, cooler in summer.

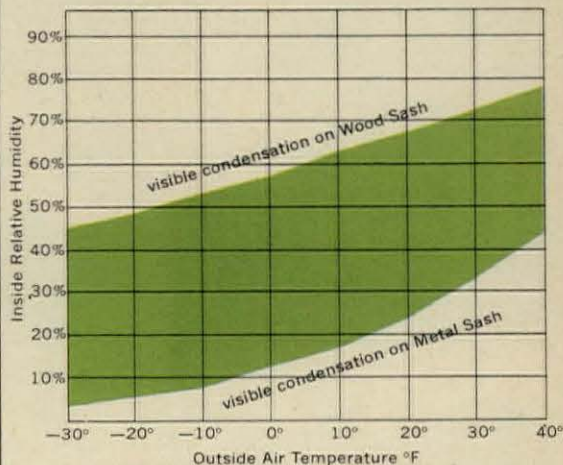
From every standpoint, it's wood windows! Wood windows blend with any architectural style — they're available in every type, style and size imaginable. And they give homes a warmth and beauty unmatched by any other type of window.

Free Window Condensation Calculator. Based on ASHRAE data, our exclusive Condensation Calculator helps you determine condensation problems so you can select the correct windows for the homes you design and build. It's free. Send requests on your business letterhead.

Visible Condensation of Inside Surfaces.

Room temperature 70°. Outside wind velocity 15 mph.

Chart shows comparative condensation on inside surface as outside temperature drops. Example: when outside temperature is 20° it would take as much as 69% inside relative humidity before condensation would appear on wood sash—but condensation will form on aluminum sash with just 22% inside relative humidity (and, most homes average 30-35%).



Source: ASHRAE Standard Psychrometric Chart



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Portland Cement Stucco ...an asset to good design

Portland cement stucco is in the limelight. This Berkeley, California apartment project won an AIA Merit Award for architects Roger Lee Associates. Using factory made finish coat portland cement stucco made with Trinity White they achieved a clean, crisp, contemporary look at a modest original cost. And they created a building that will keep its beauty with a minimum of maintenance.

Architects can get valuable help on the use of stucco from local plastering contractors or direct from the Trinity White Department of General Portland.

Trinity White
PORTLAND CEMENT



CREDITS: *Architect:* Roger Lee Associates. Stucco supplied by California Stucco Products Co., San Francisco. John Catanesi, Plastering Contractor, Richmond, Cal.



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WHERE DO ARCHITECTS LOOK FOR NEW CLIENTS?

In school an architectural student learns practically nothing about clients; or, to put it another way, what he picks up is probably all wrong. At least the 1,000-year-old concept of an architect's client is that of a wealthy individual, an influential institution (like the church or City Hall): it is little related to today's work.

The new architect learns about clients from his early employers and their clients, and from his fellows at the drafting tables. He, and they, thus tend to follow familiar groups. True, we do hear a great deal today about new types of clients—corporations, community committees, new types of government bureaus, and so on—but in general we keep looking for those with the obvious sources of funds.

Nothing wrong with that; everybody reaches for the richest prizes. What is missing is the development of new types of clients. Those big corporations, the ones with the money, are always researching, in a constant quest for new territory to cultivate. They study their products, their materials, their markets, their future possibilities. Not to mention going the same for all of their competitors' territories. The world has lost its pessimistic cry of 30 years ago—"no new frontiers"—and has its eyes firmly fixed on growth.

If you were to ask an architect about doing a study of "his markets," he would look at you with some concern. He would

think you slightly touched. He wouldn't be so scornful if you spoke about the new types of clients, and he would be interested in discussions of new types of clients' requirements. But the idea of the kind of analysis of his work that is familiar to corporation practice: horrible thought!

Well, if you can forget such horrible terms you will realize that architects are having such study thrust upon them. The point of bringing it up is merely that architects should be *ahead* of the necessities of their times, not behind them. Perhaps I should put it more constructively: some architects are ahead of the field, running away with real fortunes.

It doesn't seem natural to use the word "tycoon" with the adjective "architectural," but architectural tycoons are developing. Boom times are making architectural fortunes. And American architects are scooping up chunks of affluence in the strangest parts of the world. Leo A. Daly, of the unlikely home base of Omaha, Nebraska, said recently: "The needs in the emerging nations of South America, Africa, the Middle East and Asia are enough to keep us all busy." His own people are working in Saigon, Recife, Islamabad, Tunis, Lahore, Frankfurt, New Delhi, Santiago, Katmandu and Karachi.

So you don't want to be an architectural tycoon. You just want to stay home and limit your work to what you can design yourself, and be proud of. Well, what you can be proud of is your own

personal persuasion, but I venture to say that a good look right around home would uncover a good many new sorts of possibilities.

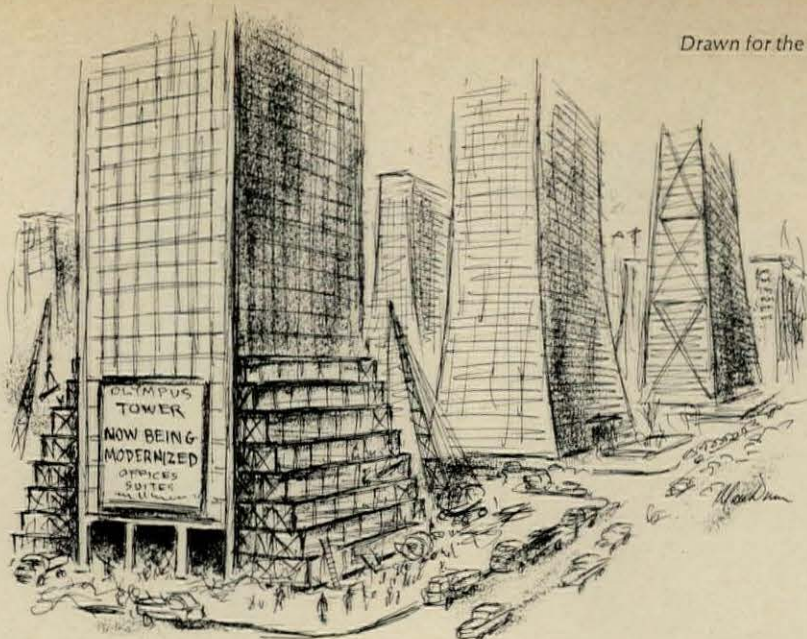
I used to think a "small" architect was an individual who did something like six to ten houses a year. I know an architect who is too busy doing smaller work than that even to undertake a single new design. He just got started in little remodeling jobs—houses, stores, and such—and it never seems to let up. I guess he has developed a special understanding of the problems of converting old structures; at any rate, he has a considerable list of satisfied clients.

The point of all this is, I think, affluence. If somebody in Katmandu needs, and will pay for, the services of an architect firm from Omaha, Nebraska, how many housewives right there in Omaha want, and can afford, professional services in making their living room just as good as the Joneses'?

Where do those housewives get help? From the local wallpaper house, the antique shoppe, the gift shop lady, the city department store, the professional decorator, the architect? You know, as well as anybody else, that the Omaha housewives tend to think of architects as Leo Daly's, who do big and expensive work and travel around the world.

It might be very good for the profession of architecture, and for its practitioners, if architects took a new look at present-day affluence, and the opportunities for design that it presents. Do the big work, yes, in Katmandu (wherever that is); but do some of the small work too. Spread your services and—forgive me—study your markets. Be a little tycoon, if you want to, but there are some big ones these days!

—Emerson Goble



Young people like it tough: send 'em around the world

A little story about how Leo A. Daly developed the world-wide architectural business I mention on the previous page:

"We found we had a group of young people who could have served in the Marine Corps. They enjoyed doing hard jobs the way other people might enjoy going on a lion hunt . . ."

Daly's problem was to find challenges big enough to keep this staff busy and happy.

"Our overseas work came from a long period of thinking and preparation. I went around the world a couple of times, trying to get the feel of the countries and of the people who live there. I talked to a number of men in other lines of business in the United States, to see what their overseas experiences were and where the growth areas were. I would talk for hours on end with the country desk officers in the Department of State, and the people in the Department of Commerce. And we found there was a tremendous need for the broad talents such as we have in the fields of architecture, engineering and planning."

Young people, young people; they'll change everything

What's new, according to the prophet Leo A. Daly, is still interesting:

"The client who involves the new breed of architect is a new breed of businessman, too. He knows there is more to producing a profitable building than simply squeezing every rentable square foot possible out of a given lot. A careful engineering study of the physical environment, transportation and other public services, the trends in future office practices, the basic trends in the econ-

omy of a given community—all of these factors, when properly analyzed, can help the client reach initial decisions that will make it easier to find financing, perhaps at a better interest rate. They can result in quicker construction at lower cost, and they can help insure a rentable building that will fill up rapidly and stay filled because it won't be made obsolete by technical changes in the near future.

"This is what is happening. In addition to the economic factors, there are and will continue to be very strong political and social factors working in favor of the person who seeks quality. You know, these days, most people don't have to stay in one place and live with what they have. If they don't like it, they can move—and they will. Most of today's young people have never known economic depression. They have grown up with television, with the jet airliner, with the post-Sputnik education, with a very healthy attitude that they can change what they don't like. So if we can mold our policies and set our goals as high as these young people have, we will be capable of producing a better world."

Small architectural jobs; another reason for them

My little spouting (previous page) about seeking out small architectural jobs has another application, according to the gospel of J. B. Jackson, editor of *Landscape magazine*, whom I have quoted before. This is from "Image 4," a student publication of the School of Architecture at the University of Texas:

"If the architect, therefore, wishes to play a more responsible role in shaping the urban environment—and we are assured that he does—then the best that he can do is to find an amenable client.

He must, in fact, learn to prefer the small client to the large and powerful one, the poor client to the rich, the small community to the metropolis; for it is in such relationships that he can make his voice heard. In short, he must apply his talent to a field which up to now he has neglected: the lower income groups, the small business and the small cities and towns. These have been left unexplored because they produced neither prestige nor money. But if it is a chance to assume or share social responsibility that the architect wants, then he can afford to ignore them no longer. Here is where his help is needed.

"Why has this field lain fallow? Architects have avoided it because to begin with they have not known how to exploit it. Once out in the world the young architect soon learns that there is more (or less) to an architectural practice than air terminals, civic centers, white-collar housing projects, resort hotels by the sea; more to office practice than what the book says. But by then it is too late. School has taught him all that it wishes to teach him, and this has proved to be not enough.

"The fault then lies partly with the curricula of our architecture schools with their undue emphasis on the grandiose and expensive, their refusal to take into account the many new urban forms and functions of modern construction and planning. But the schools have also omitted to teach their students any real sense of personal obligation to society. It is not enough for the would-be architect to be lectured on the social importance of his profession. He must also be made to see how modest the role of architecture is in the workaday world, and yet how essential it could become.

—E. C.

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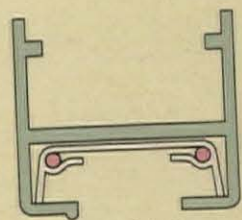
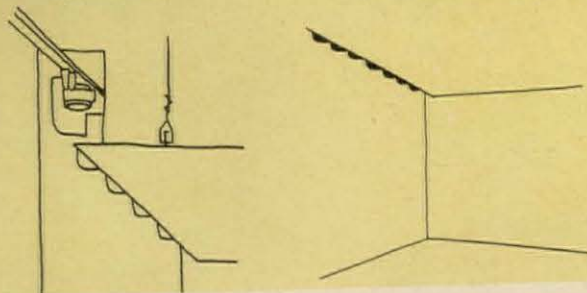
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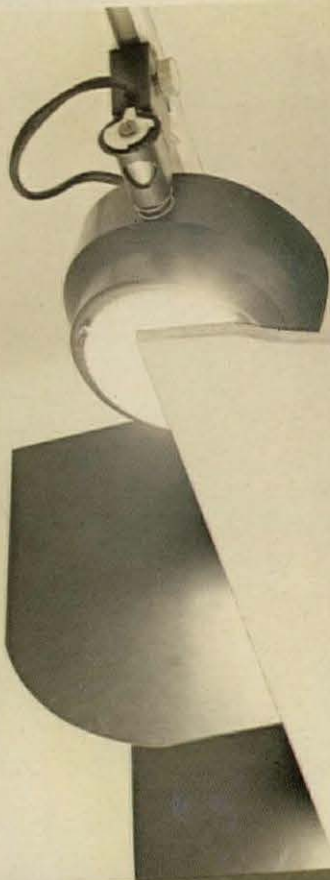
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Lytespan track comes in 4' and 8' modules, straight or curved, can be easily cut to length on the job. Lytespots can be clipped on at any point, spaced as desired.



We can think of six good reasons why you'd want to specify a Halsey Taylor water cooler.

WM SERIES WALL-MOUNTED WATER COOLERS — Designed for modern interiors. Contoured stainless steel top prevents splashing. Hot water dispenser (coffee bar) optional. Standard cabinet finish is handsome, baked gray enamel. Available also in stainless or vinyl-clad steel with choice of attractive colors and textures. Choose from 3 models. Capacities: 9.4, 16.4 or 19.9 gals. of 50° F water at 70° room temperature. Water-cooled condenser models also available.

RWM SERIES SEMI-RECESSED WATER COOLERS — Provide contemporary complement for public areas. Steel box frame allows flush mounting in any wall. Standard cabinet attractively finished in gray baked enamel. Special interior accent cabinets also furnished in stainless or vinyl-clad steel with choice of textures and colors. Two models. Capacities: 9.4 to 15.2 gals. of 50° F water at 70° room temperature.

CP CLASSIC SERIES — Complete refreshment center provides cold drinking water and hot water for coffee and other hot beverages. Large refrigerated compartment for ice cubes and bottled drinks. Modern styling combines stainless steel with wood-grain finish. Ideal for executive suite, conference room, or employees' lounge. Coffee bar, optional equipment. Capacity: 3.5 gals. 50° F water at 70° room temperature.



A two-stream bubbler is one.



WT FLOOR MODEL SERIES — Can be installed free-standing or secured tightly against the wall. All plumbing connections are made through cabinet back. Equipped with both hand and foot controls and new anti-splash stainless steel top. Goose neck glass filler and water dispenser (coffee bar) are optional. Cabinet finished in standard gray enamel. Other attractive colors on special order basis. Choose from 4 models. Capacities: 9.4 to 24.6 gals. of 50° F water at 70° room temperature. Water-cooled condenser models also available.

BL-301 BI-LEVEL ACCESSORY FOUNTAIN — Safe, practical way to serve drinking water to adults and children. Designed for side mounting on any WM series water cooler. Gray baked enamel, stainless or vinyl-clad steel cabinets to match adjoining WM cooler. Waste outlet and water supply are integral with electric water cooler. Can also be installed as separate wall fountain.

You provide a more satisfying drink of water with Halsey Taylor's exclusive, two-stream, mound-building, anti-squirt water projector. Two streams peak at a precise point to deliver a larger, more sanitary mouthful of cold water. And the unique overflow outlet in the hood guard makes this bubbler absolutely squirtproof. Guard and bubbler are a one-piece, heavy, chrome-plated forging. Constant stream height is maintained by an automatic stream regulator — never too high or too low, even though line pressure may vary as much as 50 pounds.

The five attractive water coolers shown here, with their clean, modern styling, are additional reasons why you should specify Halsey Taylor.

Before you buy or specify see the most complete line of electric water coolers and drinking fountain equipment available. Write today for new Halsey Taylor catalogs. Or look us up in Sweets or the Yellow Pages.

Halsey Taylor®

THE HALSEY W. TAYLOR COMPANY
1560 Thomas Road, Warren, Ohio





Curved buildings house 346 family units.
Architect: Bertrand Goldberg Associates



Hilliard's twin cylindrical towers together contain 364 units designed for the elderly.

This thrusting tower of concrete and glass is one of four powerful buildings making up the Raymond M. Hilliard Center, Chicago's newest low-income housing development. • The configurations of the buildings—two are cylindrical, two arc-shaped—create a vigorous outward orientation and afford unobstructed views to all residents. • The Center's elliptical windows are glazed with ASG's Lustracrystal® sheet glass. Lustracrystal has the superior transparency and lustrous surfaces you look for in the glass you specify. And, like all ASG sheet glass, Lustracrystal has an exceptional lack of "color"—the dull greenish cast so common in most sheet glass. • For full information on Lustracrystal and the complete ASG family of architectural glasses, write: Dept. D-5, American Saint Gobain Corporation, P.O. Box 929, Kingsport, Tennessee 37662.

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CREATIVE IDEAS IN GLASS

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new public housing
in Chicago***

***Opening out-
through ASG's
Lustracrystal
sheet glass***





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***in Los Angeles
helps builders and
plumbers in
Caribou, Maine***

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This knob is part of Price Pfister's Research & Development laboratory, where the most exhaustive set of tests ever conceived for plumbing valves and fittings are performed. Before any product leaves the laboratory, it is proven for strength, durability and flexibility under the most extreme pressure and flow conditions. And even as we reach new heights in quality control for our current lines, new, exciting products for the future are being created today. Price Pfister's Research & Development Division is operating full time — assuring you that Price Pfister products of tomorrow will be better — *through testing today.*

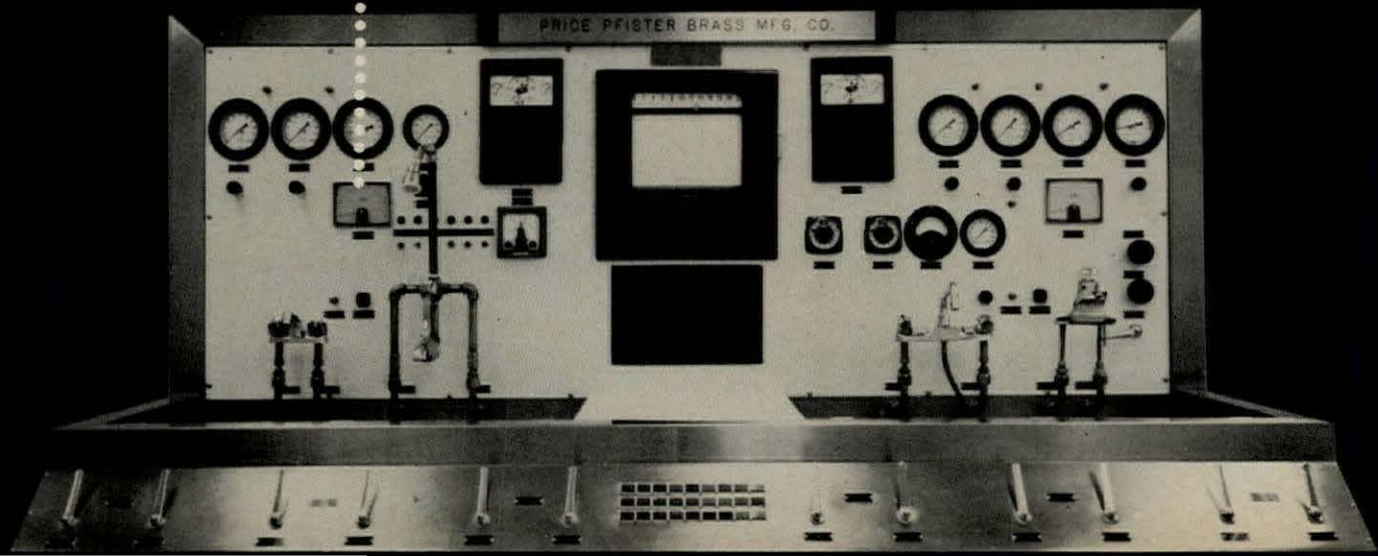


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1910*

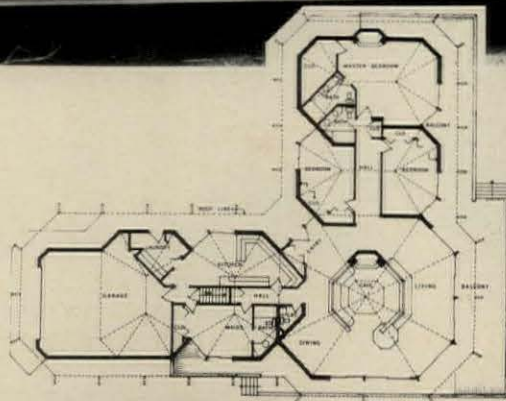
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For more data, circle 7 on inquiry card



Erickson and Stevens enhance modern day "cave" in a sophisticated country home with ceramic tile.



focus of this home located in a wooded Winnetka, Illinois is the "cave"—a room within a room. It was designed to meet the owner's requirement of an intimate yet unobstructed conversation area. The cave, as well as the surrounding entry, dining and living areas have ceramic tile floors.

The philosophy behind the design of this home is the use of a prismatic plan offering the owner an opportunity to capitalize on spectacular views in all directions. At the same time, privacy is accommodated by the adaptation of individual, adjoining living "cells," each with its own roof.

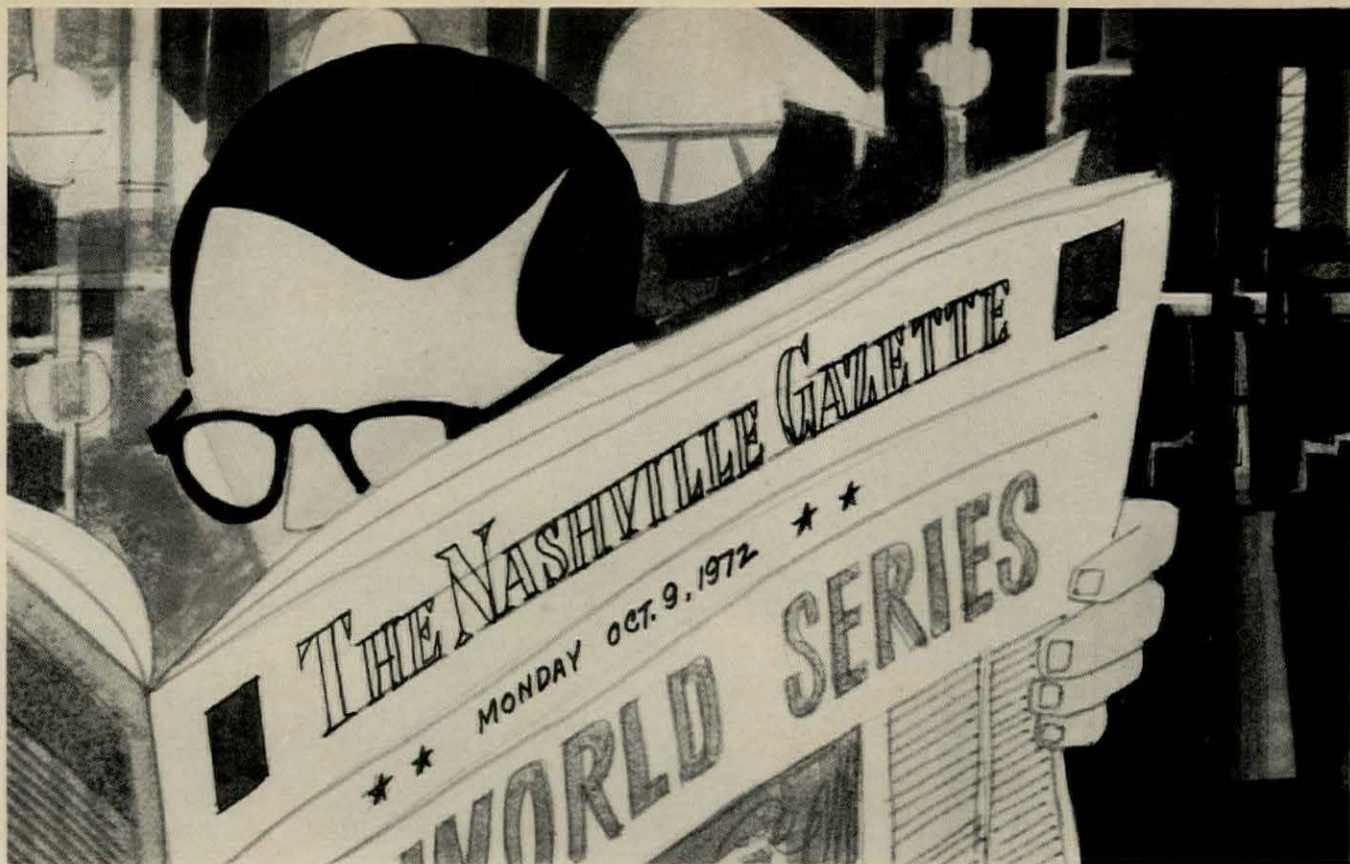
Throughout the home, architects Erickson and Stevens have made extensive use of ceramic tile for decorative as well as functional values. Bathroom vanity tops, tub enclosures and walls are finished in random mosaic tile with quarry tile in the kitchen, counter tops and backsplashes are tiled for color harmony and continuity.

If you're looking for a material with limitless possibilities in combined decorative and functional use, look for ceramic tile made in the U.S.A. and Quality Certified by the Tile Council of America. The triangular seal at the bottom right is your assurance of glazed wall tile, ceramic mosaic tile and quarry tile that is designed to meet the most rigid government specifications. For more information about Quality tile, a material that can be used with confidence indoors and out, contact the Tile Council of America, Inc., 800 Second Avenue, New York, N.Y. 10017.



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You see, to the men at Bowser-Briggs it's 1972 — and this attitude in thinking five years ahead gives you developments like the Model 610-E with patented Star-Cor® elements or the fiberglass vacuum diatomite swimming pool filters with new rectangular star-leaf construction. Leaves are individually removable

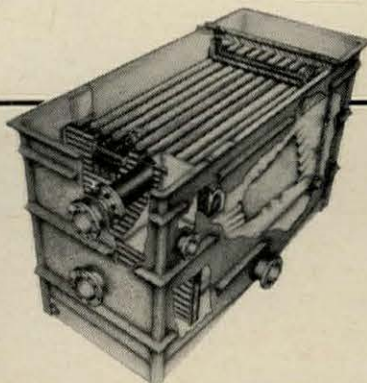
for greatest ease of maintenance, and offer uniform pre-coating-filtering and the most unrestricted water flow. These are just two examples of Bowser-Briggs' 1972-thinking. You'll also see it in many other areas . . . anywhere there's a need for dehydration, oily waste treatment, filtration, absorption or coalescence. We've been specializing in looking ahead since 1885 (1890 to us), so if you'd like a view of 1972 — in filtration — call your man from Bowser-Briggs. Or send us your requirements, without obligation.

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Preferred by leading municipalities. For swimming pools of 134,000 to 806,400 gallon capacity. Approved by National Sanitation Foundation. Complete data available. Write Dept. AR-1

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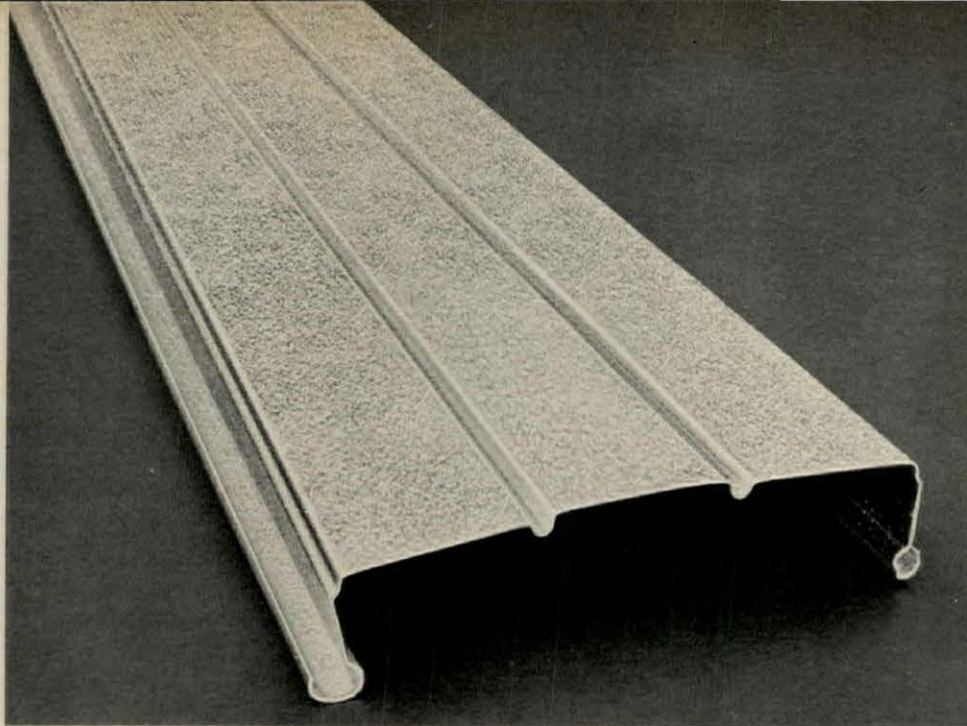
Trenton Channel Power Plant, The Detroit Edison Company, Detroit, Michigan

FLUROPON[®] By De Soto

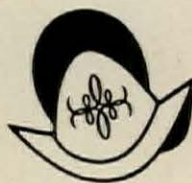
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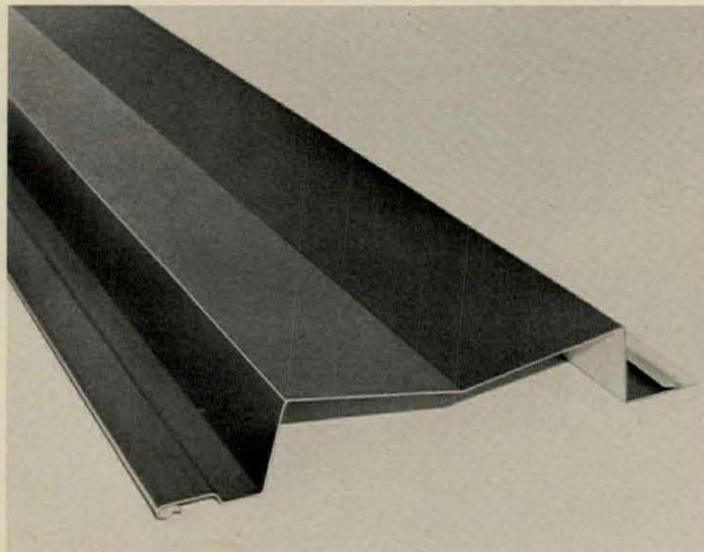


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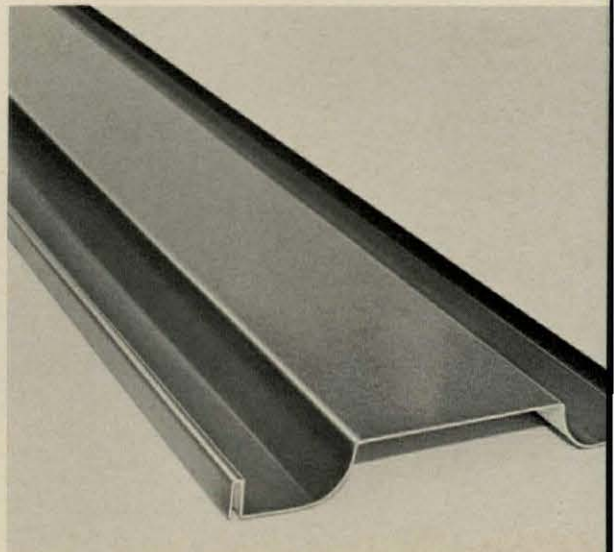
SPECIFICATION: All exposed exterior metal (aluminum and/or HDG steel)—including panels, spandrels, columns, supports, mullions, leaders, facias, copings, louvers, battens, screens, flashing, jambs, sills, fenestration and hardware as applicable and as detailed—shall be chemically cleaned, pre-treated (primed in the case of HDG steel) and coated with Fluropon as manufactured by DeSoto Chemical Coatings, Inc. Fluropon must be applied by an experienced processor in accordance with Fluropon fusion process instructions printed by the manufacturer. Colors as selected by the architect, (Longform specification available on request).

FLUROPON is the newly developed fluorocarbon polymeric coating which fuses to metal to form a highly protective and decorative finish with unequalled durability. The exceptional characteristics of Fluropon assure lasting appeal and long range economies. Available in 24 standard colors. Fluropon coated aluminum or hot dipped galvanized steel panels, louvers and window wall components are commercially available from processors listed on opposite page. Consult them or write direct for architectural information.

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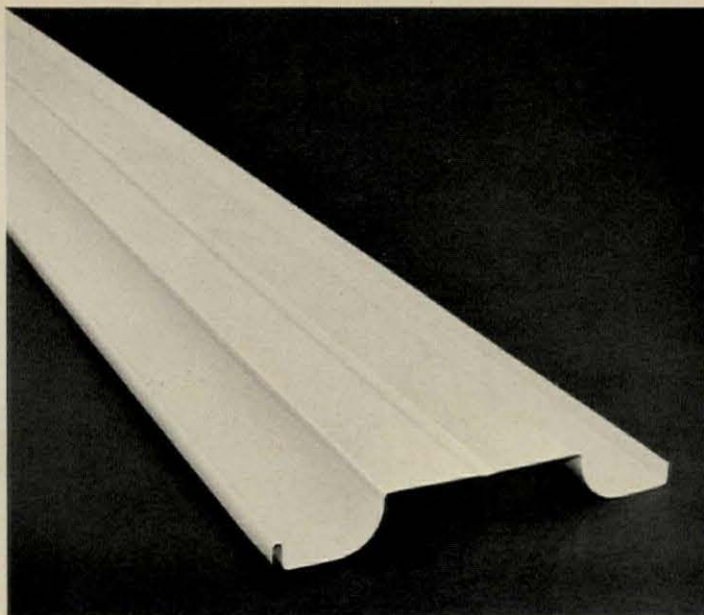


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Jamison all-metal banana room doors maintain critical temperature levels and also provide gasketed seal to contain gases used in fruit ripening.



All-metal smokehouse door with high temperature fiberglass insulation. Special gasketing and triple locking prevent escape of smoke and heat.

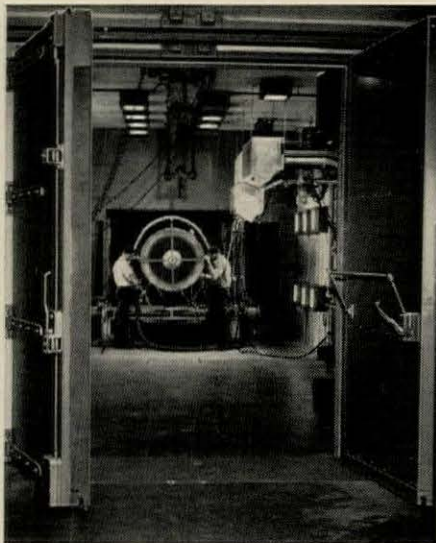


Jamison see-thru acrylic doors add efficiency and convenience in large, busy kitchens. They open easier and improve employee supervision.

If you have a door problem, there's a Jamison door to solve it



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JAMISON

COLD STORAGE DOORS

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One man operates the Honeywell automated control center that sees, hears, records, reveals, checks, adjusts, alarms, remembers, analyzes, monitors, starts and stops

almost everything in a modern building. Shown here: Northwestern National Life Insurance Company, Minneapolis, Minn. Architect: Minoru Yamasaki & Associates.

Now Honeywell **1-man** Building Control gives you 33 $\frac{1}{3}$ % annual return, microelectronic circuitry plus...

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but at least our doors
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New SHEETROCK® SW¹ Gypsum Wallboard features unique eased edges. New DURABOND® -90 Compound bonds these edges together into Super-Weld joints, strongest wallboard joints ever developed.

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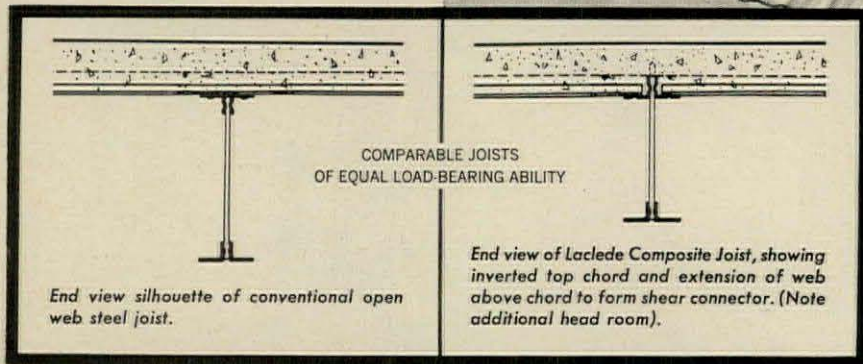
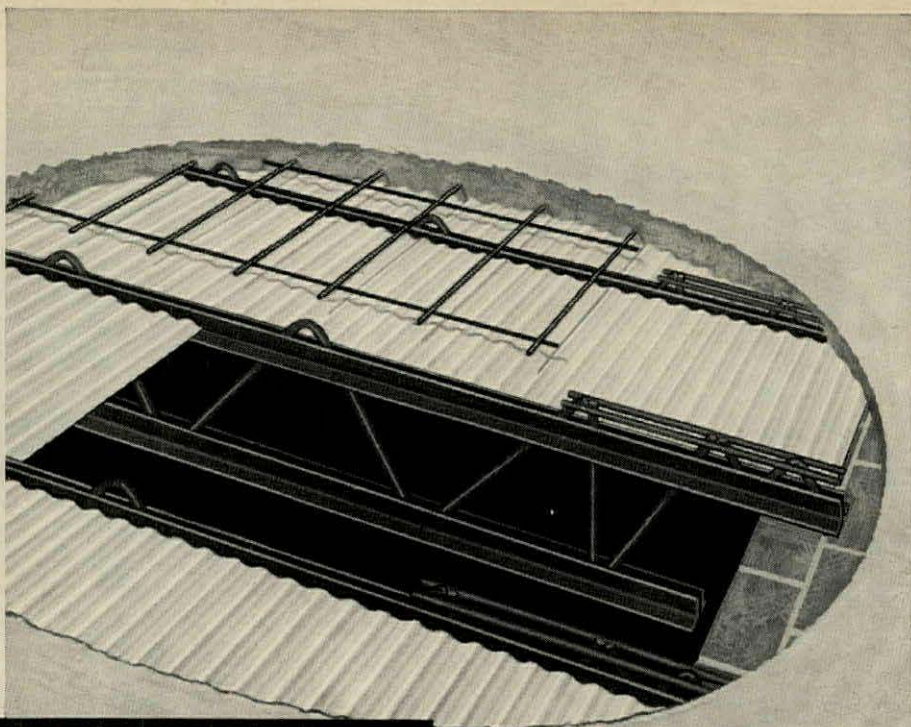
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LACLEDE composite joists improve floor construction



End view silhouette of conventional open web steel joist.

End view of Laclede Composite Joist, showing inverted top chord and extension of web above chord to form shear connector. (Note additional head room).

Combines the Advantages of Concrete and Steel for



Deck can be easily placed by one man.

- LONGER SPANS WITH LESS DEFLECTION
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- SAVING IN HEAD ROOM
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lever handle? No. Would it be enough to produce
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Arcadia lever in Yale mortise lock.

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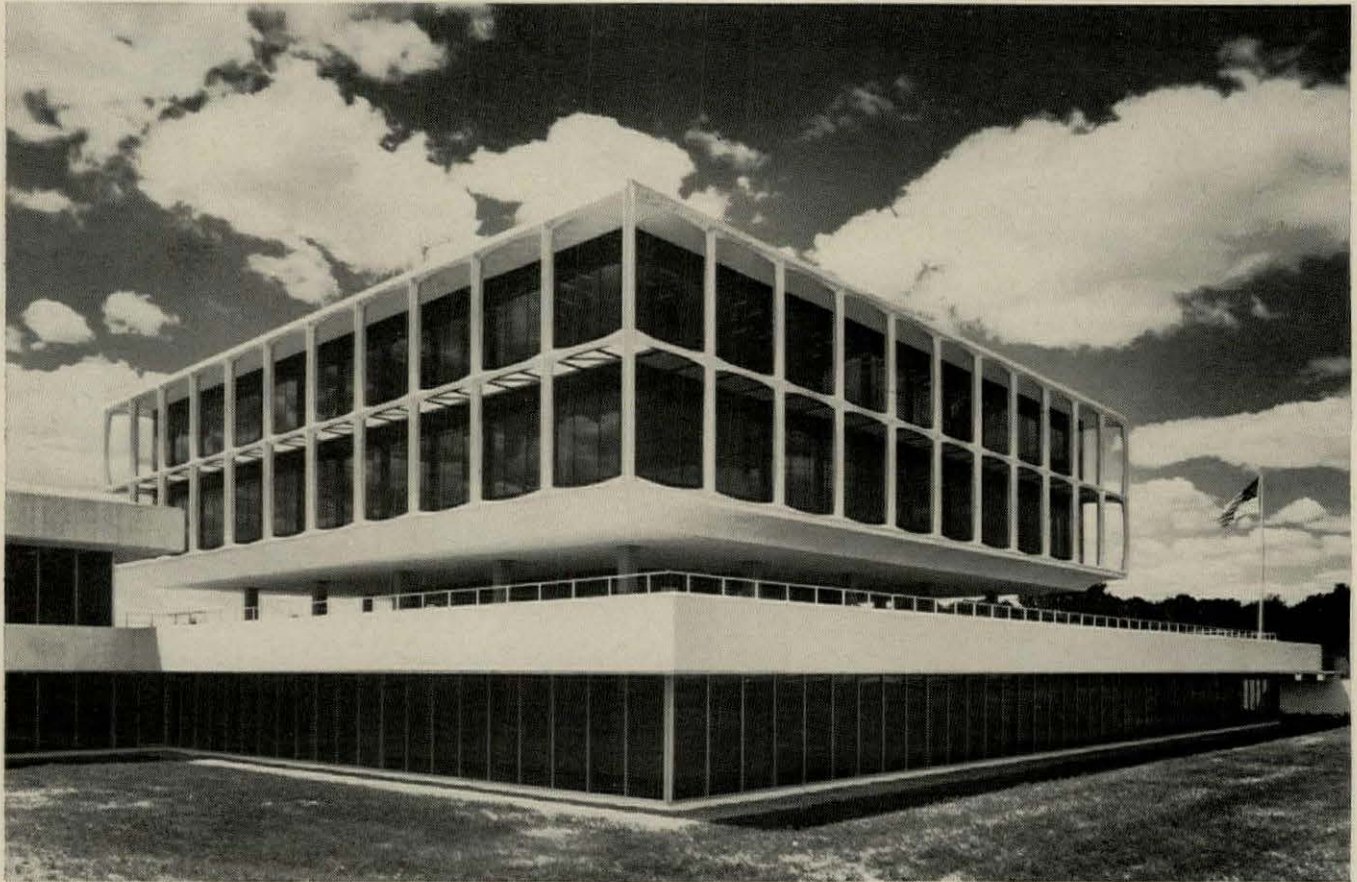
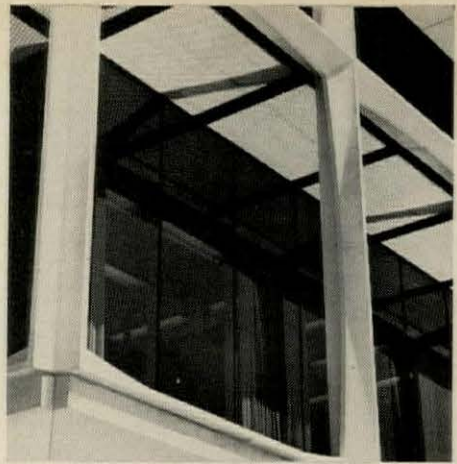
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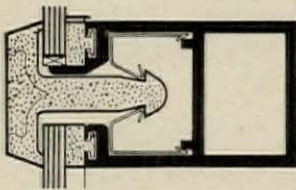
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**New PITTCO® T-WALL™
thermal framing system
controls condensation,
reduces heat loss in new
Federal-Mogul Building**



Federal-Mogul Corp. Building, Detroit. Architect: Giffels & Rossetti, Inc., Detroit. General Contractor: Barton-Malow Co., Detroit.



The new PITTCO T-WALL has a proven 0.6* U-value. There is absolutely no metal connection from inside to outside. (See section.)

That means no condensation on the metal at room temperatures up to 70° with relative humidity of 35%—even when it's minus 20° outside. Metal framing is not chilly. Sound transmission is reduced.

Appearance is slim, elegant, unobtrusive. Face of the

*Performance test data published March 1, 1965, by Pennsylvania State University.

mullion is only 1½ inches wide; gasket projects only ⅜ of an inch from surface of the glass.

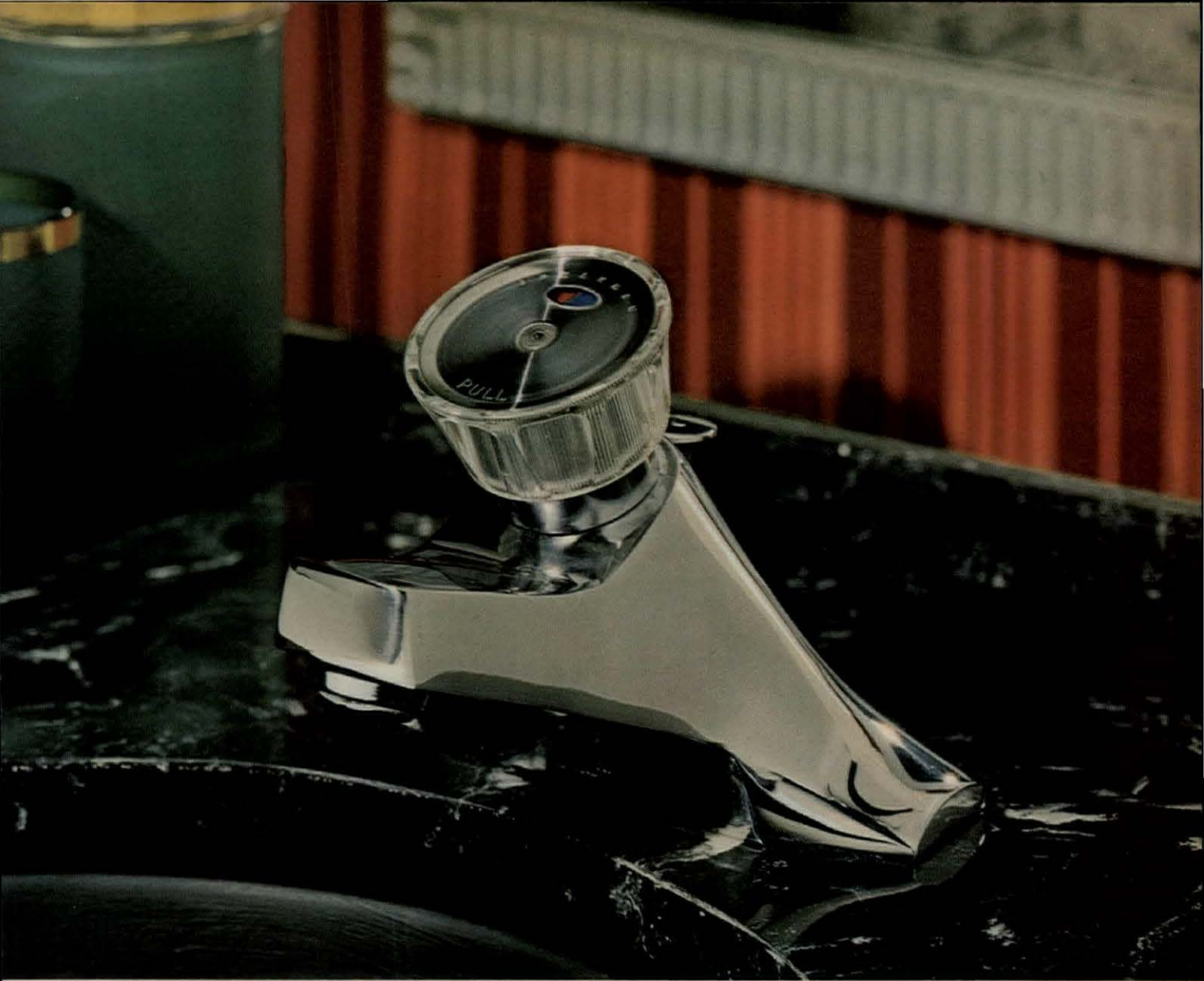
PITTCO T-WALL is available in several glazing thickness combinations, including double glazing for maximum insulation. Standard components will meet varying strength requirements.

For more information on this new PITTCO framing system, see Sweet's Architectural File, section 3a/Pi, or write for our 4-page descriptive folder. Pittsburgh Plate Glass Company, Pittco Architectural Metals Department, Ohio Street, Kokomo, Indiana 46901.

PITTCO ARCHITECTURAL METALS



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**This single control push-pull faucet dials
hot and cold in color. Beautifully by Speakman.**

Dial red for hot. Blue for cold. In-between for just right. With Speakman **Colortemp** you can *see* what you're doing. One easy hand motion and without effort you control both water flow and temperature—pre-dial the exact water temperature that suits your fancy.

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New cartridge. No grease. No rust. No stick.

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**WORKS SO SMOOTHLY THAT PEOPLE HARDLY REALIZE THE DOOR
TURNS UNDER ITS OWN POWER**

A gentle push starts the door moving. *Revolvomatic* then goes to work. It rotates the door a full turn and brings it to a stop with all wings touching the enclosure. Each user gets an "open arms" welcome. Conditioned air stays inside.



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For modern luxury, nothing beats Acrilan.[®] Nothing

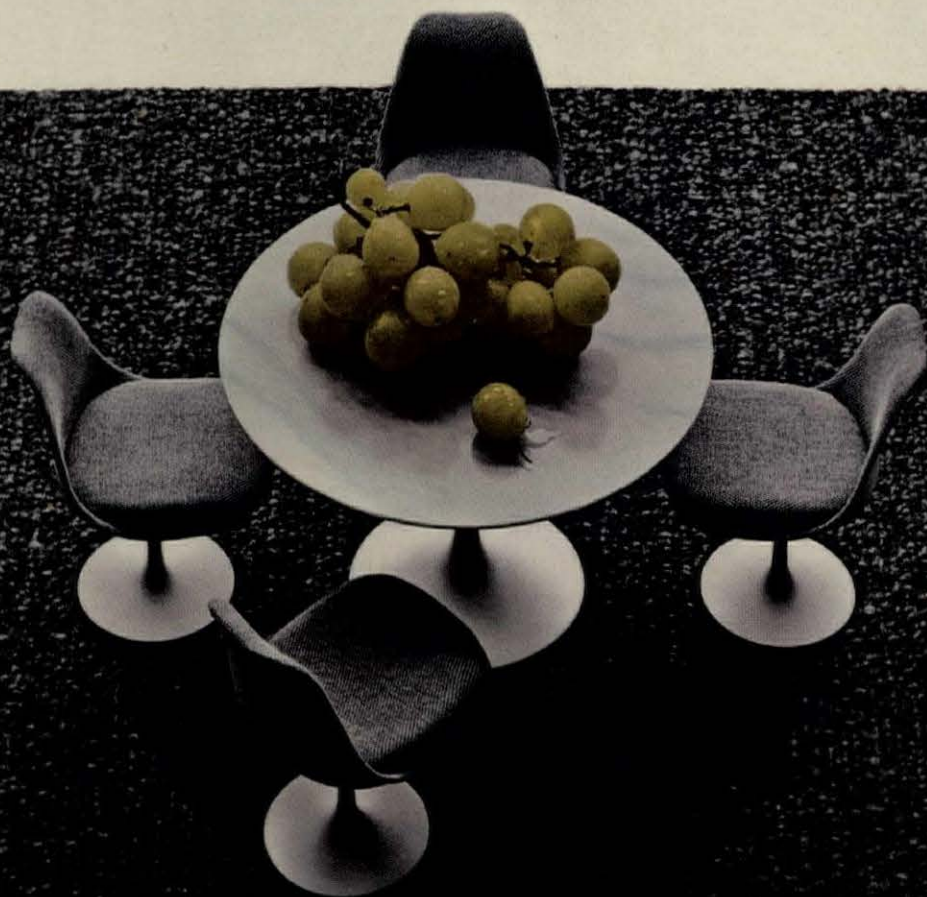
Acrilan acrylic has two kinds of luxury. The kind you see with your eyes and feel through the soles of your feet.

And the luxury of not having to be treated as if it were a tapestry. A carpet of Acrilan is made to retain its luxurious appearance in the face of repeated punishment.

It actually bounces back after being stepped on by thousands of feet. And it's simple to clean.

A carpet made with Acrilan[®] acrylic fiber in the pile is also mothproof. Mildewproof. Non-allergenic. You see, like all good modern things, Acrilan is functional as well as beautiful.

Which is the utmost in luxury for your client, isn't it?



Monsanto Textiles Division, New York, N.Y. 10001



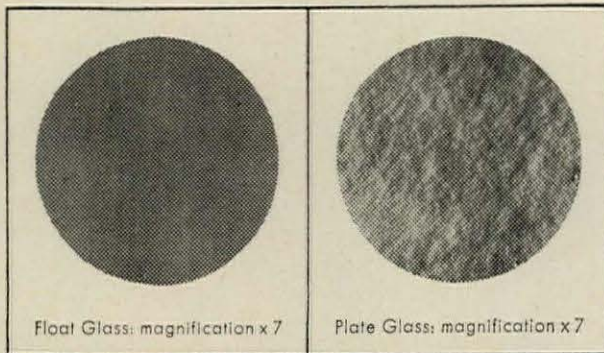
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SUIT BY VICTOIRE

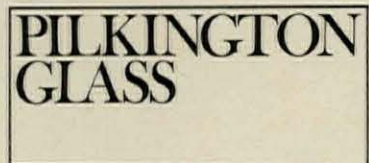


Float Glass looks just like Plate Glass...

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Look at the microphotographs. See how Pilkingtons' Float outdates Plate with its smoother, finer surface. That's because the revolutionary Float process invented by Pilkingtons gives a natural fire-finished surface, not ground and polished by abrasives. Specify Float, the world's finest, most up-to-date glass. Supplies from your glass merchant. Or contact: Mr J Baldry, (USA Sales Manager) Pilkington Brothers (Canada) Ltd., 55 Eglinton Avenue East, Toronto 12, Ontario.



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No boiler equipment.

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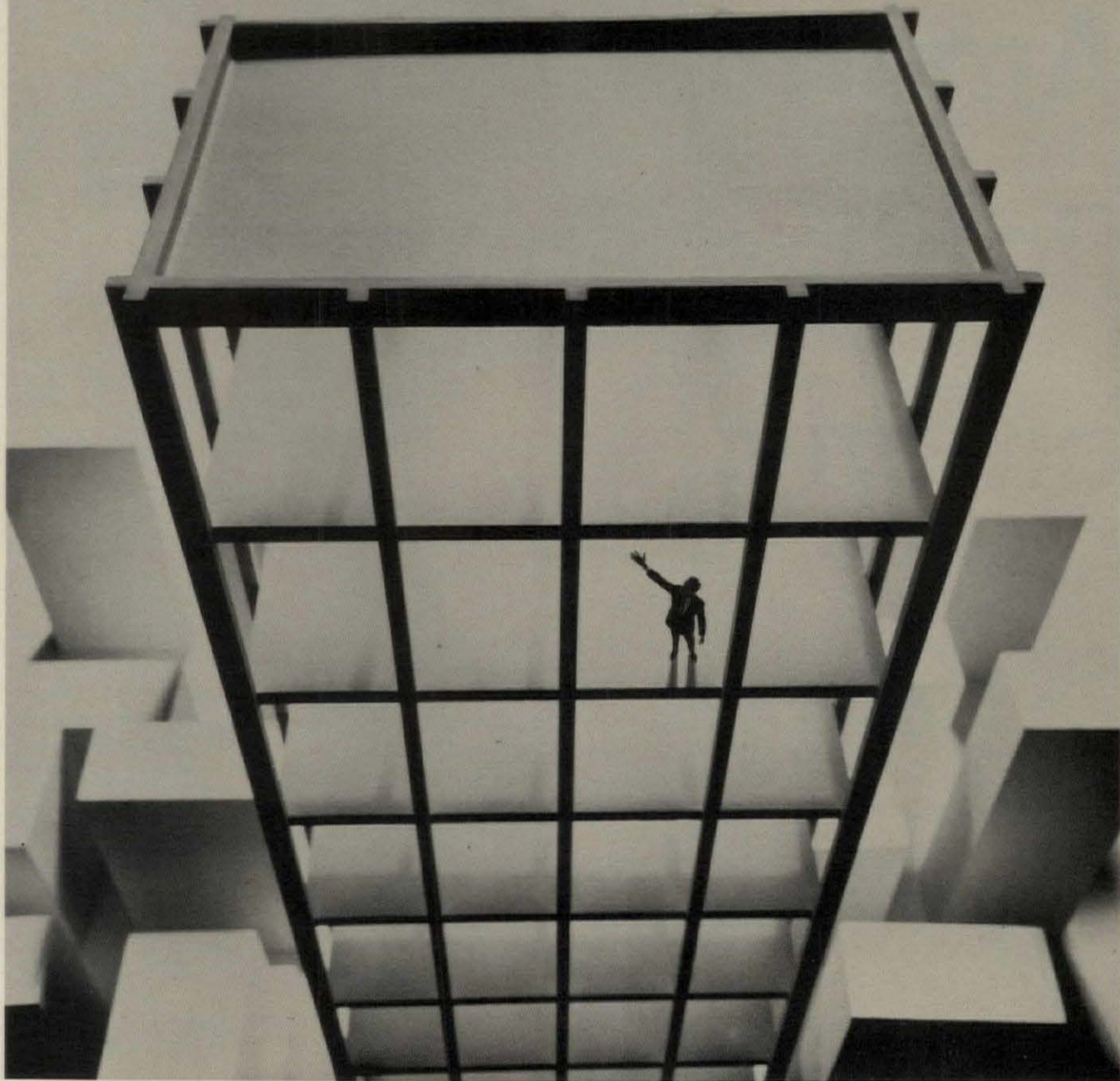
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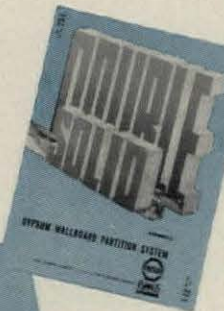
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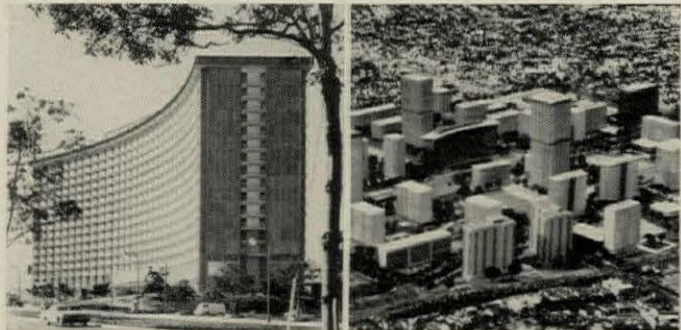
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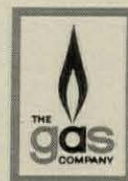
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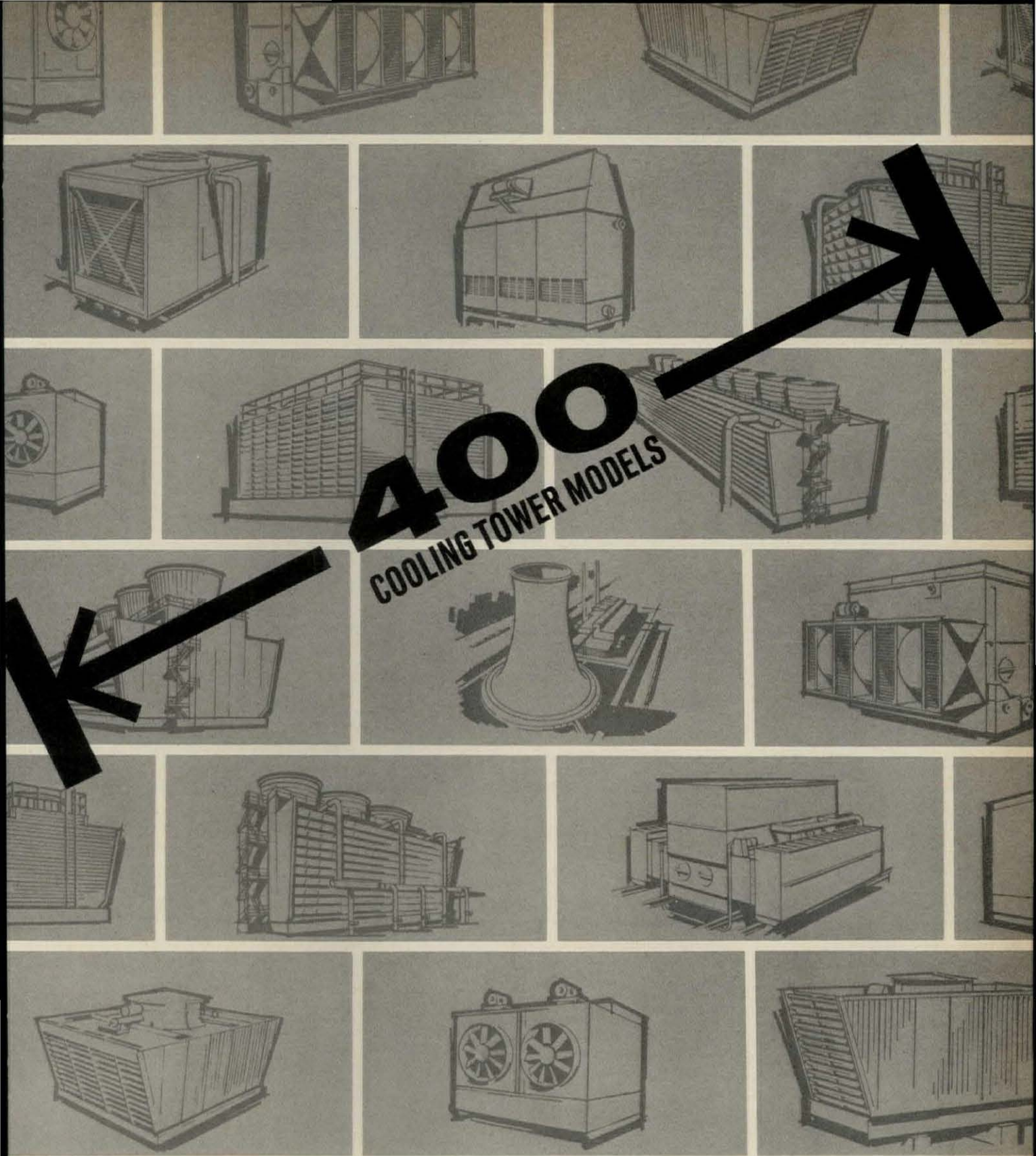


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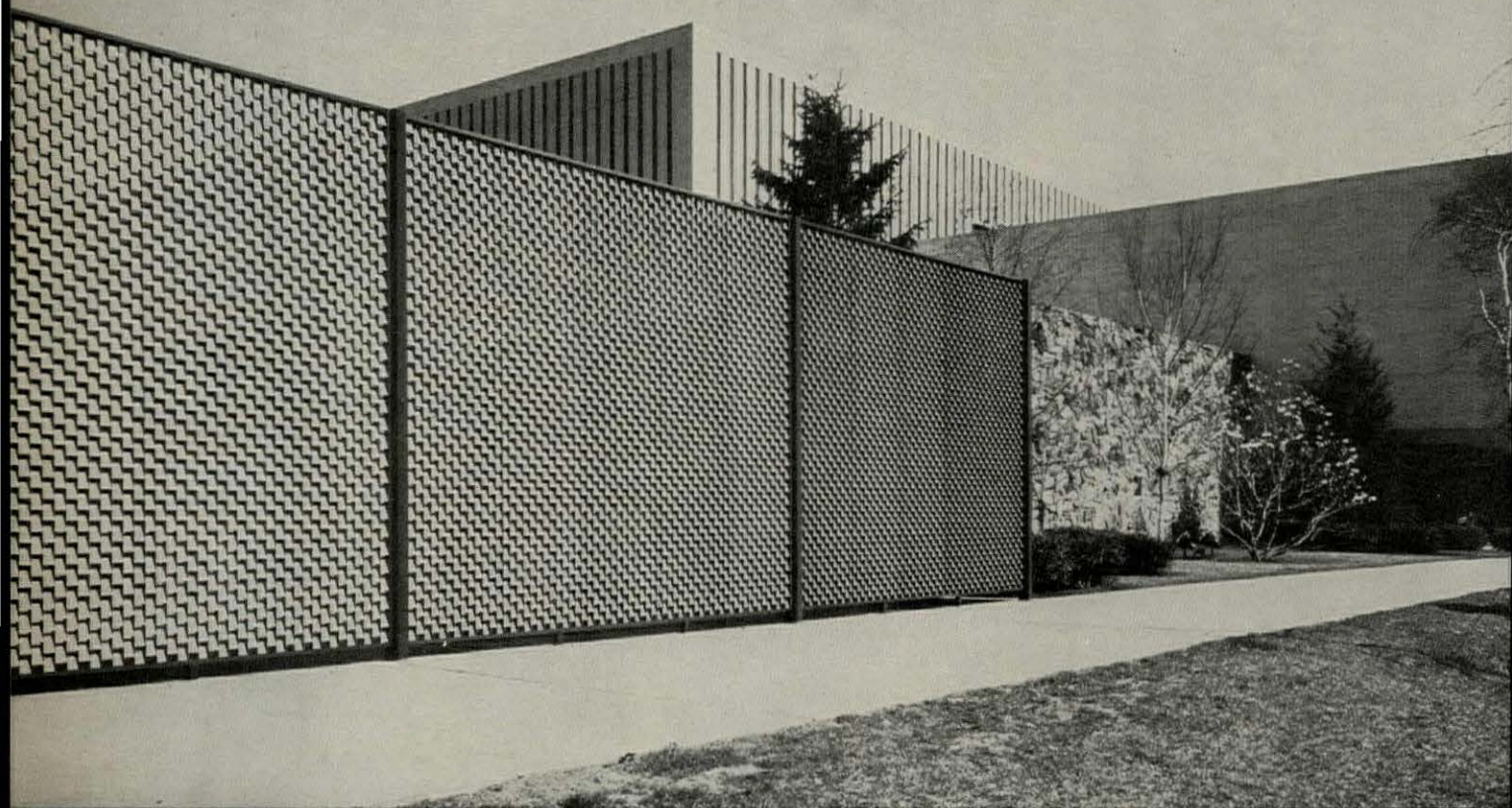
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Architect: Abbott, Merkt & Co., New York City

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Shown above: Custom-designed Borden Deca-Grid panels with tilted spacers, used to separate and screen the service area at Saks in Garden City, Long Island.

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GSA makes key staff changes; names design advisory panels

arel Yasko, who has been Assistant Commissioner for Design and (earlier) Assistant Commissioner for Design and Construction for the Public Buildings Service of the General Services Administration, Washington, D.C., has been named Special Assistant to the Commissioner of the Public Buildings Service.

Succeeding Mr. Yasko is architect Leonard L. Hunter, his immediate predecessor as Assistant Commissioner for Design and Construction, who will once again hold that title. When he resigned in 1962 to become a partner in John Carl Varnecke and Associates in San Francisco, Mr. Hunter had been associated with the Public Buildings Service of the GSA and its predecessor organizations since 1934 (except for military service in World War II).

In his newly created post, Mr. Yasko is free of major administrative responsibilities so that he can devote all of his time to design problems, and as an important part of his new assignment, he becomes the Staff Director of GSA's

Public Advisory Panel for Architectural Services.

The Public Advisory Panel is made up of two sections: a national panel which will advise GSA's Washington office, and 10 regional panels, which will advise GSA's regional offices. The national panel was instituted in 1965 and 17 members served one-year terms last year. Regional panels are new this year. Like last year's panel, members of this year's panels will get no pay except transportation expenses and \$25 per diem.

A list of the new national panel and the 10 newly instituted panels follows:

National Panel: Architects Lathrop Douglass, New York; Herbert Swinburne, Philadelphia; Robert Little, Miami; Harry Weese, Chicago; Sol King, Detroit; Harold Spitznagel, Sioux Falls, South Dakota; Ralph Rapson, Minneapolis; William Caudill, Houston; Nathaniel Curtis, Jr., New Orleans; Vernon DeMars, Berkeley, California; and Carl Feiss, Washington, D.C.; structural engineer Lev Zetlin, New York; and mechanical and electrical engineer Michael Pope, New York and Washington, D.C.

Boston Regional Panel: Hugh Stubbins, Cambridge, Massachusetts; Norman Fletcher,

Cambridge; and Thorne Sherwood, Stamford, Connecticut.

New York City Regional Panel: Simon Breines, New York; Roy F. Larson, Philadelphia; and Donald Faragher, Rochester, New York.

Washington, D.C., Regional Panel: David Yerkes, Washington, D.C.; Marcellus Wright, Richmond, Virginia; and John McLeod, Washington, D.C.

Atlanta Regional Panel: A. L. Aydelott, Memphis; Richard Aeck, Atlanta; and Robert Levison, Clearwater, Florida.

Chicago Regional Panel: Bruce Graham, Chicago; Peter Tarapata, Bloomfield Hills, Michigan; and John Noble Richards, Toledo.

Kansas City Regional Panel: Robert Cerney, Minneapolis; Harris Armstrong, Kirkwood, Missouri; Hari Van Hoefen, St. Louis; and Angus McCallum, Kansas City.

Fort Worth, Texas, Regional Panel: John Desmond, Baton Rouge, Louisiana; E. Davis Wilcox, Tyler, Texas; and mechanical engineer Alwyn Koehler, Houston.

Denver Regional Panel: Victor Hornbein, Denver; Fred Markham, Provo, Utah; and Frederick H. Porter, Cheyenne, Wyoming.

San Francisco Regional Panel: Welton Becket, Los Angeles; William Stephen Allen, Jr., San Francisco; and Frank L. Hope, Jr., San Diego.

Auburn, Washington, Regional Panel: Paul Kirk, Seattle; Perry B. Johanson, Seattle; and John R. Culler, Spokane, Washington.

HUD names seven Regional Advisory Committees

Seven Regional Advisory Committees on Design and Planning have been named, one for each of the regional offices of the Department of Housing and Urban Development. Each of the committees will be composed of four representatives of the design professions—an architect, a landscape architect, a planner and an engineer—with a HUD administrator acting as chairman of each committee.

The committees will advise the regional administrators on ways to encourage and give recognition to good design on a continuing basis in all HUD programs. Commenting on the regional committees, architect George T. Rockwell, Adviser to HUD Secretary Weaver on design, said: "We hope to transform the concerns of the design professionals to more direct impact on the Federal, State and local people who are rebuilding our cities."

Serving on the committees are:

New York Regional Office: Ulrich Franzen, architect, New York; Kevin Lynch, planner,

Cambridge, Massachusetts; Hideo Sasaki, landscape architect, Watertown, Massachusetts; and George H. Leland, engineer, Newark.

Philadelphia Regional Office: George W. Qualls, architect, Philadelphia; David A. Wallace, planner, Philadelphia; George E. Patton, landscape architect, Philadelphia; and James A. Romano, engineer, Harrisburg, Pennsylvania.

Atlanta Regional Office: James H. Finch, architect, Atlanta; Andrew E. Steiner, planner, Atlanta; Hubert B. Owens, landscape architect, Athens, Georgia; and Clarence R. Jones, engineer, Augusta, Georgia.

Chicago Regional Office: Matthew L. Rockwell, architect, Chicago; Charles A. Blessing, planner, Detroit; Eldridge H. Lovelace, landscape architect, St. Louis; and Robert B. Richards, engineer, Chicago.

Fort Worth Regional Office: E. G. Hamilton, architect, Dallas; Samuel B. Zisman, planner, San Antonio; Robert M. O'Donnell, landscape architect, Denver; and T. Carr Forrest, Jr., engineer, Dallas.

San Francisco Regional Office: Donald L. Hardison, architect, Richmond, California; Sidney H. Williams, planner, San Francisco; Robert N. Royston, landscape architect, San Francisco; and Leo W. Ruth, Jr., engineer, San Jose.

Puerto Rico Regional Office: Osvaldo L. Toro, architect, Santurce, Puerto Rico; Frank A. Molther, planner, Rio Piedras, Puerto Rico; Hunter Randolph, landscape architect, Santurce; and Octavio R. Picon, engineer, Santurce.

A.I.A. elects 82 Fellows and Honorary Fellows

Eighty-two members of The American Institute of Architects have been elevated to the rank of Fellow, bringing the total membership of the College of Fellows to 762. Investiture will take place at the annual banquet and ball at the A.I.A. convention in New York City on May 18. Serving on the Jury of Fellows were the following Fellows of the Institute: Paul R. Hunter, Los Angeles, chairman; Clinton E. Brush III, Nashville, Tennessee; Joseph D. Murphy, St. Louis; Reginald H. Roberts, San Antonio; William J. Bachman, Hammond, Indiana; and Clinton Gamble, Fort Lauderdale, Florida.

Five foreign architects have been named Honorary Fellows of the A.I.A., bringing the total number of Honorary Fellows to 131. Their investiture will also take place at the convention on May 18. The honor is bestowed by the A.I.A.'s Board of Directors upon "architects of esteemed character and distinguished achievement who are not citizens of the

United States and do not practice within the domain of the Institute."

A list of the new Fellows elected in all categories, including Honorary Fellows, follows:

Design and Service to the Profession: Allen J. Strang, Madison, Wisconsin.

Design and Education: Simon B. Zelnik, New York

Design and Literature: Isadore Rosenfield, New York, and Edward A. Sovik, Northfield, Minnesota.

Design and Public Service: Kenneth W. Brooks, Spokane, Washington, and Edwin B. Cromwell, Little Rock, Arkansas.

Design: Ralph A. Anderson Jr., Houston; Alexander H. Bacci, Chicago; Frederick F. Bassetti, Seattle; Preston M. Bolton, Houston; Simon Breines, New York; David H. Condon, Washington, D.C.; Edward D. Dart, Chicago; John J. Desmond, Hammond, Louisiana; Philmer J. Ellerbrog, Newport Beach, California; Miguel Rincon Ferrer, Santurce, Puerto Rico; Robert L. Geddes, Philadelphia; Charles B. Genter, Chicago; Mark G. Hampton, Tampa, Florida; Victorine du Pont Homsey, Wilmington, Delaware; Charles E. King, St. Louis; Victor A. Lundy, New

York; Edward A. Moulthrop, Atlanta; George Nemeny, New York; Walter A. Netsch, Chicago; Charles H. Richter Jr., Baltimore; Nicholas Satterlee, Washington, D.C.; Osvaldo L. Toro, Santurce, Puerto Rico; and Louis M. Wolff, Columbia, South Carolina.

Service to the Profession and Public Service: W. J. Evans, Baton Rouge, Louisiana; Willard S. Hahn, Allentown, Pennsylvania; George N. Hall, Gary, Indiana; Hugh McK. Jones Jr., Guilford, Connecticut; Donald H. Lutes, Springfield, Oregon; Burton Rockwell, San Francisco; and Archibald C. Rogers, Baltimore.

Service to the Profession and Science of Construction: Grayson Gill, Dallas.

Service to the Profession: Alfred S. Alschuler Jr., Chicago; Rex L. Becker, St. Louis; Charles H. Burge, Montebello, California; Albert M. Dreyfuss, Sacramento; Theodore L. Eschweiler, Milwaukee (posthumous); R. Rea Esgar, Chicago (posthumous); Albert L. Haskins Jr., Raleigh, North Carolina; Frederick H. Hobbs Jr., Columbus, Ohio; Charles S. Ingham, Pittsburgh; J. Yandell Johnson, Little Rock, Arkansas; Edward A. Kane, Edwardsville, Illinois; George E. Kassabaum, St. Louis; Robert H. Levison, Clearwater, Florida; Grinnell W. Locke, Baltimore; Chris R. Maiwald, Moline, Illinois; Julius S. Sandstedt, Oshkosh, Wisconsin; George F. Schatz, Cincinnati; Walter Scholer Jr., Lafayette, Indiana;

Adolph R. Scrimenti, Somerville, New Jersey; Harry W. Seckel, Honolulu; Bruce H. Smith, Royal Oak, Michigan; Herbert L. Smith III, Norfolk, Virginia; J. Rowland Snyder, Washington, D.C.; Walter H. Sobel, Chicago; Mace Tungka Jr., Houston; Gordon Wittenberg, Little Rock, Arkansas; and Hachiro Yuasa, Berkeley, California.

Public Service: Albert B. Bauer, New York; George D. Brown Jr., New York; M. Dwight Brown, Kansas City, Missouri; John Lane Evar, Philadelphia; Max Flatow, Albuquerque; Michael Goodman, Berkeley, California; Lester C. Haas, Shreveport, Louisiana; Clarence Kivett, Kansas City, Missouri; Stephen H. Richards, Seattle; and T. Trip Russell, Miami.

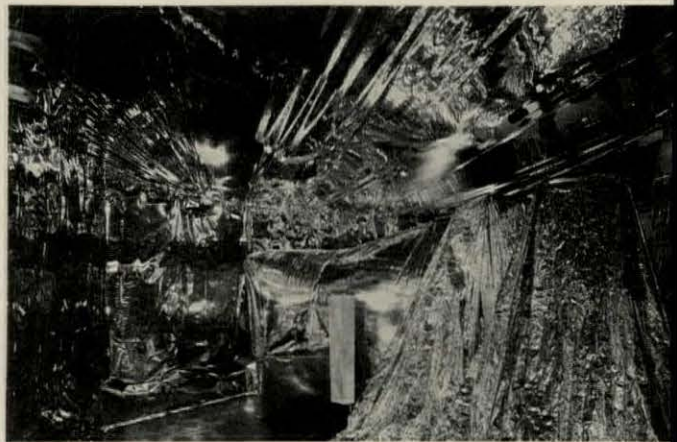
Education: George E. Danforth, Chicago; Carl Larson, Ann Arbor, Michigan; Joseph F. Minto, Kent, Ohio; and Linus Burr Smith, Lincoln, Nebraska.

Literature: Alan Burnham, New York, and Noverre Musson, Columbus, Ohio.

Literature and Education: Buford Pickens, Louis.

Science of Construction: Charles F. Ward, Philadelphia.

Honorary Fellows: Alfred V. Alvares, Hong Kong; Viscount Esher, London; Charles Fowl, Halifax, Nova Scotia; Junzo Sakakura, Tokyo; and Karl Schwanzer, Vienna.



Architectural League acts to broaden membership and activities

The 86-year-old Architectural League of New York last month voted to re-organize membership classifications, change its dues structure, and add vice presidents for "industrial design" and "urban design" to the list of vice presidents already established in its bylaws for architecture, sculpture, landscape architecture, design and crafts, engineering, and mural painting.

Under the leadership of architect Ulrich Franzen, who at the same time was elected to his second term as president, the League has created a new category of "associate member" (to include non-resident members) at an annual dues fee of \$25. It is hoped that this new category will attract many new members from all over the country. Associate members, who can be laymen as well as design professionals, are eligible for all activities of the League except that they may not vote or hold office.

"Active members" (resident profes-

sionals) who alone may vote and hold office, had their dues reduced from \$100 to \$75 (if over 35 years of age) and \$35 (for those under age 35).

Current activities of the League in keeping with its continuing purpose "to quicken and encourage the development of architecture and its allied arts" are:

- The presentation of the Michael Friedsam Medal to Walter Hoving, chairman of Tiffany & Company, New York. The Friedsam Medal is given "to provide a special means of recognition by the League of persons outside the profession of architecture and the arts who have exerted a most potent influence in promoting the development of art."

- An exhibition of architectural renderings, organized by architect Minor Bishop, and the presentation of the League's annual Birch Burdette Long Memorial Prize for architectural rendering to Zvonimir S. Tesla for his ink and airbrush drawing (above left) for a proposed

bridge over Baltimore's inner harbor, designed by Lev Zetlin & Associates, structural engineers.

- Environment III: Slipcover (picture above right, as it was installed at The Art Gallery of Ontario, Toronto, last fall), "place" by Les Levine, a young Canadian artist, which is a most unusual, highly experimental, and rather "psychedelic" exhibition planned to coincide with the national A.I.A. convention in New York. In the exhibition, which opened April 2 and continues through May 22, the walls, ceilings and floors of the three-room gallery are covered by a mirror-finished metalized polyester film. Eight huge expandable walls fill large areas of the rooms at programmed intervals, while carousel slide projectors continuously show architectural slides, various solid color slides and images of the art within the undulating environment, a closed circuit television system brings the outside environment into the gallery.

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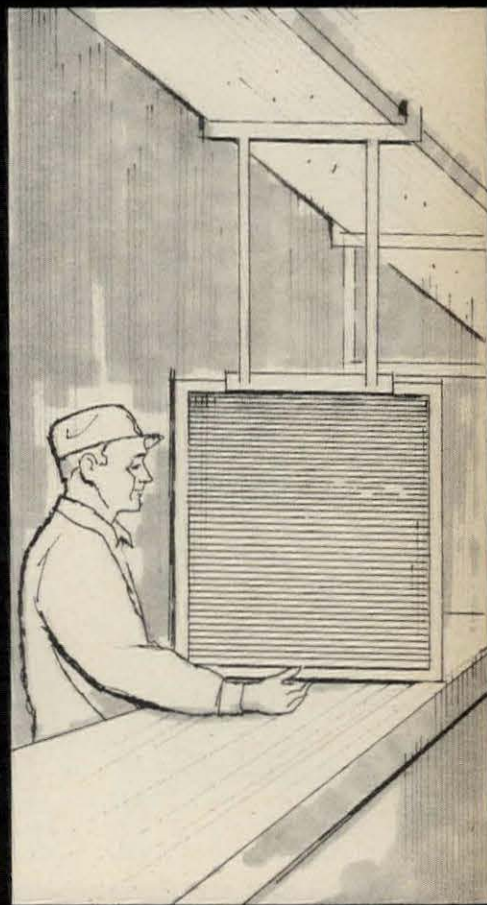
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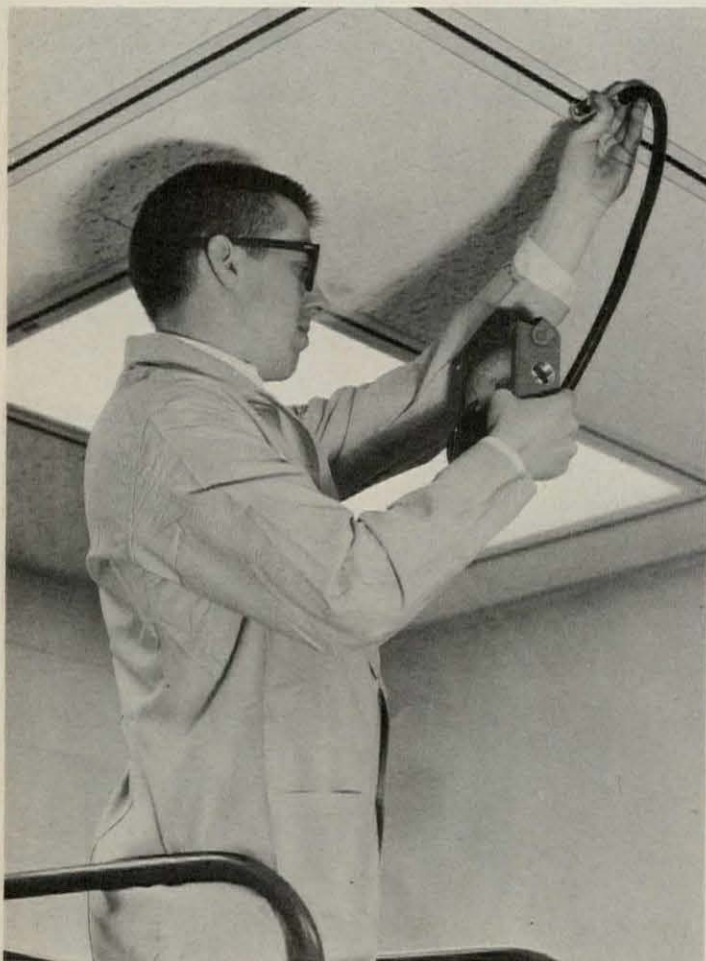
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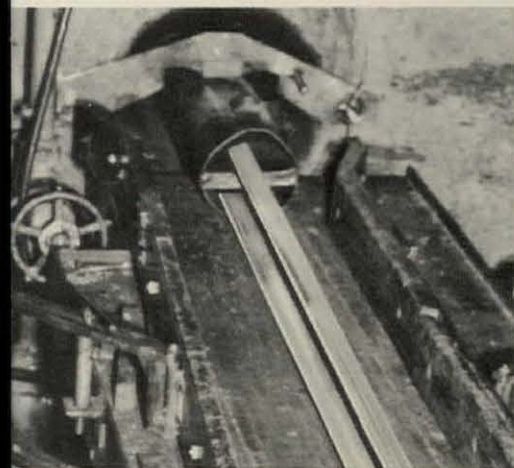
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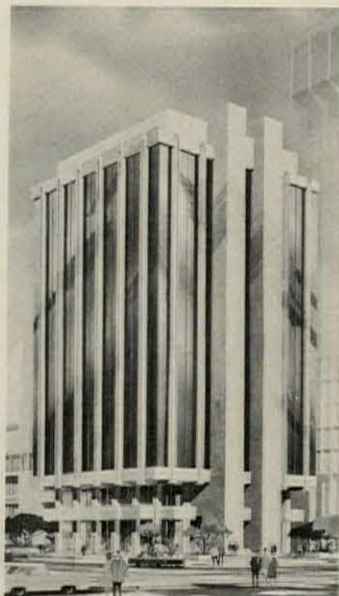
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BUILDINGS IN THE NEWS



Camera Hawaii photos

The Financial Plaza of The Pacific, Honolulu, designed by Leo S. Wou and Victor Gruen Associates, associated architects, will consist of three buildings—a six-story bank connected by a bridge to a 21-story tower (see rendering far left), and a 12-story tower (see rendering far right)—set in a landscaped plaza. The bank will have 32 teller windows and four collection windows as well as a subterranean vault located below a parking garage. The office towers will contain 288,905 and 68,686 square feet. All of the buildings in the complex will have exposed aggregate concrete exteriors with dark bronze anodized aluminum trim. Developers for the complex, which will include a condominium and cost \$20 million, are Oceanic Properties Inc. Landscape architect is Lawrence Halprin & Associates, and general contractors are Hawaiian Dredging and Construction Company in a joint venture with Pacific Construction Company and Swinerton & Walberg Company.

A mosque for Mecca in Saudi Arabia, the competition winning design by German architects Frei Otto and Rolf Gutbrod, will provide a variety of facilities arranged around four artificial oases, with the entire project to be topped with a tent roof made of rope mesh covered by aluminum. The facility will provide a mosque, congress assembly room, meeting rooms, restaurant, administration buildings, apartments, a semi-circular hotel with 200 guest rooms, and parking facilities.

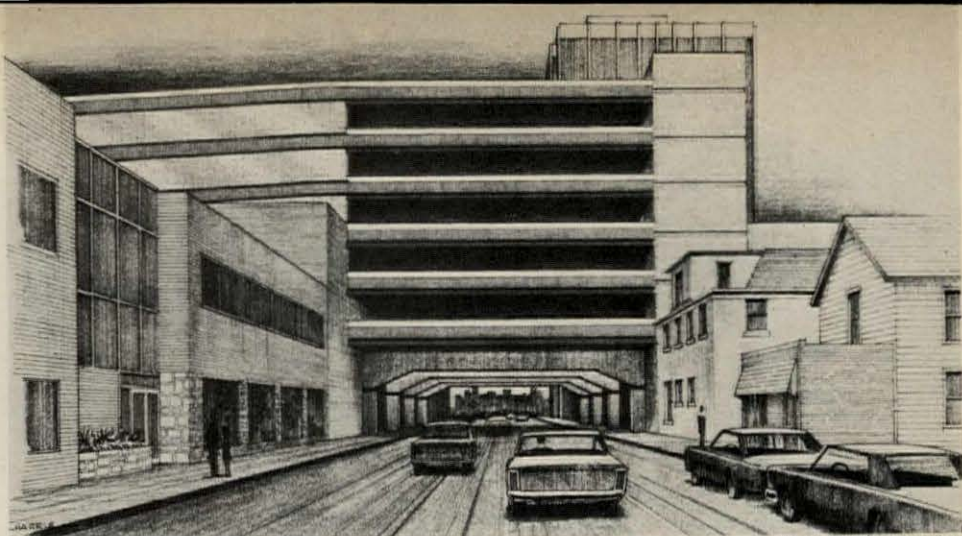


D.P.A. Pictorial

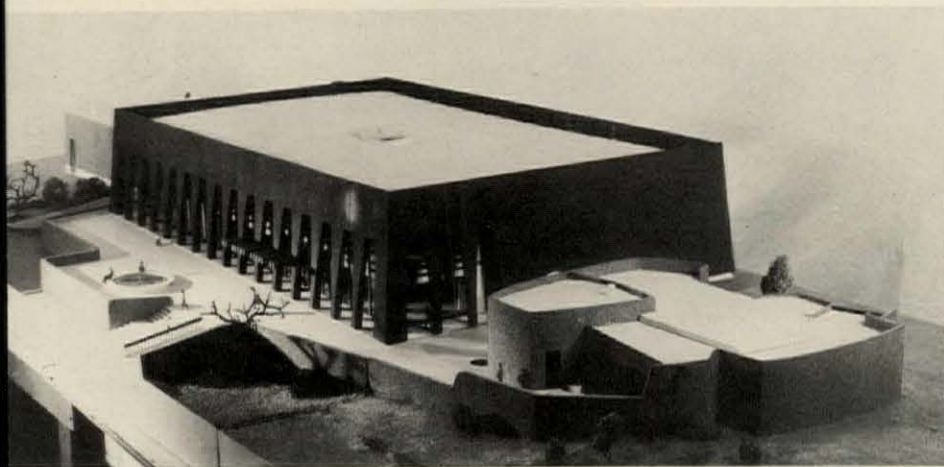


A Broadcast House for KIRO television and radio, Seattle, designed by Fred Bassetti Company, J. William Dimmich, partner in charge, will have a landscaped drive-in entrance creating a park-like setting for the building. The 85,000-square-foot structure will have a lobby and reception area, radio studios, two large television studios with public viewing rooms and a smaller executive studio on the first floor. The second floor will contain offices, conference rooms, operational and technical areas for television, and a staff lunch room. Large expanses of glass on the facade will denote office areas with solid massive walls for the television studios. General contractor is Howard S. Wright Construction Company.

Municipal parking garage in Ann Arbor, Michigan, designed by O'Dell, Hewlett and Luckenbach, Inc., will utilize air rights over private property and a city street. The multi-level structure will provide 300 parking spaces. The garage will extend over a private store, utilizing the structural frame of the store as its base. Entrance and exit to the new building will be from an existing city parking structure opposite the store. Cost of the project will be \$1,014,694.



Lens-Art Photographer

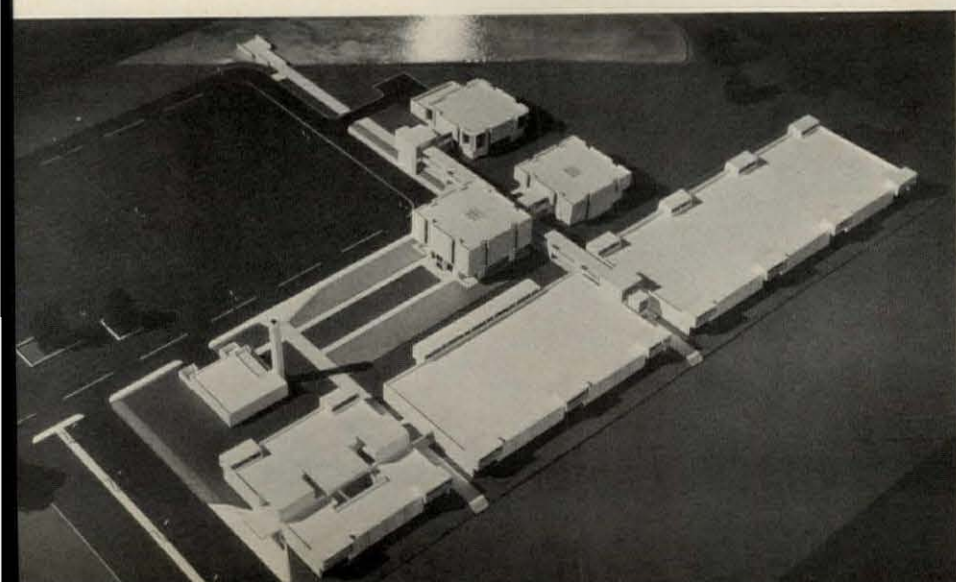


A library complex for the College of Santa Fe, New Mexico, designed by Philippe Register, will consist of three buildings: a forum building containing 4,100 square feet and seating 178, which will serve as a lecture center for the campus and community (left), a three-level library containing stack space for 250,000 volumes, lounges, offices and related services (center) and a Southwest Collection Annex to house reference material and memorabilia of the Southwest. The project, of concrete and native stone construction, will cost \$1.35 million.

The Provident Federal Savings and Loan building, Redlands, California, designed by Clinton Marr, is one of six projects in Riverside-San Bernardino Counties to be honored for "creative use of concrete" in an awards program co-sponsored by the Portland Cement Association and the San Bernardino-Riverside Counties Rock Products Association. The winning bank has eight tilt-up T-shaped concrete panels, separated by slot windows, forming the walls, and a folded plate roof of thin-shell concrete. Structural engineers were Johnson & Nielsen, and the general contractor was Forsberg & Gregory.



Robert C. Cleveland



The Shelby County State Technical Institute, Tennessee, designed by the Wadlington-Marshall Architectural Office, will be a seven-building complex mainly constructed of tilt up concrete panels and poured-in-place concrete. The complex will include an administration building with 20 faculty offices, another building with 30 faculty offices and lounge, two classroom-and-laboratory buildings, a building containing cafeteria and student lounge, a library, and a building housing mechanical equipment. Total cost of the complex, which will contain 100,600 square feet, will be \$1,661,300.

The Episcopal Church of the Crucifixion in Harlem, New York City, designed by Costas G. Machlouzarides, will have sloping barrel-vaulted walls, with each curved wall containing a separate element of the church—the baptistry, the shrine, a chapel, and the altar. The white concrete structure will sit on a platform of gray granite over the foundations of the original church, which was destroyed by fire in 1963. Located in the basement will be a parish center containing a stage, dressing rooms, kitchen, and classrooms. The church will seat 350 and will cost \$500,000.



A chapel and parish hall for the Malibu Methodist Church, Malibu, California, designed by Richard Dorman & Associates, is the first phase of construction for a complex which will also include a church seating 300 people and a bell tower. The chapel, which seats 125, has wood-stud construction with exposed glue laminated beams and a finished cedar ceiling. The walls are of heavy-textured plaster and wood. Two main factors influenced the planning of the complex: "the complete separation of the worship area from the rooms designed for secular use and placement of the buildings on a series of elevations to take full advantage of the ocean view." General contractor was the Robert Reeves Construction Company.

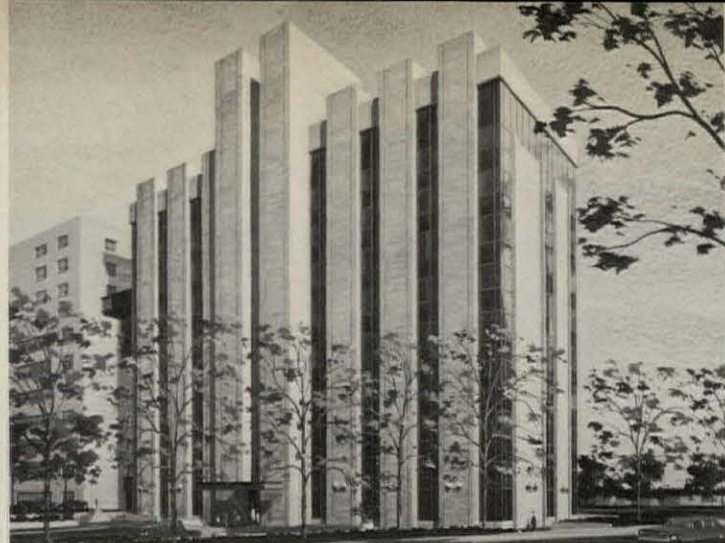


An addition to the William A. Hewitt Residence, Rock Island, Illinois, designed by Lundeen & Toline, has won the first honor award in a biennial design awards program sponsored by the Western Illinois Chapter and the Eastern Section of the Iowa Chapter of the American Institute of Architects. The addition is an outdoor living facility including a veranda, swimming pool and bath house-sauna, and was praised by the jury as "an outstanding project in every way. The elements were well studied in composition and relation to the existing residence. It showed excellence in scale and beautiful detailing."

H. K. Williams Company

The First Baptist Church, Moline, Illinois, designed by Swanson & Maiwald, was one of four projects given a merit award in the Western Illinois award program. The jury praised the project as "a very well studied one and an excellent solution to church programming, particularly in view of the excellent desires of the client in respect to the period type of church. . . . The jury felt that the architect had done a good job in terms of lighting and basic interior operation." Serving on the jury were: Ambrose M. Richardson, chairman, A. Richard Williams, and Scott Seaton.





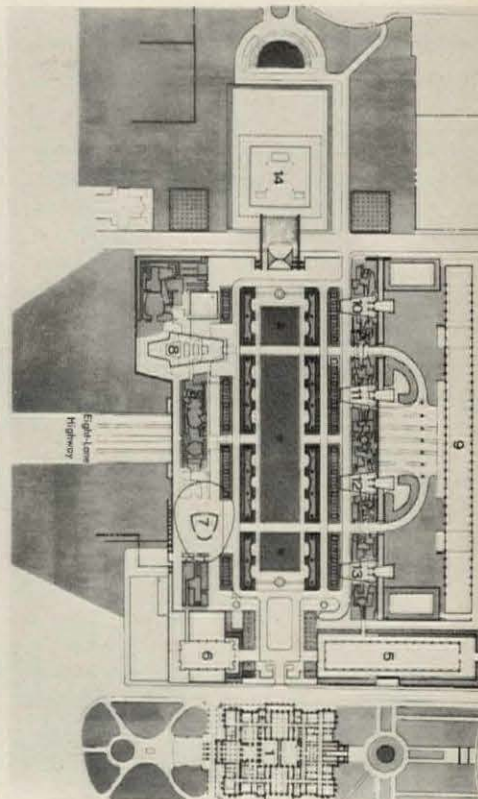
The Rose Fitzgerald Kennedy Center for Research in Mental Retardation and Human Development, Bronx, New York, designed by Pomerance & Breines, will have nine stories and will cost \$8 million. The facility will be used for research and research training in mental retardation and related aspects of human development, with special attention to maternal and child health. General contractors are Starrett Brothers and Eken.

The Century City Medical Plaza, Los Angeles, designed by Daniel, Mann, Johnson and Mendenhall (Cesar Pelli, director of design and A. J. Lumsden, assistant director of design), will consist in its first stage of a 17-story medical office tower having 200,000 square feet, and a one-story commercial facility housing a pharmacy, restaurants, and lounge, all located on a plaza covering the whole site. The second stage will consist of four floors of additional office space situated atop the commercial building. The buildings will have an exterior of gray glass windows and spandrels with dark gray mullions. General contractors are the William J. Moran Company in joint venture with the Wilsen Construction and Development Corporation.

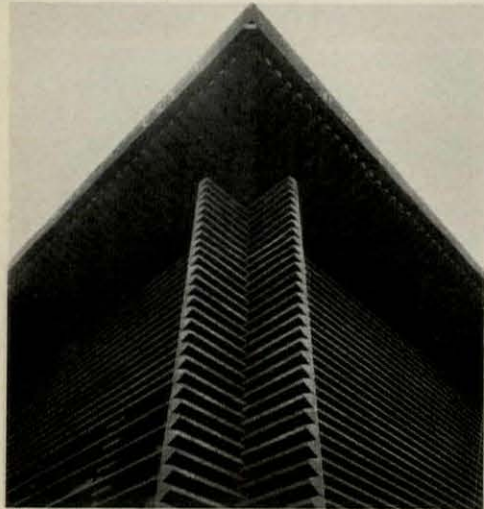


The South Mall project in Albany, New York, will place 10 new structures, integrated with existing buildings, along a four-story elevated plaza having an area of 2.8-million square feet. The project, which will cost \$480 million, will include a 43-story trapezoidal office tower containing 572,000 square feet of office space; four identical 23-story trapezoidal agency buildings, each having a gross floor area of 180,000 square feet; the Swan Street Building, five floors above grade, 1,174 feet long and 98 feet wide, with a gross area of

800,000 square feet; a nine-story justice building containing 240,000 square feet; a cultural center containing approximately 1 million square feet; a nine-story legislative building; and a bowl-shaped meeting center housing a 900-seat auditorium and a 500-seat meeting hall. Architectural credits include: Harrison & Abramovitz, coordinating architects; Carson, Lundin & Shaw, Swan Street Building; James & Meadows & Howard, legislative building; Sargent Crenshaw & Folley, Justice Building.



Key: 1. State Capitol (existing); 3. Alfred E. Smith State Office Building (existing); 5. legislative office building; 6. justice building; 7. meeting center; 8. 43-story office tower; 9. Swan Street Building; 10, 11, 12, and 13. 23-story agency buildings; and 14. cultural center. Buildings 2, 4 and 15 (not shown) are existing buildings that rim the site.

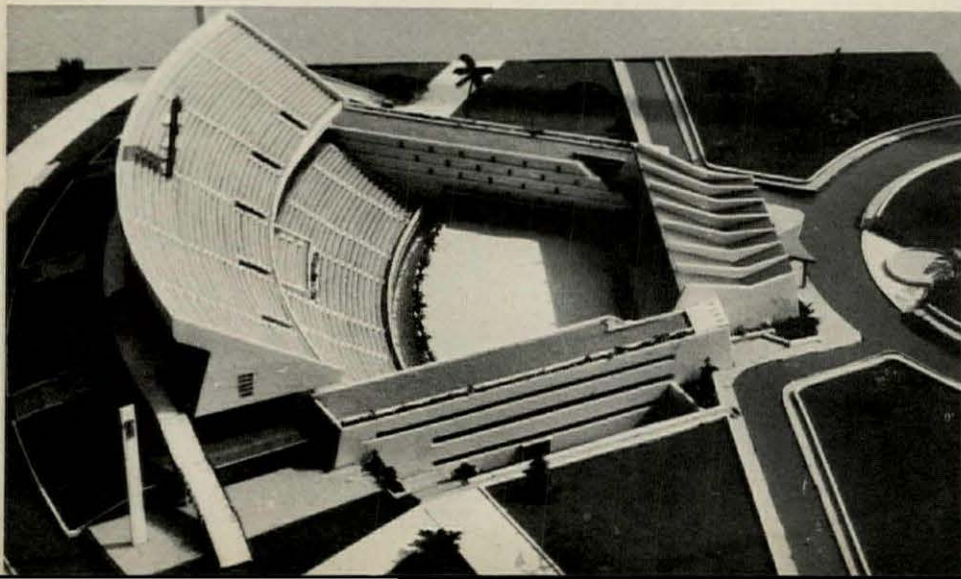


The National Theater of Japan, Tokyo, designed by Hiroyuke Iwamoto and 13 members of the Takenaka design department, utilizes traditional Japanese architectural concepts but instead of wooden logs, uses precast concrete beams which were sandblasted and then coated to simulate lumber(!). The building contains two theaters: the main theater seating 1,746, designed for kabuki performances; and a small stage and auditorium seating 630 for classical Japanese puppet plays and other events. The stage in the main theater is more than twice the size of the seating area and has a 72-foot-wide proscenium and a revolving turntable 66 feet in diameter. Twenty-four dressing rooms serve the main theater and seven dressing rooms serve the smaller one. General contractor was Takenaka Komuten Company, Ltd.

A foreign office building in Brasilia, designed by Oscar Neimeyer, consists of a three-story rectangular building which will house a minister's office and large rooms for receptions and official entertaining, and an eight-story administration building not yet built. The completed building has three stories and is surrounded by water. Access to the building is by ramps over the water. The building is surrounded and covered by a columned arched structure supporting a concrete slab roof. There are 56 arches surrounding the building, and the top floor is a 118-foot free-span area reinforced by 4-foot reinforced concrete beams. The water gardens surrounding the building are designed by landscape architect Roberto Burle-Marx.



Fotografias De Todo O Bra



An open-air athletic hall at Nasser City, near Cairo, Egypt, designed by Salah Zeitoun, will be used for games such as tennis, boxing, handball and basketball, as well as for concerts and theatrical events. The \$3-million concrete building, now under construction, has a stage at one end flanked by three-story side wings containing dressing rooms. The stage will have a proscenium width of 120 feet and a depth of 60 feet. The facility will seat 12,000—4,000 in the lower tier, 6,000 on the upper tier and 2,000 on the ground.

YORK EQUIPMENT--AND THERMOCYCLE SYSTEM--ASSURE LOW-COST COMFORT FOR SPERRY RAND BLDG.



Sperry Rand Building, 1290 Avenue of the Americas, New York City, is completely air conditioned by York equipment. Chilled water for cooling is supplied by two York Turbomaster centrifugal machines; 3,500 York Hi-I induction units distribute the tempered air. The advantageous THERMOCYCLE system was added recently to provide maximum operating economy. Owner, Rock-Uris, Inc.; Builder, Uris Buildings Corp.; Architect, Emery Roth & Sons; Mechanical Engineer, Jaros, Baum & Bolles; Mechanical Contractor, H. Sand & Co., Inc.

In buildings like this modern high-rise structure, a new development in air conditioning has attracted the attention of leading architects, consulting engineers, contractors—and building owners. Known as "THERMOCYCLE," and developed by THERMOCYCLE, Inc., this innovation is designed to effect operating economies. Owners have reported the system is quickly paying for itself. In one major New York building, the owner has recovered 85% of his investment in 12 months. In a short time, these savings will represent a net gain in the building's profitability.

The THERMOCYCLE system may be installed in new or existing buildings, and modification of present equipment is minor. In the case of new buildings, the THERMOCYCLE system is available as standard equipment and as such can be more economically installed.

Want more facts on the new THERMOCYCLE system? Just call your nearby York Sales Office. Or write York Corporation, York, Pennsylvania 17405.

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60 Broad Street 350 Park Ave.	

YOU CAN DEPEND ON YORK

YORK

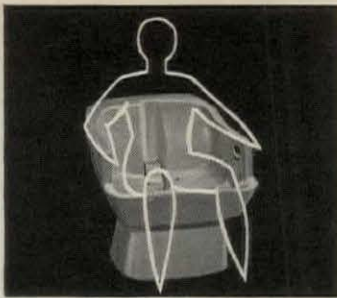
air conditioning
and refrigeration

BORG **WARNER**

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**This revolutionary
Perineal Bath
provides new comfort and
cleanliness...makes all
sitz baths obsolete**





The revolutionary new Perineal Bath† is designed to fit the patient. He sits in an unstrained, natural position at chair height. Arms and

back are supported, and both feet are planted firmly on the floor. He can usually enter and leave without help. He is bathed in clean, constantly changing water of pre-selected temperature.



The now-obsolete sitz bath makes the patient fit himself to the shape of the tub. He squats awkwardly and insecurely, with

his knees higher than his body. There is little support for his back or arms. He must usually be helped in and out. Unless attended, the patient ends his bath in cold, dirty water.

Now, for the first time, maternity-ward patients—and post-operative patients in gynecology, urology and proctology—can bathe in comfort and security. In clean, tempered, constantly changing water, providing maximum wet-heat effectiveness. Without the constant attention of a nurse. This revolutionary new American-Standard Perineal Bath does away with all the awkwardness and indignities that make old-fashioned sitz bathing so distasteful.

Provides armchair comfort. The new Perineal Bath has the back, arms and contoured seat of a chair. The patient sits naturally and confidently, with support where needed. The no-strain height makes it easy for him to enter and leave unaided.

Bathes in clean, running water. The patient takes his bath in clean, constantly changing water of pre-selected, even temperature. Water level is also changeable for different needs—so important for hot- or cold-spot treatment.

Minimum supervision required. There is practically no need for lifting or watching. The attendant can perform other duties while the patient is bathing in comfort and security.

A single, sanitary piece. The new Perineal Bath is made of glass-hard vitreous china, the smoothest and least porous of all sanitary surfaces, metal included. Water and water-borne bacteria cannot penetrate it. And it withstands years of repeated cleaning and sanitizing.

Floor-mounted and off-the-floor models. The floor-mounted Perineal Bath is recommended as a quick and easy replacement for present sitz baths. The off-the-floor model is excellent for new facilities.

So specify the American-Standard Perineal Bath, the only fixture that complies with Cornell Report* height, postural and rinsing recommendations for perineal bathing. It's another example of the way American-Standard works to meet hospital and patient needs for specialized fixtures and fittings. For more details, see your American-Standard representative. Or mail the coupon today.

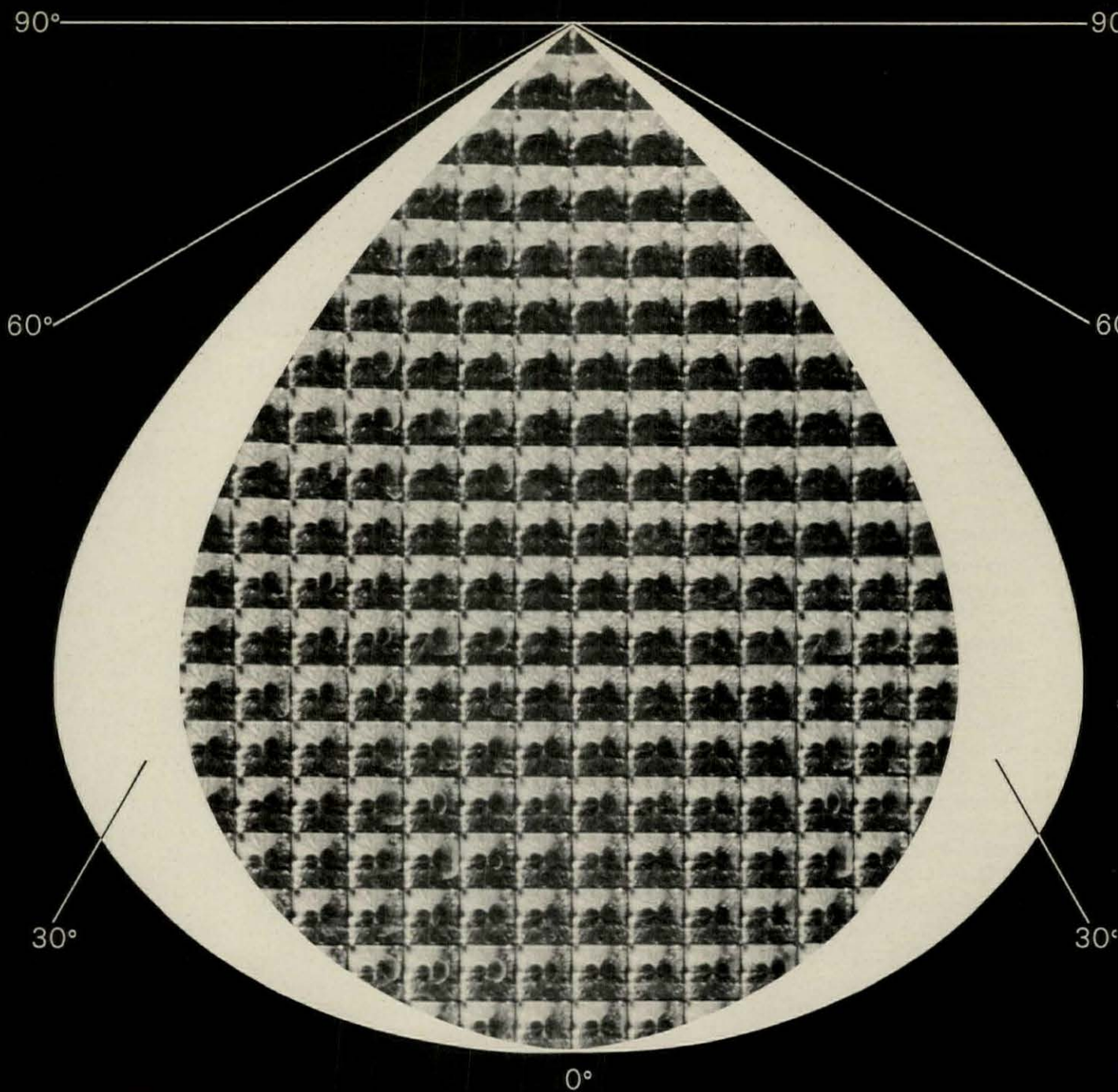
*"The Bathroom," Research Report No. 7, 1966, pp. 50-52 †Patent pending

American-Standard, Dept. PAR-567
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Please send me complete information on your new Perineal Baths.



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Now there's a 4-lamp "scissors curve" lighting panel. K-15 (ST) from K-S-H.

"ST" means Silver Tint. It gives you prismatic brightness control like you've never seen before.

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...he make you specify and the reasons for it should be "board room" sound.

...ny products are all *vogue* on the outside and all *vague* on
...inside. In a unit ventilator this won't do. There must be de-
...n superiority *inside* in addition to a refined and original
...uty on the outside. So don't buy on looks alone. We say
...even though we make the *most beautiful looking* unit. Also,
...ause we put in the most thoughtfully engineered contents.
...don't just take our word for it. Compare. Compare what is

...ffered in relation—and this is very important—to what is
...needed for 40 or more years of trouble-free performance and
...low cost fuel bills. The unit ventilator is the only *permanent*
...fixture in a classroom. It's doubly important then that
...your decisions about 'which make' be truly "board room"
...sound. You can't afford to skimp on this vital equipment.
...Schemenauer Manufacturing Co., Holland, Ohio.

SCHEMENAUER

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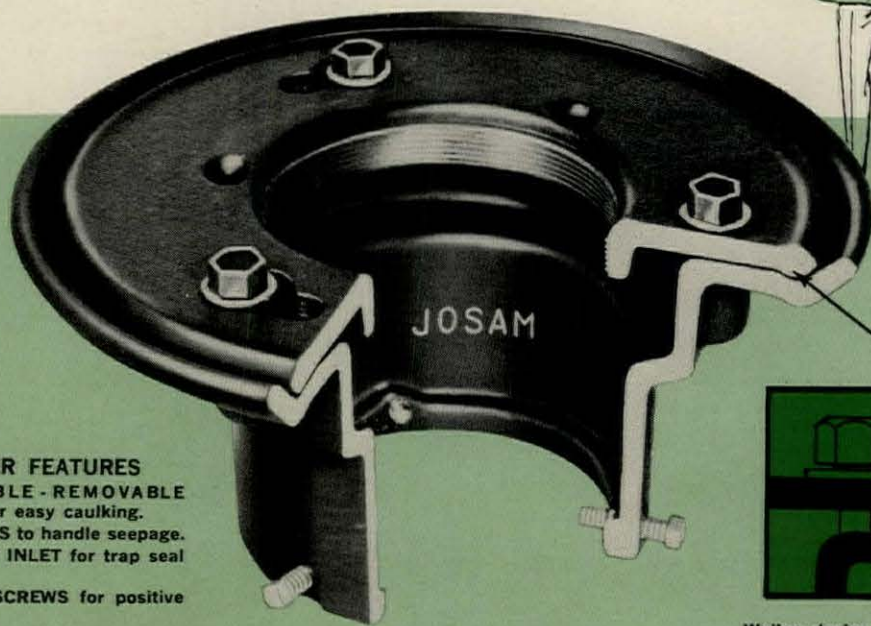
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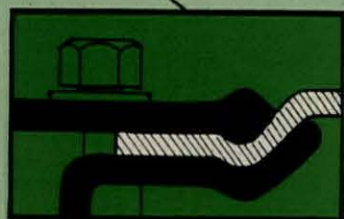
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waterproofing without puncturing to provide a solid bond with drain.

The Josam Super 300— Drain has several important features that provide a superior installation. The Wejloc design on the collar provides a positive NON-PUNCTURING bond of waterproofing to drain. The heavy threaded collar provides a choice of Josam adjustable strainers including the Type ASF Super-Flo strainer (more sanitary, stronger, and drains water faster.) The Super 300— drain is designed to meet the requirements of modern construction. Specify them on every job. Write for Manual TJ today.

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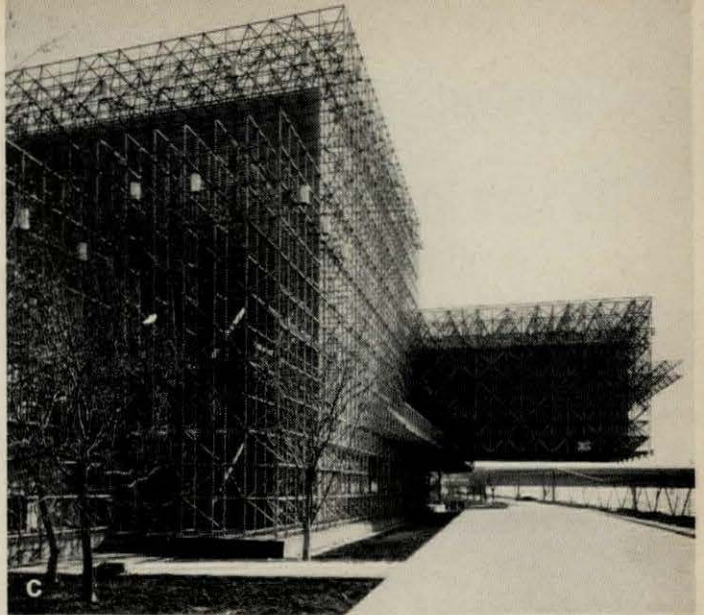
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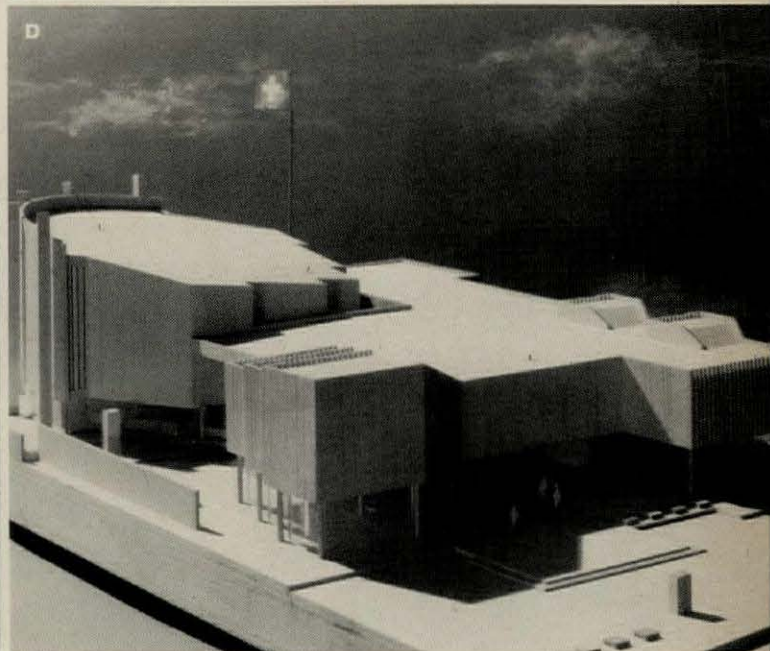
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montgomery[®] moves people at expo67

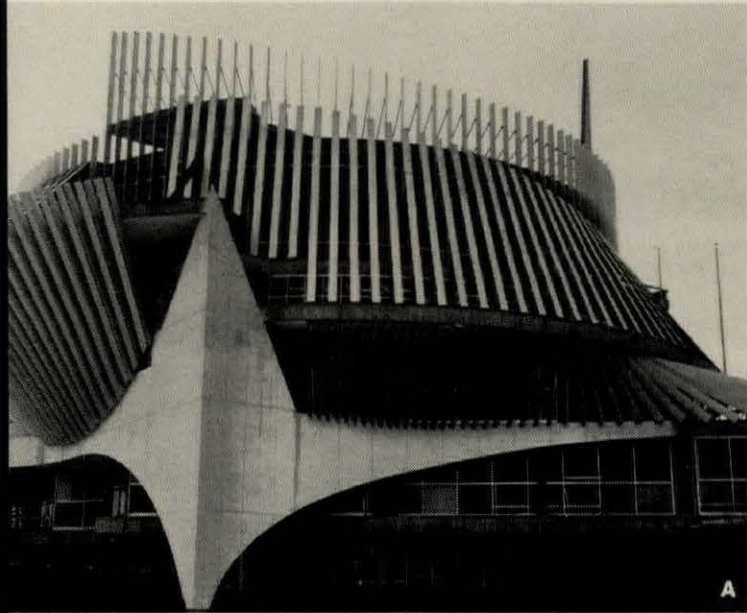
with 26 Montgomery Escalators and 2 Elevators
in 4 buildings and in the mass transit system



C



D



A



B

A. PAVILLON de la FRANCE Designed on the theme of tradition and invention, this unique building is prepared to move people rapidly with six 40" Montgomery Escalators.

B. THE BRITISH PAVILION An exciting group of buildings equipped with four 48" Montgomery Escalators to move people between the several levels.

C. THE NETHERLANDS PAVILION The exterior aluminum space-frame presents an interesting texture. Visitors here will be moved to the cantilevered wings by two 48" Montgomery Escalators.

D. PAVILION OF SWITZERLAND A classic design in exhibition buildings, this structure has two 40" Montgomery Escalators to serve traffic flow.

Not illustrated are the following Montgomery installations at Expo 67:

- ILE VERTE TRANSIT — Four 48" Escalators
- ILE NOTRE DAME TRANSIT — Four 48" Escalators
- MACKAY PIER TRANSIT — One 48" Escalator
- RENDEZVOUS la RONDE — Two 48" Escalators
- PLACE d' ACCUEIL — Two Elevators, One 48" Escalator

The Montgomery Escalator feature of Two-Steps-Level at entry and at exit assures passenger safety, reduces accidents, speeds traffic flow.



Ask us for planning guide on Montgomery Elevators, Escalators, Power Walks & Ramps. Bulletin No.5, 1967.

montgomery[®] elevator company

moline, illinois 61265

ELEVATORS / ESCALATORS / POWER WALKS & RAMPS

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How can you top a great design? With a roof of nickel stainless steel. Flashing and fascia, too.

Stainless steel stays attractive for the life of the buildings you design. Stainless complements other materials. Its permanent luster blends and highlights adjacent colors and textures. It's highly resistant to corrosion in industrial and urban atmospheres. It won't stain or streak adjacent building materials, never needs paint and is virtually maintenance free.

Stainless steel's high strength permits the use of lighter, more economical gauges, making it competitive with other roofing and flashing materials.

Stainless can be easily formed, welded, soldered—is available in a wide range of standard shapes and products.

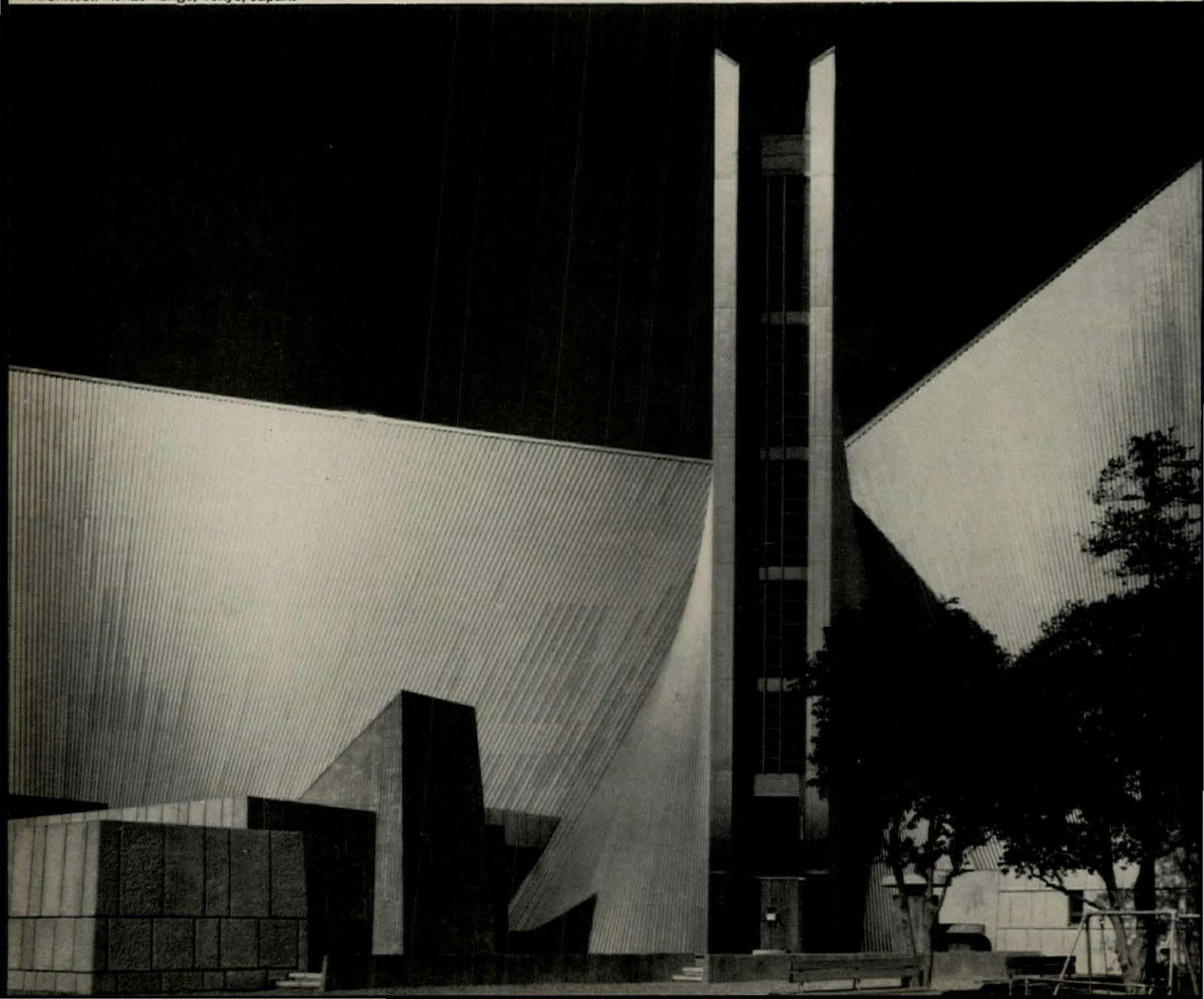
Specify the practical advantages and lifetime beauty of nickel stainless steel roofing, flashing and fascia for your next design. For the same reasons you should also specify competitive stainless curtain walls, windows, doors and hardware.

Write for: "Stainless Steel Data Manual—Suggested Practices for Roofing, Flashing, Copings, Fascia, Gravel Stops, Drainage" and "Suggested Guide Specifications for Stainless Steel Roofing, Flashing and Accessories." The International Nickel Company, Inc., 67 Wall Street, New York, N.Y. 10005.

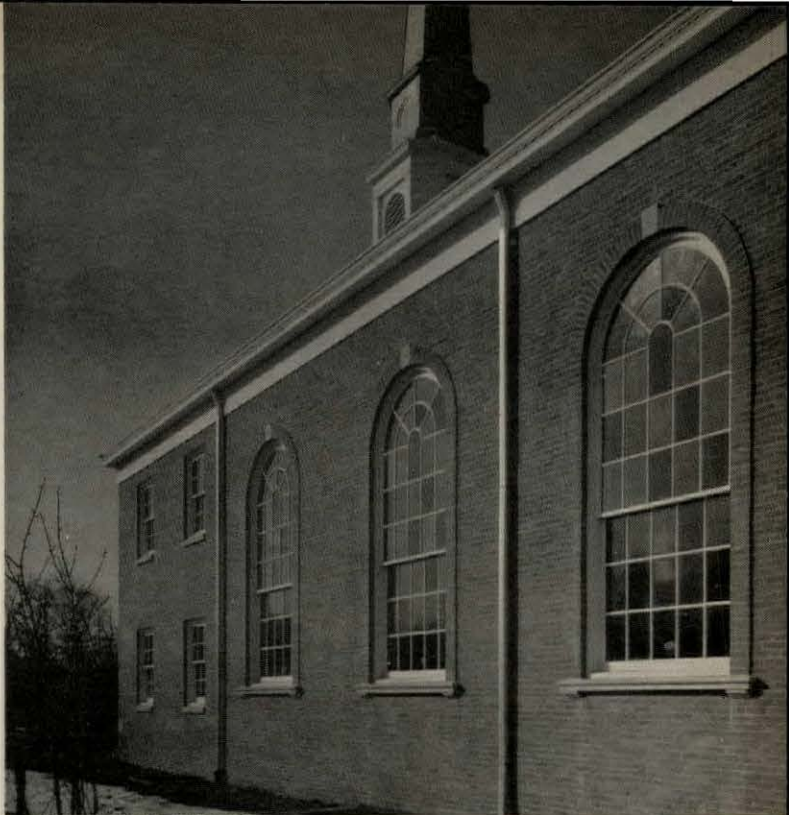
INTERNATIONAL NICKEL

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STAINLESS STEEL ROOF, copings,
flashings, gutters and accessories.
St. Mary's Cathedral, Tokyo, Japan.
Architect: Kenzo Tange, Tokyo, Japan.



STAINLESS STEEL standing seam roof, valley flashing, fascia, gutters and downspouts. The Gold Coast, Maitland, Pa. Architect: Lucian Caste. General Contractor: Caste Development Co. Roofing Contractor: General Roofing Co.



STAINLESS STEEL GUTTERS, downspouts, leaders, valleys and flashings. First Presbyterian Church, Matawan, N. J. Architect: George D. Savage. Roofing Contractor: Schtiler & Plevy.

STAINLESS STEEL VALLEY FLASHING, valley flashing, gutters, downspouts, roof flashing and chimney flashing. Trinity Episcopal Lutheran Church, Latrobe, Pa. Architect: Mansell-McGettigan Co. General Contractor: Pevarnik Brothers. Roofing Contractor: Miller, Gas, Gyekis, Inc.



STAINLESS STEEL FASCIA brightens marquee, with stainless soffit. Kirkeby Center, Los Angeles, Calif. Architects: Claud Beelman and Associates, L. A. Fabricator: Construction Metal Work Co., L. A.



OFFICES OPENED

David W. Dykeman, Jr. and **Charles B. Ogden** announce their new partnership and the opening of their offices, **Dykeman and Ogden, Architects** in the Minor Jones Building, 1712 Pacific Ave., Everett, Wash.

Jerry Grethen, A.I.A. & Associates-Architects have opened an office at 623 Deerfield Rd., Deerfield, Ill.

Joseph J. Mangan, A.I.A., Architect announces the opening of his office at The Pan Am Building, Suite 303 East, 200 Park Ave., New York City.

NEW FIRMS, FIRM CHANGES

John C. Merrick, A.I.A. has been named a senior associate and **Robert C. Spielman** and **William H. Meyer** have been named associates by **William F. Bernbrock, A.I.A., Architects and Engineers**, Fifth Avenue Building, Moline, Ill.

The office of **Ralf E. Decker, A.I.A., Architects** announces a new partnership, **Decker, Kolb & Stansfield, Architects**, 1040 Washington Building, Seattle, Wash.

Charles W. Dennis and **Robert Paul McFarland** have formed a partnership under the firm name **Dennis and McFarland, A.I.A., Architects and Planners**, at 3301 North Main St., Pleasant Hill, Calif. The firm formerly was **Charles W. Dennis and Associates**.

James P. Gray, A.I.A. and **John E. Kuieck, A.I.A.** have become associated with **Bernard J. De Vries, F.A.I.A.** under the firm name **De Vries and Associates-Architects** at 610 Hackley Union National Bank Building, Muskegon, Mich.

Robert J. Drayton, A.I.A. announces that **Frederick B. Lindsay, A.I.A.** has become a partner in the firm **Drayton and Lindsay, Architects** at 101 North Main St., Crystal Lake, Ill.

Laurence Amstadter, Leo D. Chicca, Arnold M. Colantonio, Solomon Krivo and **J. Stewart Stein** have been named vice presidents in the architectural and engineering firm, **A. Epstein and Sons, Inc.** at 2011 W. Pershing Rd., Chicago.

Ronald H. Fanning announces the opening of a new firm, **Fanning and Howey Architects & Engineers** to operate in connection with the firm **Ralph Fanning and Associates**. P.O. Box 71, Celina, Ohio.

Faulkner, Stenhouse, Fryer and **Faulkner, Architects** announce the retirement of **John W. Stenhouse, A.I.A.** and the admission to partnership of **Wyant D. Vanderpool Jr., A.I.A.** and the admission to membership of **George B. Dolby, A.I.A.** as associate.

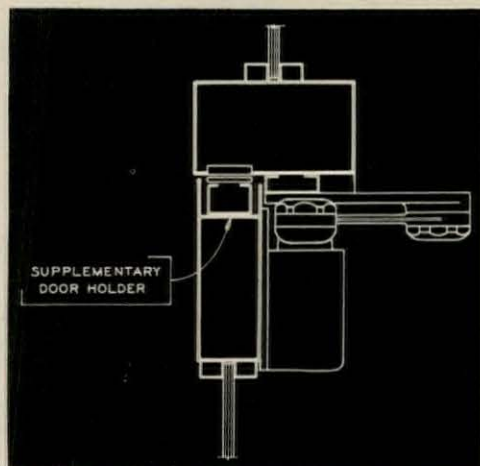
continued on page 69

Ten doors controlled by SMOOTHIES®

At this entrance to a busy campus building are five exterior doors and five vestibule doors all under firm, silent control of LCN's Smoothee® Closers.

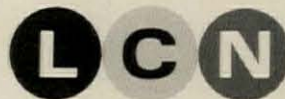
Originated by LCN a decade ago, the "Smoothees" made an immediate hit and have grown steadily more popular. Designed in simple good taste, they're easy to look at, thoroughly dependable, low in cost. They need little or no attention and no seasonal adjustment, since the LCN hydraulic liquid remains stable through very high and very low temperatures.

Specifiers earn the gratitude of owners, managers and maintenance men when they choose LCNs. Forty years of making nothing but high grade door controls led to the five-year guarantee—also to the LCN tradition of *lowest long-run cost*.



Details of installation for stop-face-mounted "Smoothee" closer shown in photograph

Send for full description or see Sweet's 1967, Sec. 16e/Lc



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Canada: LCN Closers of Canada, Ltd.
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PHOTO: Willkie Quadrangle, Indiana University, Bloomington; James Associates, Architects. 567





FLORIDA PRESBYTERIAN COLLEGE, ST. PETERSBURG, FLORIDA

NOW...COLLEGES ARE GOING ALL-ELECTRIC

Why did they choose All-Electric Design?

When these two liberal arts colleges decided to construct new campuses, their prime consideration was: how best to plan for rapid growth. Rivaling in importance was the more traditional consideration: how to stretch limited funds—both in initial construction and in annual operation.

On both accounts, studies indicated that the soundest choice was All-Electric design—with electricity as the single energy source for all needs,

including heating and cooling.

For many reasons.

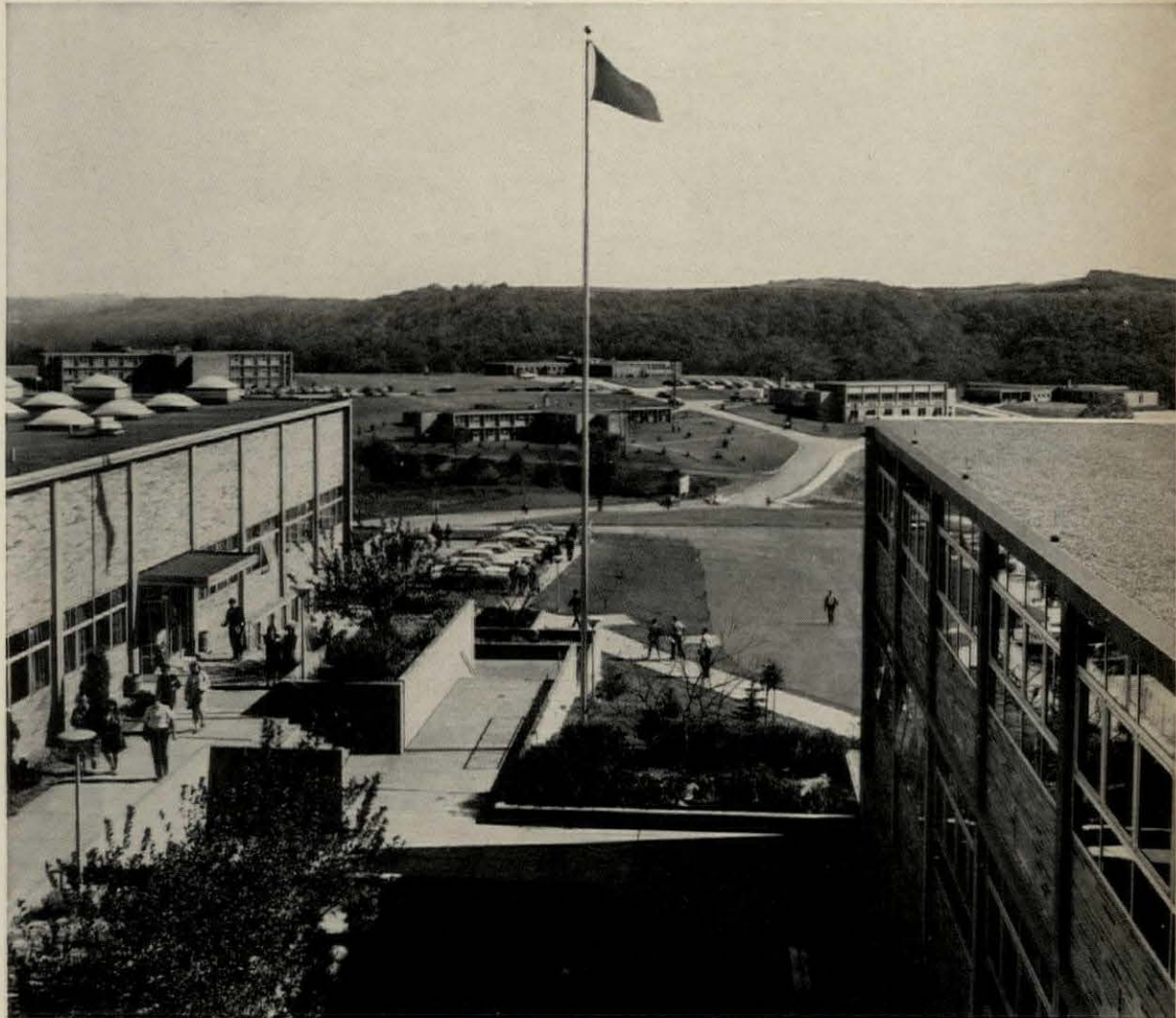
Consider expansion. Each building on both campuses has its own individual flameless electric heating system. So, when new buildings are added, the schools will avoid the problems of tunneling from central heating plants. They will thereby also avoid the complexities of balancing the capacities of flame-fired boilers with existing and future heating needs.

Now consider economy. All-Elec-

tric design precludes costly boiler rooms, chimneys, trenching, piping and fuel storage. Consequently, construction costs for both colleges were much lower than with flame-fired heating systems.

And annual cost of operation. Also much lower at both schools. Because electric heating permits savings in maintenance, operation, equipment, repairs and other operating factors. At Steubenville, for example, estimated maintenance time

• **FLORIDA PRESBYTERIAN COLLEGE, ST. PETERSBURG, FLORIDA.** Enrollment: 811. Campus: 281 acres; 50 buildings. Cost: \$11,000,000. Opened: 1960. Architects and engineers: Connell, Pierce, Garland & Friedman; Perkins & Will; Harvard & Jolly. • **THE COLLEGE OF STEUBENVILLE, STEUBENVILLE, OHIO.** Enrollment: 1,100. New campus: 50 acres, nine existing buildings (future will total 16). Cost of existing buildings: \$5,000,000. Construction began: 1960. Architect: Joseph F. Bontempo. Engineer: Michael Baker, Jr.



THE COLLEGE OF STEUBENVILLE, STEUBENVILLE, OHIO

FOR EASY EXPANSION, REASONABLE COST

For the campus's entire heating system is only six to eight hours *per year*. The colleges chose All-Electric design for other important considerations as well. Such as quality of study environment.

At Florida Presbyterian all buildings are air-conditioned to provide students and faculty with maximum environmental comfort throughout the year. At Steubenville all buildings incorporate provisions for future air-conditioning. In both cases, indi-

cations are that air-conditioning is considerably more economical with All-Electric design.

Another consideration was extra space. Because electric heating requires no bulky equipment, campus buildings gain extra space that can be used for classrooms, offices and dormitory rooms.

(At Steubenville the space originally reserved for a boiler room is now the college book store.)

There are many other advantages of All-Electric design. Call your electric utility company. They will welcome the opportunity to discuss them with you in connection with your next project.



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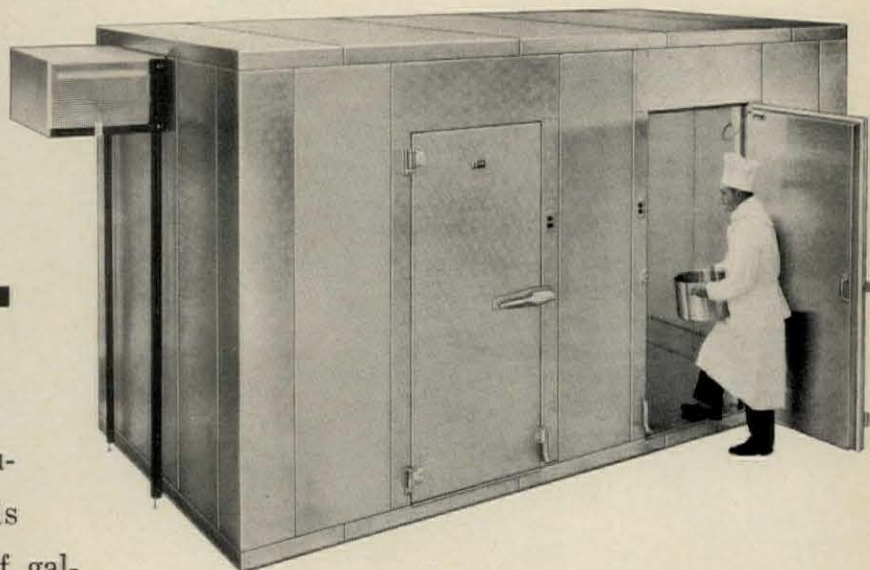
**You may have specified
and freezers for mass
in the past...**



**before modern prefabs
that was about the best
you could do!**

built-in coolers feeding kitchens

Now that modern prefabs are here with their many advantages, there's little reason for specifying non-expandable, hard-to-keep-clean, costly built-ins". ■ Today's kitchens deserve better. Which is what your client gets when you specify Bally Walk-In Coolers and Freezers. Bally, the accepted leader the world over, pioneered prefab construction, as well as the use of urethane "Foamed-in-Place", and innovated most of the important features found in walk-ins today. They have created new high standards of refrigeration efficiency with perfectly balanced, hermetically sealed self-contained refrigeration systems. ■ Assemble any size or shape needed from standard sections for use indoors or outdoors. 4" urethane insulation "Foamed-in-Place" equals 3½" of fiberglass. User has choice of galvanized steel, patterned aluminum, or stainless steel. "Speed-Lok" fasteners make it easy to add sections for growth requirements . . . equally easy to disassemble for relocation. ■ If you are specifying walk-in refrigeration for today's dynamic mass feeding industry, you will find Bally the pacemaker. Feature by feature they give your client advantages never attainable in "built-ins" and conventional "prefabs", at far lower cost than "reach ins". Write for free Architect's Fact File (including a 32-page brochure, specifying guide and urethane foam sample).



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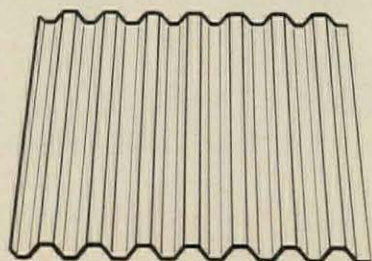
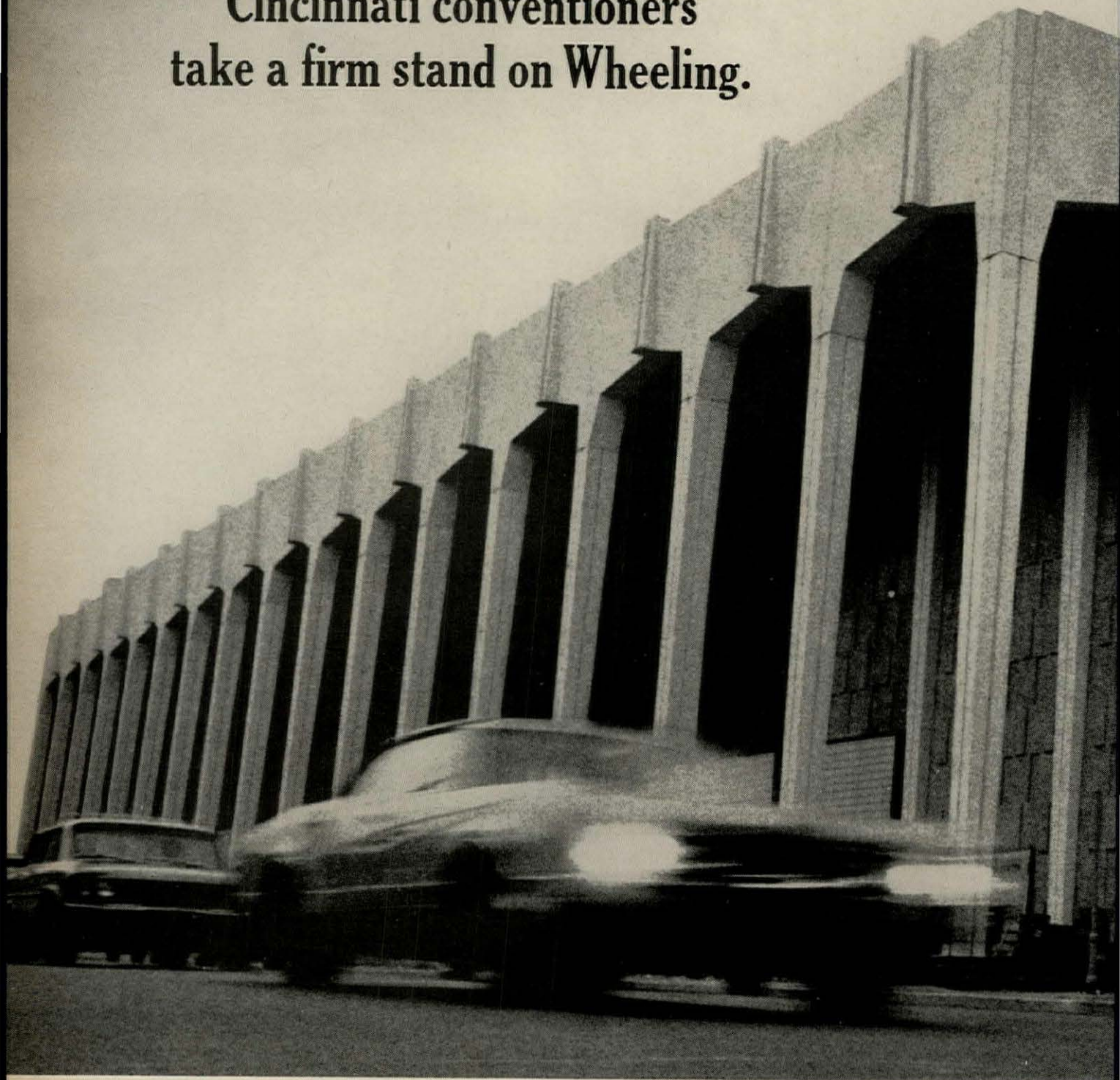
Address all correspondence to Dept. AR-5.

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Cincinnati conventioners take a firm stand on Wheeling.



The floors of Cincinnati's new Convention and Exhibition Center are made with Wheeling Tensiform®.

That's pretty firm stuff to stand on.

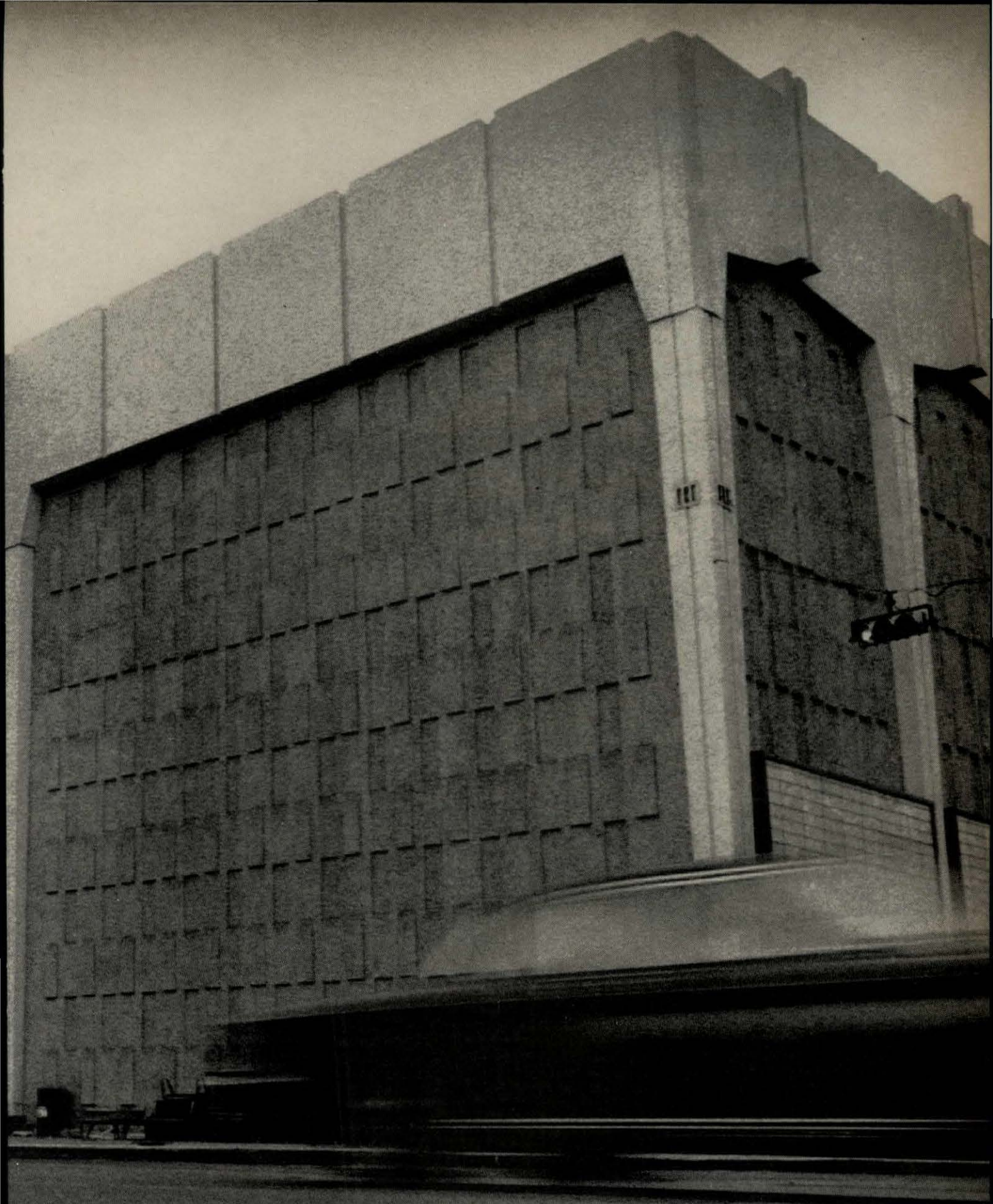
Tensiform is our permanent steel form and base for concrete.

Spot weld it in place and you've got an instant full-floor working platform.

Pour your concrete and you've got a floor.

Finish-paint the underside, if you like, and you've got a ceiling.

Use Tensiform and you've got a



free service: send us your floor plans and we'll hustle 'em back to you fully detailed.

So now you know why the Cincinnati Center, designed by Harry Hake and Harry Hake, Jr. with Hixon-Tarter, Consulting Structural Engineers, and built by the

Turner Construction Company, has floors made with Wheeling Tensiform.

Why it has a roof made with Wheeling Super Rib Roof Deck is another story.

That one you probably know already.

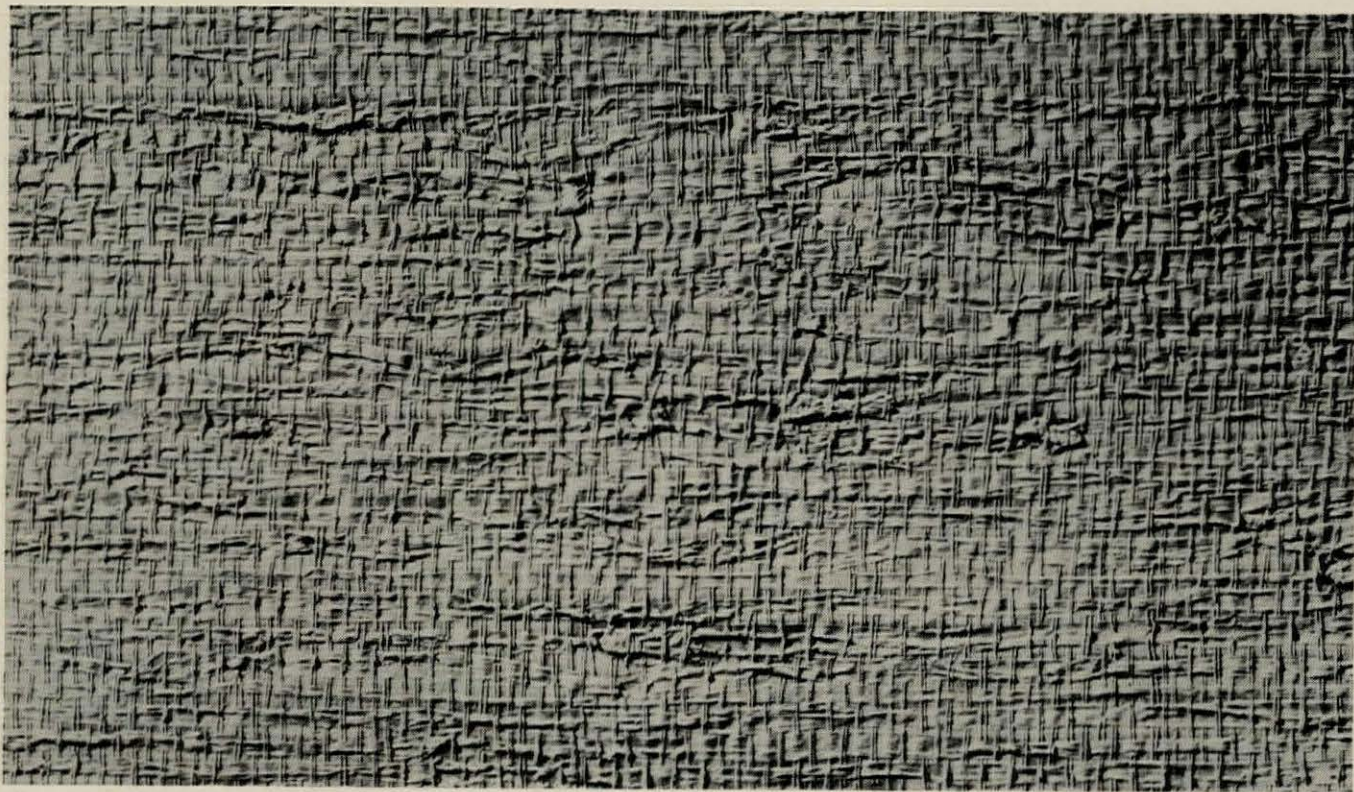
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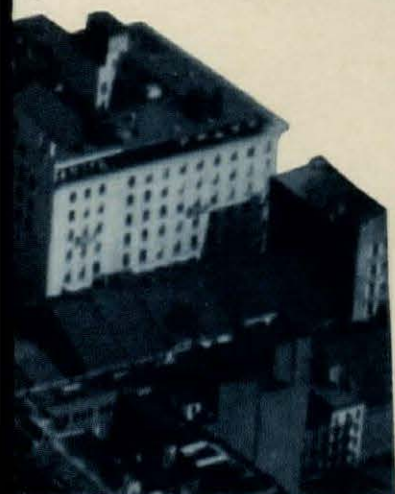
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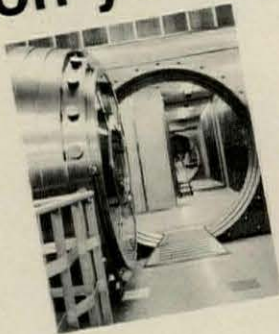
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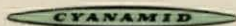
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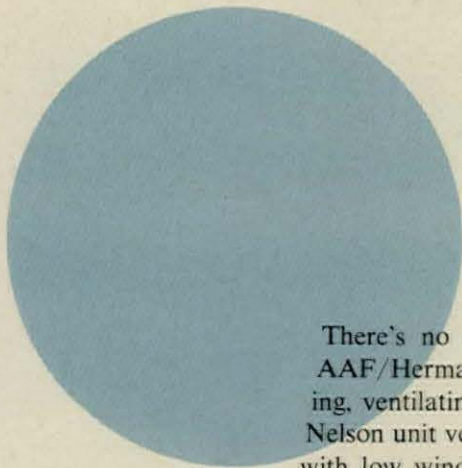
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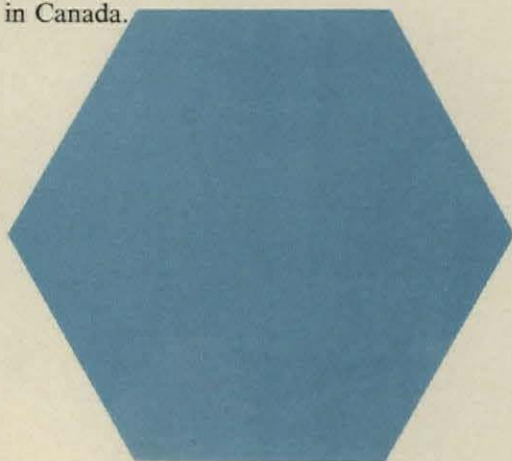
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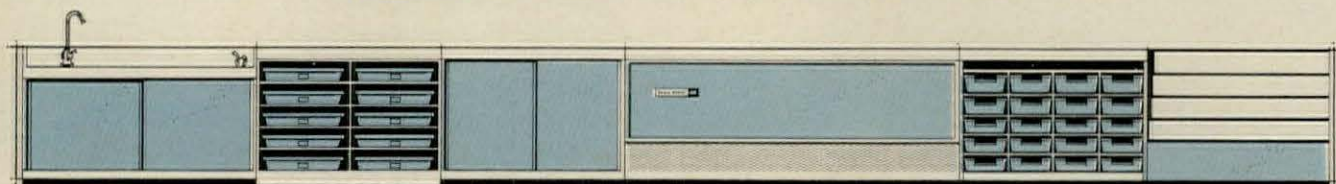
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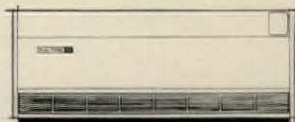
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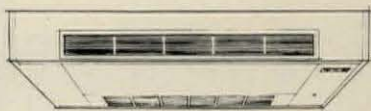
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William Peter Jarvis and **David E. Cretteau** have been named associates by the Chicago architectural firm, **Fridstein and Fitch** located at 351 East Ohio St.

P. Whitney Webb, A.I.A. has been appointed an associate in the architectural firm of **Frederick G. Frost Jr. and Associates**, 30 East 42nd St., New York City.

Goldberg-Epstein Associates announce that **Adolph Goldberg** will retire from active practice, continuing as a consultant to the firm. **Herbert Epstein** will become senior partner and **Karl R. Greenfield** will become a partner with the firm which is located at 164 Montague St., Brooklyn, N.Y.

C. H. Guernsey & Company announce that **Dudley Watkins, A.I.A.** has joined them in the formation of an affiliate firm, **Guernsey and Watkins, Architects-Engineers**, P.O. Box 53247, 2701 North Oklahoma, Oklahoma City, Okla.

W. Howard Bezenah has been appointed a consultant on the staff of **Harley, Ellington, Cowin and Stirton, Inc.**, architects and engineers located at 153 East Elizabeth, Detroit, Mich.

Lloyd A. Doughty and **Sheldon Fox** have been admitted as partners in the firm of **Kahn and Jacobs, Architects**, 2 Park Ave., New York City.

Kallen & Lemelson, Consulting Engineers have named **Feyzi N. Bil** as an associate of the firm which is located at 1271 Avenue of the Americas, New York City.

Charles A. King, A.I.A. announces that **Theodore Arieu, A.I.A.** has become a partner in his firm which will now practice under the name **King & Arieu Architects** at 266 Pearl St., Hartford, Conn.

Hans Mumper has been named an associate in the firm of **Langdon & Wilson, A.I.A.**, a Los Angeles architectural firm.

Nathan S. Levenson, A.I.A. announces that **Leonard Sedor** was made an associate in the firm of **N. S. Levenson & Associates, Architects, A.I.A.** located at 102 Fulton Building, Pittsburgh, Pa.

Ronald Getty, executive architect of **Charles Luckman Associates**, architects and planners, has been named head of the firm's Boston office.



SYMONS SLAB SHORE CUTS DECK TIME FROM 5 TO 4 DAYS



When Henry C. Beck Co. exceeded original cost estimates on a 20-story La Jolla, California, high rise, it decided to use Symons Slab Shore system in an effort to cancel the loss. Initial loss was recovered, and scheduled per floor construction time was reduced from 5 to 4 days.

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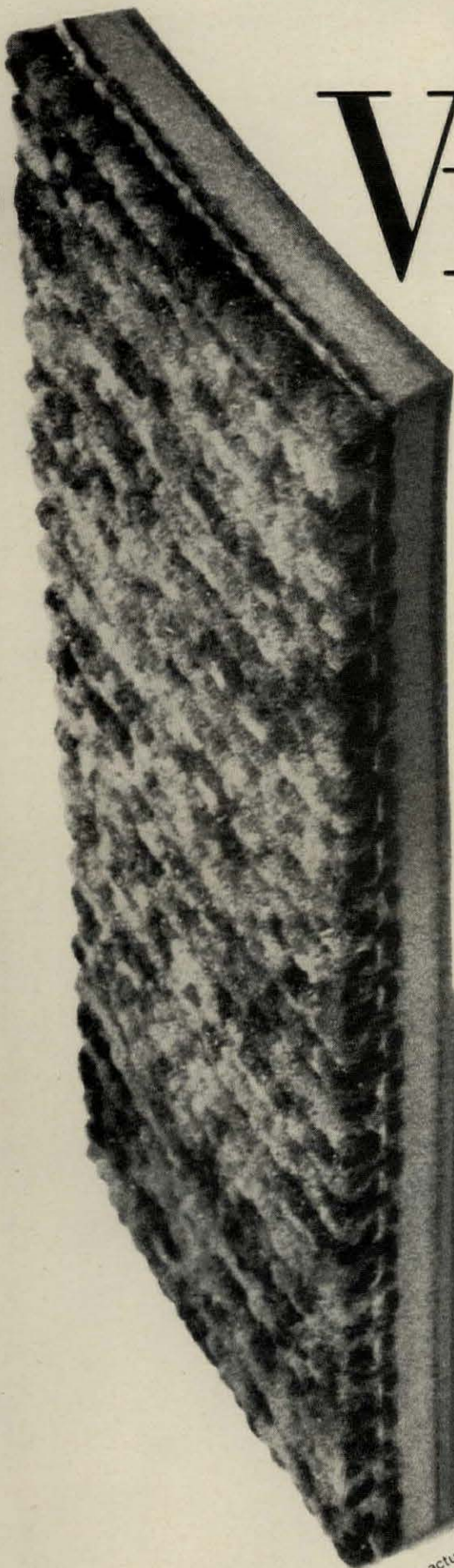
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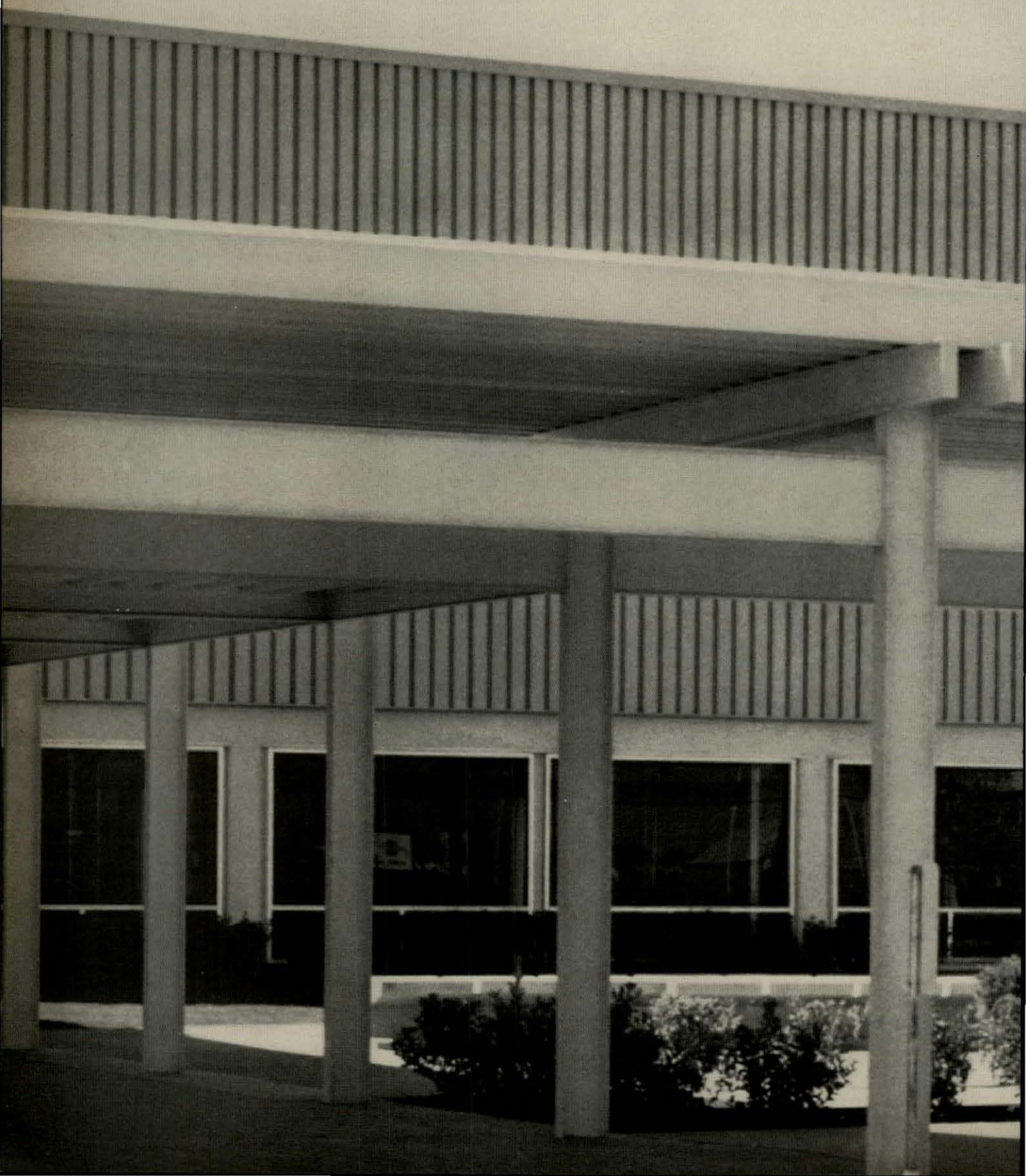
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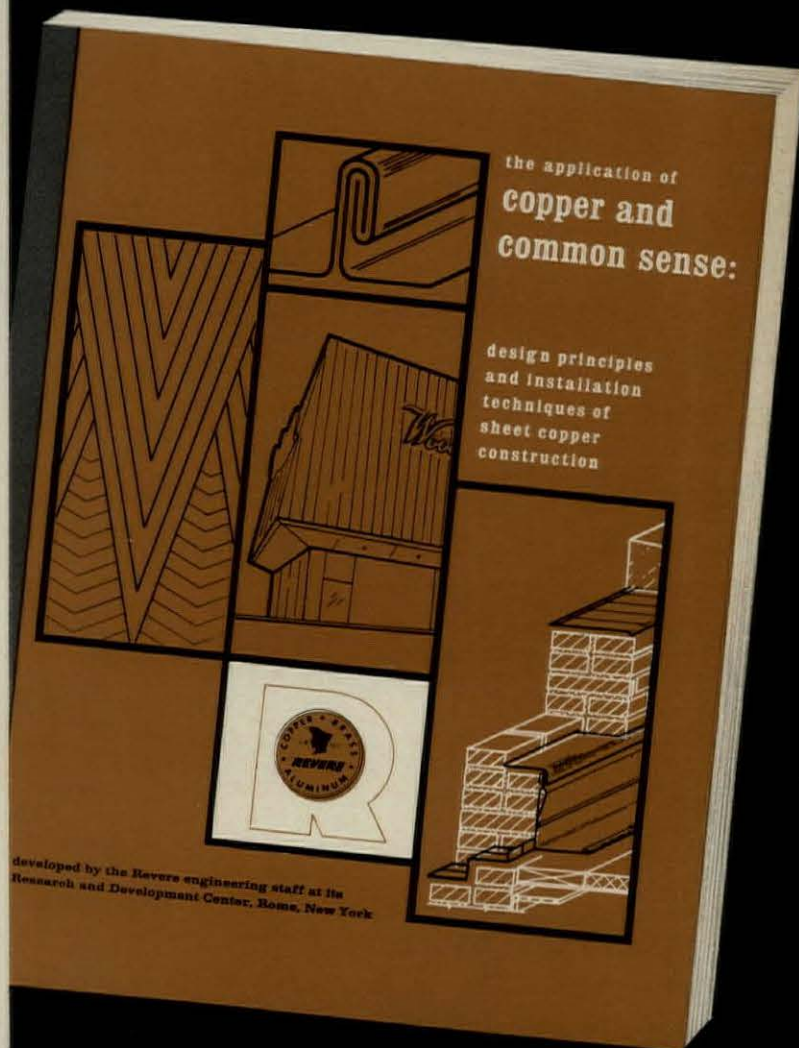
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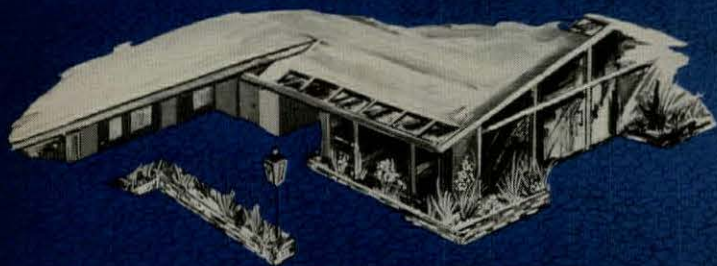
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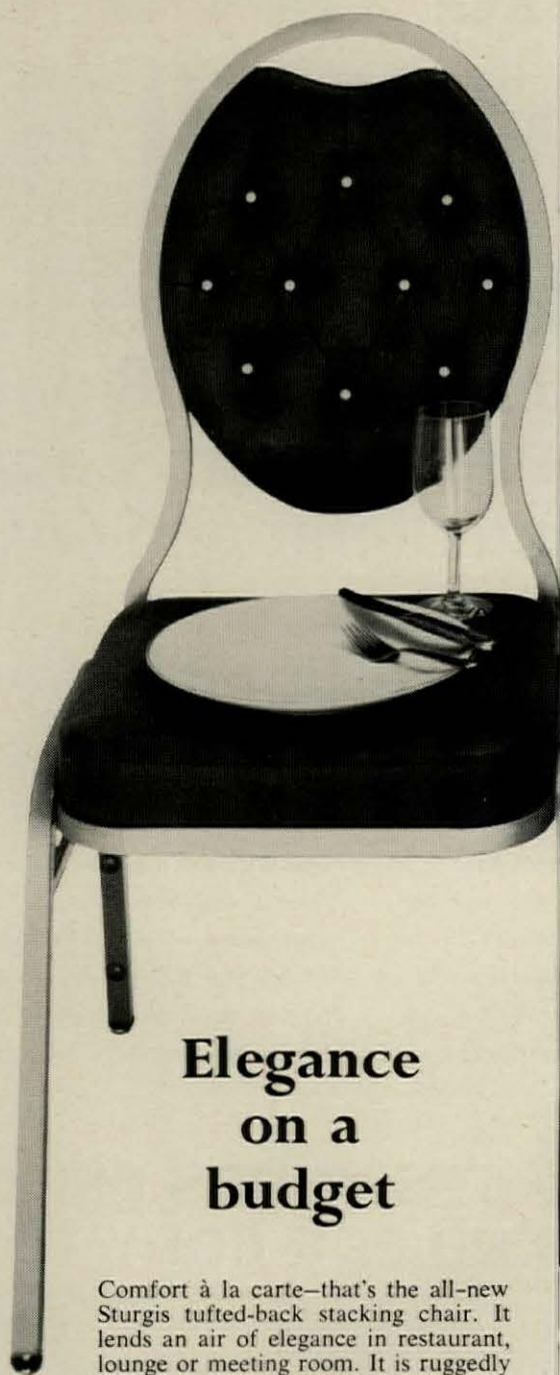
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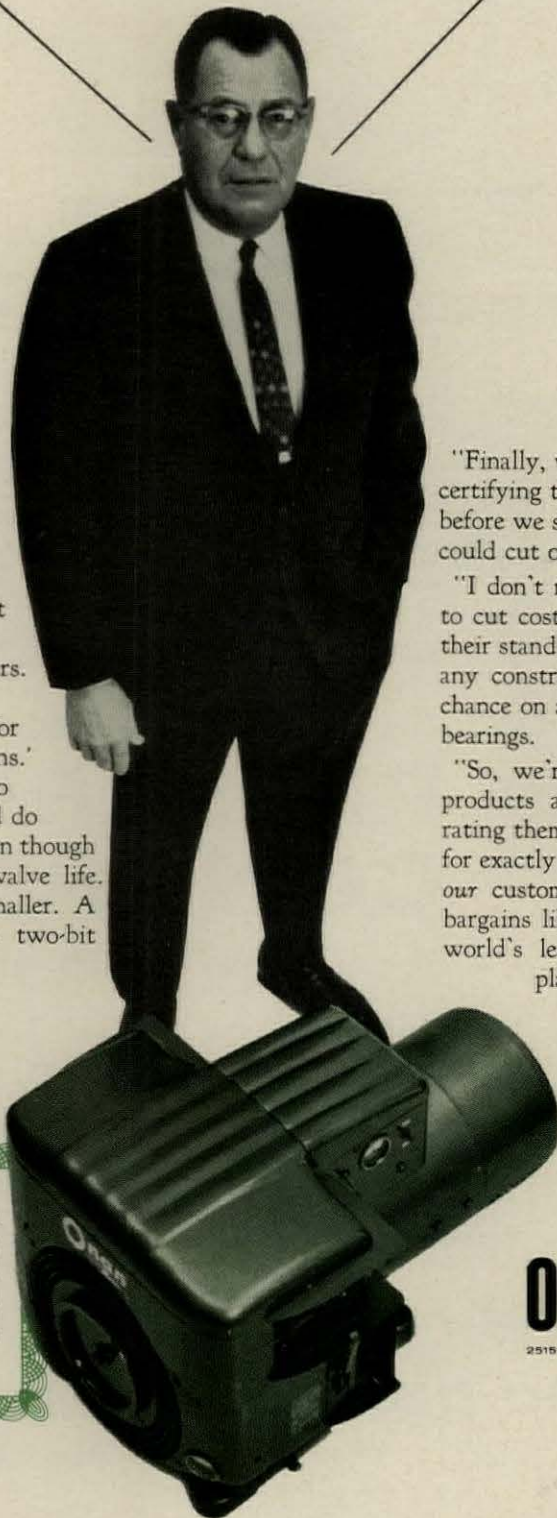
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Business' plans for new plants and equipment, 1967-1970

American business now has plans to spend \$64 billion in 1967 for new plants and equipment, according to the 20th annual McGraw-Hill Survey of Business' plans. This is 5.6 per cent higher than the amount spent last year. Between 1968 and 1970, plans now indicate, an average of nearly \$60 billion per year will be spent. Of the 1967 investment, 21 per cent (\$13 billion) will be for buildings of all kinds other than residential.

The survey probes some 17 categories of manufacturing industries and 13 categories of other business including mining, railroads, airlines, communications, utilities and commercial. Each category has a different proportion of its expected capital expenditures allocated to construction. Not surprisingly, the highest proportion is found in the commercial ventures (46 per cent of a total investment of \$13 billion, or \$6 billion

for buildings) and the lowest in utilities (3 per cent of \$9.74 billion, or \$292 million). Among manufacturers, the highest cut of the investment dollar for buildings will be in the food and beverage industries (40 per cent of \$1.45 billion, or \$580 million) while the biggest dollar volume for construction in manufacturing categories will be \$1 billion spent by machinery firms. Aerospace? A mere \$280 million.

All manufacturers together plan to spend \$29 billion on new plants and equipment this year, 7.5 per cent more than last year. An average of 18 per cent of this (\$5.22 billion) will be for buildings. Manufacturers expect expansion of plants and equipment to take from 47 to 49 per cent of capital expenditures between now and 1970. The manufacturers also report that they expect sales to increase 21 per cent over the same period.

Brakes have been applied to capital spending for 1967

In order to contain the inflationary pressures of sharply rising capital expenditures over the past two years, Congress last fall temporarily suspended both the 7 per cent investment tax credit and accelerated depreciation of buildings. This resulted in a cut of about \$2.3 billion in spending plans for 1967. And although President Johnson has requested restoration of the tax credit, companies have not yet made any significant upward revision of plans. The rebuffs encountered by early efforts in Congress to implement the President's request seem to confirm the wisdom of investment caution for the time being. The inevitable upward long-term trend of demand for new arrays of architectural services is underscored in the article by George Christie beginning page 93.

Engineers protest COE contractor inspection order

A recent revision in Corps of Engineers' policy, which would require contractors on Corps projects to assume greater responsibility for quality control in construction, has prompted a strong protest from Consulting Engineers Council President Eugene Waggoner.

Writing to Chief of Engineers William F. Cassidy, Waggoner noted that the new policy has resulted in contractors trying to retain consulting engineers for such work. Under such circumstances, said Waggoner, "the consulting engineer is placed in the untenable position of being subject to the direction of the party which he is, in turn, expected to direct." The new Corps' Regulation No.

1180-1-6 instructs contractors to establish a quality control organization, including such inspection specialists as a mechanical engineer, electrical engineer, construction engineer, etc. Such personnel would have supervisory responsibility and report directly to the contractor's

senior resident project manager. In some Corps' offices the new order has been interpreted to mean licensed professional engineers, and many contractors are asking consulting engineers to quote fees for such service which they can use in bidding jobs.

While commending the Corps' objective of better quality construction, C.E.C. challenged whether it is possible to obtain totally unbiased inspection from individuals who are on the contractor's payroll. In its protest C.E.C. pointed out that most consultants feel their primary professional responsibility is to the client, not to the contractor. Other objections cited by Waggoner

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in his letter to Cassidy were:

1. The new regulation has already resulted in contractors asking consultants for fee quotations to include in bid proposals. This places engineers in the position of bidding competitively.

2. As employees of the contractor, many professional engineers would soon find themselves confronted with labor agreements which require union membership as a prerequisite to employment on the contractor's staff.

3. The liability assumed by a consulting engineer under such circumstances is enormous, as evidenced by recent court decisions where consultants not retained for supervision have been held negligent (in one case to the tune of \$250,000).

Industrial money pool to spur 90% home mortgages

Seven manufacturers of home-building products and the giant Metropolitan Life Insurance Company are cooperating in a home-loan venture that may have an increasing effect on high-margin mortgage availability in the next few years. Some of this money will provide up to 90 per cent of purchase prices in the higher brackets (\$30,000 to \$40,000) which are less favorably supported now by FHA and public money.

Manufacturers are Andersen Corporation, Armstrong Cork Company, Flintkote Company, Kaiser Industries, Masonite Corporation, Reynolds Metals

Company and U.S. Plywood-Champion Papers.

It works this way: The manufacturers have formed Home Capital Funds, Inc. Home Capital will top an institution's 75 per cent, conventional home loan with an additional 15 per cent that will make the total loan 90 per cent of the value of a home. Metropolitan Life, the first institution to work with Home Capital, will put up the 75 per cent. Metropolitan Life now deals with a nationwide network of about 120 mortgage correspondents and banks from whom it "buys" mortgage portfolios.

As far as the home buyer is concerned, the transaction will be treated as a single loan. Metropolitan Life, which will have bought the loan from its correspondent, will sell a "junior participation certificate" to Home Capital Funds.

Home Capital has \$2 million now available for loans, and can borrow up to five times that amount if its involvement should make that necessary. The plan is to finance some 7,000 homes in the next 18 months. The homes may cost up to \$40,000—and sometimes more. There is no restriction on materials used in eligible homes.

A.I.A.-A.G.C. contract dispute makes glacial progress

Some progress toward a meeting of minds between A.I.A. and A.G.C. on contract documents was made at a meeting of representatives of the two groups April 10. At its San Diego convention in March, the Associated General Contractors had rescinded any implied endorsement of A.I.A.'s revised "General Conditions of the Contract" document A-201 in spite of the fact that its much-disputed "hold harmless" clause had previously been worked out to the mutual agreement of A.I.A., A.G.C., and the insurance industry. (See RECORD, February and March). At the April 10 meeting, a basis for agreement on some additional points was reached, although the problem of testing in the courts remains.

The contractors say they are no longer worried about the "hold harmless" clause. At least, they point out, it holds the architect responsible when the primary cause of any complaint or

liability claim is the architect's own action or inaction. But there are many other new ideas, words and phrases that must be interpreted more clearly and resolved legally before the A.G.C. will accept the new document as a whole. Some of the rules on arbitration, part of the payments section, and some of subcontractors section are among the bones of contention. A national A.G.C. spokesman explains that there are some 4,000 new words in the 1966-67 revision "that have never before been interpreted."

State legislatures prepare to bar hold-harmless clauses

Meanwhile, there has been a flurry of activity in state legislatures that could have profound effect on the use of the "hold-harmless" clause. Before the A.G.C.-A.I.A.-insurance revision was worked out, A.G.C. urged its local chapters to seek legislative relief in state nul-

lification laws outlawing any "hold harmless" principle in a contract.

Both New York and Michigan have previously passed laws barring clauses purporting to indemnify any party on a contract against liability for consequences of his own acts or omissions which, of course, was never the intent of the disputed clause in A-201.

While A.G.C. has now suggested that its chapters might better "wait and see" the timing of the whole situation had already resulted in a rash of bills being introduced into some 14 state legislatures—thereby informing local lawyers about the problems and potentials of this party lawsuits. A bill in New Mexico is awaiting the Governor's signature. Bills are in committee in Arkansas, California, Colorado, Indiana, Maine, Massachusetts, Nebraska, North Dakota, Oklahoma, Oregon, South Dakota, Texas and the state of Washington.

Washington briefs

Uniform procurement urged. The jumble of requirements set forth by Uncle Sam through the various procurement regulations would be simplified by a National Commission on Federal procurement, claims Rep. Chet Holifield (D-Calif.), who has introduced a bill that would create a study group.

Minimum wages. A quiet drive to exempt A/E firms from a recent Federal law applying minimum wage standards to members of survey teams is building;

rigid Federal systems of employee classification are being attacked, not the wage rates themselves.

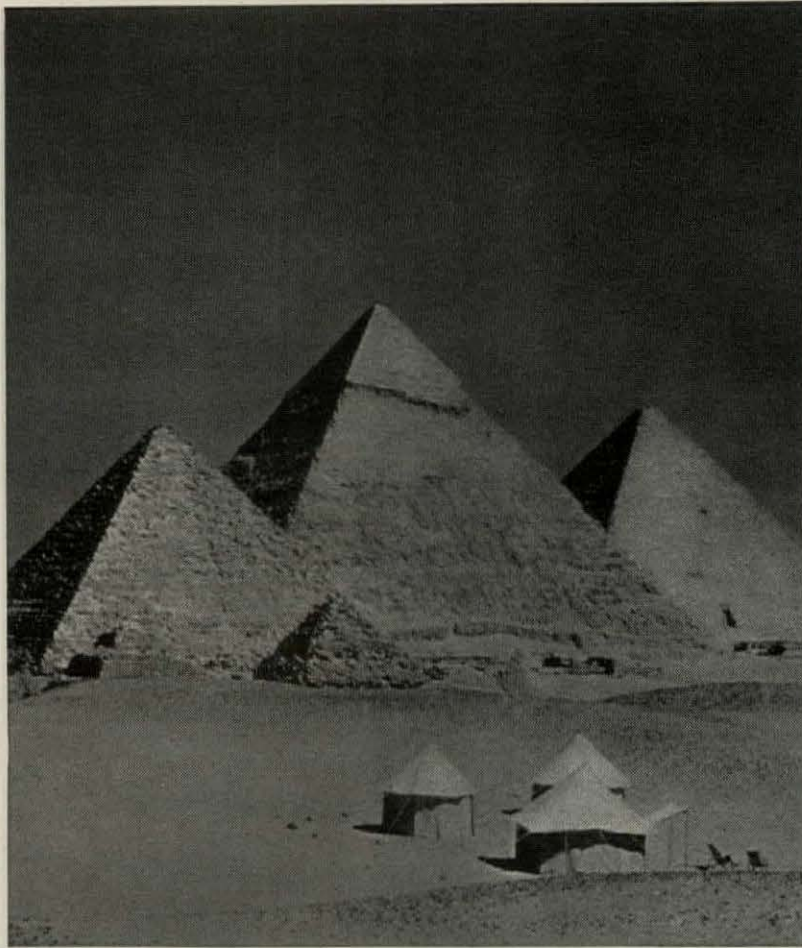
Situs picketing. Labor's "situs picketing" bill (H.R.100) which, the construction industry claims, would permit secondary boycotts of construction sites has less than a 50-50 chance of passage this year.

Incinerator design. New design criteria for municipal solid waste treatment plants are being pushed by the public

health service's experimental grant program . . . eventually, the concepts could become the groundwork for a new Federal aid program to cities for incinerator

Metric system. Once again legislation has been introduced to authorize a study of the costs and problems if the United States attempted to convert to the metric system over a prolonged period of time. Congress is likely to pass it this year. Objections within the Rules Committee of the House can be overcome.

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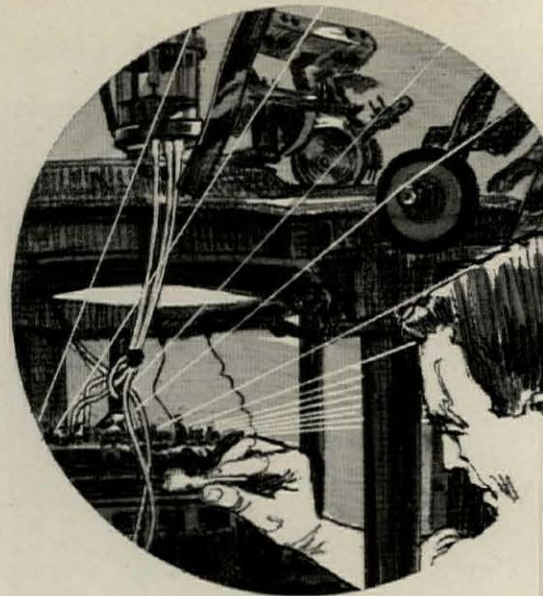
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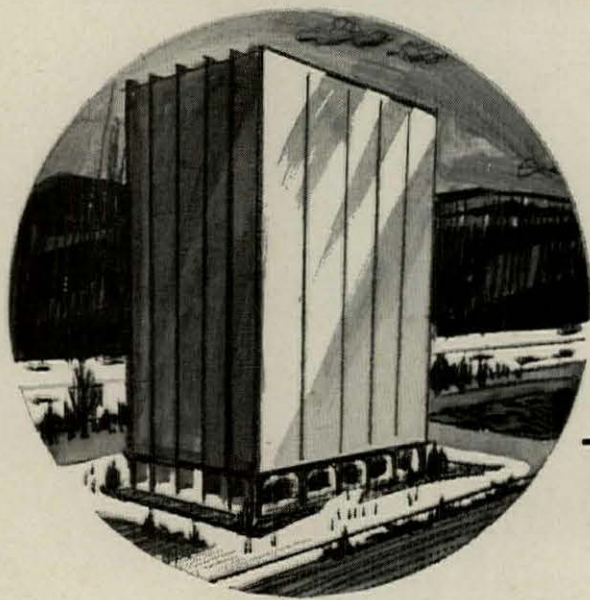
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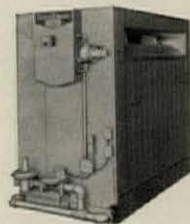
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TRENDS AND ANALYSIS

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

Contingency allowances: real numbers—not fudge factors

Contingencies are one of the major sources of confusion and misunderstanding in construction cost estimating. All too often it has not been made sufficiently clear by the estimator either what is meant by a "contingency" or why it is such an integral part of the total estimate. And it is important. Ignoring this element is tantamount to ignoring the estimated cost of the foundation.

The contingency allowance as three solid parts

A contingency is frequently defined as the estimated increase in cost from the schematic and design development phases to the final working drawings due to increases in scope. This is correct as far as it goes. The problem is that it doesn't go far enough and, as a result, can be most misleading. For from this the architect may infer that he has more leeway than actually exists to increase his scope and still stay within a budget. Or even worse, if he is over the budget on the initial estimate, he may be tempted to drastically reduce the contingency. Either could be an expensive mistake.

To prevent this, an estimate should define the three distinct elements of the contingency. Ideally they should be shown as separate contingencies.

First contingency: normal increase in scope of the work

This contingency includes allowances for: changes to more expensive finishes, changes in the owner's desires or needs from those originally expressed, and the addition of finishing touches that the architect feels he must add.

Little by little, these common occurrences increase the scope (and cost) of a project. In fact, the cumulative effect is so gradual that it is rarely recognized until the final summary is made. Yet these seemingly minor items often increase cost by from 5 to 10 per cent.

Second contingency: probable developments as design proceeds

This element can best be described as the "estimator's contingency." It is an allow-

ance for costs that will eventually materialize in the final design stages, even without an increase in scope. It is based on the estimator's interpretation of the documents at hand and any additional information he has received from the architect. Rarely, if ever, does this data represent 100 per cent of the architect's thinking and intentions in terms of cost. As a result, the estimator must anticipate quantities on some items to accurately portray their total cost. These might include utility lines, equipment, outside site work, etc. which, though incomplete on the drawings, must certainly be considered.

The estimator's contingency is usually no lower than 5 per cent and is often as high as 10 or 15 per cent.

These first two contingencies are both allowances for costs which are *implicit* in the early stages of design and become *explicit* in the later stages. Here the resemblance ends. The estimator's contingency indicates those costs which will accrue as the result of the *existing* scope at the early design stages. The contingency for normal increases in scope represents the allowance for any *additional* considerations that the architect might incorporate into the design as the project evolves.

Third contingency: projected costs in a rising market

This element might be called the *construction cost escalation factor*. An estimate based on current costs and nothing else is of little value to the architect or his client. Costs change, and all estimates must indicate the costs that will prevail when the contractors tender their bids—no matter how far in the future that time may be.

This cost escalation factor must reflect a number of elements, including labor availability and wages, material availability and prices, contractor interest, number and types of other construction projects that may be undertaken at the same time, economic factors at the job location and length of construction duration. Unlike the other two contin-

gencies, the construction cost escalation factor is a function of location and time, and will, therefore, vary accordingly.

Contingency allowances may be redundant in some cases

Proper application of these three contingencies requires a knowledge of when and how they should be used. For example, the normal scope increase and the estimating contingency should not be applied to estimates based solely on square-foot costs. Because these units reflect the total area of the building and the historical unit cost for that type building including contingencies, the square-foot cost estimate is, in itself, a total cost consideration.

It is incorrect to include these contingencies over again, as in the following example for a hospital:

325,000 square feet @ \$35.00	
or 325 beds @ \$35,000.00	= \$11,525,000.00
Normal increase in scope—5%	= 576,250.00
Estimator's contingency—10%	= 1,152,500.00
Total	\$13,263,750.00

Whether based on area or number of beds, that number times the unit cost represents the historically established cost of the *completed* project. The use of either the "scope" or "development" contingency components would be redundant in this case, although, of course, normal escalation would still apply. The unit costs represent current costs and it is necessary to indicate the projected escalation to the bid date, in this manner:

325,000 square feet @ \$35.00	= \$11,525,000.00
Escalation factor—12%	= 1,383,000.00
Total Cost	
(as of some future date)	\$12,908,000.00

If this factor is buried in the unit cost figure, the result is misleading. It is not apparent how much the estimator thinks the hospital costs at the present time. Changes in scope are difficult to analyze meaningfully when factors other than the costs of material and labor are included. By keeping this factor separate,

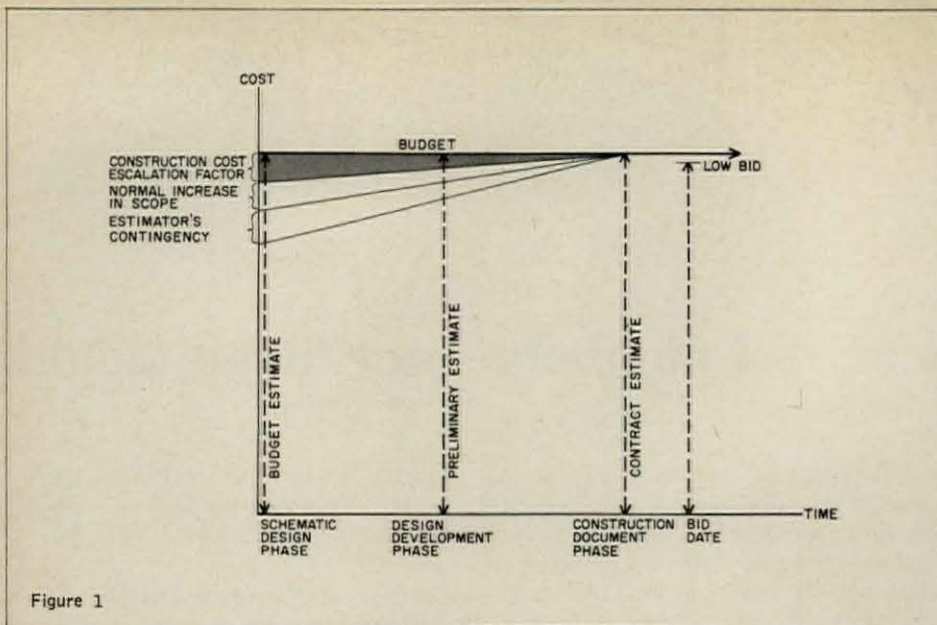


Figure 1

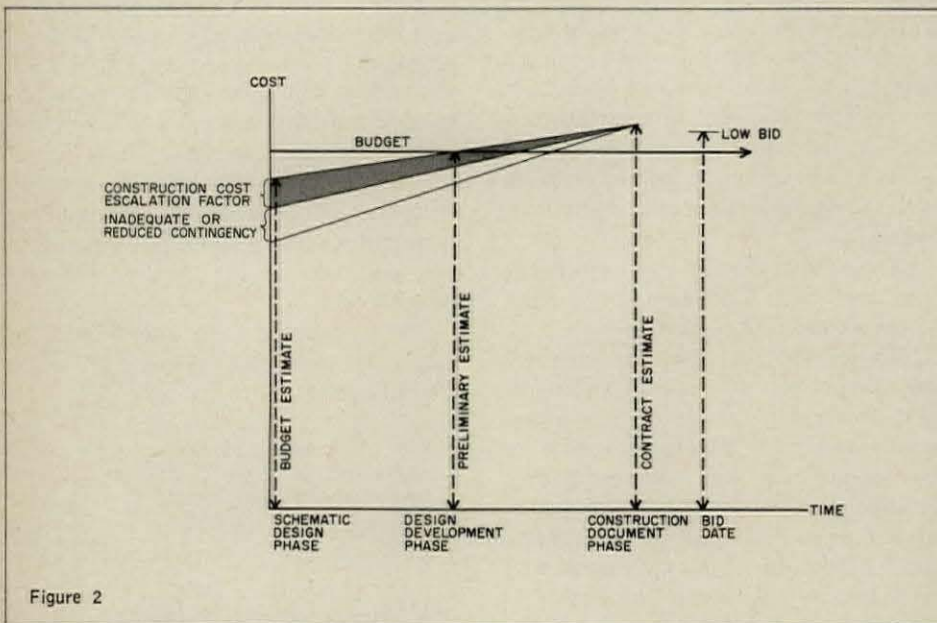


Figure 2

the architect is assisted in evaluating whether his budget is reasonable.

How to use allowances for "scope" and "development" changes

The normal increase in scope and the estimator's contingency *should* be used when the estimate represents a summary of individual costs based on a quantitative analysis. If, for example, the general construction trades were estimated by detailed take-offs of excavation, concrete, structural steel, masonry, plastering, etc., then these contingencies should be applied to these trades. If, on the same estimate, the mechanical and electrical portions were based on square-foot unit costs, then there would be no need for either contingency to be applied to those portions.

Both the normal increase in scope and the estimator's contingency are most

critical in the schematic and design development phases. They represent actual costs that will eventually materialize as the design progresses toward completion. As the design reaches the construction document phase, these become smaller and smaller. In the final analysis there should be no increase in scope and virtually no estimating contingency.

The construction cost escalation factor decreases as the bid date is approached. The relevant costs are those that, on the average, will prevail during the life of the project.

The relationship of these contingencies to the total cost of the project is shown in the charts in various design stages. Figure 1 demonstrates the desired results from the successful application of each contingency. Figure 2 indicates what may happen if any one of the three is not considered in the early phases.

One of two situations might have caused the results shown in Figure 2. The architect might have overestimated (or been poorly advised) on his leeway to increase the project's scope. Or worse, when the initial estimate showed the project to be over the budget, the contingencies were reduced. While this is the fastest and easiest way to reduce a cost estimate, the architect is deceiving himself by permitting this. The most prudent way to assure a return to the budget at this stage is to investigate the initial design. Later it might become a cost necessity.

General indexes are not intended for use in firm job estimates

A contingency for escalation in costs is frequently difficult to assess and even more difficult to sell to a client. Several cost indexes are available which show current trends but these are almost invariably misleading when applied directly to the estimating process.

The first problem encountered in the use of published indexes lies with the assumptions implicit in extrapolating recent history to arrive at anticipated future costs. Costs in future may not, of course, behave as they have in the past. But less evident in the use of indexes, and thus more troublesome, is their frequent inadequacy to describe even past cost trends (especially in the short run) with the sensitivity required for accuracy in actual job estimating.

Indexes are generally either statistical composites of component costs (labor, lumber, cement, etc.) or are statistical summaries of as-bid or as-built contract costs. In both types, short-term local market conditions are discounted.

In the "composite of components" approach, market conditions—such as premium labor costs, competition between bidders, and local construction capacity—are not included.

In the "summary of contract costs" method, these factors are included, but may be submerged in the amalgam of construction types treated (competitive contracts, negotiated contracts, owner-builder developments). Then, too, the approach to cost indexing suffers from lack of consistency in the standards used for collecting and reporting data.

While cost indexes are useful in many planning applications, they are not a substitute for projections of cost based on firsthand research—interviews with contractors, labor unions, chambers of commerce, and others who are intimately familiar with the economic factors which influence costs at the proposed job site. Contingencies for cost escalation should be based on such research wherever possible.

INDEXES AND INDICATORS

William H. Edgerton
 Manager-Editor, Dow Building Cost Calculator,
 F. W. Dodge service

MAY 1967 BUILDING COST INDEXES

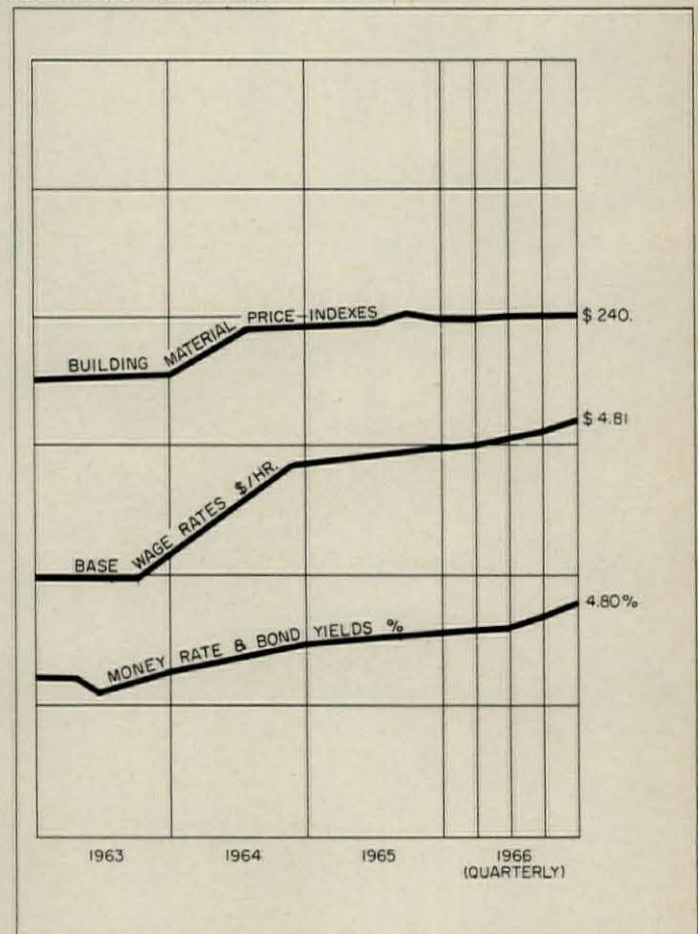
1941 averages for each city = 100.0

Metropolitan area	Cost differential	Current Dow Index		% change year ago
		residential	non-res. res. & non-res.	
U.S. Average	8.5	279.4	297.6	+2.22
Atlanta	7.2	317.8	337.1	+3.19
Baltimore	7.7	278.2	296.0	+0.66
Birmingham	7.5	257.7	277.1	+2.24
Boston	8.5	252.2	267.0	+1.74
Chicago	8.9	309.6	325.6	+2.52
Cincinnati	8.8	266.2	282.9	+1.45
Cleveland	9.2	287.0	305.0	+2.42
Dallas	7.7	262.1	270.7	+2.29
Denver	8.3	283.6	301.5	+1.02
Detroit	8.9	287.6	302.0	+4.44
Kansas City	8.3	250.3	264.9	+1.47
Los Angeles	8.3	284.2	311.0	+1.98
Miami	8.4	273.8	287.4	+1.83
Minneapolis	8.8	278.3	295.8	+2.24
New Orleans	7.8	251.4	266.4	+2.06
New York	10.0	294.9	317.2	+3.96
Philadelphia	8.7	277.1	290.9	+1.95
Pittsburgh	9.1	259.4	275.8	+1.15
St. Louis	9.1	278.1	294.7	+2.83
San Francisco	8.5	363.2	397.4	+3.10
Seattle	8.4	254.5	284.4	+2.03

Differences in costs between two cities may be compared by dividing the cost differential figure of one city by that of a second; if the cost differential of one city (10.0) divided by that of a second (8.0) equals 125%, then costs in the first city are 25% higher than costs in the second. Also, costs in the second city are 80% of those of the first (8.0 ÷ 10.0 = 80%) or they are 20% lower in the second city.

The information presented here indicates trends of building construction costs in 21 leading cities and their suburban areas (within a 25-mile radius). Information is included on past and present costs, and future costs can be projected by analysis of cost trends.

ECONOMIC INDICATORS



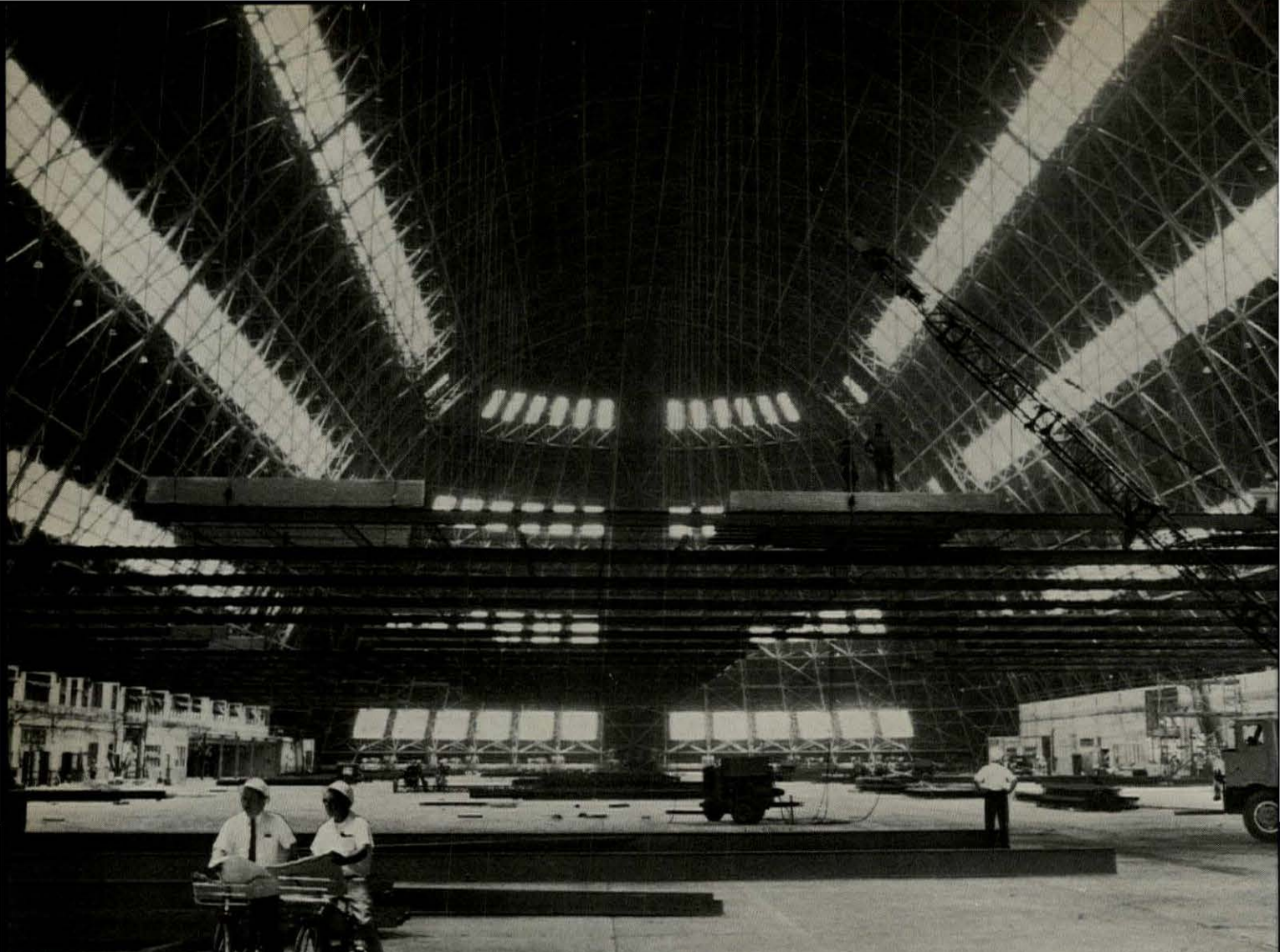
HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1952	1960	1961	1962	1963	1964	1965	1966 (Quarterly)				1967 (Quarterly)				
								1st	2nd	3rd	4th	1st	2nd	3rd	4th	
U.S. Average	213.5	259.2	264.6	266.8	273.4	279.3	284.9	286.3	287.3	290.4	286.6	292.7	—	—	—	—
Atlanta	223.5	289.0	294.7	298.2	305.7	313.7	321.5	322.2	323.3	328.5	329.8	332.4	—	—	—	—
Baltimore	213.3	272.6	269.9	271.8	275.5	280.6	285.7	288.6	289.6	289.4	290.9	290.4	—	—	—	—
Birmingham	208.1	240.2	249.9	250.0	256.3	260.9	265.6	267.1	268.1	269.7	270.7	272.9	—	—	—	—
Boston	199.0	232.8	237.5	239.8	244.1	252.1	257.8	258.5	259.6	260.9	262.0	262.9	—	—	—	—
Chicago	231.2	284.2	289.9	292.0	301.0	306.6	311.7	312.6	313.7	318.9	320.4	320.4	—	—	—	—
Cincinnati	207.7	255.0	257.6	258.8	263.9	269.5	274.0	274.7	275.7	277.2	278.3	278.7	—	—	—	—
Cleveland	220.7	263.1	265.7	268.5	275.8	283.0	292.3	293.0	294.1	299.2	300.7	300.0	—	—	—	—
Dallas	221.9	239.9	244.7	246.9	253.0	256.4	260.8	261.7	262.6	265.8	266.9	267.6	—	—	—	—
Denver	211.8	257.9	270.9	274.9	282.5	287.3	294.0	294.6	295.5	296.6	297.5	297.6	—	—	—	—
Detroit	197.8	259.5	264.7	265.9	272.2	277.7	284.7	285.5	286.5	295.7	296.9	298.0	—	—	—	—
Kansas City	213.3	237.1	237.1	240.1	247.8	250.5	256.4	257.3	258.2	260.0	261.0	260.8	—	—	—	—
Los Angeles	210.3	263.6	274.3	276.3	282.5	288.2	297.1	298.0	298.6	301.6	302.7	303.6	—	—	—	—
Miami	199.4	256.5	259.1	260.3	269.3	274.4	277.5	278.4	279.2	282.9	284.0	283.4	—	—	—	—
Minneapolis	213.5	260.0	267.9	269.0	275.3	282.4	285.0	285.7	286.6	288.3	289.4	292.0	—	—	—	—
New Orleans	207.1	242.3	244.7	245.1	248.3	249.9	256.3	257.1	258.0	258.8	259.8	262.3	—	—	—	—
New York	207.4	265.4	270.8	276.0	282.3	289.4	297.1	297.8	298.7	302.8	304.0	309.4	—	—	—	—
Philadelphia	228.3	262.8	265.4	265.2	271.2	275.2	280.8	281.7	282.6	285.3	286.6	287.1	—	—	—	—
Pittsburgh	204.0	243.5	250.9	251.8	258.2	263.8	267.0	268.9	270.1	270.7	271.7	272.2	—	—	—	—
St. Louis	213.1	251.9	256.9	255.4	263.4	272.1	280.9	282.2	283.2	287.0	288.3	290.3	—	—	—	—
San Francisco	266.4	327.5	337.4	343.3	352.4	365.4	368.6	376.2	377.7	384.7	386.0	388.1	—	—	—	—
Seattle	191.8	237.4	247.0	252.5	260.6	266.6	268.9	271.1	272.1	273.9	275.0	276.5	—	—	—	—

Costs in a given city for a certain period may be compared with costs in another period by dividing one index into the other; if the index for a city for one period (100.0) divided by the index for a second period (150.0) equals 133%, the costs in

the one period are 33% higher than the costs in the other. Also, second period costs are 75% of those in the first period (150.0 ÷ 200.0 = 75%) or they are 25% lower in the second period.



Cable-roof suspended inside blimp hangar permits conversion to cabinet factory.

There was one overriding requirement when a World War II dirigible hangar, near Elizabeth City, N. C., was bought by Westinghouse Electric Corp. for its I-XL Furniture Co. And that was control of weather inside the 300,000-sq-ft, 190-ft-high structure . . . necessary because regulation of temperature and humidity is critical in any furniture plant.

The problem was solved with a plan devised by architect-engineer, Wiley & Wilson. They suggested the *interior* cable-suspended roof which now "hovers" 24 ft above the floor of the entire hangar. The roof actually hangs from the arched roof of the main structure on 214 Bethlehem cable assemblies, which vary in length to match the curves of the arches.

"Building a real roof, instead of simply an inner ceiling," the architect-engineer explained, "was less expensive than trying to maintain . . . completely weatherproof conditions . . . in the entire hangar."

The cable assemblies required 25,000 ft of 5/8-in. extra-high-strength, galvanized strand with swaged clevis terminals on each end. And the actual roof is a grid of 14-in. steel beams and joists covered with steel roof deck, rigid insulation, and two plies of felt and asphalt. Bethlehem supplied all 251 tons of structural steel beams.

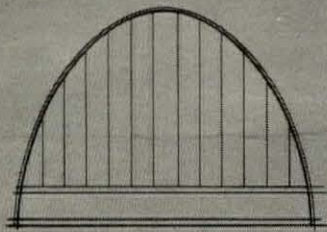
Another immediate need was speed, for the quicker the roof was up, the earlier the plant could be in production. This design, as installed by the general contractor, Basic Construction Co., fulfilled that need.

This unusual structure demonstrates the versatility of steel cables and how well they can be adapted for roof supports. If you are planning a cable roof, you may want to take advantage of our technical assistance on cables and fittings. Just call our nearest office, or write:

Bethlehem Steel Corporation, Bethlehem, Pa. 18016.



Steel for Strength

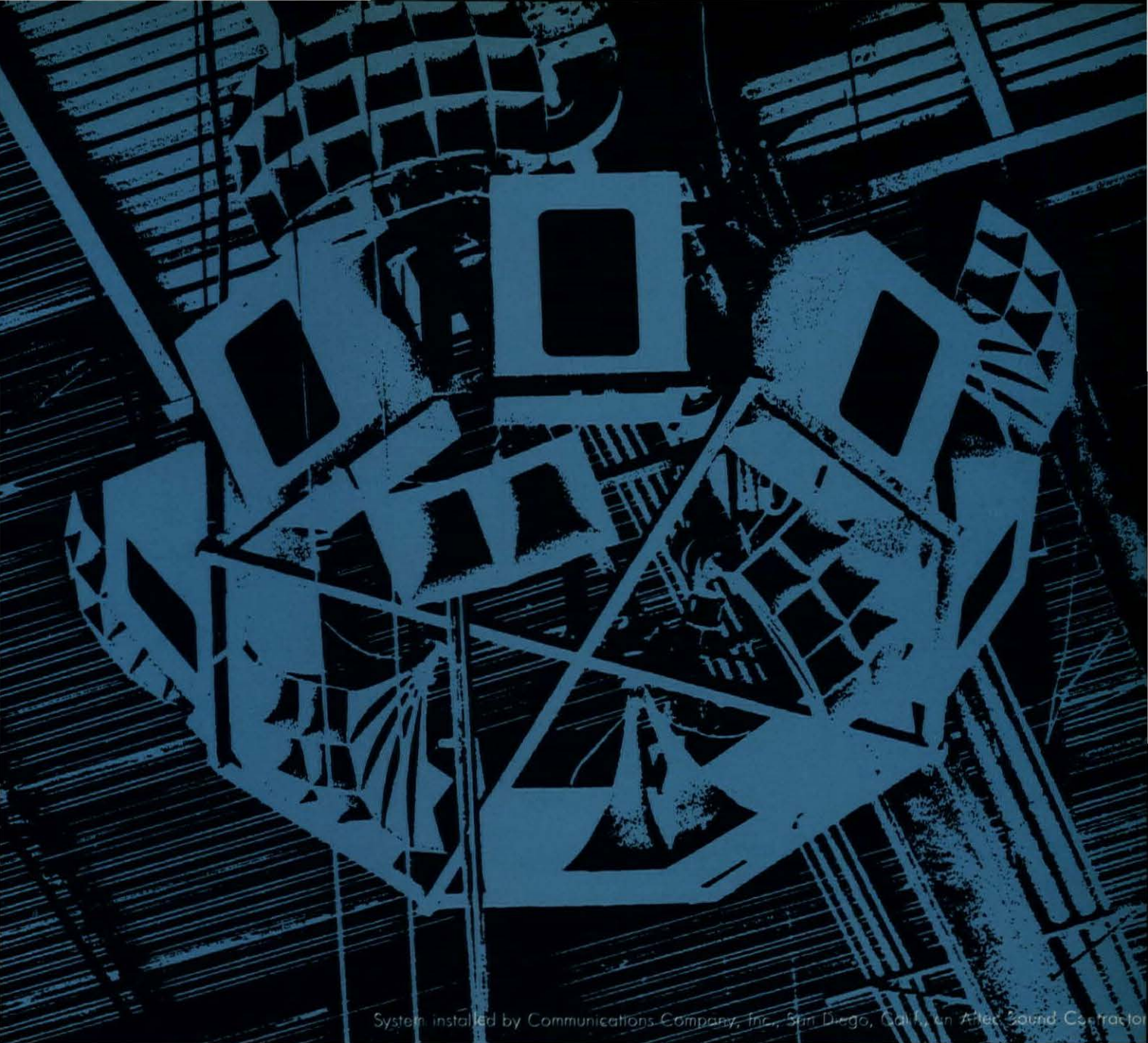


Cross-sectional view of hangar

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THE SCOPE OF FUTURE WORK

George A. Christie, Chief Economist
W. Dodge Company
Division of McGraw-Hill

What's ahead for the construction industry

Right now the building business is feeling what I'll call "policy backlash". Many of the economic policies adopted by government to cope with the unusually strong inflationary pressures of the past year—tight money, suspension of the investment tax credit¹ and accelerated depreciation, sharp cutbacks in certain Federal programs—such as highways—have had an unusually severe impact on construction. In 1966, the credit-starved building industry had its worst year in two decades; and many types of non-residential activity, though at record levels, have lost much of their steam. In the midst of unprecedented general prosperity, the building business is clearly having its trouble.

Unpleasant as these facts are, we can afford to be optimistic about two things. One is that the currently weak construction market is by no means a reflection of the true strength of demand. The other is that there are signs that the worst of the credit crisis is already behind us.

Now, rather than focus on what is basically a set of artificial market conditions, I'd like to deal with something a whole lot more real—that is what will be happening once the construction market begins functioning without today's restraints.

In this larger frame of reference, the main thing to keep in mind is the very basic role that construction plays in our economy. Construction is woven in the very fabric of our lives—first and foremost, of course, as our homes, but also in the places where we work, where we buy, where we get our education and take our recreation, and the many transportation, water supply, and sanitation facilities we need to support our very existence. Quite naturally, then, any look at the future of

construction has to begin with the structure of the population itself. How many people, how many families will there be, and what will be their needs?

And while that is the cornerstone of the problem, it's by no means the whole issue. After all, needs arise from more than just the *growth* of our population. How much of our now existing stock of buildings and other facilities will need *replacement* over the next decade or two? Too much of it is already in a thoroughly dilapidated state. One out of three new housing units currently being built is a replacement for a demolished structure, and still there are millions of substandard housing units presently being lived in (or should I say "existed in"?).

We boast of a network of more than three-and-a-half million miles of streets and highways. Yet, less than half of them are surfaced, and one out of every four miles is nothing more than dirt.

Then, too, how about our stock of perfectly sound and adequate structures? How do we know that in 10 or 20 years these facilities will be in the right places? Will they be where the people are who will want to use them? This problem of location has at least two faces. One is the broad regional shift of the nation's population; the other involves the balance—within all regions of the country—between the growth of the central city and its suburbs.

And that's only the needs or the demand side of the equation. Once having established a basis for how much construction of each type will be required, and where it will be most effectively situated, there's the other half of the problem that concerns who will provide it and how. What proportion of tomorrow's construction will be privately initiated and how much publicly sponsored? How will it be built—the vital issue of low on-site productivity as opposed to prefabrication, changes in the kinds of materials that will go into future projects and the substitution of one material for another that is bound to take place, problems of design, progress in getting outmoded building codes up to date—in short, all

the questions involving the progress of building technology. Finally, how will future construction be financed? Will there be a sufficient flow of funds to make it possible to meet all our future needs, or will there be a credit gap?

Obviously, it would be far too big a job to try to tie down all these loose ends of the future. And so, I'm going to deal mainly with the demand side of the equation—the needs of society for various types of construction in the decade or more ahead of us. And to do that, we'll first have to draw a few generalizations about the kind of society whose needs the construction industry will be responding to.

Postwar suburban expansion: a response to the needs of "Veteran"

Roughly 20 years ago we embarked on a period when just about all marketing effort was directed at meeting the needs of a guy known as "Veteran." After five years of deprivation, his wants—backed up with plenty of cash and lots of available credit—were for a time almost insatiable. For the building industry, these conditions brought a housing boom of staggering proportions.

But it meant a lot more than just a temporary housing boom. It brought, in many respects, a new way of life. The post-war suburban shift made us a nation of homeowners, instead of predominantly renters as we had been up to the Forties. And life in the suburbs brought with it a lot of other changes, too: a new retailing concept of the shopping center based on the suburbanite's almost fanatical devotion to the automobile; decentralized light manufacturing in newly-created industrial parks, a tremendous wave of educational building brought on by the fact that "Veteran" had moved away from the existing schools and besides this, he was producing little students at an astounding rate. His acquisitive urges prompted the construction of vast industrial capacity during the Fifties; his mobility demanded the development of a \$40-billion highway network. And more. Lots more.

¹ While President Johnson has requested an immediate restoration of the 7 per cent investment tax credit, there is a proposal before Congress to impose a 6 per cent surcharge on corporate income taxes which, according to McGraw-Hill's annual survey of business plans (page 81), has already reduced industry's investment plans for this year and next by \$276 million and \$363 million respectively.

It was inevitable, though, that the great stimulus of the new post-war society would eventually taper off. No one can say exactly when it happened. Some markets eased back in the middle Fifties; others held up somewhat longer. There's little question, though, that by the beginning of the Sixties, "Veteran" had had his day. He had lost his distinguishing characteristics and blended into society.

I suppose that if we wanted to make a better story out of it, we could call the Sixties a period of the "Return of Veteran"—a kind of second round of demand, if you will, in which the affluence that was an outgrowth of the very boom conditions he had helped to create was now leading him to upgrade his position where he could. He needed a larger house to hold his larger family, a second car, perhaps, and a taste of the good life as he began to spend more on leisure and recreation. But like most secondary effects, the impact of the "Return of Veteran" was dispersed and diffused.

What needs will dominate the future?

With this much perspective, let's now look in the other direction—forward. What forces will we be responding to in the second half of the Sixties, and, more important, during the Seventies? For the construction industry, I think there are two key forces. If, in the past two decades our markets have been shaped by the appearance of "Veteran" and by the subsequent "Return of Veteran", it follows that a very potent force in the near future is going to be—you've guessed it—"Son of Veteran". It's a simple fact of biology and arithmetic that the son (or daughter) of the first GI discharged after World War II is now old enough to vote. And there are millions more right behind him.

But "Son of Veteran" is only one major source of future construction demand. I said there were two key forces to watch for in the years ahead. During the Fifties, in that great rush to the suburbs, we allowed a lot of other construction needs to go largely unmet. In fact, by default, we managed to create a whole package of problems that can best be summed up under the heading of The Urban Crisis. The basis for the huge building boom of the past couple of decades was the expansion of suburbia. Now the focus is shifting to the central city and its problems. Along with providing housing and the many other facilities that will be needed by our rapidly-growing young adult population, rebuilding the nation's urban areas will be the other major challenge for the construction industry in the next decade or two. Let's see if we can now get some measure of the impact that these two important forces will have on future construction

needs. And to begin with, let's look at this burgeoning young adult group and see what it holds for housing and other construction demand.

In the decade between 1966 and 1975 we are going to have to provide a total of more than 20-million new housing units of all kinds. Does that sound like a lot? It is. It means an average of two-million units a year, and in the first year of that decade—1966—we have already fallen drastically short of that number. Bear in mind, too, that I said we are going to "have to" provide this total of housing. It's not a matter of a utopian dream, or even a desirable goal. This figure represents a kind of *minimum* based on nothing more than putting a decent roof over everyone's head. It represents an analysis of today's housing stock, its condition, and the expected growth in the number of families over the next 10 years. It also allows, of course, for the continued demolition and replacement of dilapidated structures as well as the existence of a small but important proportion of vacant housing units. Here's how the arithmetic of this projection works.

Last year's total stock, or inventory, of just over 65-million housing units—and I want to make it clear at this point that I'm dealing with the broadest measure of housing which includes public and private, non-farm and farm, even mobile homes—these 65-million units served the permanent shelter needs of roughly 58-million households (that's family units and individuals who live alone). There are more housing units than there are households simply because we include in the housing stock about 7-million units of which some are temporarily vacant—a necessary prerequisite to our high rate of population mobility—and some that are just plain uninhabitable. The ratio of occupied housing units to the total housing stock works out to about 1.1 to 1, and we've been holding at that ratio ever since the mid-Fifties.

Biggest single need: all kinds of housing

Of course, the biggest single element in the need for additional housing—the main part of the 20-million new units I spoke of—will be coming from the anticipated growth in the number of new families. And estimating the strength of this need is really not very difficult. After all, the people who will head up these new families are already very much among us, so it's largely a matter of applying a few simple actuarial-type calculations to today's young adults who will soon spin off to begin creating their own households. Before long the net addition of new households will be taking place at a rate of more than a million a year, adding a total of about 11-million more

family units by 1975, and 6-million more than that by 1980. In 1975 we'll have 11 million, and in 1980 we'll have 74 million families needing shelter.

The net addition of 11-million newly formed households is only the nucleus of the nation's total housing requirement over the next 10 years. Close to eight million units now in use will be eliminated over the next decade—some of them by fire and storm, but a lot more as a direct result of urban renewal or an indirect result of highway and other construction. Also included in this total are more than a million of today's mobile homes that will be retired and replaced by conventional houses and apartments or by bigger (and less mobile) mobile homes. Altogether it means eight million homes that will have to be replaced in addition to the 11 million needed to accommodate our newly formed families.

Then, in addition, still another million or so homes will have to be provided just to maintain flexibility in real estate markets. With our population constantly on the move, it's necessary that there always be a sizeable stock of vacant housing units available for sale or rent. And finally, some further need for housing will arise from losses of existing space through conversions and to reflect the growing demand for "second" homes.

And in all, then, the basic element of housing need (new family formations, replacements of losses to the existing stock, and vacancies) add up to a need to create some 20-million new housing units in the 10 years through 1975. Beyond just the outside dimensions of this huge market aren't enough. Let's fill in a few of the details.

Since we began with the needs of the total population for shelter, it was necessary to include mobile homes as part of the total demand. (And here we differentiate between year-round homes and travel trailers, which are not included in the housing stock total.) The vigorous mobile home market has shown very rapid growth over the past decade, making strong inroads into conventional housing demand.

Two characteristics of the mobile home *itself* are pertinent to future projection, though. One is that this is, always will be, a specialized market and therefore, a limited market. The other is that owing to improvements in mobiles in recent years, a higher proportion of future sales will reflect replacement of existing smaller units. Between now and 1975 about three million of the total 20-million-unit-demand for shelter will be met by mobile homes.

This leaves a total of about 17 million conventional housing units—ordinary family houses and apartments—as a mi-

um to be built through 1975 by the
tion's homebuilders. It means an aver-
e of 1.7-million units (compared to the
5-million rate for the first half of the
xties), and it also means that by the
ar 1975 we'll be seeing an annual
lume in excess of two million units!

Now what can we say about the
omposition of this conventional housing
emand? Over the past half-dozen or so
ars, apartment construction has grown
be a very substantial part of the total
w housing market—one out of every
ree new housing units. And for at least
e balance of the Sixties, and probably
en beyond that, rental housing will
ontinue to play a big part in the expand-
g residential picture—an even bigger
rt than it has played in the recent past.
i impressive as the apartment boom of
e Sixties has been to date, it barely met
rrent needs. Building one out of every
ree new housing units for the rental
arket may seem a high proportion by
e standards of the Forties and Fifties,
ut when we stop to think about it, the
oportion of rental units in the *total
ousing stock* is actually a bit over one-
ird. So, when we build in that propor-
on—as we have been doing recently—
e are barely matching the existing mix
rental and owner-occupied units.

Then when we look ahead, it is clear
at by far the fastest-growing parts of
e population—the young adults and
e over-sixties—are the age groups that
resent the hard core of apartment de-
and. It stands to reason that for quite a
hile yet, future levels of multi-family
nstruction must move substantially
bove the volume of recent years.

A second reason to anticipate a con-
ued high proportion of apartment
ilding in the decade ahead is the in-
eased effort that is being put into
lving the problem of urban blight. After
years of reacting to the desires of
milies for suburban living, we are being
quired to refocus our attention to the
blems of the city. In a sense, by mi-
ating to the suburbs we tried to escape
any of these problems, and they have
ly intensified out of neglect.

What are some of the main prob-
ms of the urban area, and how do they
volve construction?

The outward signs of urban deterio-
ation are often revealed in economic
ms: high unemployment, low incomes,
n-down housing, outmoded and in-
equate facilities, and a general pollu-
on of the environment—air, water,
en noise. But these are, in most cases,
ly the symptoms of the underlying
iological roots of the problem; poor
ucation, lack of job skills, racial bar-
rs, and extreme population density.

We must cope with the city as an act of will

As the noted architect Edmond Bacon
(executive director of Philadelphia's City
Planning Commission) puts it in his soon-
to-be-published book "Design of Cities",
the urban area can no longer be passed
off as a "grand accident" which is beyond
human control; the city must be made an
"act of will", substituting direction and
planning for the default, neglect, and
abandonment that has led to its state of
decay (RECORD; January, p. 113).

And just what are we doing to exert
our wills over this "grand accident" we
call the city?

For the past 18 years our attack on
the city slums has been concentrated in
the form of the Urban Renewal program.
And while some of the achievements
under this slum clearance and redevelop-
ment scheme have been quite spectacul-
ar—Philadelphia, Boston, New Haven,
San Francisco, to name a few cities where
UR has worked big changes—it has not
been an unqualified success. Perhaps its
shortcoming has been that UR is real
estate-oriented instead of people-orien-
ted; that it treats the symptoms of
urban decay—the buildings—but fails to
get to the roots of the problem.

Only now are we beginning to con-
front the urban problem in all its aspects.
And this means getting at the deep-down
causes at the same time we treat day-to-
day symptoms. Besides welfare payments,
new programs are geared to provide the
tools of self-help and developemnt, such
as Head Start and the Job Corps. Besides
just piecemeal demolition and redevelop-
ment projects which often leave spec-
tacular new residential and commercial
buildings surrounded by slums, new pro-
grams are geared to the rejuvenation of
entire neighborhoods. Besides the bull-
dozer and relocation systems of Urban
Renewal, new programs now seek oppor-
tunities to rehabilitate rundown but still
structurally sound housing, avoiding the
need to relocate residents.

The most convincing evidence that
a new and vigorous approach to the
urban problem is underway is the crea-
tion, a little over a year ago, of the De-
partment of Housing and Urban Develop-
ment. This recognition, at the cabinet
level, of the need to go deeper than
Urban Renewal for the solution to this
problem has been backed up by several
important new pieces of legislation: the
Housing Act of 1965 with its provisions
for rent supplements and its emphasis on
rehabilitation; the more recent Demon-
stration Cities Act which requires that re-
newal programs include housing for a
whole range of income groups and
stresses that they also provide for health,
welfare, recreation, and other social

services necessary—and this is the key—
"to change the total environment of the
neighborhood's residents".

Two other developments fit into this
new pattern of urban restoration.

One of them involves revitalizing
the archaic transit systems that have given
most of our cities hardening of the ar-
teries. Following San Francisco's out-
standing example, many other major
cities are taking a hard look at their facili-
ties in relation to current and future traf-
fic. Many alternate schemes are under
consideration: high-speed trains, sub-
ways, monorails, as well as the more pro-
saic but still important modes of travel
involving buses, roads, parking facilities,
and terminals. What is best for one city
is not necessarily the answer for another,
but one thing is sure—metropolitan
transit will soon be one of the biggest
heavy construction jobs ahead of us. One
estimate, by the president of an engineer-
ing firm working on the Bay Area Rapid
Transit project calls for spending more
than a billion dollars a year over the next
decade alone. And if we don't we're
liable to find that by the time the SST is
airborne, it'll take longer to go crosstown
than from coast-to-coast.

The other recent development I
mentioned concerns the environment of
the city. Recently a TV comic said that
"New York is the only city where you
have to go *indoors* to get a breath of
fresh air." I would only add that this same
gag could probably be applied equally
well to just about any metropolis in the
country, and it puts the finger on an area
in which we are only beginning to recog-
nize a need for action. The war on both
air and water pollution—as still another
aspect of the urban problem—will un-
questionably be escalated many-fold in
the decade ahead.

These trends reveal an important
change that is now in progress. The prob-
lem of urban decay was recognized a
long time ago. Urban Renewal, beginning
back in 1949, was a first attempt to deal
with it on a project-by-project basis. And
while a lot of slums were cleared, and a
lot of good (and some not so good) build-
ings were put in their place, UR never
really came to grips with the real issues.
Only now are we seeing a coordinated
public and private approach to the urban
problem in all of its aspects: the socio-
economic issues of race, education, and
employment; housing needs, involving
both new construction and rehabilitation
(where it is feasible); the environmental
problems of recreation, transportation,
and pollution control. It is only through
this kind of a total approach that we will
eventually recreate the kind of climate
which will attract large amounts of pri-
vate capital back to the city.

This "second-stage" of urban redevelopment, along with the other dynamic force of the future—our rapidly-growing young adult population, will be the sources of accelerated construction growth during the next 10 or 15 years. Briefly, let's see what they mean in the way of *specific* demands for construction.

It's been said that we build housing to satisfy *current* needs, that we build industrial and commercial capacity for *future* demand, and that most other construction is a matter of catching up with the needs of the past.

Like most glib generalizations, this one has some elements of truth in it, though maybe it states the case a bit too strongly.

There is certainly something to the point that homebuilding is geared largely to the needs of the present. It's only in rare cases—war, credit scarcities, and other emergencies—that housing demand is likely to be postponed, and once the emergency is over, the backlog of demand is soon fulfilled.

Right now, we're smack in the middle of such an emergency housing market, building only a little more than a million new housing units when we should be building more than a million and a half of them. We're accumulating a backlog of housing demand right now that's second only to the one from World War II. And pretty soon—perhaps in 1968, or as soon as credit conditions permit—we're going to see another boom housing year—maybe even a two-million unit year.

But this should not be confused with the underlying growth in housing demand I mentioned earlier. Once this backlog is met, we'll be settling down to a nice, healthy rate of growth that will put us in the two-million-a-year neighborhood to stay. And we'll be there before 1975.

Business building will follow cycles

Now, what about industrial and commercial building? If business-related construction is geared to the future, there's a pretty strong rate of growth implied there, too. But watch out for this one. Business capital spending is notoriously cyclical, and more often than not the short-term changes in business-related construction overshadows the underlying growth trend. That's certainly where we stand right now with industrial and commercial building at the peak of a very strong period of expansion—three back-to-back years of 15 per cent gains. Even though there's little excess capacity in existence at present, it would be highly unrealistic to expect continued growth at anything like this phenomenal rate. In fact, the next couple of years are likely to

bring a mild reaction to the recent capital boom with an easing back from the current peak rate of industrial building. And this in turn will likely be followed by another period of growth.

Community facilities, public and private, will offer real opportunities

This leaves us the final category on construction—what I'll call community facilities. And if our analysis of the growing importance of urban rebuilding in the years ahead is on the right track, there should be some real opportunities here.

Current total spending for community facilities by both the public and private sectors involves an outlay of more than \$30 billion. And about three-quarters of that total—more than \$20 billion—represents direct outlays for construction. Transportation and education (in other words, highways and schools) are the big ticket items, and together, they are worth about two-thirds of the total. The rest covers construction of electric and gas utilities, sewer and water facilities, hospital and health buildings, and recreational facilities.

These, you'll recognize, are the construction types that tend to lag behind the requirements of society. Because there already exists a backlog of needs for these community facilities—owing to a less-than-adequate volume of construction in the past—and because within the last couple of years there has been a veritable flood of legislation providing funds for their development, we can look for a vigorous growth of community facilities construction in the years ahead.

By 1975—that is, in less than 10 years—spending for community-related construction will have doubled to a rate of more than \$40 billion. This works out to a compound annual growth rate of 6 per cent—a much better rate of increase than the construction industry as a whole has been showing so far in the Sixties. Briefly, here's how some of the individual categories stack up.

At the lower end of the scale we find the utilities with their projected rate of about 5 per cent per year. Utilities capacity has always been well-planned, and as a result, a minimum of backlog of need exists here. So, we can anticipate that future growth will be about in line with general economic expansion.

Also in the 5-per-cent-a-year class is educational building. This category, which reflects the growth in school enrollment, saw sharp development during the Fifties when the famous "population explosion" hit the elementary schools. Now, as these postwar kids are reaching college age, school building needs will ease for awhile. Bear in mind, though, that the demands on higher educational

facilities will remain very strong for another couple of years.

Health and transportation facilities will match average growth—with peak

The growth of health and transportation facilities over the next decade will just about match the 6 per cent average rate of community construction as a whole. Programs like Medicare will provide an expanding demand for hospitals, nursing homes, and extended-care units. Specialized needs such as mental health care are also adding to basic demand. Since 1960, construction of hospital and health treatment buildings has doubled; it will double *again* by 1975.

The eight billion dollars presently being spent on transportation construction will become 15 billion or more by 1975. Far and away the biggest part of today's transportation dollars—seven billion of the eight billion—goes into roadbuilding and much of it through the Interstate and ABC Federal-aid highway programs. It's time to start anticipating some change here.

Before 1975, the huge Interstate program is scheduled to be completed. And by that time we'll have added another 20,000 miles of new highway to the 20,000 or more already built under the scheme. But from the way we're acquiring automobiles, it's fairly obvious that even then our highway system will still be inadequate.

There's little doubt that by the time the Interstate is wound up, another program will be taking its place. But the transportation plan, which will influence most of the Seventies, is likely to have a different emphasis. It will almost certainly reflect some attempt to link highway construction with urban redevelopment. It'll mean more interchanges to relieve the growing congestion around cities, greater emphasis on parking facilities, and, most of all, it will concentrate on urban mass transit. We'll have to watch the newly formed Department of Transportation for clarification of the trends.

Finally, some of the fastest of construction growth during the next decade will be taking place in categories like water supply and sanitation, a recreational and cultural facilities. Growth averaging between five and ten per cent per year can be expected in these long-neglected areas.

For several years construction markets have been going through a period of transition—a kind of void spanning the end of the postwar boom years and the beginning of the next wave of growth. In this slow period it has sometimes seemed as though the fastest-growing thing about construction was its cost.

Bright idea



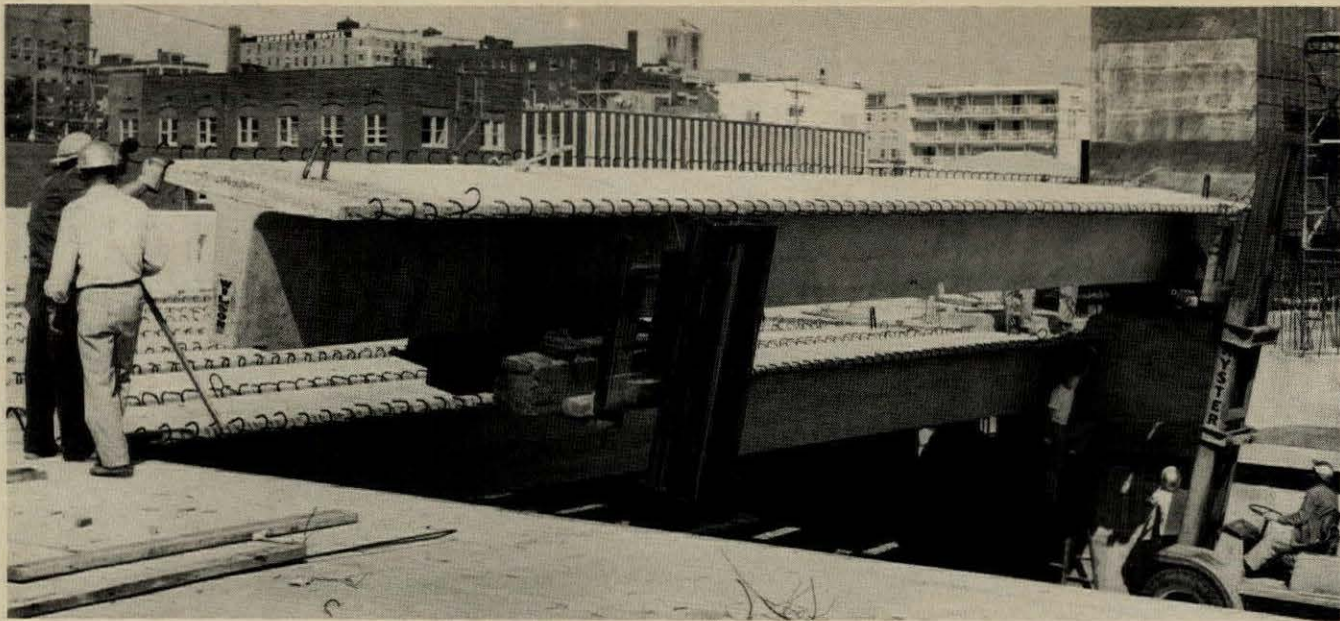
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Prestressed concrete tees form new bus terminal roof



Cranes and forklifts used in positioning prestressed concrete roof members

Both cranes and forklifts were used to position the prestressed concrete roof of the new Greyhound Terminal Building in Kansas City, Missouri.

Roof elements consisted of prestressed concrete single tees, 5-feet wide and 3-feet deep. One set of 39 tees each measured 88 feet in length; another set of 39 were each 55-feet long.

The tees were produced under carefully controlled conditions by the prestressed concrete supplier, and transported to the job-site when needed. Embedded hooks provided attachment for crane hoisting. For forklift handling, clamping blocks and cable straps cradled and stabilized the tees. More than 27,000 square feet of these prestressed concrete tees were put to efficient use in this project.

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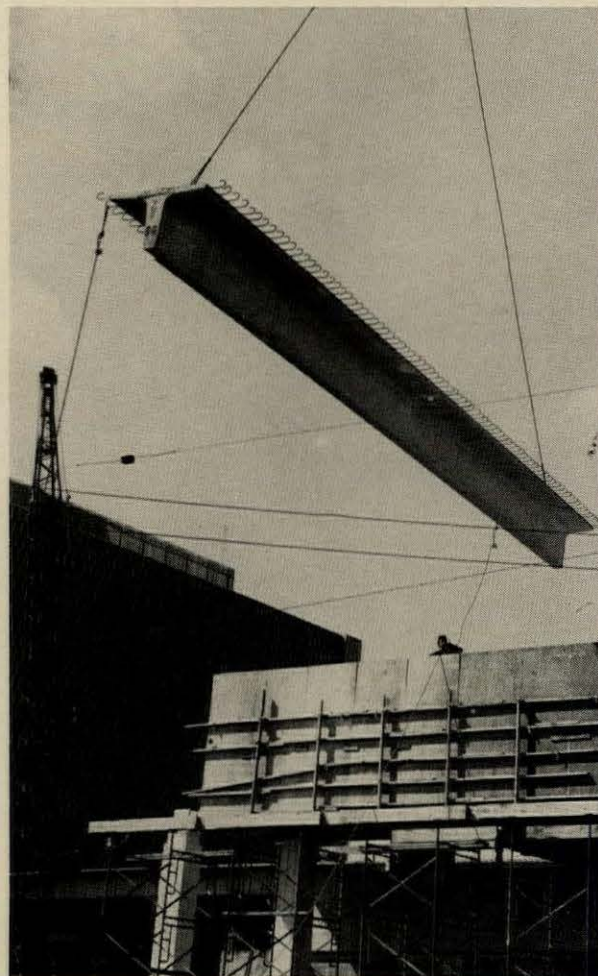
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Architect: Kivett & Myers, Kansas City, Missouri

Engineer: Pfuhl & Stevson, Kansas City, Missouri

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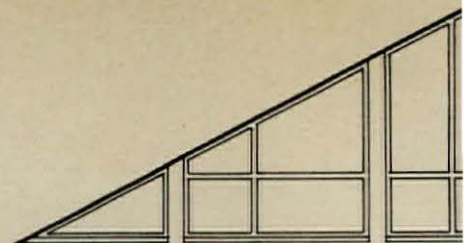
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West Lafayette Methodist Church, West Lafayette, Ohio
Architect: Wachter & McClellan, A.I.A., Warren, Ohio

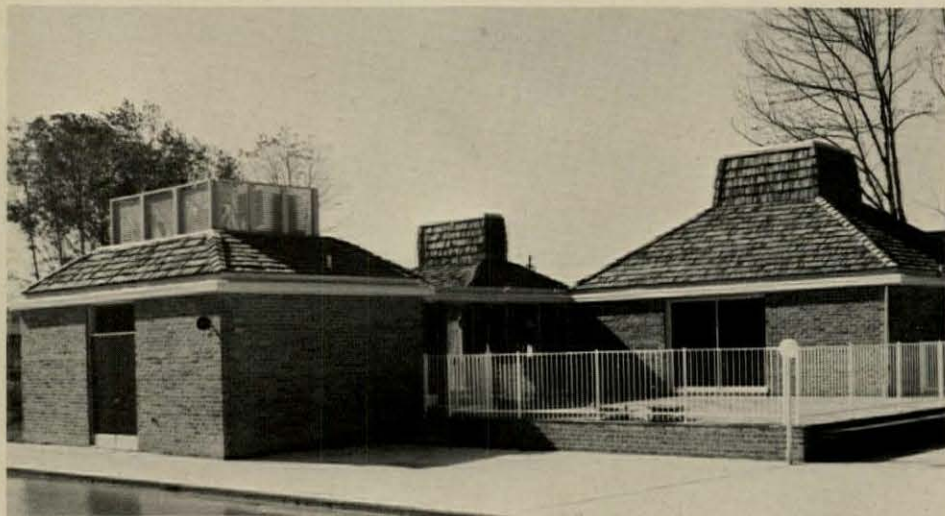


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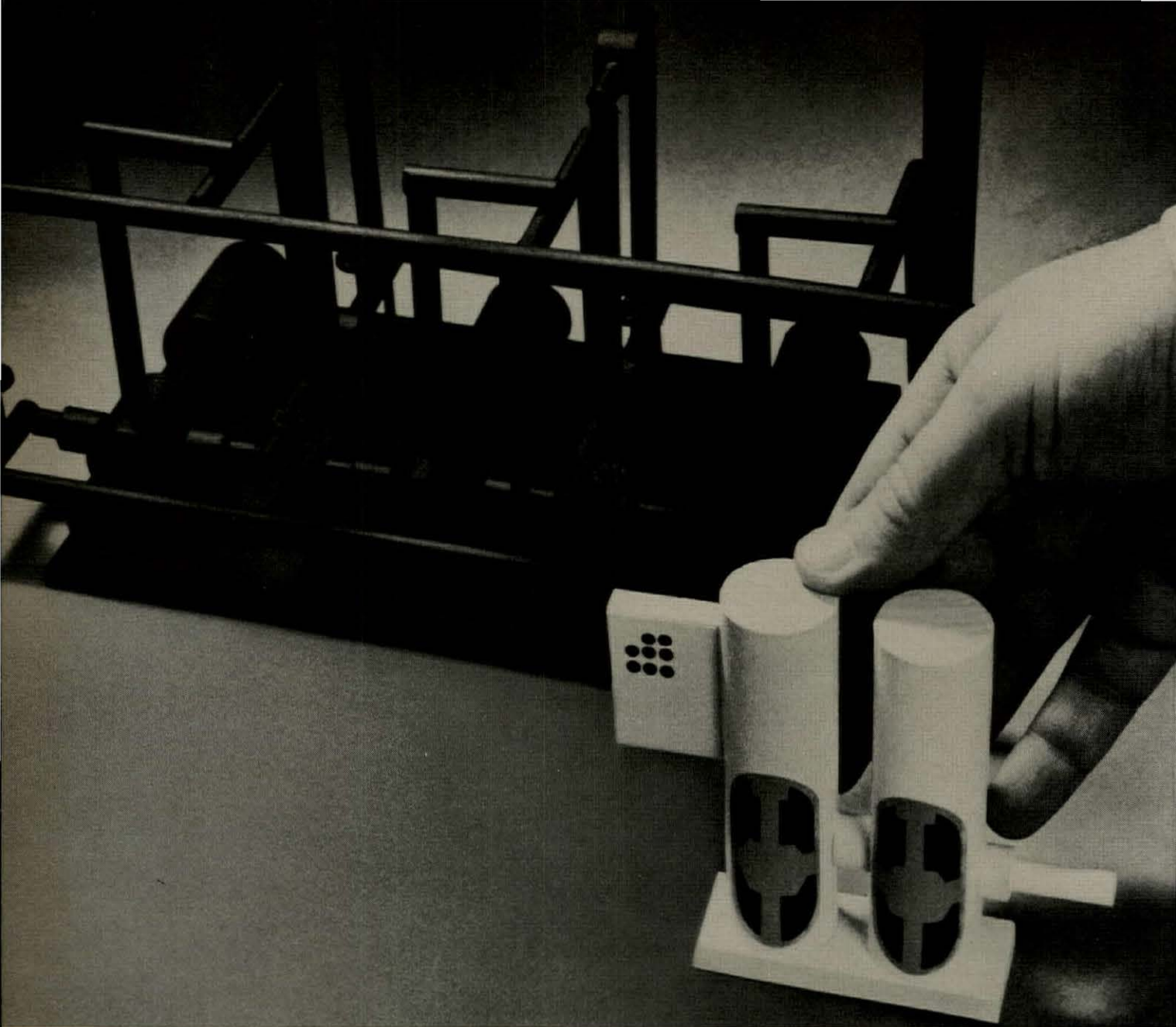
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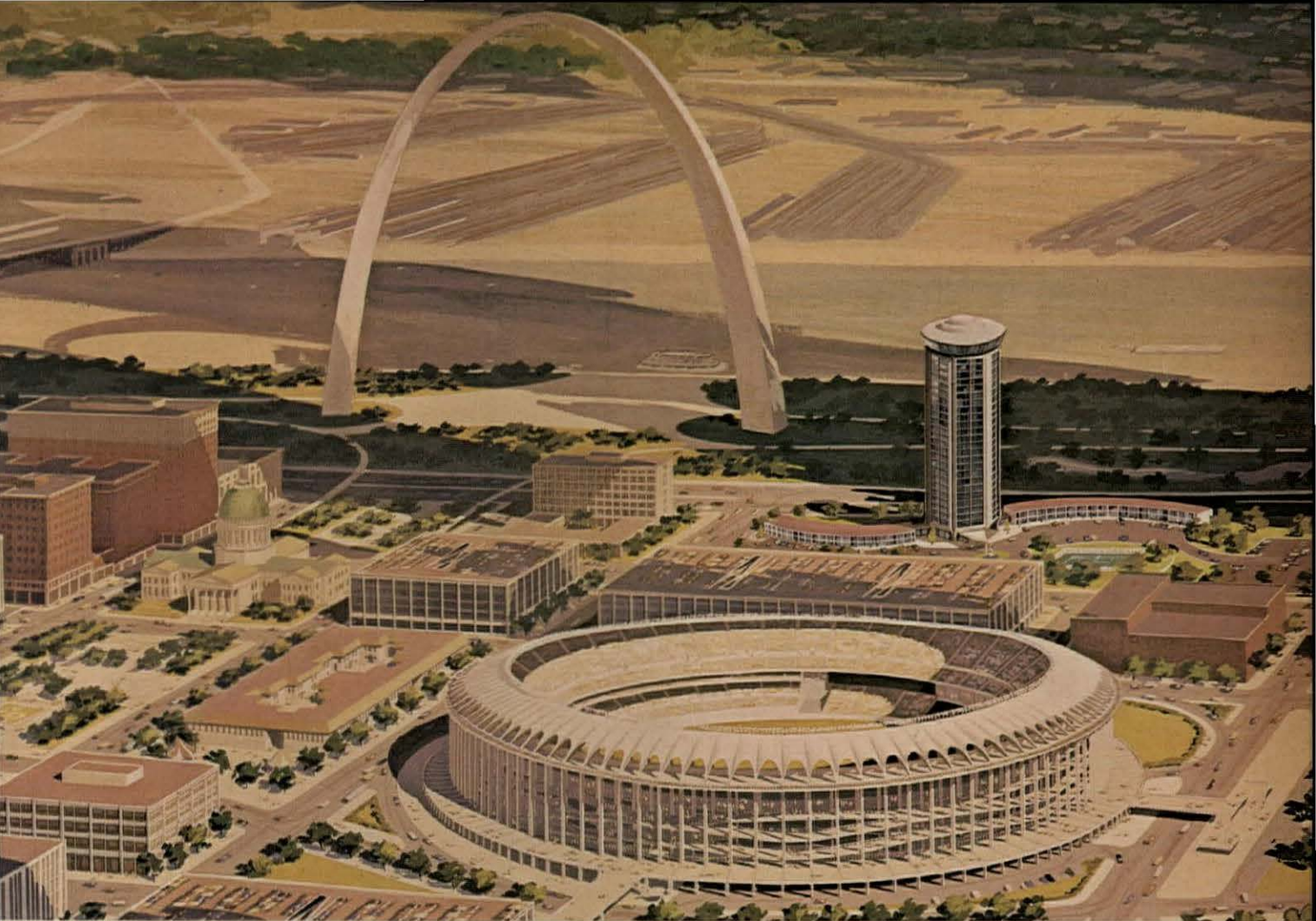


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New Civic Center, BUSCH MEMORIAL STADIUM in foreground



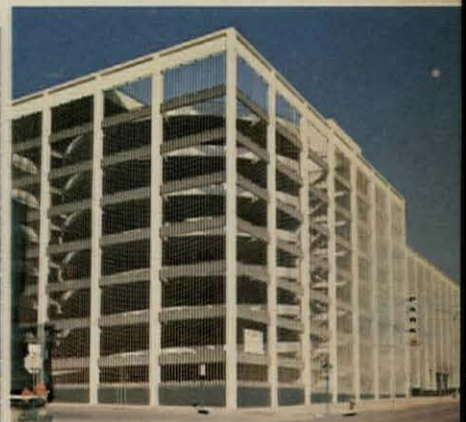
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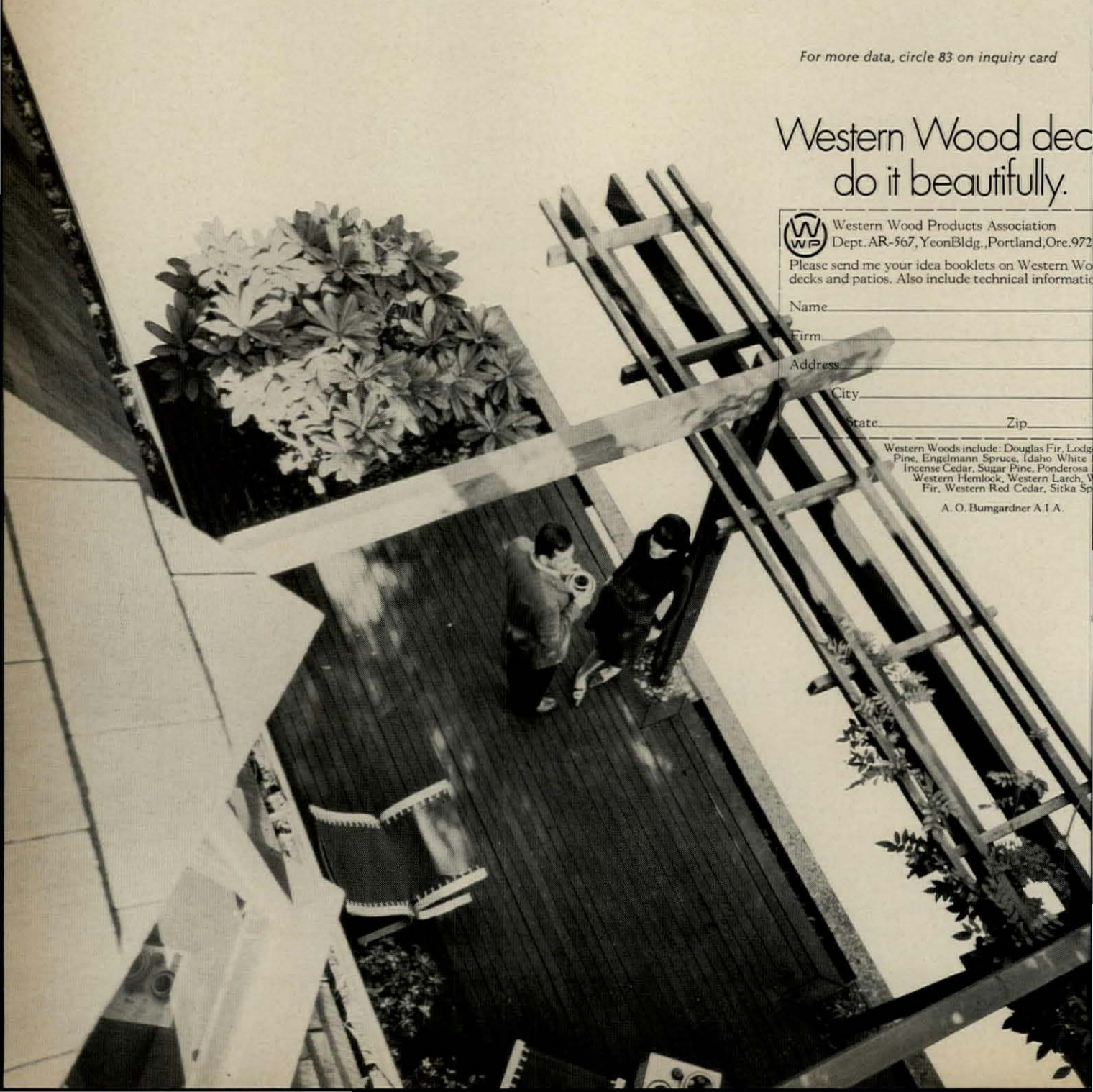
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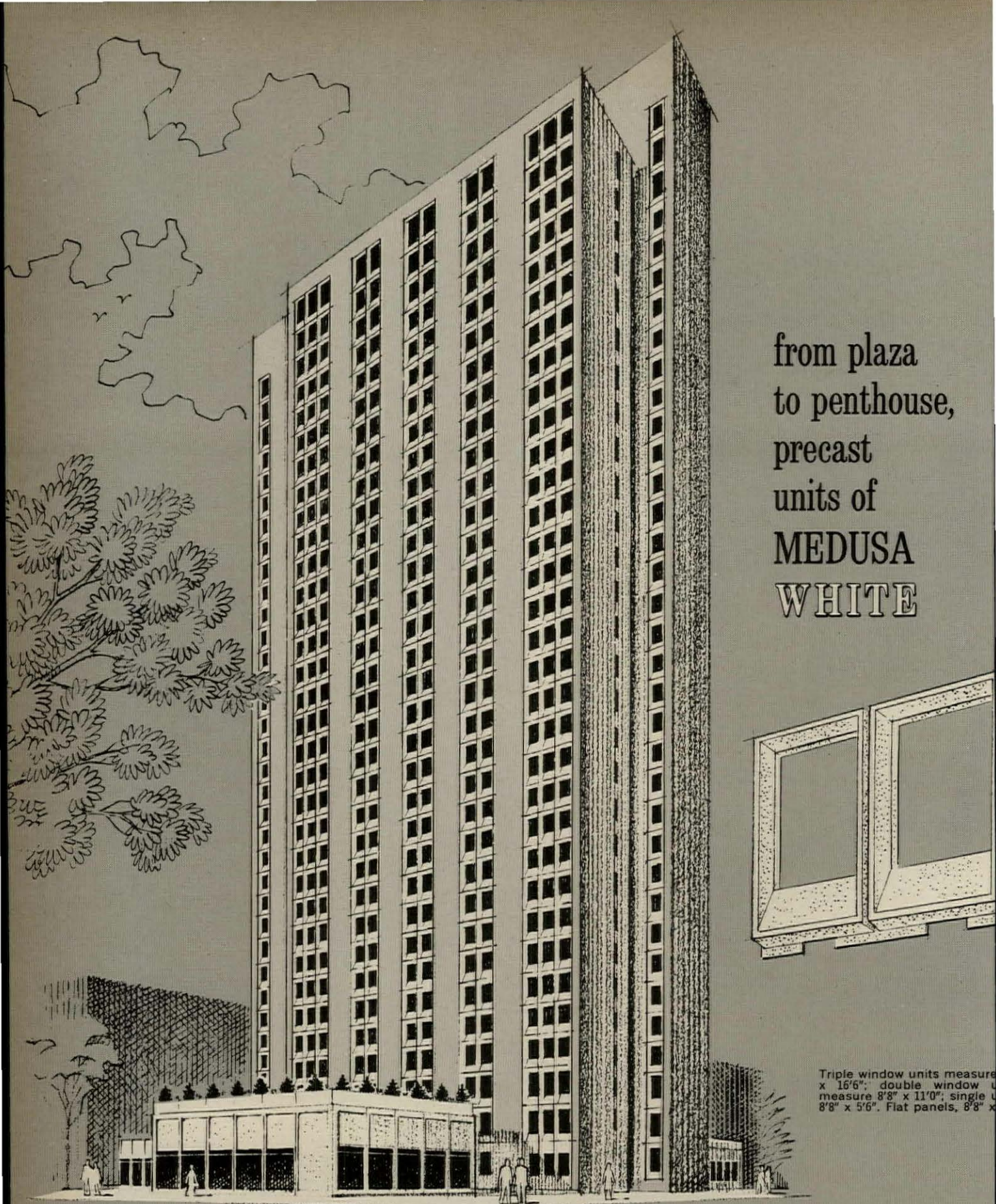
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New York, N. Y. **Architect:** Erick G. Frost, Jr. and Associates, New York, N. Y. **Contractor:** Turner Construction Co., New York, N. Y. **Producer:** Allied Castings, Inc., Chester, Conn. **Precast Erectors:** Sparks Associates Inc., New York, N. Y.



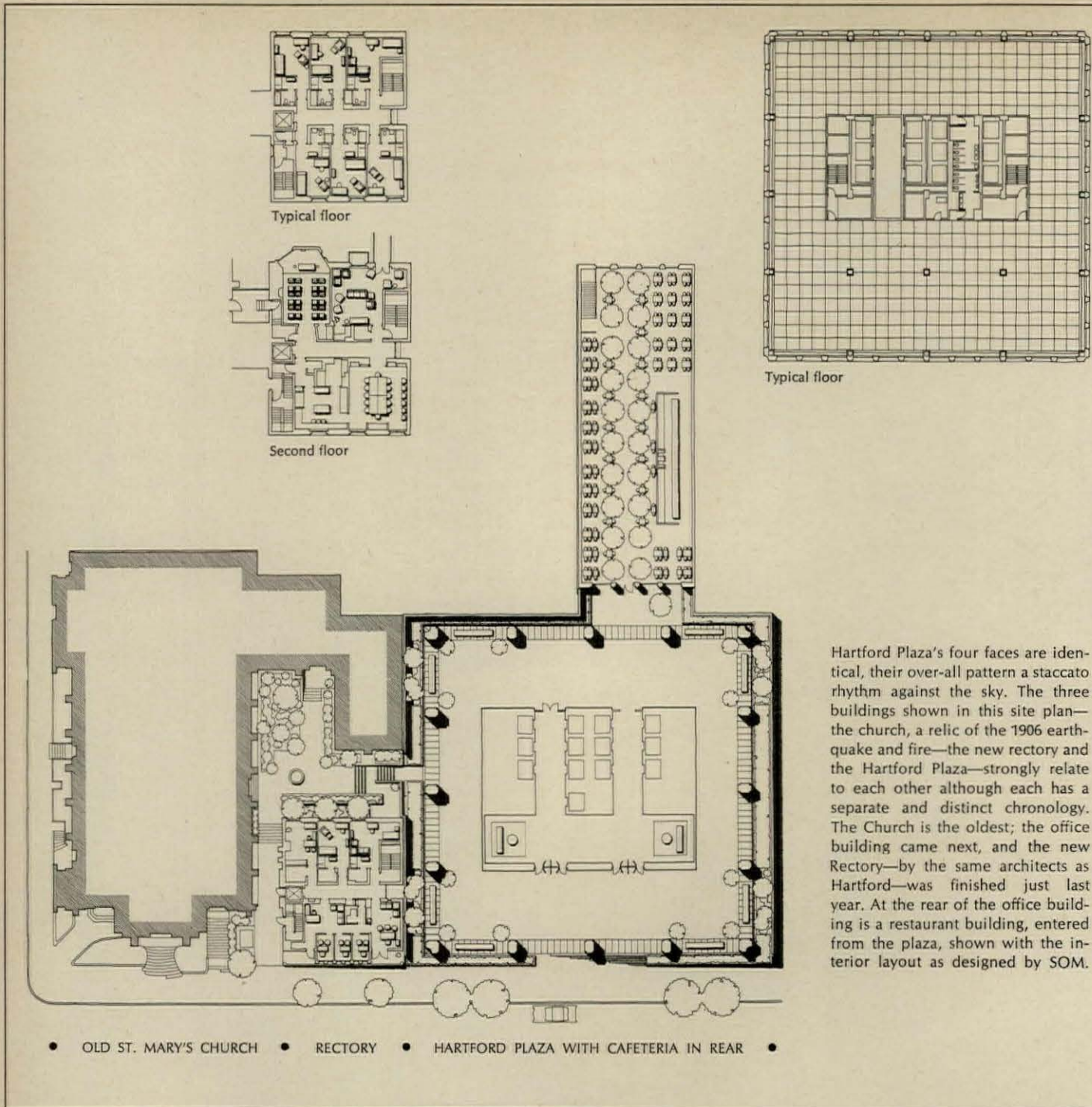
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HARTFORD PLAZA AND OLD ST. MARY'S RECTORY

TWO BUILDINGS IN SAN FRANCISCO BY SKIDMORE, OWINGS & MERRILL



Hartford Plaza's four faces are identical, their over-all pattern a staccato rhythm against the sky. The three buildings shown in this site plan—the church, a relic of the 1906 earthquake and fire—the new rectory and the Hartford Plaza—strongly relate to each other although each has a separate and distinct chronology. The Church is the oldest; the office building came next, and the new Rectory—by the same architects as Hartford—was finished just last year. At the rear of the office building is a restaurant building, entered from the plaza, shown with the interior layout as designed by SOM.

HARTFORD PLAZA a square tower which rises free against the skyline, is a 33-story office building on steep California Street in San Francisco's financial district. The site is a constricted interior lot, surrounded on three sides by buildings but with the unusual advantage of facing on the south (opposite page) a public park—St. Mary's Square. In other directions, too, the location is advantageous. On the west are two low buildings, Old St. Mary's Church of historic and sentimental interest to San Franciscans, and its new Rectory. On the north is Chinatown with its generally low building height. And on the east, California Street's grade difference makes the adjacent eight-story building the equivalent of Hartford's first four stories.

The fact that the building rises free of other buildings was, however, the basis of controversy which raged over the proposed building from its first announcement. What has happened since then points up the dynamics of the city: where Hartford seemed to some to pose a threat to the scale and



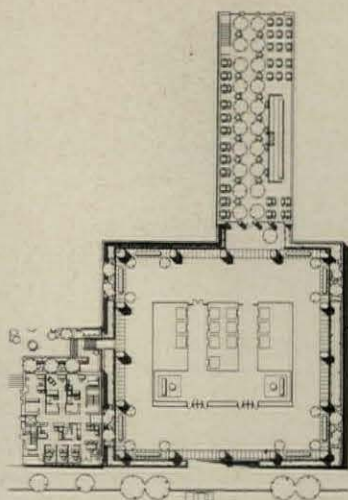


character of the area because of its 33-story height and a predicted "glassiness" (which did not materialize; in actuality the building seems more concrete than glass), a larger scale impends which will again change the area. For it is in this neighborhood—on Kearny Street and California, across from Hartford's only other present tall neighbor, the 22-story International Building—that the Bank of America is building its 55-story world headquarters building.

Although Hartford Plaza's site is small for the amount of space called for in the program, the use of the site at street level achieves an openness which belies the confined location. A 28-foot high loggia surrounds the lobby with light and air—a bold and controversial architectural solution, for the sides and backs of adjoining buildings hem in the loggia and there is no escaping them. A 12-foot wall of dark brick partially screens the plaza from these buildings on the east, and along a part of the north and west walls. On the north the screen is broken for the

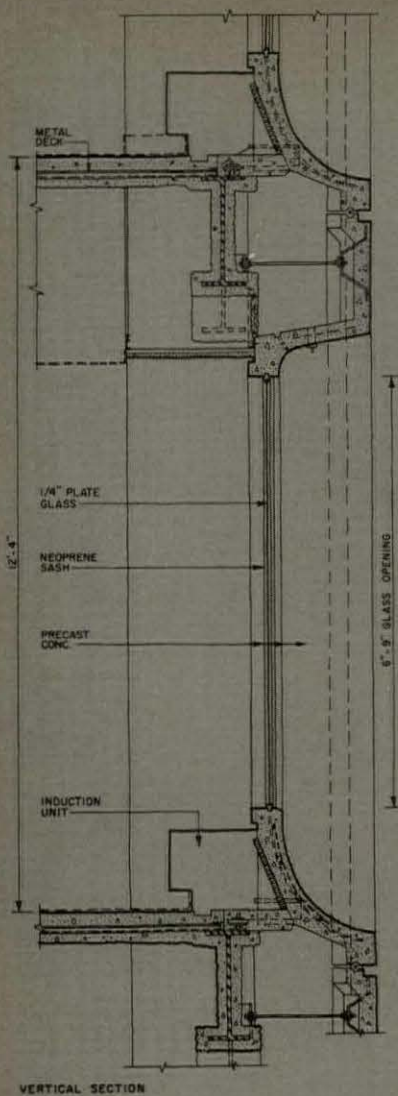
facade and entrance to the cafeteria which occupies the north extension of the plaza. On the west, the screen stops for a surprising reason: to open up the loggia to the garden of the Rectory next door and to permit thereby a delightful, if unconventional, exchange of spatial experiences. Because of the interior location, little sunlight reaches the farther recesses of the plaza, and even the Rectory garden has sun only in summer. The California Street side of the loggia, however, gets full sun all year, and since the entire street floor is used as entrance to the building (there is no rental space at this level), the loggia, or plaza, makes an inviting element in the streetscape, and it offers, as well, a sophisticated and amiable counterpart to the Rectory and Church next door.

HARTFORD PLAZA, San Francisco, California. Owner: *The Hartford Insurance Group*. Architects-engineers: *Skidmore, Owings & Merrill*. general contractor: *Dinwiddie Construction Company*; construction consultant: *Carl A. Morse*.

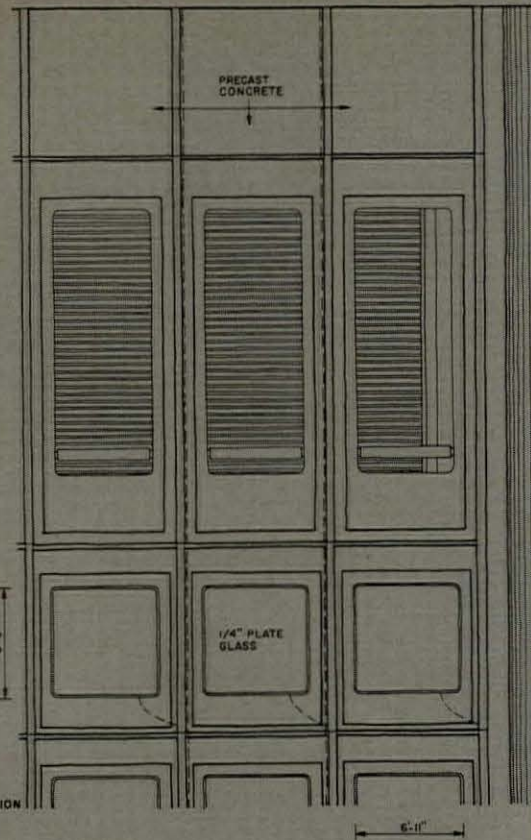


When the old Rectory had to be rebuilt, the opportunity to open up the plaza to the Rectory and the Rectory garden to the plaza was irresistible, and the result is an exceptional—and happy—relationship between buildings of very different type, character and function. The old bridge, leading from the Rectory on the left to the parish building, survives from the earlier Rectory. The cafeteria facade is of the same dark brick as the wall which screens the plaza from its neighbors.

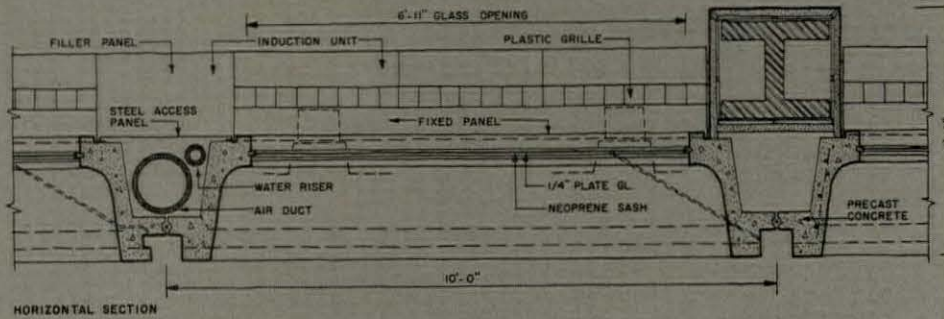




VERTICAL SECTION



CURTAIN WALL ELEVATION



HORIZONTAL SECTION



The sculptural quality of the precast concrete window units was achieved by handcrafting of models from which molds could be obtained only that way. Curtain walls have over 1500 units, prefinished inside and out, and permitting early occupancy floor by floor. Design neatly provides for mechanical services in space between units, and allows flexibility in partition location. Tolerances were very small both for precast units and steel building frame. Window units are 10 feet wide, 12 feet 4 inches high, 2 feet deep on typical floors, twice as high and deep on mechanical floors. Glass is solar bronze. Warm color of building comes from natural color of sand used with white cement in concrete.



Moulin Studios Courtesy Grassi Amer



THE RECTORY

replaces a 57-year old building which had been found to be unrepairable. The new Rectory, designed after Hartford Plaza was completed, ties in with Old St. Mary's, of which it is a part, but is in no way incongruous with the Hartford building which it also closely adjoins. The obvious difference in scale is handled so appropriately that each building meets its obligations—architectural and functional—individually and naturally. The Rectory would be a handsome town house in any location; its location here is particularly happy for its effect on the city. The building's concrete frame is faced with red brick and trimmed with sandblasted concrete, clearly recalling the old church. The entrance detail (right), however, is the key to the building's character: sensitively detailed, but essentially a strong and masculine building. The photograph above shows the Rectory in its setting between old and new.

OLD ST. MARY'S PARISH RECTORY, San Francisco, California. Owner: *The Roman Catholic Archbishop of San Francisco*. Architect-engineers: *Skidmore, Owings & Merrill*; general contractor: *Cahill Construction Co.*



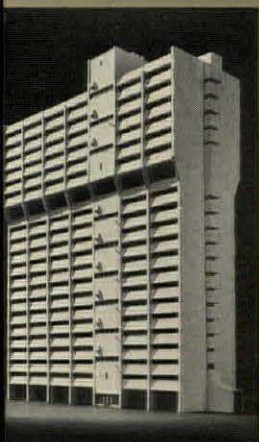


The chapel, used daily for meditation, and for mass by visiting priests, is on the second floor, secluded yet accessible—a retreat, not from life, but to quiet. The all-white room is accented by the colors of Mark Adams' vibrant concrete-and-glass window and his softer-hued wall panel of the Stations. The dark stone altar is free-standing, with a small crucifix at its front, and the ciborium recessed in the wall behind. The chairs are from the old rectory. The dining room, also on the second floor, has both a cheerful and a monastic air. Dark-stained oak is used for trim and for the north wall with its handsomely detailed double doors and storage space crafted with old-fashioned skill. The chandelier was designed by the architects.



Recent work of EVANS WOOLLEN

Five projects designed by a young Indiana architect, who offers, below, some ideas about architecture and environment. He points out the need for new rules and new viewpoints, and suggests that, beyond consistency, something incomplete, changing, and unknown is wanted in both buildings and men...



Since the environment is "in," has the individual building dissolved into the scheme of things? Not perceptibly, so far. Much work continues to be designed and judged out of context. I do not advocate relaxing all the rules, but it is time to choose, discard, or make a rule for a particular case. It is time to stop being concerned about consistency in one's own architecture—a selfish concern, at that. People and cities are vigorously inconsistent and we love them all the more. The pop artist has persuaded us to look again at the cityscape; to see that order and irrationality may coexist happily, and that the whole raucous fabric may potentially be art. There is room for many viewpoints, provided the atmosphere is liberal and respectful. Architects could be more respectful of existing spaces, of older forms, of the very spirit of a place and its purpose.

The primary commitment seems to be *the effective expression of use patterns*, for such patterns stretch beyond the building into the fabric of the city. Structural clarity seems less important than this expression.

Those who still wish to bind a loose and natural assemblage of uses into some formal order may be encouraged to do so when the context is kept in view. Perfection is unobtainable, and the idea of it boring. Something incomplete, changing, and unknown is wanted in both buildings and men.

More collaboration might help. We collaborate with the past and the present; we thrive on the continuing argument and opposition about us. We need help; we are not alone, but are—at best—involved.

—Evans Woollen

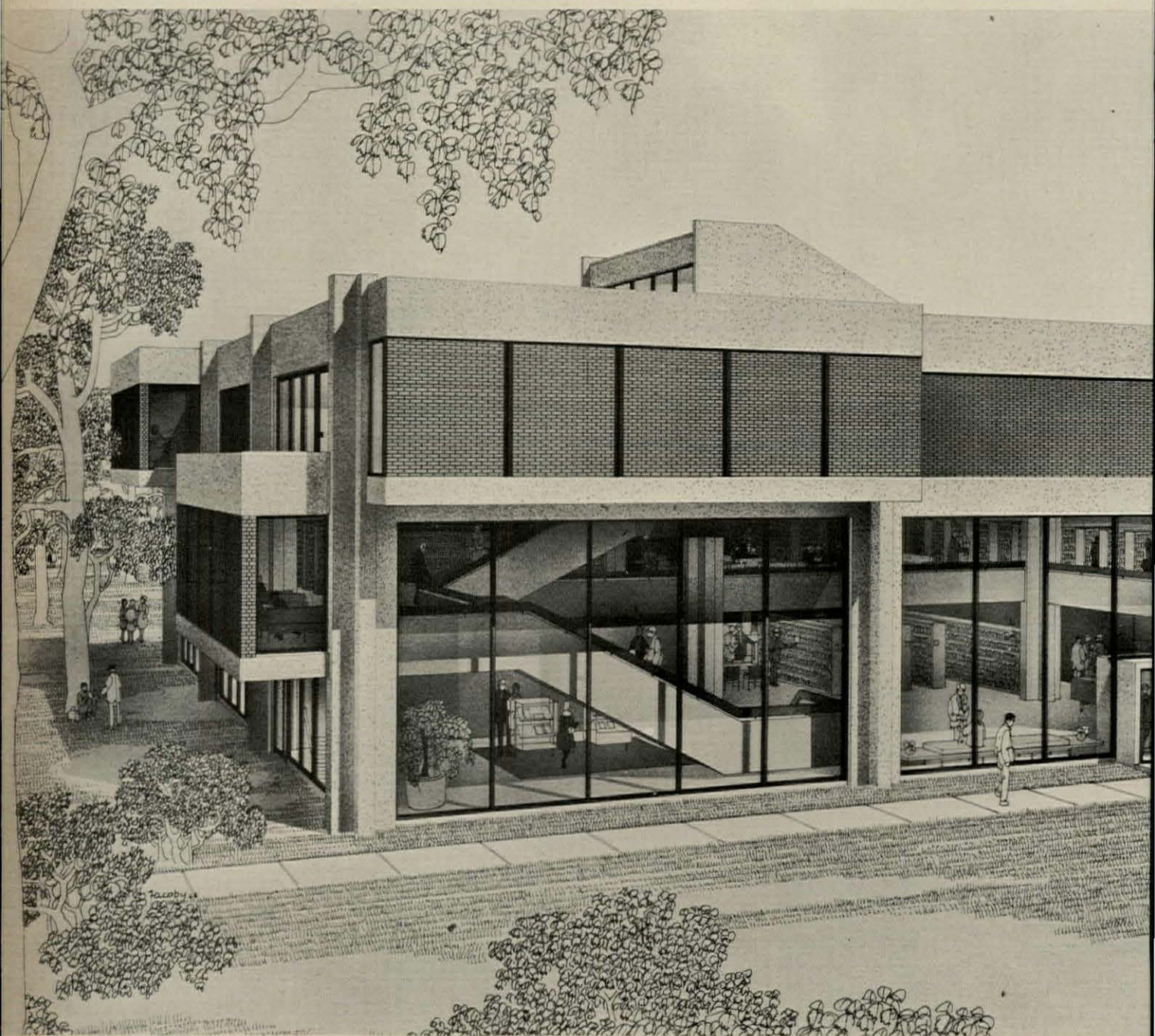
A small college library made square to honor its several approaches

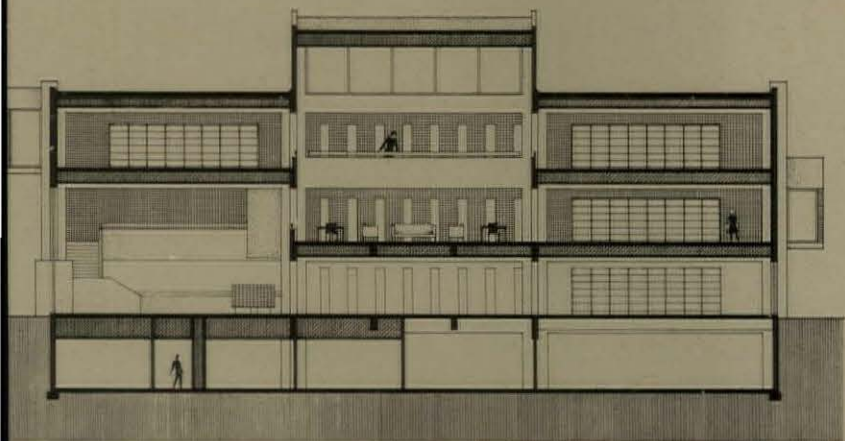
Although the cubic volume of this college library will not be as great as that of several surrounding buildings yet to be constructed, it will become the center of gravity of a major campus space—open but bounded—and thus express its importance in the life of the place.

The library's square form, in the words of the architect, "honors its several approaches and location." He further explains that "study carrels are plugged into a strong frame; the stacks form a square ring about the reading areas; and the floor of a bay is here and there omitted to relieve the building's density and relate one floor to another."

The open stairway eases the trip between levels and will accommodate, within its volume, small lounges and exhibit areas. The basement will house seminar rooms, a lecture hall, and nighttime study facilities.

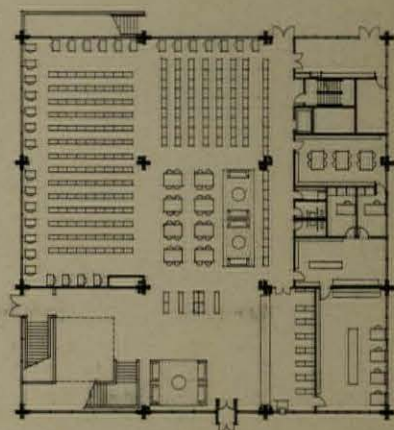
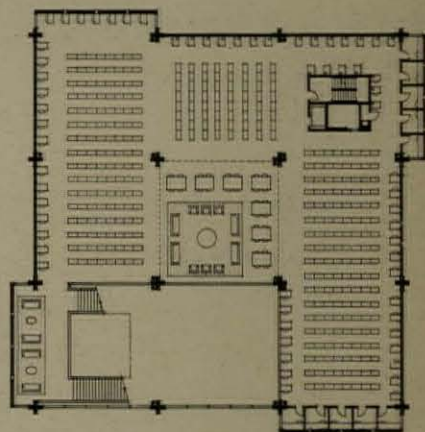
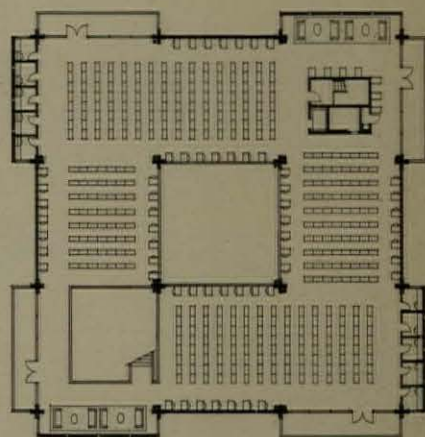
LIBRARY FOR MARIAN COLLEGE, INDIANAPOLIS, INDIANA. Architects: *Evans Woollen and Associates*; structural engineers: *Fink, Roberts and Petrie*; mechanical and electrical engineers: *Rotz Engineering Company*.

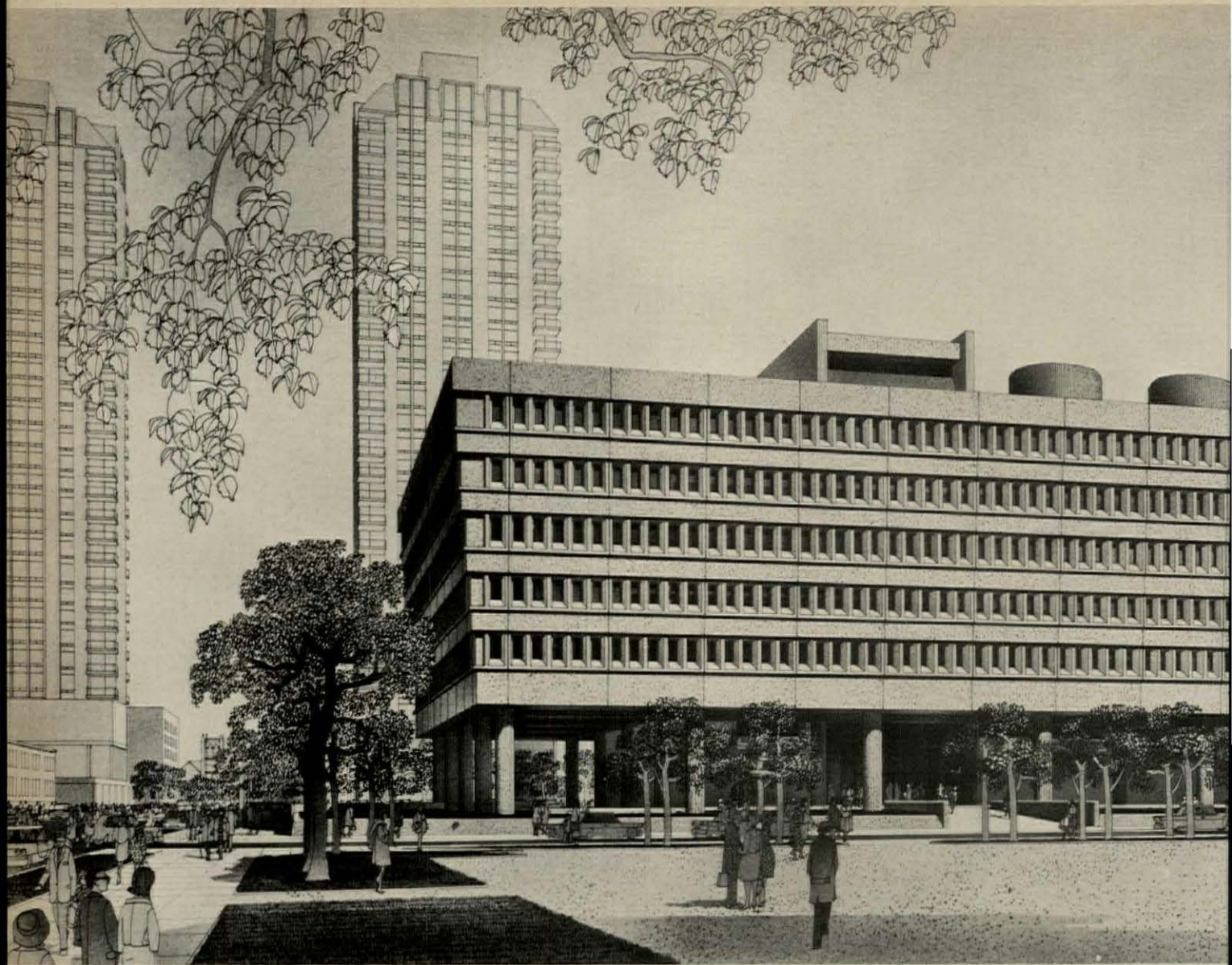




The exposed structural frame will be of poured-in-place concrete; vertical runs of ducts and pipes will be exposed at the star columns throughout the building. Exterior finishes: sandblasted concrete, infilling of red brick to match that in existing buildings, gray glass.

The library—for a liberal arts college of 1,200 students—will house a collection of 200,000 volumes.



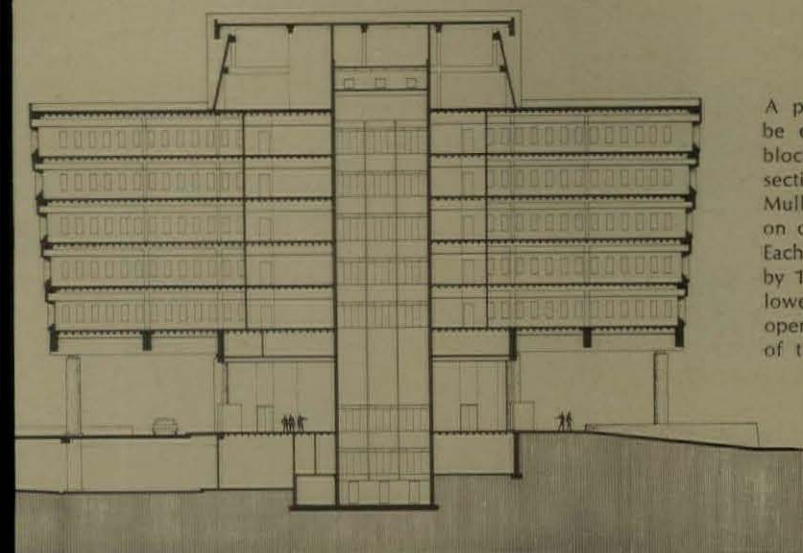
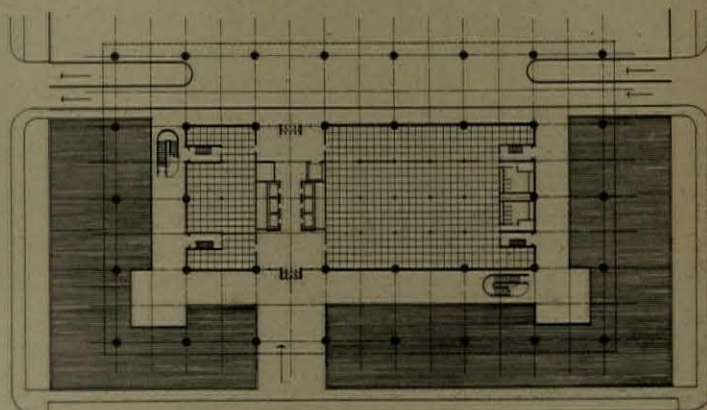
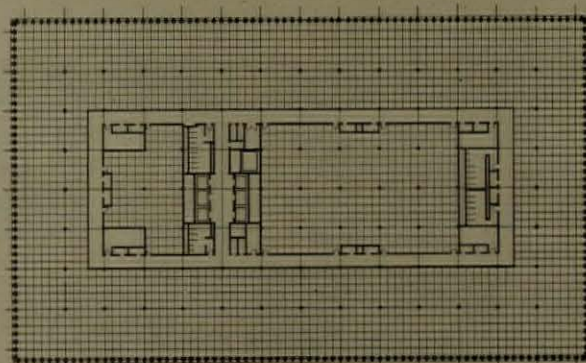


**Federal office building
with horizontal mass
and canted facade
bounds plaza space**

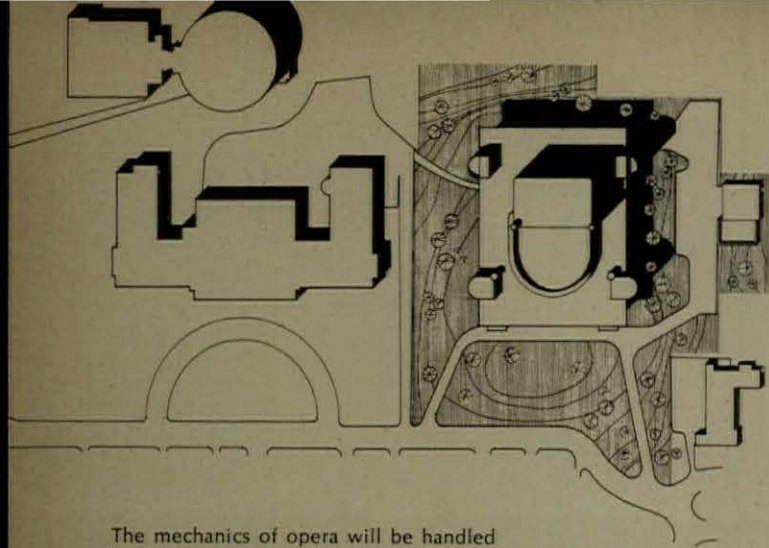
The tilted, horizontal facade of this office building—raised 24 feet above grade—serves as an enclosing element for an open plaza, or mall, in the heart of Indianapolis. Extending north and south from a war memorial to a library, the plaza is bounded on the west by a cathedral and asks for containment on the east. The dominant existing line is vertical: cathedral, obelisk, high-rise apartments. In this context a horizontal form abets the sense of enclosure, which is strengthened by the inward tilt of the upper structure.

The five office floors will provide 290,000 square feet of flexible, all-purpose space, since no special or permanent functions were required except for a cafeteria. Parking for 500 cars will be provided on two split-levels, one above and the other below grade. Penthouses, cooling towers, and stair bulkheads were located on the roof as function dictated. The core is set off-center in plan in order to furnish a larger central assignable office space.

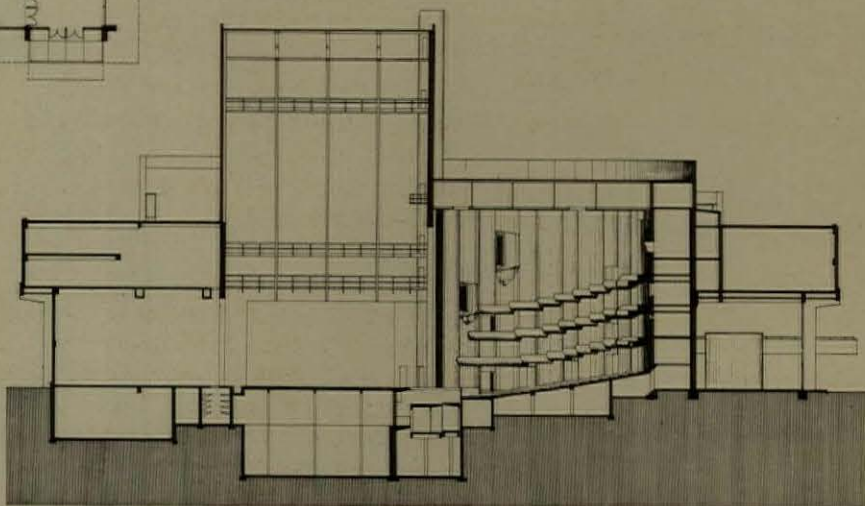
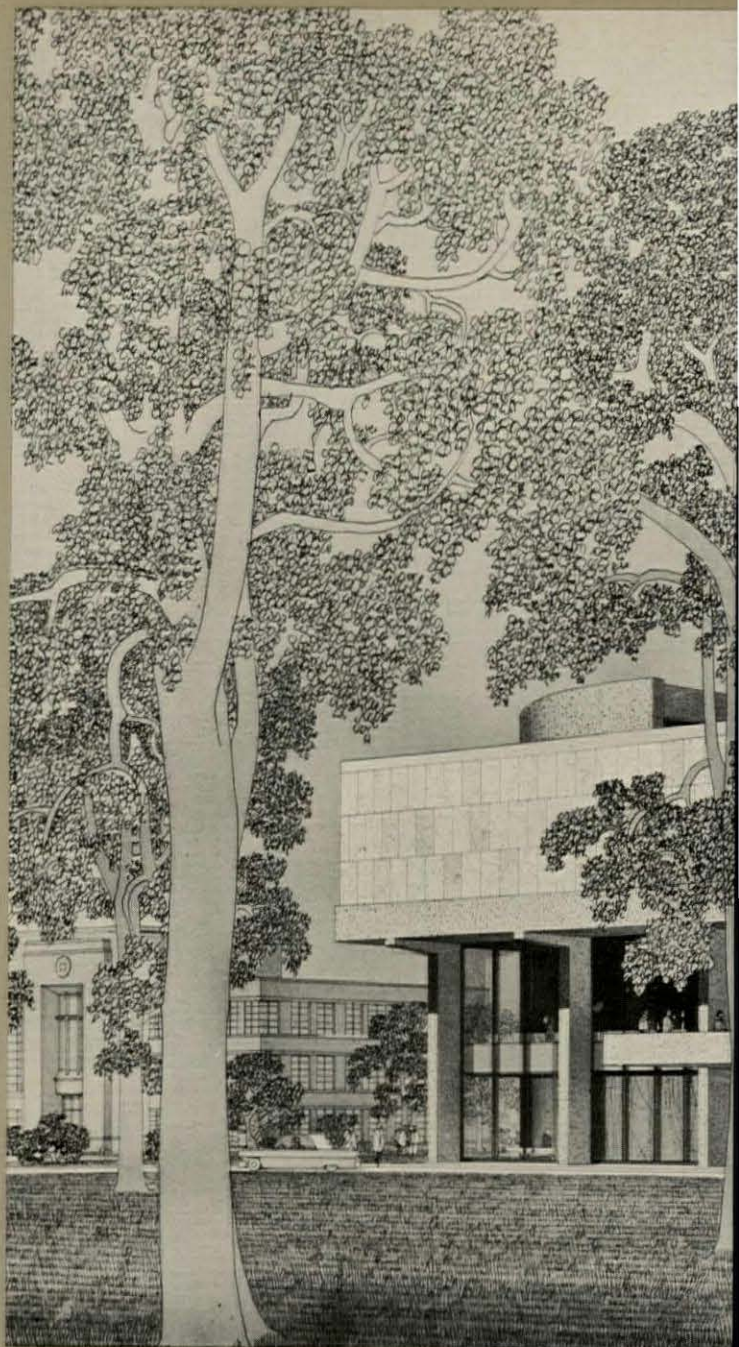
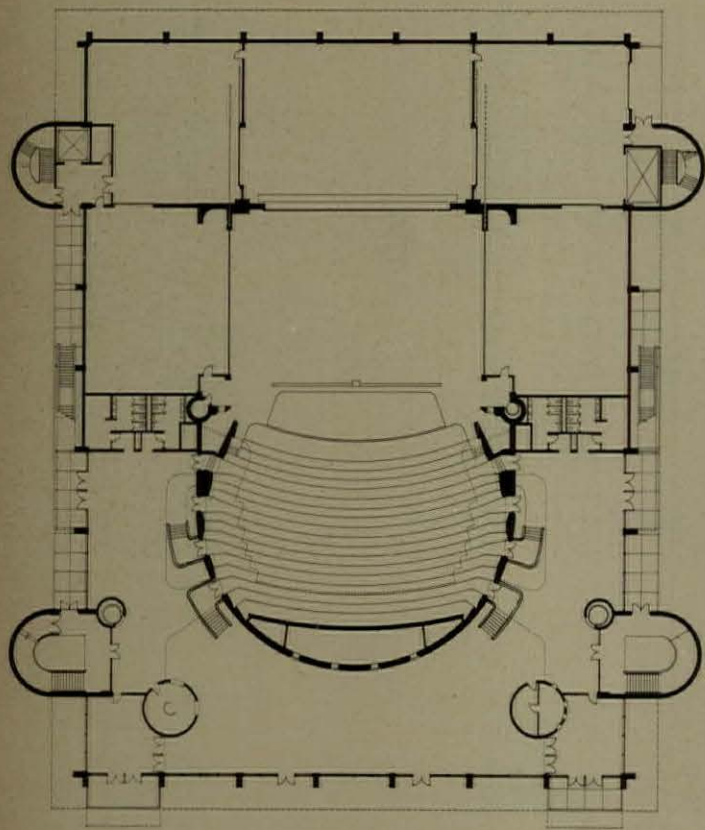
FEDERAL OFFICE BUILDING, INDIANAPOLIS, INDIANA. Architects: *Evans Woollen and Associates*; structural engineers: *Herbert Fleischer and Associates*; mechanical and electrical engineers: *Rotz Engineering Company*; lighting consultant: *William Lam*.



A poured-in-place concrete frame will be exposed under the five-floor office block, which will be clad in precast wall sections of bay length, 23 feet, 4 inches. Mullions will be located 4 feet, 8 inches on centers, following the modular grid. Each floor will overhang the one below by 14 inches; spans are doubled in the lower arcade to increase the sense of openness and emphasize the separation of the upper block from the earth.



The mechanics of opera will be handled by the large stages; while the production factory required—scene shops, carpentry shops, costume making, ballet and rehearsal studios, and other facilities—will occupy a ring with opaque walls extending around the entire building at an upper level. Various kinds of vertical circulation will be located in four semi-cylindrical towers. The structure will be an exposed concrete frame and walls, with steel trusses over the auditorium and stage house.





**Design for university
opera house groups
working elements about
cylindrical auditorium**

The Indiana University music school excels in opera, staging at least eight complete productions per year. Thus, their new opera house must seat 1,500 and include all the work spaces required to produce opera, as well as the necessary backstage machinery and lighting equipment.

The design separates the basic elements and reassembles them about a cylindrical main house. The theater will be wide and shallow—for visual acuity—and will have a flexible proscenium. The steeply raked floor will help surmount the gulf of the orchestra; caliper stages may be used if the performance demands.

MUSICAL ARTS CENTER, INDIANA UNIVERSITY, BLOOMINGTON, INDIANA. Architects: *Evans Woollen and Associates*; structural engineers: *Fink, Roberts and Petrie*; mechanical and electrical engineers: *Rotz Engineering Company*; theater architecture: *Ben Schlanger*; stage lighting consultant: *Jean Rosenthal*; public lighting consultant: *William Lam*; flexible proscenium consultant: *Olaf Soot*; acoustical consultants: *Bolt, Beranek and Newman*.

Structure and plan work together in high-rise public housing for the elderly

In this high-rise apartment building near downtown Indianapolis, concrete shear walls are not only the principal structural elements, but act to separate individual living units as well. The flat concrete floor slabs, 9 inches in thickness, are supported by the shear walls, as are the tilted, precast spandrels.

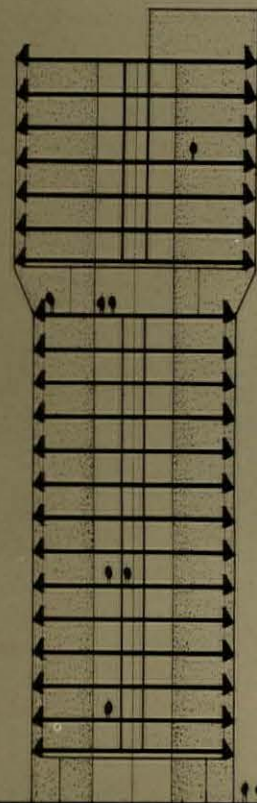
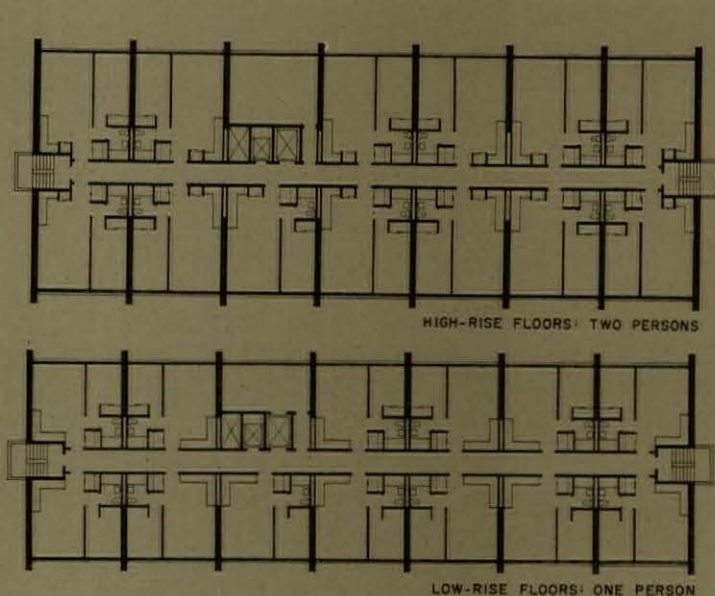
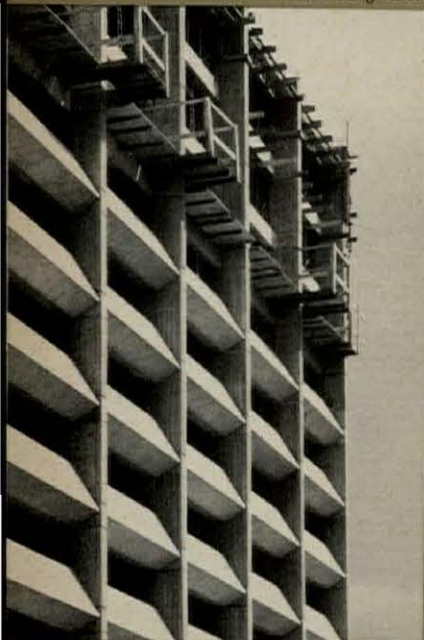
In urban context, the tall structure preserves the openness of its triangular plot by small ground coverage, and forms a visual baffle that directs the eye back towards the center of the city, only a few blocks away.

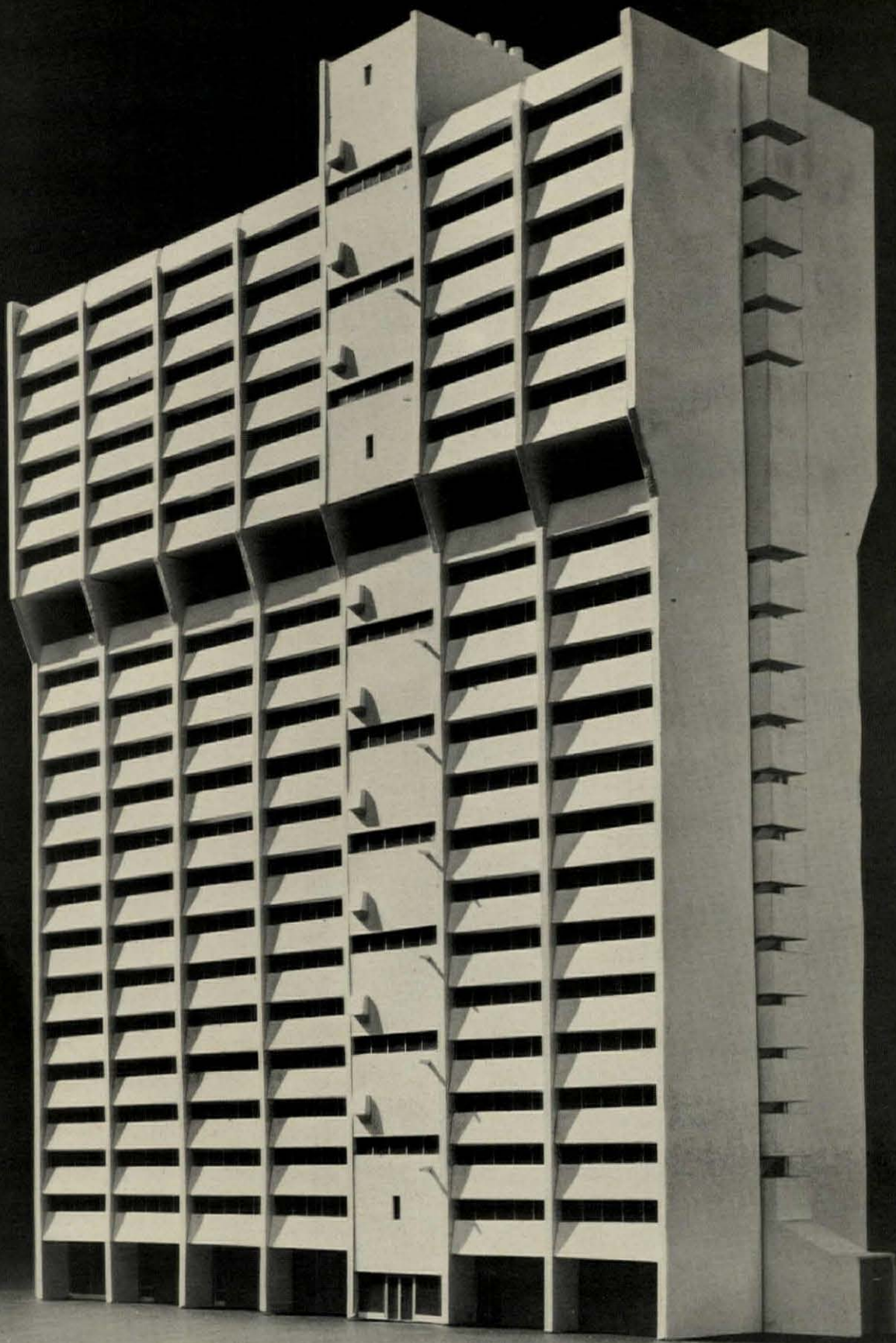
The form of the building evolved directly from the program, which called for 248 living units; 78 for two persons, and 170 for one. The top six floors contain the larger apartments, the lower 14 floors the smaller ones. The 15th, or dividing, floor is devoted to open galleries, recreation, and mechanical space; the ground floor houses the manager's office, lounge, mail room, and additional mechanical space. Each apartment includes a living room, bedroom, kitchenette, and bath. The smaller units are 430 square feet in area; the larger ones 537. Architect Woollen explains that the economics of the double-loaded corridor scheme were difficult to beat, despite considerable study of possible alternate plans.

Ceilings and party walls will be exposed concrete; partitions of dry-wall construction. The \$3.5-million building is now under construction, and scheduled to be completed in the spring of 1968.

PUBLIC HOUSING FOR THE ELDERLY, INDIANAPOLIS, INDIANA.
Architects: *Evans Woollen and Associates*; structural engineers: *Fink, Roberts and Petrie*; structural consultants: *Kolbjorn Saether*; mechanical and electrical engineers: *Rotz Engineering Company*; general contractor: *George Bahre Company*.

Paul Young Studio







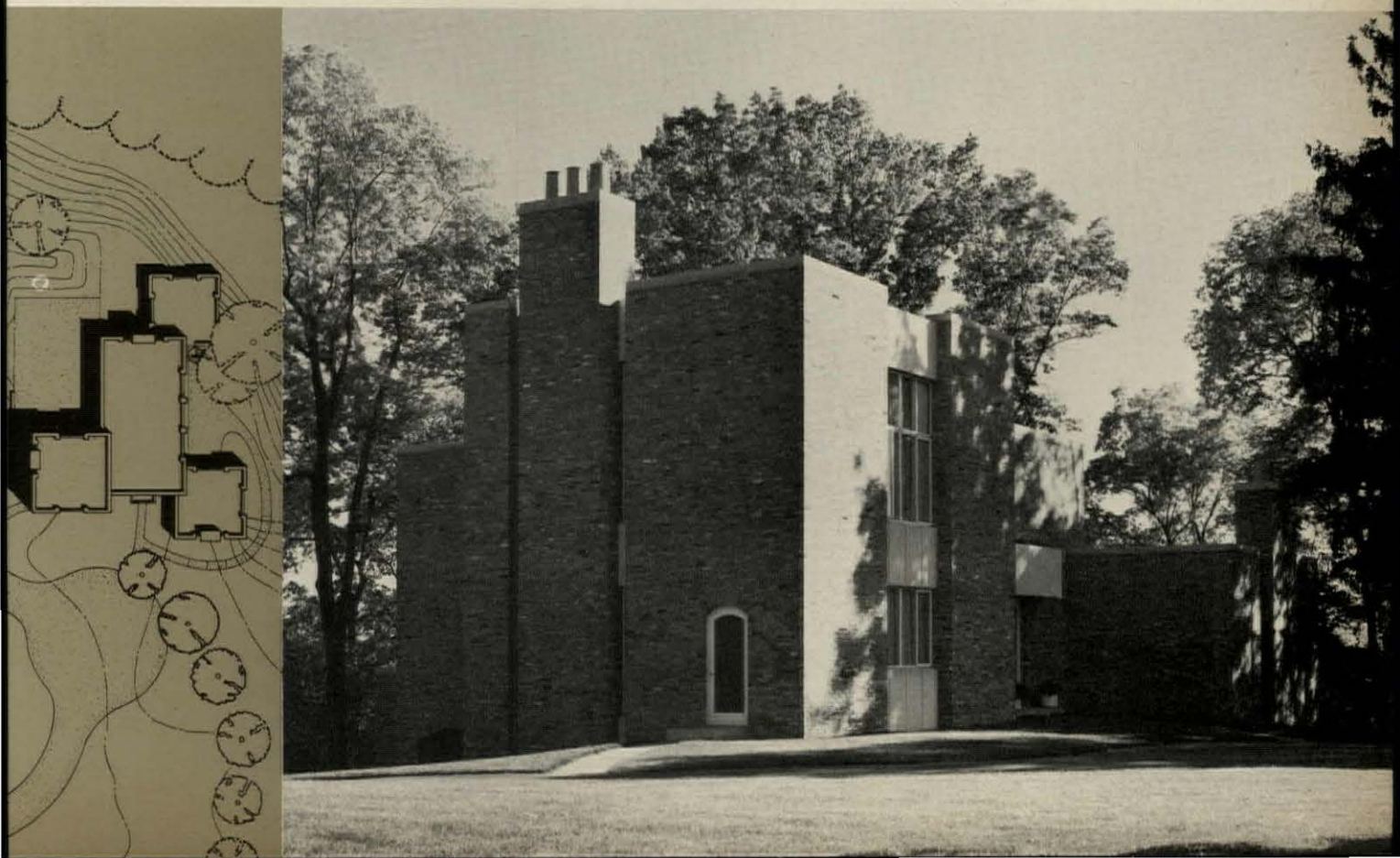
Ezra Stoller © photos

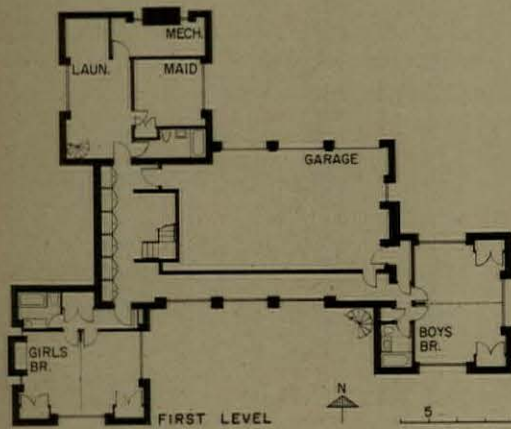
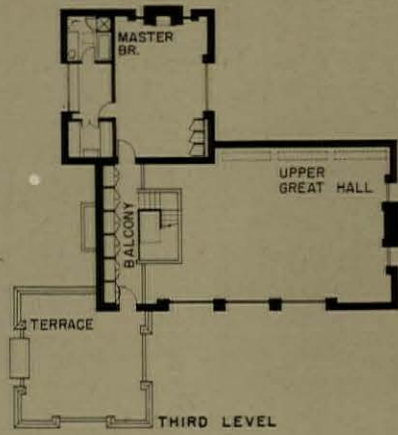
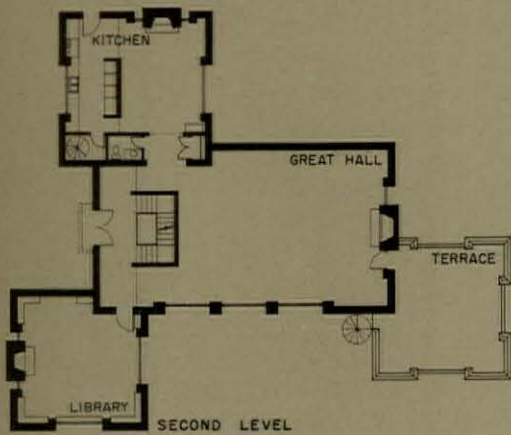
**Hillside house provides
amenity and privacy by
grouping of three towers
about a great hall**

This house in suburban Indianapolis makes the most of its sloping site by exploiting a three-level disposition of spaces for maximum livability and privacy. The parti consists of a great hall—two stories in height—as the dominant central element, which serves as a rallying point for a loose assemblage of three towers. The master bedroom suite is located on the topmost level, which is devoted entirely to the parents. The four children (actually young adults) occupy two wings at the lowest level, and have separate entrances. The third wing at this level houses work areas and a maid's room. Thus, the large hall at middle level is a nucleus to which all the other spaces—both indoor and outdoor—relate. The separation of parents and offspring works both ways to provide privacy—when desired—for each. There is the further provision that the entire lower floor can be shut off when the children are away at school and a maid not required, so the parents are not forced to live with empty rooms.

Architect Evans Woollen points out that the large scale and high ceiling of the central hall were born of the effort to accommodate the owner's existing furniture. It was necessary to design the space about several large pieces and a tapestry—see photo at left. Since the furniture is of several stylistic periods, the chaste enclosure of unadorned white plaster seemed to be the most appropriate milieu for it.

RESIDENCE FOR BARRON MALLORY, INDIANAPOLIS, INDIANA.
Architects: *Evans Woollen and Associates*; structural engineers: *Fink, Roberts and Petrie*; mechanical and electrical engineers: *Muffett, Nicholas and Stevenson*; general contractor: *Pierson Construction Company*.





Structure and materials: the concrete foundation supports masonry bearing walls which are faced with brick recovered from an old factory; the floor system consists of steel girders and wood joists. Finish walls and ceilings throughout are of white plaster; doors and trim are of natural ash; floors are oak, except that in the dining room, which is of hexagonal quarry tile; roof terraces are floored with monolithic terrazzo with a rough finish; the exterior spandrels are precast concrete.



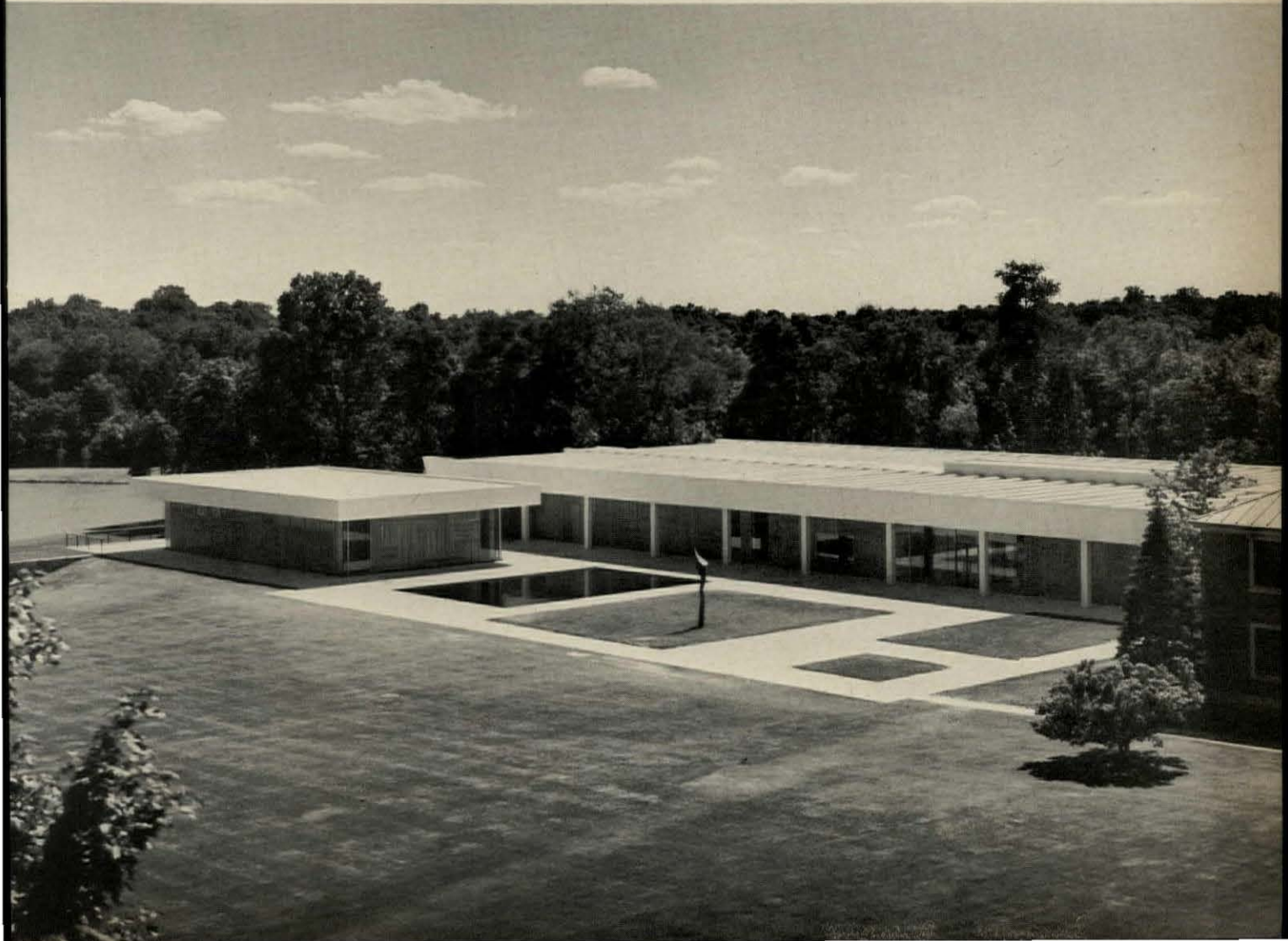
Two libraries by Harrison and Abramovitz: in one, lighting, air conditioning, and structure are skillfully interwoven; in the other, spaces and levels are put to work to bring students, faculty, and the artifacts of learning into closer relationship

Bright new use—and new form—for the monitor skylight

The horizontal, spreading character of this library in New Jersey—and its pleasantly lighted interior spaces—resulted from the bringing together of roof structure, skylighting, air conditioning, and artificial lighting into a single, overhead system that serves the entire building area. This means that all interior spaces are well lighted, and partitions can be placed where desired. In addition, the visual integrity of the entire interior space is maintained—in this case—by ending all solid partitions and bookshelves at the seven and one-half foot line, with glazing above. The smaller building is a separate mathematics wing connected to the library proper by a glass-enclosed link. This structure is the first element of a future mathematics center for The Institute.

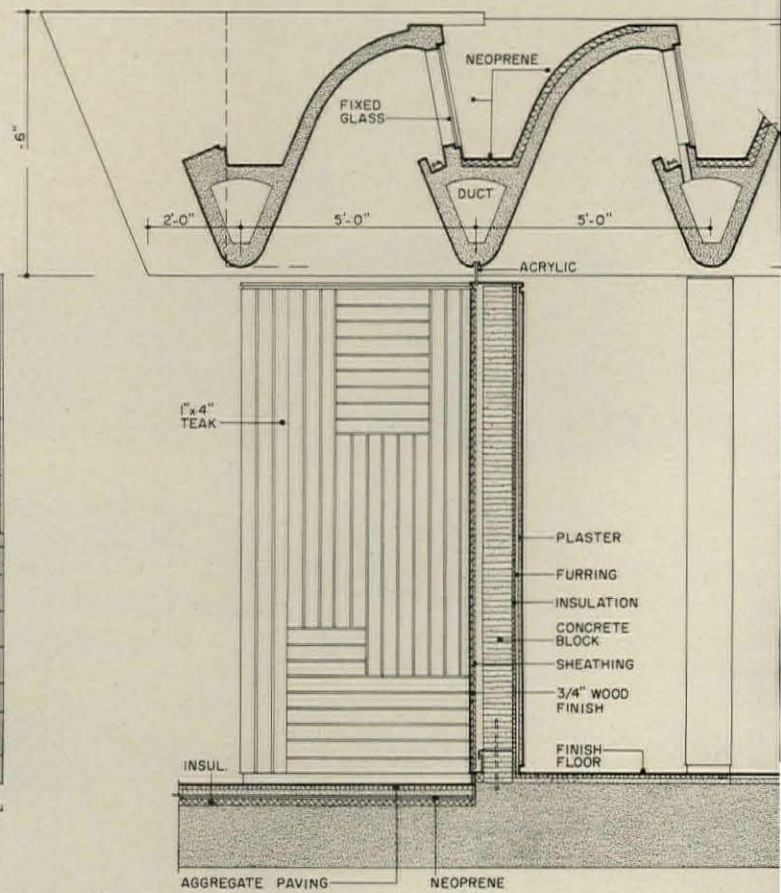
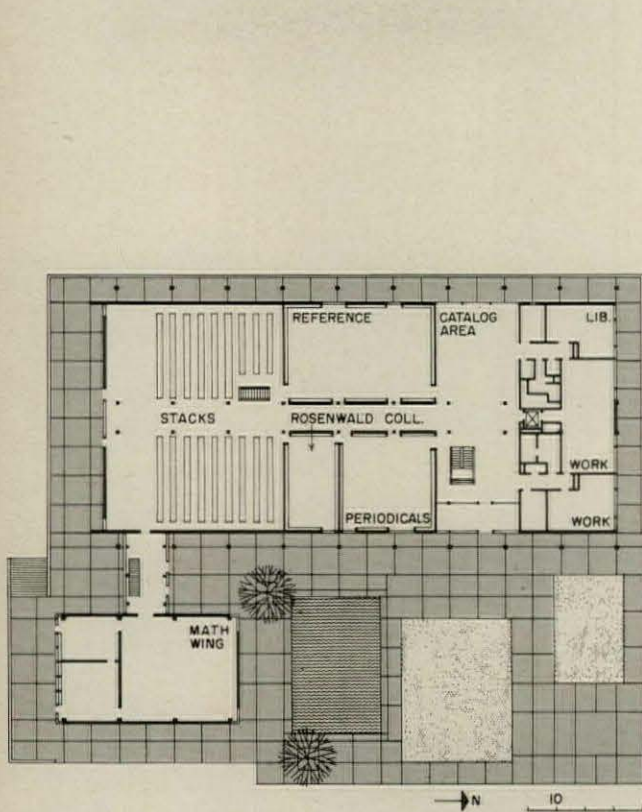
LIBRARY, The Institute for Advanced Study, Princeton, New Jersey. Architects: *Harrison & Abramovitz*; structural engineer: *Paul Weidlinger*; mechanical engineers: *Meyer, Strong & Jones*; general contractor: *Matthews Construction Company*.

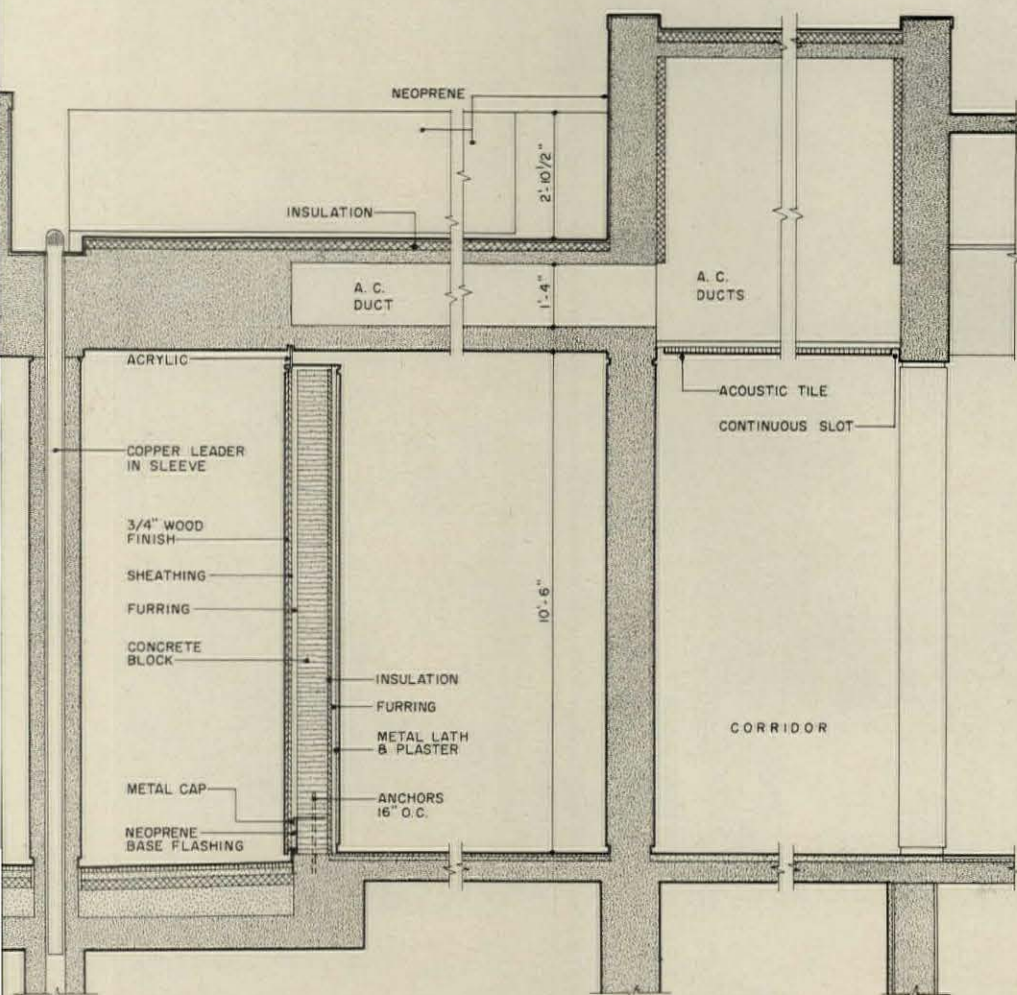
otos © Ezra Stoller





LIBRARY, INSTITUTE FOR ADVANCED STUDY





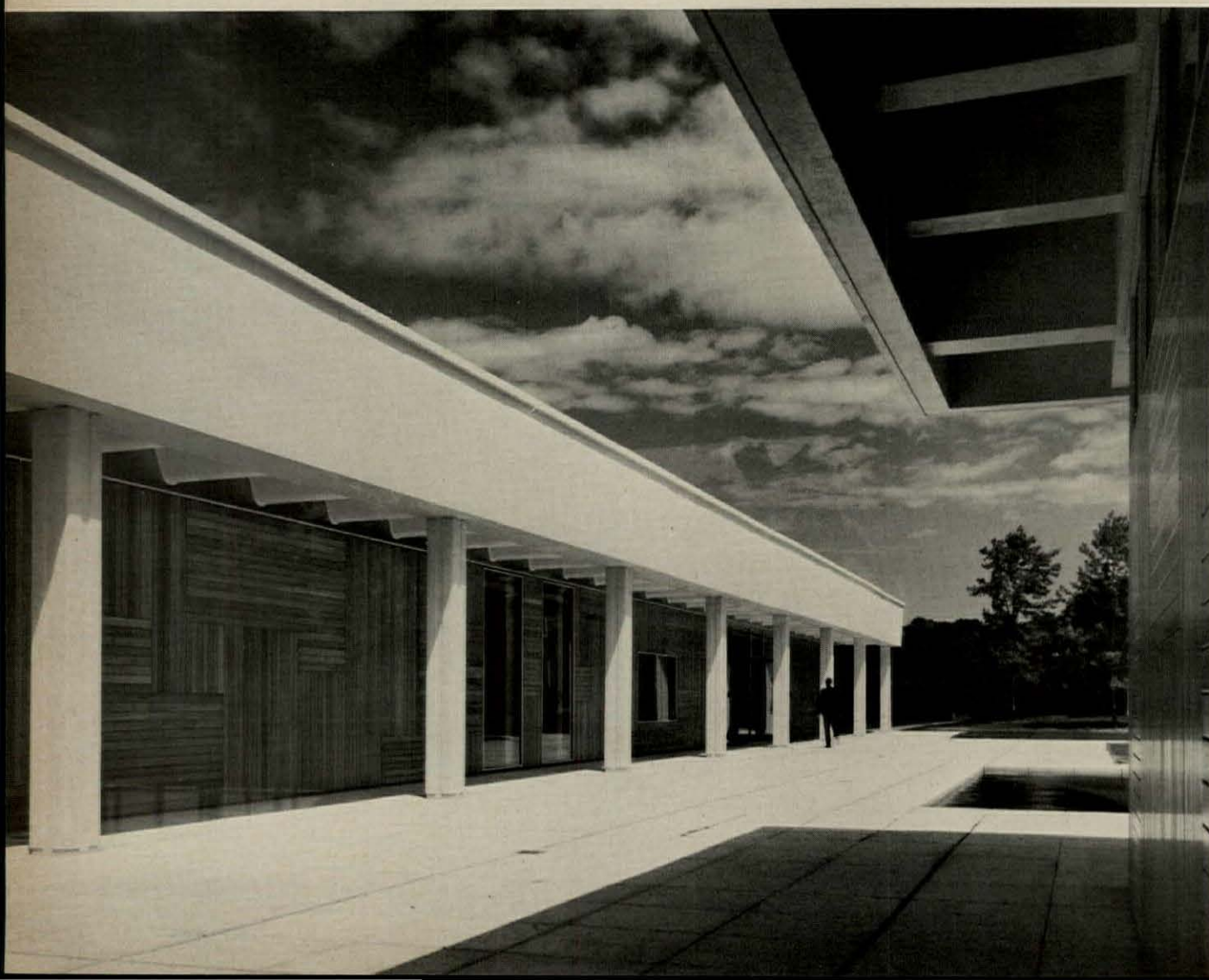
The pleasant effect the overhead system creates is shown in the photos; the details at left show the construction. The glazed, shaped, concrete beams—which incorporate a hollow duct space—span 40 feet, and are supported by 15-inch concrete girders 5 feet deep. The girders rest on concrete columns spaced at 20 feet. Note how the curved soffit and haunch of a typical beam picks up the daylight from the north-facing glass panels and reflects it downward—or, at night, serves equally well to distribute illumination from the concealed fluorescent tubes.

The space above the acoustic tile ceiling of the 10-foot-wide corridor serves as a longitudinal duct connecting the lateral ducts in the concrete beam system.



The aspect of the library from on down the hill to the south is shown above, with the mathematics wing at right. Note that the roof structure is clearly expressed; one sees the pairs of girders supporting the glazed beams, and notes the corridor space between. The lower floor—glazed on two sides—is devoted mostly to stacks, but also houses storage, mechanical equipment, microfilm, and shipping areas. The entrance side of the buildings is shown below. One-by-four teakwood boards, with rabbeted, shiplap joints, are arranged in a variety of panels which become the exterior finish.

LIBRARY, INSTITUTE FOR ADVANCED STUDY



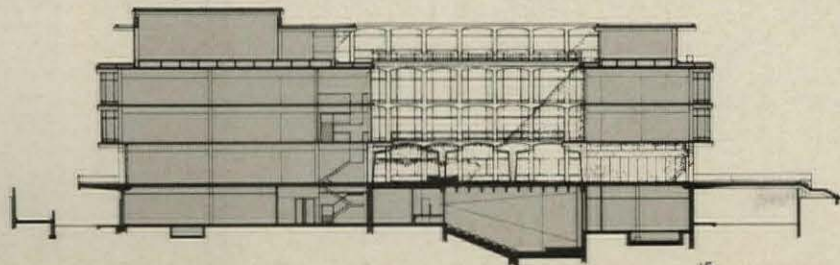
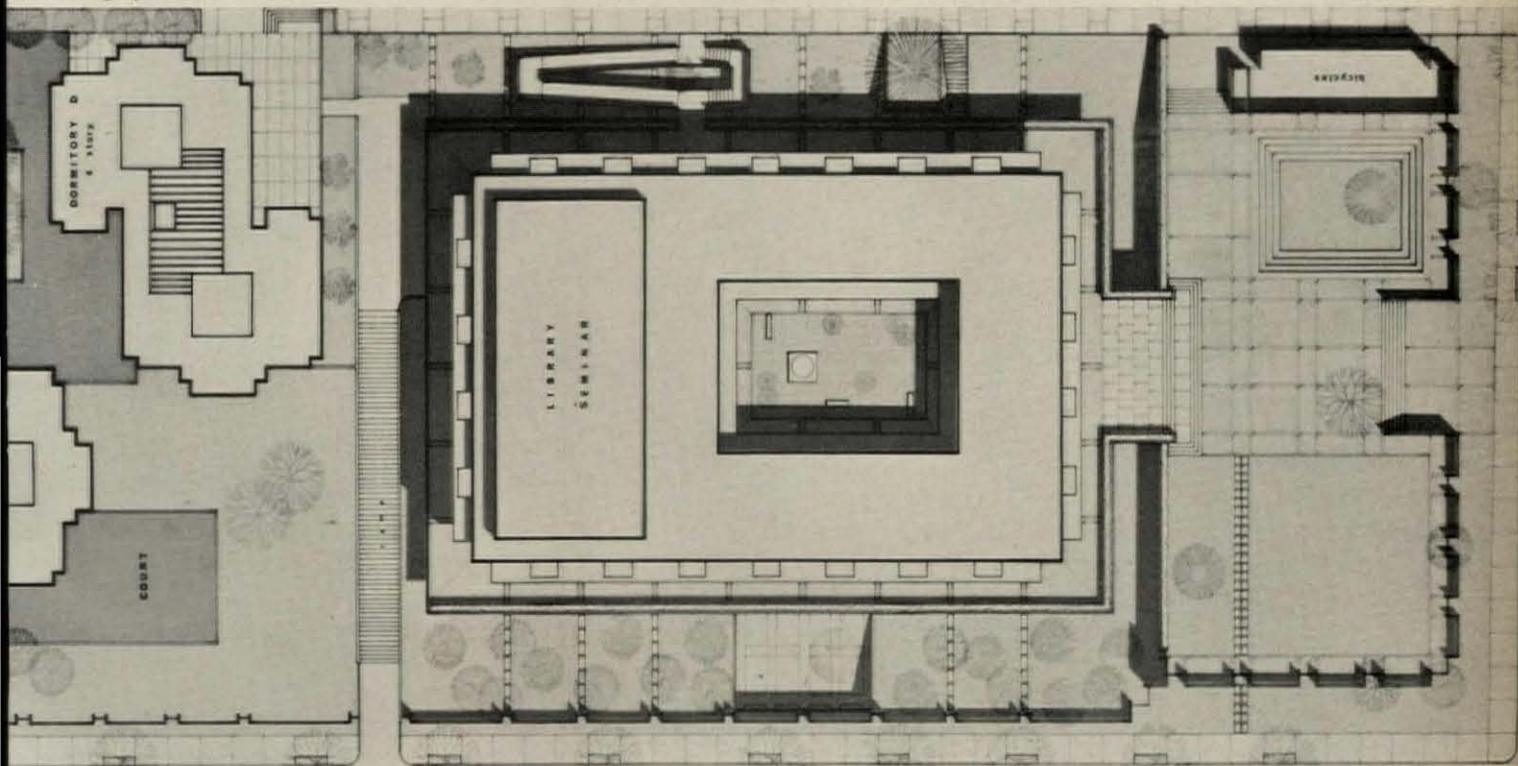
In this much larger, four-level library at Radcliffe College

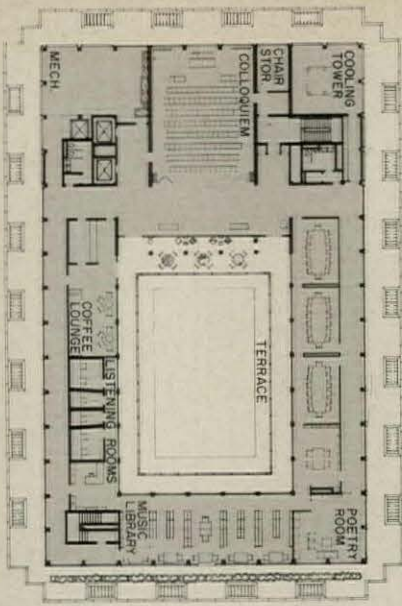
A courtyard unifies varied elements and spaces

The new library at Radcliffe College offers students a choice of spaces ranging from small-and-secluded through fairly-small-and-semi-private to relatively-large-and-almost-gregarious. The design centers about a system of more than 80 alcoves on the second and third floors—comfortable alcoves varied in size—which are formed by bookstacks rather than partitions, and otherwise bounded by blank or glass walls. Above and below the alcove floors are those with larger spaces for reading, meetings, exhibits, music, cinema—and areas for faculty and staff offices. The central courtyard and its attractive open stairway serve to provide a visual rallying point that holds the design together.

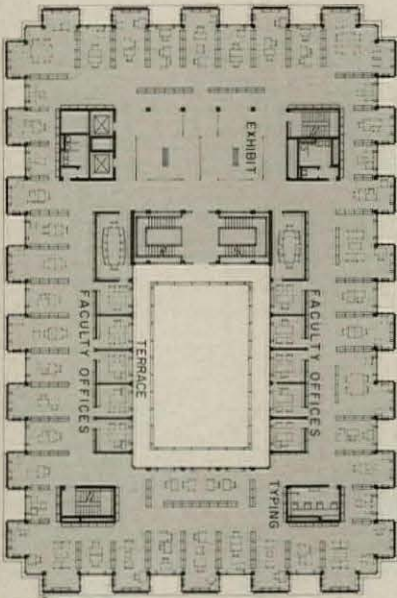
THE SUSAN MORSE AND FREDERICK WHILEY HILLES LIBRARY, Radcliffe College, Cambridge, Massachusetts. Architects: *Harrison & Abramovitz*; structural engineers: *Lev Zetlin & Associates*; mechanical engineers: *Cosentini Associates*; electrical engineers: *Eitington & Schlossberg Associates*; lighting consultant: *H. Schlossberg*; landscape architects: *Zion & Breen Associates*; general contractor: *Vappi and Company*.

Alexandre Georges photos

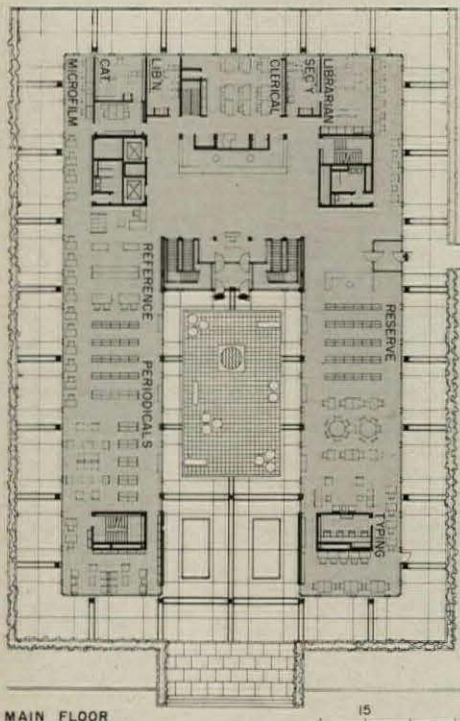




PENTHOUSE



SECOND FLOOR



MAIN FLOOR

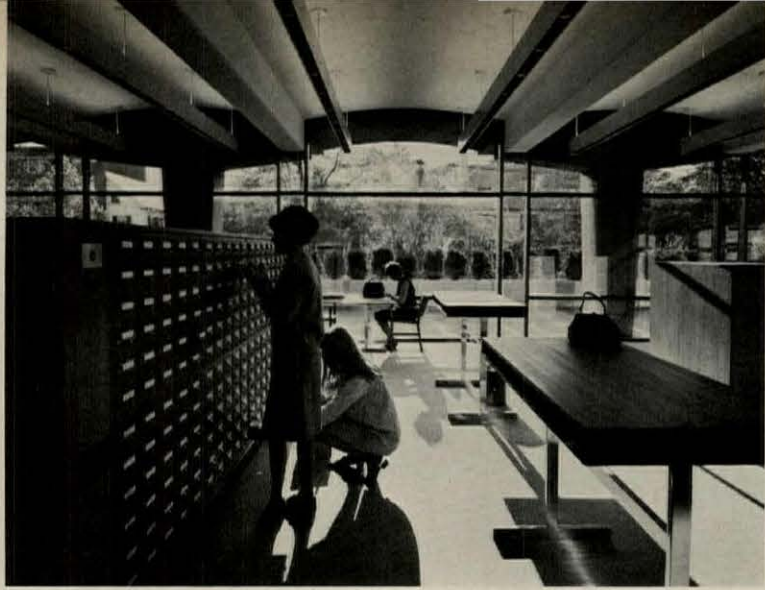
The two photos at right show the exterior of the building and a nighttime view of the central courtyard, picturing the interrelationship of spaces and levels. The exterior of the barrel-vaulted structure alternates infillings of limestone or bronze-colored glass; the fascias and exposed structure are of poured-in-place white concrete, sandblasted to expose the aggregate. Above the ground floor, the barrel-vaulted ceilings are open to view, and solid partitioning is carried only to an 8-foot height, with the glass above. Thus, the continuity of the indoor space and its relationship to the surrounding outdoor space is emphasized.

The plans show how the building functions. The lower main floor (not shown) houses the service entrance, book preparation area, special facilities for staff and service, and a cinema. The terrace surrounding the library serves as entrance to an adjacent new dormitory group, also designed by architects H & A.





The main-floor reference area is shown above: the open stairway connecting all levels below the penthouse is shown below. Placing the stair at the end of the courtyard and making it the same dimension welds these elements into a single, expressive one.



NURSING EDUCATION FACILITIES

The Nurse Training Act of 1964 provides \$90 million, to be used over a four-year period, for partial funding of new construction or expansion of nursing education facilities. This is a matching-fund program in which Federal grants cover two-thirds the cost of new schools of nursing; one-half the cost of expansions. The legislation set up grants of \$15 million to be disbursed in fiscal 1966 and \$25 million in each of three subsequent years ending June 30, 1969. As of mid-April this year, some 60 projects have been granted a total of about \$31 million. If current averages are maintained, total sponsored construction will be on the order of \$150 million in about 180 projects by the end of the present four-year program.

How effective this will be in really overcoming the nationwide and deepening shortage of trained nurses is uncertain—especially so considering Medicare's extensions of projected needs. But response to the program has underscored certain professional trends that are affecting facilities design; and it has demonstrated the vast potential of a supported construction program for meeting needs as they develop.

There is a gradual but fundamental shift taking place in the role of the registered nurse. Increasing responsibilities for supervision of aides and practical nurses in a field where techniques are rapidly changing are calling for higher and broader levels of education. In terms of architectural commissions, these changes are being reflected by increasing nursing education facilities at universities and community colleges, while the so-called diploma schools run by hospitals themselves are being curtailed as costs for maintaining them keep mounting.

One of the factors accelerating the shift of nursing education toward the colleges is the fact that costs and operating budgets are partly assumed by the college or university, often with tax money or endowments. Hence the college schools are less dependent on patient fees.

Paradoxically, in the face of acute nursing shortage, more than 100 hospital nursing schools have shut down since 1962, and another 60 of the remaining 821 such schools plan to close by next year. While college nursing schools are beginning to make up some of the resulting deficit—gaining at a rate of about a thousand graduates a year—the net gain of less than 500 is still far from adequate to meet projected needs. The Federal support program will continue for the rest of its authorized life to accelerate construction in this field, but it cannot be expected to entirely bridge the gap between an estimated need in 1970 for 850,000 registered nurses compared with fewer than 700,000 now at work full time in hospitals of the nation.

Some 60 nursing schools already have received Federal grants in a support program that will exceed \$150 million in new construction

A changing role for nurses means that more colleges will set up schools while hospitals curtail their costly training courses

The major force effecting the shift in role of the registered nurse derives from her increasing scarcity in proportion to the number of patients in hospitals. She has been forced more and more into supervisory capacities. Bedside care, while still the most important of her skills, is increasingly delegated to practical nurses and nurses' aides under her supervision. Meanwhile, advances in medical and surgical technology impose a requirement for a higher order of technical, psychological and even social skills on the nursing profession. Hence, the baccalaureate degree in nursing is gaining increasing precedence over the traditional hospital diploma. But this is a four-year course after which graduates still require a few months of on-the-job bedside training. The diploma or hospital training course is usually three years during which trainees do actual work on nursing floors. Hence, the array of college facilities must serve a larger pool of students if growing needs for a broadly trained fully professional nursing staff are to be met.

Prior to the Nurse Training Act of 1964, the background knowledge required for setting up architectural programs for nursing education was limited in both scope and distribution. Curricula were extremely varied, and the role of existing educational and medical spaces and faculty was difficult to define and reconcile with changing professional requirements.

The U.S. Public Health Service undertook to clarify some of these areas of confusion and in 1963 set up a Joint Committee on Educational Facilities for Nursing of the National League for Nursing and the Public Health Service. This committee, with additional help from a Surgeon General's Consultant Group on Nursing, advised the PHS staff in development of a publication, "Nursing Education Facilities: Programming Considerations and Architectural Guide" which was published in June 1964. This was followed in 1966 by a supplementary publication, "A Guide for Projecting Space Needs for Schools of Nursing." The latter is intended to assist schools of nursing in analyzing curricula in terms of space requirements, while the former is a more general overview of needs in the three categories of schools: diploma nursing programs, associated degree (two-year) programs and baccalaureate programs. Profiles of these programs are translated into architectural considerations.

The development of an architectural program for a nursing school follows patterns similar to those for other institutions, except that it is complicated by problems of fitting in with curricula that may overlap with those of the sciences and liberal arts programs of existing schools. The technique for resolving these problems is one of detailed tabulation of class sizes and schedules over a projected interval of several years. These tabulations are then converted to classroom utilization schedules and ancillary space requirements. Space requirement for nursing education may include demonstration spaces sized to accommodate beds and other hospital situations such as nursing station layouts. Much of the lecture and laboratory requirements may be borrowed from existing facilities, but the capacities of these spaces must be carefully studied in the light of projected class sizes. The examples on following pages show some of these varied requirements.

The grant program for construction is administered by the Division of Nursing of the Bureau of Health Manpower, Public Health Service. Applications for funding can be made with the help of an applicant's guide. Applications are processed through the Construction Grant Section of the Nurse Education and Training Branch of the Division of Nursing.

A four-year degree plus on-the-job training takes more time per graduate so a bigger pool is needed to meet demand

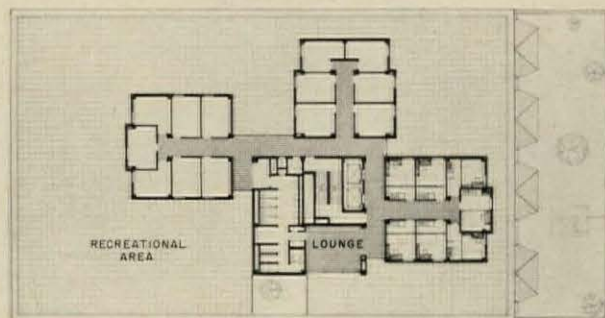
Architectural programs for college nursing schools are complicated by inter-school curricula—but guidelines are available



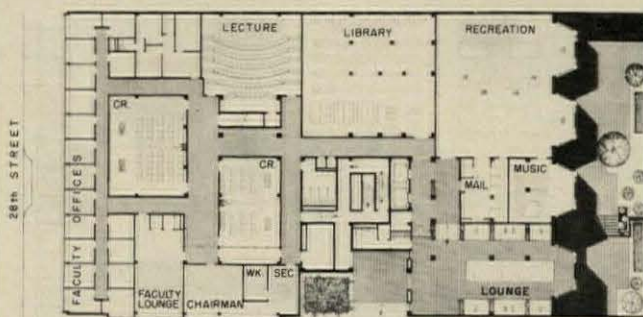
**Four-towered nursing school
and residence preserves human scale
and provides outdoor space
in midtown Manhattan**

Skidmore College tradition of small-group living, which has given character to its exurban, liberal-arts campus in Saratoga Springs, New York, has been preserved in this Manhattan extension for a nurses' residence and education center by the architects' design of a four-towered high-rise. This form avoids the monolithic massing of a single tower of equivalent area and permits a floor plan of grouped rooms that are private, in keeping with nurses' schedule requirements, while at the same time communicating in common areas at each floor and from tower to tower. Classroom, library, lecture hall, administrative and faculty offices and a large recreation room are accommodated in the one-story podium which forms the base for the tower structure. Residential quarters for 200 nurse-students are provided in clusters of single rooms in three of the towers, linked by short glass corridors. Each residential floor thus accommodates 20 students (six in one tower and seven in the other two). The fourth tower houses two elevators, a stairwell and mechanical and electrical systems. An apartment for the head resident and a guest is provided in the penthouse, while penthouse roof space is available to the students for sunbathing. The roof of the base-platform provides a patio above street level. The building is conveniently close to New York University's Medical Center, base hospital for the Skidmore baccalaureate nursing program.

SKIDMORE COLLEGE NURSES CENTER, New York, New York. Architects: Walter Kidde Constructors, Inc.—staff architect: Peter Weisman.

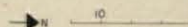


TYPICAL RESIDENTIAL FLOOR



FIRST FLOOR

FIRST AVENUE





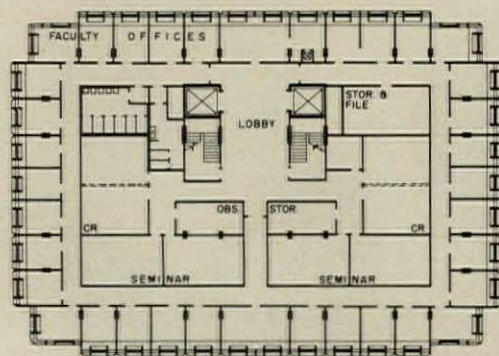
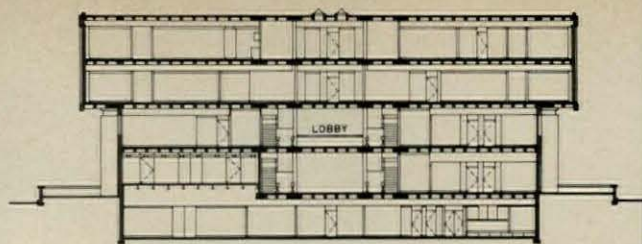
Neil Koppes photos

A careful balance of closed and open spaces provides a varied pace for nursing education

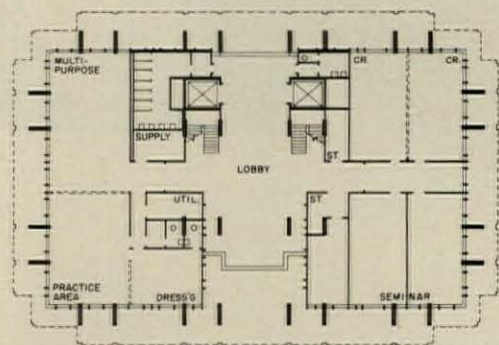
A corner site on the Arizona State University campus—bounded by a busy street on one side and separated by a pedestrian mall from the other university buildings—was selected for the College of Nursing, which thus marks one of the main approaches to the university. The program required the architect to provide a separate and identifiable environment for the nursing students which would emphasize their specific professional training, but which would at the same time maintain an appropriate physical and social relationship with the rest of the campus.

An unusual planter-base raises the entrance level of the five-floor building above the pedestrian mall, and visually balances the cantilever of the top two floors. An auditorium and audio-visual lecture rooms are accommodated on the lower level, with general classrooms on the first and second floors and faculty offices, library and smaller class and seminar areas on the third and fourth floors. Extensive open lobby areas provide a pleasant place for informal staff-student meeting and relaxation. All major classrooms and individual faculty offices enjoy pleasant views of the surroundings, but the library and seminar rooms are deliberately "inward-oriented" to encourage concentration. Although strongly-stated, the structure relates well to the older university buildings.

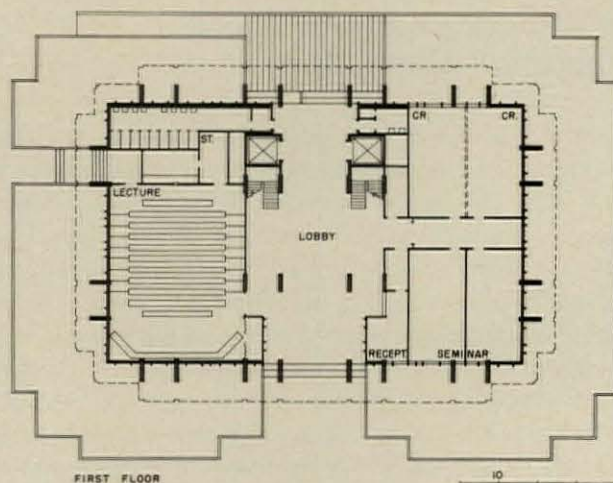
NURSING EDUCATION FACILITY, Arizona State University. Architect: George H. Schoneberger, Jr.



THIRD FLOOR

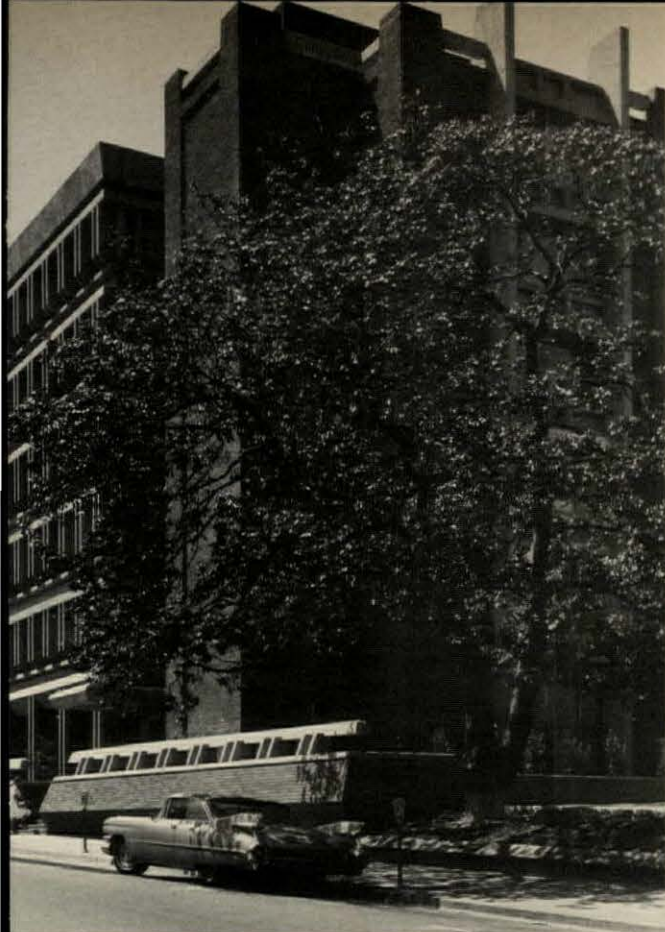


SECOND FLOOR



FIRST FLOOR



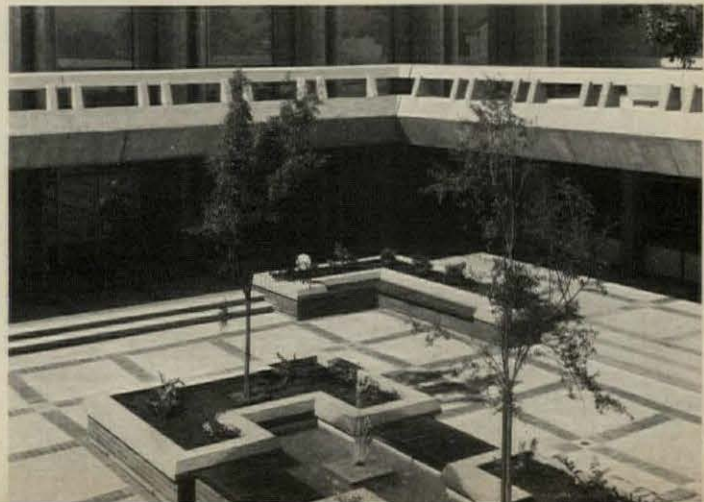
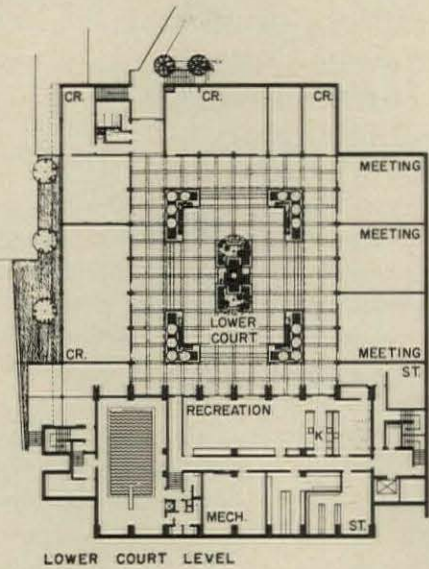
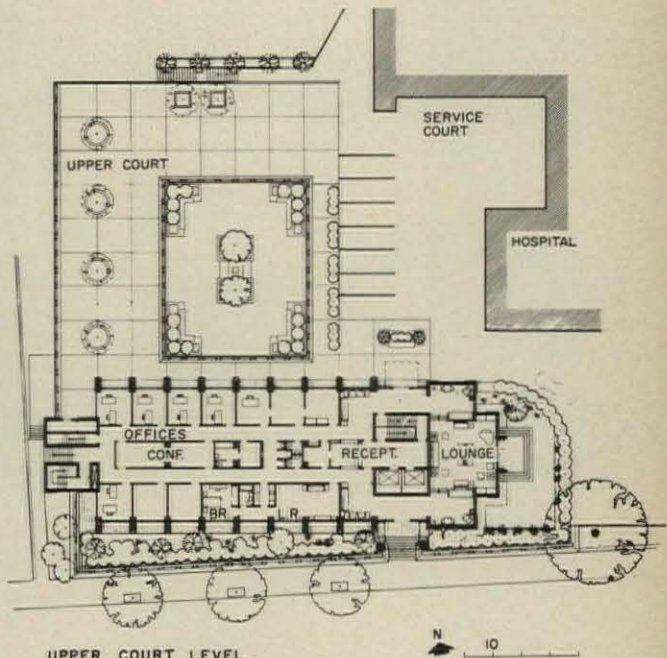
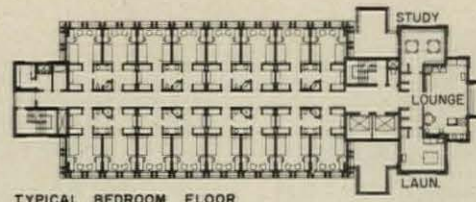


Herbert C. Shaw photos

**Landscaped two-level court
takes pleasant central focus
for combined school of nursing
and nurses residence**

Perhaps contrary to a baccalaureate trend, the Samuel Merritt Hospital, Oakland, California has recently completed the Archel Hall School of Nursing, planned by architects Stone, Marraccini and Patterson to combine teaching and living spaces around an attractive two-level courtyard. A small lower court makes a pleasant outlook for the lower-level classroom and meeting room areas, the roof of which forms an upper level deck for the residence tower. The top five floors of the seven-story tower are devoted to residential space. Each of these floors contains 16 two-bed rooms with connecting baths (for our girls on schedule!), a common room, laundry, kitchenette and storage space. Social activities are held in a handsome lounge on the lobby floor. This floor also accommodates a number of faculty offices, conference rooms and a self-contained suite of rooms for the housemother. An informal recreation room with a kitchen and a handcrafts area is located on the lower level, where glass walls provide it with a view of the landscaped courtyard. Structure of the building is reinforced concrete and brick, with each floor clearly articulated. A circular auditorium and medical library is planned for construction adjacent to the classroom section of the school.

ARCHEL HALL SCHOOL OF NURSING AND STUDENT NURSES' RESIDENCE, Samuel Merritt Hospital, Oakland, California. Architects: Stone, Marraccini and Patterson—principal-in-charge: Robert J. Betcourt; contractors: MacDonald, Young & Nelson, Inc.





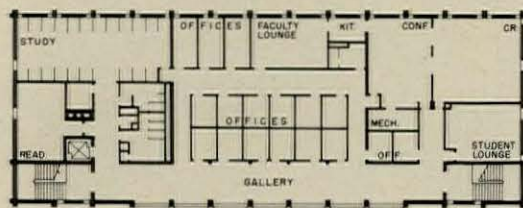
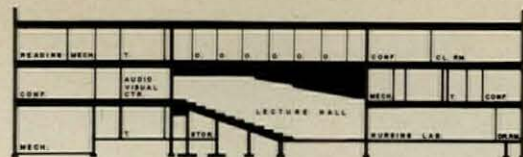
Marion Greer photos

Progressive college of nursing is planned around a large auditorium, audio-visual aids and a training laboratory

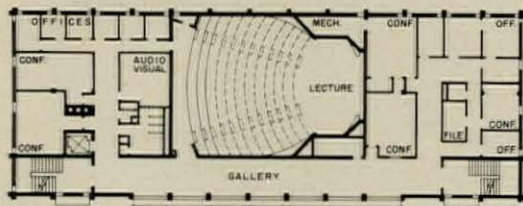
The use of closed circuit television and individual audio-visual aids was a dominant program requirement for this new College of Nursing at the University of Bridgeport. While plenty of provision has been made for small-group and individual study, a large auditorium and lecture room allows half the 400-student body at one time to watch closed-circuit television transmissions from clinical settings at associated hospitals, or to see wheeled-in demonstrations from a back-stage nursing lab. Site problems complicated the design program: a height restriction of three stories was imposed since the building is in a residential district, ground water problems precluded the use of a basement. The finished scheme, however, is both pleasant and functional, and allows for future change and expansion by providing a covered passage connection with another building 200 feet away, and by using movable walls wherever possible. Planned around the functional core of the training laboratory and auditorium, the building uses a steel frame construction with concrete floor slabs. Glazed yellow brick exterior walls with a glass facade extending the full three-story height give life to both interior and exterior.

The academic program was developed by Dean Martha P. Jayne and offers both two- and four-year courses.

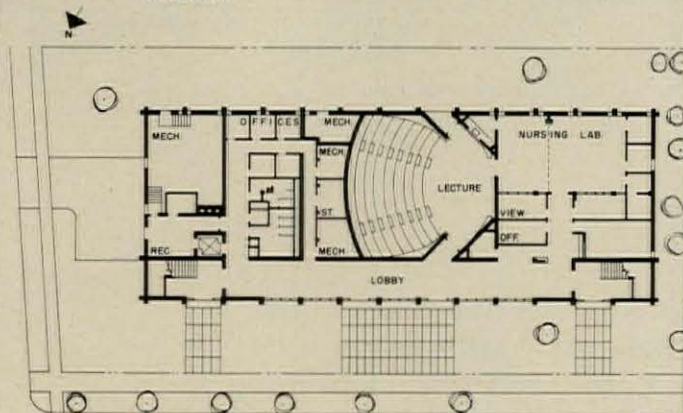
COLLEGE OF NURSING, UNIVERSITY OF BRIDGEPORT, CONNECTICUT. Architects: *Lyons & Mather*—partner-in-charge: *Austin Mather*, project architect: *Alfred H. Lange*.



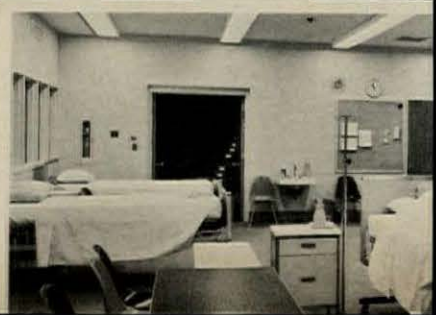
THIRD FLOOR



SECOND FLOOR



FIRST FLOOR





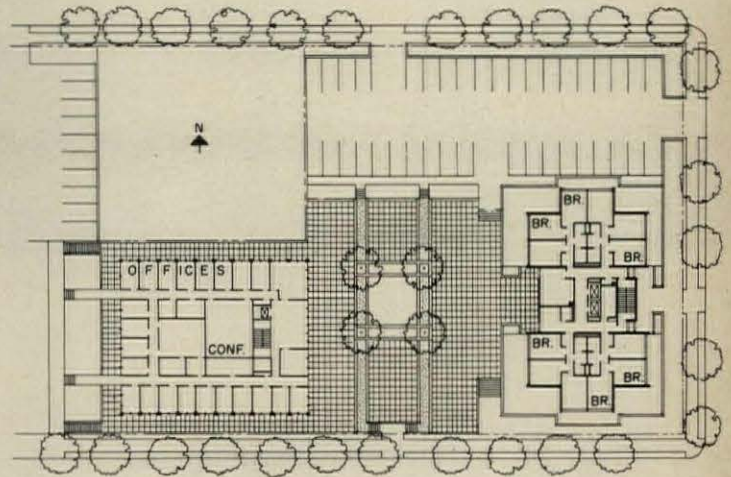
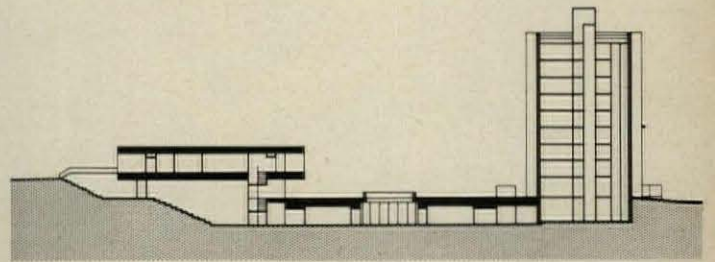
Ray Wing

**Campus effect is achieved
by landscaping the roof of a
below-grade classroom building**

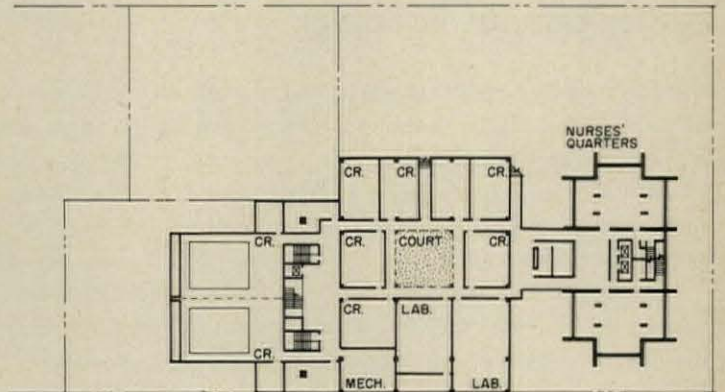
Federal grant under the 1964 Nurse Training Act has helped finance this projected new \$1-million classroom and office building for the Good Samaritan Medical Center's School of Nursing. The 33,000-square-foot air-conditioned building is located just to the west of the recently opened nurses' dormitory (photo above) to which it will be connected by a basement-level walkway. In addition to classrooms, lecture rooms and laboratories—with capacities ranging from 20 to 250 students—the new building will contain 25 faculty offices, conference rooms, a student health office, exhibition space and appropriate supporting facilities.

In order to develop a campus approach to the complex, the architects adopted a three-level solution, which fully exploits a restricted site by depressing the classroom area below grade. In this way, the roof of the classroom building can be landscaped and planted to form a campus-like quadrangle area. The placing of the classrooms below grade also has the advantage of making it easy to provide an all-weather connection with the dormitory. The entrance to the new building is placed at mid-level, between classrooms below and the offices above. The building is fireproofed and has been equipped with an elevator for the benefit of handicapped students and to facilitate the movement of supplies.

SCHOOL OF NURSING, GOOD SAMARITAN HOSPITAL, Portland, Oregon. Architects: Skidmore, Owings & Merrill.

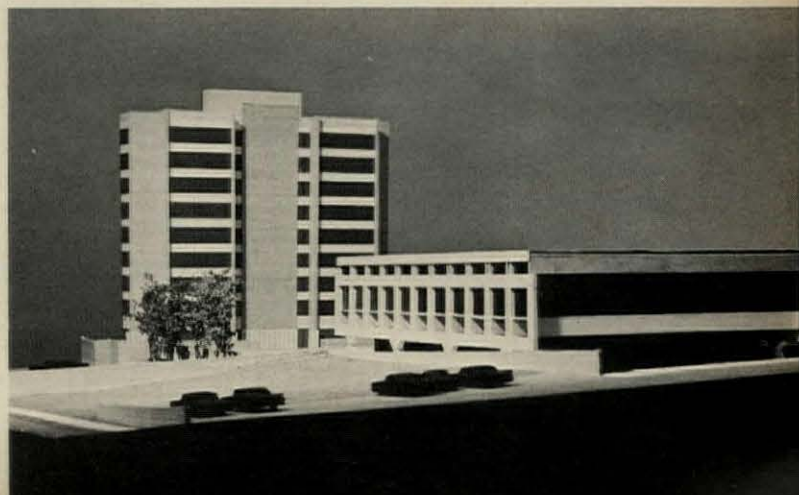


ADMINISTRATION FLOOR



BASEMENT

20





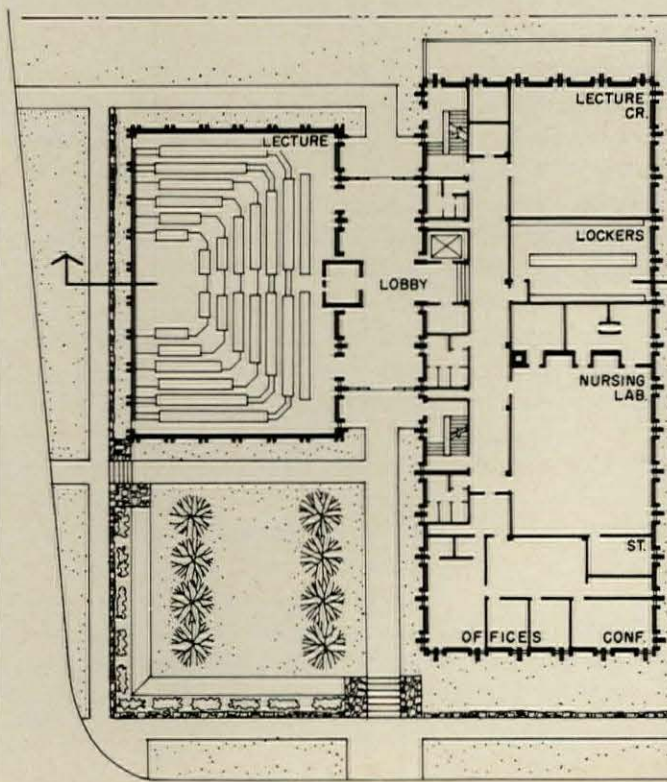
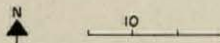
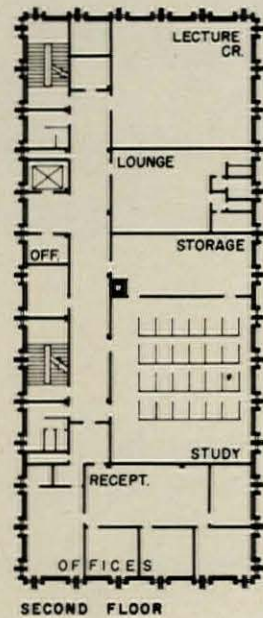
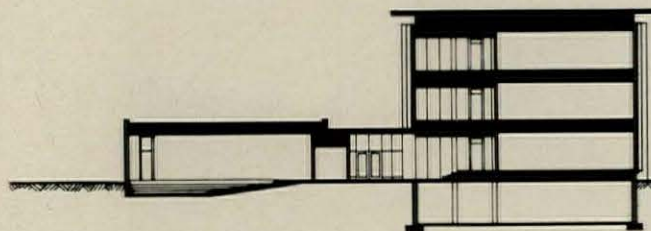
David M. Stanley, F.P.S.A.

Design for a state nursing school takes advantage of an awkward site, and echoes earlier campus buildings

Although, with 74 new students last fall, enrollment at the new Murray State College (Kentucky) Department of Nursing is running ahead of predictions, this three-story building, designed for expansion, should easily handle the load. And against future bumper enrollments, the potential for as many as four additional floors atop the classroom block is built in.

An awkward, irregular corner site (150 by 180 feet), described as "an old gravel pit, dump and hillside combined," was salvaged by earth terraces and retaining walls to accommodate the major design feature: an auditorium wing at right angles to the classroom block that takes advantage of the slope of the site and provides a small courtyard which occupies the corner itself. The main entrance, located at the junction of auditorium and classroom wings well away from corner traffic, opens on a lobby which separates the 215-seat auditorium from first-floor lecture-laboratory spaces. The latter include an individual study room, and a locker room for uniform changes. The busy corner location, as well as southern weather, may have influenced the architects to reduce windows to thin, residual strips on either side of the pre-cast concrete columns of the classroom block and to eliminate them entirely from the projecting auditorium.

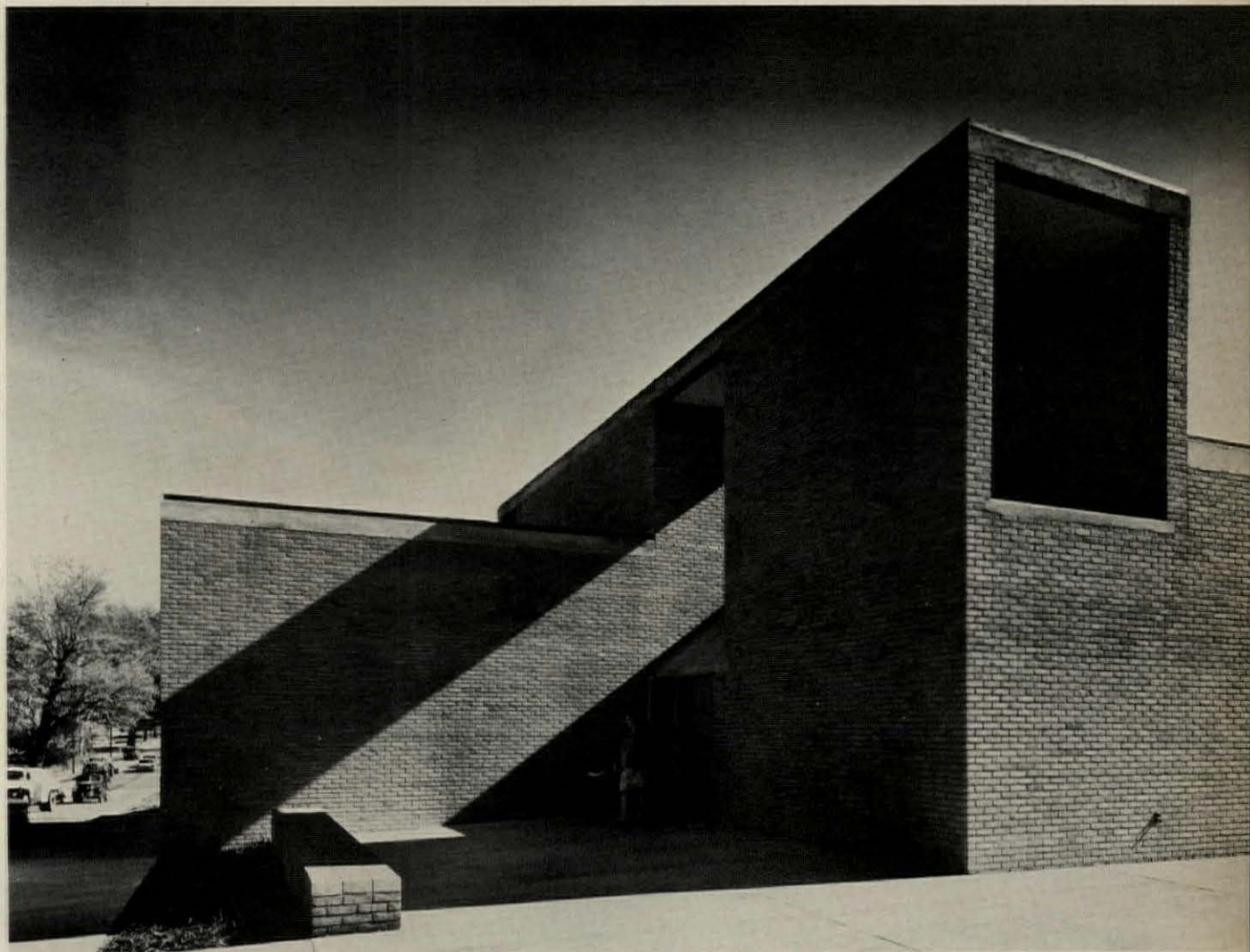
LABORATORY AND CLASSROOM BUILDING, DEPARTMENT OF NURSING, Murray State College, Murray, Kentucky. Architects: Lee Potter Smith and Associates.

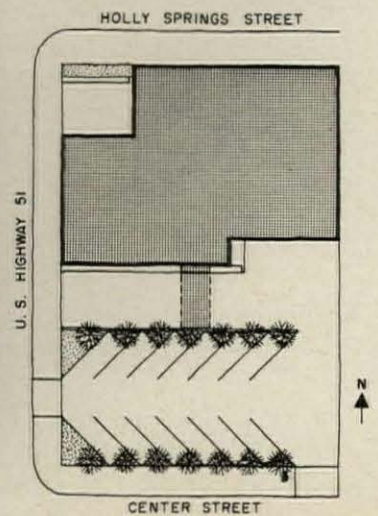
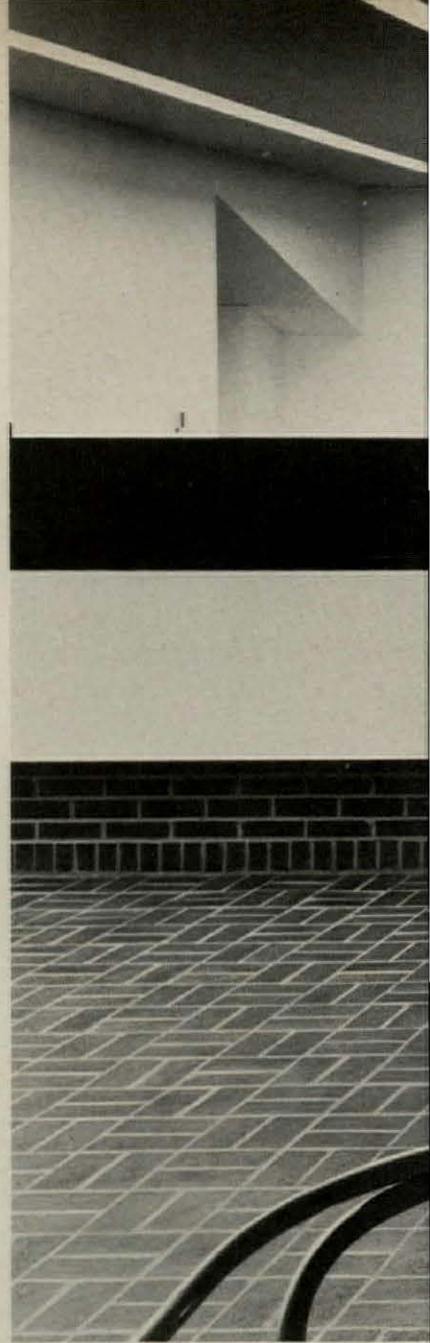
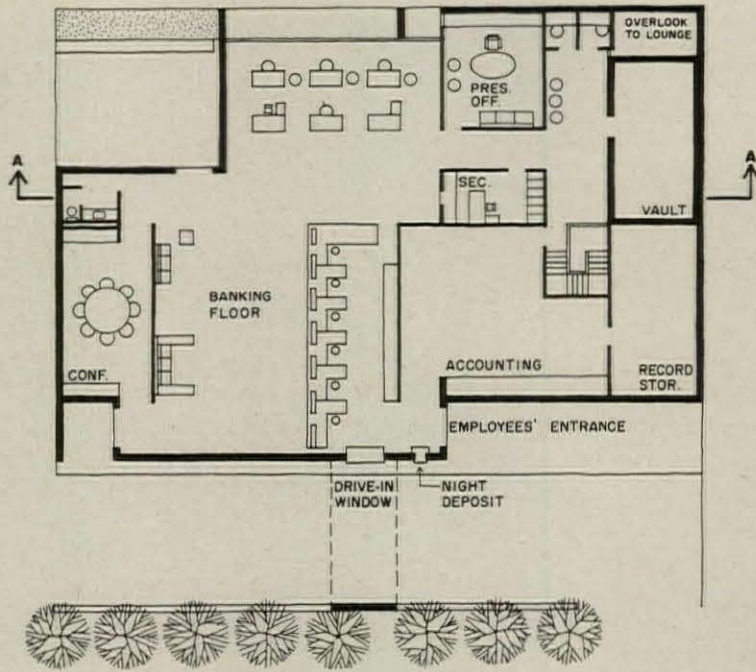
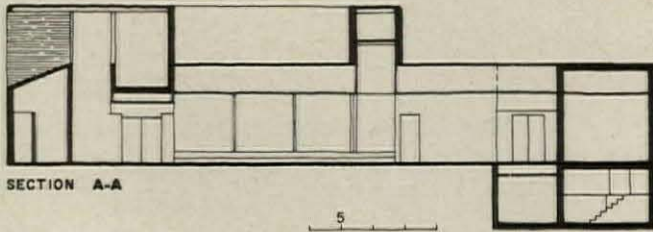


FIRST FLOOR

A MONUMENTAL SMALL BANK

This bold design for a small country bank achieves a sense of dignity and permanence; its massing is a simple and direct solution to basic program needs.







Alexandre George photos

Two main design considerations determined the massing in this bank—the functional relationship between the main banking space and its supporting facilities, and the establishment of effective sun control. On the interior, the main banking space is the dominant feature of the design and has the highest ceiling level. The supporting facilities on the same level are located in areas with lower ceiling levels.

Maximum sun control is achieved by lighting the main banking space and adjoining areas by one skylight (which penetrates the mechanical penthouse) and three clerestories. The clerestories are located over the entrances which all have deep, low, sloping sills. The only ground-floor windows are located in the north wall, where the sun is not a problem.

The main entrance to the bank had to be located to the north at a main intersection, and so the architects designed this entrance as a reentrant corner to bring light to the area. A hole in the ceiling above this entrance gives additional light.

The purpose of the design, say the architects, "was to develop the optimum volumetric relationship of interdependent functions. The clerestory windows, integrated with the penthouse, form the exterior massing. The correctness of this relationship evokes the character and permanence appropriate to banking function."





Conference room (above) benefits from natural lighting at both ends drawn from the same clerestories which light the main banking space. The vault, waiting area, and coupon-clipping booths (below) are readily accessible from the main banking area.

HERNANDO BANK, Hernando, Mississippi. Architect and interior designer: *Walk Jones / Mah & Jones / Architects / Inc.*; structural engineer: *Gardner & Howe*; mechanical and electrical engineer: *Allen & Hoshall*; general contractor: *John Cassidy Construction Company*.



ARCHITECTURE FOR SELLING

Retailing is entering a transitional period, and where it will lead is uncertain. The basic design of the store building has not changed significantly—except in parts and pieces—for the past two decades, but it seems clear that change is in the wind. Although the emergent ideas are random and unorganized, certain ones tend to keep coming to the top of the simmer. Architects concerned with store design may be interested in considering a few:

- The store can no longer be thought of as a goodlooking warehouse for selling goods, according to William Snaith,* but as a means of visual communication; since today—he contends—we comprehend by seeing in more cases than by reading. Thus, the retailer's task is to point out—visually—reasons to buy, the benefits, values, and qualities of goods.

- The computer will soon be able to analyze the effectiveness of floor plans, display techniques, and new services, thus setting up completely new concepts of merchandising.

- The manufacturer is increasingly reaching the ultimate consumer by:

1. Large-scale advertising, which more or less transforms the store into a place where the product is available.

2. Direct selling, due to dissatisfaction with present retailing methods and share of the market.

3. Taking an equity position in the market, especially in housing. General Electric and Alcoa are examples.

- The fact that discretionary income is now up to one-third of the total tends to negate price differentials and place greater importance on quality.

- The demographic fact of youth as a market. The 18 to 34 age group is the great market of the very near future; a generation bred to affluence, knowing nothing of depressions, in rebellion against many established standards. Teenagers have \$10 billion per year to spend; will have \$20 billion in five years. The store of the 70's will be younger than—as well as different from—the store today.

* President, Raymond Loewy-William Snaith Associates



Elkins shoe store; photo © Maris ESTO; see page 176



PROTOTYPE FOR SERVICE STATIONS: MOBIL TESTS EFFECT

OF DESIGN ON SALE AT 58 LOCATIONS

In July of 1966 the Mobil Oil Corporation opened, in New England, three new and unusual service stations that were built according to a prototype design by architect-industrial designer Eliot Noyes. Public reaction was favorable—consumers liked their clean lines and smart look; sales for the first six months far exceeded forecasts for the locations. On the strength of this success, Mobil is now building 55 additional stations across the country. Here is a notable example of good design benefitting business, while simultaneously performing a public service by improving—at least in part—the roadside scene.

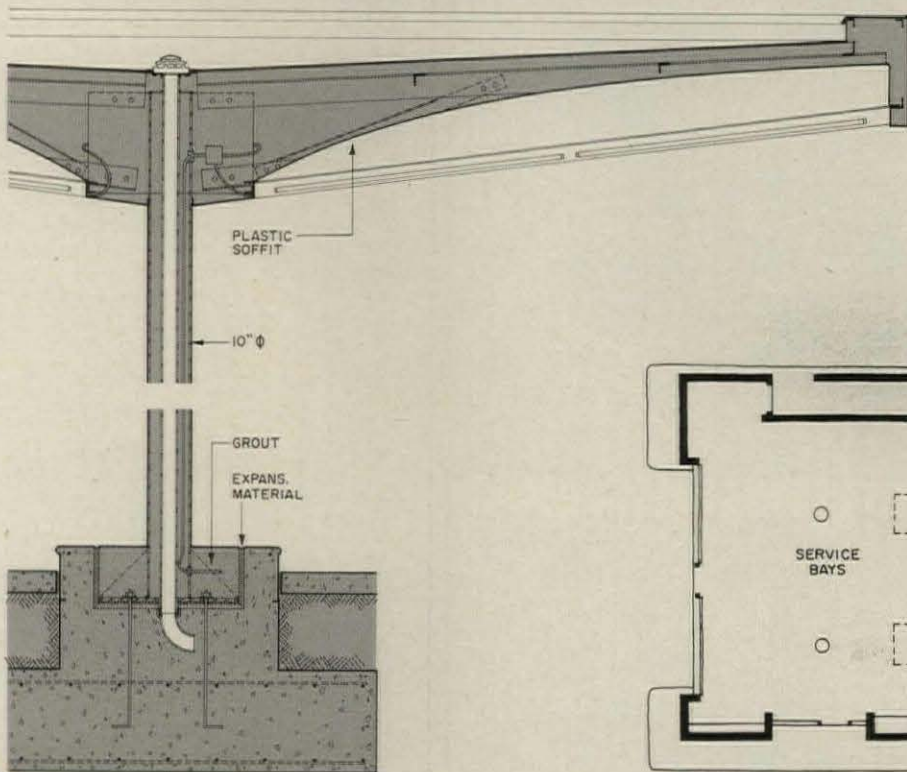
The design is of a character that will look well in almost any situation, and is applicable to stations of any ordinary size. It consists of circular pump canopies and a greatly improved and cleaned-up service building—of brick, stone, wood,

or any appropriate material—which is entered at the ends, not the front, in order to deconfuse intra-station traffic. The cantilevered, circular canopies provide shelter and act as giant lighting fixtures; are likely to become identifying trademarks for Mobil. Their number is determined by the size of the station. Mobil has also retained Noyes as general consultant for a comprehensive corporate design program.

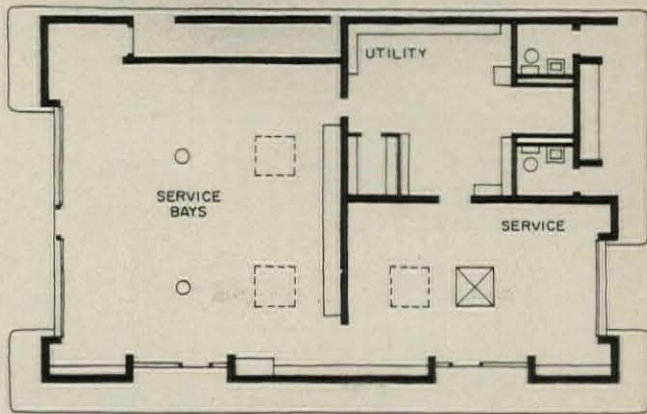
SERVICE STATION DESIGNS FOR MOBIL OIL CORPORATION. Architects and industrial designers: *Eliot Noyes & Associates*; structural engineers for canopy: *Lev Zetlin & Associates*; for buildings: *Werner-Jensen & Korst*; mechanical and electrical engineer: *Anthony J. Dimartino*; graphics consultants: *Chermayeff & Geismar Associates*; landscape consultant: *Robert T. Steinholtz*; lighting consultants: *Stanley K. Peterson & Associates*.

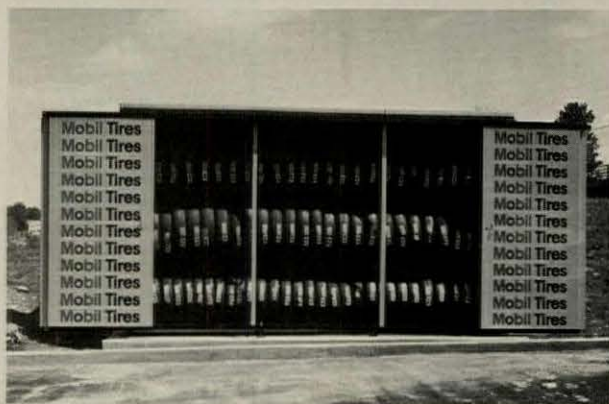


Joseph W. Molitor photos



The construction of a typical circular canopy is shown in the section at left; photos and the plan of a service building are shown above and below. Eight radial, steel-angle truss arms support the metal deck, set at least 15 feet above grade. The curved ceiling shells are of white plastic; the fascia is of white-painted metal. Fluorescent tubes fasten to the radial arms.

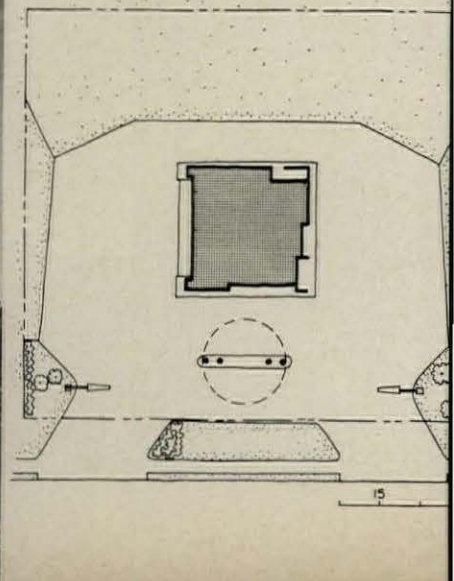
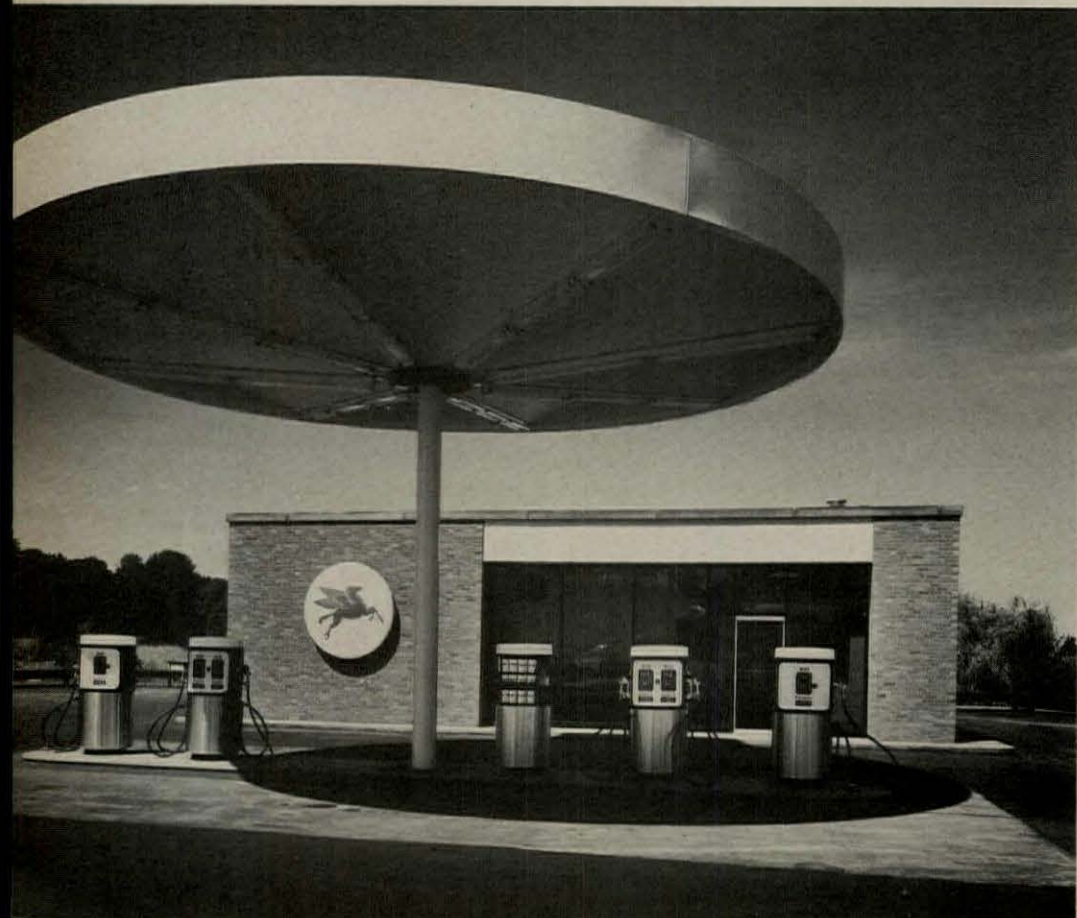




The stainless-steel pumps and the tire racks were designed by Noyes and will be used eventually in all Mobil stations. Two of the smaller stations are pictured on this page; larger one on the preceding two pages.

The service stations will not be just another face-lifting operation according to architect Noyes, but will instead be a complete and continuing program dealing with the comprehensive design of the stations and their relationship to the community. The program will be concerned with the welfare of the motorist, the dealer, the town, and the sponsoring corporation.

The idea of basing the design program as a whole—including the service stations and their details—on a circular motif, occurred to Noyes early in his study of the problem, and has been consistently used throughout; witness the red circle. Upon the recommendation of Eli Noyes, Chermayeff and Geismar have been retained by Mobil to develop their graphics program.



"...initial business performance of the new stations has been encouraging."

by Rawleigh Warner, Jr.
President, Mobil Oil Corporation

••• During the coming months Mobil will be studying the operation of 58 service stations designed to test the concept that good architecture is good business. These experimental stations are part of a comprehensive, worldwide design program which Eliot Noyes is now undertaking for the Mobil Oil Corporation.

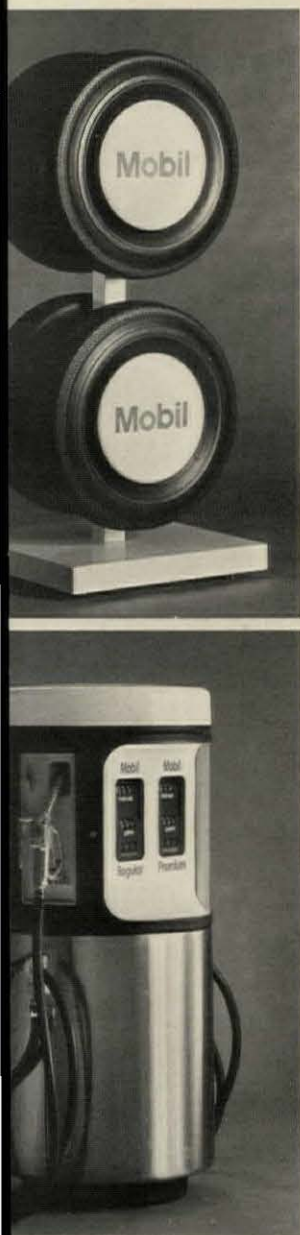
The service-station program is responsive to public opinion, which strongly supports roadside beautification. People are fed up with the clutter that spoils so many of our streets and highways, and zoning boards are making it increasingly difficult for companies to secure construction permits for any kind of roadside establishment.

Some oil companies have long emphasized to dealers the importance of good housekeeping, and many service stations are reasonably clean and neat. But in 1964 Mobil decided to look harder at a more basic factor—the design of the station itself. Several of my associates were familiar with the outstanding job that Eliot Noyes had been doing for IBM and Westinghouse, so we discussed our problem with him. He agreed to try to develop a service station prototype that would be economically viable; and that also would—through good design—express the company's responsibility to the community and the nation.

At the suggestion of Eliot Noyes we also enlisted the services of Chermayeff and Geismar Associates to study the problem from the standpoint of graphic design. The result is the fresh, consistent approach to graphics that we are now adopting all over the world.

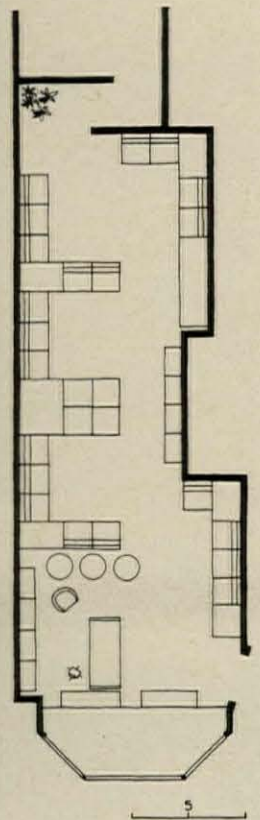
The first three experimental stations were completed in July of 1966. Their initial business performance has been encouraging—enough so to prompt us to go ahead with a much larger program of 55 more stations. By the end of this year motorists in 17 states will be telling us—by patronizing or passing up these new stations—how well they perform as profitable places of business for the dealer, and as sound investments for us.

If our experiment in architectural excellence is as successful as we expect it to be, the ultimate result should be a pace-setting contribution towards making the streets and highways of our country more attractive for everyone.





Photos © Maris (ESTO)



BOSTON SHOE STORE REMODELING ACCOMPLISHED FOR TOTAL BUDGET OF

\$20,000

The remodeling of this shoe store involved very little actual construction; consisted principally of installing a new suspended ceiling of acoustical material, and of lighting, painting, and furnishings. The work was awarded as a series of separate contracts, so a general contractor was not required. The total cost—including all furnishings and exterior signs—was \$20,000.

The existing store was long, narrow, and high-ceilinged: 50 by 18 by 15 feet. In the redesign, the store was divided into "areas" by means of furniture arrangements, color, and lighting. Thus the long, awkward space was cut into manageable elements of much better scale. Warm colors are used near the entrance, and range through the spectrum to cool tones at the rear. Recessed lighting projects narrow shafts of high intensity on arrangements of accessories; a special group of hanging lamps—designed by the architect—add further interest and color.

ELKINS SHOE STORE, BOSTON, MASSACHUSETTS. Architects: *William Riseman and Associates.*





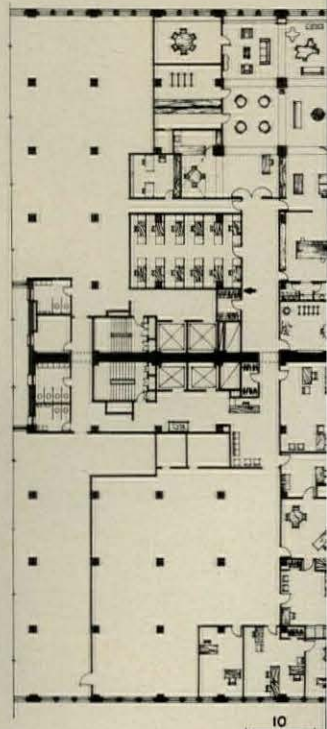
NEW YORK SHOWROOM USES BRICK AND NATURAL WOOD FOR DISPLAY OF EXOTIC LEATHERS

This showroom and executive headquarters for a New York wholesaler of leathers is located on the top floors of two adjacent and similar loft buildings; the two areas connected and ingeniously designed to work together as one. The scheme was based on the desire to use natural materials—wood and brick—as background, and on the knowledge that the New York code permits a certain amount of finish woodwork in sprinklered structures of less than 12 stories. The plan consists essentially of showrooms, executive, sales, and design offices, general office space, a gallery, and areas for receiving and shipping.

In the remodeling process, all existing partitions, floor finishes, and lighting fixtures were first removed. The new huge ceilings were made of natural sand-finished plaster, or of interlocking, fire-proofed 2 x 4s stained dark brown, supported on the column lines by fire-proofed, rough beams, with recessed plywood between. Walls are sand-finished plaster; columns are covered with secondhand common brick; radiator covers have steel frames and plywood fronts.

SHOWROOM FOR FLEMING-JOFFE, NEW YORK CITY. Architects: *Edelman and Salzman*; general contractor: *Garson-Bergman*.

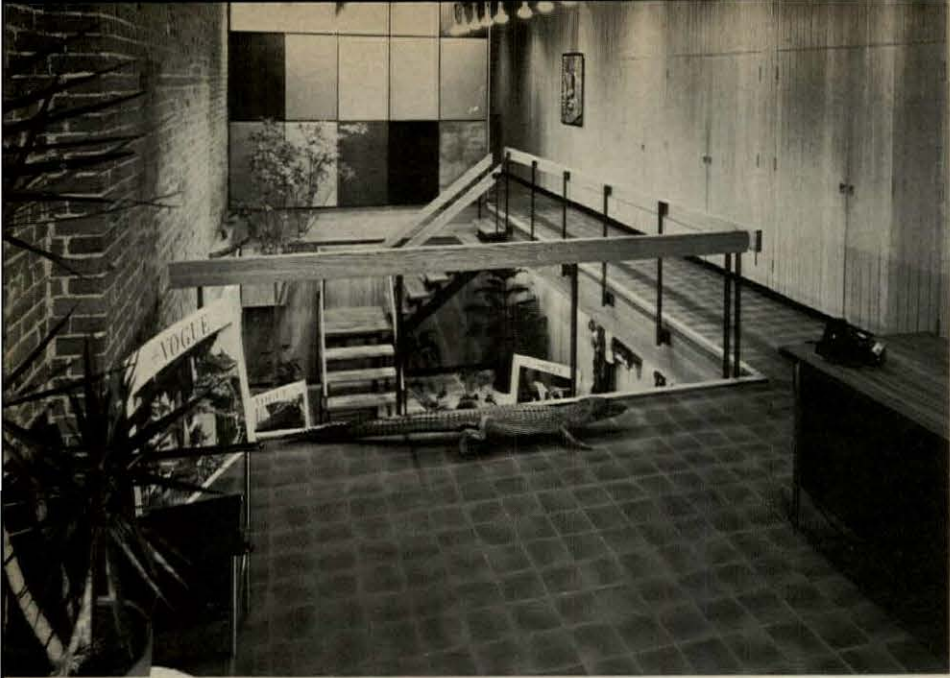
FOR DISPLAY OF
EXOTIC LEATHERS



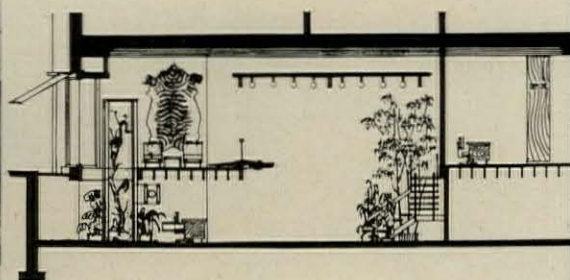


Cabinets, trim, and the wooden members of the glazed partitions were made to detail by the cabinet-maker, who also fabricated and installed the display racks, radiator covers, desks, tables, storage walls, and display walls. Tack-up walls are of 1-inch-thick sheet cork in a dark, chocolate-brown color.



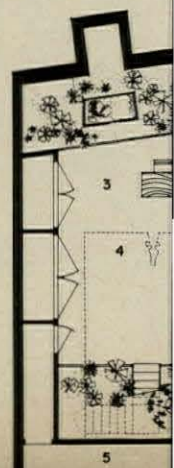
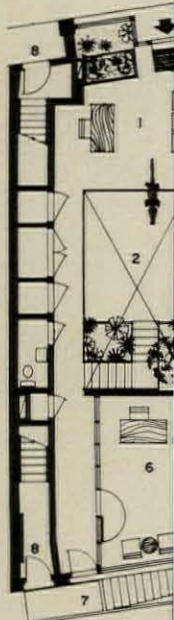


W. C. Runder photos



Party walls were stripped to expose the granite foundation and brick wall above; the ceiling is made of latticed 2 x 4's, and serves to conceal air-conditioning ducts and the lighting for adjacent walls. The stairway is built of welded steel and has treads and handrailings of oiled birch.

The wall opposite the entrance, visible from the street, terminates the well for the lower area. It is made of lift-off plywood panels which are covered with leather samples to show the range of seasonal designs available.



REMODELING CREATES DRAMATIC SPACES

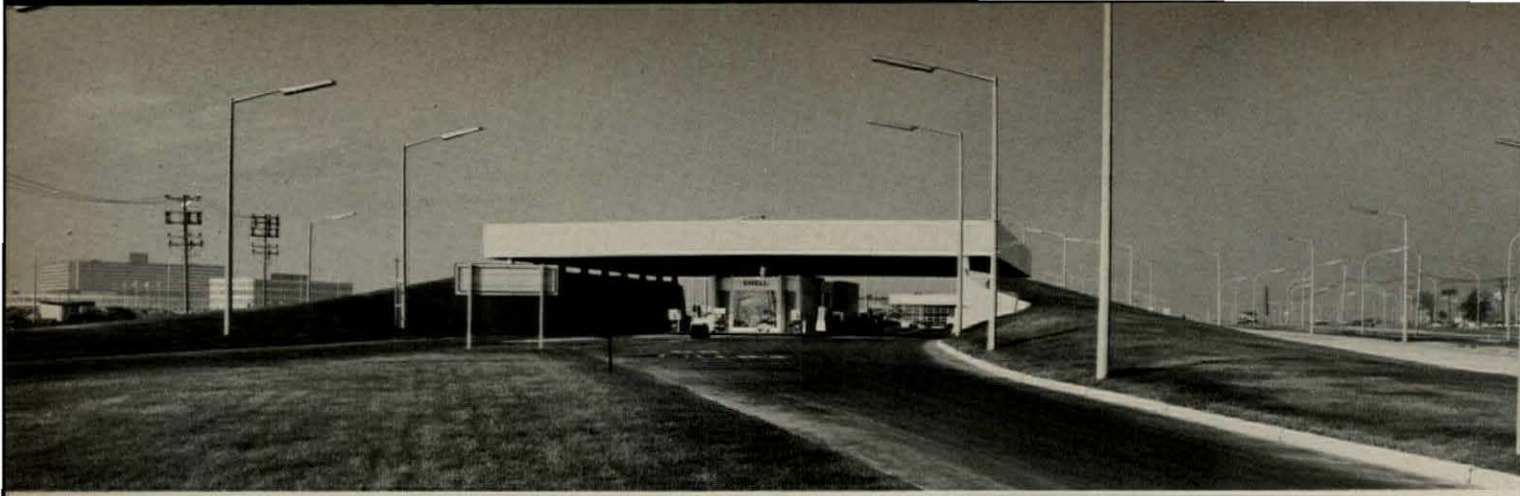
FOR THIS SHOWROOM

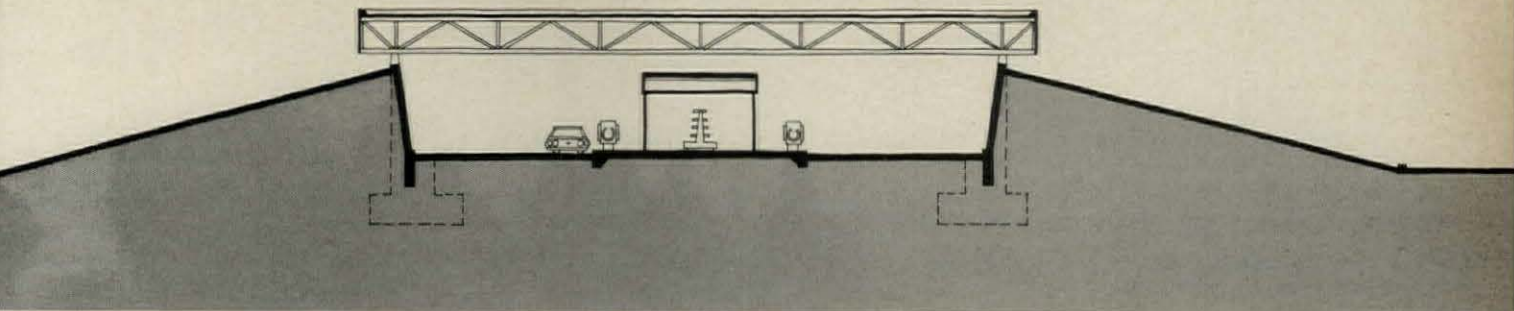
This interesting St. Louis showroom for Fleming-Joffe (see also preceding two pages), located in an 1890 store, was created by cutting a large opening in the ground floor to create a dramatic, lower-level display space; and by installing a two-story glass cage at the front for snakes and lizards. The cage serves as both indoor and outdoor display.

SHOWROOM FOR FLEMING-JOFFE, ST. LOUIS, MISSOURI. Architects: *Edelman and Salzman*; general contractor and cabinet-maker: *Pernikoff Construction Company*.

1. Receptionist
2. Open well
3. Salesman
4. Display area
5. Storage and mechanical
6. Manager
7. Rear entrance from parking
8. Apartment entrance







5

CANADIAN SERVICE STATION IS PLEASINGLY CONCEALED BY BUILT-UP EARTH BERMS

This highly original automobile service center is designed so that it is virtually invisible from the highway, since it is integrated into the landscape by means of earth berms—as the section above and the photographs at left make clear. The center is located in the median strip of a four-lane parkway approach to the Toronto International Airport, and consists of two separated structures: a filling station, and a repair and lubricating building.

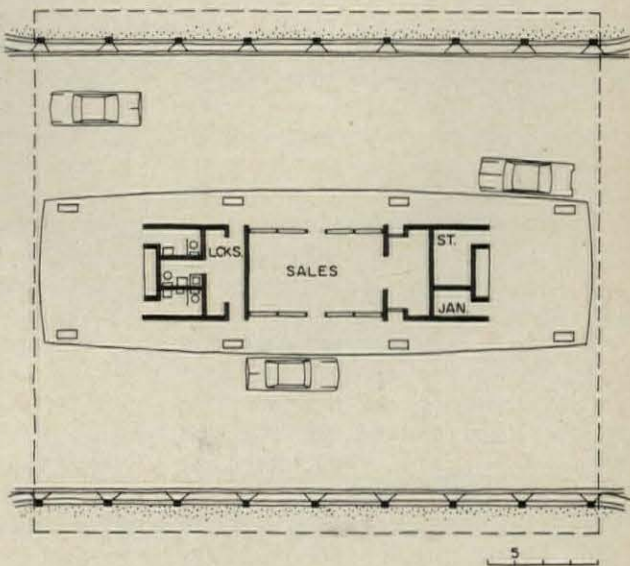
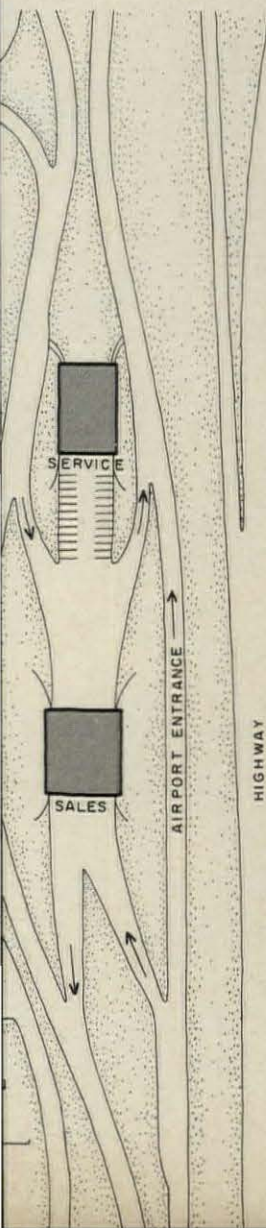
Beyond the major concern of designing a service center in keeping with the scale and character of the other airport structures, there was that of maintaining a scale appropriate for a car moving at 30 or 40 miles per hour. Thus, the station consists of a streamlined form of three-dimensional curves with two projecting spines. A 100-foot-square roof, supported by exposed steel trusses resting on concrete columns and retaining walls, hovers over the double-spined central structure.

The earth berms rise 12 feet above the highway and serve as an effective visual barrier for the surrounding headlight glare and vehicular confusion emanating from the many lanes of the airport roads and parkway. The result is a pleasing form in harmony with its setting.

AUTOMOTIVE SERVICE CENTER, TORONTO INTERNATIONAL AIRPORT, MALTON, ONTARIO. Architects and engineers: *John B. Parkin Associates.*



This photo: H. R. Jowett; photos opposite: Panda Associates



5



GRAPHIC DESIGN AND ALLIED ARTS PLAY IMPORTANT ROLE IN
 THE DESIGN OF
 WEST COAST STORE

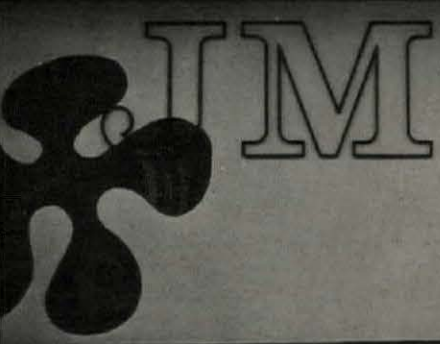
The Gruen architectural office has consistently made generous use of graphic design—and other related arts—in the development of its designs; and has maintained its own graphics department for a good many years. The Joseph Magnin store, occupying 38,000 square feet on two floors of the Century Square Shopping Center in Los Angeles, is an interesting case in point. Its main entrance lies at the intersection of two of the center's walkways, as shown above. This entrance is marked by corner doorways of black-anodized aluminum and glass, which house a sculpture by Claire Falkenstein, set in a terrazzo fountain that is equally visible from inside or outside. The sculpture is balanced—on the

opposite side of the entrance—by a terrazzo display platform, raised above the floor.

Both of the walls flanking the entrance are of white-painted, textured plaster, decorated by colorful floral patterns of Byzantine tile, and by the Magnin JM logotype in a black-painted metal frame set free of the wall.

JOSEPH MAGNIN STORE, CENTURY SQUARE SHOPPING CENTER, LOS ANGELES, CALIFORNIA. Architects and engineers: *Victor Gruen Associates—R. L. Baumfeld, partner in charge; general contractor: Diversified Builders, Incorporated.* Architects for the Century Square Shopping Center: *Welton Becket and Associates.*

JOSEPH MAGNIN



Variety and effectiveness seem to characterize the use of graphics on both the exterior and all through the interior of the building. Due probably to its greater legibility, most of the lettering—except for the name of the store—is in lower case with initial capital letters.

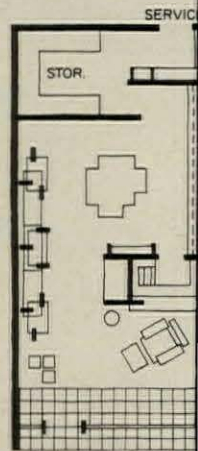




*SMALL HONOLULU SHOP FOR "GREAT THINGS"
OFFERS GOOD
DESIGN FOR SALE*

This small shop in Honolulu is, in the words of architect Tom Wells, "dedicated to design excellence." Thus, the overriding thought in designing the interior was that it should not compete with the carefully selected merchandise. To this end, it was decided to make the piers and standards of dark-stained, resawn redwood—a material offering a strong contrast to the generally soft character of the shapes and textures offered. Glass slabs set in redwood uprights provide a maximum view of the objects on the shelves. A redwood grill covers the entire ceiling, providing flexibility for lighting and serving as a screen for air-conditioning outlets and stereo speakers.

GREAT THINGS SHOP, ALA MOANA SHOPPING CENTER, HONOLULU, HAWAII. Architect: *Thomas O. Wells*; general contractors: *Watanabe and Kondo*.



Instant rehab does it in hours

With considerable press agentry—closed circuit TV; colored hard hats for the press, HUD officials and workmen; an all-night press room; and speeches by Mayor Lindsay and Secretary Weaver—HUD put on its 48-hour demonstration of "instant rehabilitation" the week of April 1. The demonstration took place in the third of three five-story tenement buildings on New York's lower east side, being renovated by the instant rehabilitation technique—a packaged kitchen-bathroom core plus new floor, wall and ceiling finishes (January RECORD, page 175).

The problems experienced last November when instant rehabilitation was first shown to the press—principally misalignment of apartment floors and floor joists of the core units—had been worked out. What apparently had not been taken care of, however, was the New York City Building Department's concern over the method of venting the gas furnaces which were incorporated in the cores used in the first two tenement buildings. (A com-

mon vent was used for the two five-story buildings, and there was no room at the top of the core for recommended vertical rise in the connection between draft hood and the flue.) The building in which the demonstration took place last month uses the existing one-pipe steam system for heating. The oil-fired steam boiler which originally heated all three of the buildings being rehabilitated will now heat the third one; it also provides domestic hot water for the project. Thus the packaged cores in this last building consist of kitchen and bathroom, but not heating.

Engineers familiar with structural problems that occur in rehabilitation like the idea of using an independent struc-

tural system for a renovated kitchen-and-bath. They point out that with these old buildings, structural reinforcement of the floor system generally would be required if kitchens and bathrooms were being installed conventionally. In addition to the weight of the fixtures and appliances, the structure has to take the weight of piping. In this case, not only does the steel frame of the core support the core itself, but it also shortens the spans of the original floor joists. This is similar, in a way, to the technique which has been occasionally used to modernize hospitals, of stacked "outrigger" bathroom units installed externally of the existing building, simplifying the structural problem and minimizing interference with normal occupancy.

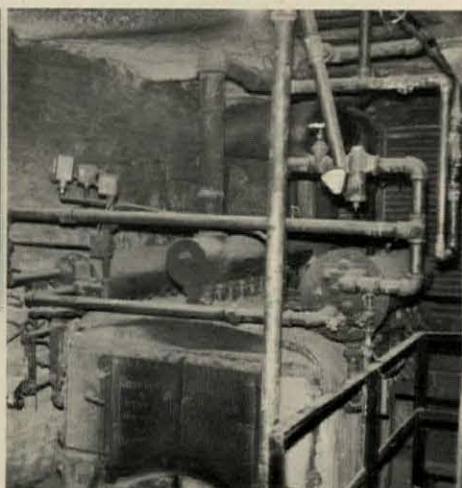
The rehabilitated apartments have a clean, trim appearance with their new hung ceilings and furred-out vinyl-covered gypsum board panels. Further, the cores, which are located centrally in the apartments, nicely divide the bedroom and living room areas. A 3/8-in. particle board sheet flooring material was used which conforms to the sag of the

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The New York Times photo



floors. Coated with polyester, the flooring is scored to give the appearance of floor tile.

It could be that the 48-hour elapsed time notion may have been unnecessarily dramatic in terms of actual need and additional costs that had to be incurred for overtime labor, standby crane and waiting trucks with core units.

Conrad Engineers, who researched and planned the project, said cost of the initial units would approximate that of conventional rehabilitation, or around \$13,000. Projected costs for any future units might be more nearly \$11,000. Of course cost figures now have to be hypothetical estimates because of the experimental nature of the project. Actual costs will depend upon competitive bidding by contractors experienced in rehabilitation work.

The instant rehabilitation project is being sponsored by the Carolyndale Foundation of New York City under a program of Federal Housing Administration mortgage insurance and a low-income housing demonstration grant from HUD, originally in the amount of \$420,000, but now reported to be \$1-million. FHA is insuring a mortgage covering the project under Section 233 (experimental housing) of the National Housing Act. The private loan of \$568,400 is being made by the Chase Manhattan Bank. At closing, the mortgage will bear interest at 3 per cent, and will be purchased by the Federal National Mortgage Association, a part of HUD.

Conrad Engineers (Construction Research and Development Corporation), headed by Edward K. Rice, arranged for off-site assembly of the kitchen-bathroom core units and for delivery of the units through shafts cut in the buildings. They were fabricated on a city-owned pier a few miles from the rehab site. Mr. Rice is also president of Impcon, the general contractor for the project.

Building faults cited in Cornell dormitory fire

Inadequate and substandard escape facilities were principally responsible for the deaths of eight students and one faculty member in the April 5th fire in a Cornell University dormitory, according to a preliminary report of the National Fire Protection Association. The report states that an inadequately-enclosed stairway allowed smoke and hot gases from the fire—which originated in a basement lounge at 4 a.m.—to pour up into the first and second floor corridors and lobby of the dormitory, which housed 71 students and faculty advisors.

The report points out that the stairway lacked approved fire doors and en-

losures at the basement and first floor levels, and that the door at the top of the stairway on the second floor had been removed for alteration. And while the building had two avenues of escape to the outside, they were located in close proximity to each other, contrary to the N.F.P.A. Life Safety Code. The smoke and gases filled one stairway, making it impossible to use as an escape route, the N.F.P.A. report said. The other stairway, which should have been the alternate escape route, could not be reached by the students because it opened into a corridor which also was filled with smoke.

Another factor which may have contributed to the deaths, according to the report, was the absence of a building fire alarm.

A particularly tragic note, the report concludes, is the fact that plans had been made to install automatic sprinklers, but the work had not been started. Preprints of the report will be available around May 15 and are available for 50 cents from N.F.P.A., 60 Batterymarch Street, Boston, Massachusetts 02110.

Steps in front of the Met will get railings, lights

Architects for the new Metropolitan Opera House at Lincoln Center, Harrison & Abramovitz have designed new bronze railings for the four shallow steps leading up to the building from the plaza area. These steps had been the source of a number of tripping accidents, following the opening, until mid-November when wooden police barricades were set up and black tape put on a number of treads as a temporary expedient (January RECORD, page 167). The 2-ft-10-in. high lacquered-bronze railings will have fluorescent lamps enclosed within the rail for nighttime illumination. In addition, a dark nonskid abrasive surfacing, 3/4-in. wide will be cut into the treads. The railings will be installed on 17-ft centers along the 540-ft-width of steps.

Apparently the difficulty arose from the unconventional riser/tread ratio of 31 inches to 25 inches.

Max Abramovitz was quoted in the New York Times as saying that, "These are probably going to be the most over-protected steps in New York City."

Achieving greater consistency in building codes

Developing standards suitable for reference by building codes still remains a tough problem in the opinion of Edwin A. Weed, New York architect and engineer and chairman of the Construction Standards Board of the U.S.A. Standards

Institute. In a recent speech, one of a 12-lecture series, at the National Bureau of Standards, Weed said that the biggest problem the Construction Standards Board faces is how to achieve required "consensus" of members on specific subjects. (A proposed new draft of the National Plumbing Code is in a stalemate situation currently, partly because of a few technical points of contention, but mostly because of disagreement between representatives of several materials organizations and trade associations.)

In his talk, Weed called for a new body that could judge promulgated standards in support of building codes which would be composed of representatives of various standards boards, but would not include any representatives of materials producers.

While Weed did not come out for a Federal national building code, he did say he hoped that standards could be developed by industry and government to meet performance requirements. On the other hand, he did point out that the four model codes do not cover all cities of the nation, and the major cities not at all.

Weed also urged that a standard preferred construction nomenclature dictionary be developed, having such a format that both user and code enforcer could understand it.

Alaskan earthquake fully documented

The first in a series of six volumes on the Anchorage earthquake has been published by the Geological Survey of the Department of the Interior. This particular volume deals with the geological setting of the earthquake, earthquake effects, field investigations, and public and private reconstruction efforts. The remaining volumes will cover local and regional effects on communities, water supplies and transportation and communication facilities.

An unpublicized fact of the earthquake reported in the book is that the earthquake caused the largest known surface movement of land from a single earthquake in recorded history. For instance, seismic sea waves caused severe damage along the West Coast, particularly at Crescent City, California; water levels fluctuated in wells throughout much of North America and at places far distant as the Virgin Islands and Denmark.

The 111-page book, "The Alaskan Earthquake—Investigations and Reconstruction," is available for \$2.75 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402.



The Sydney Opera House —what happened and why

The story of the Sydney Opera House is a parable of the relationship between the "artist" architect and the "practical, realistic" client—with each side fulfilling his predestined role. At the point where one longs to drop the curtain, see the principal actors take a bow, and realize that the whole agonizing spectacle was not something that had actually happened.

The Opera House seems to have begun as almost a personal dream of Joseph Cahill, who was the Labor Party Prime Minister of New South Wales during the 1950's. He had considerable support from the late Eugene Goossens, who was resident conductor of the Sydney Symphony Orchestra. In fact, it is said that the idea for the project came from the persistent efforts of Goossens to find a new "home" for the Symphony.

The result was that in 1956 the Government conducted a competition, offering a top prize equivalent to \$11,500 which drew 223 entries from 30 countries including 61 from Australia. The program stipulated that the major hall be convertible for

both opera and symphony performances and designed to seat between 3,000 and 3,500, and that a minor hall for music and drama be designed to seat 1,100.

Utzon has been out of the picture for a year now, having been replaced by a panel of architects selected by the new (as of 1965) Minister of Public Works, Davis Hughes. In February of 1966 Utzon wrote a letter to Hughes complaining of lack of cooperation, lack of respect for himself as an architect, and non-payment of fees, in view of which he said, "I will be forced to leave the job." The next day Minister Hughes announced to the cabinet his plan to finish the building with a panel of "leading private architects." On March 7 of last year, Minister Hughes proposed that the Government Architect should be in charge of the job, assisted by a panel of architects, responsible for programing, documentation, supervision, and general administration. Utzon was to be offered the position of "design architect," with responsibility for "originating, su-

pervising and development of design." Utzon replied on March 8 that, "the Basis of Proposal is acceptable to me in part but cannot be acceptable in total—nor would it be to any architect with any sense of responsibility to his client. It takes for granted that my office is incapable of remaining in full technical control of the job for unspecified reasons." Utzon suggested modifications to the Proposal which essentially confirmed him as architect in full control, but the Minister refused to consider it. In April 1966 the Minister announced his panel of architects: Government Architect E. H. Farmer to be coordinating architect of the panel consisting of D. S. Littlemore (responsible for supervision); L. Todd (responsible for contract documents); and Peter Hall, who had worked in the Government Architect's office until shortly before Utzon's "resignation", responsible for design.

The costs kept going up with no end in sight

The most immediate reason that Joern Utzon is no longer associated with the Sydney Opera House is, undoubtedly, government embarrassment and concern over soaring costs, which while officially put at \$50 million, are privately expected to reach \$65 or \$70 million. But perhaps more to the heart of the matter was the fact that from the very beginning and throughout the 10 years of design and construction, there was



The magnificent, but narrow, site, which overlooks Sydney harbor from its best vantage point, offered little room for two halls.

little, if any, realistic programming from the standpoint of performing arts management. Utzon's consultants were structural engineers, acoustical consultants and stage design consultants, all of whom were experts in their own specialties, but none of whom could direct themselves to the question of what kind of performing arts facilities were needed and could be publicly supported.

The original cost estimate, made by a firm of quantity surveyors from the competition drawings, was \$7 million, which was not regarded as at all realistic by either Utzon or Ove Arup & Partners. In 1960, the Sydney Opera House Act was passed. It provided for an expenditure of \$10 million, plus or minus 10 per cent. In 1962 the government issued the figure of \$25 million as the first complete up-to-date estimate for the entire building prepared by the architect, consultant and quantity surveyors.

At the end of 1964 a tentative figure of \$35 million for the Opera House was given—tentative because so much of the

interiors were yet to be designed. Hughes told the Parliament in November 1965 that the cost of the opera house would approach \$50 million.

Latest decision: the switch is made to a concert hall

The government has now made the decision, based on the recommendation of the architects' panel, that the major hall be designed solely for symphony concert performance with a seating capacity of 2800. There will be no stage machinery of any sort; the \$3 million worth of stage lifts originally intended for opera production, and now in storage in Sydney, will be sold if possible.

Apparently this decision was made on the basis that symphony orchestra is a known quantity in Sydney—a definite attendance and income could be projected. The Australian Broadcasting Commission, a semi-government body, which manages the Sydney Symphony Orchestra, maintained that there must have close to the originally projected 3000 seats for orchestra performance, or they could not leave their present home, the Sydney Town Hall. They, and the architects' panel, say that Utzon's latest plan for a multi-purpose hall would only allow 1800 seats if a comfortable row spacing were to be had. This fact was reported last June to the minister of public works by the architects' panel. They said that row spacing intended by Utzon was 29 in. in the galleries and 31 in. in the lower auditorium; seat spacing was 20 in. If the row spacing were changed to 3 ft to allow more comfort and room for people to move, the number of seats would drop to 1800. Since it was felt that a 3-ft (or even wider) row spacing was highly desirable, it was suggested that a new approach must be taken to the design of the interior layout. Utzon's last plan had 2,500 seats in the auditorium and 300 student seats behind the orchestra (i.e., on stage). Ben Schlanger of New York City has been retained as consulting architect by the Government to work with the architects' panel on seating and circulation.

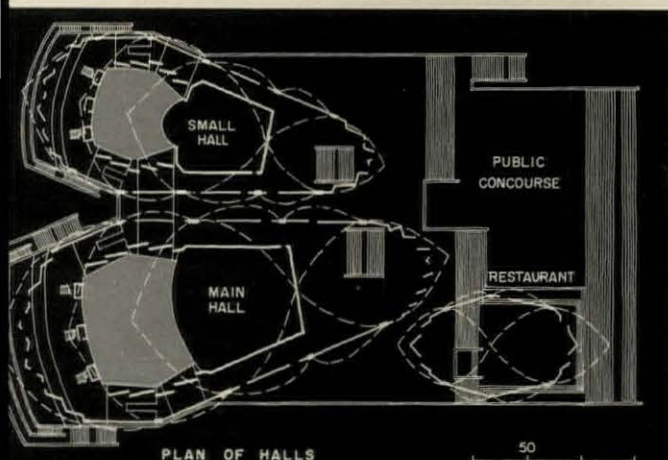
The Australian Broadcasting Commission said that the only way of providing a satisfactory orchestra enclosure around the orchestra for acoustical purposes, as well as providing additional seating and installation of a fixed organ, was to remove the stage machinery. Since Utzon placed both the major and minor hall stage ends side by side on the relatively narrow site, there was scarcely any side stage space at all for these halls. This meant, in the main, that vertical articulation of scenes and staging was necessary. Much of this was to have been accomplished with a series of 12 by 38 ft lifts. Proponents of the concert hall scheme and others argued that, in any case, this arrangement would pose considerable difficulties for mechanics and performers if complicated stage productions were to be put on. But more importantly, in order to get in the desired 2,800 seats, with sight lines generally used for concert halls, the main floor seating will have to move forward and take away original stage space.

The orchestra shell will be permanent. Plans for a movable mountable acoustic shell which could be moved in and out of the main hall to make it suitable for either activity were scrapped. The team of architects, led by Peter Hall, which took over when Joern Utzon resigned, said the acoustic shell would weigh around 300 tons. Hughes has said it would be excessively heavy and would present an almost insurmountable obstacle. Professor Cremer of Berlin, who was Utzon's acoustical expert, came up with plans for a sectionalized acoustic shell weighing around 50 tons. But since neither Utzon or Cremer

involved with the Opera House, their plan has not been examined by the Minister or architectural team.

Arguing against the single-use design for the major hall were The Sydney Opera House Trust, representing performing arts in general, and the Elizabethan Theatre Trust, representing opera, ballet and drama in particular. The Opera House Trust said that abandoning the multi-purpose concept of the main hall would be a betrayal of the Trust's obligations to the public and the people who supported the original concept of the opera house, if large-scale opera and ballet works could not be performed. The limitation imposed by relegation of opera to the minor hall would prevent patrons from experiencing performance of grand opera or ballet, except on a scale that best could be termed "provincial". The concert-hall advocates, on the other hand, say that there has been little progress in establishing permanent companies; that financing would be difficult without extensive subsidies which do not appear forthcoming; and that the public's apathy toward live theater would form a serious obstacle to attracting large audiences to opera.

The differences between Utzon's latest plans and the architects' panel recommendations, which were accepted by the government, are these: Utzon had a multi-purpose major hall seating 2,500; a minor hall accommodating 1,100; an experimental theater for 400 and a chamber-music hall for 300.



This early plan, published in 1959, shows how the two halls were wedged within the enclosing shells. Because of their juxtaposition and the narrow site, Utzon was unable to provide side stages, which later was to lead to controversy.

The new plans call for a concert hall seating 2,800; a minor hall for opera and ballet seating 1,500; a drama theater seating 700-750; a cinema seating 700-750; and a chamber-music hall for 450. The space under the major hall stage, which formerly was used for lift machinery, will be converted to a rehearsal and recording theater for the Sydney Symphony Orchestra, giving an over-all space of 300,000 cubic feet.

The lottery kept the government from worrying

The probable reason that Utzon's design proceeded as far as it did before the whistle was blown on mounting costs is the fact that the money is being raised by a public lottery. Also, the Prime Minister set up procedures that by-passed the usual channels for government construction at the beginning, giving Utzon an unusually privileged and protected position. Construction on the foundations was well under way when, in 1960, an act was finally passed establishing a budget, and making the Minister of Public Works responsible for the construction.

In the meantime, while construction on the foundations proceeded, and to all outward appearances the structure was well under way, the architect and engineer continued to struggle with the design of the shells, a task that ultimately took six years to complete. Since 1957, the Arup office has spent something like 380,000 man-hours and 2,000 hours of computer time on the design of the opera house. (For a detailed account, see RECORD, January 1966, pages 175-180).

After a tremendous effort, the engineers succeeded in rationalizing Utzon's free-form shapes into parabolic curves that left the original silhouette intact. Many other problems remained, however, and late in 1961 it was Utzon himself who provided the breakthrough, changing the form of the shells so that they all become parts of the surface of a sphere. The engineers bravely scrapped their calculations and started all over again.

Meanwhile, Prime Minister Cahill had died suddenly in office, and the Ministry of Public Works was trying to establish lines of communication with Utzon. Not surprisingly, there was considerable confusion over who was responsible for what, particularly in the area of the program for the building.

If the client had underestimated the construction difficulties, the architect seems to have overestimated the client's knowledge of what it wanted. The client for the programmatic aspects was in any case not the Ministry of Public Works, but the Opera House Executive Committee. This Committee, working in relative isolation from both the architect (who did not move from Denmark to Australia until 1962) and the Ministry, seems to have made a whole series of program decisions without thoroughly assessing their cost implication, and without systematically redefining the whole list of requirements.

Early in 1963, when the foundations were in place, and it was time to let the contract for placing the shells, it became evident that a certain amount of demolition of earlier foundation work would be necessary because of design and program changes. The final bill for the first stage had been settled by negotiation at a figure very nearly double the original contract, because of design changes and program modifications. The amount of stage two contract made it clear that the original budget figures were too low. The Ministry began to press for detailed drawings of stage three interiors, installations, and finishes as soon as possible, so that the final contract could be let on a lump sum basis, and a final budget figure published.

An ordinary architectural office might have been able to meet the Ministry's request, particularly as official action up to this point had been patient and understanding to an unusual degree. Utzon, however, believes fervently that the architectural designer must be involved in every detail of both design and construction.

In the meantime the Opera House was becoming a hot election issue. Its prominent site in Sydney harbor made every delay and construction change painfully obvious; the rising costs were front-page news. The opposition Liberal-Country party pointed to the Opera House as an example of ineptitude by a Labor government too long in power.

In May 1965, the Liberal-Country party won the election, and the new Ministry of Public Works was chosen. It is not clear whether Utzon realized the significance of the change at the Ministry from exasperated-but-friendly to exasperated-and-highly-skeptical. He had, however, begun to give full attention to the stage three design. The major problem of stage three was the main auditorium which was to be both a concert

hall and an opera house. Utzon had prepared a design for the acoustical shape of the ceiling, and he allowed the Minister to see a report from Arup's office stating that this particular version of the ceiling put too much weight on the structure. It was also all too clear that the working drawings for stage three were still far from complete. Utzon seems to have relied to a large extent on mock-ups and instructions for fabrication, and certainly for a building with so many curved surfaces, something other than a conventional set of drawings was in order. There never was, however, any complete documentation of the whole building, nor had Utzon kept a written record of all the numerous decisions by various agencies and committees that had taken place since 1957.

Utzon was therefore at a tremendous disadvantage in dealing with the bureaucracy. The protection he had enjoyed under Cahill had turned into complete vulnerability. The Ministry pressed Utzon harder and harder, and the architect, immersed in his work and probably not fully aware of the change in his position, made no conciliatory moves.

Finally, in February 1966, Utzon wrote the exasperated letter that was construed as a resignation (it is still not clear whether Utzon actually intended to resign)—and his departure was accepted with alacrity. The resulting sensational publicity has made the basic issues more obscure than ever. Certain

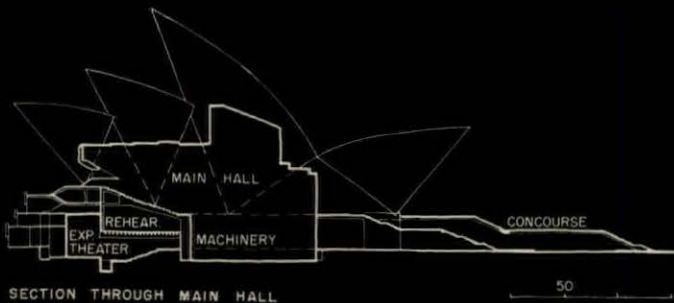
thought was given to stating clearly the intention or aim to be achieved and leaving the manner of their achievement to the competitors. The drawings submitted by the winner were simple to the point of being diagrammatic. Nevertheless, the assessors [judges] stated that they returned again and again to the study of these drawings, as representing the most original and creative submission." The opera house competition provided for the engagement of an additional architect if that should be considered necessary. However, it has been said that the late Eero Saarinen and Sir Leslie Martin, two of the judges, were satisfied that Utzon could do the work alone. It also has been said that Utzon suggested that the large firm of Ove Arup & Partners of London could be his "backing" to speak, since Utzon considered some of the most difficult technical problems to be structural.

The government set up two bodies to advise Utzon on requirements: The Sydney Opera House Trust, a group of 10 eminent persons, some of whom had had careers in organizations likely to be ultimate users of the building; and a technical advisory panel, made up principally of a number of architects and engineers. The Opera House Trust has another group responsible to and appointed by it, the Music and Drama Panel. Essentially, the Sydney Opera House Trust was to represent users' interests from a management standpoint, serving basically as a board of directors. Users were represented on the one hand by The Australian Broadcasting Commission managing the Sydney Symphony orchestra, and the Elizabethan Theatre Trust (formed in 1954 and headquartered in Melbourne) which was concerned with opera, drama, ballet, etc. The Elizabethan Theatre Trust formed an opera company in 1955, and the government last year presented a token figure of \$15,000 for the start of an opera company in Sydney.

The tale of the competition judging, perhaps apocryphal but inherently quite plausible, is that the competition jury had methodically narrowed the entries down to ten, when Eero Saarinen, who was one of the assessors but had only just arrived, pulled the Utzon scheme out of the reject pile and persuaded the rest of the jury that this was the one to choose. One can see exactly why Saarinen and the rest of the jury chose this design, but it is also easy to see why the assessors had initially put it aside. No such structure had ever been built before, and it was not possible to judge on the basis of the drawings whether the architect really knew how it might be constructed. The competition jury therefore had to premiate a design without knowing how it could be built—in fact with only an educated guess that it could be built at all.

It is questionable whether this point was ever clear to either the New South Wales government or the Australian public. It seemed to have been assumed that the design submitted by a professional architect and selected by a distinguished international jury would be fully worked out in every thing but detail. The realization never seems to have penetrated that the selection of an architect, and even a concept, was only a first step. Prime Minister Cahill was anxious to start construction at once, and apparently did not pay much attention when Utzon and Ove Arup, whom Utzon had chosen to be the engineer, told him that years of design development would be necessary.

At least the Prime Minister seems to have said: let's get the foundations in. The "practical" course of action, making a commitment to the Opera House on the ground before popular enthusiasm for the design had dissipated, was of course, a thoroughly impractical decision. But Cahill bent his political power to expediting the start of construction.



This section corresponds with the plan on the previous page. The government has now decided that the main hall will be for symphony concert only and not multi-purpose as originally called for and designed for by Utzon. Now there will be no stage house and no stage machinery. Instead the stage end will have a permanent orchestra shell.

points seem fairly well established, however. It is evident that the Minister of Public Works is perfectly willing to let the Opera House go on without Utzon. Secondly, the architectural profession in Australia was not able to give Utzon its undivided support, nor was it able to act as a mediator in the situation. Thirdly, Utzon himself did not behave in a clear-headed manner. He allowed his most vociferous supporters to make public demonstrations and statements that made any compromise more difficult, and he did not seem able to explain his own position persuasively.

The program needed better definition

In retrospect it can be seen that the Sydney Opera House was headed for trouble from the start. For example, the dedication program states that "... conditions [of the competition] were deliberately set out in the simplest form, leaving the competitor the widest scope ... New ideas are always on the brink of disqualification and in this competition, considerable



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Selecting interior finishes for college buildings

New York's State University Construction Fund has been working with the Building Materials Research Institute in developing a new set of performance criteria for interior finishes

Interior finishes is the subject of the test in a series of performance criteria being developed by the New York State University Construction Fund. [S.U.C.F. is the State's agency for coordinating and directing the construction of academic buildings and related facilities to meet the State University's master plan requirements.] Objectives of all these criteria are: 1) to provide an objective basis for planning, design and construction and for review and approval by the Fund of design submissions; 2) to provide a system of communication by which the architect can make its preferences known to building designers while still maintaining sufficient flexibility to utilize resources effectively; 3) to provide an environment which will permit and stimulate the development of design solutions, materials and products, and construction techniques, that respond to the functional and economic requirements of individual projects; and 4) to document and make available current significant results of research and experience in the building industry.

In the area of interior finishes, the Fund began its initial study by investigating a 10-year cross-section of acceptable building finish schedules for the State University of New York. This led first to a skeleton type of performance criteria; then to a master list of different spaces for the various University physical facilities; and finally to a method for classifying the various spaces into a workable system of criteria designation. The State's consultant on this project, Building Materials Research Institute, accomplished the latter by working out lists of design criteria and exposure criteria for spaces in nine basic classifications.

Included among the design criteria are acoustical requirements, esthetic considerations, and normal temperatures of the spaces. Exposure criteria include: probability of bacteriological or biological

attack, probability of chemical damage, probability of exposure to food, probability of physical damage, and probability of damage by water.

The acoustical, decorative and temperature criteria are coded as arbitrary numbers. These numbers denote a design condition, but not the physical properties of the finishes themselves. For example, the acoustical criteria simply designate whether or not sound absorptive materials are required, or attention to problems of noise transmission is indicated. Criteria covering the functional aspects of acoustics are handled separately. The same holds true for decorative criteria, which denote whether decor is unimportant or an important part of the space. These criteria thus merely act as flags to alert the architect to these parameters as well as those of exposure. The exposure criteria are rated on a continuous scale of one (least important) to 10 (most damaging type of exposure).

The interior finishes study conducted by B.M.R.I. includes test methods to permit interpretation of the criteria. While most of these basically are based on test methods extant, modifications are included; modifications were made, in fact, to almost every test method. The reason given was that, excepting the Taber Abraser and Weather-O-Meter tests, there are very few procedures which apply to a wide range of materials and finishes. For example, existing programs may spotlight better or poorer vinyl tiles, but no one test method or sequence now available is said to give a logical basis for appraising the relative suitability of slate, bare concrete, vinyl tile, and plastic-impregnated wood. With each test method listed are given: outline of test method; modification of this method; applicability; significance; and test results reporting procedure.

Criteria ratings have been assigned to various spaces (nine types are identified, see below) according to the severity of the exposure. Acceptable classes of materials have been listed.

As an example of how the criteria might work for a given space let us take

Series II-2 Spaces: faculty and student-oriented spaces with water, chemical, or other special exposures, in which the intensity is moderate to heavy and primarily bacteriological or biological. The acoustical design criterion would be A-3—ceiling treatment alone generally adequate. The decorative criterion D-3 indicates that the decor should be unobtrusive. The temperature criterion T-3 means that the temperature range will normally be between 50 F and 100 F. The bacteriological or biological criterion is B-10—infectious or harmful cultures frequently found. The chemical criterion is C-5—occasional exposure to chemicals of all sorts through spillage, etc. The food criterion is F-2—minimum quantity of food consumed in the area. The mechanical damage criterion (abrasion, indentation, soiling) is M-5—heavy use of generous space or moderate use of cramped spaces. The physical damage criterion is P-6—likelihood or repeated contact with light objects. The water criterion is W-10, the most severe condition (this rating is maximum here because of the complicating factor of water in relation to the bacteriological and chemical criteria.)

Spaces are assigned to a given series, not by the name of the space, but by the activities which will be carried on in the space and by the utilities supplied.

Space categories

Series I—Faculty and student oriented spaces, no water (offices, conference rooms, lecture halls, class rooms and laboratories with no water or utility connections except electricity).

Series II—Faculty and student oriented spaces with water, chemical or other special exposure (art rooms; bacteriological, biological, chemical, earth science, natural science, physics and other laboratories with associated offices and storage or preparation areas).

Series III—Gymnasiums and other physical education spaces (gymnasiums, multipurpose rooms designed for athletics as one of the "purposes," exercise rooms, training rooms and other spaces in which physical education activities or

sports take place, except for swimming pools).

Series IV—Heavy traffic spaces, primarily foot traffic (corridors, vestibules, foyers, museum and display areas, interior courts, shipping and receiving areas and staff access passageways).

Series V—Toilet rooms, shower rooms and janitor's closets (including deck areas around swimming pools, indoor pool rooms and other areas where

large quantities of water are used).

Series VI—All locker rooms except staff lounge-locker rooms.

Series VII—Spaces for storage, preparation and consumption of food (pantries, kitchens, cafeterias, dining rooms, snack bars and lounges with food spaces adjacent).

Series VIII—All storage areas except for food storage. Separate subdivisions are designated for dry storage of small

units (Series VIII-1), dry storage of large units or items (Series VIII-2), refrigerate storage areas for non-food items (Series VIII-3) and unsanitary storage of rubbish and garbage (Series VIII-4).

Series IX—All spaces not otherwise classified (workrooms, temporary storage areas, projection rooms used by staff or by faculty and students as well as a laboratory spaces with heavy floor loadings).

Performance criteria codes and ratings

DESIGN CRITERIA

Acoustical—A

- 1- No consideration necessary, space should be safe.
- 2- No special treatment ordinarily needed.
- 3- Ceiling treatment alone generally adequate.
- 4- Suppression of noise transmission (in and out) required.
- 5- Control of noise transmission (in and out) required.

Decorative—D

- 1- Need only consider preservation of surface.
- 2- Code not used.
- 3- The decor should be unobtrusive.
- 4- The decor is to be obviously attractive.
- 5- The decor is a dominant part of the architectural treatment of the space.

Temperature—T

Normal temperature in space is:

- 1- below 0 F
- 2- between 0 F and 50 F
- 3- between 50 F and 100 F
- 4- between 100 F and 150 F
- 5- over 150 F

EXPOSURE CRITERIA

Probability of bacteriological or biological attack:

This factor rates the likelihood of exposure and toxicity to man of the organisms. A rating of B-5 or higher increases the "W" rating by four points.

- B-1 The space is occupied only by healthy humans and there is no likelihood of any appreciable accumulation of organisms.
- B-2 *
- B-3 Healthy, warm-blooded animals, birds, or fish are housed.
- B-4 Hospital sleeping spaces.
- B-5 Non-harmful cultures are grown or inspected in space.
- B-6 *
- B-7 Infected humans or animals contact the floors or walls.
- B-8 *
- B-9 *
- B-10 Pathology involved; infectious or harmful cultures found frequently within the space.

Probability of Chemical Damage

This factor measures the likelihood of exposure to various chemicals by frequency and the corrosiveness of the chemicals. Unless self-evident, the notes should indicate the classes of chemicals anticipated when ratings of C-5 or higher are given. A rating of C-7 or higher increases the "W" rating by two points.

- C-1 No chemicals other than ordinary house-

keeping chemicals are normally kept or used in the area.

- C-2 Small quantities of food may be in the area.
- C-3 Large quantities of very mild chemicals (such as in foods being processed) or chemicals in closed strong storage containers.
- C-4 *
- C-5 Occasional exposure to chemicals of all sorts through spillage, etc.
- C-6 *
- C-7 Frequent exposure to chemicals with some fumes.
- C-8 *
- C-9 Constant exposure to chemicals by splash, spill, etc.
- C-10 Chemical dispensing, bulk chemicals

Probability of Exposure to Food

This factor measures the likelihood of food or food products being present in an area. Since sanitation laws in some areas, and common sense elsewhere, dictate tighter housekeeping standards where food is prepared, handled, or stored, two points are added to the "W" rating for "F" ratings of 3 to 5 and four points when ratings exceed F-6.

- F-1 No food found normally in the area.
- F-2 Minimum quantity of food consumed in area (usually as light lunches, etc.).
- F-3 Sugary liquid spillage somewhat common. (As near vending and soft drink machines).
- F-4 Eating areas, public side of cafeteria counters, dining rooms.
- F-5 *
- F-6 Food storage and preparation areas, including dry vegetable storage, cold storage, and staff side of cafeteria serving lines. Excludes areas devoted to processing and storage of milk products.
- F-7 *
- F-8 Unrefrigerated garbage storage spaces.
- F-9 *
- F-10 Storage and preparation areas primarily for milk and milk products.

Probability of Mechanical Damage

This factor measures the likelihood of exposure to the normal wear and tear factors of abrasion, indentation of floors, presence of normal office and household type soils on surfaces, finger-markings, and dust and tobacco stains on ceilings.

- M-1 Roomy, lightly occupied spaces (usually executive type).
- M-2 Spaces frequented by few people for relatively short periods.
- M-3 Spaces given moderate usage by few people or heavy usage by many people on an infrequent schedule.
- M-4 *
- M-5 Heavy use of generous space or moderate use of cramped spaces.
- M-6 *

- M-7 Heavy use of crowded spaces.

M-8 *

M-9 *

- M-10 Constant use of a confined space or definite traffic patterning or an area of limited use.

Probability of Physical Damage

This factor measures primarily the impact component of the damaging forces found within an area. The damage can be from dropped, thrown, swung, or sliding objects.

- P-1 Little likelihood of impact.
 - P-2 Most damage likely from infrequent moving of furniture during cleaning or rearrangement.
 - P-3 Much moving of light, well-padded objects such as balls, etc.
 - P-4 Chance for human body impact on wall or floor is high.
 - P-5 *
 - P-6 Likelihood of repeated contact with light objects such as balls, etc.
 - P-7 *
 - P-8 Constant exposure to uncushioned moving objects, not usually sharp cornered.
 - P-9 *
 - P-10 Constant exposure to sharp-cornered objects.
- Note: Ceilings are P-2 rating in all spaces up to P-6 over-all.

Probability of Damage by Water

This factor measures the likelihood of exposure to water, steam, vapor, or ice. The moisture can occur as droplets from spills or spray, as condensation, or as high humidities. As explained above, the "W" ratings are increased wherever there are bacteriological, chemical or food factors above certain levels. These added points yield the "Wcorr" value. The added points are cumulative and meant to adjust the "W" rating for the extra water or steam used in housekeeping in such areas.

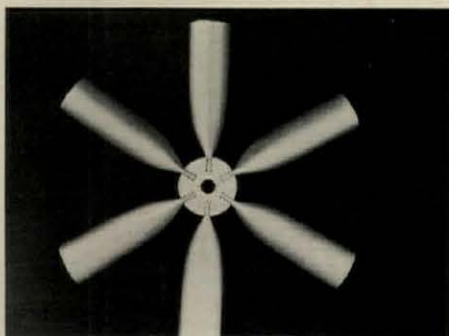
- W-1 No water present, except in drinking carafes.
 - W-2 Water used only in housekeeping (primarily floor care).
 - W-3 There are sinks with faucets in the area.
 - W-4 Small amounts of vapor can be present in the air.
 - W-5 Condensation may be present on wall and ceiling.
 - W-6 There is likelihood of occasional splashes.
 - W-7 Frequent spills occur.
 - W-8 Some pools of water may occur.
 - W-9 There is likely to be considerable standing water.
 - W-10 Running water or water under pressure contact walls, floors or ceilings.
- Note: Assumption of one rating is a automatic assumption that all lesser conditions also prevail.

* Left blank for insertion of future possible criteria

For more information circle selected item numbers on Reader Service Inquiry Cards, pages 301-302



STRUCTURAL SYSTEM / The *Triodetic* structural system consists of aluminum or steel tubing with ends that fit into a connector hub. The hub (picture), also made of aluminum or steel, joins almost any number of tubes of different lengths. The tubes radiate from the hub at various angles forming geometric structural patterns. The *Triodetic* space frame spans itself without additional support, covering broad expanses in such applications as arenas, auditoriums, theaters, museums, churches, gymnasiums, restaurants, shopping centers, stadiums



and industrial buildings. One mobile exhibit is 76½ ft in diameter, weighs about 1½ tons, and—reports the manufacturer—can be erected in 10 hours. When dismantled the exhibit and all internal furnishings can be packed into light 800-cu-ft containers. In assembling the structure there is no welding, bolting or riveting; the tubes are inserted into grooved slots of the hub. Estimated in-place cost is \$3 to \$4 per sq ft for a building of about 20,000 sq ft. ■ Butler Mfg. Co., Kansas City, Mo.

Circle 300 on inquiry card



STEEL PLATES / Steel plate was used for a 16-sided, folded, star-shaped roof, 76 ft in diameter, over a circular lounge at the Masonic and Eastern Star Home in Greensboro, N.C. Approximately 13 tons of ASTM-A36 steel plate was used in the roof. Sixteen symmetrical plates of 1/2-in. carbon steel form sides of the roof. The 4-ft-dia compression ring was made from plate ½ in. thick, and the five-sided welded columns from 1/2-in. plate. The roof plates were field bolted and welded, and the roof was bolted to the compression ring and columns. ■ Bethlehem Steel Corporation, Bethlehem, Pa.

Circle 303 on inquiry card



OUTDOOR-INDOOR CARPET / *Sun & Shade* made of 100 per cent *Herculon polypropylene olefin fiber* in 12 color combinations and several smooth or embossed styles may be used for such applications as patios and porches, dens and living rooms, or, commercially, supermarkets and schools. Cleaning consists of vacuuming inside or hosing outside. The fiber resists fading, stains, rot, mildew, fungi and moth damage. And it is non-allergenic. ■ Orcco Industries, Inc., Los Angeles.

Circle 304 on inquiry card

TITANALLOY / This titanium-copper-zinc alloy is reported to be light in weight, strong and dent-resistant, with good corrosion and creep resistance, and favorable thermal expansion. It is recommended for mansard-type roofs, batten and standing-seam roofs, fascia, valley, flashing, and expansion joints. It does not require a protective coating, but can be readily painted. Material can be used with curving roof forms. ■ Moncrief-Lenoir Mfg. Co., Houston, Tex.

Circle 301 on inquiry card

CARPET GUARANTEE PROGRAM / A three-year *A.C.E. nylon* surface-wear guarantee for commercial carpets sets a standard for measuring carpet quality. The guarantee will cover surface wear to the extent of loss of more than 10 per cent (per sq yd) of pile fiber. The guarantee does not cover tears, burns, pulls, cuts, or damage due to improper cleaning agents or methods. ■ Allied Chemical Corp., Fibers Division, New York, N.Y.

Circle 302 on inquiry card



SYNTHETIC TURF / *Perma-Turf*, or vinyl grass, is a blended polymer compound reported to be resilient and durable. It resists spike or cleat damage, abrasion and most chemicals, and withstands all outside elements. It is recommended for both outdoor and indoor installation and may be swept, vacuumed or hosed clean. The strips (in continuous lengths of 36-, 48-, and 54-in. widths) need not be cemented to the ground. ■ American Biltrite Rubber Co., Inc., Boston.

Circle 305 on inquiry card

more products on page 210

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 301-302

AIR CONDITIONING / The 11th edition of a directory listing products which are licensed to use the A.M.C.A. Certified Ratings Seal includes 749 products of 60 manufacturers. The 34-page directory rates the products for performance in tests conforming to the Association's Certified Ratings Program. ■ Air Moving and Conditioning Association, Inc., Park Ridge, Ill.

Circle 400 on inquiry card

LIBRARY FURNITURE / A catalog illustrates and details the *Metwood Group I*, a complete all-walnut line. Each major piece is shown in a full-page photo. The pages, in loose-leaf form, are bound in a laminated cover. ■ Standard Furniture Company, Herkimer, N.Y.

Circle 401 on inquiry card

METAL ROOFING / A 4-page brochure describes prefabricated metal batten and Bermuda roofing systems. Specifications and detail drawings are given for both types. Illustrations show a broad range of designs. ■ Overly Manufacturing Co., Greensburg, Pa.*

Circle 402 on inquiry card

WATERPROOFING SYSTEM / An information brochure describes *Thio-Deck Membrane*, a membrane waterproofing system based on a one-coat, seamless adhesive sealant. ■ Toch Bros., Inc., Paterson, N.J.*

Circle 403 on inquiry card

FACING PANELS / An 8-page color brochure illustrates the six basic *Plexiglas* panel designs, and a booklet describes the three basic installation systems. The brochure reports that *Plexiglas* panels are lightweight and resistant to breakage and weather. ■ Rohm and Haas Company, Philadelphia.*

Circle 404 on inquiry card

STEEL PARTITIONERS / A 16-page color catalog details free-standing steel units. The catalog shows and tells how partitioners solve problems of changing space requirements in commercial and institutional buildings. ■ Rockaway Metal Products Corp., Inwood, L.I., N.Y.

Circle 405 on inquiry card

VINYL WALLCOVERINGS / Pre-prints of an 8-page color file contain 16 patterns in a wide range of colors. Included is information on the custom-printed hand-prints. ■ L. E. Carpenter & Company, Inc., New York, N.Y.*

Circle 406 on inquiry card

SOFTWOOD PLYWOOD / Buying and specifying for construction and industrial applications is simplified by a booklet based on the new Product Standard, PS 1-66. ■ American Plywood Association, Tacoma, Washington.*

Circle 407 on inquiry card

ROOF DECK / A 12-page booklet contains data, ideas, specifications and diagrams for *All-weather Crete Roof Deck Insulation*. This seamless roof deck contains no water and is applied hot and dry even in freezing weather. It can be compacted to cover protrusions and deck irregularities providing a smooth surface for roofing. ■ Silbrico Corporation, Hodgkins, Ill.*

Circle 408 on inquiry card

FILING SYSTEMS / A 16-page catalog offers thirty-one filing systems for vertical, roll and lateral filing. ■ Plan Hold Corporation, Torrance, Calif.

Circle 409 on inquiry card

DOORS, GRILLES, SHUTTERS / A catalog features units in steel, aluminum, stainless and bronze. Items include the *Flat-slat* rolling door with *Weatherguide*, a motor operated fire door, rolling grilles permitting great visibility, and vinyl-clad sliding grilles. ■ Cornell Iron Works, Wilkes-Barre, Pa.

Circle 410 on inquiry card

FLASHING / A 4-page bulletin describes elastomeric flashing and contains complete guide specifications. ■ The Glidden Company, Wilmington, Del.*

Circle 411 on inquiry card

WASHROOM-HOSPITAL EQUIPMENT / A 24-page catalog illustrates and describes more than 300 recessed and surface-mounted accessories. ■ The Bobrick Corporation, Brooklyn, N.Y.*

Circle 412 on inquiry card

STEEL JOISTS / "Standard Specifications and Load Tables for Longspan Steel Joist and Open Web Steel Joists" is a 52-page book that presents two standard specifications with accompanying load tables covering the design, manufacture and use of four series of joists. ■ American Institute of Steel Construction, New York, N.Y.

Circle 413 on inquiry card

CHAIN LINK FENCE / A comprehensive file of specification sheets, detailed engineering drawings, testing-laboratory and A.S.T.M. reports, reference lists and sample proposals show how to design with and draw up specifications for aluminum chain-link fence installations. Wire Products Group, American Chain & Cable Co., Monessen, Pa.

Circle 414 on inquiry card

PAINTED ALUMINUM / A new edition *Color and Quality Standards for Painted Aluminum Sheet* contains samples of colors adopted for factory-painted aluminum sheet and gives the minimum quality standards. A table gives recommended minimum radii for varying thicknesses of painted sheet. ■ The Aluminum Association, New York, N.Y.

Circle 415 on inquiry card

HEATING, VENTILATING / Three guides help pre-select harmonious colors and surfaces for heating and ventilating products. ■ Modine Manufacturing Company, Racine, Wisc.

Circle 416 on inquiry card

PARKING DECKS / A 6-page design guide explains post-tensioned monolithic concrete construction methods for multilevel parking decks. ■ Prestressing Industries, San Antonio, Tex.

Circle 417 on inquiry card

LUMINOUS CEILINGS / A 16-page brochure presents a cross-section of systems and a variety of completely integrated environmental control ceiling systems. ■ Luminous Ceilings Inc., Chicago.*

Circle 418 on inquiry card

*Additional product information in Sweet's Architectural File
more literature on page



New angle from G.E.

Semi-recessed fountain or cooler.

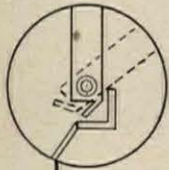
Or fountain first and cooler later: refrigeration package is available separately. Choose either 8 or 12 gph cooler model (or the fountain). Logical—and good-looking design from the thoughtful engineers at General Electric.

For more information, see the Yellow Pages. Or write: G. E. Co., Dept. 761-37, 14th and Arnold Streets, Chicago Heights, Illinois 60411.

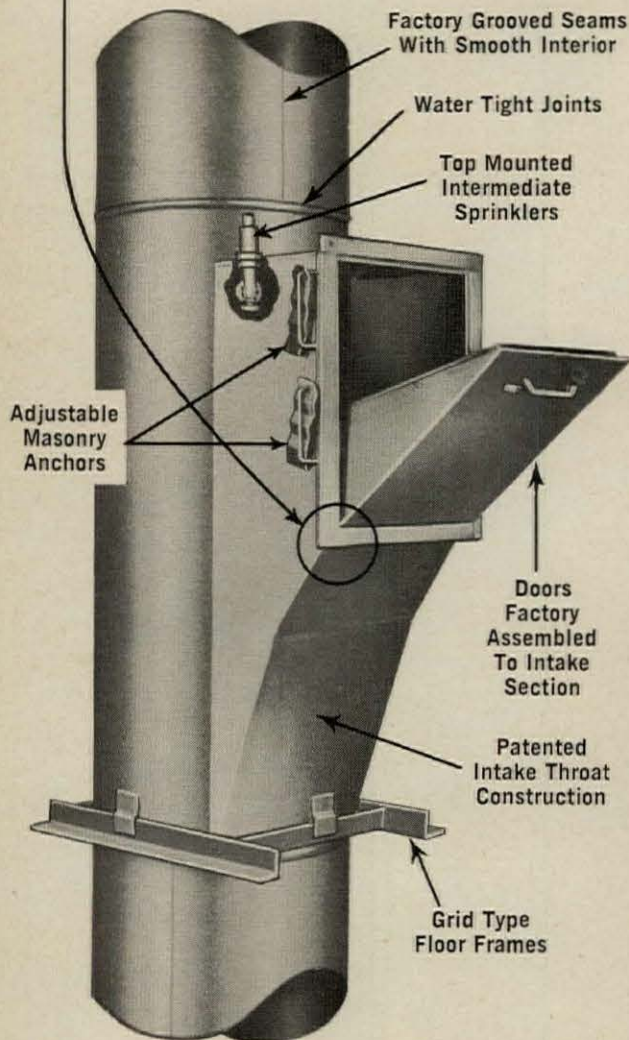
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200,000 TEST CYCLES

That's how often we checked out the new nylon door pivot bushings now being installed in Wilkinson Chutes. Unlike their predecessors, these bushings do not corrode, never require lubrication . . . and wear longer.



Whether it is a small bushing, major part or assembly detail; such thoroughness is typical at Wilkinson Chutes. It is this extra care that makes Wilkinson Chutes the most dependable you can specify.



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WILKINSON CHUTES (Canada) LTD.

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For more data, circle 92 on inquiry card

DOCKBOARDS ARE AS DIFFERENT AS NIGHT and DAY



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It's vital that your clients have all the permanent adjustable dockboard features needed to run a safe, efficient loading dock operation. All materials and products must go across the loading dock. It must be adequate.

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DELTA
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The absolute finest . . .



DELTA FAUCET COMPANY GREENSBURG, IND. Div. MASCO Corp.

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For more data, circle 93 on inquiry

Zinc Prevents "Undercover" Corrosion



To Give This Building A Beautiful Future

The Federal Government insured the beauty of Washington's new Department of Housing and Urban Development building by specifying that all reinforcing steel less than 2 inches from the surface be hot dip galvanized. □ This will protect the striking concrete and cast stone exterior against ugly stains and discoloration caused by rust bleeding through to the surface. The zinc galvanized reinforcing rod also eliminates any danger of cracking or spalling caused by the pressure of expanding rust. And the zinc coating on the rods actually provides a better

bond with the concrete than is possible with uncoated steel. □ The inset photo shows the hot dip galvanized steel reinforcing rod extending from precast concrete wall panels. A total of 1,584 of these precast panels will be used in the building which is scheduled for occupancy late in 1967. □ When you specify materials remember that no other metal gives you the proven combination of strength, corrosion resistance and economy found in galvanized steel.

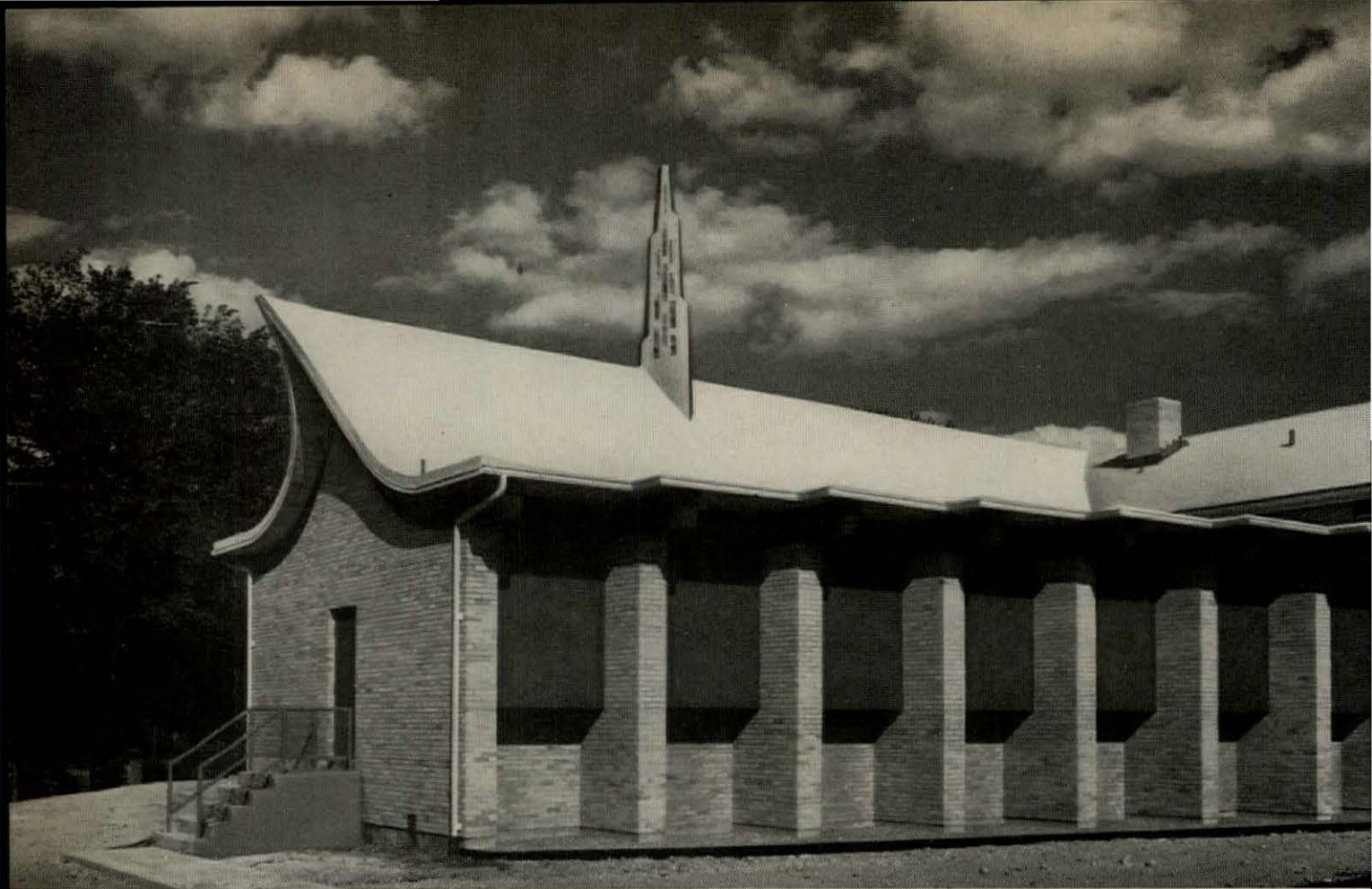
ST. JOE

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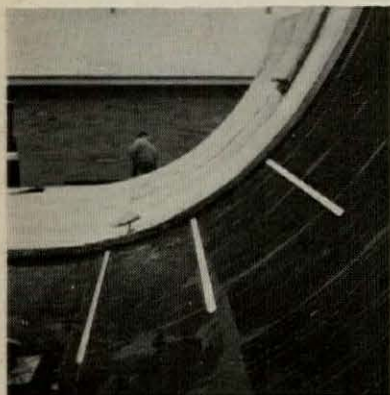
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St. Joe is a Major Supplier of Zinc to the Galvanizing Industry

ZN-300



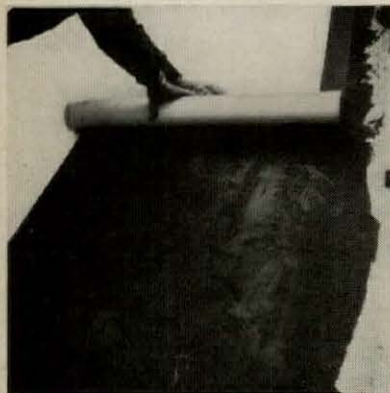
**For roofs of unexcelled beauty and durability...
specify Ruberoid T/NA 200® roofing (with Du Pont TEDLAR*)**



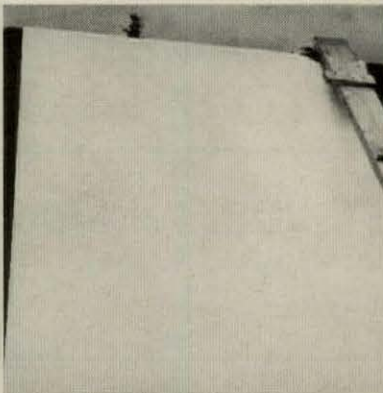
1. On any contour, any slope.



2. Easy, quick to apply.



3. Cements directly to underlayment.



4. Forms a smooth, clean attractive surface.

The bold sweeping curves of this roof for the New Chapel for the Sisters of Mercy of Notre Dame High School in Elmira, New York illustrate the remarkable effects that can be achieved with a roof of Ruberoid T/NA 200.

As functional and maintenance-free as it is attractive, this gleaming white pre-finished roof membrane will stay weathertight and beautiful for years and years. It's the ideal roofing material for roofs of unusual contour, on any slope.

The roof was fabricated by Hall Roofing & Sheet Metal Co., Inc., of Elmira and the T/NA 200 membrane was applied on the site. The smaller photos show some details of the construction.

Haskell & Connor, were the architects and Welliver Construction Co., Inc., both of Elmira, were the General Contractors.

Write today for full information on this unusual roofing material. Also available in pastel grey or green.

*DuPont's registered trademark.

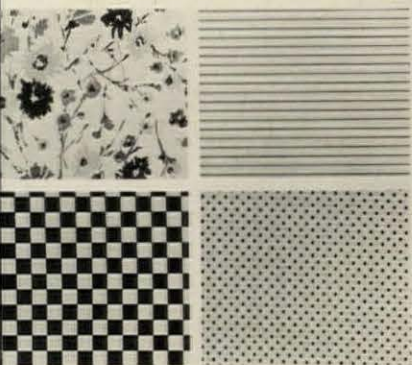
RUBEROID®

The RUBEROID Co. TECHNICAL SALES & FIELD ENGINEERING DEPT.
Dept. RA-57, 733 Third Avenue, New York, N. Y. 10017

continued from page 240

INSULATION BOARDS / Boards for commercial and industrial use have a core of fire-retardant, rigid urethane foam bonded in sandwich form to a variety of facings. With the core (said to have the lowest heat transfer rate of all materials) and facings working together, the manufacturer reports the system to be one of the most efficient and versatile systems available. Six products are available: a rigid insulation board, two low temperature insulation boards, one with aluminum foil facings and the other with kraft resistant foil facings; a plasterboard substitute that acts as an insulator as well as a base for plaster or dry walls; a white plastic-coated wallboard for interiors of agricultural buildings and small industrial plants; and a product for perimeter and cavity wall insulation. The board is produced in 1/4 in. to 2 in. thicknesses. Panels from 2 by 4 ft to 4 by 8 ft are available. In roofing applications, the insulation weighs about 1/10 that of conventional fiberboard roofing. ■ Atlas Chemical Industries, Inc., Wilmington, Del.

Circle 318 on inquiry card



FLOORCOVERING / A collection of 32 textures, prints and designs, includes checkboards, polka dots, pin stripes and stripes on patent "wet look" vinyl as well as silks, moires, broadtail, linens, antique greens, travertines, burlaps and other popular textures. ■ Adams Vinyls Inc., Parsippany, N.J.

Circle 319 on inquiry card

SHEDDING / Crescent-Sawn redwood siding, siding or fencing with circular wavy-texturing is designed for both clear and pigmented finishes or natural weathering. Among patterns are board-and-batten, channel rustic and V-joint in clear heart, construction heart and other grades in either vertical or flat grain. ■ Oregon-Pacific, Portland, Ore.

Circle 320 on inquiry card

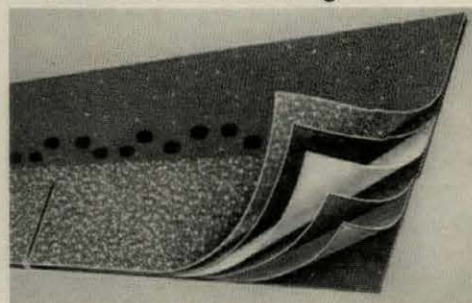
more products on page 274

...tough roofing from RUBEROID®



and

fire-resistant shingles



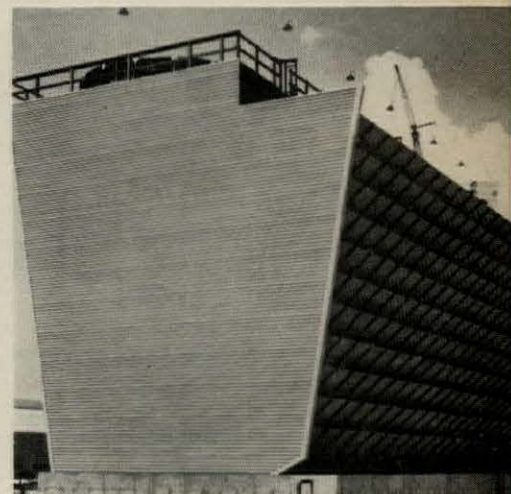
Ruberoid FIRE-GUARD 325-lb. residential shingles feature a built-in, special fiberglass blanket, in addition to other flame-resistant layers. U.L. puts these self-sealing shingles in top Class A rating for fire and wind resistance. Good looks too, in 7 modern colors!

wear-resistant flooring



Ruberoid offers the most widely varied line of vinyl asbestos floor tile. Pattern shown above is ROYAL STONEGLOW® which combines the looks of stone with the practicality of vinyl asbestos. There are dozens of other exciting patterns to choose from.

corrosion-resistant siding



Ruberoid Corrugated Asbestos Sheets are an economical, weather-proof and fire-proof construction material for industrial buildings. This combination of cement and asbestos gives maintenance-free service indefinitely! Resistant to corrosive atmospheres. Easy to assemble without sheathing.

When you have a tough, challenging building problem, call in Ruberoid. We specialize in imaginative answers to every-day and brand-new questions for every type of building. We make dozens of accepted, proven products—backed by almost 80 years of experience!

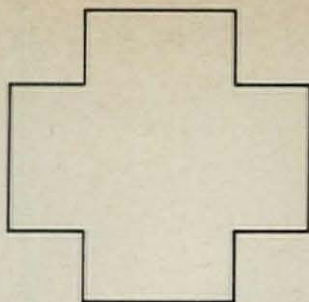
RUBEROID®

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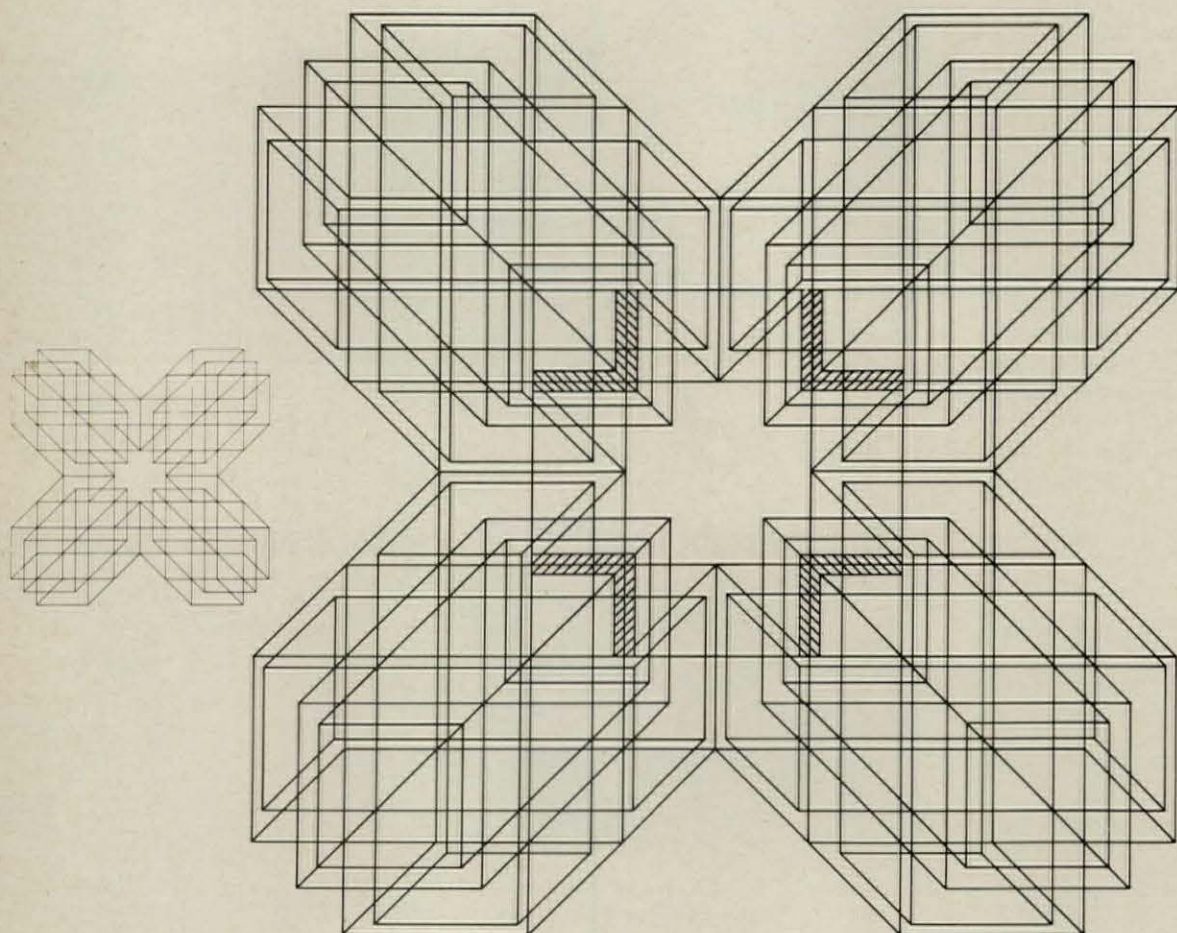
For more data, circle 121 on inquiry card

The formal generators
of masonry structure:

The cruciform



no. 4 of 36

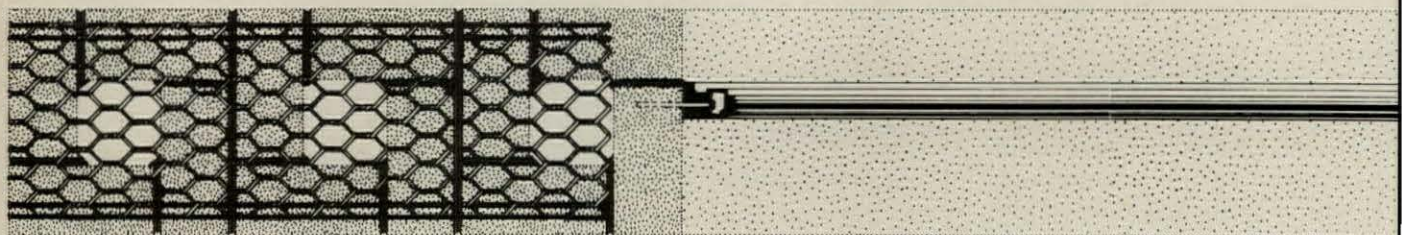


Architect Stanley Tigerman continues his exploration of masonry structures with the cruciform. Projected three dimensionally, it then proceeds from parti to floor plan to complete structure.

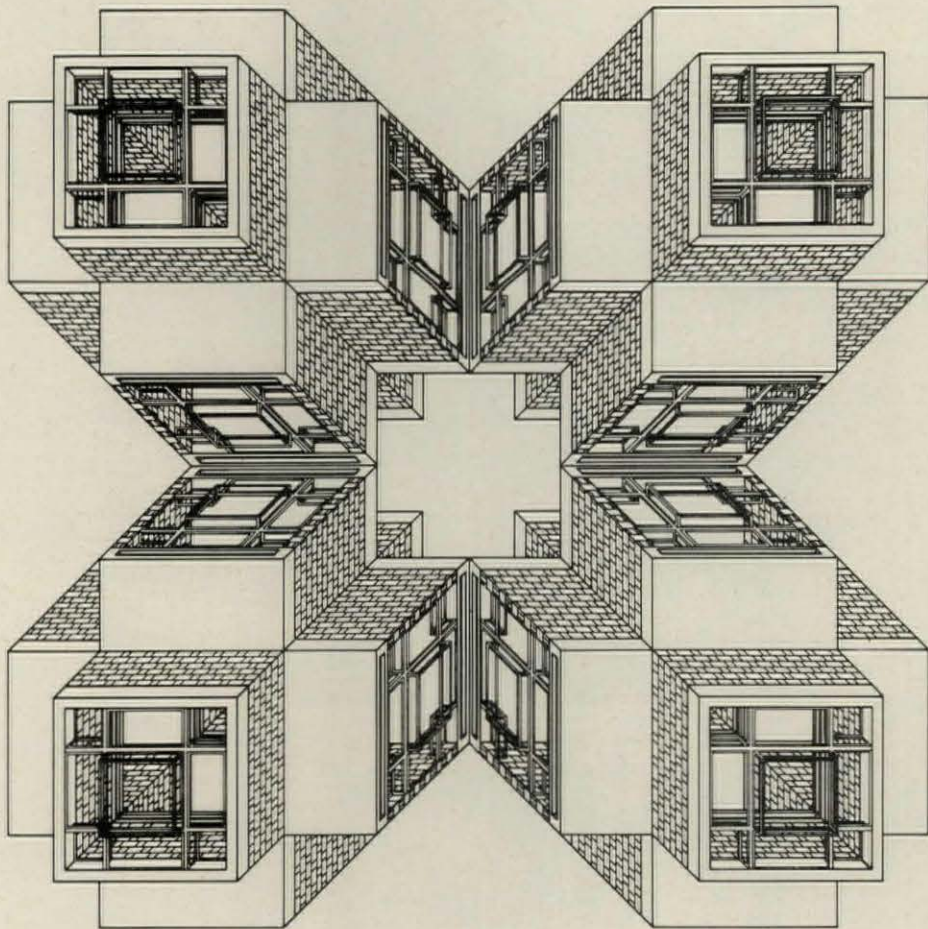
Throughout this series, we shall continue to show how the basic orthogonal shapes of masonry construction—

the square, lozenge, rectangle, pinwheel, cross and linked figure—can be developed and projected. We hope the drawings offered here will not only be of interest to you but also prove helpful by serving as both idea stimulators and time-savers.

Our motives, however, are more concerned with products



Jamb sections: 12" brick masonry wall,
Flemish bond with operative steel sash.



STANLEY TIGERMAN, ARCHITECT

We have two products, roll-type and rod-type Keywall® masonry reinforcement, which can help you improve the usage and quality of masonry construction. We want you to use them, so we make it easy by including them in the details shown below.

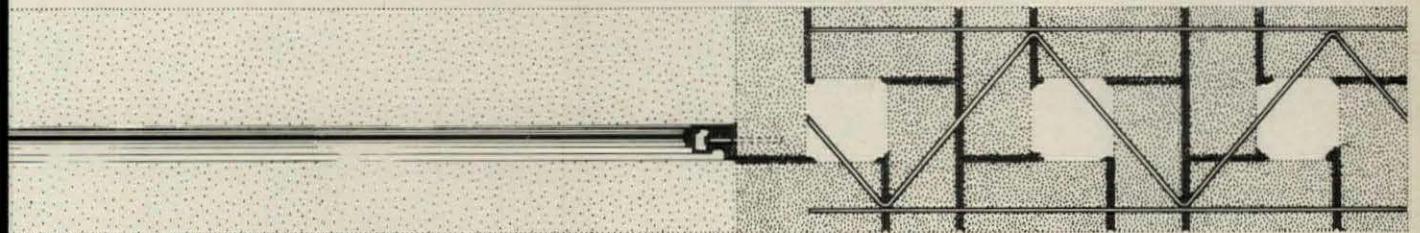
This structure—with the details drawn to 3"=1'0" for

easy tracing—are reproduced on convenient 8½" x 11" sheets. To receive these and the entire series, write:

Dept. AR-57

KEYSTONE STEEL & WIRE COMPANY

Peoria, Illinois 61607



For more data, circle 122 on inquiry card

Endowed by Nature.



The better homes in every neighborhood have WOOD WINDOWS

The Caradco C-100' Double-Hung Window starts right off with material advantages. First, it has the unbeatable thermal and esthetic characteristics of wood (treated with a water-repellent preservative to insure maximum service). Vinyl adds value, with a premium grade extruded vinyl glazing gasket for insulating glass that far out-classes glazing compounds—it's maintenance-free, leak-proof and vir-

tually invulnerable. Weatherstrip and jamb liners are of stainless steel; its proved durability keeps C-100' windows operating like new long after they're old.

For lasting satisfaction, let Caradco C-100' Window Units fill the bill in your next residential or commercial building. A detailed, descriptive brochure will be sent promptly upon request.

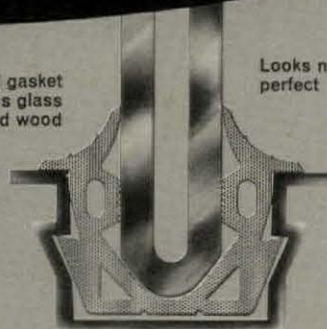


Caradco C-100'
Stainless Steel
Jamb Liners . . .



- Last a lifetime • Stay strong and springy for simple sash removal • Provide automatic give-and-take adjustment to weather changes • Are rust-proof, bind-proof and damage resistant.

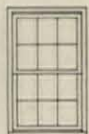
Vinyl gasket
grips glass
and wood



Looks neat,
perfect

No putty
repairing;
no painting
pains

Caradco vinyl glazing ends leakage problems . . . permanently.



Double-Hung
Windows



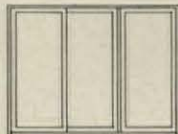
Casement
Windows



Awning
Windows



Slider Windows



Patio Doors

From the manufacturers of
creative building products
CARADCO, INC.
Dubuque, Iowa

Caradco Eastern, Inc. • Pemberton, New Jersey

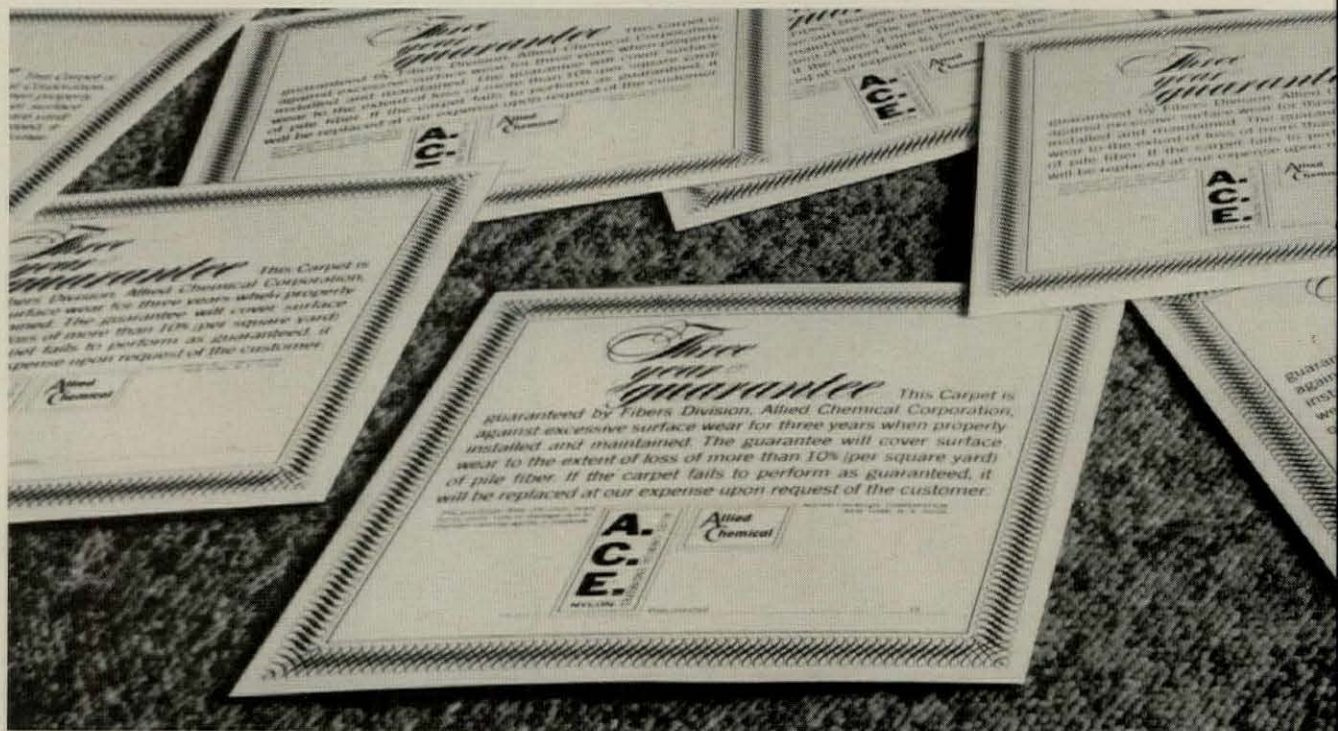
Caradco Windows and Patio Door products are further detailed in Sweets $\frac{19c}{Ca}$ and Canadian file $\frac{8wmw}{Car}$

For more data, circle 123 on inquiry card

Since 9:30 A.M., March 27, 1967 you've been covered.

Allied Chemical is the only fiber producer to give a Three-Year Guarantee for commercial carpets.

Now everyone in the business—mill, distributor, specifier, even customer—can hand over to us, Allied Chemical, total responsibility for A.C.E.™ surface wear! Already there are more than 40 A.C.E.-labelled qualities in the market that have met the rigid performance standards required for this new selling concept.



This is why Allied Chemical is the first and only fiber producer to cover you.

1. Because we're nylon, proved to wear better than acrylic, wool, polypropylene, or anything else!

We have the unique cross-section nylon fiber specially engineered to resist soiling, to stand up to all kinds of traffic with the kind of surface resilience and all-around durability that beats anything else going in the market.

2. A.C.E. has proof! From thousands of installations of every kind (restaurants, hotels, motels, schools, locker rooms, ladies' rooms) ... hundreds of thousands of yards that have taken traffic and come out looking terrific.

That's why we can guarantee A.C.E. for you!

3. From here on in, A.C.E. covers you, the specifier (you're off the hook with your client), you the distributor (you get the biggest added selling advantage in sales history because we stand solidly behind every A.C.E. sale), and the customer (who takes any problem on surface wear he might have with A.C.E. directly to Allied Chemical). Our 3-year guarantee insures immediate replacement!

4. A.C.E. has the label that requires rigid standards. Just a few of these 11 quality-performance proofs are pile density, proper backing, pile height, color fastness. You have to be good to be with it!

Starting now,

send this coupon for more information on the biggest change in commercial carpet selling —the Allied Chemical A.C.E. 3-year guarantee!

Call (212) HA 2-7300. Ask for Ext. ACE. Or fill out this coupon and send to: Allied Chemical Corporation, Fibers Division, No. 1 Times Square, Dept. S, New York, New York 10036.

Name _____

Firm _____ Position _____

Address _____

City _____ State _____ Zip _____

- Please send literature on the A.C.E. program.
- Please send information on mills carrying A.C.E. carpets.
- Please have a representative call on me.



For more data, circle 124 on inquiry card



SIGNAL

TELEPHONE

POWER

243
7A

CEL-WAY

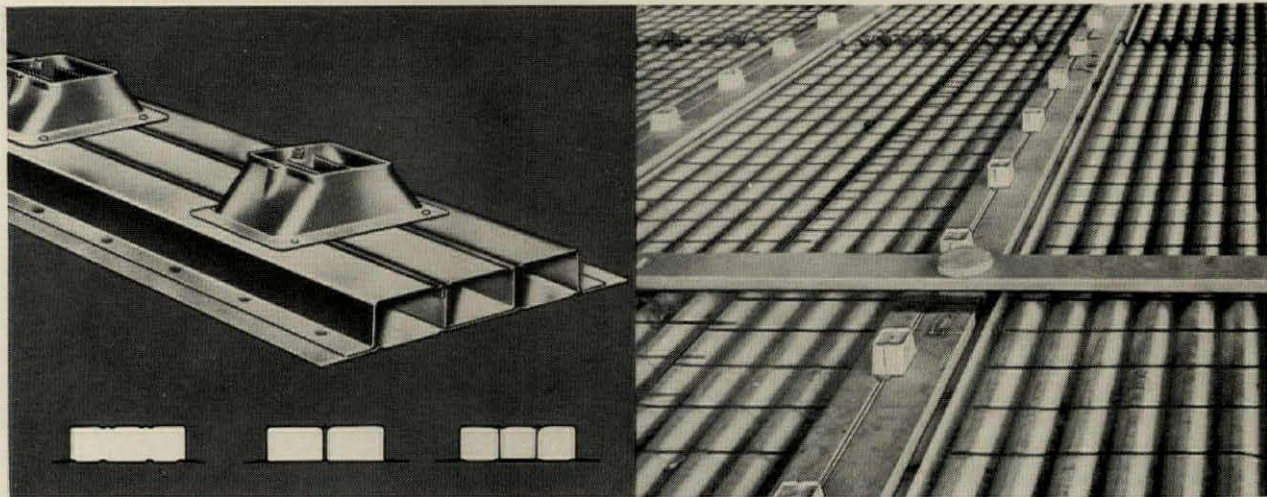
Puts Telephone, Electric and Signal Service Anywhere You Want it... *in One Fitting*

Instant success. It's Cel-Way, the in-floor electrification system that makes a success of any building. Cel-Way puts telephone service, electric outlets, even special signal service anywhere you want it today ... or anywhere it might be needed in the future.

New, architectural style fittings eliminate floor clutter. They provide outlets for either telephone or electric or signal service—or all three—in a single fitting. Even accommodate up to 5 telephone amphenol jacks in a single fitting. Twelve types available for a variety of service requirements.

Cel-Way is the practical, economical way to electrify floor slabs—a method that's compatible with all types of construction: slabs 2½" thick and up, for slabs on grade or concrete or steel frame construction.

Get complete information. See Sweet's File 1J/GR or write for Cel-Way product manual. Granco Steel Products Company, 6506 North Broadway, St. Louis, Mo. 63147. A subsidiary of Granite City Steel Co.



Factory-installed single, double or triple inserts can be spaced at any centering along cells to provide access to single, double or triple cells. Service fittings can then be installed at any desired location. Openings in inserts are designed to facilitate pulling large cables.

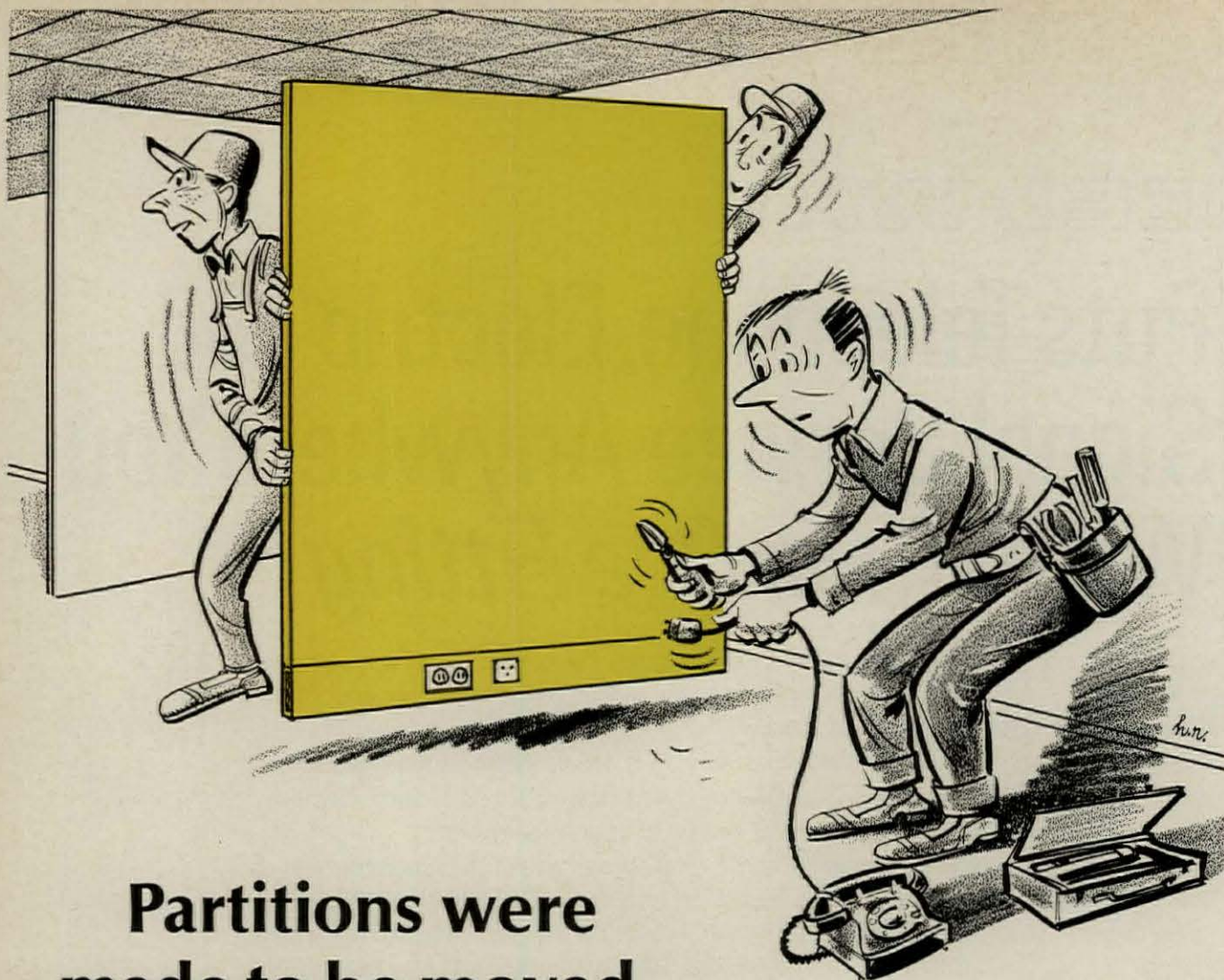
Cells and pre-set insert spacing can be designed to fit any building module, thus assuring widest flexibility of desk or equipment placement. Pre-set inserts eliminate noise, mess, and expense of core drilling through slabs for later relocation. Unique cell transitions provide practical way to get header ducts into thin slabs.



IMAGINATION IN STEEL

For more data, circle 125 on inquiry card





Partitions were made to be moved

And you can bet that your client will take advantage of that fact during the life of his building. That's why the wiring system you recommend is so important.

Take in-partition wiring for example. Each time a move is necessary, electricians and telephone men have a double task. One trip to remove or deactivate power and telephone cables; another trip to rewire after the new partitions are installed. Precious time and money go down the drain and you never get away from unsightly termination boxes hung on the partitions.

The real answer to effective wiring in a modern building is a PYRAMIDAL FEED* underfloor raceway system. It can carry heavy loads of power and communication cable to any location in the floor. And the Pyramidal Feed system allows you to plan the most beautiful floors, tiled or carpeted. Square D junction boxes and service fittings were designed with this in mind.

The Pyramidal Feed system saves money, both in the original installation and in countless changes in the building, while still offering unparalleled versatility. Find out more about it. Write Square D Company, Dept. SA, Lexington, Kentucky 40505.

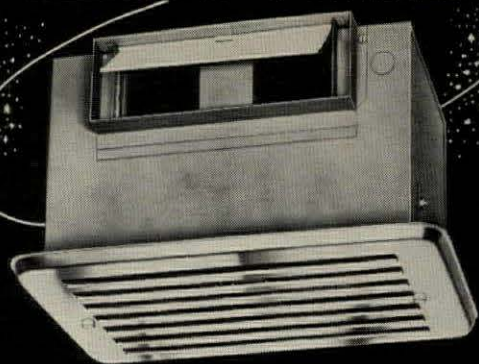
*Trademark of Square D Company



SQUARE D COMPANY

Wherever Electricity is Distributed and Controlled

QUIET AS OUTER SPACE
COOK
GEMINI TWINS



**FOR CEILING, SOFFIT or CABINET
 COOK GEMINI I & II TWIN BLOWERS**

Ample air delivery to meet your most difficult small blower needs. Gemini I delivers 225 cfm, Gemini II, 375 cfm. Twin blower wheels force air quietly through long ducts. Discharge may be horizontal or vertical through 3 1/4" x 10" duct. Washable aluminum filter optional. Anodized aluminum grille. Integral damper. Both sizes carry AMCA ratings and are UL listed. Designed for long life and noiseless operation. Write for the Gemini Twins Bulletin.

LOREN COOK COMPANY
 640 N. Rocky River Drive
 Berea, Ohio 44017

For more data, circle 127 on inquiry card

**The best
 commercial
 fixtures made
 come from
 Wheeler.**

The single lamp Ultima II semi-indirect fixture for modular dimensions is made of strong lightweight extruded aluminum. With integral ballast. And plastic louvers (metal louvers, solid acrylic, or prismatic shielding optional). Crevice-free, clean-lined styling for easy maintenance. For 4', 6' or 8' 1500 MA lamps. Easily relamped from above. For information write E. Quintilliani, General Sales Manager, Wheeler Reflector Co., Inc., Hanson, Mass.
 Designed by Paul Lamson
 Illuminating Engineer



For more data, circle 128 on inquiry card

REGAL EPLU

**tamper-proof, easy-to-install
 MIRROR FRAMES**
 in stainless steel or
 extruded aluminum

Here are mirror frames with a clean stylish look to blend with today's modern architecture, and offer tamper-proof protection.

Regal frames are ideal for all types of public buildings: schools, hospitals, restaurants, offices and factories . . . perfect for security-type institutions and ends the nuisance of theft in public facilities. Regal frames are easily mounted. After the hanger frame is installed, the mirror framing slips into place and is locked automatically and securely in place.



STAINLESS STEEL

Consists of a reinforced frame and a special hanger with built-in spring locks . . . Has no screws or exposed fasteners. Stock sizes are 16 x 20, 16 x 22, 18 x 24, 36 x 24 and 48 x 24. Other sizes up to 12 feet are available. Finishes are satin or polished. Tamper-proof steel shelving and accessories are also available.

EXTRUDED ALUMINUM

Heavy duty extruded frames are precision mitered and double reinforced with extruded corner keys. Special interlocking brackets and hangers make installation perfect and easy. The magna-lok feature secures the frame to wall without exposed screws or bolts — makes the unit tamper-proof. Available in all sizes. Finishes are buffed, polished and brush satin in anodized natural and anodized gold. Matching extruded aluminum, tamper-proof shelving is available.

See your jobber, or write direct to:

REGAL P.O. BOX 108 FLINT, MICHIGAN 48501 PHONE 239-8689
 SUBSIDIARY OF THE ENGINEERED PRODUCTS COMPANY

For more data, circle 129 on inquiry card

Weis solid brass recessed latch releases by merely lifting door upward. No delay in reaching an emergency situation fast.



This Weis feature is especially important in hospital, school, and other institutional locations.

Compact demonstration kit shows action... display brought to your office upon request.



For more data, circle 130 on inquiry card

The best commercial fixtures made come from Wheeler.

The double lamp Ultima II semi-indirect fixtures for modular dimensions is made of strong, lightweight extruded aluminum. With integral ballast. And plastic louvers (metal louvers, solid acrylic, or prismatic shielding optional). Pendants can be mounted anyplace. Crevice-free, clean-lined styling for easy maintenance. For 4', 6' or 8' 1500 MA lamps. Easily relamped from above. For information write E. Quintilliani, General Sales Manager, Wheeler Reflector Co., Inc., Hanson, Mass.



Designed by Paul Lamson Illuminating Engineer



For more data, circle 132 on inquiry card

** Comfortable...*

The draftsmen who design Cramer draftsman's chairs must sit on these same chairs most all day. So they design them to be comfortable. Can you think of a better reason?

Here are just a few of the things they've included for comfort.

*A seat that tilts forward to relieve under leg pressure . . . it's individually adjustable (only Cramer chairs have this). *Adjustable foot rings. *Adjustable back for your individual height and tension comfort. *A soft thick seat cushion that's cool. *And for your esthetic sense, you have a wide choice of fabric colors . . . and you can change colors, because covers are easily replaceable.

If you can't find a supplier close-by that carries Cramer draftsman's chairs—write us. We'll reply. Immediately! Cramer Industries, Inc., 625 Adams St., Kansas City, Kansas 66105.

CRAMER

CRAMER INDUSTRIES INC. • KANSAS CITY, KANSAS
A Subsidiary of U S M Oil Co.

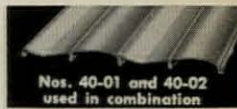
Cramer - The leader in style and quality

For more data, circle 131 on inquiry card

HASTINGS COMMERCIAL MARQUEE and CoPan aluminum building facing



A PROFITABLE COMBINATION FOR YOU!



Nos. 40-01 and 40-02 used in combination

Here are two products that offer the pleasing combination of beauty, versatility and economy that you are constantly looking for.

The Hastings Commercial Marquee provides a structural roof engineered to fit the job. Its low cost and ease of installation allow you to stay well within the budget—keeps construction on schedule.

And CoPan, unquestionably the lowest cost, fine-quality aluminum building facing material on the market today, adapts to all applications—new construction or remodeling.



16" WIDE MARQUEE PANELS—Big, extra strong aluminum panels interlock for positive leak-proof installation. Heavy-duty extruded aluminum fascia designed for large load carrying capacity. Panels are coated top and bottom with long-wearing Hastings white vinyl finish.

SPECIFY THIS PROFITABLE COMBINATION ON YOUR NEXT JOB

See CoPan in Sweets

HASTINGS ALUMINUM PRODUCTS, INC.
Hastings, Michigan 49508

For more data, circle 133 on inquiry card

continued from page 261

 Designing
a pool
into your next
project?

It makes sense
to specify



quality pool
products

here's why:

The built-in, no-compromise quality of Paragon pool products and equipment has a far-reaching effect upon the design of any commercial, institution or residential pool. That's because excellence — in durability, performance and appearance, is the only standard we accept. As a result, Paragon equipment has become the largest single grouping specified and selected by architects.

If you need technical information, specification sheets and data, we will be glad to answer your request. In addition, our skilled staff is ready to aid you with special custom fabrication requirements — please submit details. See our Sweet's Architectural Catalog File 36c/PA or write for your copy.

Paragon Swimming Pool Co., Inc.
Dept. AR
Pleasantville, N.Y. 10570
Mfrs. of Quality Pool Products

Please send me a copy of Sweet's
Arch. Catalog File 36c/PA.

NAME

ADDRESS

CITY STATE ZIP

For more data, circle 134 on inquiry card

EDUCATIONAL TELEVISION / A flexible, versatile closed-circuit system has been developed for the new Northern Highlands Regional High School in Allendale, N.J. The system, which can be operated by students, offers unlimited ways to supplement classroom instruction. A concealed distribution cable with a system of wall-mounted jacks enables any of 79 locations throughout the building to serve as a studio or point of reception. Portable control and camera equipment can be rolled to any part of the school to televise lectures and special events, and the equipment can be moved outside to videotape events for later playback. In addition, programs televised by local commercial and educational stations can be piped directly to classrooms. ■ Sylvania, New York, N.Y.

Circle 321 on inquiry card



SPLIT-TOP BELL NOZZLE / This unit features a slotted cap to permit insertion of appliance cords with molded plugs without cutting the cord. The nozzle is made of brass and the cap is black thermoplastic. The split-cover nozzle is said to protect the floor box from water and dirt and eliminate the possibility of the cord plug being kicked out. ■ The Thomas & Betts Company, Elizabeth, N.J.

Circle 322 on inquiry card

WINDOWS / The L.L.S. reversible window in stainless steel or bronze is custom produced for each job. No special pockets are required to keep blinds and curtains out of the way as the frame, in reversing for washing, never enters the interior. Deep and heavy weatherproofing set in the full perimeter of the sash is brought tightly compressed against the full perimeter of the frame. Window permits full opening in case of fire emergency. ■ Schacht Associates, Inc., Bronx, N.Y.

Circle 323 on inquiry card



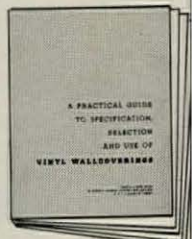
how to be sure
you get
VICRTEX
when you specify
VICRTEX Vinyl
Wallcoverings

Occasionally an architect wanting VICRTEX quality discovers that through misinterpretation of specifications a different, less desirable wall covering has been installed. With tighter specifications this might never have happened. The wall covering installed would have been VICRTEX with its full beauty of color; distinctive texture and patterns; permanent wall protection; low maintenance; and tested and proven fire safety. To be sure you get VICRTEX quality when you specify vinyl wall coverings:

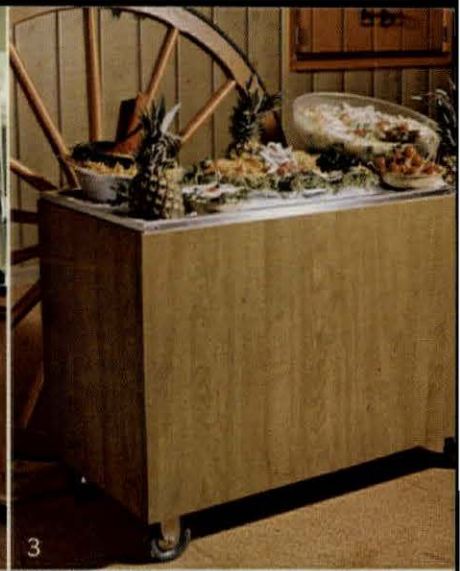
1. specify by weight and thread count bleached, pre-shrunk, mildew-inhibiting cotton fabric backing sufficient to give blomish free, dimensionally stable, easily applied wall covering.
2. specify by weight, adhesion to backing and abrasion resistance a vinyl coating compounded of top grade ingredients and electronically fused to the fabric.
3. specify a low fire hazard classification continually maintained and confirmed by an independent laboratory; and delivery of the wall fabric to the job site in containers bearing the inspection label of that laboratory.
4. require subcontractor to submit with his bid the manufacturer's name and product quality on which his bid is based.

Write for our booklet "A Practical Guide to Specification, Selection and Use of Vinyl Wallcoverings." Do it today!

L.E. CARPENTER & COMPANY
Empire State Building, New York 1
(212) Longacre 4-0080



For more data, circle 135 on inquiry card



Hoffman House Restaurant, Madison, Wisconsin—Donald Hay, Architect

For Your Carefully Planned
Interiors Specify
CONSOWELD
Laminated Plastic.
It Lasts Forever.

Consoweld laminated plastic provides both beauty and durability in this restaurant interior. Consoweld was specified for (1) cabinet facings and salad bars, (2) counter tops and cabinets, (3) vertical surfacing on self-service units and (4) table tops, booth partitions and cocktail bar. ■ Specify Consoweld for interiors in hospitals, schools, nursing homes, offices and other commercial and institutional applications. Call your Consoweld distributor for samples and see Sweet's Catalog. Consoweld Corporation, Wisconsin Rapids, Wisconsin.



continued from page 200

SHORELINE FOUNDATIONS / A 6-page brochure gives tested protective construction ideas with creosoted wood piling for foundations of homes and other structures on waterways and beaches. The brochure is illustrated with photos of shore construction where loss of land from banks of waterways and around foundations has been successfully combatted. Detail installation drawings are included. ■ Koppers Company, Inc., Pittsburgh.

Circle 419 on inquiry card

PLYWOOD SIDING / Applications and properties of plywood sidings are described in a 12-page guide that has photos of available surface textures plus descriptions and finishing information. Specific sections deal with the *sturd-i-wall* system, insulation valves, and code acceptance. ■ American Plywood Association, Tacoma, Wash.*

Circle 420 on inquiry card

TILE INSTALLATION / The "1967 Handbook for Ceramic Tile Installation" gives technical procedures for floor and wall

installations, swimming pools, countertops, shower receptors, refrigeration rooms, and steam rooms. A chart compares the advantages of different types of mortars. Available for 10 cents. Tile Council of America, 800 Second Avenue, New York 10017.*

CHAIRS / One hundred and seventy-five chairs for commercial installation in school libraries and courtrooms are shown in a 52-page catalog. Included are chairs with adjustable posture backs, a swivel, guest arm, side, upholstered, and wooden chairs. ■ Jasper Chair Company, Jasper, Ind.

Circle 421 on inquiry card

WASHROOM CABINETS, FIXTURES / A 36-page catalog shows three lines of cabinets and fixtures. Cabinets have vinyl-clad steel door and panel members contrasted with stainless steel frames polished to a number 4 satin finish. Various textures include stocked walnut wood grain and, by special order, a selection of color and texture combinations. ■ Accessory Specialties, Inc., Long Island City, N.Y.*

Circle 422 on inquiry card

LIGHTING FIXTURES / A 164-page catalog includes sections on ceiling-mounted downlights, decorative and functional chandeliers, flexible adjustable units, recessed incandescent lights and special groups such as exit signs and step lighting. The catalog illustrates more than 50 items. ■ NL Corporation, Cleveland, Ohio.

Circle 423 on inquiry card

CHURCH SPIRES / A catalog describes prefabricated metal church spires, steeples, domes and campaniles. Five types of spire construction, as well as general specifications, are discussed. The catalog illustrates 12 typical installations representing several styles. ■ Overly Manufacturing Company, Greensburg, Pa.*

Circle 424 on inquiry card

AIR CONDITIONERS / The first 1967 directory of Certified Room Air Conditioner Models lists 1,370 models of brand name participants in the certification program. The first section handles units designed primarily for window installation, and the second, those through-the-wall installation. ■ Room Air Conditioner Certification Program, NEMA, New York, N.Y.

Circle 425 on inquiry card

* Additional product information in Sweet's Architectural File

more literature on page 1

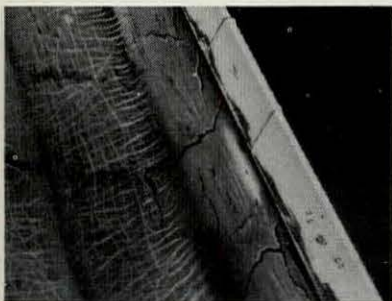
HICKMAN *Safeguard* EXPANSION JOINT FASCIA AND WATER DAM SYSTEM (pat.)



Water leakage at the expansion joint is prevented as shown by this cross section. A butyl rubber strip at bottom, from one roof section to the other, and a second strip from top of the cant, fastened into the cover section, move with the building to form positive, continuous seals. The extruded aluminum sides and related components, being free-floating, are independent of the thermal reaction between the galvanized

water dam and felts; this construction also insures that electrolytic action is negligible. All materials and parts are furnished: from end plugs to silicone sealant; from #10 cover-plate screws to the tool for clamping rubber strip into cover section. Transitions for eaves and junctions are factory fabricated to insure accurate matching of adjacent components of the fascia and expansion joint system.

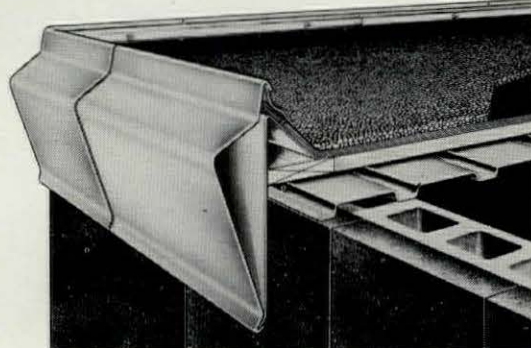
TO STOP ROOF LEAKS AT EAVES AND EXPANSION JOINTS See SWEET'S 21G-Hi



This is a photo of a probable calamity for some client. It could have been prevented . . . The Hickman *Safeguard* System stops felts from cracking because of thermal reaction, thus giving positive control of roof water at eaves (and expansion joints, if any). Please remember too, you have a selection of extruded aluminum fascia profiles in Kalcolors, Porcelain and Baked enamel (all with concealed cover plates). It is easy to combine utility and beauty.

Write for expansion joint details
and additional Sweet's Pages.

ROOF LEAKS! They happen most at the eaves and expansion joints. They mean trouble for your owners—time consuming annoyances for you. To prevent roof leaks at these points, refer to the 8 pages of Hickman in Sweet's and you will understand how thermal cycling between the roofing felts and the metal water dams, the main cause of these leaks, is neutralized and cracked felts avoided; also you will see why tar dripping and wall stains are averted.



H 10 Fascia Contour

W. P. HICKMAN COMPANY, INC.

2520 INDUSTRIAL ROW, TROY, MICHIGAN 48084 PHONE (313) 549 8484

For more data, circle 139 on inquiry card

For more data, circle 140 on inquiry card

Economical Design Flexibility



Thermal Barrier

with

METALBOARD

FACTORY INSULATED MODULAR STEEL PANELS

Metalboard is a patented tongue and groove, insulated panel. It has a full 3" insulation of fiberglass or urethane in 16" panels up to 30' lengths. Panels are separated by a thermal barrier on the outside and inside which minimizes transmission of sound, heat, and cold.

Metalboard offers superior structural strength with a mini-

mum of skeleton frame work. They can be installed either vertically or horizontally for side walls or roof decking. There are no fasteners required for installation—speeding erection time and cutting labor costs. Metalboard modular panels can be used for complete construction of buildings or in conjunction with other types building materials. Simple to erect.

- Patented interlocking tongue and groove
- Fast, easy erection—simple to service
- Available in up to 30 ft. lengths
- Pre-engineered for custom requirements
- Available pre-coated or pre-finished

SIMPLE TO ERECT



Metalboard panels can be installed either horizontally or vertically to provide a rugged, pre-finished, and insulated wall or roof decking structure.



Metalboard panels are available in lengths up to 30 ft. which eliminates the need for purlin and secondary girts.



With skeleton structure in place, simple two man erection is done quickly, easily, and effectively.



Ideal for schools, stores, gymnasiums, and practically any other type buildings. The Metalboard building system offers maximum floor space, unobstructed by central supporting pillars or expensive roof trusses.

FOR
"U" FACTOR AND
ENGINEERING
AND DESIGN DATA
WRITE TO:

METALBOARD®



FRANCHISE DEALERSHIPS AVAILABLE

METALBOARD INCORPORATED P.O. BOX 50231
CHICAGO, ILLINOIS 60650

For more data, circle 145 on inquiry card

Three volumes that stress the importance of visual logic over expression and intuition

MODULE, PROPORTION, SYMMETRY, RHYTHM, 230 pp., illus., \$12.50. THE MAN MADE OBJECT, 230 pp., illus. \$12.50. SIGN, IMAGE, AND SYMBOL, 282 pp., illus. \$12.50. Edited by Gyorgy Kepes. George Braziller Inc., One Park Ave., New York, N.Y. 10016.

By Bill N. Lacy, A.I.A.

For those who have not yet read the first three volumes in the Vision and Value series by Kepes, one can only repeat the remark of Sir Herbert Read who admonishes you for "missing one of the most exciting and progressive developments in the whole field of education." The question for those who did read the earlier volumes is whether or not Mr. Kepes has been able to maintain the high standard of quality in this sequel. He has—with only a few exceptions.

These volumes, like the earlier ones, are an anthology of essays by a distinguished group of architects, artists, designers, critics, educators, psychologists, and musicians. The essays are in a sense a collection of forewords which themselves become the collective work they are each introducing. In the three volumes there are a total of some 47 vignettes masterfully composed by editor Kepes, and they provide a many-faceted view of the role which design should play in our emerging, changing world—a world which places increasing value on precision and logic over expression and intuition. Kepes has cunningly placed at least two or three essays in each volume which every reader will feel that he must have as a readily available reference. The total of six volumes in the Vision and Value series comprise an encyclopedic reference of contemporary thoughts on visual knowledge, which anyone in the design field will consider essential to his personal library. All six volumes in the Vision and Value series seem to mildly upbraid the designer for refusing to move with the times; for refusing to become a participant in today's society. The subtle examples Kepes employs to make this

point have discernible bases in logic and scientific methods of observation. He seeks to give the designer a new respectability by suggesting to him ways in which he can push back artistic frontiers in the same manner that the scientists have done in their respective fields. By selecting works of an interdisciplinarian range he affords designers a view of their particular task in the broader context that is rarely illustrated today.

Kepes seems to be calling for a more rational approach; one that would be no less innovative or shocking, but one based on logic and an understanding of the scientific techno-biological forces that govern the contemporary world. Too much of current design in all fields continues to be based on personal self-expression that can only be explained by purely subjective rationalizations.

The designer most readily singled out as a culprit is the fine artist. The public has relegated him to the role of a mischievous little boy—too immature to participate in adult affairs of science and technology, but tolerated as a comic relief to the seriousness of the world's business. Architects and designers are rapidly shedding the label of artist and many flatly deny any identification or allegiance to the fine arts.

But denying artistic associations is not enough. The architect is faced with the decision of whether or not to move into the second machine age, having missed the first, or of becoming the Master Craftsman of the other custom crafts. The former decision requires that he accept the methods of mass production; that he design for standardization. To do this, he must understand the module as a means by which he can repeat units without being repetitious; multiply without becoming monotonous.

The second volume of this series, *Module, Proportion, Symmetry, Rhythm* suggests steps toward such an understanding and will undoubtedly have the most appeal for architects. As Lawrence Anderson points out in one of the best essays in this volume, "the idea of module is again asserted, with emphasis on its capability to encompass growth and

change." This idea is illustrated in our practical application by the contribution of Ezra Ehrenkrantz, who shows the principles behind his School Constructive Systems Development program in California. These discussions of modularity and pattern in nature, science and mathematics would not be complete without the inclusion of Corbusier's Modulor—some point, and the comments by a biologist and an art critic afford a fresh attitude on this well-worn proposition. C. H. Waddington, a biologist, concludes that the Modulor of Le Corbusier "is arrived at by a peculiar mathematical procedure which has nothing to do with any sort of biology, human or other." Rudolph Arnheim, the only person to contribute two articles in the series, carries the criticism further in his customary brilliant fashion by pointing out the inability of the Modulor to adapt to the combination of standardized units. In so doing he gives us not only an understandable explanation of Corbusier's attempt to apply measurement to visual proportion, but also a key to some of the problems facing "systems" designers.

The recurrent theme in many of the essays in *The Man Made Object* depicts the artist today as a kind of museum curator who expresses our culture through the collection and arrangement of the man-made objects of our materialistic society. The incorporation of these objects in his works serve partially to make us aware of these everyday objects as an important part of our culture, and partially as a historical, albeit satirical statement for future generations. The movement is traced from Marcel Duchamp's "ready-mades" up to the present-day junk art.

The inclusion of essays by Marshall McLuhan, Christopher Alexander and Dore Ashton, all writers of current popularity in the design professions, lends prevailing authority to this volume. Alexander compares three ways in which forces can be resolved to meet the design needs of form. He illustrates one of these theories with a fascinating example of the location of a highway between

continued on page 29

Mr. Lacy is Dean of the School of Architecture at The University of Tennessee.

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Springfield and Northampton, Massachusetts arrived at by considering twenty-six criteria in a visual superimposition pattern. The difficulty in assessing values to design criteria because of the complex psychological factors of human reaction to environment is pointed out as a caution to those who would put computer techniques to exclusive use in the design process. Marshall McLuhan, in an essay entitled "The Emperor's Old Clothes," discusses how new technology creates new environment and raises the question of the extent to which the old environment becomes a part of the new one.

The Bauhaus episode, regarded by most scholars of architecture as a milestone in the designer's relation to the machine, comes in for comment by art critic Dore Ashton, who sees it as a "utopian scheme," comparable to the misdirected Arts and Crafts movement of 19th Century England. Francois Choay describes it as a "scandal" in the history of a search for equilibrium between the artist and the object in an industrialized society.

If it were not for the wish to maintain the sequence of the set, one could afford to bypass the purchase of the third book, *Sign, Image and Symbol*. Lawrence Frank opens the book well enough with a comprehensive keynote essay, but none of the other articles adhere very closely to his description of the universe as a gigantic communications system in which our perceptual environment is formed by the messages we choose to receive and transmit. It is predictable that in such a book there would be discussion of graphic symbols. In it Rudolph Modley outlines the need for a universally acceptable and recognizable system of graphic symbols. Such attempts have heretofore been left to airlines, railways and other transportation industries whose work, although commendable, is not coordinated toward the ends of universality. Devising such a system of pictographic language is complicated by the different sets of associational references in different cultures. One culture uniquely different from our own is discussed in two fine articles about the Eskimo. The destroying need for self-expression that characterizes so much of our own artistic effort seems absent in the Eskimo philosophy and thought processes that has resulted in some of the world's finest art forms.

None of the three articles that deal with architecture contribute appreciably to the theme of the book. John Burckard's rather shallow essay on the city

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begins with the time-worn flight to Webster's to seek the definitions of the three words he is to write about. Thereafter he takes the reader on "work-association" tour of famous cities of the world in an effort to convince that the city is more a verbal than a visual symbol.

Listed as an "urban architect," Ernesto Rogers describes this new species already having lost faith in their ability. The architect has always been accused by the artist and landscape architect of adding their specialties as unimportant afterthoughts and now the planner is accused by urban architect Rogers of regarding architecture in much the same manner in the planning of the cities. The architect's unstable and vulnerable position as a specialist in specialists, proficient in none, is well documented. Signor Rogers suggests that the answer lies in the architect's ability to imagine the image of a city from all the statistics being gathered by the other professions.

In each of the three volumes Kepes has included articles that do not at first consideration seem especially pertinent to the announced title of the book, but possibly in part because of this incongruity, they are the articles that remain with the reader after he has set the book aside. Candid interviews with motorcyclists, the importance of the bead as an eye symbol, and a cartoon essay by Osborn on the effects of a hangover would seem to have no relevance in the series, but they each provide a respite which somehow becomes appropriate among the other essays.

As one would expect of books that stress the importance of visual design, the volumes are very attractive. The layouts are spacious, often restricting one idea to one page. The over-all effect is an extravagance of white page that is not seen often enough today. In keeping with author Kepes' belief that there are important ideas that cannot be wholly grasped by words alone, he has organized the books so that "the visual images are the content and the verbal statements are the illustrations."

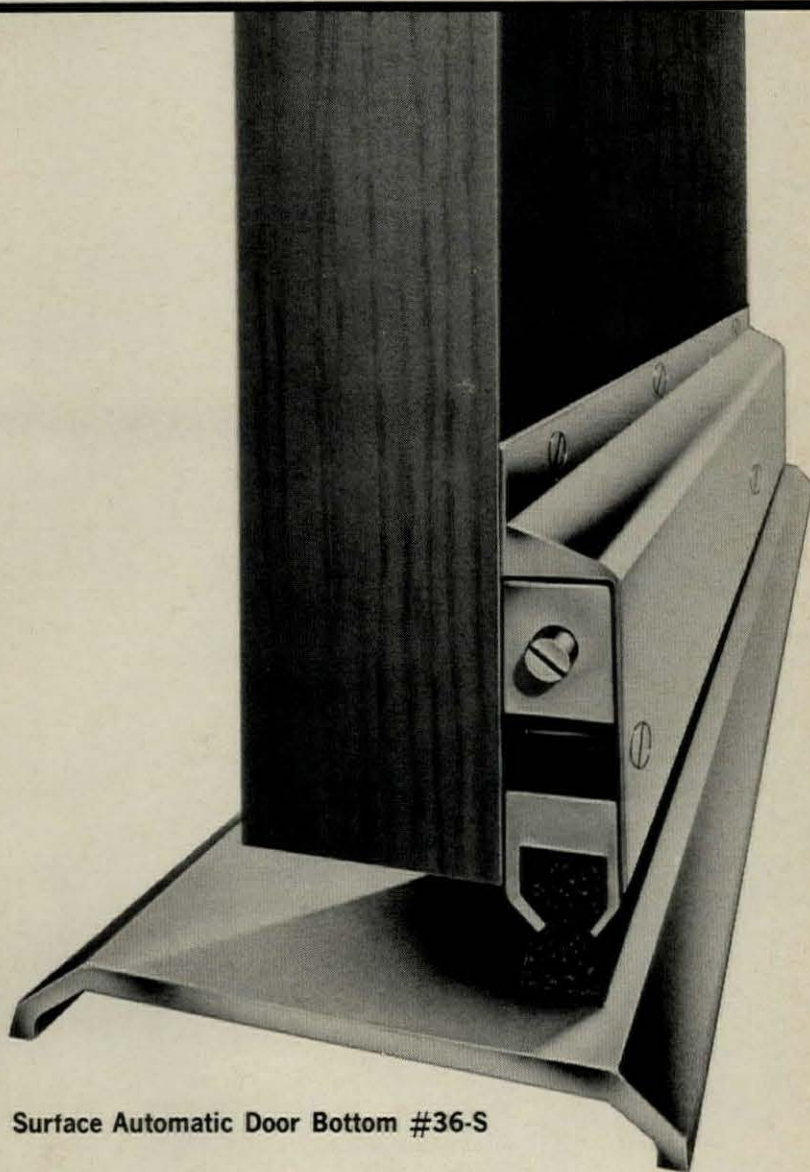
The criticism of the "readability" of the series lies in the frequent use of lengthy lines. These long lines require a conscious effort and become annoyingly tiresome when compounded by the artist-authors continual reliance on words like mythopoetic, initiatic, and anthropomorphized. This group of writers seems to have at last mastered unintelligibility in both the visual and verbal media.

Anthropologist Paul Riesman sums up the theme of all three volumes with

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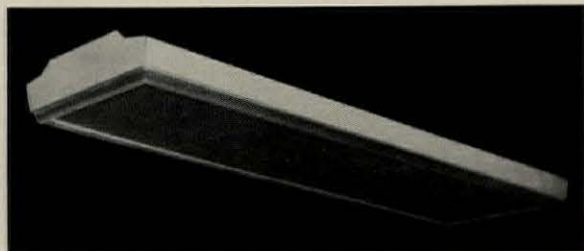
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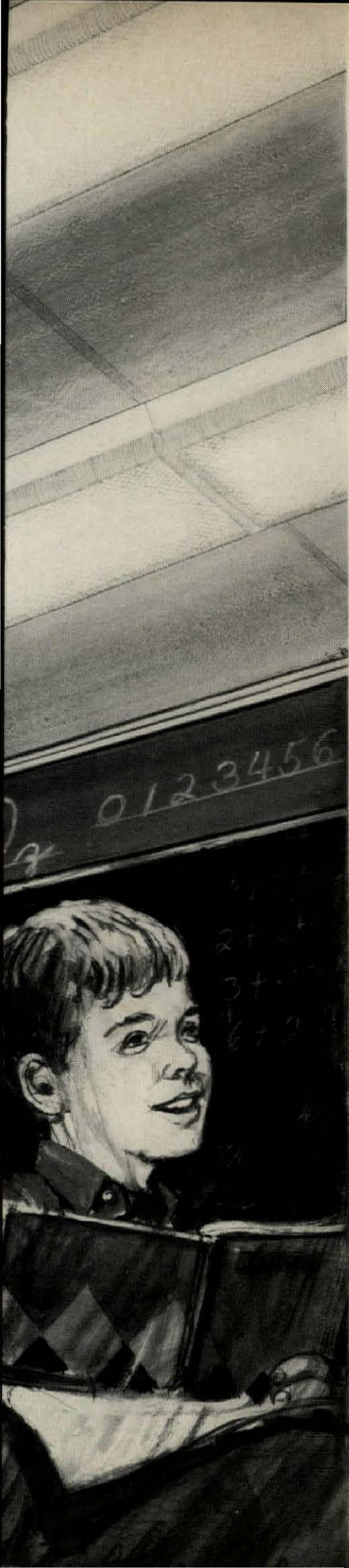
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a lament that applies to every generation since the advent of the scientific revolution: "The most powerful tool which science has at its disposal for investigation of the universe is measurement and statistical analysis. The result of this is that our knowledge of the universe, at its most precise, consists of numbers: almost everything we know about the universe—from atoms to stars, from cells to societies—can be expressed in terms of equations and probabilities. And yet when we ask of science the question

'Why are we here?' or 'What is our place in the universe?' the probabilities and equations which we get for answers do not satisfy us."

Respectability for visual knowledge is Kepes' plea. The odds are against it, because the world of measurement and numbers is a demonstrable world and the visual world seems of urgent importance only to the few who see it. But one can still admire the perseverance and vision of Kepes in producing this series and wish that its influence may be as widespread as it surely deserves.

BOOKS RECEIVED

TIMBER CONSTRUCTION MANUAL. Prepared by the American Institute of Timber Construction. John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10016. 459 pp., illus. \$12.50.

THE ARCHITECTURAL INDEX FOR 1966. Edited by Ervin J. Bell. P.O. Box 2399, Norman, Okla. 77 pp., Paperbound, \$6.00.

URBINA: THE STORY OF A CITY AND THE PLAN FOR ITS URBANISTIC DEVELOPMENT. By Giancarlo De Carlo. Marsilio Editori S.p.A., Padova, V. Eufemia, 5. 257 pp., illus.

EMERGENCE AND GROWTH OF AN URBAN REGION: The Developing Urban Detroit Area. Vol. 1: Analysis. Directed by Constantinos A. Doxiadis. The Detroit Edison Company, 1132 Washington Blvd., Detroit Mich. 48226. 334 pp., illus. \$20.00.

DAWLEY: WELLINGTON: OAKENGATES, Consultant proposals for development. British Information Service, 845 Third Ave., New York, N.Y. 10022. 84 pp., illus. \$5.00.

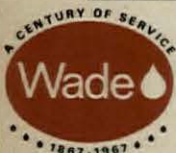
ARCHITECTURAL DRAWING AND LIGHT CONSTRUCTION. By Edward J. Muller. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632. 450 pp., illus. \$10.00.

NEW MOVEMENT IN CITIES. By Brian Richard Reinhold Publishing Corp, 430 Park Ave., New York, N.Y. 10022. 96 pp., illus. Paperbound, \$2.45.

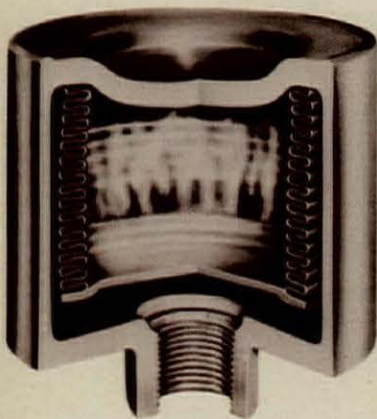
MODERN ARCHITECTURE AND EXPRESSIONISM. By Dennis Sharp. George Braziller, Inc., One Park Ave. New York, N.Y. 10016. 204 pp., illus. \$15.00.

BUILDERS IN THE SUN, Five Mexican Architects. By Clive Bamford Smith. Architectural Book Publishing Co., 151 East Fiftieth St., New York, N.Y. 10022. 22 pp., illus. \$12.95.

CABINS AND VACATION HOUSES. By the Editors of Sunset Magazine. Lane Magazine & Book Company, Willow Road at Middlefield Road, Menlo Park, Calif. 94025. 128 pp., illus. Paperbound, \$1.95.



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