ARCHITECTURAL RECORD

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BUILDING TYPES STUDY: COLLEGE BUILDINGS

"THE CASE FOR ONE TOTAL PROFESSION" BY ALBERT MAYER

STARTING A SUCCESSFUL PRACTICE: GENE LEEDY

FULL CONTENTS ON PAGES 4 & 5

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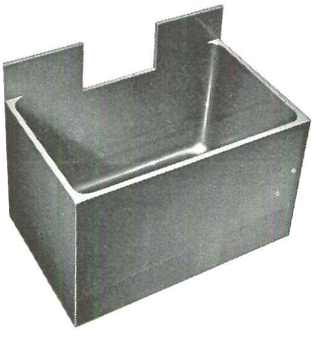

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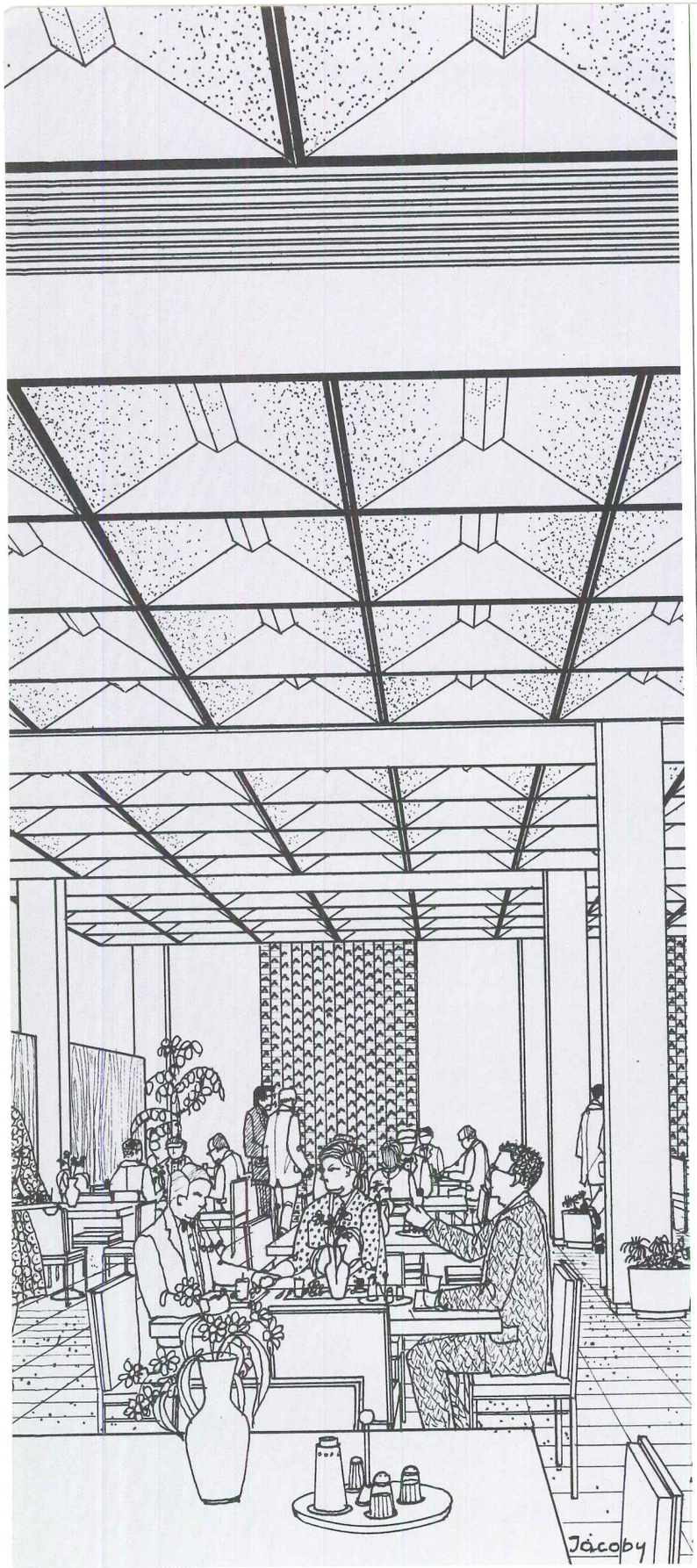

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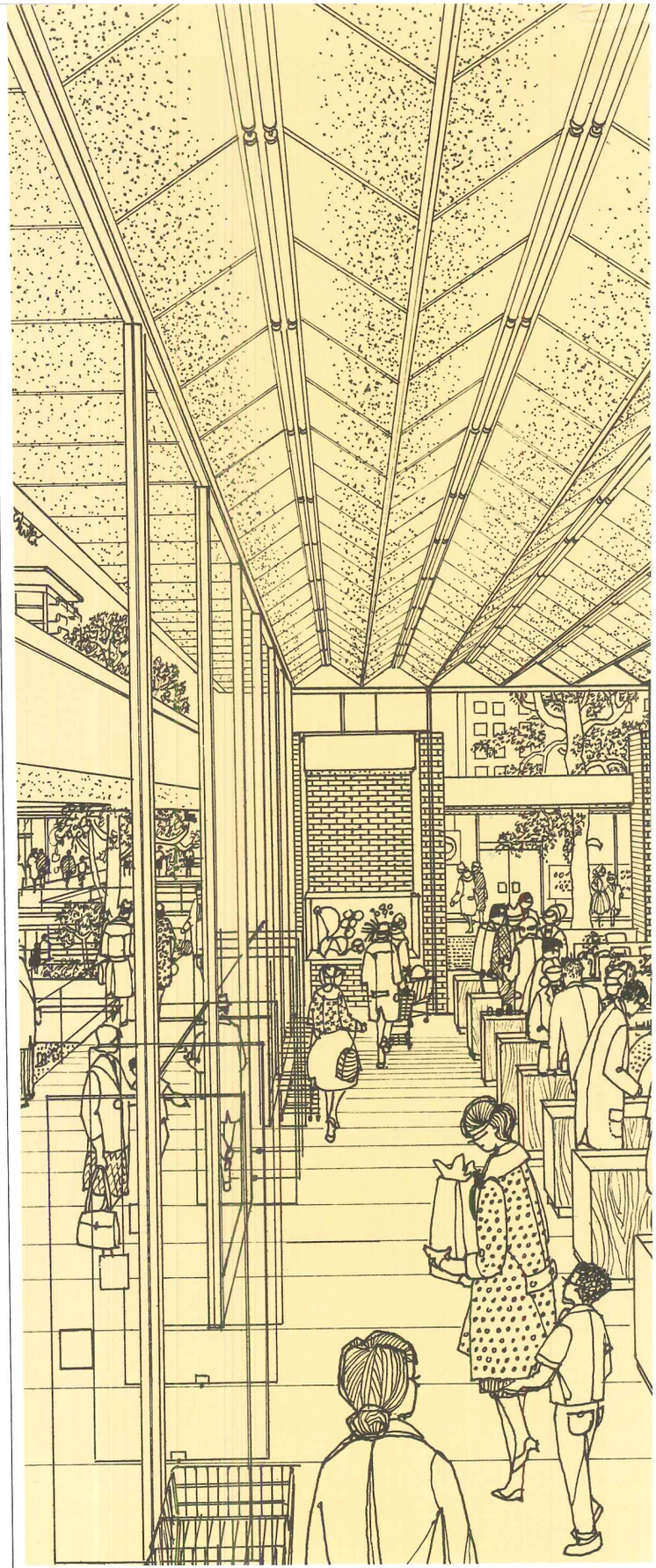

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ANALYZING LABORATORY DESIGN PROBLEMS

In next month's Building Types Study, the complex conditions of laboratory design, from mechanical services to the need for continuing flexibility, are examined in their relationship to the solution of specific design problems.

CONSTRUCTION OUTLOOK FOR 1966

Prospects for construction activity next year, and the opportunities for architects they suggest, will be analyzed in a special report on the annual F. W. Dodge Construction Outlook.

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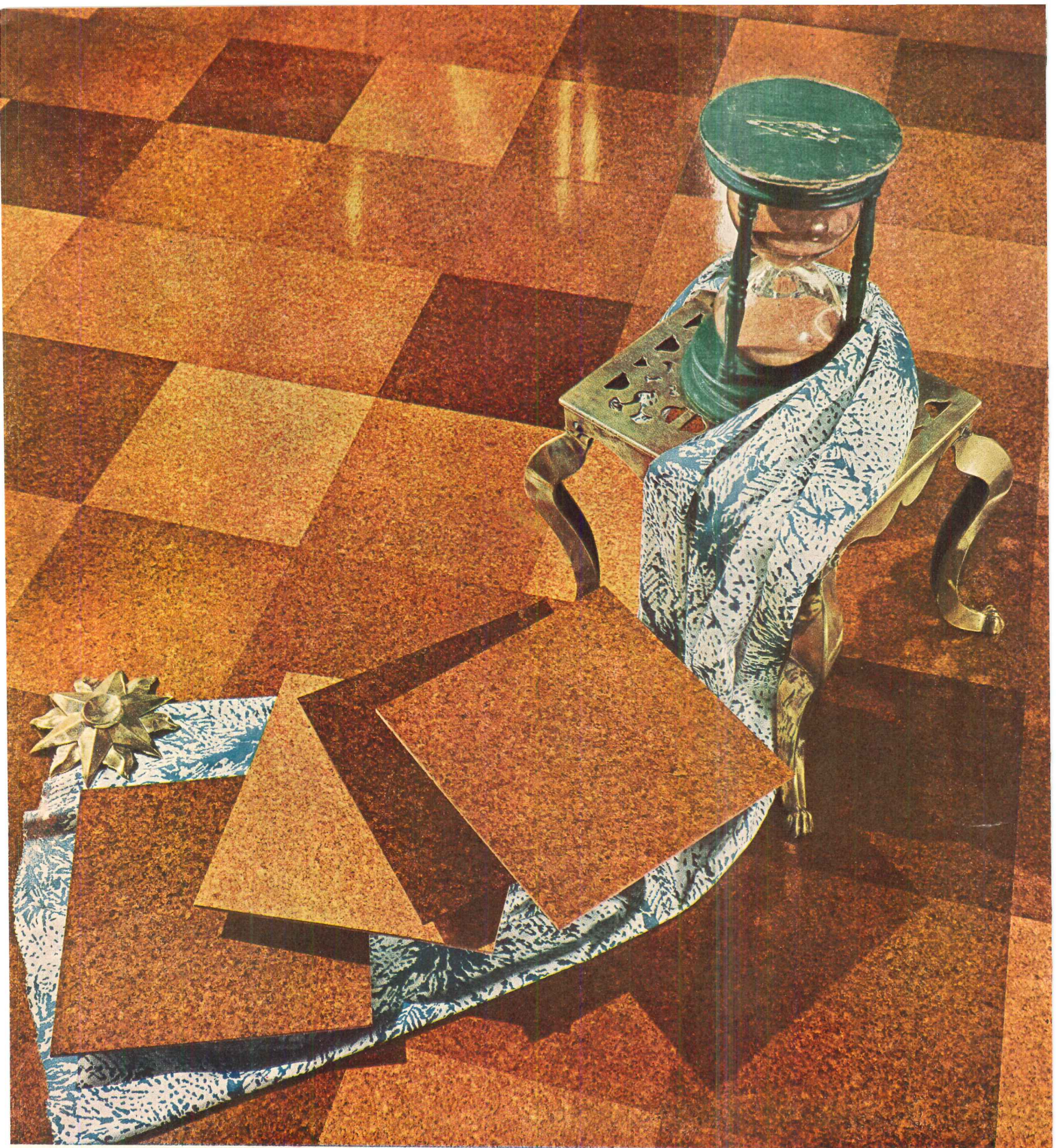

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Do Publicity Efforts Damage the Architects?

A very interesting letter, commenting on an earlier editorial, suggests the question above. The writer of the letter might not appreciate the stated question, since she is a professional public relations director for a large architect-engineer firm, but she raises the question herself, and suggests the answer. What appears to me significant is that she points out that "the architect" already has a better "image," a larger stature, than he is trying for. That's a thought to ponder.

She is Nancy Williams, director of public relations for Daniel, Mann, Johnson, & Mendenhall. Her letter, in part:

"May I commend you on your very practical editorial 'Who Takes the Blame When the Roof Leaks?' in the July RECORD.

"I was particularly struck by two comments out of the whole—the 'tacit assumption that publicity is always desirable'—and 'the architect as an "image" is asking for it.'

"The latter comment points up a fact that I have long felt to be true in spite of the architectural professionals' wounded cries concerning the public's lack of knowledge about who they are and what they do. I think most people who can pronounce the word think the architect is the man responsible for the building—responsible in all ways like the master builder of old.

"So, while it is perhaps unfair to the professional to blame him for the faulty caulking work which makes the roof leak, it also points out to him that he has a solid general reputation to live up to in the public's practical experience of him as the man who puts the building—all of it—together and makes it work. Architects who complain most plaintively may wish to be freed from the onerous task of making all of the building work (still possible under most client-architect-contractor relationships), and be considered only as artists subject only to artistic rather than practical critiques . . . "

Yes, that would be the wishful thinking of the architect. One might put it more crudely and say it represents the posture of the architect. He likes to think of himself as an individual, being quietly creative in a lonely garret, with clients climbing the stairs to beat on his door.

But the truth is generally quite different. A young architect, scratching for clients as he tries to start his practice, may indeed be a lonely individual. But as he wins success he accumulates size, in the form of helpers like secretaries and draftsmen, then designers and engineers and consultants, representing the skills now required of a master builder.

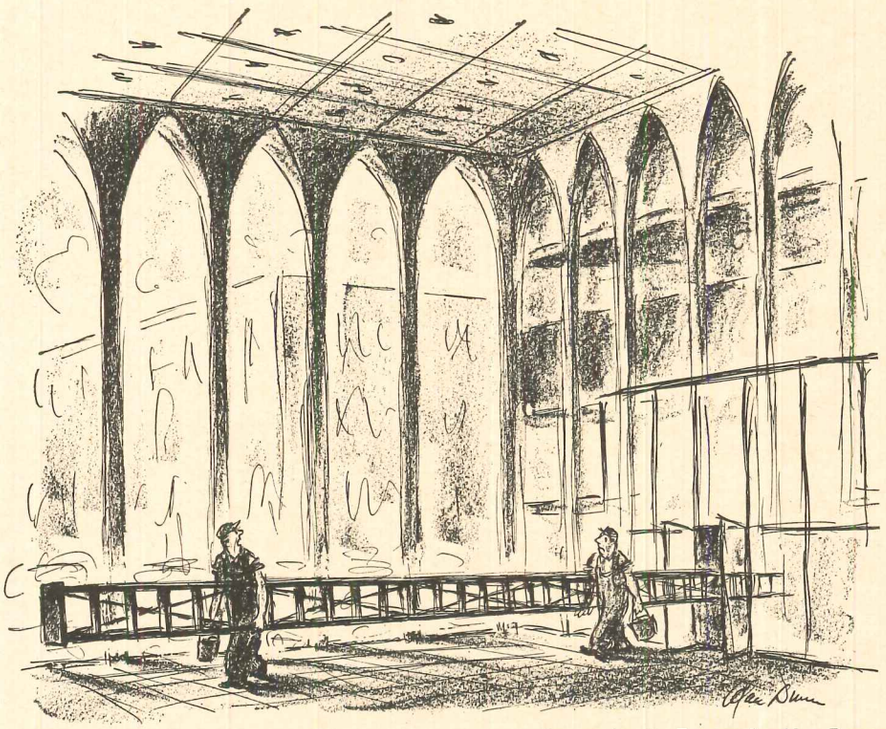
As recently as the A.I.A. convention one architect proclaimed himself as a "small" architect; he has 65 people working for him.

The "young Turks" of the late thirties, who led the fight for functional contemporary architecture, now have 75 to 100 people in their offices; some have many more. I suppose—I often hear it—that they struggle to remain individualists, to keep control of design (Aalto would be the prime example). I suppose that they long for their youthful campaign fever, as who doesn't? But they now are busy *doing* that architecture, not merely fighting for it.

Yes, there *are* small architects, some of them determinedly so. And I shall support and applaud them. But I have listened to so many who talk about being small as they grow larger and larger.

Miss Williams' point, of course, was that the public expects them, and wants them, to be responsible master builders, capable at least if not large. And that these continued protestations about lack of appreciation merely tend to downgrade them in the public estimation. I should perhaps point out that Miss W is not talking about her own employers, DMJM, who are not about to abjure any of the rights or responsibilities of architects and/or engineers, and who would look pretty silly going about proclaiming their small size.

Her other point—is publicity always desirable?—is quickly stated. She was not as brusque as this quotation sounds, but in a nutshell: " . . . statements of intent are written in wind and statements of accomplishment speak with their own voices to a ready audience." —*Emerson Goble*



—*Drawn for the* RECORD *by Alan Dunn*

"I bet Yama never had to clean a ceiling—"

That Human Hunger For a Little Space

Suburbia has a champion, according to a recent story from the Urban Land Institute. A generation ago a statement like that would be like a defense of motherhood, but now it does seem like news when the president of such a group must expound suburbia's advantages. The president, Robert T. Nahas, is a land developer in northern California. He says:

"Those who criticize suburban life, who invent contrived phrases such as 'sleasy slurbs' and 'scatteration,' who compose ditties such as 'Ticky Tacky,' and who never cease to ridicule that which they consider the inadequate cultural and social life of the suburbs, are missing altogether the motivation for this migration.

"They either fail to understand or prefer not to understand the basic human hunger for a little space, for a plot of earth in which to plant a few flowers, better schools for the children and a place for them to play other than asphalt streets. The detractors fail to recognize the struggle to maintain a tenuous hold on one's individuality—one's sense of uniqueness—a sense so effectively stripped from a man living in a beehive."

A little idyllic? Yes. Yes, but this is a kind of poetry that rules the world. Maybe like "Lebensraum"? Bucky Fuller is fond of telling us that material welfare, via the assembly line, will bring peace and contentment to the world. But I'd be willing to bet him that the greater the material welfare, the greater will be the push toward ideals that people hold dear, including a "tenuous hold on one's individuality."

One of the little problems for the Great Society will be an increasing push to "suburbs."

Choking to Death With Motor Cars

"Those who forsee the world ending in a nuclear flash are wrong, according to meteorologist Morris Neiburger. Humanity, he predicts, will smother in smog first." So reports the New York Herald Tribune. Not right away, but eventually; says the story: "The world's atmosphere will grow more and more polluted until, a century from now, it will be too poisonous to allow human life, and civilization will pass away."

Neiburger, a professor at U.C.-L.A., asks us to imagine the amount of smog that would accumulate if every one of the 800 million Chinese drove an automobile that burned gasoline, like everybody in Los Angeles does.

Under such conditions he doesn't believe that all the ingenuity science and modern engineering can muster will make the internal combustion engine possible to live with.

I guess the answer to the professor would be that long before that the auto would have choked the streets and highways until they couldn't even start the motors.

Or, we could use rocket motors. Not that they don't make smog, but they would take us to another planet. We just have to keep looking around until we find a planet with some fresh air on it.

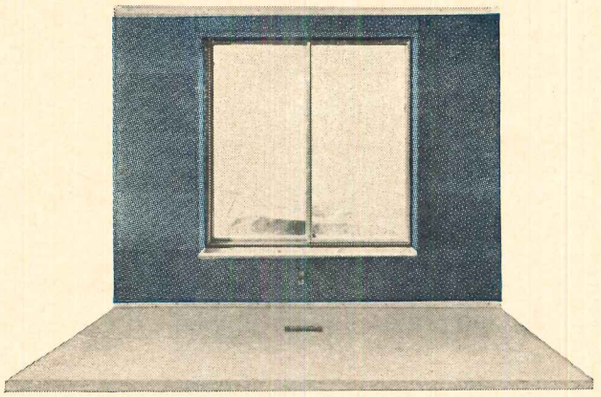
The Micro and Macro In the Environment

As this column is being ground out, a group of engineers is meeting in Andover, New Hampshire to investigate "Engineering Design to Fit the Environment." One has to agree with the stated objectives: "The primary purpose of the Conference is to study the role of the engineer in dealing with the environment, to locate gaps in the engineer's knowledge and to analyze and suggest ways in which these gaps can be filled."

It must be that this observer is not up to date in his conceptual grasp of methodological and analytical approaches. I just ain't with it. In a list of nine points to be stressed I find five mentions of "the micro- and macro-environment."

One of the nine points, in the language of the announcement, is: "methodological and analytical approaches that the engineer might follow in designing a more optimal and micro- and macro-environment."

There's going to be some smog in that environment, obviously at macro level.



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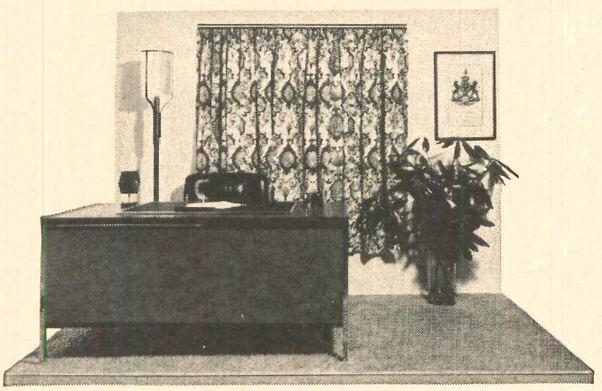

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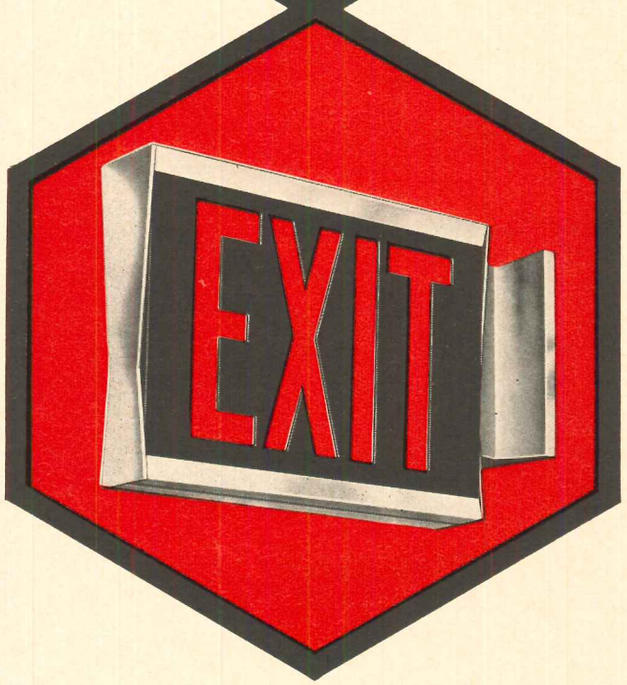

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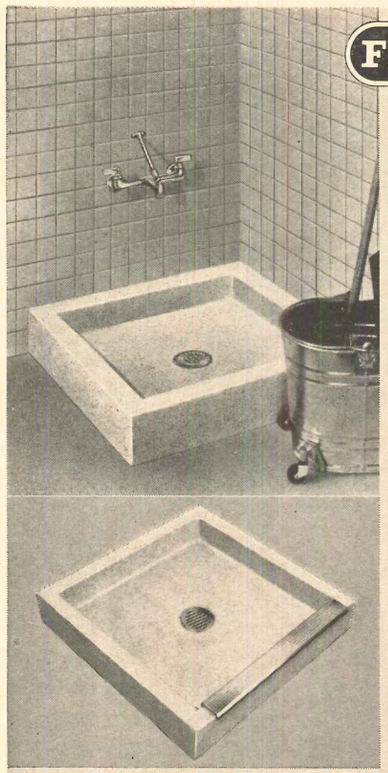

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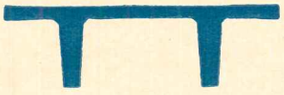

DOUBLE TEE

Basic floor and roof panel member, span range to 60 feet. Also made as giant double tee in spans to 125 feet. This versatile unit simplifies and speeds erection of single and multi-story structures. May be used exposed with or without finishing. Excellent for long cantilevers. Creates dramatic effect used vertically as exterior wall panels. Underwriters Laboratory label service is available on double and single tees and most prestressed concrete products.

I GIRDER

Generally used as long span beam to support extremely heavy loads. Serves as principal girder in many beam and deck systems. Spans to 120 feet.

CHANNEL SLABS

A very rigid member with minimum deflection characteristics at maximum load conditions. Used where heavy floor and roof loads are encountered in short and medium span ranges.

MONOWING OR F SECTION

Primary roof and floor deck members, used to best advantage where hidden joints are required for architectural reasons. Provides spans to 60 feet with minimum depth.

BOX GIRDER

Principal application as girder in heavily loaded structural framing systems. Void accommodates mechanical and electrical services. Also provides complete deck requiring grouting only between members. Ideal for industrial applications.

INVERTED T BEAM

This basic component beam reduces total structural depth since deck members can be supported on haunches. Mainly used with double tee, single tee and hollow core slabs for structural framing including the deck sections.

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. . . of every description are made in precast and precast prestressed concrete for partial and full story heights for curtain wall or load bearing use. An unlimited choice is available in plain, sculptured, textured, or exposed aggregate units of all shapes and sizes. May be combined with insulating material for partition or exterior walls.

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Used for floor and roof structural decks in the longer span ranges, to 125 feet. Normally 6, 8 and 10 feet in width, each unit provides large coverage. Popular for exposed ceilings in gymnasiums, garages, bowling alleys, etc. Ends can be custom shaped to provide architectural treatment when cantilevered.

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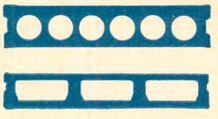

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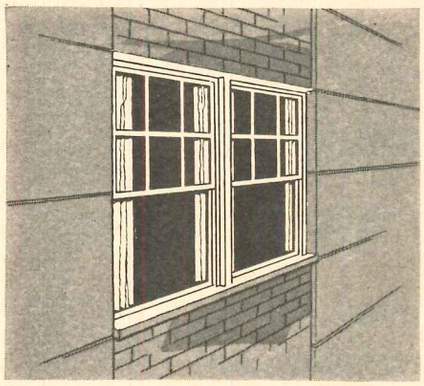

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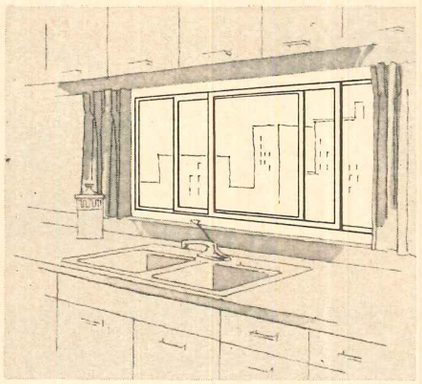
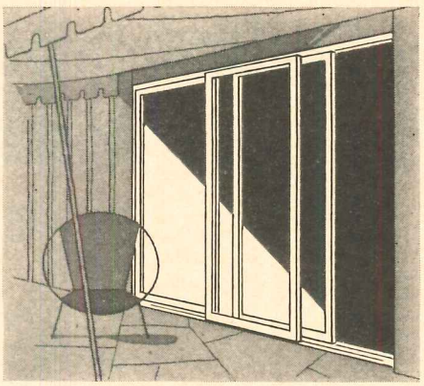
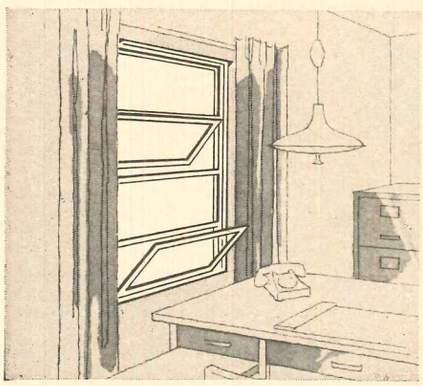


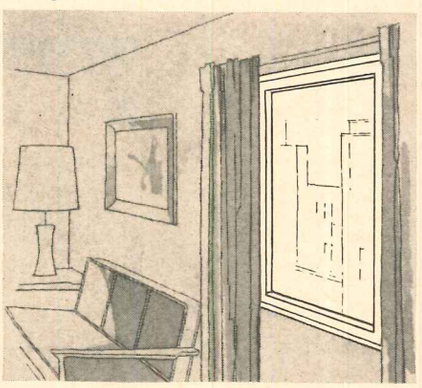
Can I write my own window specification for a special job using the AAMA specifications as a guide?



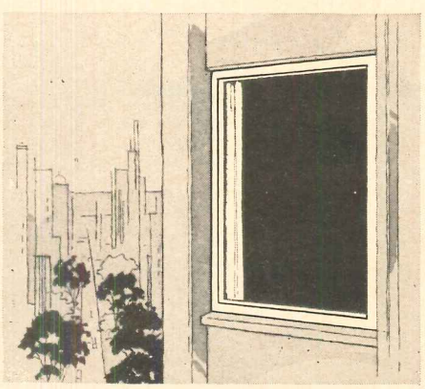
Should I be concerned with metal thicknesses or size of sections?



What thickness of glass do I specify?



Will the AAMA specifications and other data provide me with information regarding industry standard practices and sizes?.



What concern should I have regarding finishes and protection during construction?

any other questions?

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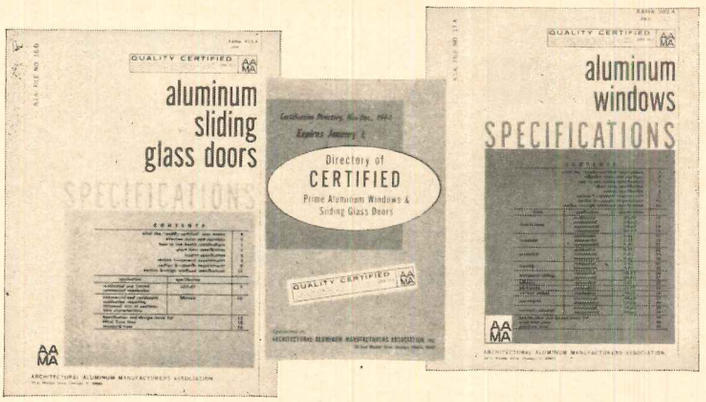

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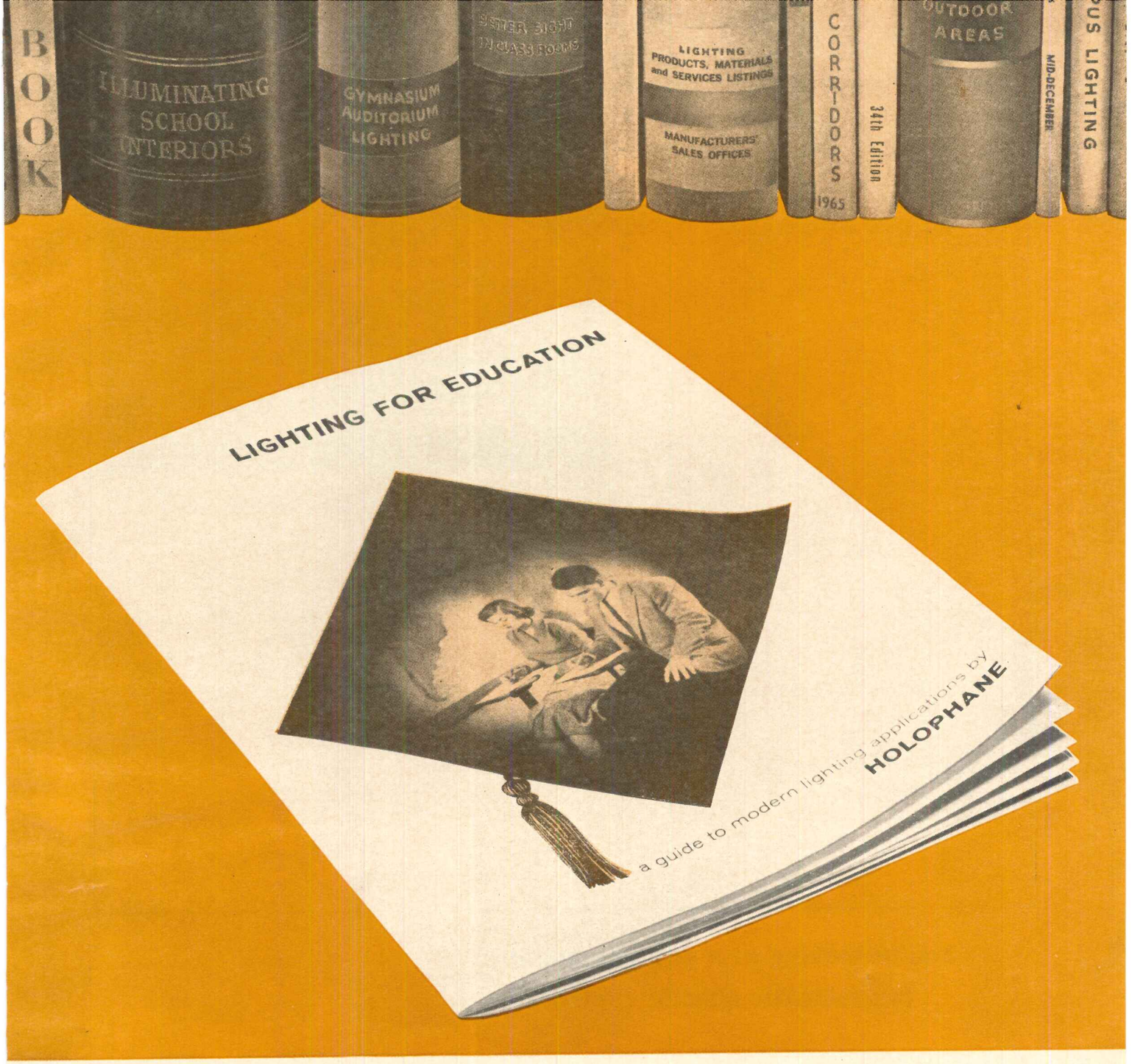

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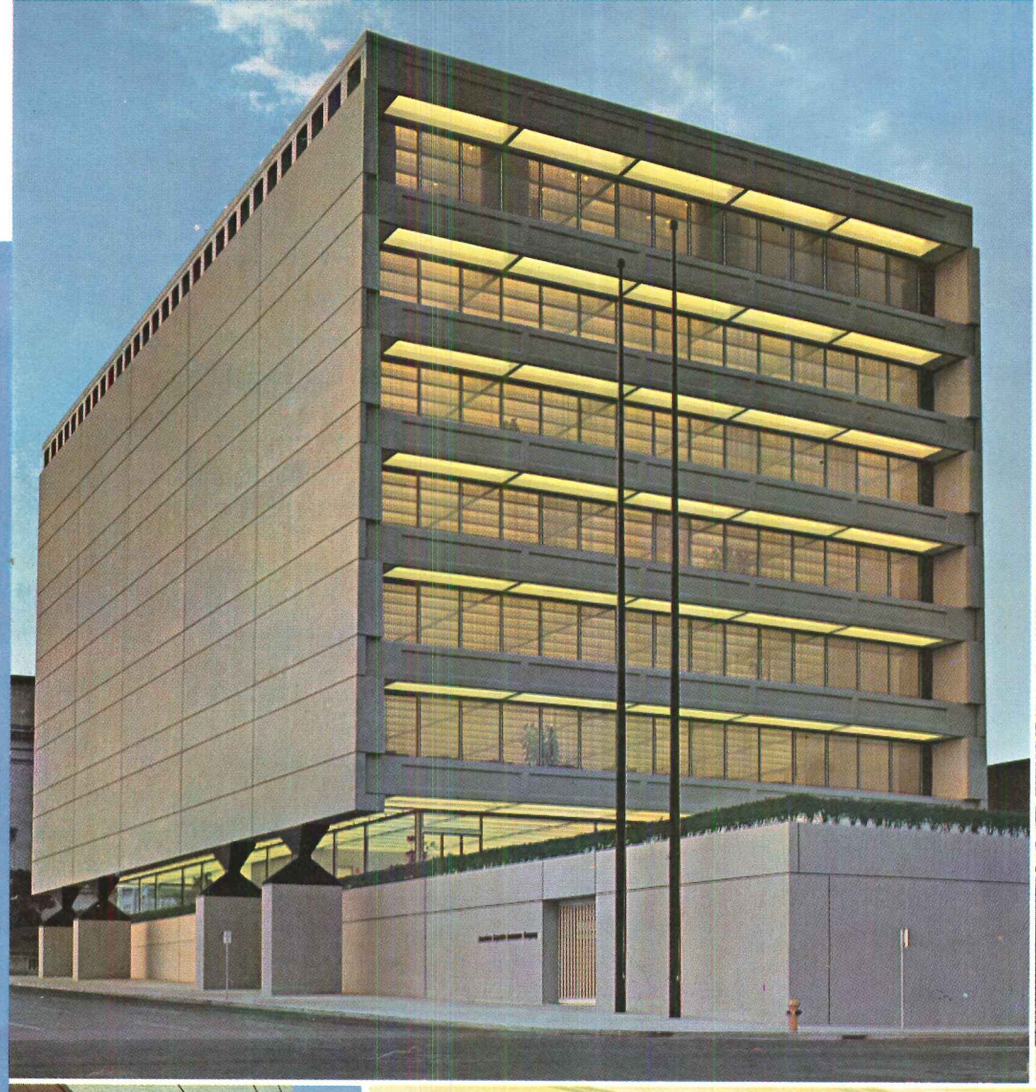
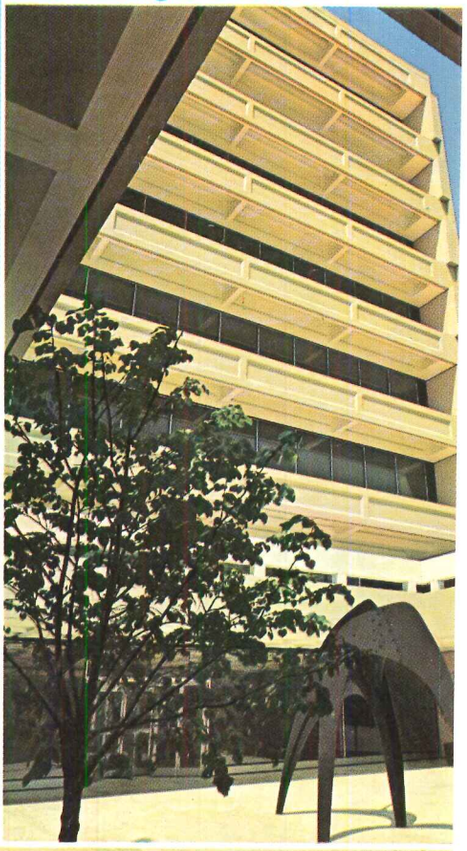
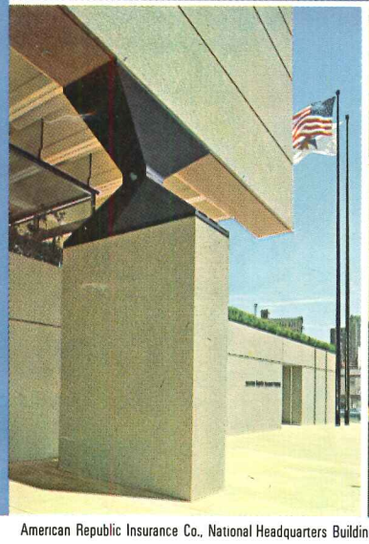


The best ideas are more exciting in CONCRETE





American Republic Insurance Co., National Headquarters Building, Des Moines, Iowa. Architect: Skidmore, Owings & Merrill, New York. Structural Engineer: Paul Weidlinger, New York. General Contractor: Arthur H. Neumann & Brothers, Inc., Des Moines, Iowa.

Dramatic simplicity in concrete... with cast walls and prestressed spans. Poised on four paired pedestals astride an independent ground floor, the American Republic Insurance Company's new headquarters attests the versatility of concrete. ■ Long span girders of precast, prestressed concrete are fitted into cast-in-place walls with the pleasing precision of rabbet-joint cabinetry. 90-foot clear floor spans, interrupted only by a service core, produce office space of maximum efficiency. ■ For added interior spaciousness, girders were left exposed to form impressive coffered ceilings that accommodate lighting and air-conditioning functions, as well as acoustic and structural elements. Walls, inside and out, present heightened visual interest, achieved by use of crushed granite aggregate exposed by sand-blasting for a rough-hewn texture. ■ Exciting designs in buildings of all types demonstrate concrete's dual talents as a structural and esthetic material.

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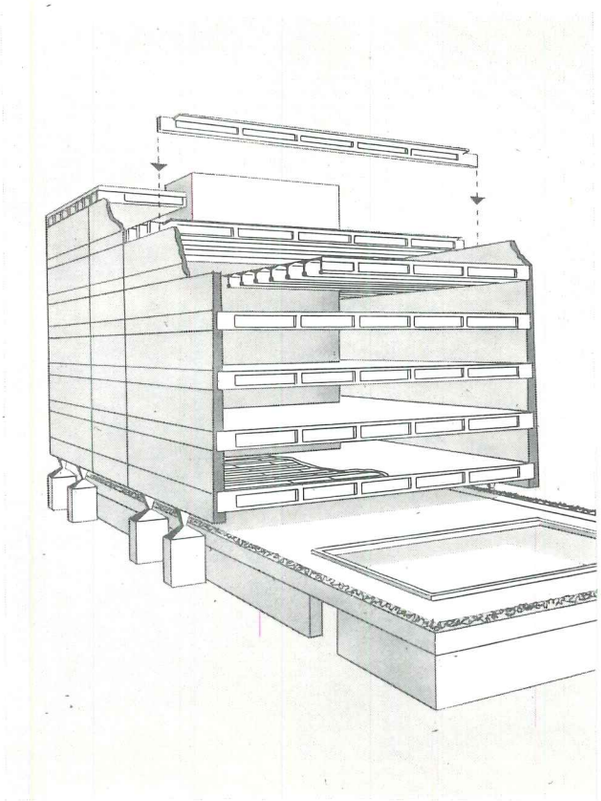
Basic design of new American Republic headquarters is unique "package" of two concrete components

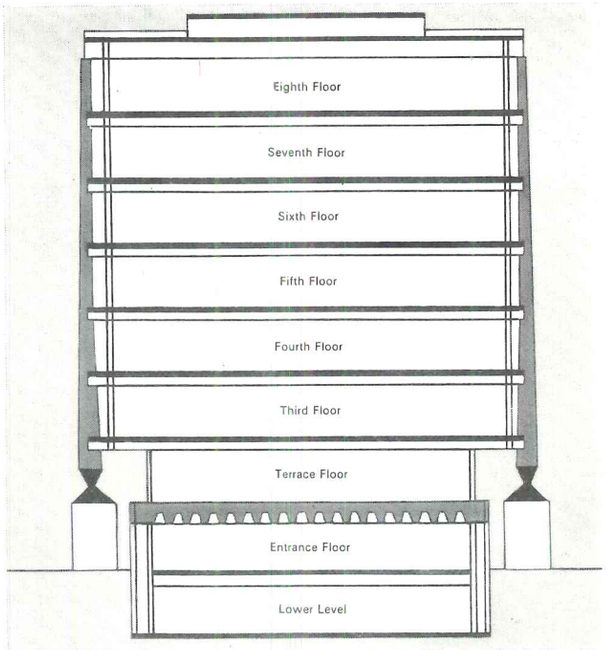


The arresting simplicity of the American Republic Insurance Company building is readily evident in the exploded view. This building is essentially a "two-part" structure, an architectural innovation which "packages" two components: girders and walls. The walls (1 ft. 6 in. thick at top, 4 ft. at bottom) act as a huge bearing envelope for seven levels of precast, prestressed concrete floor girders. There are no interior columns. The elimination resulted in an exceptionally efficient layout: each floor contains about 13,000 sq. ft. of clear area (54 sq. ft. per worker). Total interior area is 100,000 sq. ft. (650 employee capacity).

The entire weight of the building above the terrace level is supported on a central concrete core and eight steel hinges on concrete piers. Each hinge and pier supports 2,500 tons. This ingenious engineering solution provides elegance and a look of lightness for the structure.

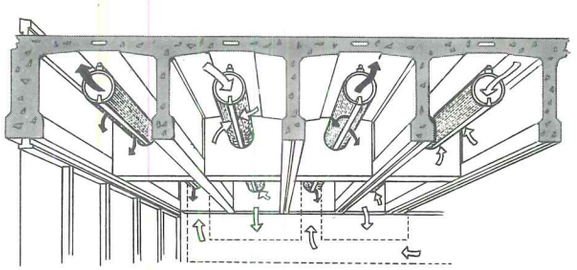
Precast, prestressed concrete girders provide long spans, support cavity walls

The precast, prestressed girders shown in the cross section are 99 ft. 4 in. long. Each "T" shaped girder weighs approximately 36 tons and rests in pockets cast into the bearing walls. The bearing is on neoprene pads centered on the wall. At a varying distance from the interior face of the bearing walls, the girders support a concrete block cavity wall which runs in a single vertical plane from the second to the eighth floor. Slots in the floor behind the cavity wall allow for mechanical and electrical utilities to flow uninterrupted between floors.



The clear interior room space on either side of the core is 66 ft. by 90 ft. Lateral forces, wind loads for example, are transferred to the building's central core through diaphragms cast in place between girders. A concrete slab cast atop the girders and diaphragms provides a composite floor system which ties walls, girders and floor to the core or "vertical backbone."

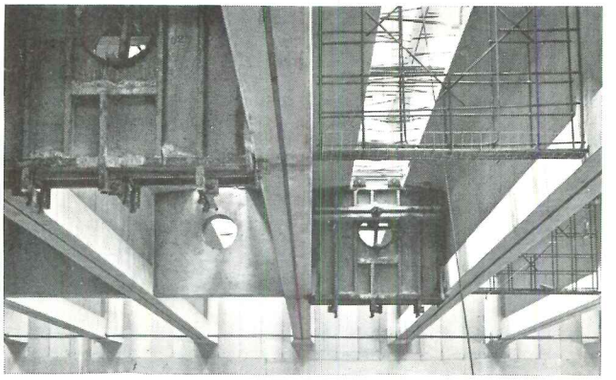
Mechanical/electrical systems designed as integral part of structure



To develop an integrated design that would provide the finest possible working environment, mechanical engineers Syska & Hennessy built a full-scale mock-up of the ceiling system. Ducts are fed vertically from the cavity wall which acts as a plenum; ducts then branch out into 6-ft. bays transversely across the building. A continuous perforated diffuser runs along the bottom of each 16-in. diameter duct. Each bay alternately contains supply and return ducts. Glass fiber duct liners act also as acoustical units because the aluminum duct is continuously perforated. The fluorescent lighting "rides" on top of the ducts.

Cast-in-place concrete diaphragms are key to integrated design

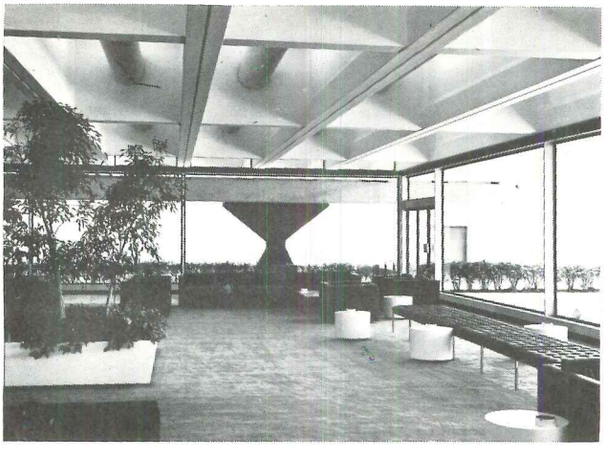
This construction scene shows a typical floor installation with girder diaphragms in various stages of completion. When cast in place, the diaphragms form continuous cross-members which transfer floor loads from girder to girder. Diaphragms also support the integrated system for heating, lighting and air conditioning, which is supplied to each floor from inside the walls. Notice that the diaphragm reinforcing steel extends up into the floor slab, which will be cast over and between the flanges of the girders.



Clean, sweeping look of service system indicates new trend in esthetic design

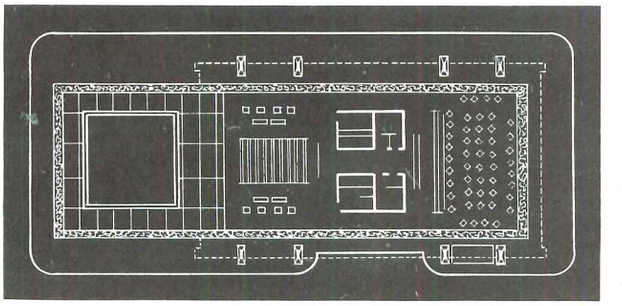
The completed view of integrated structural, heating, air conditioning and lighting system shows a striking departure from the usual practice of moving air through ceiling registers or wall outlets. The graceful, modern look of the continuous diffuser coffered by the clean lines of the concrete girders is not only an innovation in meshing mechanical and electrical equipment with architectural and structural requirements, but a dramatic step forward in esthetics.

At the far end of the photo can be seen one of the eight steel support hinges.

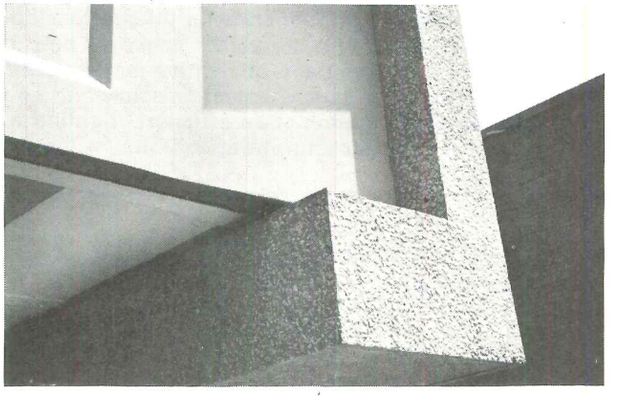


8-story structure supported on eight perimeter piers

As seen in the plan, the eight piers which support the structure anatomy of the 8-story giant are located outside the ground floor perimeter. By so doing, the architect dramatized the connection between superstructure and foundation. Thus the structure in effect straddles a "free standing terrace floor," which accounts for its open-air effect. The ground floor height is 14 ft. 8 in.; succeeding floor story heights vary from 13 ft. 6 in. to 16 ft. (approx.). The service core shown is a continuous, reinforced concrete shaft, carrying stairways and part of the mechanical equipment, and serving as a "shear wall" to resist lateral loads. The core also houses four elevators.



Rough-hewn texture achieved by sandblasting gap-graded concrete



The clear, sharply defined texture of exterior and interior surfaces of the cast-in-place walls is the result of a special technique using a "gap-graded" concrete mix with aggregate exposed by sandblasting. The concrete mix contains a large percentage of coarse aggregates and a small percentage of fines (sufficient for workability) with no aggregates in the intermediate size ranges—thus "gap-graded."

Striking results are achieved when surfaces contain a maximum amount of exposed aggregate of predominately large size. The exposed aggregate surfaces for this structure were obtained with the following concrete mix:

Portland cement, Type I	564 lb per cu yd
Masonry sand, minus #8 screen	975 lb per cu yd
Crushed granite, ¾ to 1½ in.	1777 lb per cu yd
Crushed granite, ⅜ to ¾ in.	444 lb per cu yd
Water	225 lb per cu yd
Water/cement ratio	4.50 gal. per bag
Sand, percent of total aggregate by volume	30
AEA	as required to obtain approximately 5 percent air content
Slump	approximately ½ in.
Matrix percentage	50

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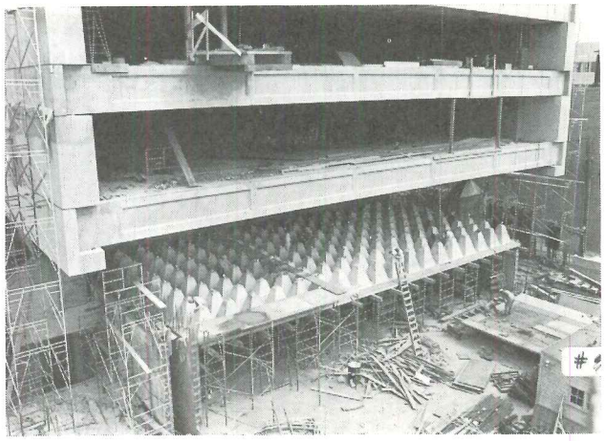
Prestressed concrete waffle slab serves double-duty in free-standing terrace floor

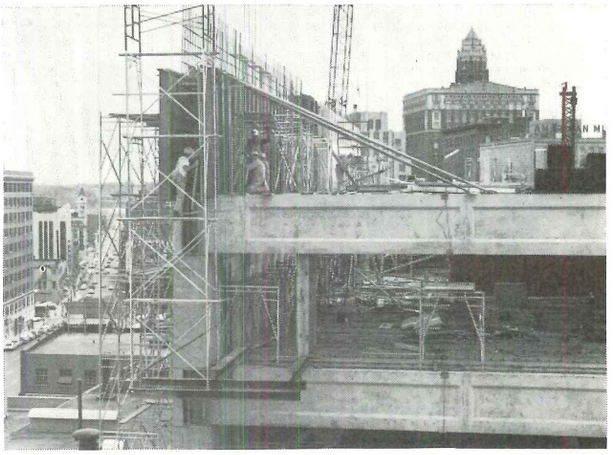


The view above shows how the terrace and entrance lobby of the American Republic headquarters are sandwiched between the colossal piers supporting the main structure. The terrace floor is a 4-foot-deep concrete waffle slab supported separately on adjoining walls. The long span slab (approx. 80 ft.) is posttensioned between wall supports and was formed with fiberglass molds. The concrete for this waffle slab was placed by means of a horizontal conveyor belt. Each "concrete cone" contains a lighting unit for the impressive exposed concrete ceiling below and so provides the dual function of an efficient "lighting grid" and a long span structural waffle slab.

Design simplicity and reusable forms make the job go faster

Illustrated here is the forming process for the cast-in-place concrete bearing walls. The reusable forms were made of steel specially designed for the job. These walls and all other exposed concrete, including the service core and the 12-in.-thick walls of the lower structure, consist of the gap-graded granite aggregate concrete in which the aggregate was exposed by sandblasting.

Two giant cranes, one on each side of the building, virtually "walked in tandem" along the structure to install the girders. This rapid construction technique was possible due to the simple make-up of the building—two basic components, walls and girders.



Back-to-back tractors maneuver girders through city traffic

All prestressed girders were cast at a plant 210 miles from the site.The 99-ft. 4-in., 36-ton units were transported to Des Moines by loading them in pairs on two 60-ft. railroad flat-cars. To keep the building construction on schedule, 12 railroad cars were leased for the duration of the job. In the railroad yard at Des Moines, the girders were transferred to a pair of truck-tractors aligned back to back for easy maneuverability through the city streets. Delivery timing was critical as there was no room for storage at the job site and girders were placed into the structure as they arrived.

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Write for your free copy of Structural Data Sheets 1962-1965. Specifications and construction methods covering a number of basic uses for concrete. (U.S. and Canada only.)

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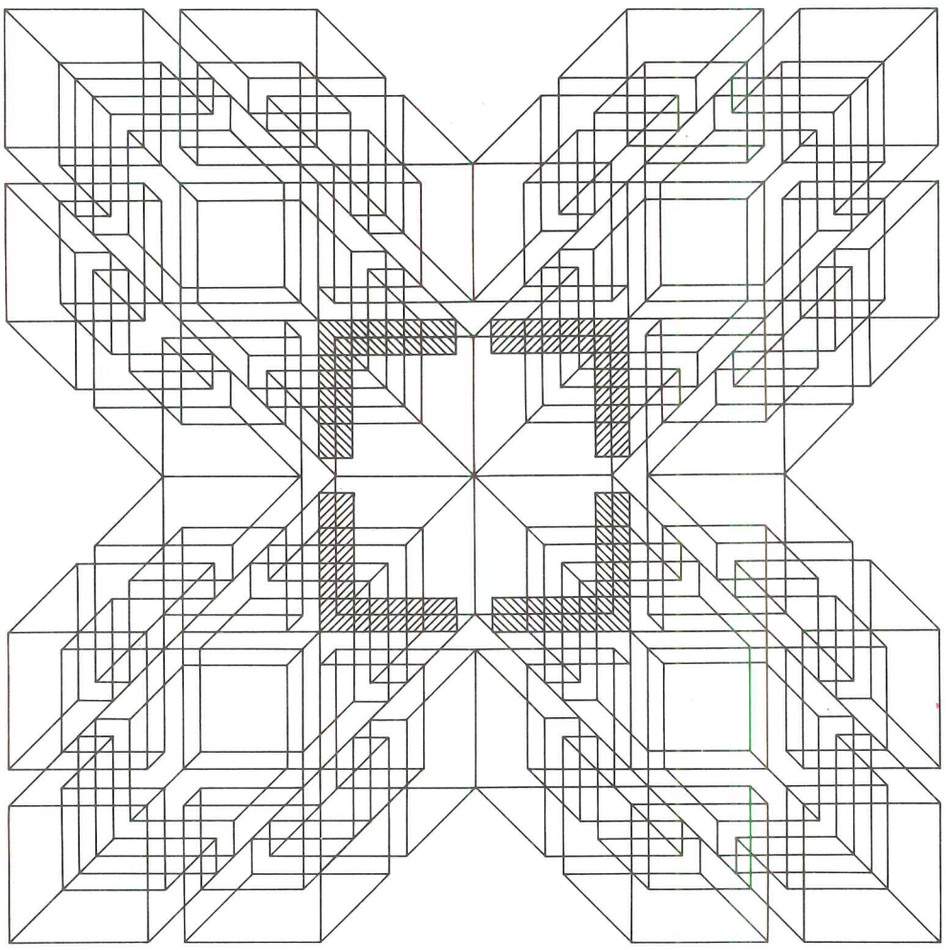
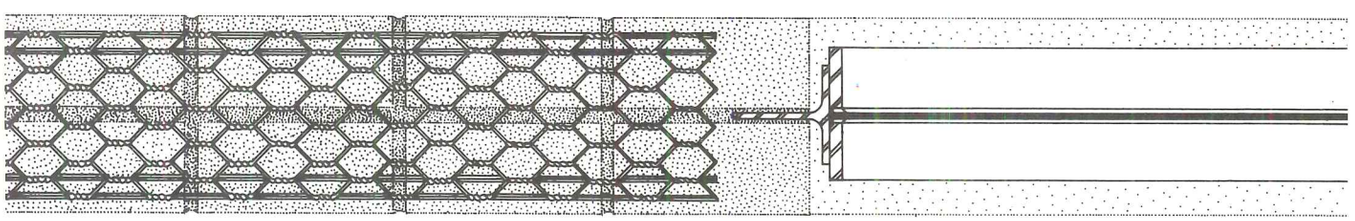
The formal generators of masonry structure:



The square, the lozenge, the cruciform, the rectangle, the pinwheel and the linked form . . . these basic orthogonal shapes are the formal generators of masonry structure.

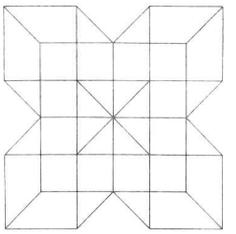
Keystone Steel & Wire Company commissioned architect Stanley Tigerman to study these basic shapes and their logical extensions. The result, we believe, provides a unique view of architecture.

Mr. Tigerman projects a basic shape into three dimensions and marries it to a basic method of enclosure, support and division. The resulting parti becomes a floor plan, then a

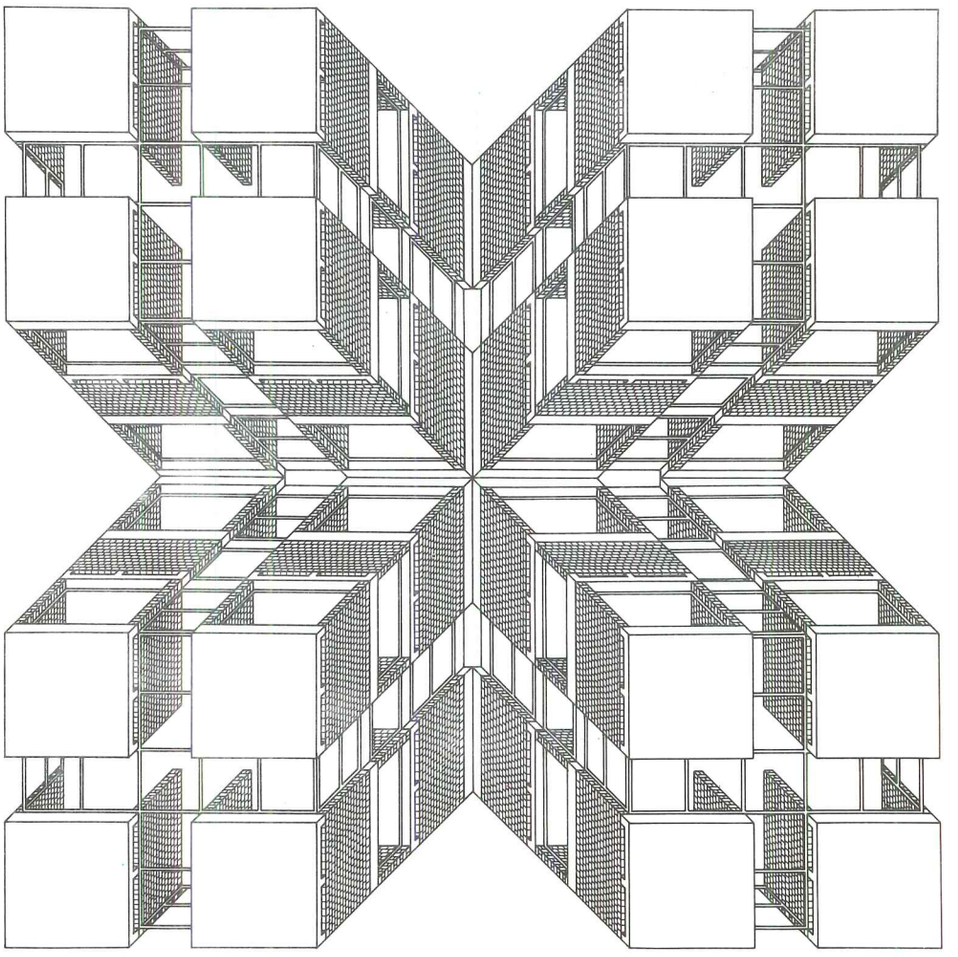


Keywall Roll comes in 5 widths for 4, 6, 8, 10 and 12″ walls. 200′ per roll.

the square



no. 1 of 36



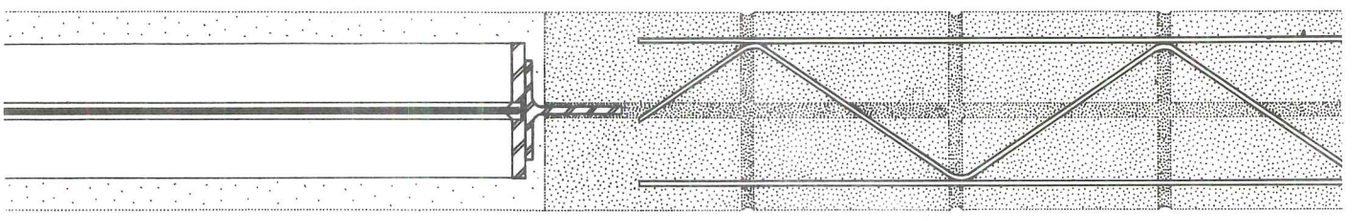
STANLEY TIGERMAN ARCHITECT

structure with details. It should come as no great surprise that the details include our Keywall® masonry reinforcement, both rod and roll.

In this example, the square becomes cubes, which are married to load-bearing walls to create the parti.

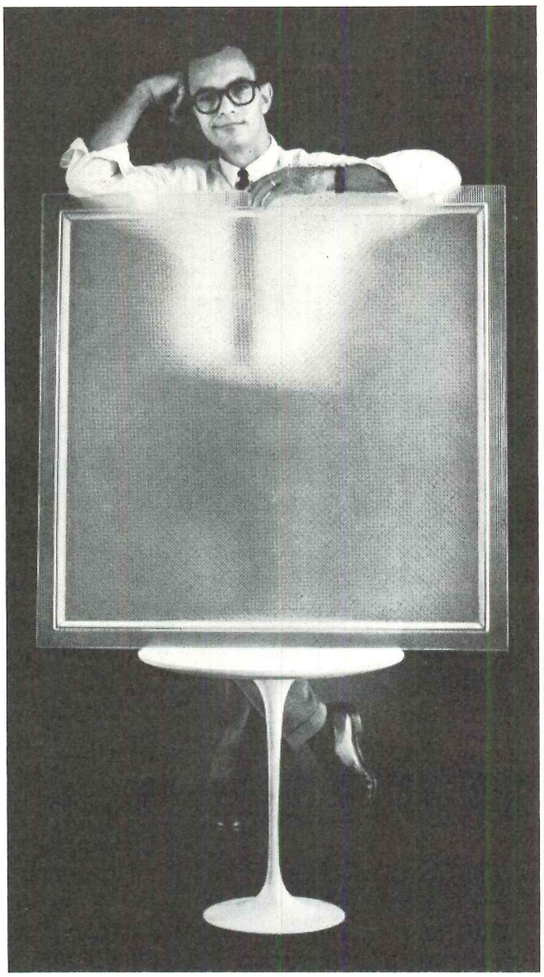
For your personal reference, drawings and details (drawn to 3″ = 1′0″) are available. To receive the first in the series and all that follow, write:

Dept. AR105
KEYSTONE STEEL & WIRE COMPANY
Peoria, Illinois 61607



Keywall Rod comes in 9 ga. wire and 3/16″ rods for 4, 6, 8, 10, 12, 13 and 14″ walls. 10′ length.

For more data, circle 15 on Inquiry Card



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NEW K-S-H K-33 PRISMATIC

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*Tedlar is a DuPont Registered Trademark

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Only banks can afford bronze. Right?

Wrong.

Let's be frank.

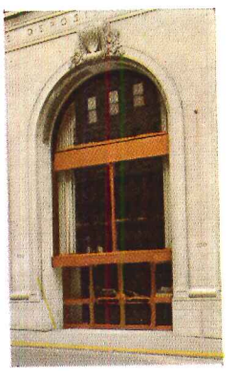
Copper, brass and bronze are specified because they're better, not cheaper. But here's something you may not know: new design economies can bring the in-place cost of these beautiful metals down to a very competitive level.

The recently renovated entrance of the Boston Safe Deposit and Trust Company is a good example. Original specifications called for .125" gage anodized aluminum extrusion. By redesigning in brake-formed bronze sheet, gages were reduced to .064" through .101".

And this reduced the in-place premium on bronze to less than 11%.

Most important, the use of bronze preserved the feeling of dignity and permanence imparted by the marble facade of the building. Add to this the maintenance economies for this high traffic area, and you see why both bank and architect were so pleased with bronze.

Our new brochure, "Copper, Brass and Bronze in Architecture" is full of other fresh ideas, facts, figures and design details. For a copy, just send a note on your letterhead.



Boston Safe Deposit and Trust Company
Boston, Massachusetts
Architects: The Architects Collaborative
Fabricator: Trio Industries

COPPER DEVELOPMENT ASSOCIATION INC.
405 LEXINGTON AVENUE, NEW YORK, N.Y. 10017

6 patterns-60 colors-in vinyl asbestos

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For quick, convenient reference Ruberoid has assembled 60 choices of colors and patterns in vinyl asbestos floor tile, covering every possible design need in commercial or institutional areas. All meet or exceed requirements for top quality performance. Whenever you consider vinyl asbestos, Ruberoid has the pattern and color you are looking for in three file-size samplers.

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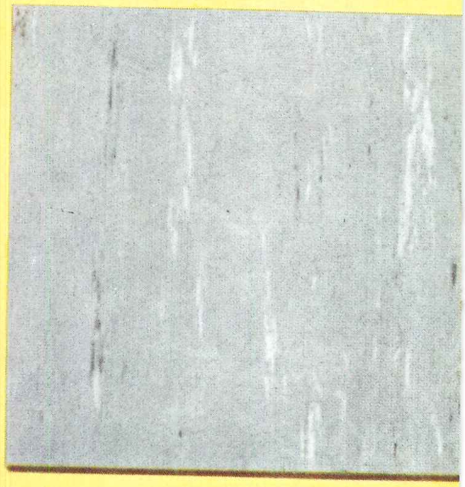
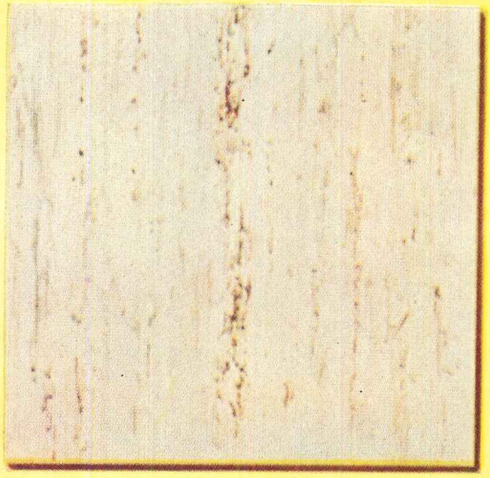
MARBLEIZED



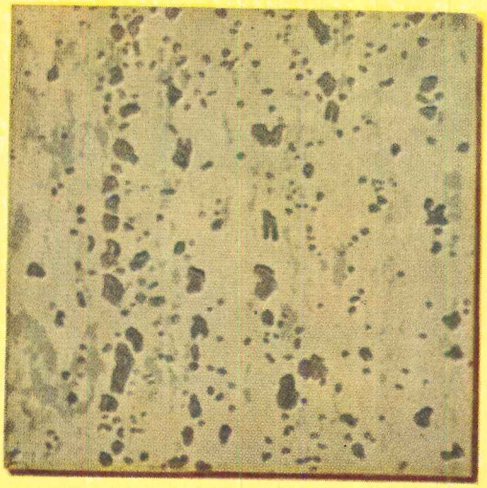
THRU-CHIP

ANTIQUA

FINEGRAIN



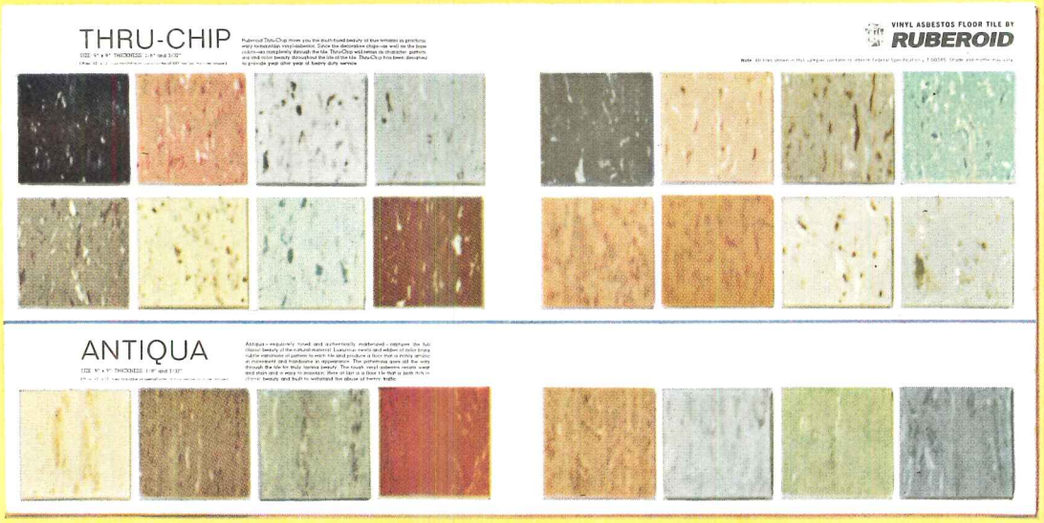
TRAVERTINE



ROYAL STONEGLOW

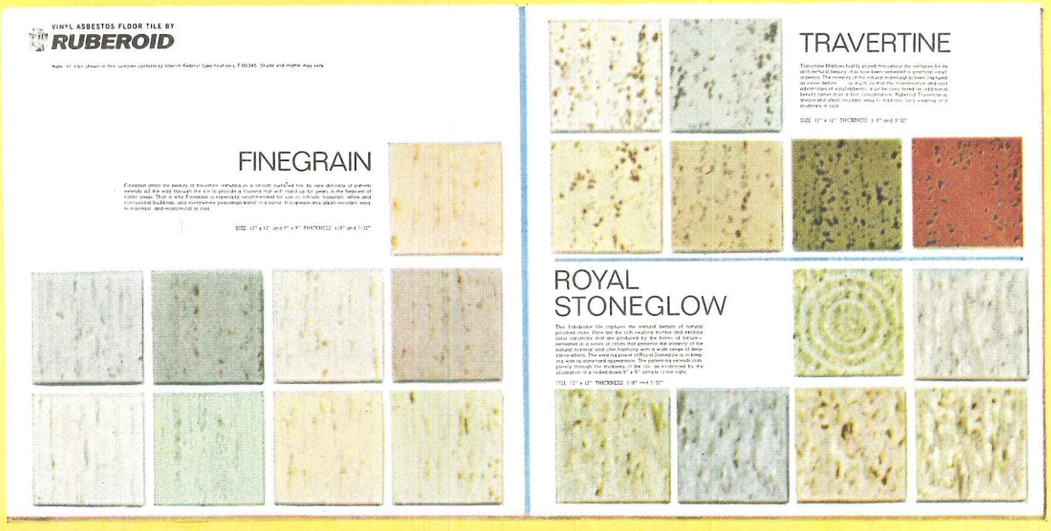
to satisfy every architectural need!

MARBLEIZED
a complete range of styles. The marbleization goes through the tile.
Colors: 16; Size: 9″ x 9″;
Thickness: ⅛″, 3⁄32″ and std. ga.



THRU-CHIP
the look of terrazzo for high traffic areas. Color chips go completely through the tile.
Colors: 16; Size: 9″ x 9″;
Thickness: ⅛″ and 3⁄32″.

ANTIQUA
the appearance of classic marble. Swirls of color go all the way through.
Colors: 8; Size: 9″ x 9″;
Thickness: ⅛″ and 3⁄32″.



FINEGRAIN
subtle flowing marbleization with pattern going all the way through.
Colors: 9; Size: 9″ x 9″;
Thickness: ⅛″ and 3⁄32″.

TRAVERTINE
pitted and veined in simulation of travertine marble.
Colors: 6; Size: 12″ x 12″;
Thickness: ⅛″, 3⁄32″ and std. ga.

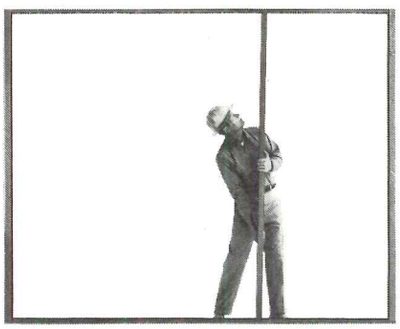
ROYAL STONEGLOW
the glow of natural polished stones. The pattern goes all the way through.
Colors: 5; Size: 12″ x 12″;
Thickness: ⅛″ and 3⁄32″.

Why would an architect be interested in a new Arcadia 'loose stick' window wall system?

Everyone knows an architect is only supposed to think about aesthetics.

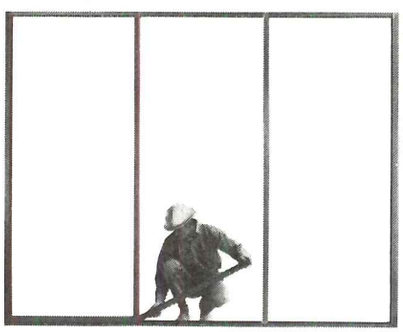
He's not supposed to care that Arcadia S-45 snaps together without screws or clips of any kind...

Even if it means installation time and cost are cut from ⅓ to ½.



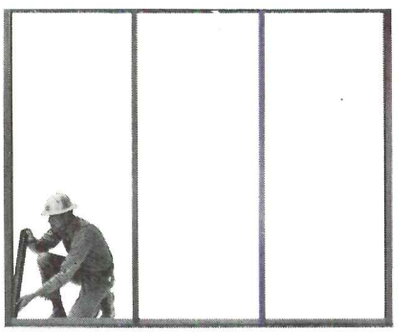
Why should an architect notice that S-45's new non-stretch glazing vinyl simply won't pull out of position...ever!

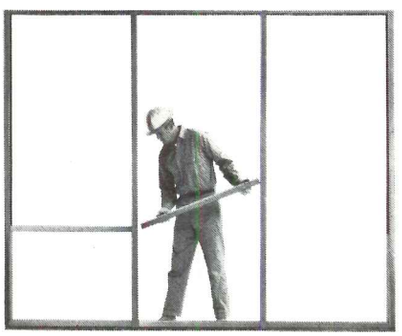
He's too busy making sure that the slim 1¾" sightlines are maintained throughout. (They are.)



And finding out if S-45 is available in genuine Duranodic® colors. (It is.)

It's no skin off an architect's nose that an installer can cut and stack S-45 "sticks" on the job.



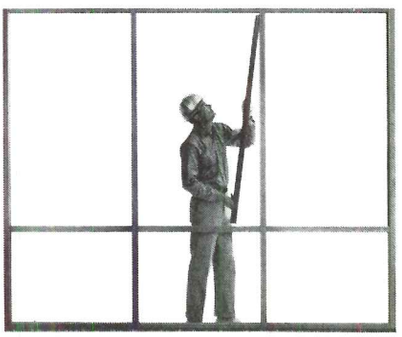


He's more interested in knowing the system is designed to make open joints impossible.

And that he can flush glaze glass and panels from ⅛"to1½" thick...in any combination.

And that S-45 can be glazed from inside or outside...or half and half.

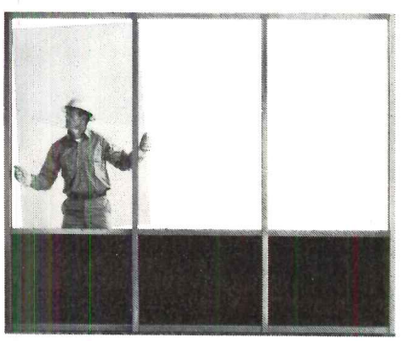
And that it works equally well as storefront or window wall.



Of course, an architect worries about windload capacity... and weatherproof design...

But then he knows Arcadia wouldn't offer a product that didn't measure up.

Everyone knows what an architect thinks of most loose-stick systems...that's why he's apt to get excited about the new



ARCADIA S-45

...the first loose-stick window wall with everything an architect wants!

Send for complete new details and installation data.

NORTHROP ARCHITECTURAL SYSTEMS A SUBSIDIARY OF NORTHROP CORPORATION
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COPENHAGEN: LOOKS AS GOOD AS IT LOCKS

Simplicity. We never forget that word when we make a lock. So when we put a keyway on a rounded doorknob, it's rounded. Nobody else bothers with that. But we know simplicity is based on unity of form. Not on clutter. Or garishness. So after we make a Yale lock, we go to lots of trouble to see that it's beautifully simple. Clean and honest. That's not so simple.

YALE®
THE FINEST NAME IN LOCKS AND HARDWARE
YALE & TOWNE

The Copenhagen knob shown with Yale Mono-Lock

Yale & Towne, Inc.
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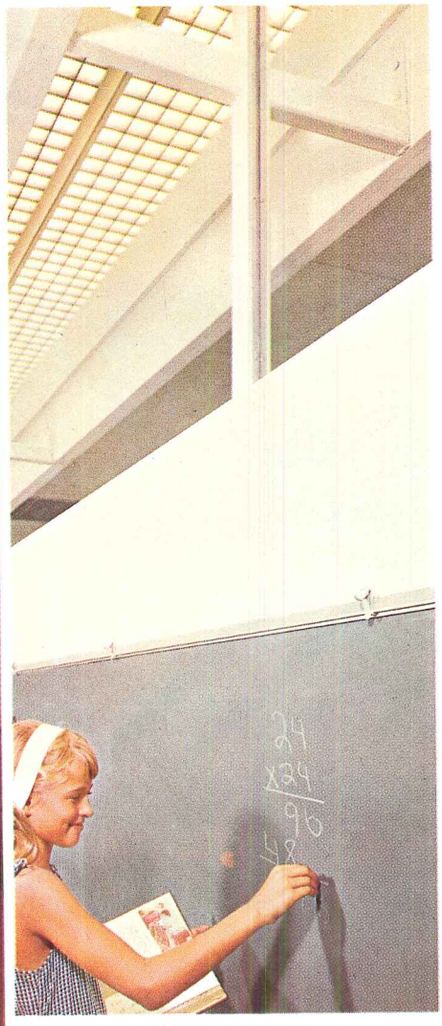
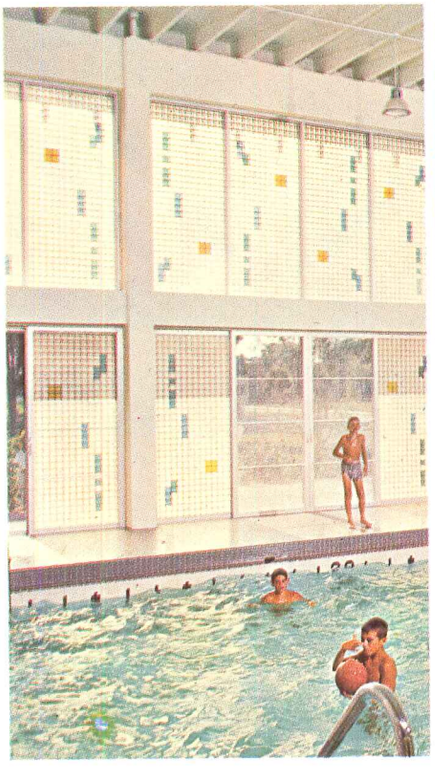
Glidden invites you to design with daylight . . .

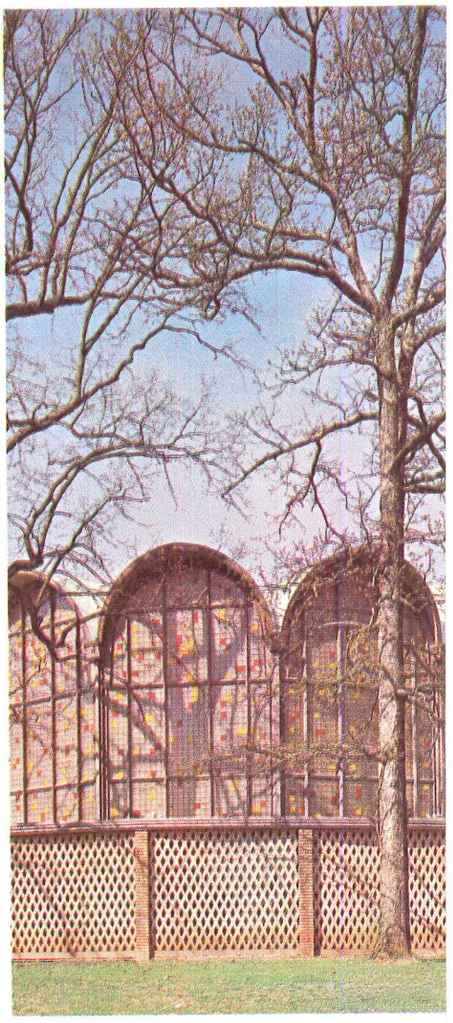
Glidden presents PANELUX® a translucent sandwich panel for curtain walls, skylights, wall panels



FOR TOPLIGHTING—PANELUX transmits and diffuses natural daylight, reduces glare, in classroom of Oneco Elementary School, Oneco, Florida.
Architect: Edward Dean Wyke



FOR IMAGINATION—PANELUX curtain wall with shoji cell pattern adds drama to upswept design of Stone Mountain Marina, Stone Mountain, Ga.
Architect: Cunningham & Forehand



FOR DECORATION—PANELUX brings decorative color, complements wood frame and masonry grill of circular building, Congregation Beth Jacob in Atlanta, Ga.
Architect: Barker & Cunningham

FOR INSULATION—PANELUX helps maintain an even temperature, eliminates condensation, resists shattering in Selby YMCA pool, Orlando, Fla.
Architect: Erwin Gremli II, AIA

PANELUX imparts new richness and variety to panel design. Its translucent polyester and glass fiber faces—with the subtle edge silhouette of the core grid—may be intermixed with a wide choice of accent colors in practically unlimited pattern combinations.

PANELUX transmits controlled daylight, yet assures privacy. It offers you a combination of advantages, such as structural strength, insulation value, weather and shatter resistance, that cannot be equalled by other panel materials. Contact your local Building Specialist Distributor. PANELUX is represented in every major city.

SOLAR LIGHT TRANSMISSION

MATERIAL		SOLAR TRANSMISSION
1. PANELUX, Type I	1-1/2" Thick	43.8%
2. PANELUX, Type I	2-3/4" Thick	37.5%
3. PANELUX, Type II	1-1/2" Thick	58.5%
4. Single Strength Glass		85.0%
5. Double Strength Glass		87.7%
6. Plate Glass, 1/4" Thick		88.0%

One of the primary advantages of PANELUX panels is its transmission of diffused daylight without glare. Tests show the human eye squints when light transmission is above 45%.

INSULATION "U" VALUE

MATERIAL	"U" VALUE
1. PANELUX, Types I and II	0.425
2. Glass Block	0.560
3. Thermopane 1/4" Air Space	0.610
4. Thermopane 1/2" Air Space	0.550
5. Thermopane 1" Air Space	0.530

"U" value is the overall coefficient of heat transfer. Heat energy is reported as Btu/hr./sq.ft. for each degree Fahrenheit. PANELUX panels possess the best insulation factor of any conventional light transmitting material.

Glidden

ARCHITECTURAL PRODUCTS DIVISION

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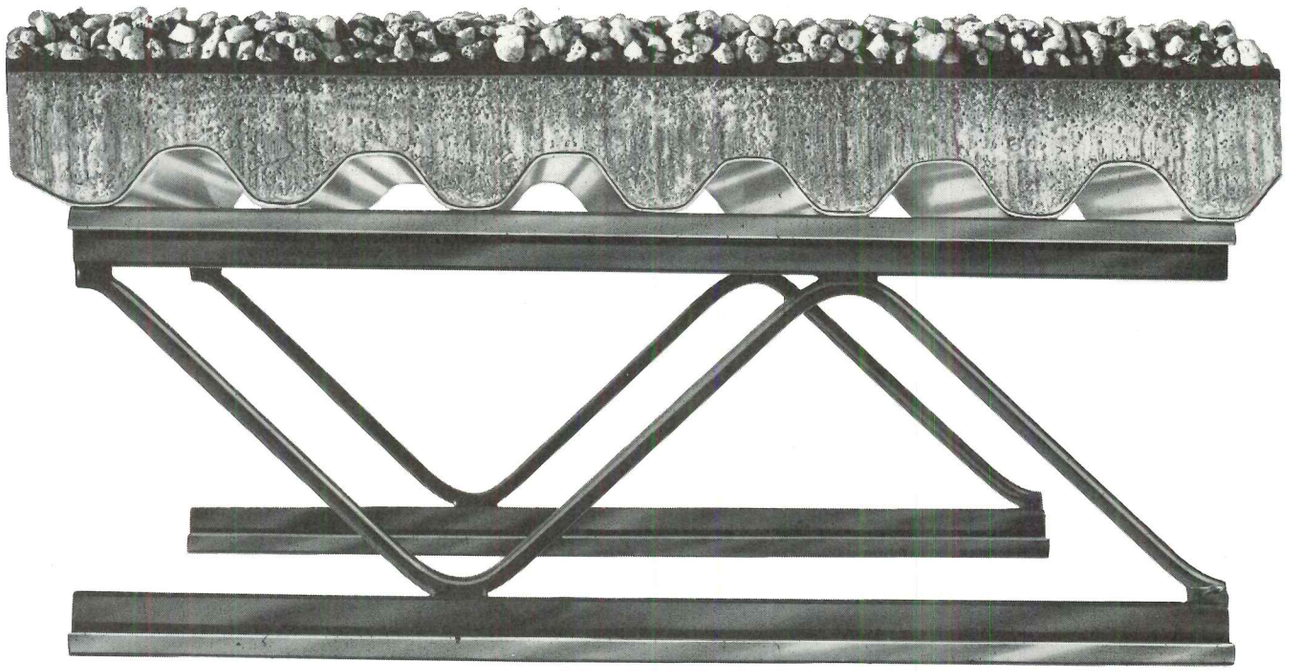
What do you expect for 8¢?



A roof deck like this costs $1.00 per square foot.* Joists 40¢, galvanized steel form 20¢, concrete 22¢, built-up roofing 18¢. This *includes* 8¢ worth of Permalite perlite concrete aggregate.

What does the 8¢ buy?

A better *all-around* deck with actual savings on the entire roof system. Here's how:

INSULATION: Permalite concrete, with a "K" of 0.58, *is* the insulation. Eliminates the need for other insulating materials; cuts heating and air-conditioning costs.

LIGHTWEIGHT STRENGTH: The deck shown, including steel form and concrete, weighs only 6½ pounds, and is stronger than other concretes in its class. Saves steel.

FIREPROOF: Permalite is non-combustible and carries maximum UL approved fire rating when supporting members are protected. Insurance costs less.

PERMANENT: Permalite and Portland cement is *true* concrete. There is no structural loss due to possible leaks; the insulation remains efficient for all the years you design into the building.

Put these and other Permalite features together into *one* roof deck and have a *combination* of advantages you can't get in any other type of roof . . . 8¢ well spent when you specify Permalite.

*Based on 2" of Permalite concrete over top of steel form corrugations, using cost averages of major market areas.

Permalite® LIGHTWEIGHT INSULATING CONCRETE

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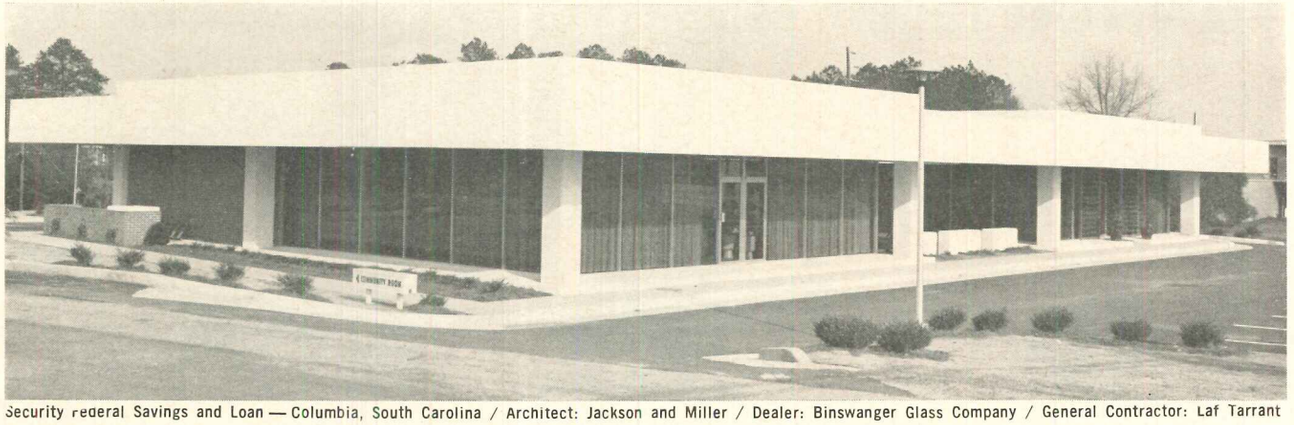
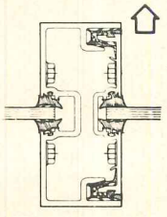
Versatility Means Savings

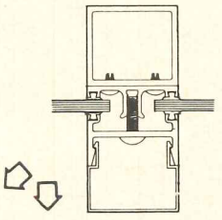
with professional architectural aluminum systems by Amarlite



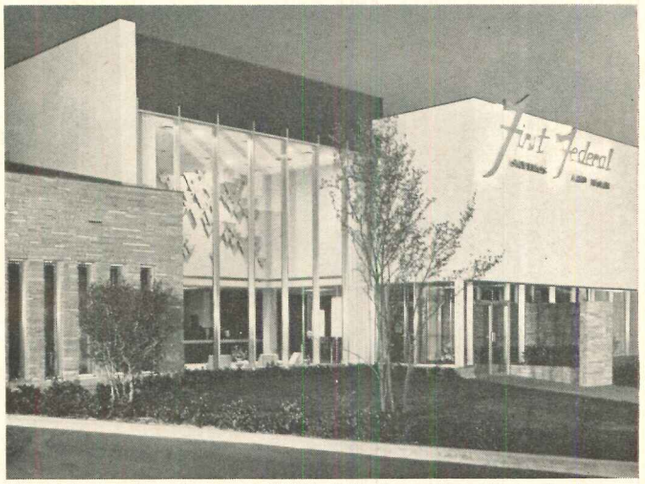
Security Federal Savings and Loan — Columbia, South Carolina / Architect: Jackson and Miller / Dealer: Binswanger Glass Company / General Contractor: Laf Tarrant

Amar-Tite . . . Built-in Resilience
Each mullion takes care of expansion/contraction . . . no matter how long the wall. Flush-glazed, weather-tight, with concealed fastenings. Clean and simple for a show window or a complete wall.





H V Trimline, Series 404
A basic grid system, easily erected and glazed from the exterior. Depth of mullion variable by your choice of back members and snap-on face. Accommodates glass, panels, doors, vents. No exposed fastenings.



First Federal Savings & Loan — Wichita Falls, Texas / Architect: Bank Building & Equipment Corporation / Dealer: Southwestern Glass & Paint Company, Inc. / General Contractor: Bank Building & Equipment Corporation

Citizens Bank — Gainesville, Florida / Architect: Kemp, Bunch & Jackson / Dealer: Crystal Glass & Paint, Inc. / General Contractor: Tassinari Construction Company

Your designs, executed in Amarlite's engineered systems, will be distinctive in detail, reliable in performance, and economically efficient. Your Sweet's file has Amarlite catalogs of entrances, curtain walls, store fronts, sliding doors, and LaPorte — newest in flush doors. For a representative, contact Amarlite Division of Anaconda Aluminum Company, P. O. Box 1719, Atlanta, Georgia 30301

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Good design provides for modern communications long before the concrete is poured.

Complex telephone systems, television, data transmission . . . today's businesses are depending more and more on services like these.

Plan for them in the blueprints.

Call the Architects and Builders Service at your local Bell Telephone Business Office.

No obligation, of course.

For further information on communications planning, see Sweet's Architectural File 33a/Be.

Bell System
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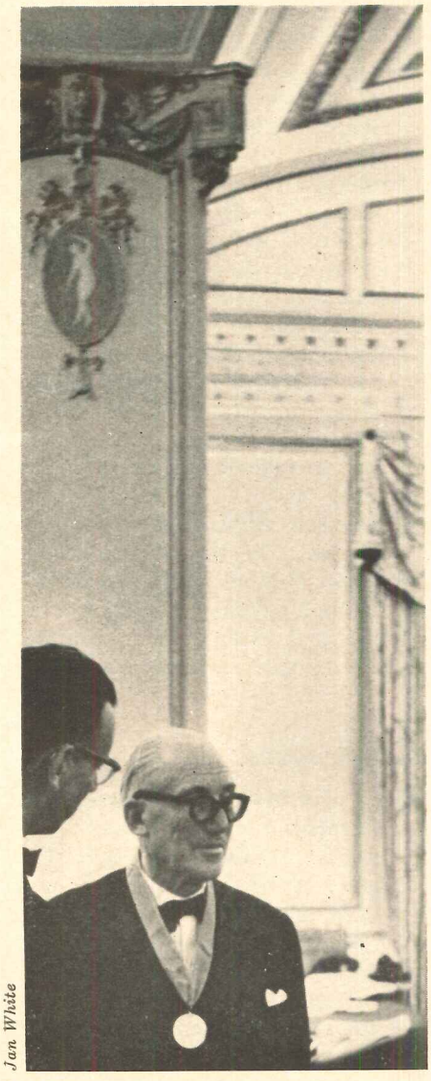
CHARLES EDOUARD JEANNERET, LE CORBUSIER

October 6, 1887 — August 27, 1965

Le Corbusier after he received the A.I.A. Gold Medal in 1961



Jan White

In theory the form of a building always comes out of the problem at hand, but the ability to invent an architectural form seems to be an unusual quality, given only to a very small number of people at any time in history. Le Corbusier possessed this rare ability; and his death is a loss to the entire world of architecture.

It is not that other architects copy the innovators, but that the existence of new forms defines the architectural problem in a different way. It is hard to believe that the design for the Boston City Hall would have been the same if there had never been a Convent of La Tourette, and yet the two buildings could not be more different in function, and their appearance is not really similar.

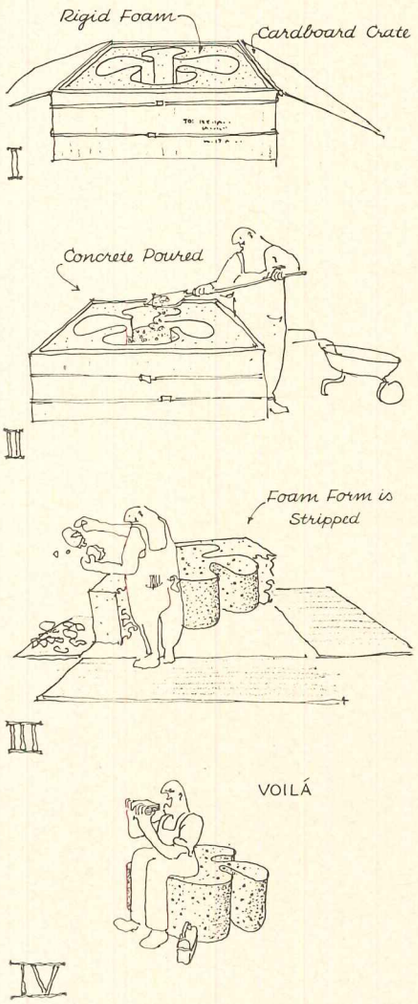
Le Corbusier's legacy for architects is far larger than La Tourette. It goes back to his diagram for the Citrohan house defining the separation of enclosure from support, the familiar concepts of pilotis and brise-soleils, the tall building in the park, the continuous building of Algiers, the edge beam of the Maison Jaoul, the look of concrete with the board and tie marks showing.

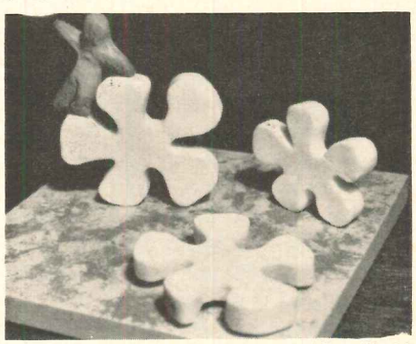
Architects, however, are seldom commissioned to invent architectural form, they are hired to design buildings. Le Corbusier's life as an architect resolved itself into a struggle between the requirments of the ordinary professional situation and the demands of his art. He rejected the fashionable formulas which might well have brought him early and easy success, and used his few architectural opportunities to build fragments of the Utopia he envisaged, and had expressed in the Voisin Plan and in his projects for Algiers. Even a relatively late building like the "Unite d'Habitation" in Marseille is only a small portion of what Le Corbusier would have, and could have, devised if the opportunity had been offered. Perhaps only with the buildings he designed in India was Le Corbusier able to attain full expression of his ideas, and from his Indian experience came the maturity that allowed him to do Ronchamp and La Tourette. Even Chandigarh, however, remains a fragment, with the realization of the total city surrendered to others, and only the government buildings really Le Corbusier's own.

The contrast between the wide diffusion of his ideas and his own relatively meager opportunities embittered Le Corbusier's last years. The scarlet robe of a Cambridge honorary degree or the Gold Medal of the A.I.A. only embarrassed him, when the only recognition that he felt to be important continued to be withheld.

Le Corbusier's vision was, of course, far from universal. His last design, for a hospital at Venice, showed that his active life had given him little sympathy with the special lonely battle of the sick. His buildings were not always well-constructed; his preoccupation with basic ideas made him impatient of detail. A consummate architectural sculptor, a painter in architectural form and light, his painting and sculpture by themselves seem a much lower order of achievement, although to the end he continued to assert that they were his real *metier*. He was a prolific writer, but his ideas never reached their true expression in the printed word. Although he understood his role as an innovator, he to some extent misunderstood the medium by which his ideas could be transmitted. His statements on city planning, divorced from their original architectural context, have done little but harm. His elaborate theory of *Le Modulor* is far from being the universal ordering principle its creator hoped it would be.

Nevertheless, Le Corbusier's influence will go on surrounding us for a long time to come. The apartment house with a garden terrace for each unit is his idea; it descends through Sir Basil Spence's housing in the Gorbals to Moshe Safdie's Habitat '67. The Marseille block continues to influence every residential quarter in Europe, the architecture of Japan continues to pay its tribute to Chandigarh. From the current vogue for bentwood furniture and studio houses and the universal presence of *beton brut*, to a vision of the city perhaps more prophetic than we care to acknowledge at this moment, we are all in Le Corbusier's debt.





Adam Ritchie

Do-it-yourself Playground Sculpture Proposed by Rolf Myller

New York architect Rolf Myller has devised a shipping and casting method which would make playground sculpture available at a reasonable cost. According to the architect, "the idea is simple. Instead of manufacturing the sculpture at some central location and shipping the object which may weigh more than a ton to the various destinations, the idea is to bubble up a negative or female form of urethane or styrofoam from the original shape. The form work for this shape may be a simple cardboard crate. This is set up on the site, concrete is then poured in at the site and when this has cured, the cardboard box and the foam form is then chipped away leaving the finished sculpture."

The idea has not yet been tried because Mr. Myller is still searching for appropriate fabricators.

President Signs Bill Creating Department of Housing and Urban Affairs

President Johnson signed into law a bill creating a new cabinet department of housing and urban affairs at a ceremony at the White House on September 9. "We are bringing into being today a very new and needed instrument to serve all the people of America," said the President. "It is not enough for us to erect towers of stone and glass, or to lay out vast suburbs of order and conformity. We must seek, and we must find, the ways to preserve and to perpetuate in the city the individuality, the human dignity, the respect for individual rights, the devotion for individual responsibility that has been part of the American character and the strength of the American system.

A White House spokesman reported that there was no indication as to when President Johnson will name the secretary of the new department.

SOM Named to Design New York Stock Exchange

The New York Office of Skidmore, Owings & Merrill has been named architect for the new New York Stock Exchange, which will rise on a super-block in Lower Manhattan. Keith Funston, president of the New York Stock Exchange, reported that the selection had been made on the recommendation of the building committee of the Exchange.

Gordon Bunshaft will be the designer in charge for SOM and J. Walter Severinghaus will be the general supervisor. Carl A. Morse, Inc., will serve as project consultant and general contractor is to be the Turner Construction Company. James D. Landauer, Associates, Inc. are real estate consultants.

General plans for the 100,000 square-foot site call for a building costing from $50 million to $65 million. Site cost is $7 million. The New York architectural firm of O'Conor & Kilham had been retained by the Exchange during study phase and site search for the project.

"Of special importance to the entire community," said Mr. Funston, "is the opportunity that our new location—at the entrance to New York's majestic harbor—affords us to make a significant contribution to the renaissance of Lower Manhattan."

A.I.A. Announces Staff Appointments

Kenneth C. Landry has been named as Administrator of Government Affairs by the American Institute of Architects in Washington, D.C. Mr. Landry, Administrator of the A.I.A.'s Department of Public Services for the past two years, assumes a new post created to increase the service the Institute can provide to federal agencies seeking to improve their design capabilities.

Replacing Mr. Landry is **M. Elliott Carroll,** for the past two-and-one-half years Administrator of the Department of Professional Services. Mr. Carroll will continue to be staff executive to the Committees on Aesthetics and Industrial Architecture, and he will also staff the Committee on International Relations.

Succeeding Mr. Carroll is **Robert J. Piper,** director of the Institute's Professional Practice Programs and Urban Design Programs since September, 1961.

Leonard Mayer will succeed Mr. Piper as Director of Professional Practice Programs. He was with the Washington firm of Faulkner, Kingsbury and Stenhouse, architects, where he was a project manager.

Obituaries

Mrs. Jean Bodman Fletcher, practicing architect and partner in The Architects Collaborative, Inc., Cambridge, Massachusetts since its inception in 1946, died on September 13. She was 50 years old.

Francis Joseph McCarthy, San Francisco architect and a former member of the city's Art Commission died on August 20, at the age of 55.

NEW. The handsome flush-line design 4200 Series desk; and the versatile 440 modular seating that includes one-, two-, three- and four-cushion units as well as add-on tables.

What's new for you in office furniture?

Plenty—from Steelcase! And for every area. New ideas . . . new lines . . . new ways to improve the beauty, comfort and efficiency of your clients' offices. In the established Steelcase tradition, emphasis is on quality, engineering and construction. Nature-perfect wood-grained laminates, super-hard acrylic finishes and flawless nickel chrome plating are some of the features that create a custom-designed look at production line prices. See for yourself at one of our conveniently located showrooms. Or, write Dept. G for full-color literature. Steelcase Inc., Grand Rapids, Mich.; Los Angeles, Calif.; Canadian Steelcase Co., Ltd., Don Mills, Ont.

NEW. The 4200 table—used effectively here as a desk; the fixed cushion 2200 line sofa; and the 1392 executive posture chair with high-back styling; fluted upholstery.

NEW. The 4900 table, with its attractive pedestal is ideal for an executive office conference corner. The flush-line credenza is from our 4200 Series.

NEW. Gracefully styled 2900 table, in four sizes from 96″ to 180″! Chair upholstery is new Nyron—the latest Steelcase combination of beauty and durability.

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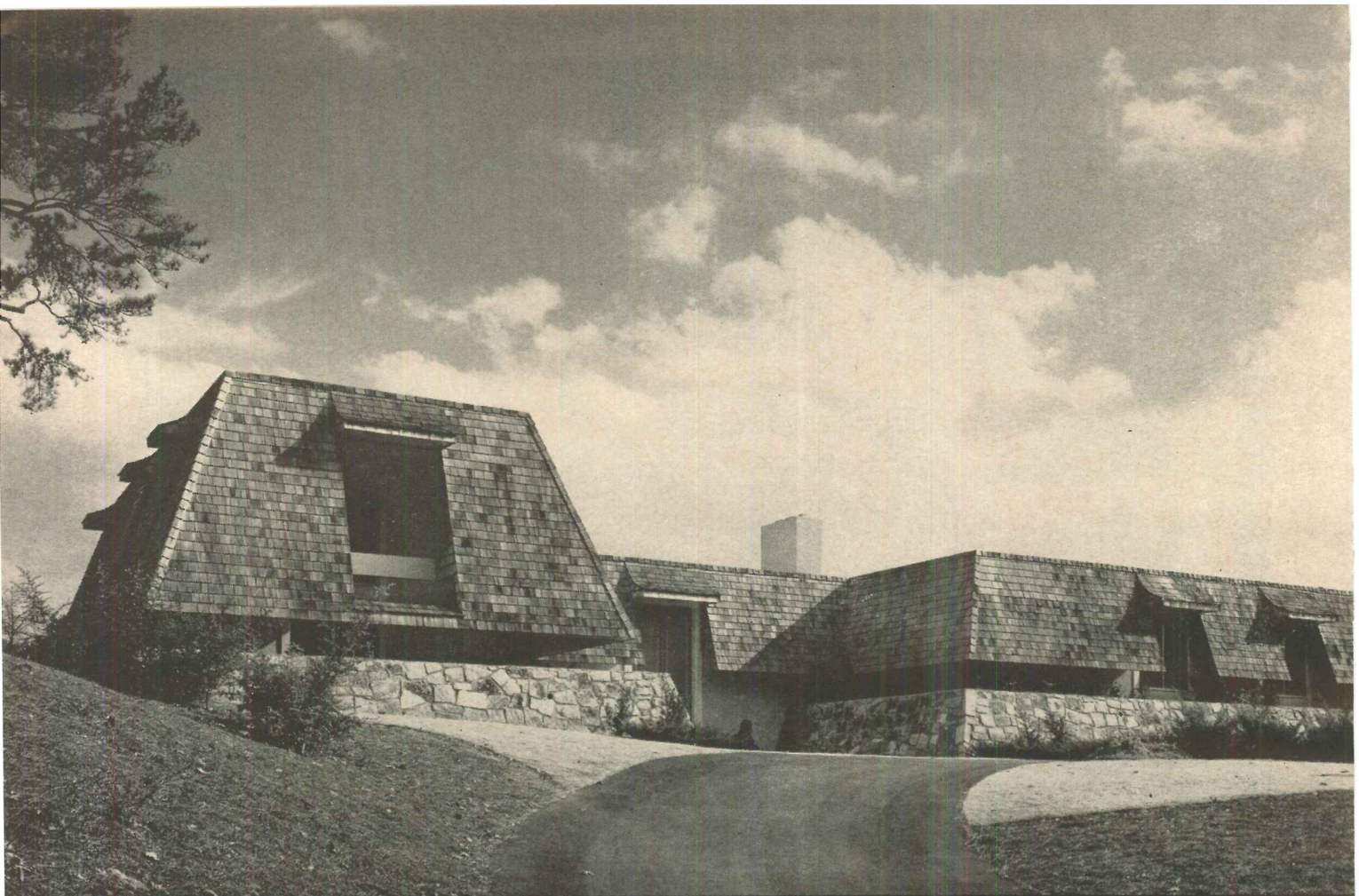
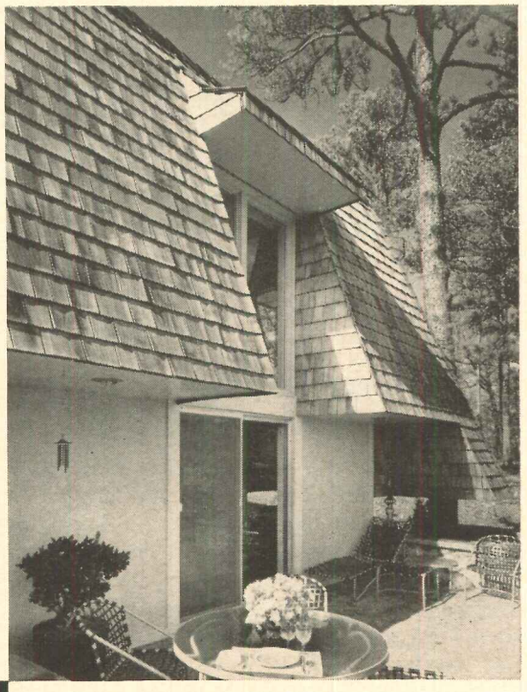
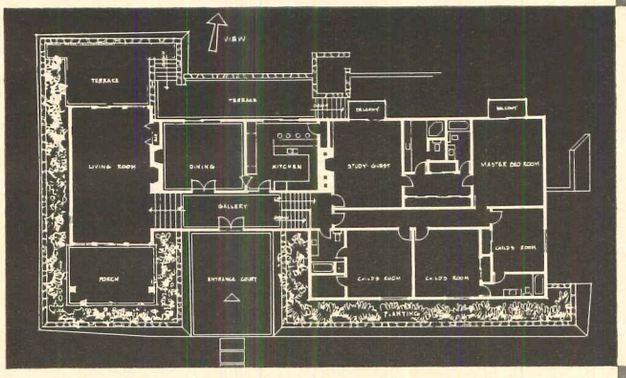


Natural, go-with-anything elegance:

Red Cedar Shingles and Handsplit Shakes

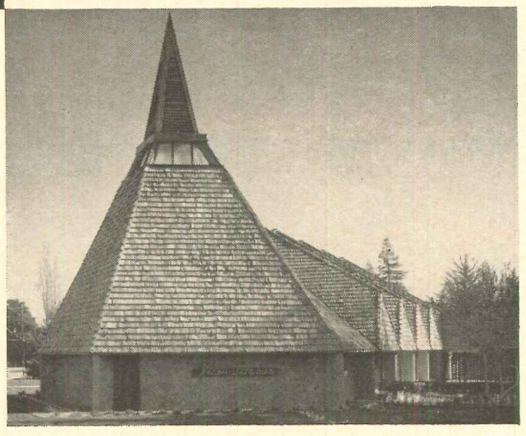
Whether it's a spired church on the open sward of a California coastal town, or an impregnable-yet-gracious home commanding a ridge over Atlanta, there's a red cedar shingle or handsplit shake just right for the project. Few, if any, roofing or wall covering materials offer the architect such a striking combination of aesthetic and practical advantages. Design versatility, beauty, strength, durability — these are just a few. We like to answer questions. Just write the Red Cedar Shingle & Handsplit Shake Bureau, 5510 White Building, Seattle, Washington 98101. (In Canada — 1477 West Pender Street, Vancouver 5, B.C.)





THE CROWNING TOUCH OF QUALITY
RED CEDAR SHINGLES & HANDSPLIT SHAKES

Architects Martin & Bainbridge of Atlanta designed this AIA Honor Award home for an Atlanta family of five. Sloping walls of shingle and stone lend a protective air while allowing full advantage to be taken of a spectacular view that extends beyond a nearby street. Certigrade shingle, 16" Red Label grade, were used with a 5" weather exposure.



The Messiah Lutheran Church is in Santa Cruz, California. *Architects Robert A. Bennighof and Associates* selected Certi-Split No. 1 Handsplit-Reswan Shakes 24" x ¾"-to-1¼", 10" to the weather.

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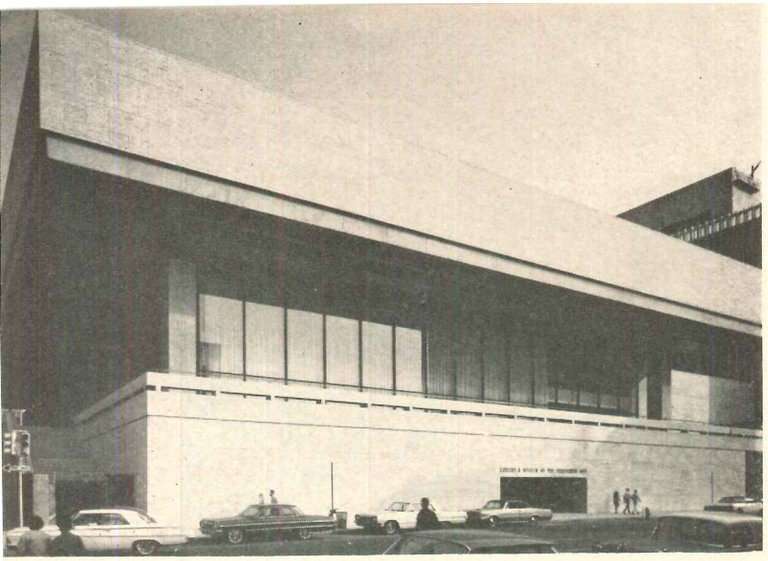
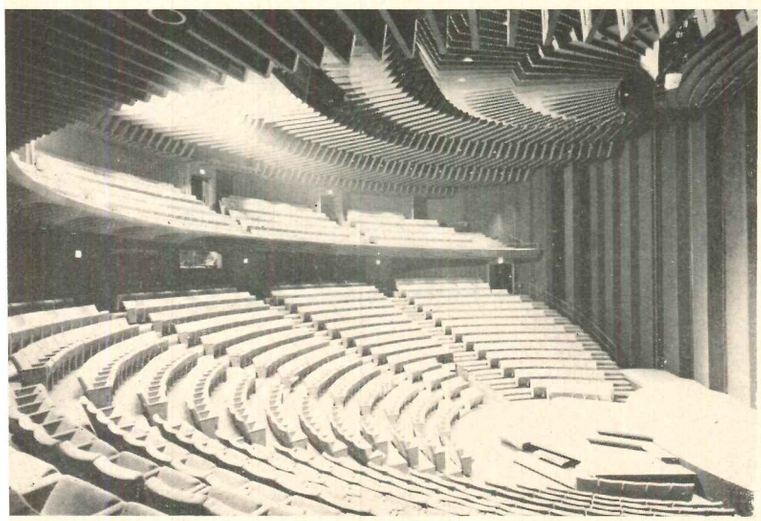


Ezra Stoller Photo

West Facade of Library and Museum of Performing Arts.

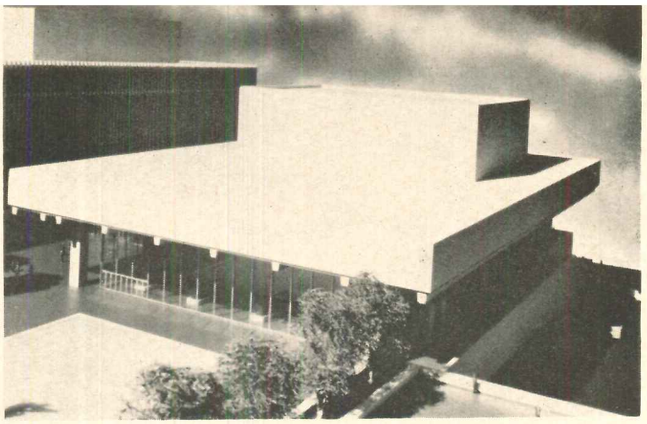
Theater-Library-Museum Is Completed at Lincoln Center

The Vivian Beaumont Theater and the Library and Museum of the Performing Arts at Lincoln Center, New York City share the same building, which was jointly designed by Eero Saarinen & Associates and the New York Office of Skidmore, Owings & Merrill. The Beaumont Theater, with interiors by Eero Saarinen & Associates, with Jo Mielziner as collaborating designer, was designed to provide for maximum flexibility, variety of stage arrangements, intimacy, and comfort. The main theater, which seats 1,140 at a maximum distance of 64 feet from the stage, can have a proscenium stage or an open stage of extreme thrust. A second theater, for experimental productions or rehearsals, seats 299. The exterior of the structure is concrete and glass. The Library and Museum, whose interior design was the responsibility of Skidmore, Owings & Merrill, integrates three functions: a popular library; a research library; and thematic exhibitions in the fields of the performing arts. Structural engineers were Amman & Whitney; mechanical engineers, Syska & Hennessy, Inc.; and general contractor, Turner Construction Company. Carl A. Morse was construction consultant and Col. William F. Powers, vice-president, engineering, both represented Lincoln Center.



Ezra Stoller Photo

Main theater seating 1,140, stage in thrust position.

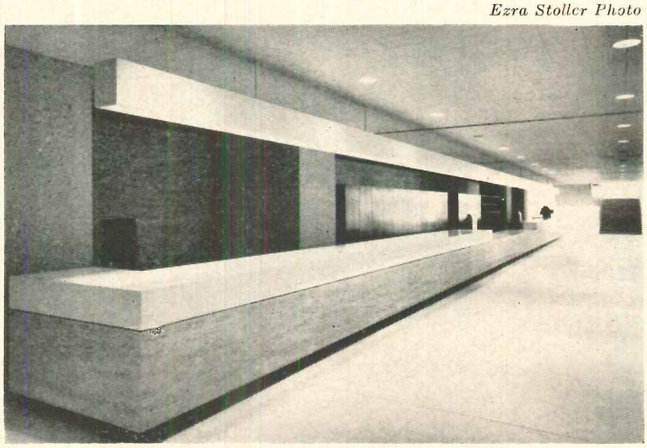


East facade of Vivian Beaumont Theater and Library and Museum Performing Arts.

Bob Serating

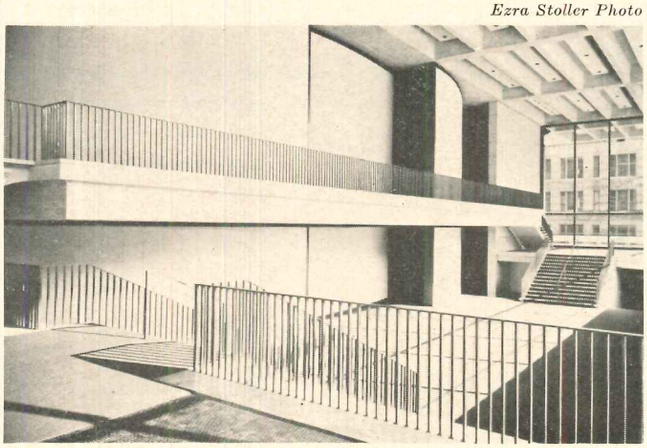
Sculptor Henry Moore with monumental "Reclining Figure," commissioned by Lincoln Center for reflecting pool between Vivian Beaumont Theater and Philharmonic Hall.

Ezra Stoller Photo

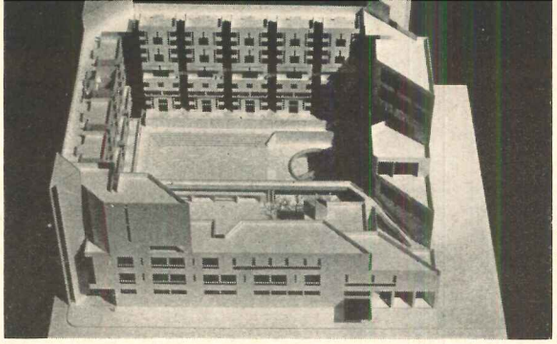


The 80-foot-long registration and circulation desk in Plaza Gallery in the Library and Museum of the Performing Arts.

Ezra Stoller Photo

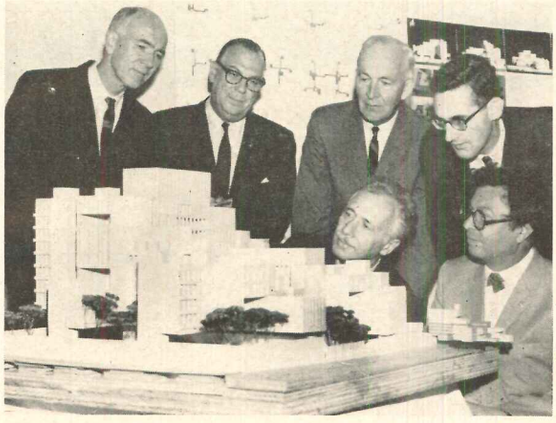


The lobby of the Vivian Beaumont Theater.



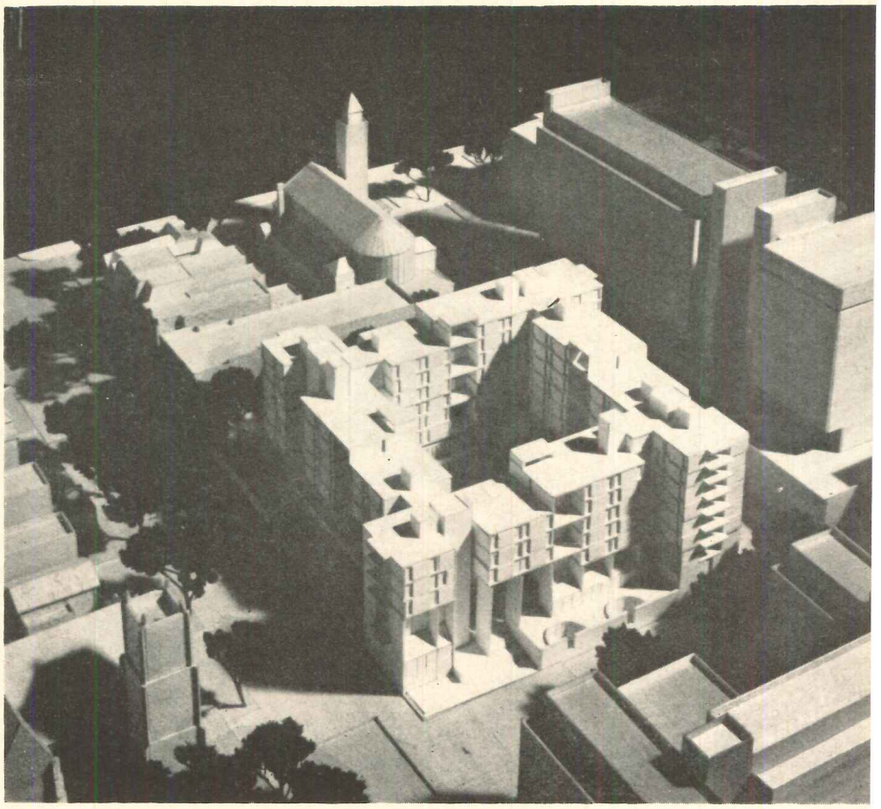
Louis R. La France

Above: Mitchell/Giurgola entry
Below: Entry of Geddes, Brecher, Qualls & Cunningham is examined by jury consisting of (left to right clockwise) William T. McClintock, businessman; J. Roy Carroll, Jr., architect; Frederick J. Rarig, businessman; H. Mather Lippincott, architect (professional adviser); Philip Klein, businessman; and Pietro Belluschi, architect and jury chairman.



Sam Miller

Below: The winning scheme by Bowers and Fradley.



Bower and Fradley Win International House Competition in Philadelphia

The Philadelphia architectural firm of Bower and Fradley have been named the winners in a limited competition for the design of International House in Philadelphia, a nonprofit institution which was founded in 1910 to promote understanding between foreign and domestic students. The other two firms in the competition were Mitchell/Giurgola associates and Geddes, Brecher, Qualls and Cunningham.

The $5.3 million structure designed by Bower and Fradley will rise on a site adjacent to the University of Pennsylvania campus and will house 425 residents in seven "houses" around a courtyard. Construction will be of brick, concrete and glass. The jury commended the winning design as being well organized and "the grouping of the four wings around a central court is pleasing. . . . The design of the typical suites, the sizes, proportions and the relationship of these rooms to each other was commended, as was the shared living rooms of more generous height."

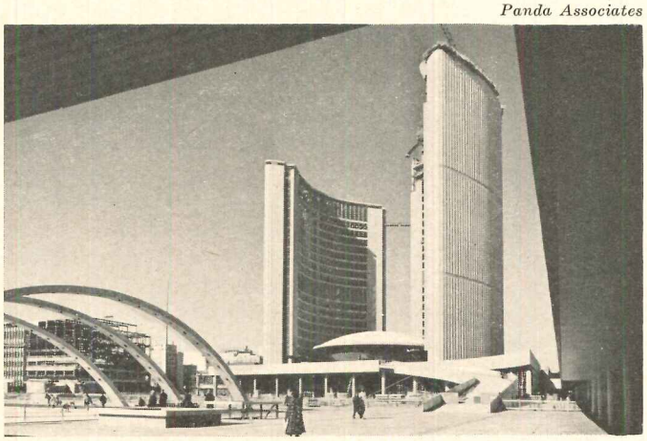
The Mitchell/Giurgola scheme called for six "houses" accommodating 432 students. The complex is organized in a linear scheme around the perimeter of the site, allowing a large courtyard. The jury, while praising the talent of the architects, criticized the one large courtyard as being "too institutional, creating a monumental rather than human scale."

The solution by Geddes, Brecher, Qualls and Cunningham called for five "houses" to accommodate 431 students, with the public facilities located below at pedestrian walkway level, under the stepped residences. A major effort was made to utilize roofs for sports and social functions.

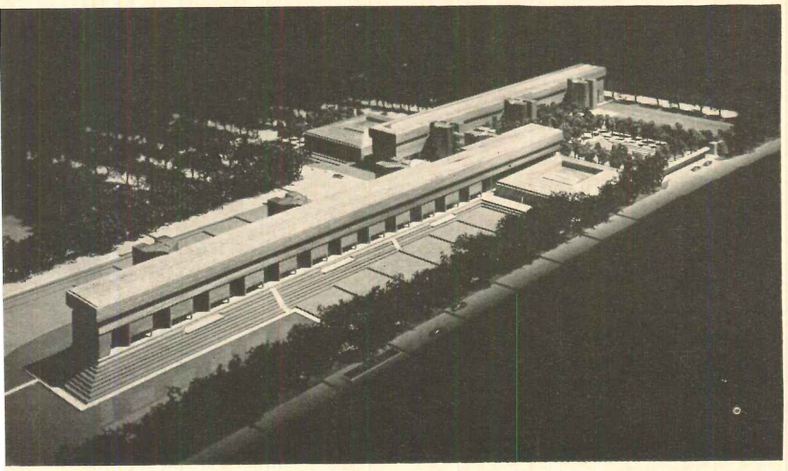
Toronto Hall Is Dedicated

The Toronto City Hall complex designed by the late Finnish architect Viljo Revell as a result of being the winner of a 1958 international competition, contains one 20-story office building and a 27-story office building wrapped around a domed Council Chamber with all buildings situated on a two-story podium. The remainder of the 12.75-acre site is composed of Nathan Phillips Square, a landscaped recreational area containing a giant reflecting pool. Construction is of steel, concrete, glass and marble. Parking for 2,400 cars is located under the plaza. Associated architects and engineers were John B. Parkin Associates and the general contractor was Anglin-Norcross (Ontario) Ltd.

Panda Associates

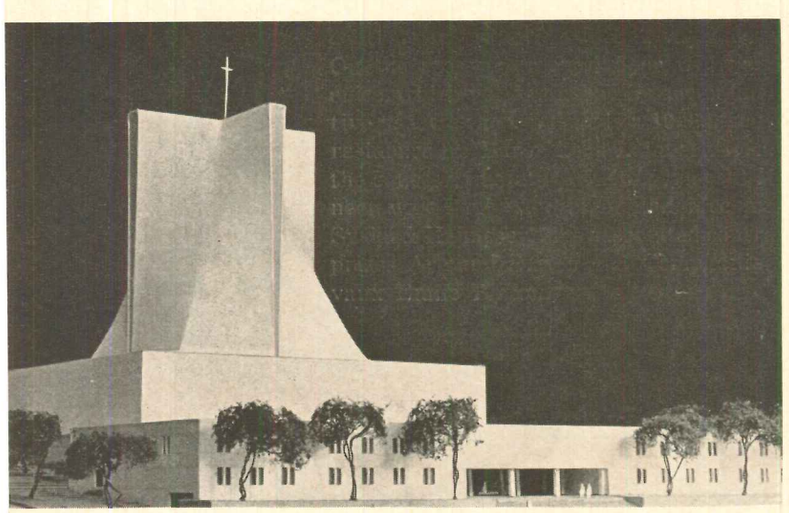


Bill Engdahl, Hedrich-Blessing



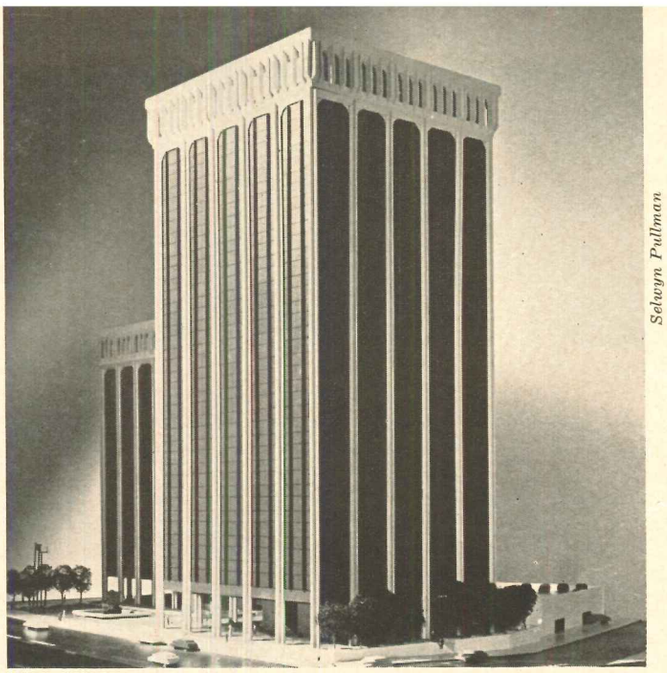
Community College Designed for 7000

The Forest Park Community College in St. Louis, designed by Harry Weese & Associates, architects will grow lineally from a central core containing the student center, dining facilities and educational resources center, which houses the library and audio-visual teaching facilities. The lineal elements, five stories high, will house large lecture halls on the lower floors, classrooms and faculty offices on the intermediate stories, and laboratories and other spaces used by students for longer periods of time on the top floors. Also included is a gymnasium and theater-lecture center. Construction is of brick cavity walls and concrete frame.



Cathedral Complex in San Francisco

The first Stage of the St. Mary's Cathedral Complex in San Francisco, will consist of a convent (*above left*), high school (*center*) and rectory (*right*) contained in a single two-story structure with the remainder of the complex containing a memorial museum and other facilities. The total complex will serve as a podium to the cathedral, whose spire will rise 180 feet from the 30-foot-high foundation. The reinforced concrete building will be faced in Roman Travertine. Architects are Angus McSweeney, Paul A. Ryan and John Michael Lee with Pier Luigi Nervi and Pietro Belluschi as design consultants. General contractor is the Cahill Construction Company.



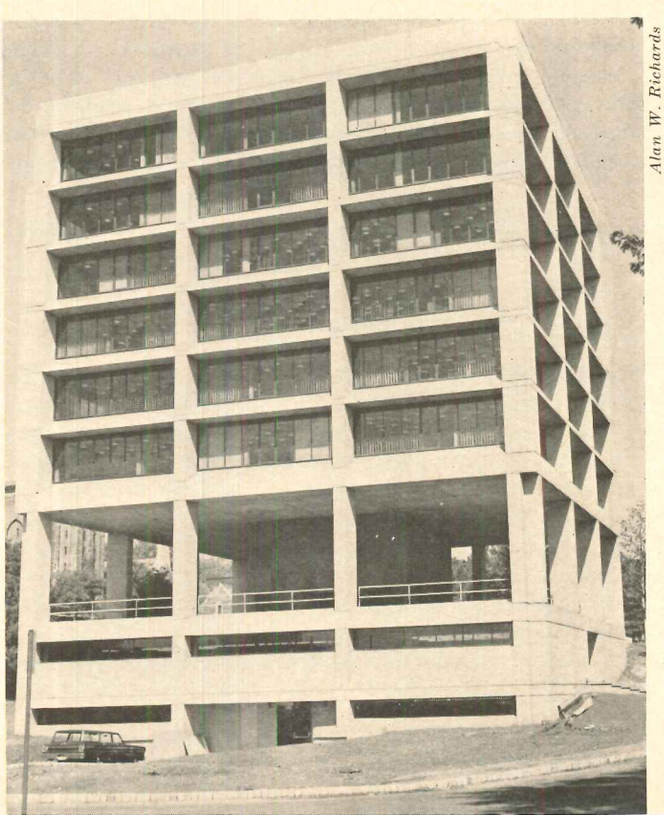
Selwyn Pullman

Bentall Center Rises in Vancouver

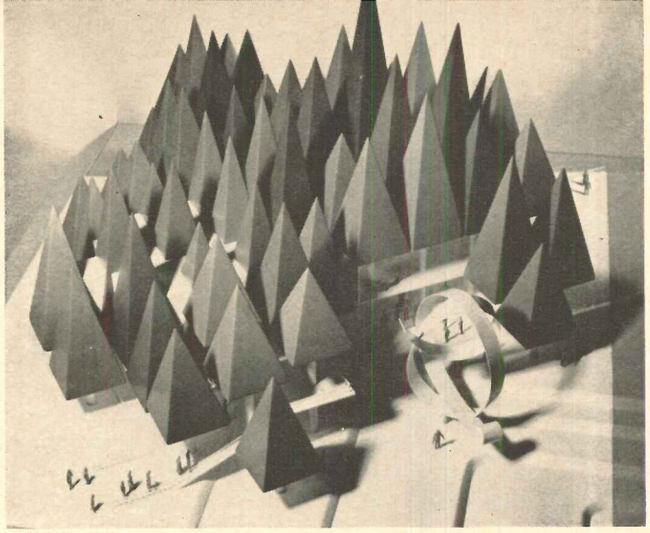
Construction has started on the 21-story, 116-foot-square first tower of the Bentall Center office building complex in Vancouver, British Columbia, Canada. Also planned for the complex, designed by architect Frank W. Musson, is a parking structure housing 500 cars and a small office tower. The main tower will have six bearing columns on each wall sheathed in white quartz aggregate with bronze tinted glass, bronze window mullions and bronze panels completing the facade. Completion is scheduled for January, 1967.

New South Building at Princeton

The administration building, known officially as the New South Building at Princeton University, Princeton, New Jersey, designed by architect Edward L. Barnes, has 59,000 square feet of area on two below-grade office floors, lobby, five above-grade office floors and a top floor cafeteria. The recently completed concrete and grey glass structure cost $2.2 million. The general contractor was the Matthews Construction Company.



Alan W. Richards



Province of Québec Film Bureau

Two Additional Pavilion Designs Are Disclosed For Expo. '67

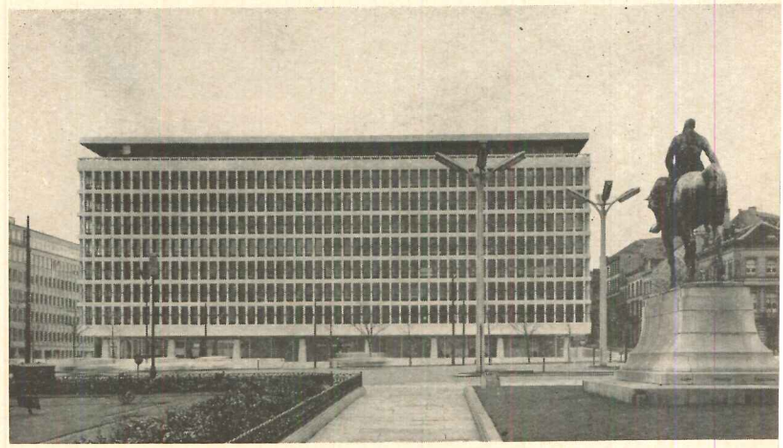
The Canadian Pulp and Paper Pavilion at Expo '67, the Universal and International Exhibition to be held in Montreal, Canada from April 28 to October 27, 1967 will be a two-story, glass enclosed structure with stylized evergreen trees of varying heights up to 90 feet high and made of translucent material in several shades of green, which will serve as the roof. At the front of the pavilion is an enormous sculpture of a spiraling roll of paper. Architects for the $1.5 million structure are Peter M. Acres and his associate C. A. Dubois. Designers are Kissiloff & Wimmershoff, Ltd.

The $7 million Quebec Pavilion for Expo '67, is a 50-foot-high truncated pyramid, raised about 10 feet above ground level so that the lower level will be a terrace open on all sides overlooking a lagoon. The project is designed by Papineau, Gérin Lajoie, Le Blanc and Durand, Montreal architects, who won a competition for the design of the building in October, 1964. The building will have a steel frame and an all-glass facade. At the top of the pavilion will be administrative offices and a terrace restaurant. Structural engineers are Boulva, Wermenlinger and Associates, mechanical and electrical engineers are Bouthillette and Parizeau.

Jean Malvaux, S.A.

Bauque Lambert Completed in Belgium

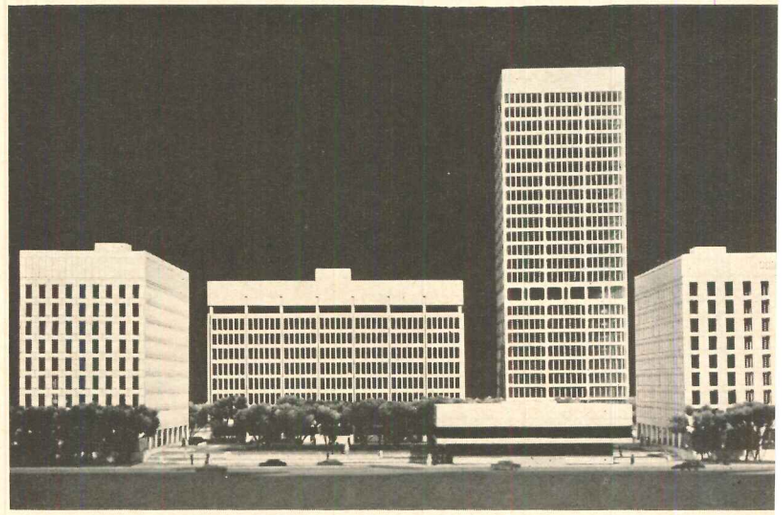
The new Bauque Lambert in Brussels, designed by Gordon Bunshaft of the New York Office of Skidmore, Owings & Merrill, is an elegant structure of cross-shaped precast concrete units on the facade with a recessed glass wall. On the recessed ground floor will be the main banking office, which will be topped by seven floors for administrative use. On the top floor is a 10,000-square-foot penthouse residence for Baron Léon Lambert. Located at the right is the equestrian statue of King Leopold II. Structural engineer was Paul Weidlinger and Mechanical engineer was Syska & Hennessy. The associated contractors were Enterprises Armand Blaton and Compagnie Industrie et Travaux Emile Blaton.

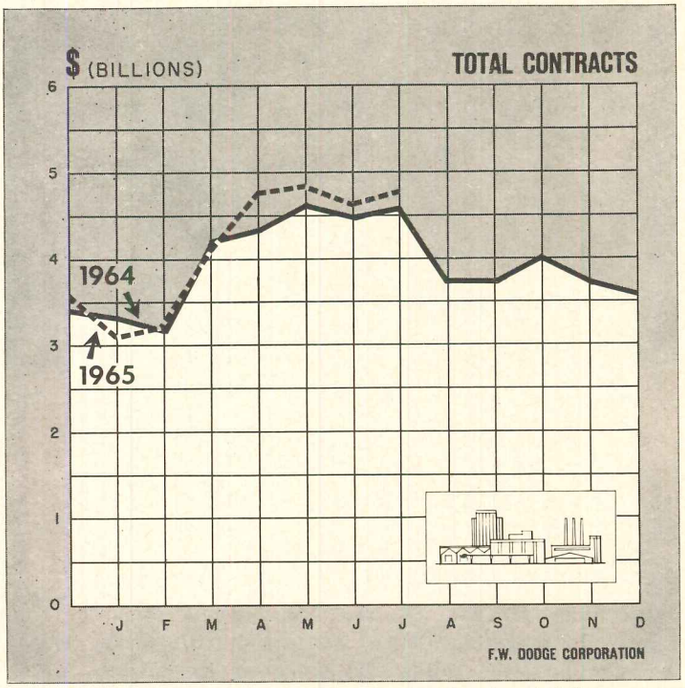


Alessandro Macone, Inc.

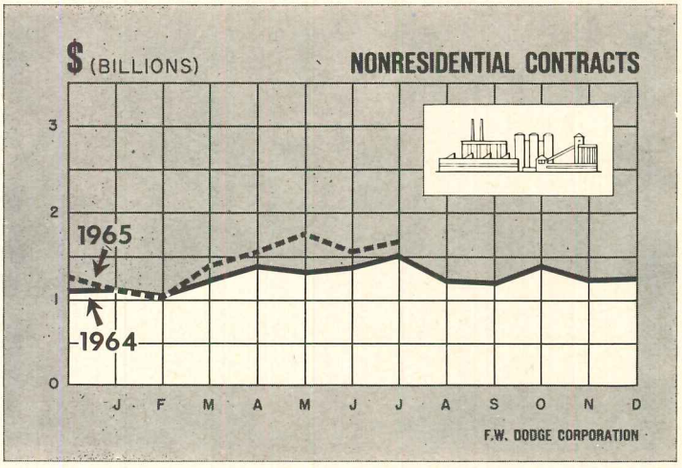
Two New Buildings for Technology Square

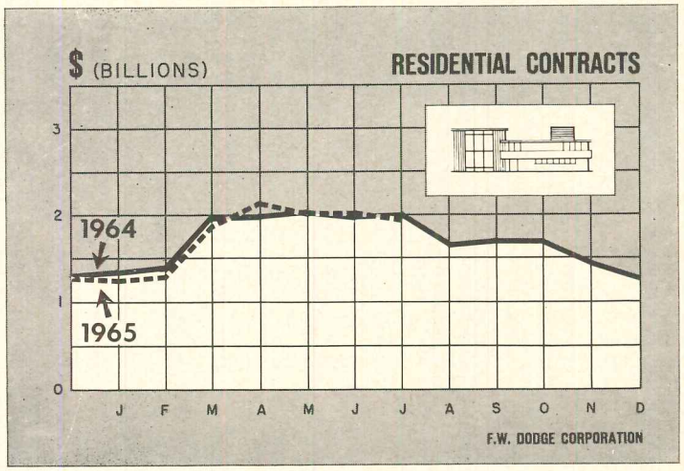
Two new buildings are under construction at Technology Square in Cambridge, Massachusetts—565 Technology Square, a nine-story office building designed by Pietro Belluschi and Eduardo F. Catalano (second from left) and 549 Technology Square, a three story for commercial and administrative use designed by Mr. Catalano, and located in front of a contemplated 22-story office building. Already completed are two nine-story office structures at the far left and far right of the model, both designed by Mr. Belluschi and Mr. Catalano. The complex is a joint development of the Massachusetts Institute of Technology and Cabot, Cabot & Forbes Company. The new nine-story structure will contain 172,000 square feet and is of precast concrete and glass construction, as is the three-story building. General contractor for the new buildings is the Aberthaw Construction Company.





Total contracts include residential, nonresidential and non-building contracts





BETTER SCHOOLS BUILT IN 1965

Building costs, measured on a dollars-per-square-foot basis, have been rising faster in the past few years. In 1964, the average cost for new buildings advanced two and a half per cent, and this year, square foot cost is up another three and a half per cent.

What's behind the rise? It's more than just a matter of prices. In addition to steadily rising wage rates in the construction trades, and a recent firming in the prices of structural materials, building costs also reflect the impact of the architect—the costs arising from changes in design and selection of products that go into newly built structures.

Often such increases in building costs are the price of progress, reflecting the introduction of recent advances in design and materials. And, while these might raise the initial unit cost of construction, they may well more than pay their way by lowering operating and maintenance costs (not to mention comfort, efficiency, convenience, etc.). Perhaps more important in the cost structure, though, is that changes in the *functions* of buildings often require higher-cost design and materials to do a different, more complicated job. This month's building type—educational building—is a good illustration of both these cost-raising forces at work.

Back in the fifties, when the sub-teen citizenry was growing by leaps and bounds, elementary school space was constantly in short supply. As a result, school construction at that time was geared to providing the maximum amount of classroom space for the available dollars. Cost per square foot remained low—between $14 and $15. Later, as needs became less urgent, communities were able to afford something more than just the bare essentials, and costs began to rise.

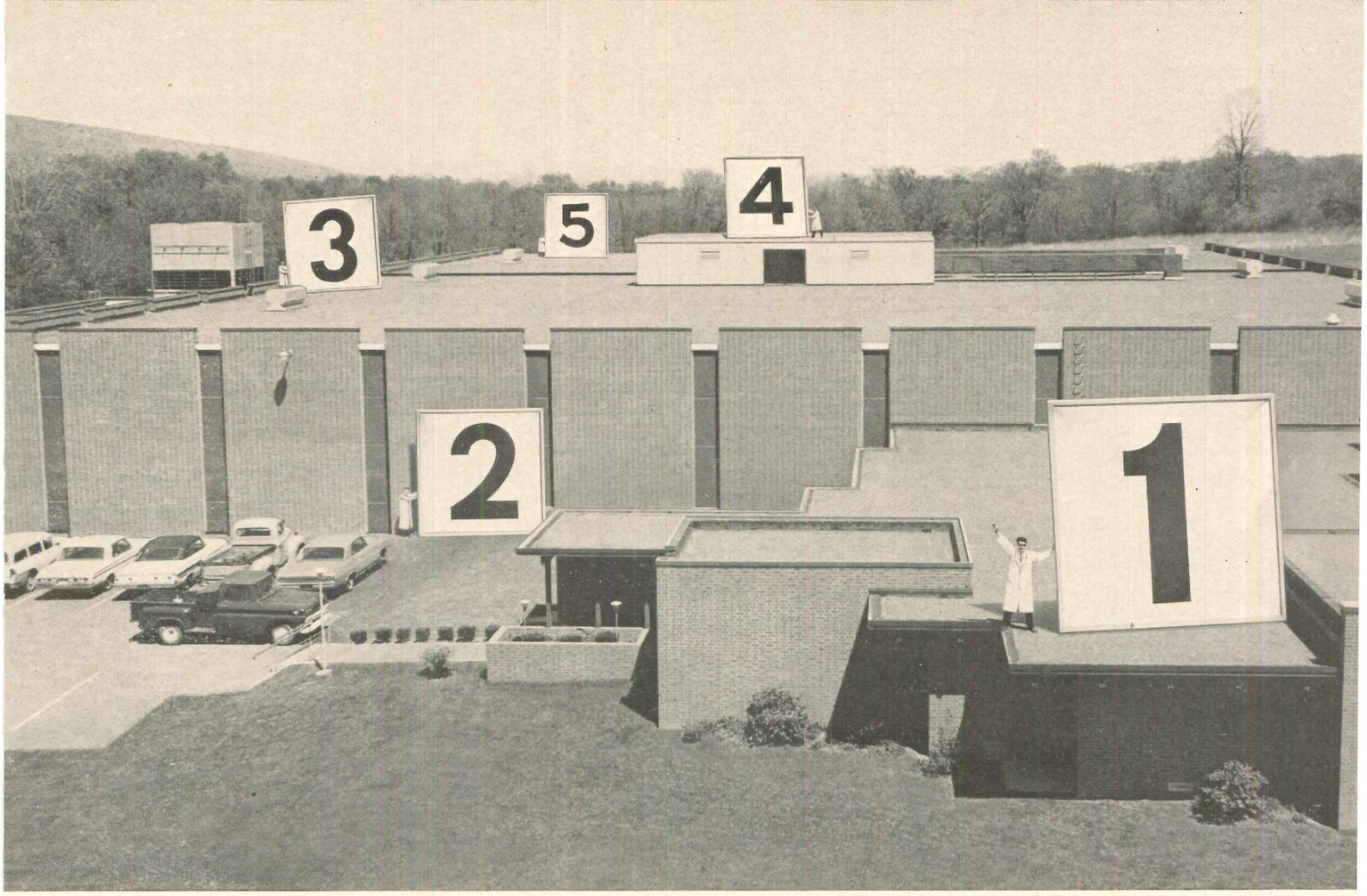
Over the years, however, the student body kept getting older, and educational building had to respond to its changing requirements. Even so, the impact of this factor on costs still wasn't too noticeable even in the early sixties when the enrollment pressure shifted from elementary schools to junior and senior high schools. But the only reason for this is that there's no great difference in the unit cost among any of these three types of buildings. All cost (in 1965) between $16 and $17 per square foot, on the average.

The big boost in educational building costs, driving the overall average up from $16 as recently as 1962 to the current $18.25, has come from the recent spurt in college building. Just about all possible conditions are favoring higher educational construction these days—the college age group is now the fastest-growing population category; a higher percentage of this age group is actually going on to college; new Federal programs are backing college construction with loans and grants. Higher educational construction is largely responsible for the unusual expansion in total educational building this year, and is making this category one of today's hottest building markets.

The cost impact of this shift in educational needs has been clear and direct. A typical unit of college classroom involves roughly 40 per cent more design, materials, labor, etc., than an equivalent amount of elementary or high school building ($23 per square foot against $16.50).

Thus with both the physical volume *and* the unit value of educational building up sharply, and slated to remain high for the next several years, school construction—and especially colleges—will be getting a bigger share of the total building market.

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



NEW PLASTI-VAC PLANT, Montgomery, Pa., features all-electric design for maximum efficiency and economy. Architects: Wagner and Hartman Associates, Williamsport, Pa. Engineers: Nicholas-Cowley Associates, Harrisburg, Pa.

New Pennsylvania factory points up five exclusive benefits of all-electric design!

Engineer Fred Nicholas, P.E., Nicholas-Cowley Associates, Harrisburg, Pa., is a firm believer in all-electric design.

The new 60,000 square-foot Plasti-Vac plant in Montgomery, Pennsylvania, is the job that sold Fred Nicholas on all-electric design as a valuable engineering tool.

He reports, "By specifying electric equipment throughout, we were able to plan a thoroughly modern factory in which all plant production operations were integrated with heating, cooling and lighting for maximum efficiency.

"The net result, according to Plasti-Vac management, is greater year-round comfort, reduced absenteeism and improved housekeeping."

Five basic advantages which influenced the choice of all-electric design for the Plasti-Vac plant are illustrated by the numbers in the picture above. They include:

1 **Operating economy:** Process water used for cooling in the plant's plastic molding operation is also used subsequently as a heat reservoir for space heating in office, storage and production areas.

2 **Freedom of design:** Floor plan featuring core production, perimeter storage and windowless exterior helps to minimize building maintenance and cut down heat loss and gain.

3 **No space needed for boiler:** All heating and cooling is supplied by 300-ton electric chiller unit which recirculates water throughout the plant at a steady year-round 78°.

4 **Flameless process heating:** In central production area, all heat for injection molding and elevated-temperature storage room is supplied electrically, providing an additional safeguard in dealing with a product requiring careful thermal control.

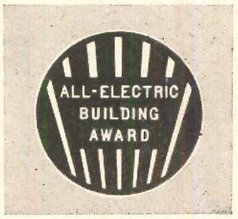
5 **Ease of expansion:** Heating and cooling for future 35,000 square-foot addition can be accomplished by linking in a supplemental chiller unit.

If you are interested in knowing more about the factory covered in this report, or other ways all-electric design can help you in planning industrial and commercial construction, contact your local electric utility company. They will welcome the opportunity to work with you.

BUILD BETTER ELECTRICALLY

Edison Electric Institute, 750 Third Avenue, New York, N.Y. 10017

THIS PLAQUE, now given by many electric utility companies, identifies a modern building which has met the high standards of electric heating, cooling, lighting—and other applications—set by the Edison Electric Institute. On your clients' buildings, this All-Electric Award serves as a reminder of your role in specifying clean, automatic, economical electric equipment.



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Building Construction Costs

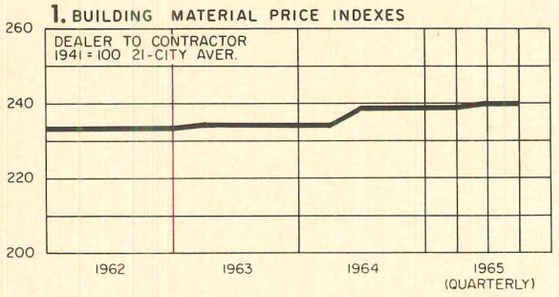
By William H. Edgerton
Manager-Editor, Dow Building Cost Calculator, an F. W. Dodge service

The information presented here permits quick approximations of building construction costs in 21 leading cities and their suburban areas (within a 25-mile radius). The tables and charts can be used independently, or in combination as a system of complementary cost indicators. Information is included on past and present costs, and future cost can be projected by analysis of cost trends.

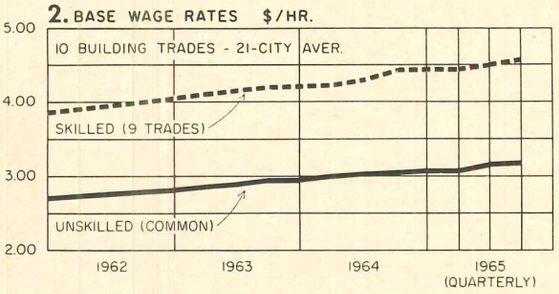
A. CURRENT BUILDING COST INDEXES—SEPTEMBER 1965
1941 Averages for each city = 100.0

Metropolitan Area	Cost Differential	Current Dow Index Residential	Current Dow Index Nonresidential	Per Cent Change Year Ago Res. & Nonres.
U. S. AVERAGE— 21 Cities	8.5	270.5	288.2	+1.89
Atlanta	7.2	306.2	324.7	+2.13
Baltimore	7.9	272.5	289.8	+1.42
Birmingham	7.5	249.8	268.6	+1.41
Boston	8.5	245.5	259.9	+2.43
Chicago	8.9	299.3	314.8	+1.37
Cincinnati	8.8	260.3	276.9	+1.60
Cleveland	9.2	277.7	295.2	+3.52
Dallas	7.7	253.8	262.1	+1.01
Denver	8.3	278.6	296.2	+2.09
Detroit	8.9	273.3	286.9	+2.38
Kansas City	8.3	244.3	258.6	+2.24
Los Angeles	8.3	276.6	302.6	+2.85
Miami	8.4	266.9	280.2	+1.13
Minneapolis	8.8	270.3	287.3	+1.39
New Orleans	7.8	244.1	258.6	+1.95
New York	10.0	281.8	303.1	+2.42
Philadelphia	8.7	269.4	282.8	+1.82
Pittsburgh	9.1	253.1	269.1	+0.68
St. Louis	9.1	267.8	283.8	+3.39
San Francisco	8.5	343.8	376.2	+1.18
Seattle	8.4	246.1	275.0	+1.24

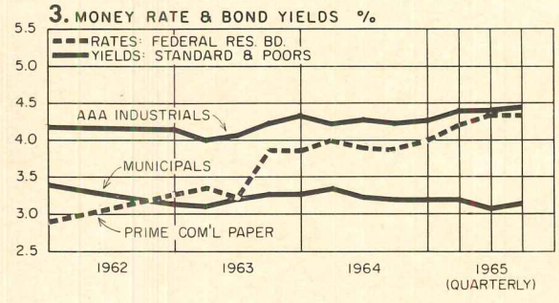
1. BUILDING MATERIAL PRICE INDEXES



2. BASE WAGE RATES $/HR.



3. MONEY RATE & BOND YIELDS %



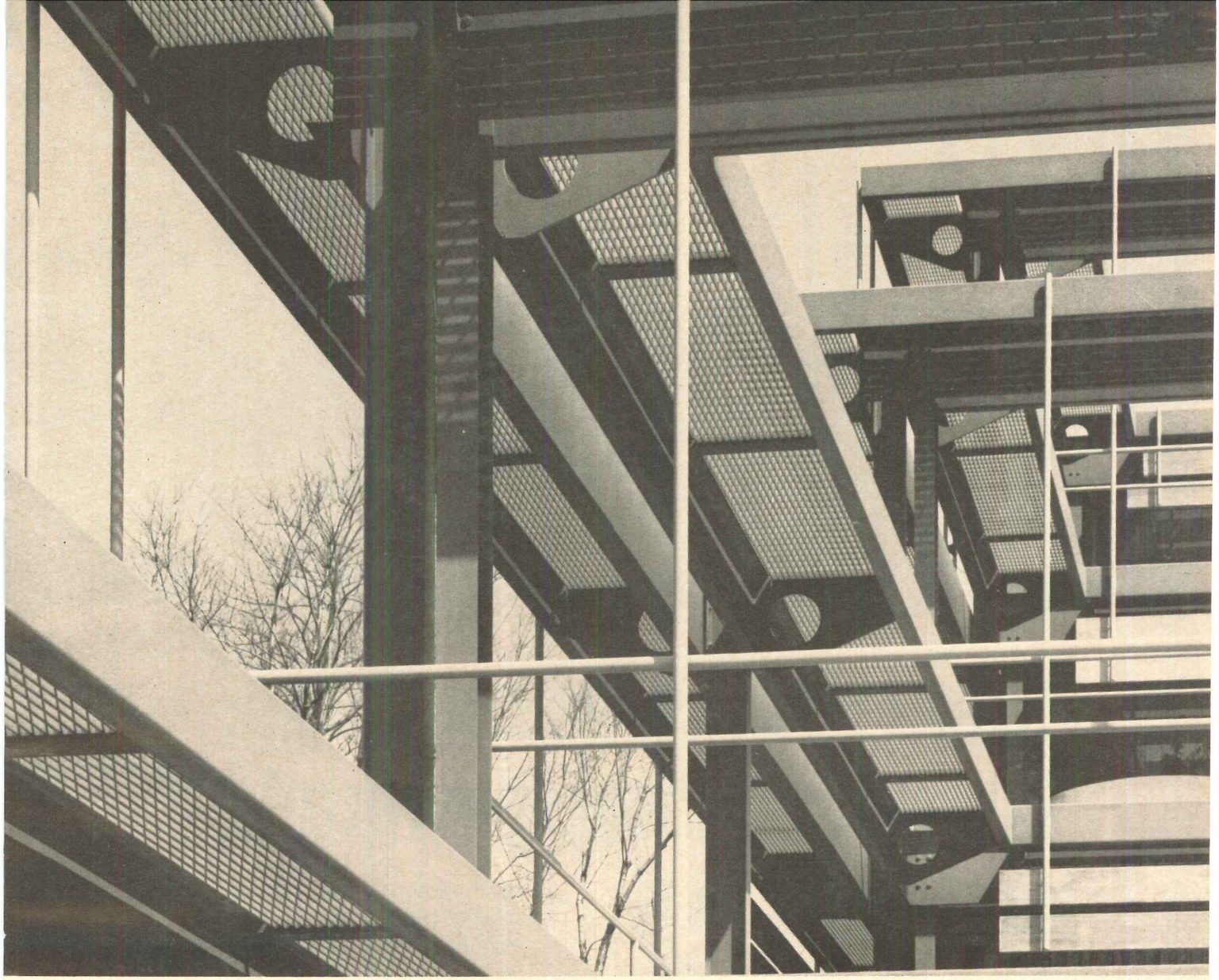
B. HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES — 1941 average for each city = 100

Metropolitan Area	1952	1958	1959	1960	1961	1962	1963	1964 (Quarterly) 1st	2nd	3rd	4th	1965 (Quarterly) 1st	2nd	3rd	4th
U.S. AVERAGE 21 Cities	213.5	248.9	255.0	259.2	264.6	266.8	273.4	274.7	276.8	278.6	279.3	279.5	281.0	283.7	
Atlanta	223.5	277.7	283.3	289.0	294.7	298.2	305.7	310.0	312.3	313.4	313.7	313.9	317.9	320.6	
Baltimore	213.3	251.9	264.5	272.6	269.9	271.8	275.5	277.2	279.3	280.5	280.6	280.5	281.0	284.7	
Birmingham	208.1	233.2	233.2	240.2	249.9	250.0	256.3	258.0	259.9	260.1	260.9	261.2	264.1	264.9	
Boston	199.0	230.5	230.5	232.8	237.5	239.8	244.1	246.1	247.9	251.3	252.1	251.7	252.6	256.3	
Chicago	231.2	273.2	278.6	284.2	289.9	292.0	301.0	302.2	304.5	305.1	306.6	306.5	307.3	310.2	
Cincinnati	207.7	250.0	250.0	255.0	257.6	258.8	263.9	265.1	267.1	268.9	269.5	269.4	270.2	272.9	
Cleveland	220.7	257.9	260.5	263.1	265.7	268.5	275.8	276.3	278.4	282.0	283.0	282.3	283.4	290.8	
Dallas	221.9	230.5	237.5	239.9	244.7	246.9	253.0	253.7	255.6	255.6	256.4	256.9	257.9	259.5	
Denver	211.8	252.8	257.9	257.9	270.9	274.9	282.5	282.6	284.7	287.3	287.3	287.3	288.2	292.7	
Detroit	197.8	239.9	249.4	259.5	264.7	265.9	272.2	272.7	274.7	277.7	277.7	277.7	279.3	283.5	
Kansas City	213.3	235.0	239.6	237.1	237.1	240.1	247.8	246.2	248.0	249.6	250.5	251.2	252.0	255.0	
Los Angeles	210.3	253.4	263.5	263.6	274.3	276.3	282.5	284.0	286.1	286.1	288.2	288.9	289.7	295.8	
Miami	199.4	239.3	249.0	256.5	259.1	260.3	269.3	270.1	272.1	273.1	274.4	274.4	275.4	276.6	
Minneapolis	213.5	249.9	254.9	260.0	267.9	269.0	275.3	275.0	277.1	281.6	282.4	283.4	283.6	283.9	
New Orleans	207.1	235.1	237.5	242.3	244.7	245.1	248.3	247.1	248.9	249.3	249.9	250.5	253.1	255.1	
New York	207.4	247.6	260.2	265.4	270.8	276.0	282.3	284.8	286.9	289.7	289.4	290.2	294.0	296.0	
Philadelphia	228.3	257.6	262.8	262.8	265.4	265.2	271.2	271.1	273.1	274.5	275.2	275.5	276.4	279.5	
Pittsburgh	204.0	236.4	241.1	243.5	250.9	251.8	258.2	260.8	262.7	262.9	263.8	264.0	264.9	265.9	
St. Louis	213.1	239.7	246.9	251.9	256.9	255.4	263.4	266.8	268.8	271.4	272.1	272.9	276.1	279.9	
San Francisco	266.4	308.6	321.1	327.5	337.4	343.3	352.4	358.2	360.9	364.1	365.4	366.6	366.9	367.7	
Seattle	191.8	225.8	232.7	237.4	247.0	252.5	260.6	260.1	262.0	265.7	266.6	265.1	266.3	267.8	

HOW TO USE TABLES AND CHARTS: Building costs may be directly compared to costs in the 1941 base year in tables A and B: an index of 256.3 for a given city for a certain period means that costs in that city for that period are 2.563 times 1941 costs, an increase of 156.3% over 1941 costs.

TABLE A. 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 first city are 25% higher than costs in second. Also, costs in second city are 80% of those in first (8.0 ÷ 10.0 = 80%) or 20% lower in the second city

TABLE B. 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 index for a city for one period (200.0) divided by index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than those of the other. Also, second period costs are 75% of those of the other date (150.0 ÷ 200.0 = 75%) or 25% lower in the second period. **CHART 1.** Building materials indexes reflect prices paid by builders for quantity purchases delivered at construction sites. **CHART 2.** The $1.20 per hour gap between skilled and unskilled labor has remained fairly constant. **CHART 3.** Barometric business indicators that reflect variations in the state of the money market



VERSATILE BORDEN PRESSURE LOCKED GRATING

Borden's Pressure Locked steel grating is used extensively as the flooring of the continuous balconies surrounding the new Washington, D.C. German Chancery building shown here. An integral part of the design of this striking 95,000 sq. ft. steel-and-wood-framed structure, the grating adds the practical advantages of sun shading, ease of window cleaning, and needing no maintenance itself.

Available in many types, Borden's Pressure Locked Type B, approved for all general purposes, was chosen for the above application. For complete information on this grating type and Borden's Riveted and All/Weld gratings, all in both steel and aluminum, write for a free copy of:

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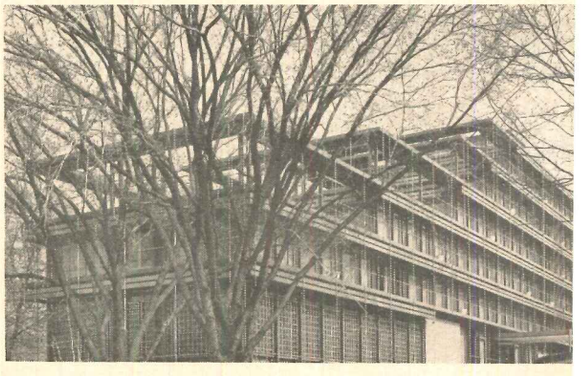

ARCHITECT/ENGINEER: GEORGE L. DAHL • GENERAL CONTRACTOR: ROBERT E. MC KEE • MECHANICAL CONTRACTOR: C. WALLACE PLUMBING CO.

Ideal climate for savings: Carrier cooling, powered by the Gas-fired heating boilers

Southwestern Life Insurance recently completed this striking new headquarters building in Dallas. One of its ultra-modern features: a year-round Carrier Gas absorption refrigeration system.

Optimum temperature control and dependability were important determinants in the choice. But economy was the big factor. Gas-fired boilers supply hot water for winter heat *and* for the Carrier cooling unit in summer. And an exclusive solution-capacity control makes Carrier's partial cooling load efficiency unbeatable.

Add to this the trouble-free simplicity of Carrier equipment. (No major moving parts.) And the low energy costs of clean-burning Gas. Insure the economy of your next project—with Carrier and Gas. For details, call your local Gas Company sales engineer. Or write: Carrier Air Conditioning Company, Syracuse 1, N. Y.

AMERICAN GAS ASSOCIATION, INC.

For heating and cooling... Gas is good business.

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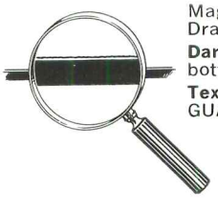
New Kohler buy-word

SAFEGUARD

...textured bathtub bottom for stand-up safety

Kohler has developed the slip-resistant bathtub to protect bathers from falls. It increases safety especially for children and older people. Kohler SAFEGUARD is not an accessory. An integral part of the tub, it consists of a textured section of the tub bottom which provides a firm footing—but also comfortable to sit on. This section is the same acid-resisting, easy to clean, smooth and beautiful enamel used on all Kohler tubs.

SAFEGUARD is optional at slight extra cost on any bathtub made by KOHLER. Specify SAFEGUARD when ordering, and add "S" to the bathtub plate number. Sell SAFEGUARD as a desirable extra in all installations to be used by young children and the elderly. For details write, SAFEGUARD, Kohler Co., Kohler, Wisconsin.



Magnified Cross-Section Drawing Shows:
Dark area—cast-iron tub bottom
Textured surface is SAFEGUARD enamel

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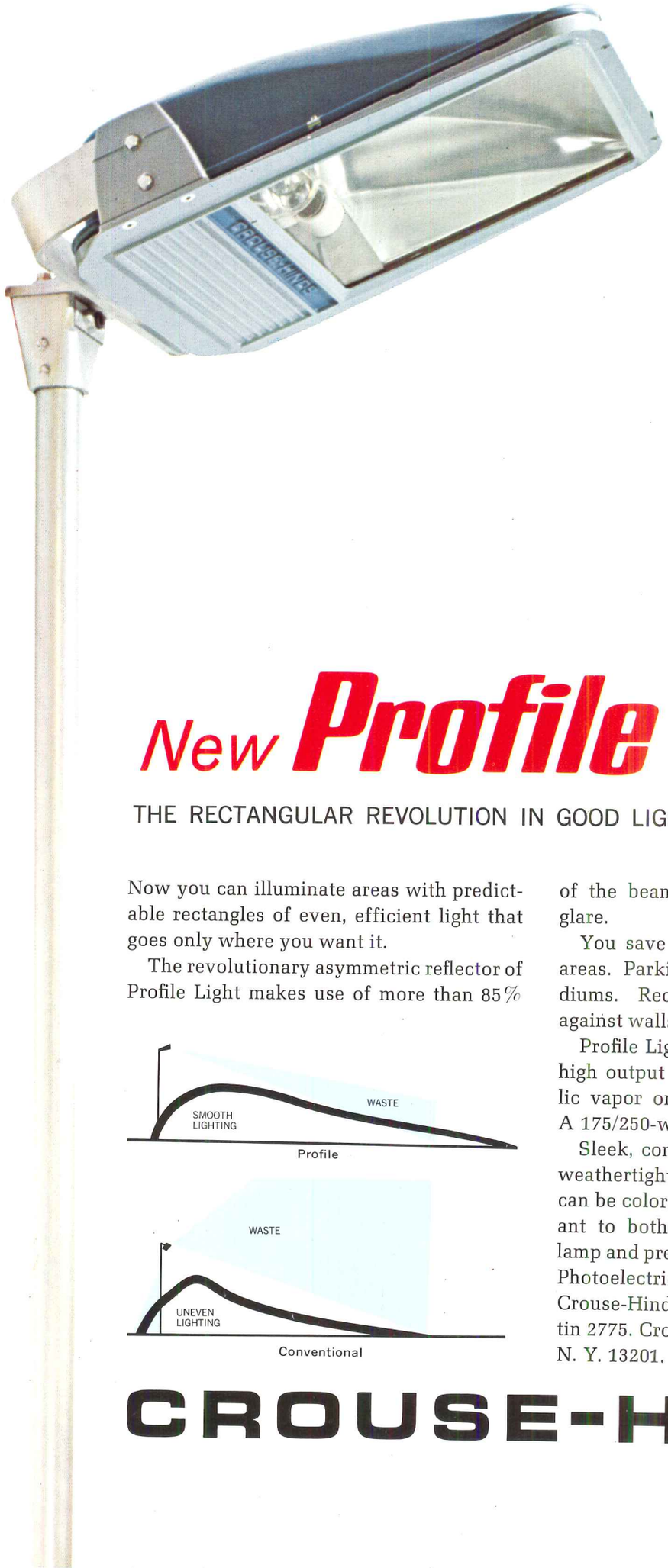

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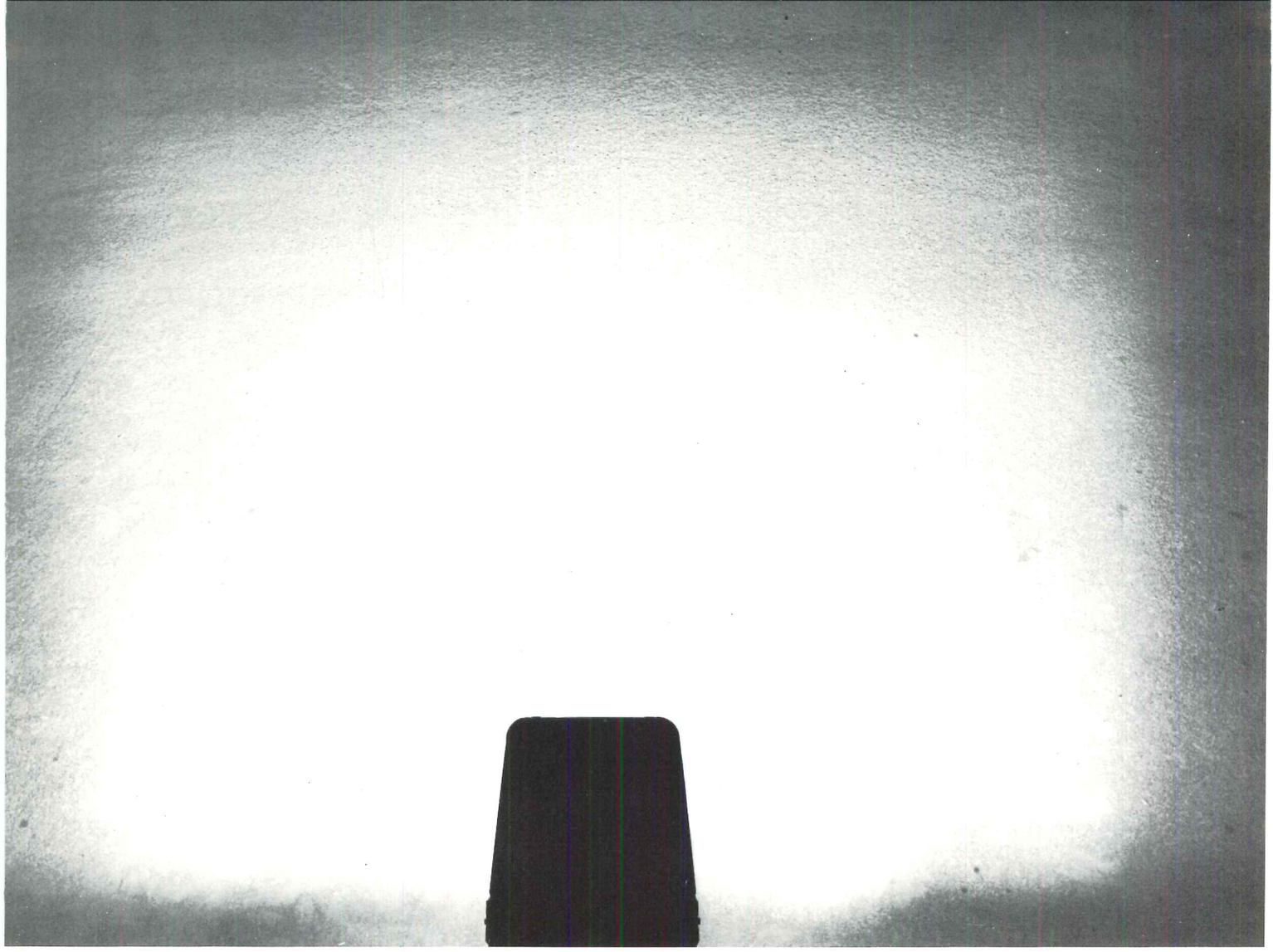
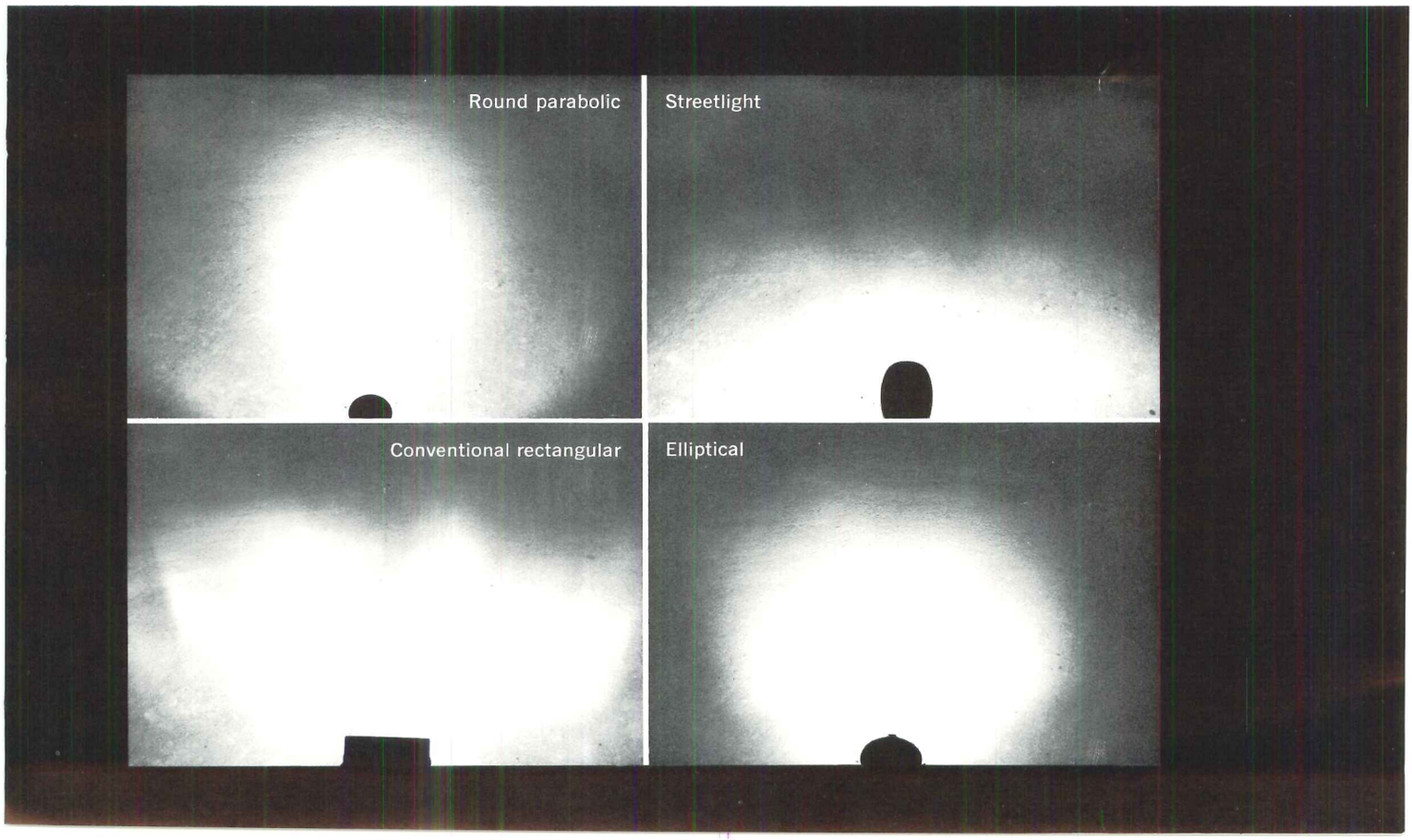
CROUSE-HINDS



The Rectangular Revolution. Profile Light, with its asymmetrical reflector, punches a bright rectangle of light, smooths footcandle variance across the entire pattern, and cuts glare and spill to a minimum. Think how much easier and how much more efficient it will be to work with this than with the conventional fixtures shown below.



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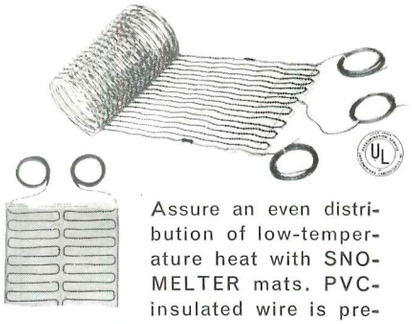
EASY-HEAT* *and Sno-Melter** *electric heating cable products*

Wire Mesh and Fiber Mesh SNO-MELTER Heat Mats



Assure an even distribution of low-temperature heat with SNO-MELTER mats. PVC-insulated wire is pre-assembled and anchored in place on wire or fiber mesh. Mats roll out fast, save time and money to install. Embedded in concrete or asphalt, they operate unseen, *automatically.*

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Select from over 1000 EASY-HEAT M. I. Cable units. Pre-assembled, 24 to 3782 feet long, 10 to 50 watts per lineal foot. Choice of 120, 208, 240, 277, 480 V. Single or dual conductors, completely insulated with magnesium oxide and a waterproof, gas-tight copper sheath. Has 7′ cold lead, 12″ insulated pigtail, explosion-proof UL-listed threaded glands.

Fiber Mesh Concrete Floor Heat Mats

Wherever warm slab floors are desired—factories or schools, etc.—EASY-HEAT Electric Floor Heat Mats, embedded in concrete, offer great flexibility at lowest cost. Factory assembled, PVC heating wire bonded to Fiberglas mesh to provide 10 or 20 watts per sq. ft. of heated area. Mats can be fitted around corners, and curves, columns, fixtures.

Write for illustrated spec folder and cost data on the COMPLETE line.

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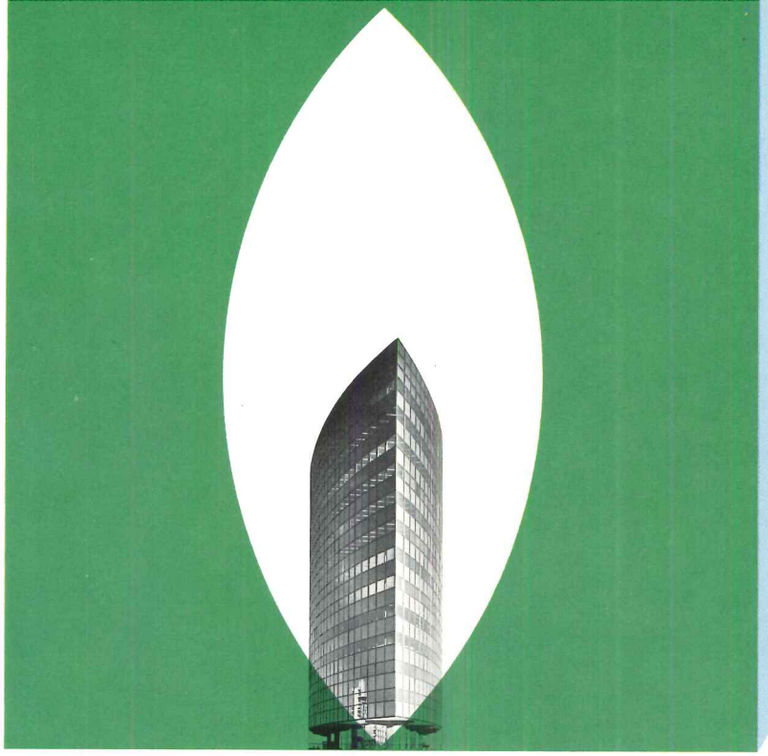
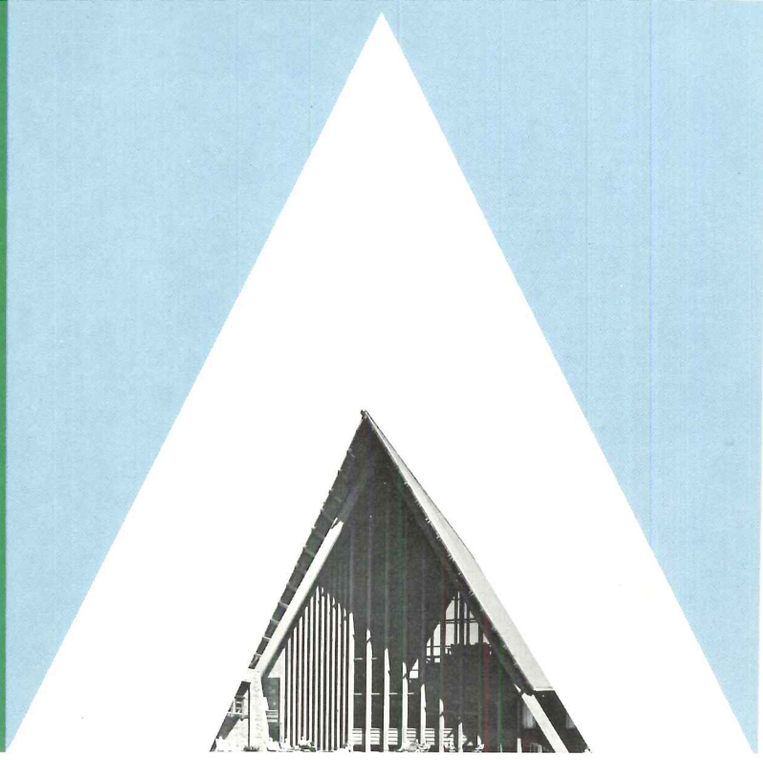
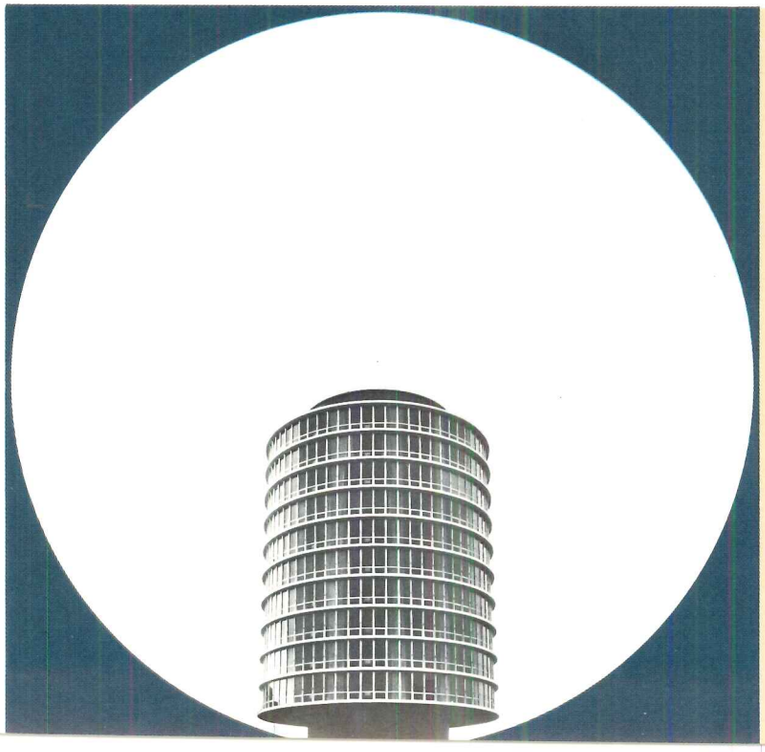




Visual Drama With Glass

Four applications
in which the esthetic
and functional qualities of glass
made significant
contributions to design.



The Phoenix Mutual Life Insurance Building in Hartford, Connecticut, dramatically demonstrates both the beauty and practicality of glass. The unique building design eliminates corner offices and provides maximum usable floor space while glass opens the walls to an unbroken view up and down the Connecticut River.

PPG SOLEX® in the vision areas shuts out much of the sun's heat as the total glass curtain wall presents an ever-changing pattern of reflections to the surrounding buildings.

Architects: Harrison & Abramovitz, New York

A towering 80-foot A-frame dominates the front elevation of The Abbey Motor Hotel and Resort at Fontana, Wisconsin. The soft tint of versatile PPG SOLARGRAY® plate glass blends warmly with the rustic timbers—extends an "open" invitation to travelers.

The functional beauty of SOLARGRAY® is that it keeps guests comfortable by reducing the sun's heat and glare.

Architect: A. Epstein and Sons, Inc.,
Engineers and Architects, Chicago

Glass heightens the drama of almost any design, yet does it unobtrusively. A case in point is the Christopher Inn motor hotel in Columbus, Ohio. PPG GRAYLITE™ glass dramatically enhances this simple reinforced concrete structure.

In the guest rooms, floor-to-ceiling glass gives the illusion of greater space. Outside, the soft gray hue of GRAYLITE blends smoothly with the exposed concrete while blocking a good percentage of the sun's glare. The effect is striking.

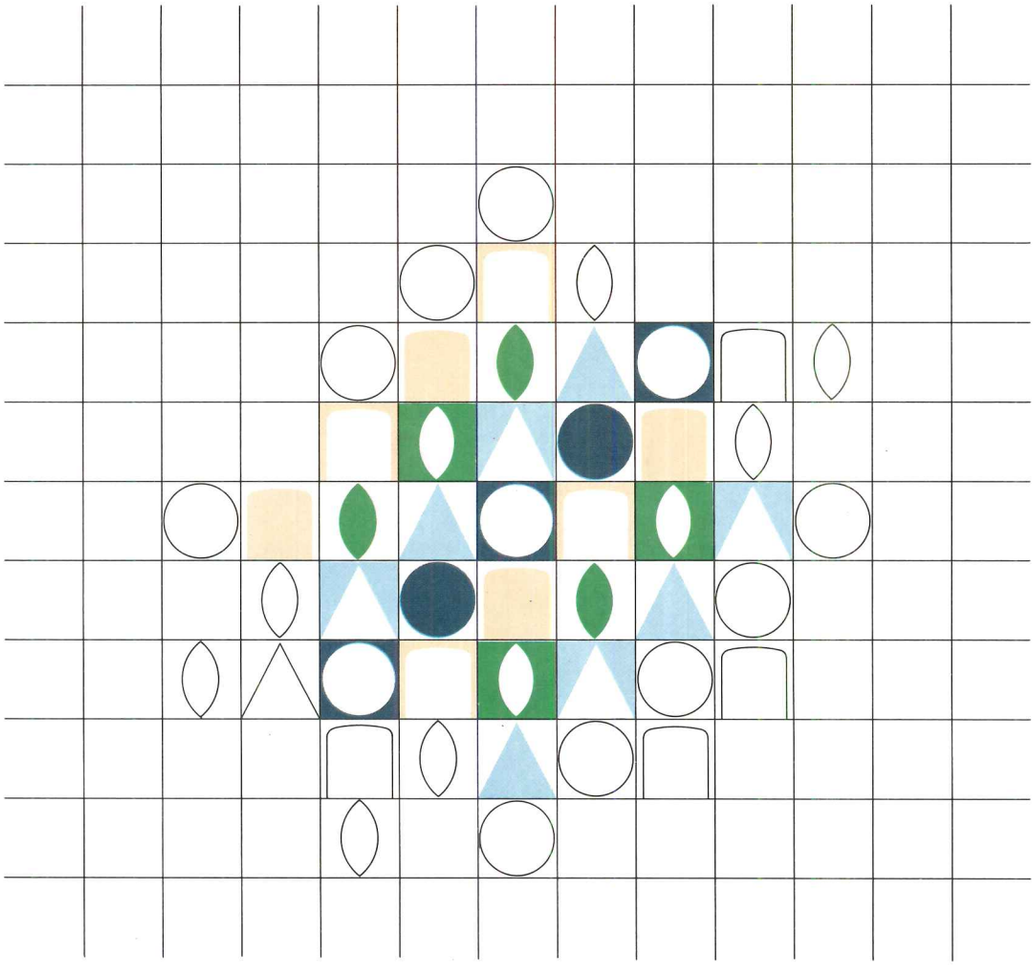
Architect: Karlsberger and Associates, Columbus

Inwood Manor, a 16-story apartment building in Houston, Texas, demonstrates an imaginative contrast—or visual contradiction—in the use of building materials. The lacelike, delicate white arches are solid concrete, while the dark "substantial" material behind them is glass.

The vision glass, PPG SOLARGRAY® plate, is flanked by "matching" black panels of PPG SPANDRELITE® glass. In addition to its important esthetic contribution to the building, SOLARGRAY handles the practical job of blocking part of the sun's heat.

Architects and Planning Consultants: Neuhaus & Taylor, Houston

PITTSBURGH PLATE GLASS COMPANY

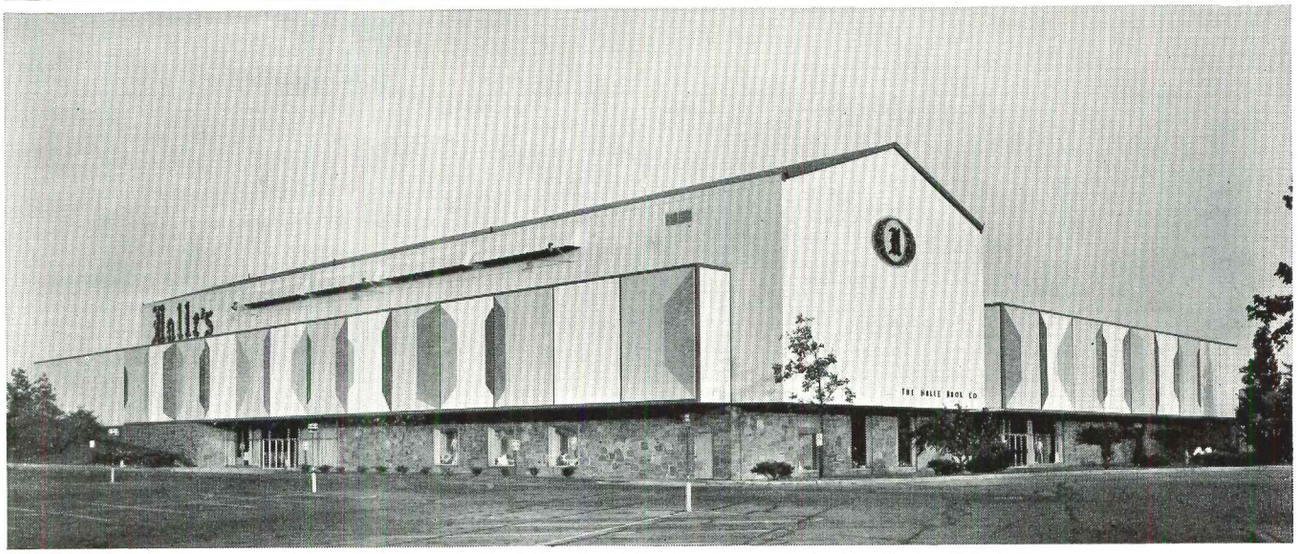


These four examples demonstrate how glass brings its brilliance and its contrasts, its color and its transparency, its infinite variety to architectural design. It offers advantages both esthetic and practical, ethereal and permanent. For further information, contact your nearest PPG branch office or distributor, consult Sweet's Catalog file, or write to *Pittsburgh Plate Glass Company, One Gateway Center, Pittsburgh, Pa. 15222.*

PPG makes the glass that makes the difference.

"We didn't repaint until 10 years after the first coat of Colorcoat went on*"

...John G. Mitchell
Operating Superintendent
The Halle Bros. Co.,
Cleveland



The Halle Bros. Co. Westgate Suburban Store, Greater Cleveland. One of eight department stores. Design Coordinator: Pierre Lalire. Planners and Designers: Raymond Loewy/William Snaith, Inc.; Architects: Fordyce & Hamby.

* *lasts 2 to 3 times longer than ordinary paints*

* *saves the cost of a second coat*

"We like the permanence of Hydrocide Colorcoat on our concrete and masonry walls," reports John G. Mitchell, Operating Superintendent of the Halle Bros. Co., one of America's most beautiful, complete department stores.

"We didn't repaint until *10 years after* the first coat of Colorcoat went on. Another exterior masonry paint required three recoats in the same 10-year period.

"We're *sold completely* on Hydrocide Colorcoat. So much so that we use it on all of our stores."

Painting Contractor, Too, Praises Colorcoat

Adds Ward Howells, Vice President of Frank Novak & Sons, Inc., Cleveland painting contractor for Halle's:

"One coat of Colorcoat was all we needed. Many other masonry paints would have required two coats to cover the previous color.

"Our experience proves the life of Colorcoat surpasses, by far, other coatings we have applied.

"We're so satisfied with the performance and permanence of Colorcoat that we used it on our own office and warehouse."

Write for Colorcoat Color Card and Brochure

To find out how heavy-bodied Hydrocide Colorcoat prevents water penetration, covers hairline cracks, pinholes and small voids; will not peel or flake, minimizes chalking, reduces "sun fading" of colors—clip the coupon.

Sonneborn Building Products, Inc.
subsidiary of **De Soto** Chemical Coatings, Inc.

SONNEBORN Building Products, Inc. AR-10
1700 South Mt. Prospect Road
Des Plaines, Illinois 60018

Please send your Colorcoat literature

Name_____ Title_____

Company_____

Address_____

City_____ State_____ Zip Code_____

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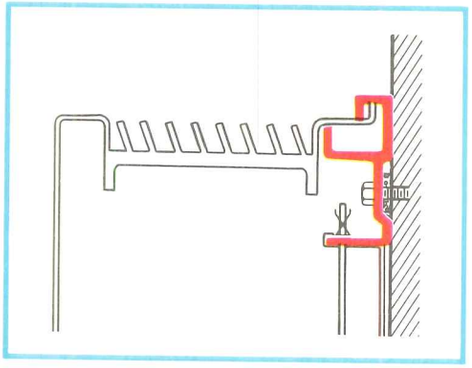
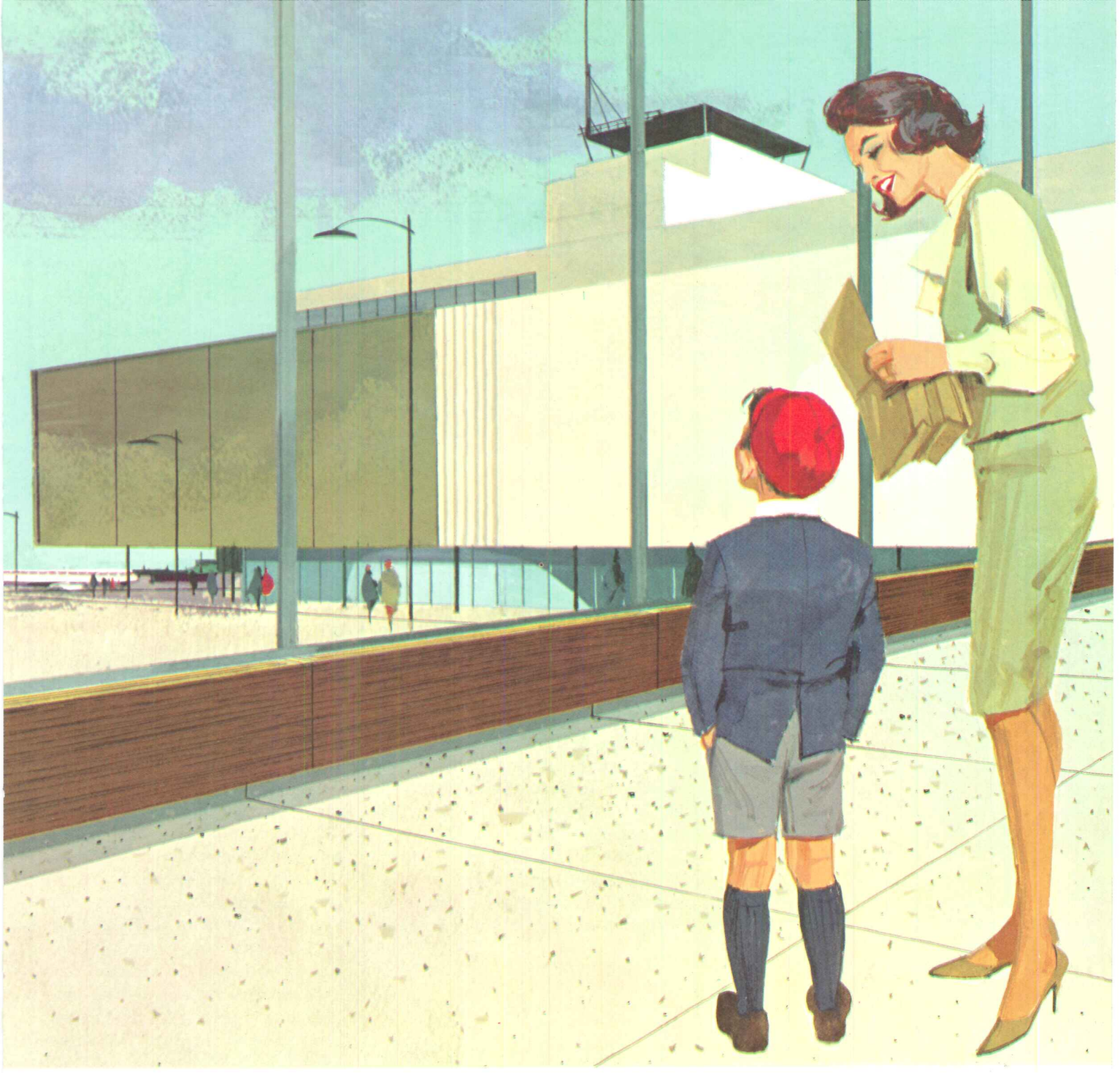
Heating never looked better or installed easier



Modine's exclusive Perma-Trim aluminum wall support channel gives rigid support, perfect alignment on any wall surface. Urethane seals prevent air leakage—no wall streaking. Flanged edges of enclosure sections interlock for added strength and sleek appearance.



—new Modine finned-tube radiation

Remember when finned-tube units all looked alike? Most still do.

This is the exception—Modine's new Imperial line. With sleek architectural styling, Imperial presents a clean-line appearance from one end of the area to the other. And what could add more richness and warmth than the look of a hand-rubbed wood grain finish or one of the many Modine decorator colors.

You'll find, too, that Imperial's beauty is more than skin deep. Installation is a *snap*—because the enclosure sections *snap-fit* into Modine's exclusive Perma-Trim® aluminum wall support channels. Wall mounting with Perma-Trim is straight-as-an-arrow even on irregular wall surfaces. And that's a Modine exclusive, too.

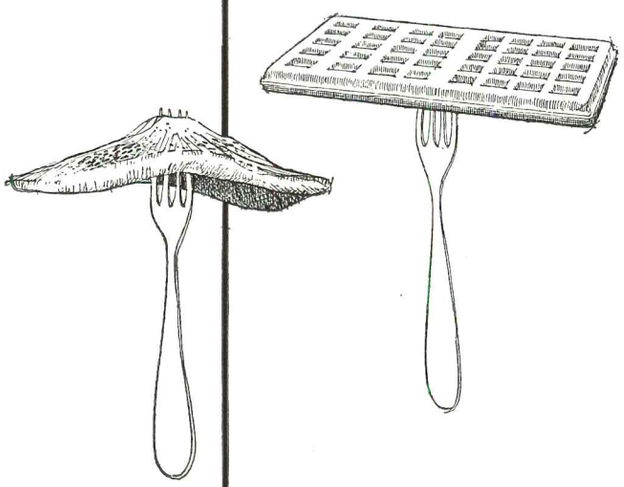
Trim pieces retain the smart styling of the enclosure sections, and also serve as access panels. There are no access plates or doors. A tamperproof "Pik-Lok" latch, another Modine exclusive, securely fastens trim pieces yet affords instant access by authorized persons.

With this modular design concept, Modine offers 12″, 18″ or 24″ heights, lengths from 2 to 8 ft in 6″ increments. Just measure up the job and fit Imperial to it. There's no costly on-the-job cutting and piecing to compromise appearance.

We'll gladly supply all the facts about Imperial and Modine's other two new finned-tube styles. Call your Modine representative, or write for Bulletin 4-101. Modine, 1500 DeKoven Ave., Racine, Wis. 53401. FT-1535-C

MODINE

Waffles are stiffer than pancakes.



When you hold up a waffle, it stays flat. A pancake droops.

You can get a pancake to stay flat by using more batter. But the extra materials and the overcooking add to the cost of the breakfast.

Reinforced concrete floors are similar. Use a waffle system and you stiffen the floor. The deeper the square voids in the waffle system, the stiffer the floor and the more materials saved... And the farther apart you can place the columns without overloading the system.

Appropriately, we do our waffle forming on a flat fee. This usually proves to be much less than the general contractor would spend to form the floors himself. With a Ceco quotation, you and your contractor have a firm cost before building starts. There are no variables such as insurance, overhead, labor, lumber, and form conditioning. The Ceco quotation includes all these. Your contractor is not subject to a sudden piling up of hidden costs. Tell him so.

Get full particulars about Ceco's Steeldome Service, for you and your contractor. Write for literature. Also see Ceco's Steelform catalog in Sweet's. The Ceco Corporation, general offices at 5601 West 26th Street, Chicago, Illinois 60650. Sales offices and plants in principal cities.

CECO
STEELDOME
SERVICE

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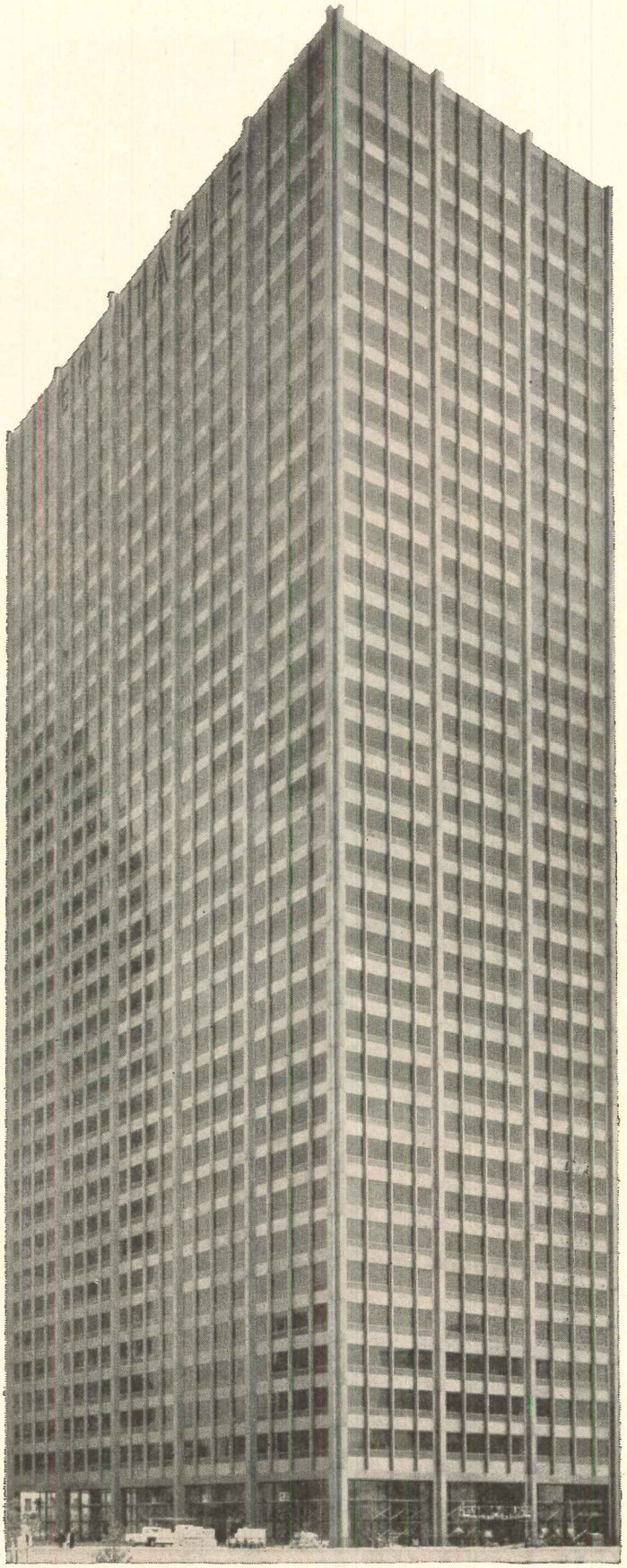

Architects/Engineers: *Skidmore, Owings & Merrill*
Foam Applicator: *Vierling Steel Works*
Foam System: *Phelan's Resins & Plastics Company*

Run water pipes?

. . . up the *outside* of a building?

in *Chicago?*

Yes. The new 35-story Equitable Building was built this way—with more than 13,000 linear feet of pipe installed in the mullions of the marble-and-glass walls to supply chilled (52°F) water in summer or hot (156°F) water in winter with minimal heat loss or gain. Only a super-efficient insulant like pour-in-place urethane foam could make this design innovation practical in the cold-hot-and-windy city. If this much of the latest success story for rigid urethane foam surprises you, write for the full report and really flip. Mobay Chemical Company, Code AR-5, Pittsburgh, Pennsylvania 15205.

MOBAY

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For more data, circle 51 on Inquiry Card

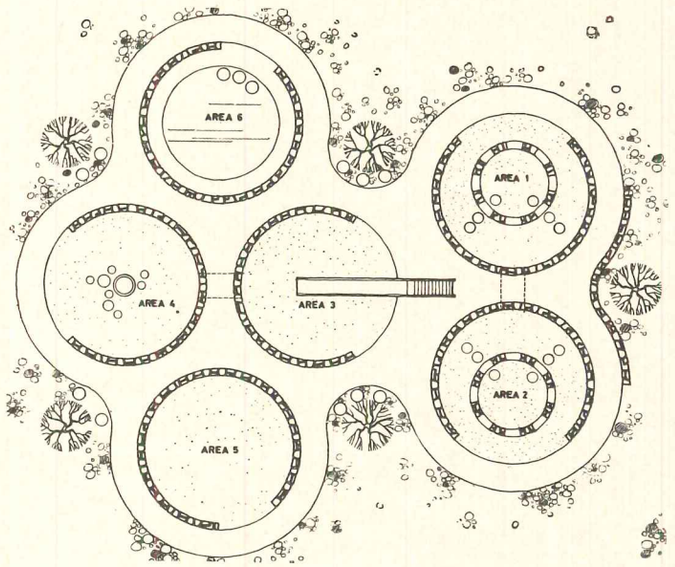
Prototype Playground Designed By Peace Corps Architect in Peru

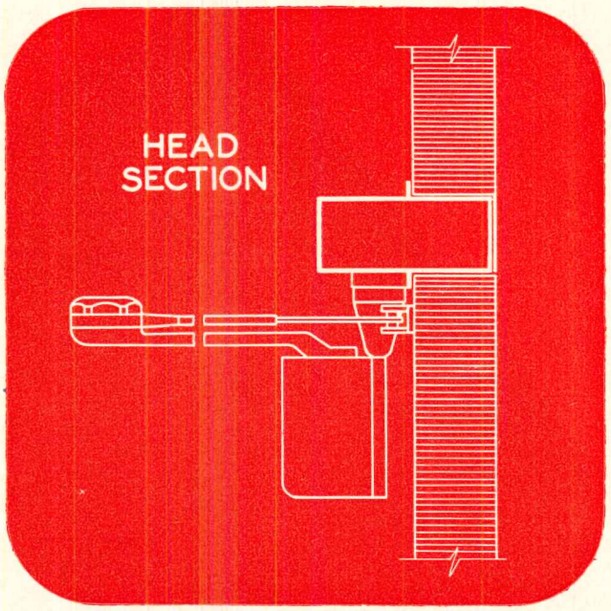
Architect Edward Mazria, a 1962 graduate of Pratt Institute, who worked for one year as a designer for the New York firm of I. & Z. Rosenfield, entered the Peace Corps with his wife in June, 1964. One of his recent jobs is a playground for the *barriadas* or outlying communities not yet incorporated into the governmental structures of the cities in Peru.

The design problem was, according to the architect, "to design a park . . . that would be unbreakable and a model for the seven parks to follow. Designing for the barriadas, an architect is faced with limited materials, funds, methods of construction, as well as value concepts."

The design solution was a series of interconnected walls, ramps and tunnels with a slide in the center which serves as the focal point and which also serves to echo the shape of the volcanic mountain in the background. Construction, which was undertaken by 15 men, took one month, and cost of the park was $300. The park was dedicated to the late President John F. Kennedy.

Area (1) contains a stone castle with "stumps" or cylindrical water pipes used as stepping stones and is connected to area (2) by a tunnel. Area (2) has a fox-hole and these same stumps. The slide is located in area (3) which is connected to area (4) by a tunnel. Area (4) contains a cluster of stumps of various sizes. Area (5) is left empty and level and area (6) consists of a small wading pool.





Application Details

for 4010 series SMOOTHEE® door closer installation shown on opposite page (see drawing above)

Here is a metal door frame with a 1¾" panel over it and a 1¾" door below. The 4010 series Smoothee® closer is mounted on a No. 16 type bracket which is mounted close to the "blade" door stop.

This makes an efficient use of the powerful LCN closer for the entrance door.

Spring power of the 4010 series closer is adjustable (can be increased 50%). Power at the latch also may be increased or decreased by reversing position of the shoe. The hydraulic back-check is also adjustable. Highly stable hydraulic fluid makes winter-summer adjustments unnecessary.

A thoroughly practical installation.

Comprehensive brochure on request—no obligation or see Sweet's '65, Section 19e/Lc

LCN

LCN CLOSERS, PRINCETON, ILLINOIS

A Division of Schlage Lock Company

Canada: LCN Closers of Canada, Ltd., P. O. Box 100, Port Credit, Ontario

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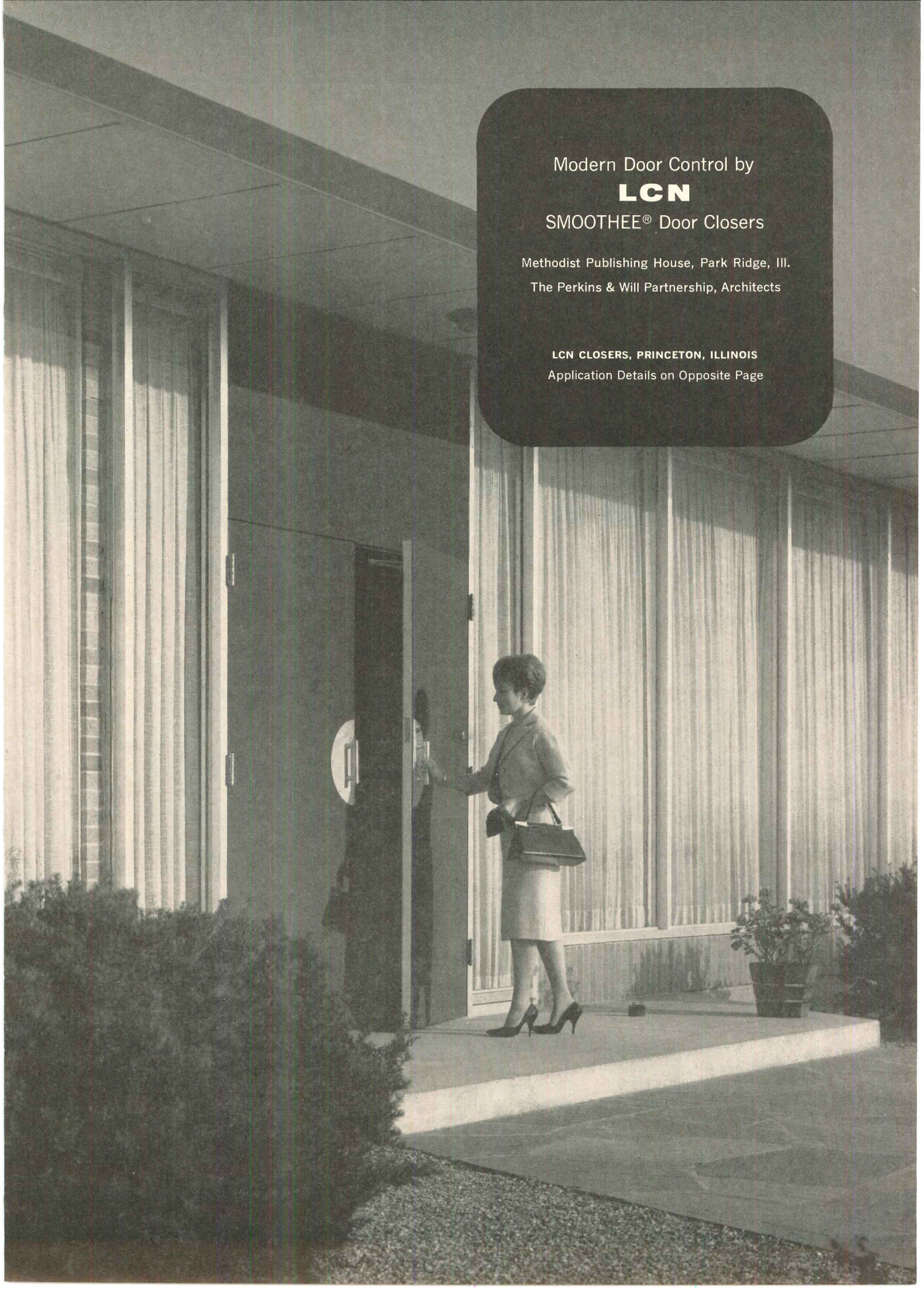

Modern Door Control by

LCN

SMOOTHEE® Door Closers

Methodist Publishing House, Park Ridge, Ill.

The Perkins & Will Partnership, Architects

LCN CLOSERS, PRINCETON, ILLINOIS

Application Details on Opposite Page

"We chose G-E air conditioning because it blended in so well with our decor..."

. . . say Salvatore and Anthony Simonetta, owners of the Casa Continental Restaurant, Willow Grove, Pennsylvania.

"We spent a lot of time and money decorating the Casa Continental, so we didn't want any air conditioning equipment showing that would spoil the effect. You can bet we did a lot of looking around. We found that the only air conditioning that filled the bill was General Electric.

"Our G-E air conditioning is so unobtrusive and so quiet that the only way you can tell we have it at all is the great job it does."

Another plus for General Electric: each of the three G-E Central air conditioning systems at Casa Continental can be individually controlled. "With G-E we can have just the right amount of air conditioning whether it's in the ballroom and dining area or in the cocktail lounge," say the Simonettas.

"If anyone is doing a big job decorating his place and doesn't want the air conditioning to get in the way, just send him to us," say Salvatore and Anthony Simonetta. "We'll tell him about General Electric."

B. J. Parola, installing contractor, with Salvatore and Anthony Simonetta.

If the Simonettas are talking about you, write:

Air Conditioning Dept., General Electric, Appliance Park, Louisville, Kentucky.

GENERAL ELECTRIC

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For YOUR apartment building

...uptown, downtown, large or small...

CARADCO has a style of Window Unit strikingly suitable, fittingly sized (and all include the great, natural insulating advantages of wood)

Awning Windows

Caradco Awning Units give light and ventilation for any exposure. The exterior lines are architecturally appropriate for most contemporary designs and interior decorative possibilities are legion. Easily operated by any of several types of attractive hardware (your choice), Caradco Awnings marry excellent design with careful manufacture. Caradco Awnings are weathertight, of course, and insulating glass with Caradco's vinyl glazing* is optionally offered.

Casement Windows

Caradco's superb Casement presents the classic appearance that is always satisfying. Designed for the very best construction (but reasonably priced) this install-it-and-forget-it unit means decades of flawless appearance and faultless function. Check these features:

Virtually weatherproof due to *two* independent systems of weatherstrip.

Dove-tailed construction at the four vital corners of the frame for maximum strength and squareness.

The finest hardware—finger-touch operation; from fully open to fully closed with a few easy turns of the crank. The option of insulating glass with Caradco's magnificent permanent vinyl glazing.*

Slider Windows

The easiest, fastest and most economical way we know to fill a window opening with exterior elegance and interior comfort is by using Caradco Sliders. These Sliders are completely factory primed and assembled, with corners dadoed and caulked. Even the neat sash lock is factory applied. Operation? A breeze: the movable sash slides smoothly and quietly on nylon glide buttons.

The total cost of any window unit is the cost installed and finished. Caradco Sliders eliminate most of the labor and, therefore, much of the cost.

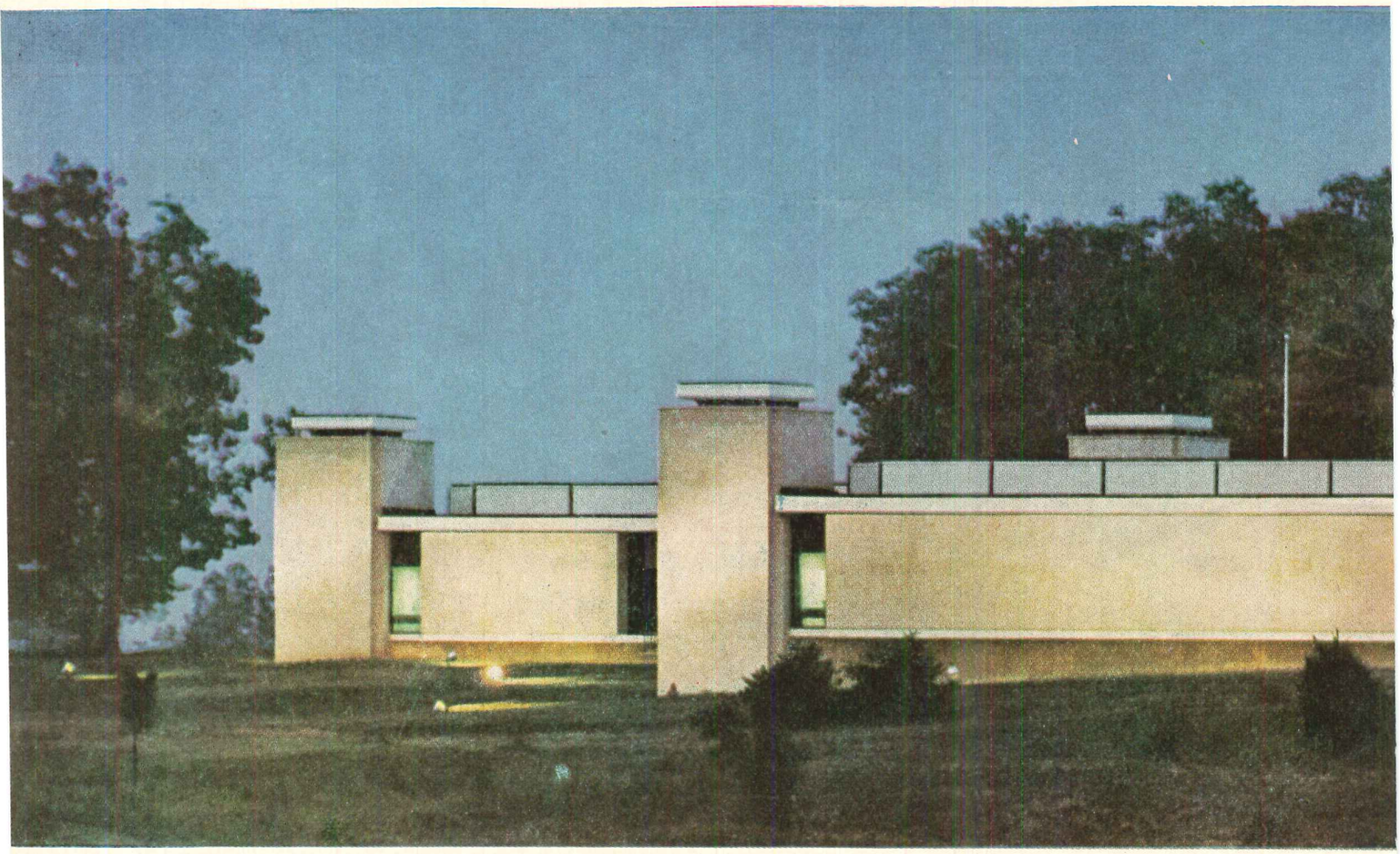
CARADCO®

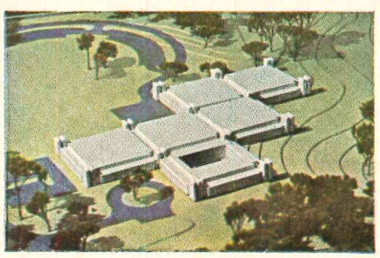
CARADCO INC. DUBUQUE, IOWA

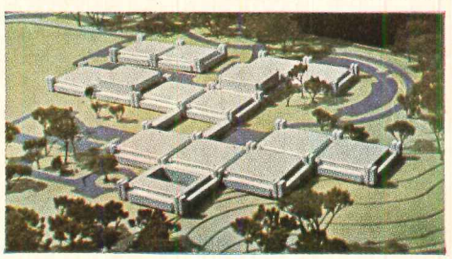
A Century of Manufacturing Creative Building Products

*Patent Pending

Molecular Electronics Division
Westinghouse Electric Corporation







First phase of the project (108,000 sq ft) is composed of four modules, three for research and production, the fourth for administration. Additional modules will be placed to form a number of partially and fully enclosed landscaped courtyards.

Space modules permit easy enlargement in relatively small increments

Westinghouse's Molecular Electronics Division facility is situated on a rolling, wooded, 7-acre tract in Anne Arundel County, Md. Roads, parking areas, and buildings are located so that a minimum of the site is disturbed.

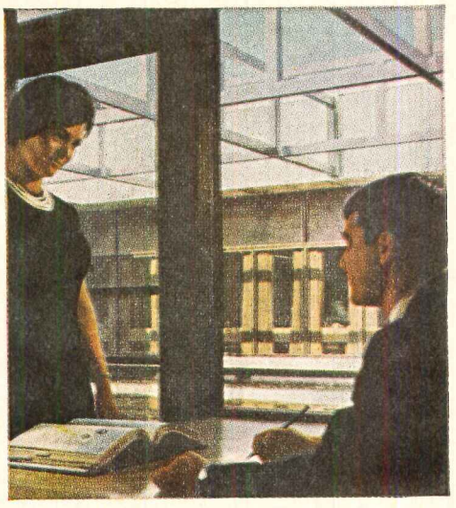
Architect: Vincent G. Kling FAIA, Philadelphia
Structural Engineers: Allabach & Rennis, Inc., Philadelphia
General Contractor: Kirby & McGuire, Inc., Baltimore
Steel Fabricator: Derby Steel Co., Baltimore

Primary design motivation was to create a low-dust, noise-free, wide-span unit of space in which a controlled environment could be easily maintained . . . which could serve small research and production teams efficiently . . . and which could be expanded easily and economically when additional research or manufacturing space became necessary.

Solution is a simply organized square "space module" which structurally and architecturally can stand as an independent unit or in combination with other space modules.

Each unit is a square composed of a 90 x 90 ft, column-free central space 14-ft high, designed for laboratory or production use. Each is surrounded by a band of lower-ceiling space designed for office and service support areas.

The high ceiling portion of the structure is roofed with a steel-truss space frame resting on four Bethlehem wide-flange columns at the corners. The roof for the lower-ceiling perimeter area is formed by cantilevering the lower chord of the trusses beyond the columns to the outer walls.



Courtyards provide interior spaces with an abundance of natural light and pleasant vistas, and create a stimulating human environment.

BETHLEHEM STEEL
BETHLEHEM STEEL CORPORATION, BETHLEHEM, PA.

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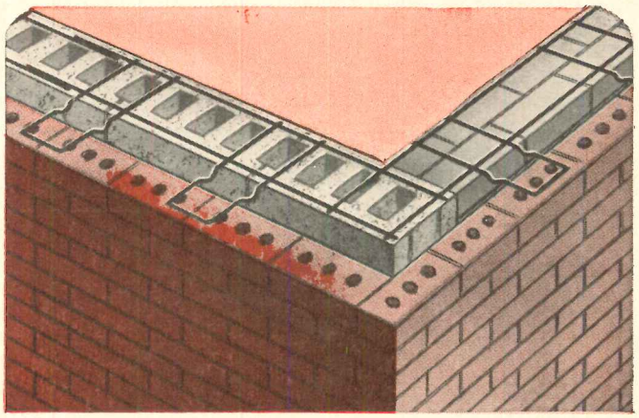
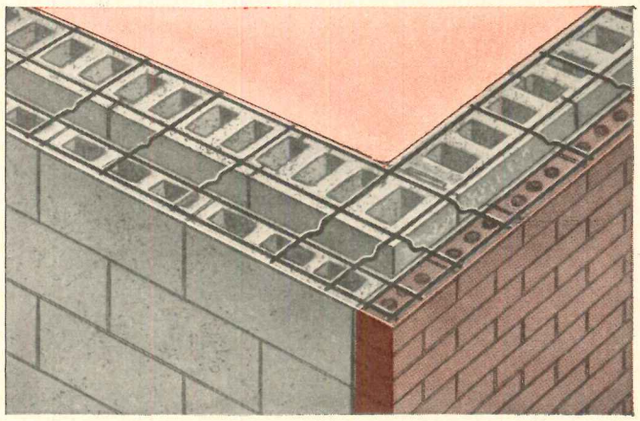
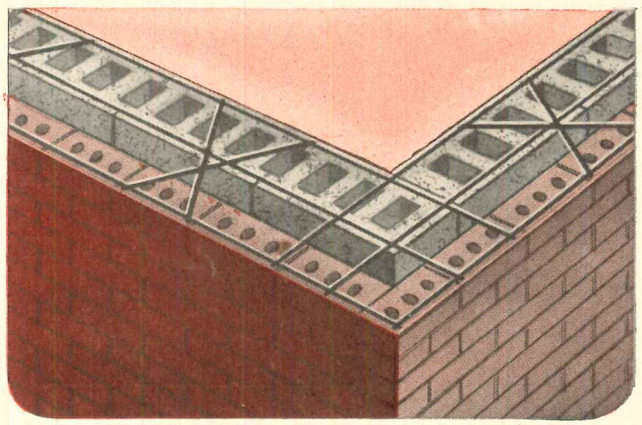


ECONO CAVITY-LOK® For composite cavity walls.



CAVITY-LOK® For concrete masonry cavity walls.



AA-LOK® For maximum strength with all cavity walls.

3 better ways to cavity wall strength and beauty

Only AA Wire Products offers a full line of quality cavity wall reinforcing designed specifically for each type of wall. Reduce material costs—reduce labor—and obtain maximum wall strength at a savings. Exclusive AA "Flush Welded" is proven strongest. Sizes, gauges and finishes to fit your requirements.

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A.I.A. File 3M-5F
1965 Sweets' File 4h/Aa
1964 A.I.A. BPR 4.05 A-B
1965 CE Spec. Data file S-a

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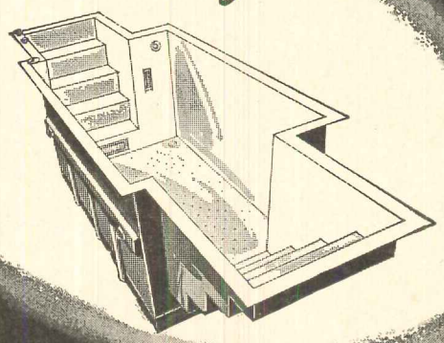
BAPTISTRY
Quality WITH THE GUARANTEE
of Fiberglass, of course by Wiedemann



- Quality guaranteed up to 10 years on workmanship and materials
- Superior strength with Wiedemann's exclusive Fiberstressing process.
- Unit-molded.
- Skid-resistant steps and bottom.
- Complete line of heaters and accessories.

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Originator and Leading Baptistry Specialists.

Wiedemann Industries, Inc.
BOX 672 — MUSCATINE, IOWA

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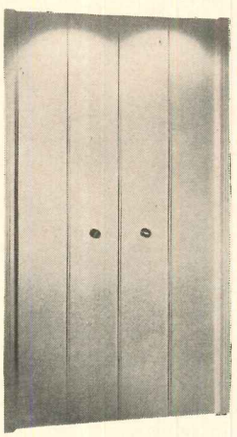
DESIGNING FOR A COLLEGE-OF-HARD KNOCKS?

specify **SLIMDOR®**
CLOSET DOORS



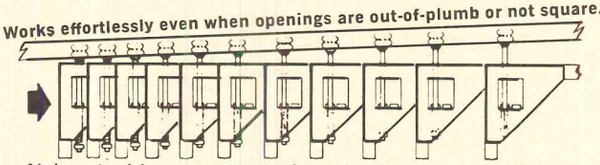
STUDENT PROOF. Reinforced tubular steel frame, 20 U.S. gauge galvanized gussets, heavy-duty hinges.

MAINTENANCE FREE. Escape-proof 63-ST-5 extruded aluminum tracks with locked-in pivot pins.

SIZES. Standard 6'9"-7'6"-8'0" heights in widths from 1'6" to 8'0". (Special sizes can be quickly fabricated for practically any installation.)

UNLIMITED FACINGS. Cover with any hardboard, plywood, melamine or vinyl panels for beauty and lifetime durability.

Works effortlessly even when openings are out-of-plumb or not square.



Nylon double counter-rotating wheels are spring-loaded, won't escape track under the toughest treatment.

For the name of your nearest fabricator write:

VEGA INDUSTRIES, INC. | **505 E. Brighton Ave. Syracuse, N.Y. 13205**

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Here's real NEWS for you...

PyProtect
PYRO-CHEM PROTECTED

Now TOTAL mineral tile performance still at cost saving woodfiber tile prices!

NEW FIRE SAFETY RATINGS

Simpson PyROTECT acoustical products have been re-tested by Underwriters' Laboratories, Inc. and assigned an improved Fire-Hazard Classification that is equal in all respects to that of mineral material.

NEW PATTERNS

Simpson has invested over a million dollars in brand new equipment to produce ceiling tiles and boards that offer a range of patterns to complement contemporary design while providing optimum functional efficiency.

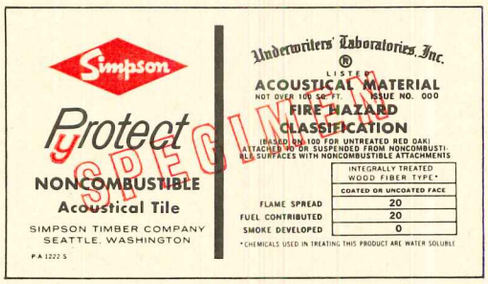
NEW DESIGN FLEXIBILITY

A new idea in ceilings, LINEAR PyROTECT helps do away with the design limitations of fixed modules. The LINEAR concept helps solve unusual building problems and client needs within the framework of budgets and functional requirements.

NEW SOUND ABSORPTION & ATTENUATION RATINGS

Latest test results from Riverbank Acoustical Laboratories, Inc. and Geiger & Hamme Acoustical Laboratories show PyROTECT to have improved ratings in both sound absorption and room-to-room attenuation factors.

We are very enthusiastic about these new ceiling developments and are certain you will share some of that enthusiasm when you receive all the details and technical information regarding them. All you have to do is contact the nearest Simpson Certified Acoustical Contractor listed in the Yellow Pages . . . or write the address below.



Specify Simpson and be sure

SIMPSON TIMBER COMPANY
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A monthly roundup of reports on new books of special interest to architects and engineers

This Month's Books

REVIEWS

American Hospital Association, Hospital Design Checklist, Selected Designs —Psychiatric Services in General Hospitals . . . 78

American Library Association, The Library Environment . . . 78

José A. Fernandez, Architecture in Puerto Rico . . . 78

Lois Davidson Gottlieb, Environment and Design in Housing . . . 80

Museum of Modern Art, Modern Architecture U.S.A. . . . 78

George O'Brien, The New York Times Book of Interior Design and Decoration . . . 78

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Puerto Rico

ARCHITECTURE IN PUERTO RICO. *By José A. Fernandez. Architectural Book Publishing Company, 51 E. 50th St., New York, N.Y. 10022. 256 pp., illus. $12.50.*

José Fernandez, a Puerto Rico-born architect who has practiced in New York for many years while continuing his close ties with his birthplace, introduces his book with a short history of Puerto Rico and a statement about architecture on the island today, followed by a quick glimpse of historical Puerto Rican architecture. However, he concentrates his pages on a survey of contemporary architecture which includes not only the famous luxury hotels, but also buildings concerned with every aspect of Puerto Rican life. Brief descriptions accompany photographs, model photographs and/or drawings of a building.

Library Interiors

THE LIBRARY ENVIROMNENT. *By the American Library Association. 50 E. Huron St., Chicago, Ill. 69 pp. $2.00*

The proceedings of the June, 1964 Institute on Library Equipment are presented in this report. The texts of the papers and the discussions of the panelists are included and divided into five sections comprising furnishings, illumination, audio, transportation and flooring.

U.S. Architecture

MODERN ARCHITECTURE U.S.A. *By the Museum of Modern Art, 11 W. 53rd St., New York, N.Y. 10019. 69 pp., illus. Paperbound, $.95.*

Sixty-five years of modern architecture in the U.S. were reviewed in an exhibition by the Museum of Modern Art this past summer. The exhibition is now traveling here and in Europe.

This booklet presents 69 buildings from the exhibition. Each building is presented as a singular achievement of U.S. architectural excellence.

Interior Design

THE NEW YORK TIMES BOOK OF INTERIOR DESIGN AND DECORATION. *Edited by George O'Brien. Farrar, Straus and Giroux, 19 Union Square West, New York, N.Y. 10003. 240 pp., illus. $15.00.*

This is a book of decoration that is far more architectural than most. Apartments, houses and vacation homes with great individuality of expression are presented. The book is not a primer on decoration, but rather a compilation of well designed rooms and houses for everyday living.

The material, for the most part, has appeared in *The Times Magazine* of *The New York Times*. The book is replete with handsome illustrations and includes a glossary of decorating terms and styles.

Hospitals

SELECTED DESIGNS-PSYCHIATRIC SERVICES IN GENERAL HOSPITALS. *A collection from the A.H.A. architectural exhibition of 1964. American Hospital Association, 840 North Lake Shore Drive, Chicago, Ill. 60611 20 pp., illus. $1.00.*

HOSPITAL DESIGN CHECK LIST. *Looseleaf work sheets for checking preliminary hospital plans listing items to be checked and providing columns for designating each as satisfactory, unnecessary or requiring restudy. American Hospital Association, 840 North Lake Shore Drive, Chicago, Ill. 60611. 48 pp. $2.50.*

continued on page 80

School of Journalism, S. I. Newhouse Communications Center, Syracuse University, Syracuse, N.Y. Architect: King & King, Syracuse, N.Y. and I. M. Pei & Associates. New York, N.Y.; Painting Contractor: Hester Bros., Syracuse, N.Y.

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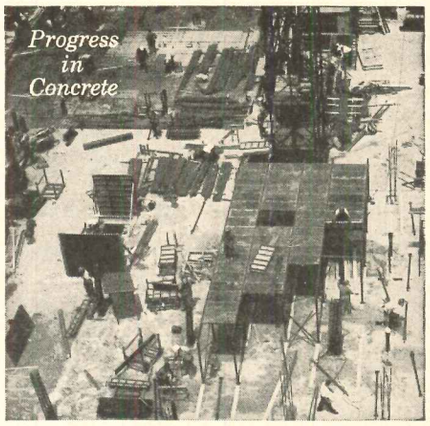

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Required Reading

continued from page 78

Planning a Home

ENVIRONMENT AND DESIGN IN HOUSING. *By Lois Davidson Gottlieb, Julius Shulman, photography consultant. The Macmillan Company, 60 Fifth Avenue, New York, N.Y. 10011. 258 pp., illus., $6.95.*

This book is intended primarily to be a reference for the client who, realizing that he must create his home within certain limitations, knows he must have good design and good planning in order to achieve the best solution.

By presenting lists of factors to consider in choosing the location and kind of building and in developing a plan for the house, Mrs. Gottlieb shows that the prospective client must know what is important in his own pattern of living so that he can intelligently plan a home that will relate to it in a successful and meaningful way. Also included is information on the roles of the architect and the other professionals who may help in planning a home. Julius Shulman has done 135 of the photographs.

Books Received

ETHICAL PROBLEMS IN ENGINEERING. *By Philip L. Alger, N.A. Christensen and Sterling P. Olmsted. Edited by Barrington S. Havens and John A. Miller. John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10016. 299 pp. $6.50.*

1965 BOOK OF ASTM STANDARDS. *By the American Society for Testing and Materials. 1916 Race St., Philadelphia, Pa. 19103. Part 9, Cement, Magnesium Oxychloride and Magnesium Oxysulfate Cements, Lime; and Gypsum. 512 pp., illus. $9.00.*

SURVEY OF ARCHITECTURAL HISTORY IN CAMBRIDGE: EAST CAMBRIDGE. *By the Cambridge Historical Commission, Cambridge, Mass. 101 pp., illus. $3.00.*

CHANGING IDEALS IN MODERN ARCHITECTURE. *By Peter Collins. McGill University Press, 3458 Redpath St., Montreal 25, Canada. 309 pp., illus. $12.50.*

ELEMENTARY STRUCTURAL ANALYSIS AND DESIGN. *By Linton E. Grinter. The Macmillan Company, 60 Fifth Ave., New York, N.Y. 10011. 465 pp., illus. $9.75.*

ESSENTIALS OF STRUCTURAL DESIGN. *By Anthony Hoadley. John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10016. 609 pp., illus. $11.50.*

continued on page 98

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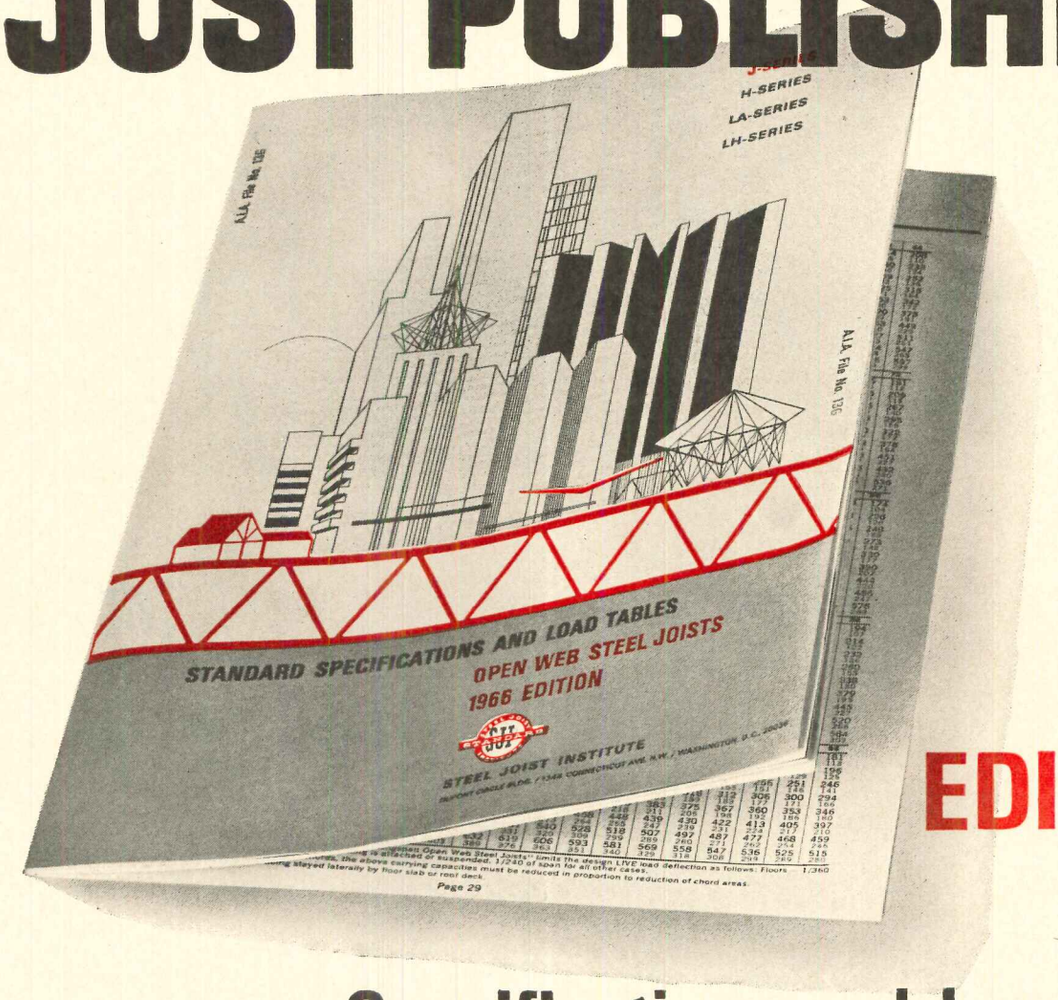

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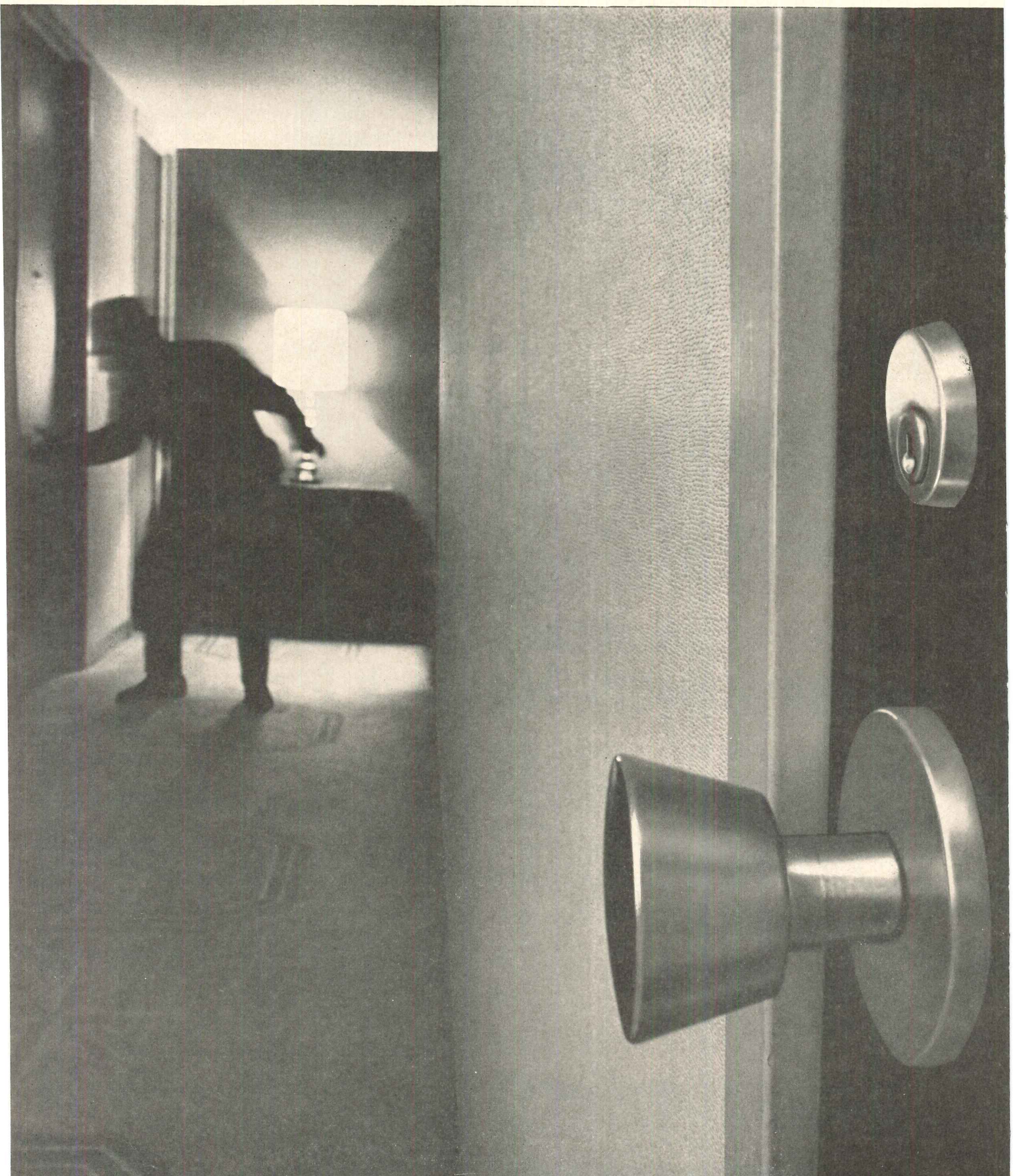

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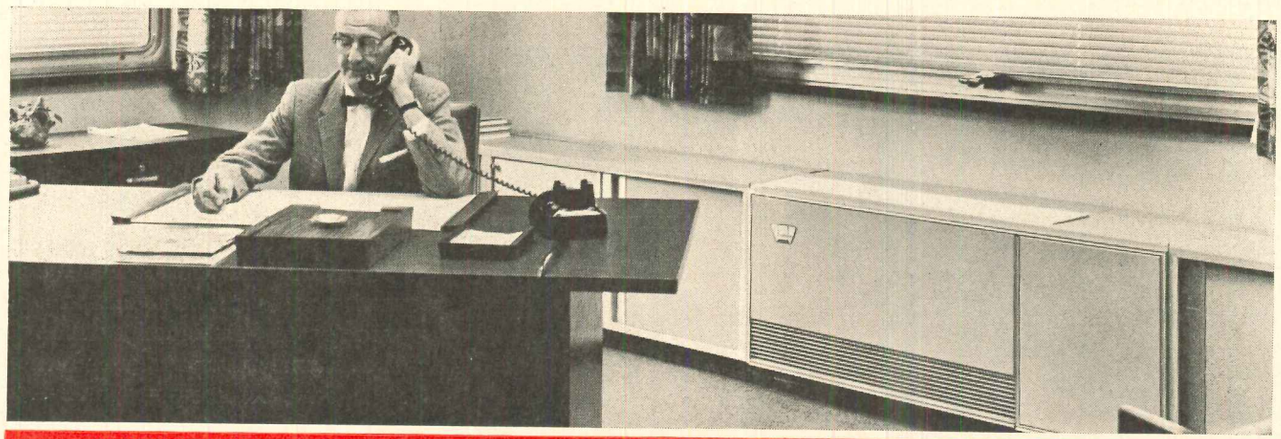

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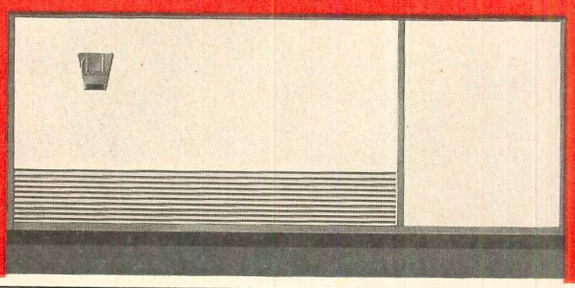

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COMPUTER-AIDED DESIGN AND AUTOMATED WORKING DRAWINGS

A second report on new uses of the computer
that could change the practice of architecture

By Jonathan Barnett

The time is rapidly approaching when the new computer technology will be able to make a significant contribution to the practice of architecture. It can do so in two ways: by making the computer's prodigious memory and split-second calculating ability a part of the design process itself, and by drastically reducing the time and manpower needed to produce working drawings and specifications. The basic technological advances in both these areas already exist; how soon, and to what extent, the architectural profession will be able to make use of them is largely a matter that it must decide for itself.

Computer-Assisted Design

Architects are fond of saying that the computer cannot create, which is, at least at this point, an unassailable statement. The computer is a device that performs calculations, and it cannot do anything it has not been instructed to do. It does not follow, however, that one should then dismiss the computer out of hand as an adjunct to the creative process, any more than one would discard the automobile as a means of transportation simply because it is not a self-guiding mechanism.

It is true that, when the computer was first introduced, it could only be used through the intervention of technicians skilled in rephrasing problems in terms that the computer could solve. This process could be cumbersome and time-consuming, and it tended to restrict the application of the computer to problems that involved only calculation, or problems in which the part that could be calculated was clearly defined and separate. In design problems, those aspects that can be calculated are closely intertwined with intangibles and concepts that can not be clearly defined. It seldom made sense for a designer to have a special program written, corrected and run on a computer when his thinking was in such a flexible state that he might have a completely fresh conception of the problem by the time he got the answer to his original question.

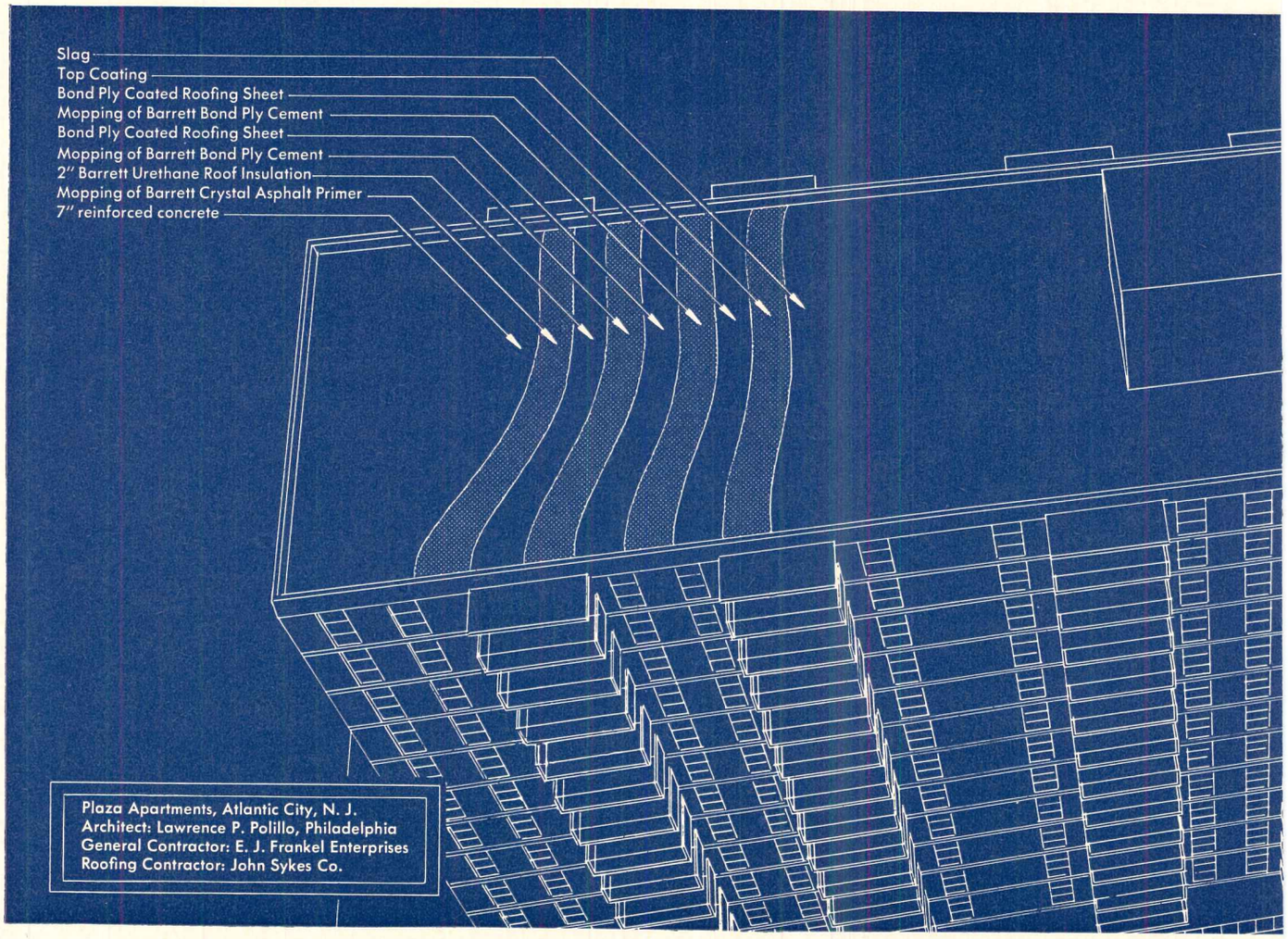
If a computer is to be useful to a designer, then, he must be able to use it himself; and the answers to his questions must be available to him quickly.

The key to these two capabilities has been provided within the last few years by the invention of master programs designed to simplify the procedure for whole classes of problems. The FORTRAN language and the STRESS program for architectural engineering problems enable the operator to type instructions to the computer in words and algebra, activating in turn a series of pre-programed instructions in the computer's own language of binary numbers.

The major development as far as architects are concerned, however, was the invention of the Sketchpad program, because Sketchpad permits the designer to "converse" with the computer in graphic terms, without

continued on page 88

The first report appeared in the January 1965 ARCHITECTURAL RECORD on pages 143-150



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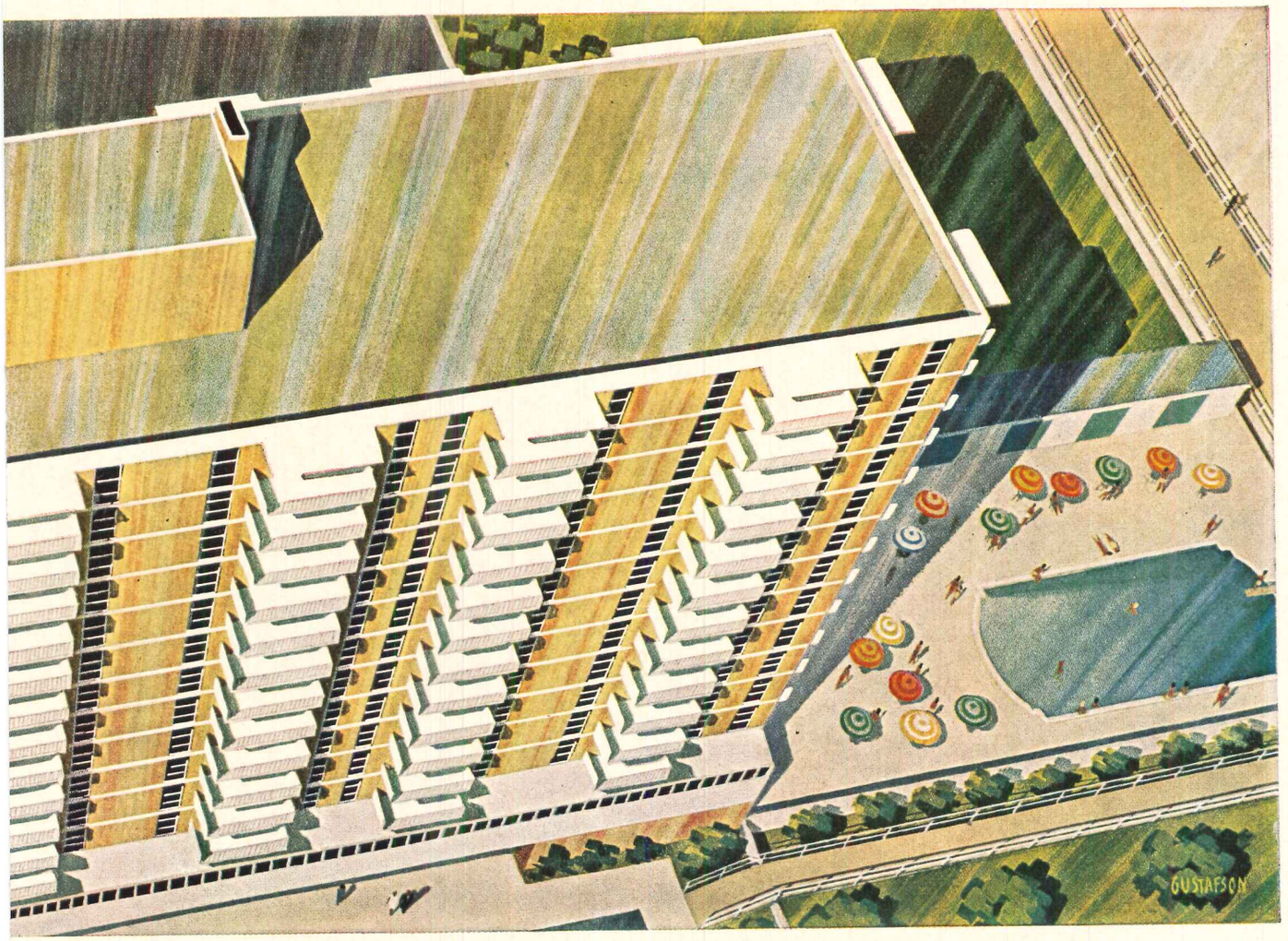

tant advantages. Two less layers of roofing sheet are required and two moppings are eliminated, saving much time and effort, particularly in getting the material up on the job. In addition, a greater percentage of the roof cost goes into fixed-cost, quality-controlled material, while less goes into variable-cost labor, permitting more accurate bids.

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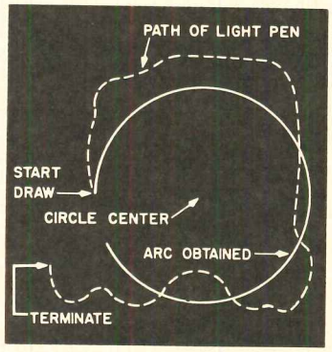
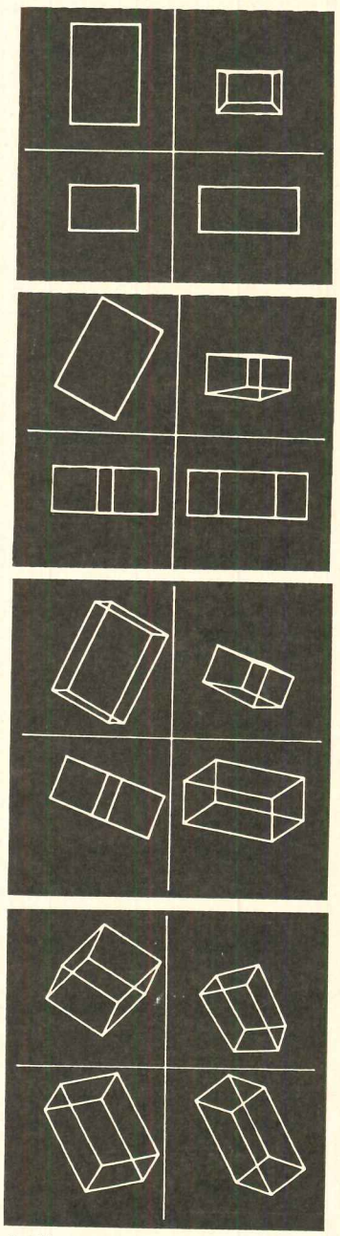


Path of light pencil is formalized by pre-programed constraint.



Additive rotation of three-dimensional Sketchpad drawings. Quadrants display plan, two elevations, and perspective.

having to translate his problems into mathematics at all.

The Sketchpad Program

The Sketchpad program was developed by Ivan Sutherland as a doctoral project at M.I.T., an institution with a long record of research in the development of computers. In the Sketchpad system the operator uses a light amplifier, encased in a pencil-like holder, to draw upon the surface of a cathode ray tube that is essentially similar to an ordinary television screen. The patterns traced in light on the face of the tube are "tracked" and registered in the computer memory; so that information is introduced into the machine without any need for written statements.

The system includes a number of pre-programed constraints, so that the pattern traced on the screen can be formalized into regular geometric figures and perfectly straight lines (see diagram *upper left*). Using these constraints, it is possible to build up complex configurations, which, once completed, can be stored in the computer memory as part of a permanent library of drawing elements. Other pre-programed capabilities permit the operator to erase, rotate views, and enlarge and reduce drawings.

Timothy Johnson, another M.I.T. researcher, has developed a collateral Sketchpad program which adds a three-dimensional drawing capability. For this program the screen is divided into quadrants, which show a plan, front and side elevations, and a perspective. To build up the drawings shown at left, the operator drew the height, width and length in the appropriate quadrant, automatically producing the perspective view. Once the dimensions are established, it is possible to revolve the views along the three axes of rotation, as shown.

These drawings are of a "wire-frame" type, that is, the lines that would be hidden in a solid object still appear on the screen. Experiments by Lawrence Roberts, also at M.I.T., have produced perspective drawings with the hidden lines removed—one of which is shown at right. Roberts' drawings are generated mathematically, and not built up with the light pencil, but the Sketchpad program should also be able to erase hidden lines in due course. Still another group of researchers at M.I.T. has devised programs that generate "wire-frame" drawings of complex curved surfaces. These various programs are compatible with each other so that eventually it should be possible to hitch all these processes together.

A Different Kind of Drawing

The drawings on the face of the screen can be translated into conventional drawings by a number of different means. They can be reproduced through a micro-film process, or a taped record of the coordinates of each point and line can be used to drive a graphic plotter, which draws directly on paper. Both of these processes are commercially available. In addition, a scanning device is now available which is capable of reading line drawings, translating them into mathematical approximations, and then displaying the result on a screen. For those who dislike drawing on a cathode ray tube, there is a device called the Rand Tablet, a sensitized glass plate on which the operator can place an ordinary sheet of paper and draw with a special stylus. The result goes into the computer memory and can be displayed on a screen. Thus the means already exist to tie the Sketchpad system to drawings made by conventional means.

What appears on the screen in the Sketchpad system is, however, essentially different from the ordinary drawing, which is, in Ivan Sutherland's phrase, a trail of carbon left on a piece of paper. Information about how the drawing is tied together is stored in the computer, and not just the information needed to show a particular view. The computer possesses an outline description of a three-dimensional object, so that the "wire-frame" perspectives at left are similar to what you would see if you shone a light through an actual wire frame and projected its image on to a screen. Because of the rapid recalculation possible in a computer, a series of three-dimensional views can be ro-

tated continuously, giving the illusion of movement. Architects, used to a few conventionalized perspective viewpoints, may find that this new way of drawing stretches their ability to visualize things in three dimensions, as well as providing a wonderfully flexible means of design investigation.

Revising Drawings Instantly

Because the relationship of part to part is completely defined, the operator has the opportunity to make sweeping system-wide changes. For example, it would be possible to switch a Sketchpad drawing made on a 3 foot module to a 2 foot 9 inch module; a few typed instructions and a flick of the light pencil, and the drawing would adjust immediately—and so would all other dimensions of the building, whether in plan, section or elevation, and whether or not these dimensions were visible on the screen at the time. To achieve a comparable result with a conventional drawing, or set of drawings, it would of course be necessary to start over again.

Quick Access to Calculations

Another important aspect of Sketchpad is its ability to present in visual form the results of other programs and routines, giving the designer immediate access to all sorts of precise calculations at any stage of the design. On this page there are two Sketchpad drawings of a basic bridge shape shown as a cantilever (four supports) and as a three-hinged arch (two supports). The numbers represent the forces in the members, as calculated by the STRESS program, for example. A designer choosing between the two structures can obtain a very quick representation of the distribution of forces in each case, by drawing the trusses with the light pencil and instructing the computer to perform the calculations. Mechanical engineering results could also be displayed in a similar fashion, as could the design analysis and synthesis process proposed by Christopher Alexander in the April issue of ARCHITECTURAL RECORD (pages 177-186).

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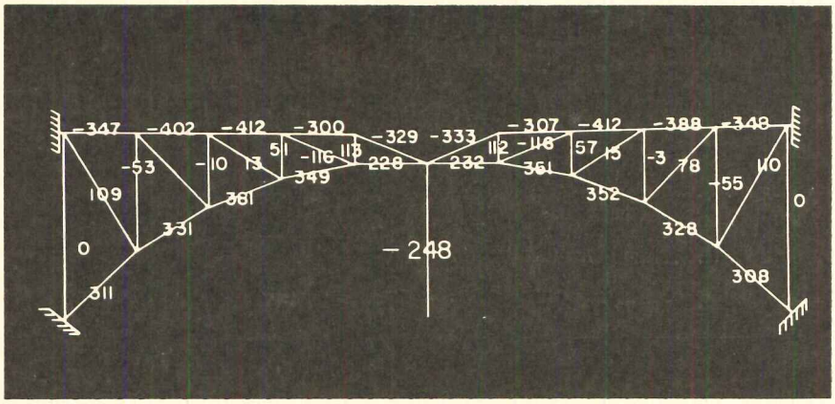
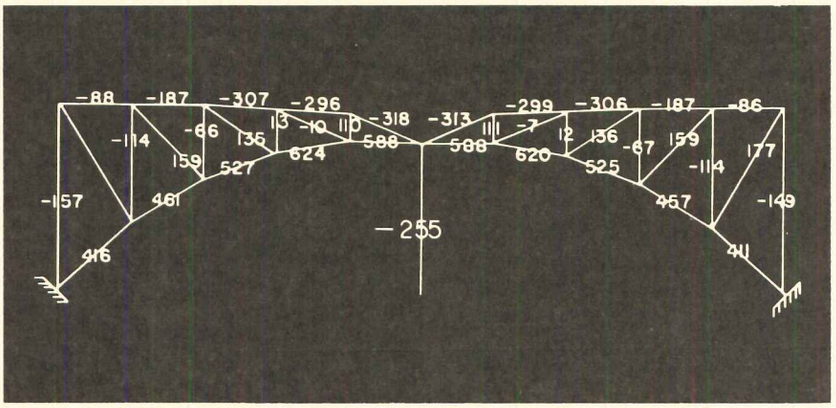
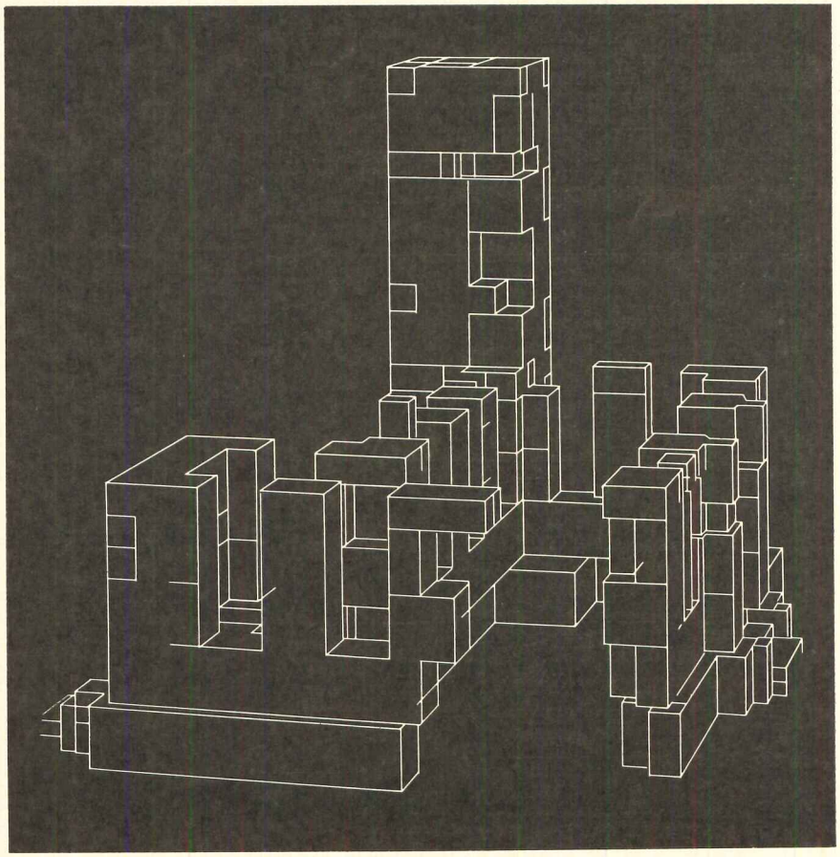




Sketchpad drawings of a truss displaying stresses in members under different support conditions.



A perspective drawn by a computer in which the hidden lines have been automatically erased by the computer program.

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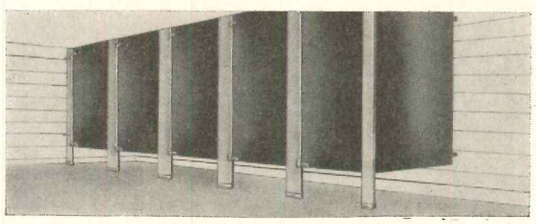

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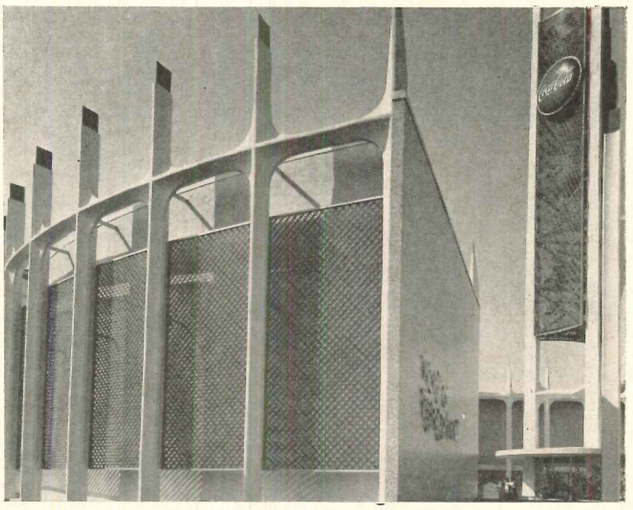

Photo above: Design #10, Industrial Designers Institute gold medal award winner.
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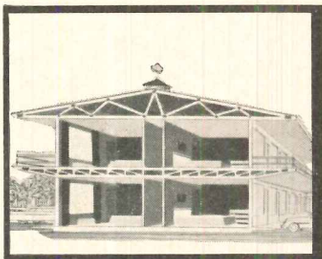

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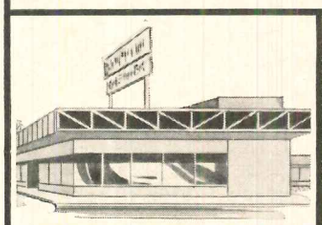

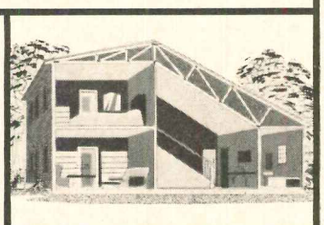

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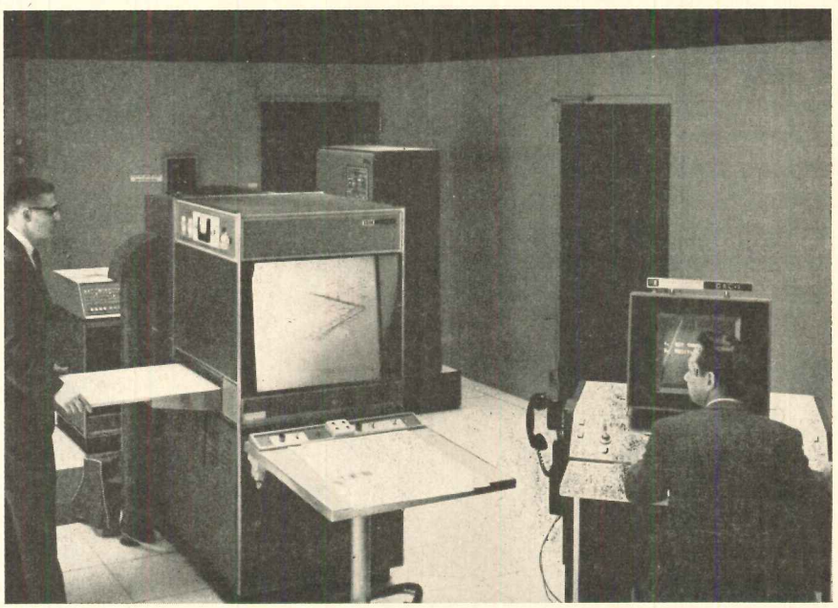

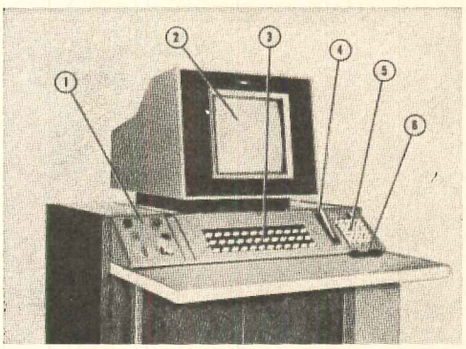

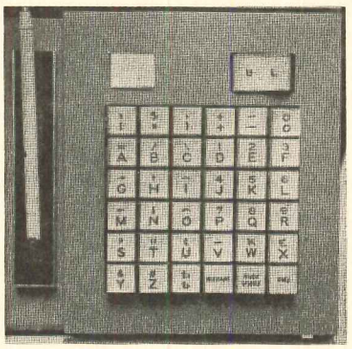

The DAC (Design Augmented by Computer) system developed by General Motors and IBM. This is not a Sketchpad system, but the physical equipment would be generally similar in appearance. 1. Power controls and indicators. 2. Cathode ray tube screen. 3. Program function switches and indicators. 4. Light pencil. 5. Alpha-numeric keyboard. 6. Card reader. Large machine in top picture is an image processor for converting drawings on paper into images stored by the computer in mathematical form.

Working Drawings

The capabilities of Sketchpad and related systems seem to indicate that the process of producing a set of working drawings will eventually become simply a matter of the computer printing out, in a few hours at most, all the stored information on a particular job, possibly accompanied by detailed instructions to the machines that will make the building components.

The ability to produce a set of contract documents almost immediately after the last design decision has been made is only a by-product of the capabilities that can be of great assistance to the designer. It is probably the working drawing application, however, that will be the greatest single factor militating for the widespread acceptance of computer techniques.

How Soon, and How Costly?

The photographs at left show the equipment used in the DAC, Design Augmented by Computer, system developed by General Motors and IBM. This is not a Sketchpad system, although the general appearance of the equipment would probably be quite similar if it were. It does have facilities for scanning drawings on paper, and converting them to mathematical descriptions, reconstituting the drawing on a screen, modifying it, and reproducing the image as a drawing again. It lacks some of Sketchpad's potential for architectural applications.

Another operational computer graphic system is the Digigraphic Display Program developed by Charles W. Adams Associates and the Itek Corporation, utilizing Control Data Corporation equipment. This system has many of the sketch capabilities previously described; at this point, however, only in two dimensions. In its present form this program would seem to be better adapted for engineering drawings than for architecture.

If architects wish an operational computer graphic system closely adapted to their own needs, they will probably have to become involved in its development. At least during the

next few years, they are not likely to receive a free ride from the researches of engineers and the large manufacturing concerns. This type of program development is very costly, beyond the reach of all but a few firms; it is probably a job for the schools, the local A.I.A. chapters, or for the Institute itself.

The computers themselves are also costly, and become economic for the individual architect only upon the perfection of time-sharing techniques. In a time-sharing system, the architect would have only a small console and screen in his own office, and this console would be connected by telephone lines to a large central computer. Because of the speed with which computers calculate, a central machine could service many such consoles, and the architect would be billed only for the actual elapsed calculation time of the central machine. At a recent demonstration of time sharing at project MAC (Machine-Aided Cognition) at M.I.T., two hours of sketching at a console used less than two minutes of calculation time. The Digital Equipment Corporation has already produced a suitable console; its cost is comparable to a year's salary for two draftsmen.

Obviously, the widespread adoption of computer-graphic techniques could mean a considerable dislocation of architectural employment. Professor Steven Coons of M.I.T. has a good working axiom: if the task is dull and machine-like, it can probably be done better and faster by a machine. These new techniques could also suddenly put jobs of great size and complexity within the reach of the small office, and there are doubtless other consequences of computer graphics that would be equally far reaching and very probably painful as well. Outside the pages of Samuel Butler's *Erewhon,* however, it has never been possible to turn back the technological clock. Someone is going to put these new developments to an architectural use, whether it be the architect, the "package dealer" or the manufacturer of building components. It is time for the profession and the schools of architecture to begin asking themselves some serious questions.

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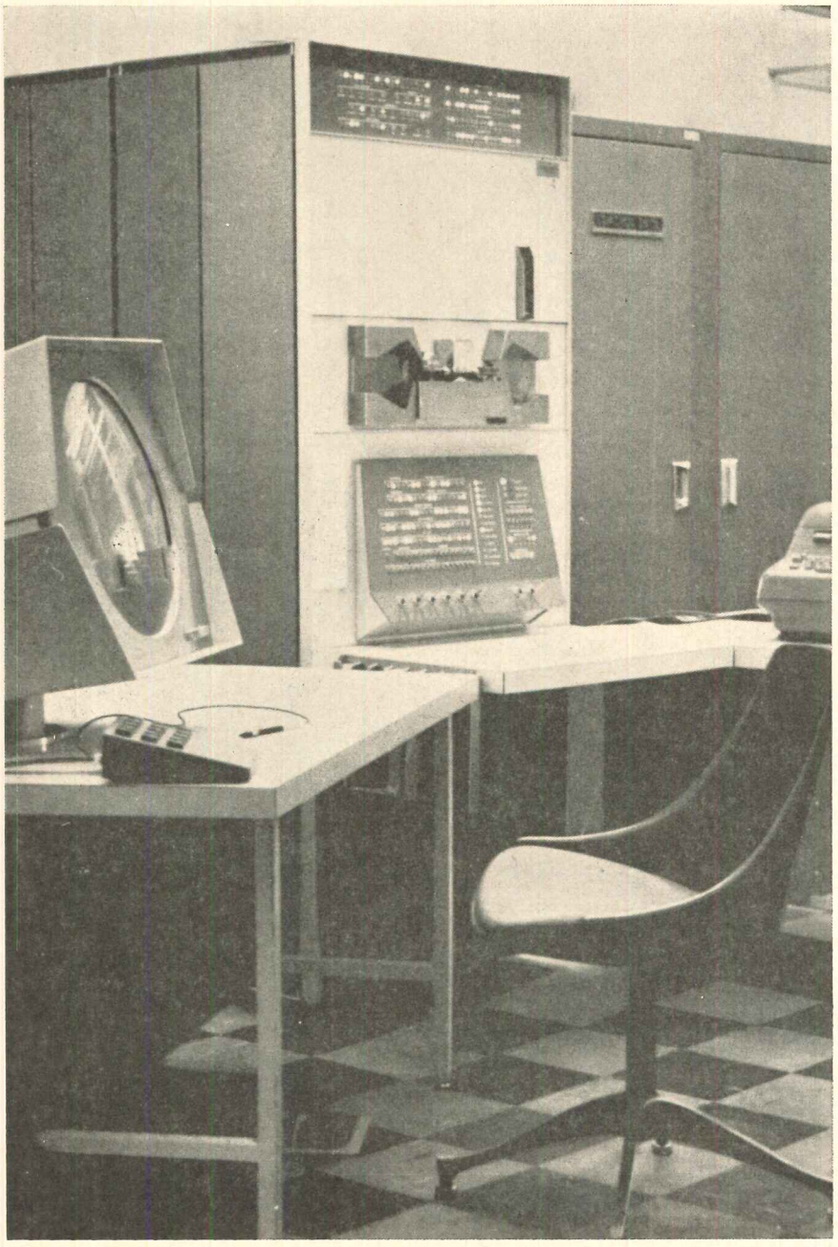
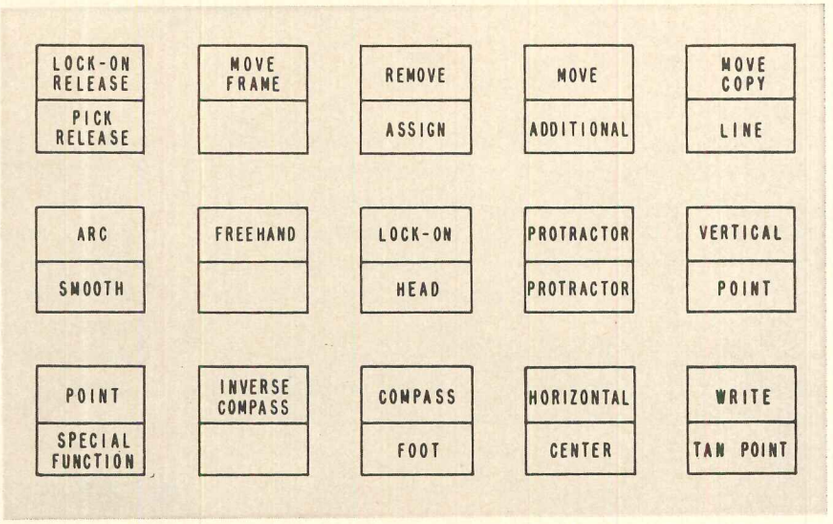
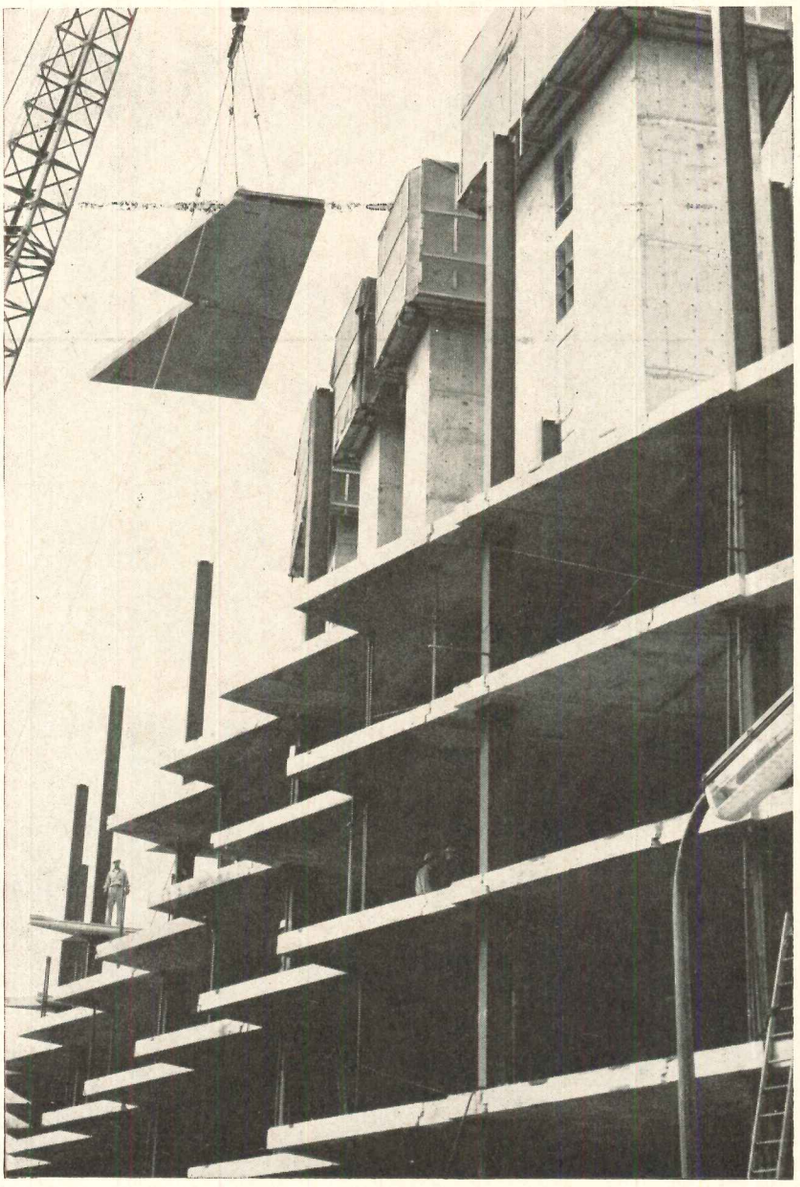




Equipment used for the Digigraphic Display Program, with diagram of push button keyboard.



PRESTRESSED CONCRETE FABRICATOR: Prestressed Concrete, Inc., St. Paul, Minnesota.

Architects: Ackerberg and Cooperman, and Ackerberg and Associates, Inc., Architects, Minneapolis, Minnesota.

General Contractor: Robin Hood Construction Company, Minneapolis, Minnesota.

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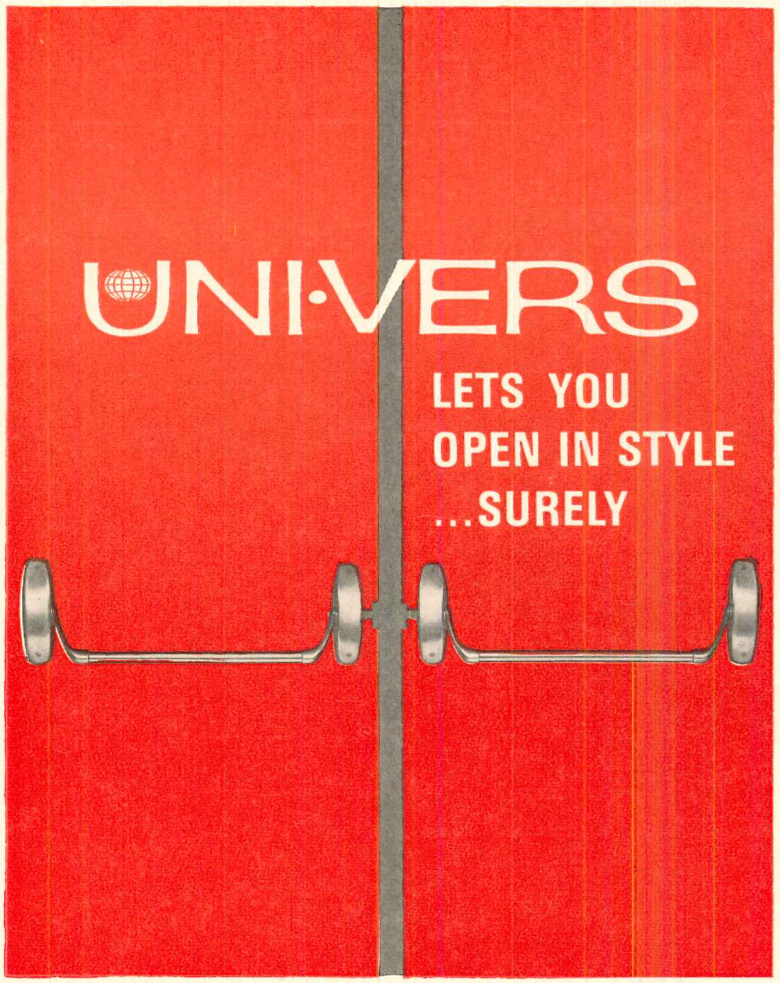

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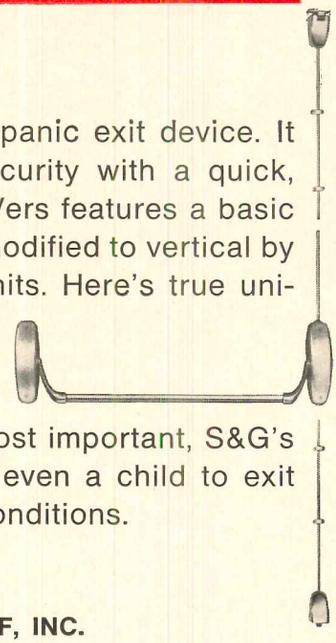

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Suggestions for Further Reading

One of the best books on computers for the interested, but non-mathematically oriented, reader is "Electronic Computers" by S. H. Hollingdale and G. C. Tootill, which was published this summer by Penguin Books. Several of the developments mentioned in this article have occurred since the book was compiled, but, in a fast-moving field, a few such gaps are inevitable, and the work makes up for them by its lucid and comprehensive presentation of basic computer theory. While the text will require the reader's close attention, there is nothing arcane or obscure about it. Another general work that may be helpful is Jeremy Bernstein's "The Analytical Engine," published last year by Random House. It contains a detailed discussion of the new programing languages. The articles listed below are more specifically concerned with the use of computers in an architectural context. The two sets of papers from the Joint Computer Conferences are naturally quite technical, but they are indispensable to a detailed investigation of the subject.

Computer-Aided Design. A group of five papers by Massachusetts Institute of Technology authors, presented as a special session at the AFIPS Spring Joint Computer Conference, Detroit, Michigan, May 1963.
1. S.A. Coons: "An Outline of the Requirements for a Computer-Aided Design System."
2. D.T. Ross and J.E. Rodriguez: "Theoretical Foundations for the Computer-Aided Design System."
3. R. Stotz: "Man-Machine Console Facilities for Computer-Aided Design."
4. I.E. Sutherland: "Sketchpad: A Man-Machine Graphical Communication System."
5. T.E. Johnson: "Sketchpad III: A Computer Program for Drawing in Three Dimensions."

Design Augmented by Computers. Five papers presented at the Fall Joint Computer Conference, San Francisco, California, October 1964.

1. Edwin L. Jacks: "A Laboratory for the Study of Graphical Man-Machine Communications."
2. M. Phyllis Cole, Philip H. Dorn and Richard Lewis: "Operational Software in a Disk Oriented System."
3. Barrett Hargreaves, John D. Joyce, George L. Cole, Ernest D. Foss, Richard G. Gray, Elmer M. Sharp, Robert J. Sippel, Thomas M. Spellman and Robert A. Thorpe: "Image Processing Hardware for a Man-Machine Graphical Communication."
4. T.R. Allen and J.E. Foote: "Input, Output Software Capability for a Man-Machine Communication and Image Processing System."
5. F.N. Krull and J.E. Foote: "A Line Scanning System Controlled from an On-Line Console."

Architecture and the Computer. The proceedings of the First Boston Architectural Center Conference, December 5, 1964, Boston, Massachusetts.

Abzug, Irving. "Graphic Data Processing," *Datamation,* January 1965, 35-37.

Cowan, Jack D. "Some Principles Underlying the Mechanization of Thought Processes," *Architectural Association Journal,* March 1965, 251-257.

Licklider, J.C.R. "Man-Computer Partnership," *International Science and Technology,* May 1965, 18-26.

Pritchard, Tram C. "Future Trends in Technical Communication," *Graphic Science,* March 1965, 17-19.

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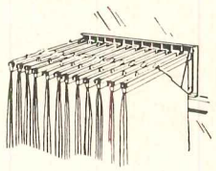
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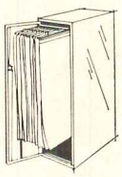
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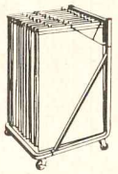
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Required Reading

continued from page 80

THE BARNS OF THE ABBEY OF BEAULIEU AT ITS GRANGES OF GREAT COXWELL & BEAULIER-ST.-LEONARDS. *By Walter Horn and Ernest Born. University of California Press, Berkeley 4, Calif. 74 pp., illus. $10.00.*

DETERIORATION, MAINTENANCE, AND REPAIR OF STRUCTURES. *By Sidney M. Johnson. McGraw-Hill Book Company, 330 W. 42nd St., New York, N.Y. 373 pp., illus. $10.50.*

METROPOLITAN PARKING STRUCTURES. *By Dietrich Klose. Frederick A. Praeger, 111 Fourth Ave., New York, N.Y. 10003. 248 pp., illus. $18.50.*

THREE ESSAYS ON TOWN PLANNING. *By Paul Kriesis. Office of the Dean, School of Architecture, Washington University, St. Louis, Mo. 63130. 116 pp. $1.50.*

INVESTIGATIONS IN COLLECTIVE FORM. *By Fumihiko Maki. Office of the Dean, School of Architecture, Washington University, St. Louis, Mo. 63130. 87 pp., illus. $1.50.*

YOUR ENGLAND VISITED. *By Ian Nairn. Hutchinson & Co., Ltd., 178-202 Great Portland St., London, W.1. 125 pp., illus. 30s.*

MAN'S RAGE FOR CHAOS. *By Morse Peckham. Chilton Books, 227 S. 6th St., Philadelphia, Pa. 19106. 339 pp., illus. $6.95.*

PERSIAN ARCHITECTURE. *By Arthur Upham Pope. George Braziller, Inc., One Park Ave., New York, N.Y. 10016. 288 pp., illus. $20.00.*

HANNES MEYER. *Edited by Claude Schnaidt. Architectural Book Publishing Co., Inc., 151 E. Fiftieth St., New York, N.Y. 10022. 123 pp., illus. $16.50.*

STAINED GLASS: AN ARCHITECTURAL ART. *By Robert Sowers. Universe Books, Inc., 381 Park Avenue South, New York, N.Y. 10016. 128 pp., Illus. $12.50.*

THE WORK OF FRANK LLOYD WRIGHT FROM 1893 TO 1900. *By Robert C. Spencer Jr. The Prairie School Press, 117 Fir St., Park Forest, Ill. 72 pp., illus. $2.50.*

DEFECTS & FAILURES IN PRESSURE VESSELS & PIPING. *By Helmut Thielsch. Reinhold Publishing Corp., 430 Park Ave., New York, N. Y. 10022. 427 pp., illus. $15.50.*

PARKING FOR RECREATION. *Prepared by Vollmer Associates. American Institute of Park Executives, Inc., Oglebay Park, Wheeling, West Virginia. 39 pp., illus. $2.00.*

ADDENDUM

In Books Received (July 1965, page 258) the INTERNATIONAL ENGINEERING DIRECTORY was incorrectly listed as having no charge and should have been listed at a price of $10.00 to non-members of the Consulting Engineers Council.

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MCA Tower, Universal City, Calif.; Architect-Engineer: Skidmore, Owings & Merrill, San Francisco; KALCOLOR® aluminum fabricator: Fentron Industries, Inc.

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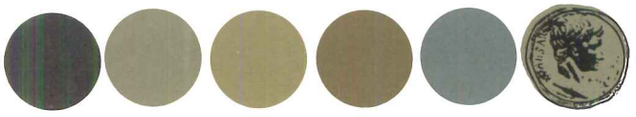
MCA's new tower at Universal City, California, has giant solar gray glass windows of record size for the Los Angeles area. Other than that, the entire exterior is rich, black KALCOLOR anodized aluminum—frames, column facings, doors, railings—chosen for superior color-uniformity and resistance to weather. KALCOLOR is sunfast, highly corrosion resistant, twice as resistant to abrasion as ordinary anodizing and may be applied to almost any aluminum building product. Most important, only KALCOLOR can be specified in ten color values—in the wide range represented by the circles below. See Sweet's File 6a/Ka for technical information on KALCOLOR aluminum. To locate KALCOLOR products of our fabricator customers, call Kaiser Aluminum in your city... or write Kaiser Aluminum, Dept. 845i, Kaiser Center, Oakland, California 94604.



KAISER ALUMINUM

COLOR IN ARCHITECTURE...ACHIEVED WITH ALUMINUM

The place:

The prestigious
Republic National Bank,
Dallas, Texas

The man:

Joe W. Toomey
Design Coordinator
Dallas, Texas

The carpets:

Bigelows. For the Board of Directors' Room, Mr. Toomey specified *Dean* wall-to-wall. Special Beige, Temple Gold and Avocado were the carpet colors used throughout this beautifully decorated 50-story bank.

Why do people like Joe W. Toomey specify Bigelow? Because they know that for every hotel, motel or commercial building, Bigelow has or can custom-create the perfect carpet. We've done it since 1825. Our carpet counselors will give you all the help you need in solving any kind of carpet problem—at no charge. Simply call your nearest Bigelow sales office. Or for a colorful free brochure on commercial carpets, write Dept. A, 140 Madison Avenue, New York, N.Y. 10016. Find out for yourself why

people who know buy Bigelow

Bigelow sales offices are located in Atlanta, Boston, Chicago, Cleveland, Dallas, Denver, Detroit, Los Angeles, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco, Seattle.

For more data, circle 77 on Inquiry Card

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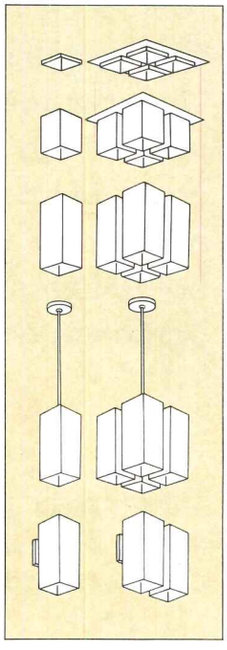
Ingenious combination { our Quadrille... your Imagination

Quadrille offers a fresh look in downlighting. Warm. Rugged. Clean. Square tubes of extruded aluminum, anodized in architectural bronze, express the lighting function with new strength and simplicity. Used singly, or in 12" x 12" quads that can replace a standard ceiling tile and be gang mounted, Quadrille makes possible an endless variety of patterns, allows you to design with light, to accent a feature, guide traffic, establish a mood—what you will. Each tube has its own internal reflector, can be used with a general service lamp or, for added punch, with an R-20 or R-30 reflector lamp. A range of variegated bronze shadings within each lighting cluster, inherent in the anodizing process, adds a note of warmth and richness to any installation. Quadrille: Another new lighting tool by Lightolier. See the Yellow Pages for the name of your nearest Lightolier distributor or write to Lightolier, Jersey City, N.J. 07305 for brochure 48.

Available in single and quad combinations in stem, surface mounted, semi-recessed, recessed and one and two-light matching wall brackets. Can be custom-cut to your specifications in exposed lengths up to 6'-6".



Quadrille, developed in cooperation with architects Javier Carvajal and Kelly & Gruzen, A.I.A. was first installed in the Pavilion of Spain, N.Y. World's Fair.

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Showrooms: 11 East 36th Street, New York; 1267 Merchandise Mart, Chicago; 2515 South Broadway, Los Angeles; 1718 Hi-Line Dr., Dallas.

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Architects responsible for many college buildings are continually specifying DULITE roof deck for educational structures. And for good reason—advantages include 2-hour Underwriters' rating, exceptional insulating value, high acoustical sound control, fast construction, economy and savings (initially and long range) and more. Check all the advantages of DULITE. **Phone or write for complete details.**

THE DUWE SYSTEM

DUWE

PRECAST CONCRETE PRODUCTS, INC.
Phone Area 414-231-3980 • P. O. Box 1277
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For more data, circle 80 on Inquiry Card ➔

Except when it's the elegant American Classic Rose permanently imbedded within the plastic of a luxurious Beneke seat. In that case, it is the most magnificent decorative device ever created to enhance a toilet seat. Now you can choose from a wide variety of designs, each preserved for the lifetime of the seat by a new technique in molding perfected by Beneke. There's a trend toward colorful decorating in bathrooms. Beneke decorates the best.

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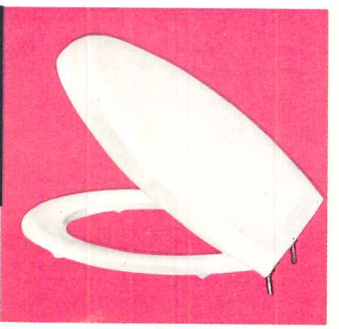
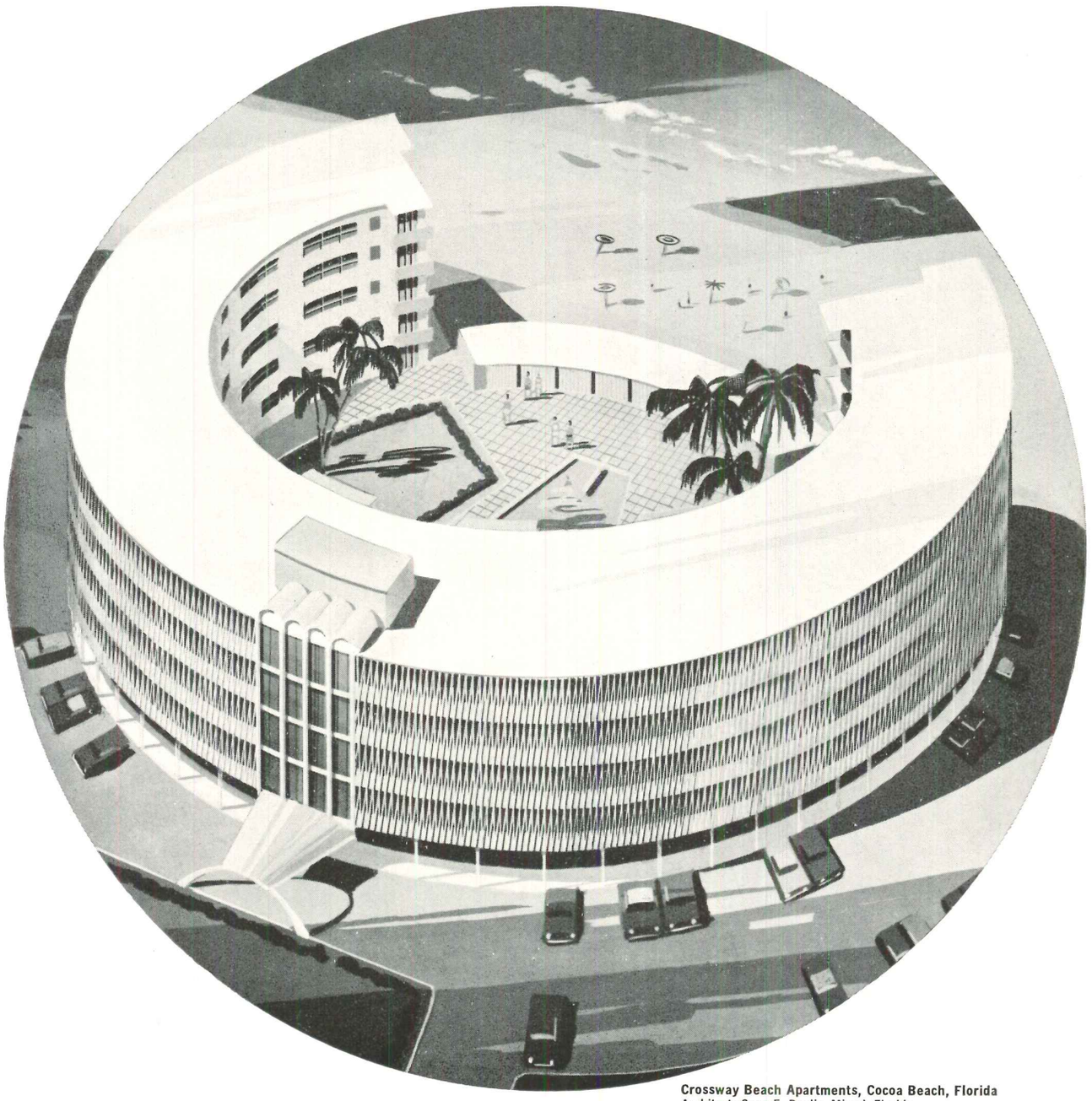
THE FIRST NAME IN SEATS—THE LAST WORD IN QUALITY



CHICAGO	NEW YORK	SAN FRANCISCO	NEW ORLEANS	PARIS	TORONTO
Oak Park	Woodside	Milpitas	Louisiana	France	Canada
AU 7-9500	OL 1-9200	262-4410	JA 5-3776	Passy 19-53	CH 9-7170



Crossway Beach Apartments, Cocoa Beach, Florida
Architect: Gene E. Baylis, Miami, Florida
Mechanical Contractor: Southern Plumbing,
Cocoa Beach, Florida

How does the future look to you?

Florida is famous for spectacular architecture. Yet, even here, the Crossway Beach Apartments are a monument to architectural achievement: functional artistic design freedom. Much of this freedom resulted from the wise choice of ℄ NO-HUB® Cast Iron plumbing drainage piping for the sanitary system.

℄ NO-HUB is new, yet thoroughly tested; strong, yet slim and modern. And streamlined for use in even the most advanced construction such as this example. Remarkably adaptable for use above and below ground, whatever you're planning. Check into ℄ NO-HUB—with hubless ends, and compact, permanent joints. It's genuine Cast Iron Soil Pipe—the kind that outlasts buildings. That's the way it's made.

Qualified counsel and assistance to code committees available in all areas through resident district manager. Contact the Institute; we'll put him in touch with you.

CAST IRON SOIL PIPE INSTITUTE
1824-26 Jefferson Place, N.W., Washington, D.C. 20036

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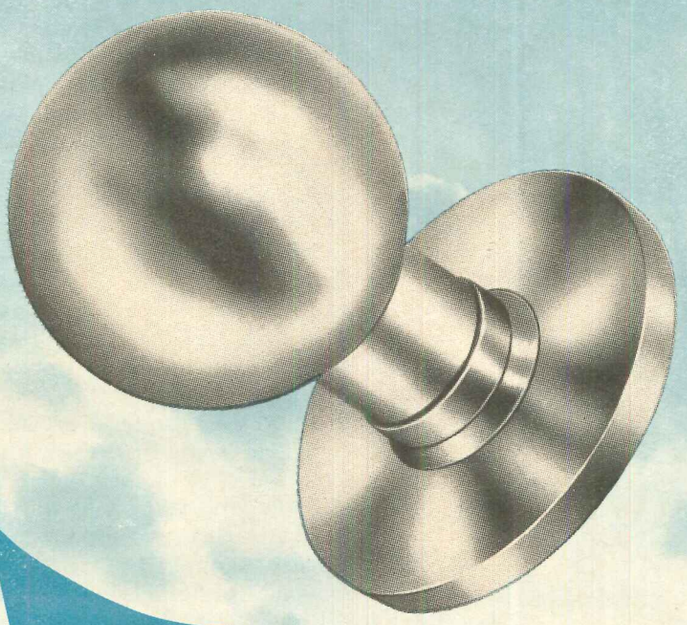
LOCKWOOD'S New Tempest Design
Takes the World BY STORM



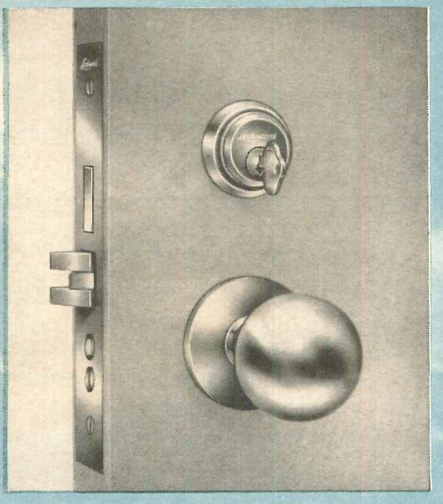
There seems to be something about a perfectly **round** knob and a perfectly **round** rose and a perfectly **round** cylinder that makes architects wild about putting them on a perfectly **SQUARE** door.

Maybe it's because this Tempest trim is an approach to design in builders' hardware that's as fresh as an ocean breeze.

Or it could be that they just like the solid feel of that round knob in their hands.

We like to think it goes deeper than that because underneath that Lockwood trademark is the finest mortise lock ever made.

With or without Tempest trim, it will run circles around any other lock in the world.



Tempest's big sister, the Sphere Design, features a 2¼" diameter knob.

LOCKWOOD

LOCKWOOD HARDWARE DIVISION

INDEPENDENT LOCK COMPANY ILCO
Fitchburg, Massachusetts

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He must have married money . . .
he has a Speakman Anystream

What makes the Anystream® the most wanted shower head in America? No longer is the bathroom a utility room. Today, it is the newest and most important status symbol in homes, apartments, and executive offices . . . making a Speakman Anystream a must. Alert architects and builders are taking full advantage of this strong trend to elegance and affluence. Get the facts, before you specify your next job.

SPEAKMAN ANYSTREAM: the only shower head that gives you instant choice of all kinds of spray, with a flick of the lever handle. Made of the finest quality chromium plated brass in elegant sculptured design, the Anystream gives full-pattern spray with no after-drip. Self-cleaning and no pinholes to clog. Easily installed in minutes and available with water-saving Autoflo® feature.

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Wilmington, Delaware 19899
In Canada write Cuthbert-Speakman, 47 Duke Street, Montreal 3, Quebec

See Sweet's Catalog 26b/sp

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On the Calendar

October

1-3 Annual Conference, New England Region, American Institute of Architects—Colony Motor Hotel, Providence, R.I.

3-8 47th National Recreation Congress, sponsored by the National Recreation Association and the American Recreation Society with the cooperation of the Minnesota Park Board and the Minnesota Parks and Recreation Administration—Minneapolis

6-10 Annual Conference, California Region, American Institute of Architects—Yosemite National Park, Calif.

13-15 Ninth Semi-Annual Board of Directors Meeting, Consulting Engineers Council—Wort Hotel, Jackson Hole, Wyo.

14-16 Annual Conference, Ohio Region, American Institute of Architects—Atwood Lake Lodge, New Philadelphia, Ohio

18-22 American Society of Civil Engineers Annual Meeting and Environmental Engineering Conference—Hotel Continental and Hotel Muehlebach, Kansas City, Mo.

21-23 Annual Convention, Western Mountain Region, American Institute of Architects—Mountain Shadows Resort, Scottsdale, Ariz.

21-23 Annual Conference, Pennsylvania Region, American Institute of Architects—Hershey, Pa.

26-27 Symposium on the Performance Concept in Building, Building Research Advisory Board—Edgewater Beach Hotel, Chicago

28-29 American Society of Civil Engineers Urban Planning and Development Division Specialty Conference—Americana, San Juan, Puerto Rico

November

1-5 Fall Convention, American Concrete Institute—Statler Hilton Hotel, Cleveland

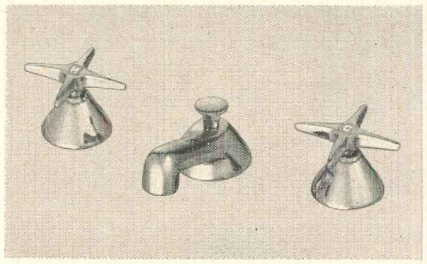
3-5 Annual American Institute of Architects State Convention, Texas Society of Architects—Austin, Tex.

3-6 Annual Conference, Central States Region, American Institute of Architects—Des Moines, Iowa

9-10 Motel Days Program, National Hotel and Motel Exposition—New York Coliseum, New York City

continued on page 109

He's so artistic...
Renoir in the living room and
Diamond 75 in the bathroom



DIAMOND 75*
for Slim Beauty

The New Diamond 75 expresses the rare combination of functional design and sculptured beauty. Add the famous Speakman quality and you have the most exciting and popular lavatory and shower and bath fixtures of the year. All Diamond 75 parts that are subject to daily wear are removable and renewable, assuring years of trouble-free operation. Before you specify fittings at any price, be sure to see the Diamond 75 line . . . you'll be surprised how such quality can be priced so competitively.

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specify elegance with
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Office Notes

continued from page 108

10-12 Fall Conference, Building Research Institute—Washington Hilton Hotel, Washington, D.C.
13-15 Annual Meeting, Air-Conditioning and Refrigeration Institute—Hollywood Beach Hotel, Hollywood Beach, Fla.
16-18 11th Annual International Nuclear Industry Trade Show, Atom-fair '65 and Annual Conference of the Atomic Industrial Forum and the 1965 Winter Meeting of the American Nuclear Society—Sheraton-Park Hotel, Washington, D.C.
17-20 Annual Conference, Florida Region, American Institute of Architects—Jack Tar Hotel, Clearwater, Fla.

December

5-10 Eleventh Annual Convention, Prestressed Concrete Institute—Americana Hotel, Miami Beach, Fla.; followed by a 3-day Caribbean cruise

Office Notes

Offices Opened

Brock Arms, A.I.A., N.S.I.D., has opened an office for the practice of architecture and interior planning, 951 Sheridan Rd., Glencoe, Ill.

Bovay Engineers, Inc., Professional Engineers with home offices in Houston, have purchased controlling interest in **Limbaugh Engineers, Inc.,** Albuquerque, N.M., where George C. Love will become vice president.

Donald A. Denis Associates has opened an office for the general practice of architecture at 6 E. Main St., Riverhead, L.I., N.Y.

The firm of **Walter Roberts & Associates** has been formed for the practice of architecture, 100 Ross St., Pittsburgh 15219.

New Firms, Firm Changes

Richard K. Albyn has joined the architectural firm of **Tarapata-MacMahon Associates, Inc.,** Bloomfield Hills, Mich. as a principal.

Smith, Hinchman & Grylls Associates, Inc., Detroit, has appointed **John J. Andrews** as director of industrial engineering and facilities

continued on page 116

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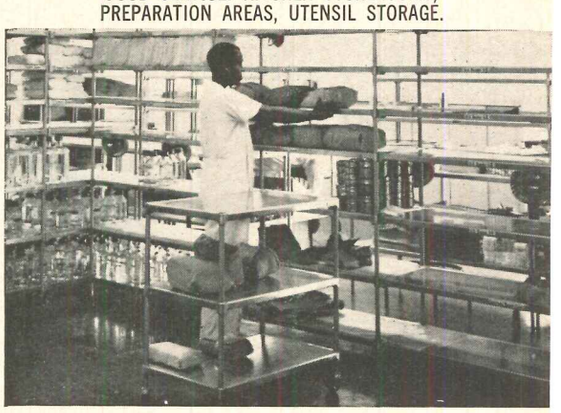
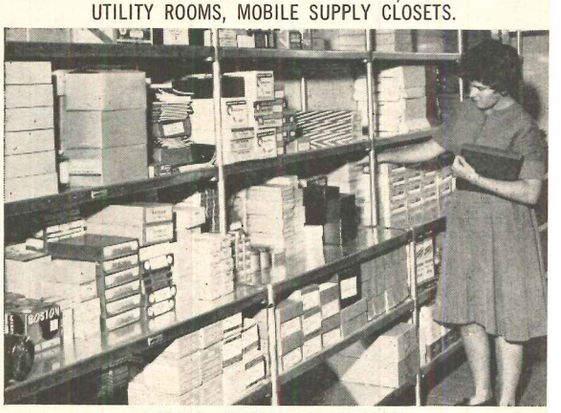
HOLD EVERYTHING...

FOOD SERVICE: KITCHEN STOREROOMS, PREPARATION AREAS, UTENSIL STORAGE.



HOSPITALS: CENTRAL SUPPLY, UTILITY ROOMS, MOBILE SUPPLY CLOSETS.



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Modular Marketier Shelving and Modular Storage Systems are designed and built especially for institutional storage needs. RUGGED — Patented corner construction and double reinforced edges withstand years of use and abuse. ADJUSTABLE — Shelves may be instantly set at any desired spacing. Nine modular scientifically determined shelf sizes. Easy to install or relocate. SANITARY — Maximum ease of cleaning with solid crevice-free construction. Spills wipe up easily. Stainless steel or aluminized steel with wide variety of casters and accessories for mobile use and other applications.

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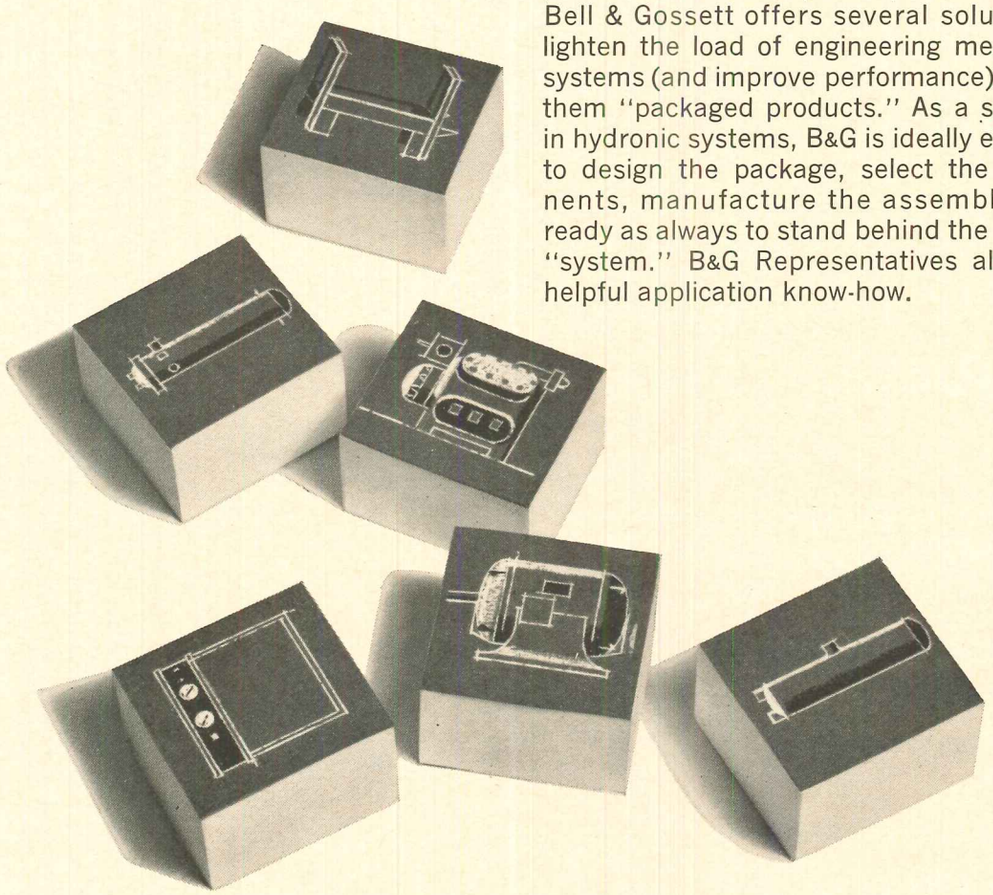
Engineered systems to pump fluids, maintain circuit pressures, heat and cool grow more complex daily. Analyzing and pricing the components for these installations places burdensome loads on the engineering staff. In the end, the individually designed "package" generally costs more and often poses problems of split responsibility.

Bell & Gossett offers several solutions to lighten the load of engineering mechanical systems (and improve performance). We call them "packaged products." As a specialist in hydronic systems, B&G is ideally equipped to design the package, select the components, manufacture the assembly...and ready as always to stand behind the finished "system." B&G Representatives also offer helpful application know-how.



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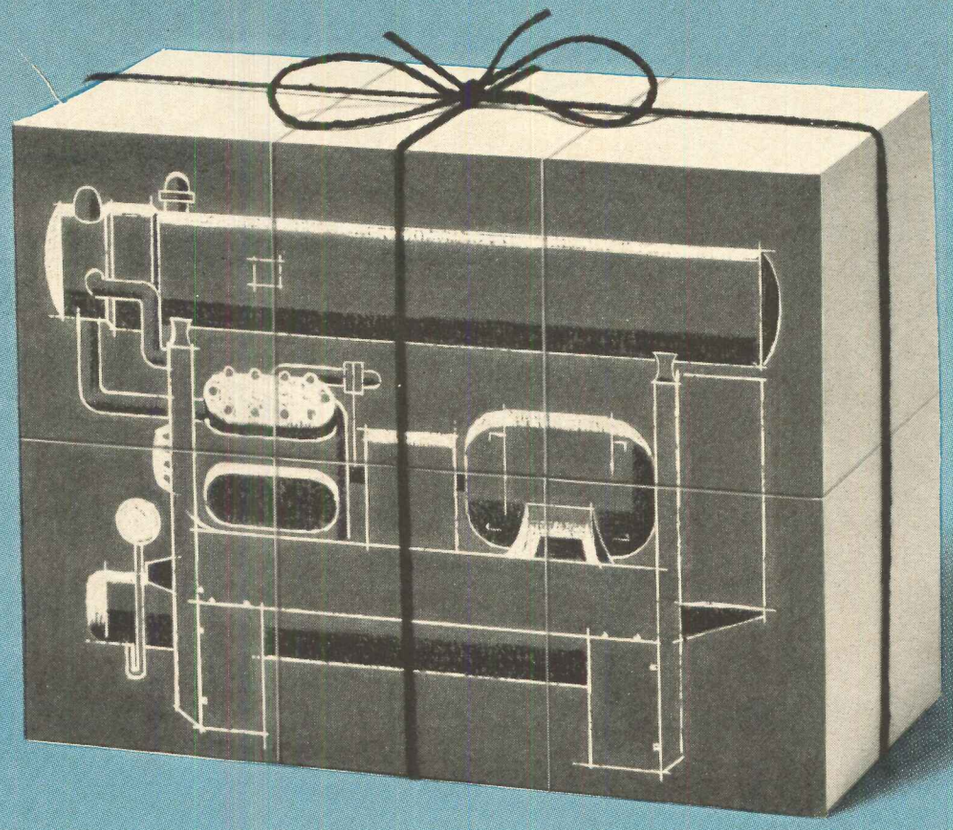
B&G offers packages for four basic applications: (1) Pressure Boosting to maintain uniform pressure throughout a domestic or industrial water distribution system without use of storage tanks; (2) Packaged Chiller units for air conditioning; (3) Heating/Cooling in industrial process circuits; (4) Air Control in hydronic heating and cooling systems.

(More data provided on following page.)



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See if one of these packages doesn't fit your needs

B&G Pressure Booster Package is the first complete water pressure boosting unit including electrical control panel mounted and pre-wired. Automatic, variable speed control provides constant system pressure in office buildings, hotels, motels, apartments, hospitals, schools and factories. Available as single units; or multiples connected in parallel and electrically interlocked.

Packaged Chillers for air conditioning by B&G consist of electric or gas engine drive, compressor, condenser, evaporator and controls all mounted on a common frame. 7½ to 200 ton capacity with open compressors; 7½ to 30 ton semi-hermetic compressors. Heavy-duty construction and precision machining assure smooth, trouble-free performance.

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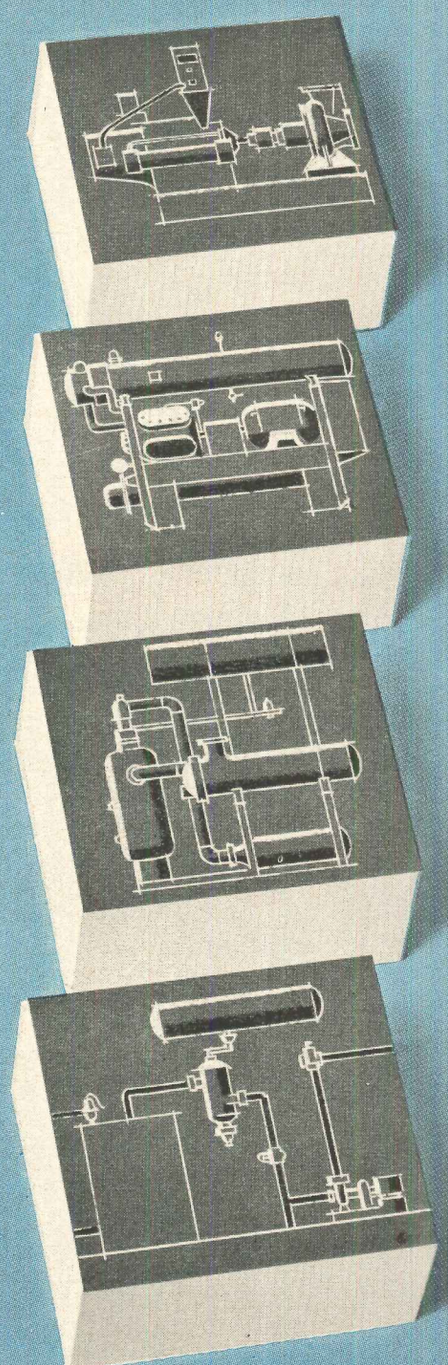
Air Control Devices from B&G provide a *guaranteed* method of eliminating entrained air in hydronic systems. While the wide diversity of installations does not permit factory assembly, B&G Air Control does represent a "package" in the complete selection of valves, fittings and Air Control Boosters from a single source for your needs.



It will pay you to get the full facts about B&G "packaged" savings. Write ITT Bell & Gossett Hydronics, a division of International Telephone and Telegraph Corporation, Morton Grove, Illinois, Dept. 32D.

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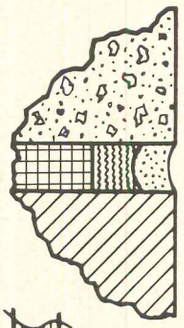
5 OUTSTANDING DAP® SEALANTS... AND WHERE PROFESSIONALS USE THEM

1 DAP BUTYL-FLEX® BUTYL RUBBER CAULK

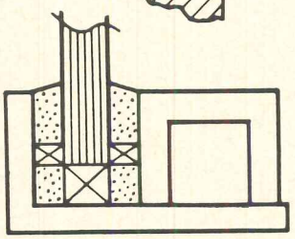
APPLICATIONS: Curtain wall construction and general caulking applications calling for a superior seal.



CHARACTERISTICS: Outlasts, outperforms conventional caulks 5-to-1. Butyl rubber base assures permanent flexibility. Butyl-Flex gives airtight, watertight seals between similar and dissimilar materials. Sticks tight to aluminum, concrete, glass, steel, marble and other construction materials. Won't sag or slump over wide temperature range. Non-bleeding, non-toxic, non-corrosive. Available in cartridges and bulk containers.

2 DAP FLEXISEAL® POLYSULPHIDE POLYMER COMPOUND

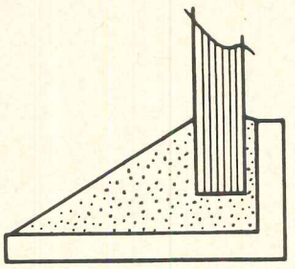
APPLICATIONS: Wherever critical conditions of expansion and contraction exist: expansion joints, curtain walls, swimming pools, porcelainized metal panels, tilt-up panels, skylights, channel or stop-glazed sash and similar installations.



CHARACTERISTICS: A 2-part liquid polysulphide polymer compound for trouble-free service in the toughest caulking, glazing and sealing jobs. Balanced Modulus means adhesion always exceeds cohesion . . . assures airtight, watertight seals under severest conditions of expansion, contraction, temperature and exposure. Smooth, buttery consistency makes mixing and application easy throughout a wide temperature range. Compounded in one, premium-grade quality only. Meets and exceeds Federal Specification TT-S-227b.

3 DAP '1012'® GLAZING COMPOUND

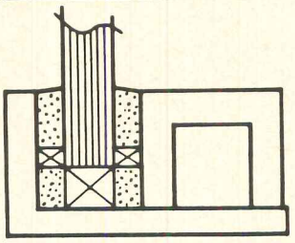
APPLICATIONS: Interior and exterior face glazing of metal sash.



CHARACTERISTICS: Aluminum gray color matches color of aluminum sash. Easily applied. Excellent handling and knifing. Sets quickly without cracking, sagging. Stays flexible. Adheres to all metals. Takes paint. Meets and exceeds Interim Federal Specification TT-G-00410c for a non-hardening glazing compound resistant to damaging effects of heat, cold, vibration and moisture. Available in cans and bulk containers.

4 DAP '1231' FLEXIGLAZE® GLAZING

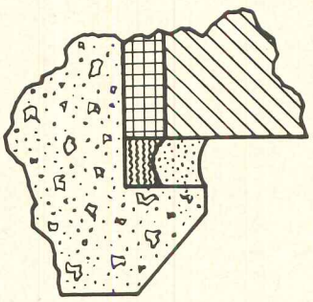
APPLICATIONS: Channel, bead or stop glazing. Bedding glass in primed wood or metal sash. Setting insulated glass window units or panels.



CHARACTERISTICS: Specially formulated from 100% solids—the finest synthetics and inerts—to eliminate shrinkage, cracking, discoloration. An outstanding mastic compound with excellent adhesion, cohesion, and flexibility. Adheres to primed wood, metal, glass, porcelain—most any kind of construction material. Forms a tough permanent seal that won't harden, bleed or stain.

5 DAP ARCHITECTURAL GRADE CAULK

APPLICATION: General caulking.



CHARACTERISTICS: Forms a tough skin for dependable airtight, watertight seals. Meets and exceeds Federal Specification TT-C-598b, Grade 1, for oil-based caulks. Stays flexible throughout extremes of weather and temperature conditions. Compounded for easy gunning. Colors: white, brilliant white, gray, aluminum gray—special colors available on special order. Packaging: cartridges and bulk containers.

DAP makes a complete range of specialized caulking, glazing and sealing products for the construction industry. For knowledgeable assistance in selecting the right sealant for your next project, write us about the DAP Technical Service Program.

DAP®
ARCHITECTURAL SEALANTS

DAP INC., GENERAL OFFICES: DAYTON, OHIO 45431 SUBSIDIARY OF *Plough, Inc.*

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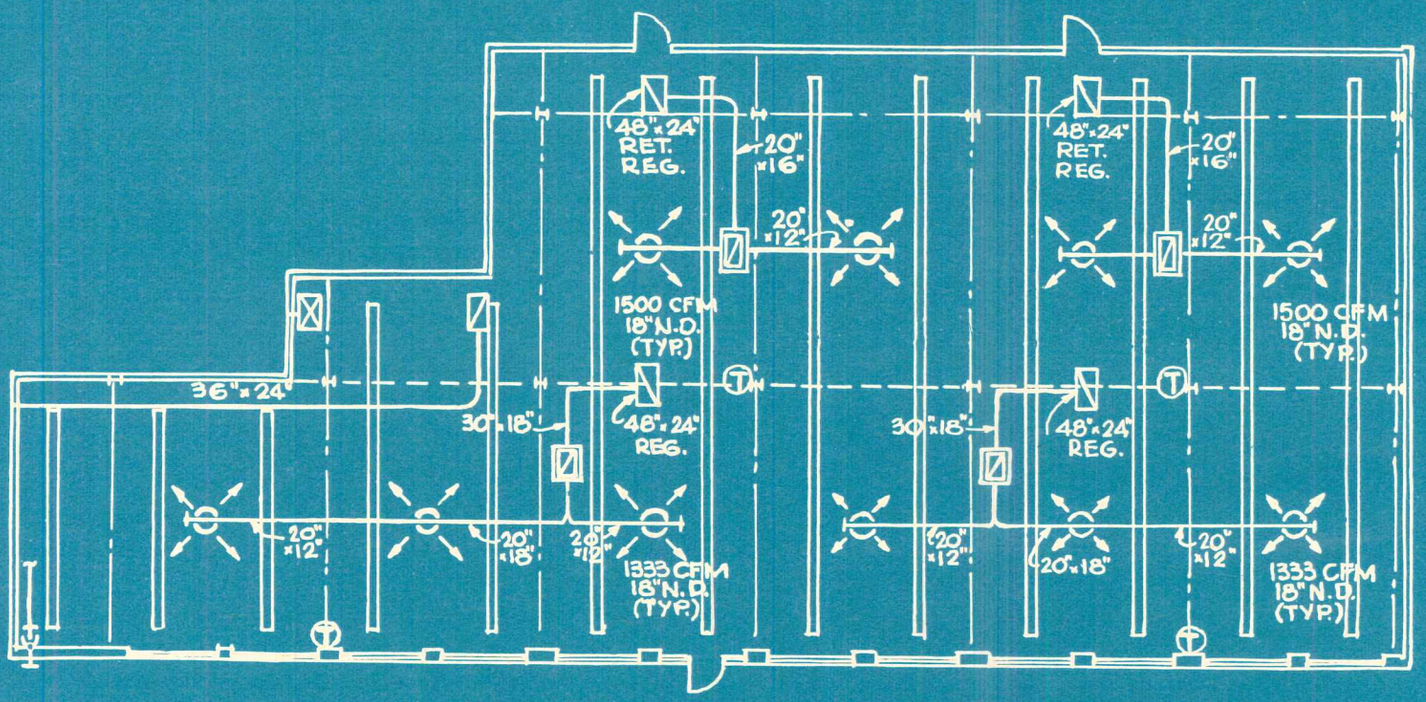
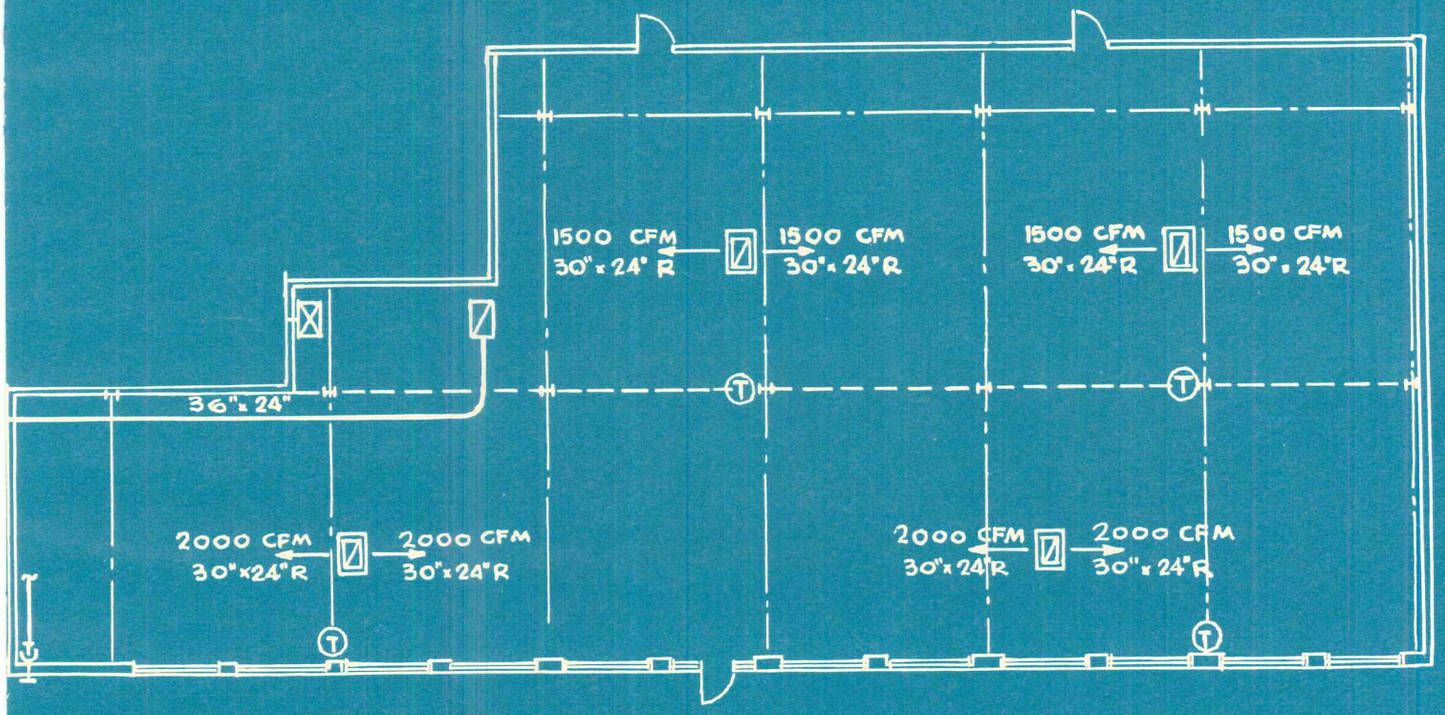


Conventional air distribution system

Celo-Flow system costs less,



Celo-Flow® air distribution system

performs better, looks better

The drawings above show an actual job in the southeastern United States, figured two ways.

The architect recommended the Celo-Flow system because he concluded that it was best for the job. It eliminated ceiling clutter and the almost inevitable soiling that sooner or later accompanies diffusers. And the Celo-Flow system gave his client more quiet, even air distribution than ducts and diffusers could.

Of course the real clincher came when he showed his client comparative cost estimates. The 6,040 sq. ft. job done conventionally would have cost $6,190 installed—including ducts, duct insulation, diffusers and ceiling. The installed Celo-Flow system cost $4,635 including perimeter insulation, baffling and ceiling. That's a saving of $1,555—more than 25%!

The Celo-Flow system is performing beautifully—just as it is in hundreds of other installations. The architect is happy and so is his client.

For complete information about Celo-Flow air distribution systems, call your Acousti-Celotex consultant-distributor (see the Yellow Pages) or write The Celotex Corporation, 120 N. Florida Ave., Tampa, Fla. 33602.

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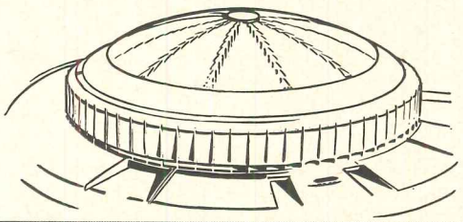
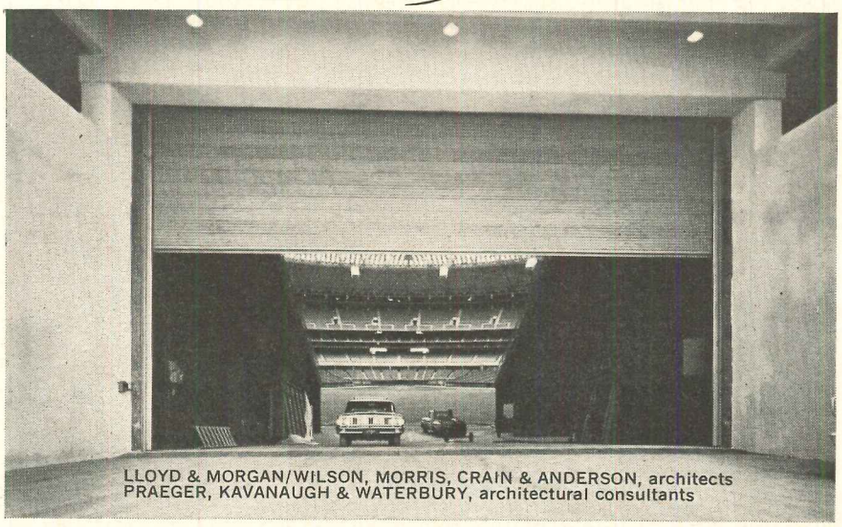
a big hit.....

in the colossal ASTRODOME





LLOYD & MORGAN/WILSON, MORRIS, CRAIN & ANDERSON, architects
PRAEGER, KAVANAUGH & WATERBURY, architectural consultants

"Big" is by no means an exaggeration in this instance. It's true in every sense. The Kinnear Motor Operated Rolling Door installed in the big $31 million ASTRODOME is 44′ wide x 24′ high* — the biggest Kinnear Door in the **big** state of Texas. This provides, at the push of a button, for the 1056 sq. ft. curtain of steel — weighing over 9 tons — to coil up out of the way, at a speed of one foot per second. And with the time-proven design and rugged construction of a Kinnear Door, **big** economies in operating efficiency and maintenance are a certainty. Such benefits make it only logical that KINNEAR — the **big name** in door reliability for over 70 years — was selected to participate in this internationally famous structure.

*Kinnear has, of course, built and installed larger doors!

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Office Notes

continued from page 109

and **William R. Jarratt,** A.I.A., an associate in the firm.

Thomas E. Calabrese has been appointed to the staff of **Fred S. Dubin Associates,** Consulting Engineers with main offices in Hartford.

Five new associates have been named by **Caudill, Rowlett & Scott,** Houston-based architects, planners and engineers. They are **James Falick, M. K. Goodman, Dan R. Stewart, Charles B. Thomsen** and **Robert D. Williams.**

Fling & Eeman, Inc., Consulting Structural Engineers, Columbus, Ohio, have admitted **William W. Fallon** and **John E. Sadler** to membership in the firm.

John Kariotis and **James Kesler** have formed the firm of **Kariotis and Kesler,** Structural Engineers, 1414 Fair Oaks Ave., South Pasadena, Calif.

With the retirement of **Sydney E. Martin,** F.A.I.A., A.E.D., from active practice, the firm of **Martin, Stewart, Noble & Class** will become **Stewart, Noble, Class & Partners,** Philadelphia.

New Addresses

Istvan Botond, A.I.A., Architect, 2152 Wyoming Ave., N.W., Washington, D.C. 20008.

Gardner and Howe, Consulting-Structural Engineers, Suite 1907, First National Bank Building, 165 Madison Ave., Memphis.

Alfred Greenberg Associates, Environmental Consultants, 101 Park Ave., New York City 10017.

Carl Koch & Associates, Inc., 35-36 Lewis Wharf, Boston 02110.

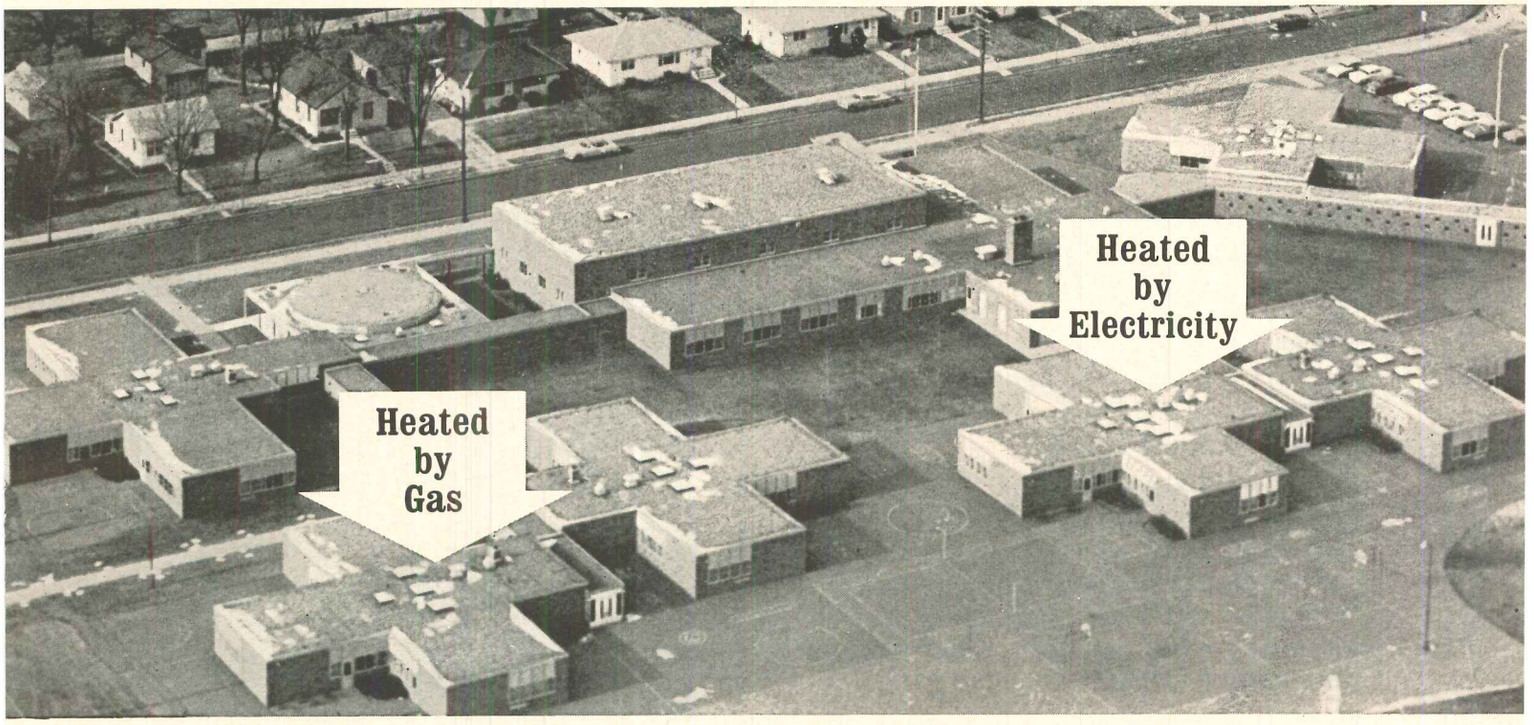
T.Y. Lin, Kulka, Yang & Associate and **T.Y. Lin International,** 15 Vandewater, San Francisco 94133.

Lawrence E. Matson, A.I.A., Architect, 413 B St., Idaho Falls, Idaho.

Gordon A. Phillips, Architect, A.I.A., 1312 Third St., San Rafael, Calif.

Rochlin & Baran, A.I.A., & Associates, Architects & Engineers, 10883 Kinross Ave., Glendale Federal Building, Westwood Village, Calif.

Van Osdol and Associates, Architecture and Planning, 339 S. Robertson Blvd., Beverly Hills, Calif.



TEST SITE: Identical classroom clusters. Identical construction. Identical exposure. Identical student use.

New Facts on Gas vs. Electric Heat

1. In one unique 3-year study, a major school system found heating with electricity cost 7 times more than Gas.

2. And 16 other comparative bid studies prove no basic difference in first costs between the two systems.

1. OPERATING COSTS

When you're responsible for a 100-plant school system, with an annual fuel bill of $500,000, the hard facts about heating methods are important. But officials of a major North Central state school system came to the conclusion a few years ago that existing information on the subject conflicted seriously.

They determined to find out for themselves. They would gather objective data, over an extended period, on the relative cost of heating a modern school plant with Gas vs. electricity. What they learned has significance for architects, engineers, and school administrators throughout America.

Previous Studies Inconclusive

Many comparisons of electric vs. nonelectric heating have been built on theoretical assumptions of what might have happened if one fuel had been used instead of another.

THESE TESTS WERE INEQUITABLE, SCHOOL OFFICIALS FELT, BECAUSE THEY DID NOT PROVIDE IDENTICAL THERMAL AND USE CONDITIONS.

The opportunity for this kind of study presented itself in the form of a new campus-type elementary school. The plant consisted of several three classroom clusters, attached to a central administration building. Design was similar to many other masonry and curtain wall schools.

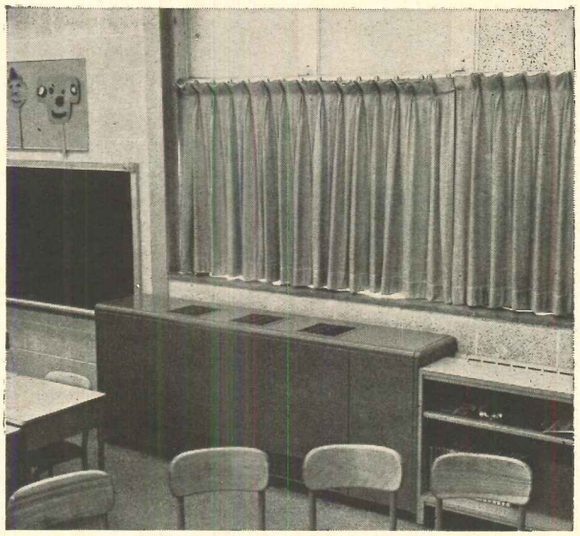
Identical Units Selected

School officials chose two physically identical classroom cluster units for the study. Clusters 1 and 3 had identical orientation, identical use hours, and equivalent occupancy. Thus, they could be used, heated and ventilated under *simultaneous* equivalent study conditions —insuring the complete objectivity and impartiality of the experiment.

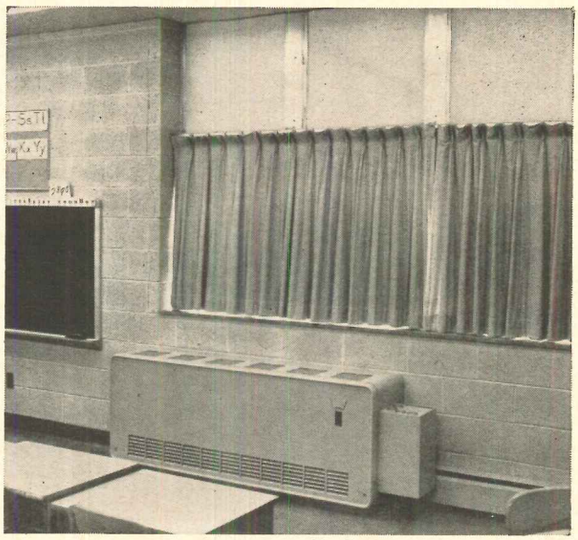
(It should be emphasized that the local electric power and Gas companies cooperated in the study from the early design stages of the school.)

Heating Systems Chosen

Into Unit No. 1 went a hot water system supplied by a firebox boiler, with a Gas-fired burner of 550,000 BTU input. Individual rooms in this test cluster had unit ventilators with supplementary fin radiation. Firing efficiency, according to a flue gas analysis, was 84.6%. Unit No. 3 received an electric resistance heating system with a total of 89.9 KW installed—equivalent to 306,828 BTU. The system included a unit ventilator and strip heating in each classroom. Efficiency was assumed to be 100%.



Typical gas heating unit.



Typical electric heating unit.

AN IMPORTANT POINT: BOTH OF THESE SYSTEMS WERE INSTALLED BY PRIVATE HEATING CONTRACTORS, THE SUCCESSFUL LOW BIDDERS FOR THE WORK. THUS, ALL RELATIVE CONSTRUCTION COST DATA AND SPECIFIC COST AMORTIZATION REQUIREMENTS ARE BASED ON FIGURES SUBMITTED UNDER ACTUAL COMPETITIVE CONDITIONS. THEY ARE NOT THEORETICAL OR "ESTIMATED" COMPARATIVE COSTS.

Test Equipment Used

An extensive array of test and recording equipment was used to keep close check on each unit. One meter measured the amount of Gas consumed in heating Unit 1. Unit 3 employed four meters—one in each classroom and one for the non-classroom storage and activity area. A master switch in the main building boiler room operated ventilation controls.

The temperature and operational "watchdog" for both test units consisted of a 12-point recorder, located in the boiler room of Unit 1. Every six minutes the instrument recorded: temperature, on-off operation of ventilating equipment, and day-night operation of the thermostat pneumatic system.

The location of thermostats in each classroom and hallway corresponded exactly in Units 1 and 3. Also determined by the recorder were the degree days in each unit. Once a week the recorder was unlocked to change the paper and tape copies were provided to all the parties concerned. In addition, school engineers read the meters each weekday and submitted reports to school officials and both utility companies.

Fuel Rates

Electricity used in the study was charged at the same rate as for all city agencies—2⅜ cents per KWH. Gas charges were 50.1 cents per 1000 cu./ft., the interruptible rate for users in this class. However, during the test period Gas was not interrupted in Unit 1, as it was in other parts of the building. An adjustment was made in the final cost tabulations to reflect this non-interruption factor.

Operating Cost Results

The initial test period of the more than three-year study ran from January 5 to April 30, 1959. *Actual cost of Gas: $149.73. Actual cost of electricity: $1,330.19.*

The costs listed above were then adjusted to determine what the figures would have been under normal interruptible conditions, heating with Gas and standby oil. The curtailment figure used for Unit 1 was 350 hours—the same time which applied to other Gas heated sections of the school. Total adjusted fuel cost for Unit 1: $171.74.

For the period of the test, the cost of operating electric motor auxiliaries in the control units—$28.44 for the Gas unit, $11.68 for the electric.

> *On the basis of these final adjustments, the ratio of electric heating cost to Gas cost was 6.70 to 1.*

In the test city, electric rates are higher and Gas rates are lower than the average. But applying the facts of this study to other sections of the country, electricity would still cost two to three times more than Gas.

> **OPERATING COST COMPARISONS THROUGH THE BALANCE OF THE THREE-YEAR STUDY CONTINUED TO BE HIGHLY FAVORABLE TO GAS. IT IS SIGNIFICANT THAT NO CHANGES WERE NECESSARY IN THE GAS TEST UNIT AT ANY TIME DURING THE STUDY. BUT SEVERAL PHYSICAL, EQUIPMENT AND CONTROL MODIFICATIONS WERE MADE IN THE CLASSROOM CLUSTER HEATED BY ELECTRICITY.**

These adjustments, suggested by the early phases of the study, included more insulation, larger unit ventilator motors, and new thermostats. Energy rates remained the same throughout the experiment for both Gas and electricity.

The final adjusted cost for the total test period is illustrated in the following table:

Ratio of Adjusted Costs

	Adjusted Gas Cost	Adjusted Electric Cost	Electric to Gas Ratio
First season	$305.11	$2,668.30	8.7 to 1
Second season	$290.50	$1,958.01	6.7 to 1
Third season	$331.03	$2,082.94	6.3 to 1
		Average:	7.2 to 1

Because Unit 1 was equipped with a Gas-oil dual fuel burner—to take advantage of interruptible Gas rates in future operation—first costs were somewhat higher than with the electric unit. (Approximately a 3-year write-off period for first cost difference.)

2. FIRST COSTS

However, in more typical studies of installation costs, actual dual bid figures for 16 new schools showed *no basic difference in first costs between electric and Gas-heated schools.*

Eight Illinois Schools...each bid two ways

Location, Name of School	Square Feet	Total Construction Bids Gas	Total Construction Bids Electric (Resistance)	Date of Bid	System Installed
Crestwood (Kolmar)	34,000	$418,153	$444,054	Mar. '64	Gas Heat
Matteson (Matteson)	11,720	154,886	151,900	Mar. '64	Gas Heat
Morton Grove (Golf)	28,653	474,730	466,982	Dec. '60	Gas Heat
Villa Park (Iowa)	24,130	309,847	304,880	Feb. '62	Gas Heat
Glen Ellyn (Glen Crest)	34,270	436,838	456,467	Apr. '62	Gas Heat
Malta (Malta High)	35,470	430,353	424,122	Feb. '64	Gas Heat
Joliet (Oak Valley)	20,400	336,561	337,684	Mar. '64	Gas Heat
Plainfield (Eastern Ave.)	20,800	290,348	284,755	Aug. '63	Gas Heat

Eight Pennsylvania Schools...each bid two ways

Location, Name of School	Square Feet	Total Construction Bids Gas	Total Construction Bids Electric (Resistance)	Date of Bid	System Installed
Monroeville (South Jr.)	104,000	$1,580,700	$1,636,300	July '60	Gas Heat
Claysville (Findley)	14,000	205,633	204,173	July '59	Gas Heat
Claysville (Blaine-Buffalo)	14,000	216,459	217,725	July '59	Gas Heat
Claysville (South Franklin)	4,600*	96,952	95,938	July '59	Electric Heat
Mount Morris (Perry)	18,000	267,285	270,132	Jan. '61	Gas Heat
Westmoreland Co. (West Point)	39,071	729,620	715,666	Apr. '63	Gas Heat
North Braddock (Fairless)	17,000	345,279	348,679	Apr. '61	Gas Heat
Plum Boro (Holiday Park)	35,000	530,790	522,970	Dec. '61	Gas Heat

*Addition

The schools were built over a 5-year period in Illinois and Pennsylvania. Shown above are the construction bid figures as reported in a recent issue of a leading plumbing-heating-cooling magazine.

RECOMMENDATION TO SCHOOL BUILDERS: CONSIDER THESE COST FIGURES OBTAINED IN ACTUAL ALTERNATE BIDS. THEY REFUTE THE CLAIM THAT ELECTRIC RESISTANCE HEATING OFFERS DRAMATIC FIRST COST SAVINGS OVER GAS.

Conclusions on Operating and First Costs—Gas vs. Electric

— THE COMPARATIVE FUEL COST FIGURES SPEAK FOR THEMSELVES. USING THE HEATING EQUIPMENT SPECIFIED IN THE TEST INSTALLATION, ELECTRIC HEATING IS OBVIOUSLY SUBSTANTIALLY MORE EXPENSIVE TO OPERATE THAN GAS. IN THE GREAT MAJORITY OF CASES THERE IS NO BASIC DIFFERENCE IN THE FIRST COSTS OF ELECTRIC AND GAS-FIRED SYSTEMS.

—IN THE TEST INSTALLATION NO SIGNIFICANT DIFFERENCES APPEARED TO FAVOR EITHER HEATING SYSTEM IN THE FOLLOWING AREAS: ROOM CLEANLINESS, PAINT DETERIORATION, JANITORIAL AND CUSTODIAL EXPENSE, INSTRUCTIONAL EFFICIENCIES.

—WHILE THE ELECTRIC UNITS HEATED UP MORE QUICKLY IN THE TEST INSTALLATION, OVER THE COURSE OF THE SEASON THE ON-OFF NATURE OF THE ELECTRIC SYSTEM PROVIDED LESS THERMAL RESERVE. AND OVERALL ROOM COMFORT APPEARED TO VARY MORE THAN IN THE GAS HEATED UNIT.

* * *

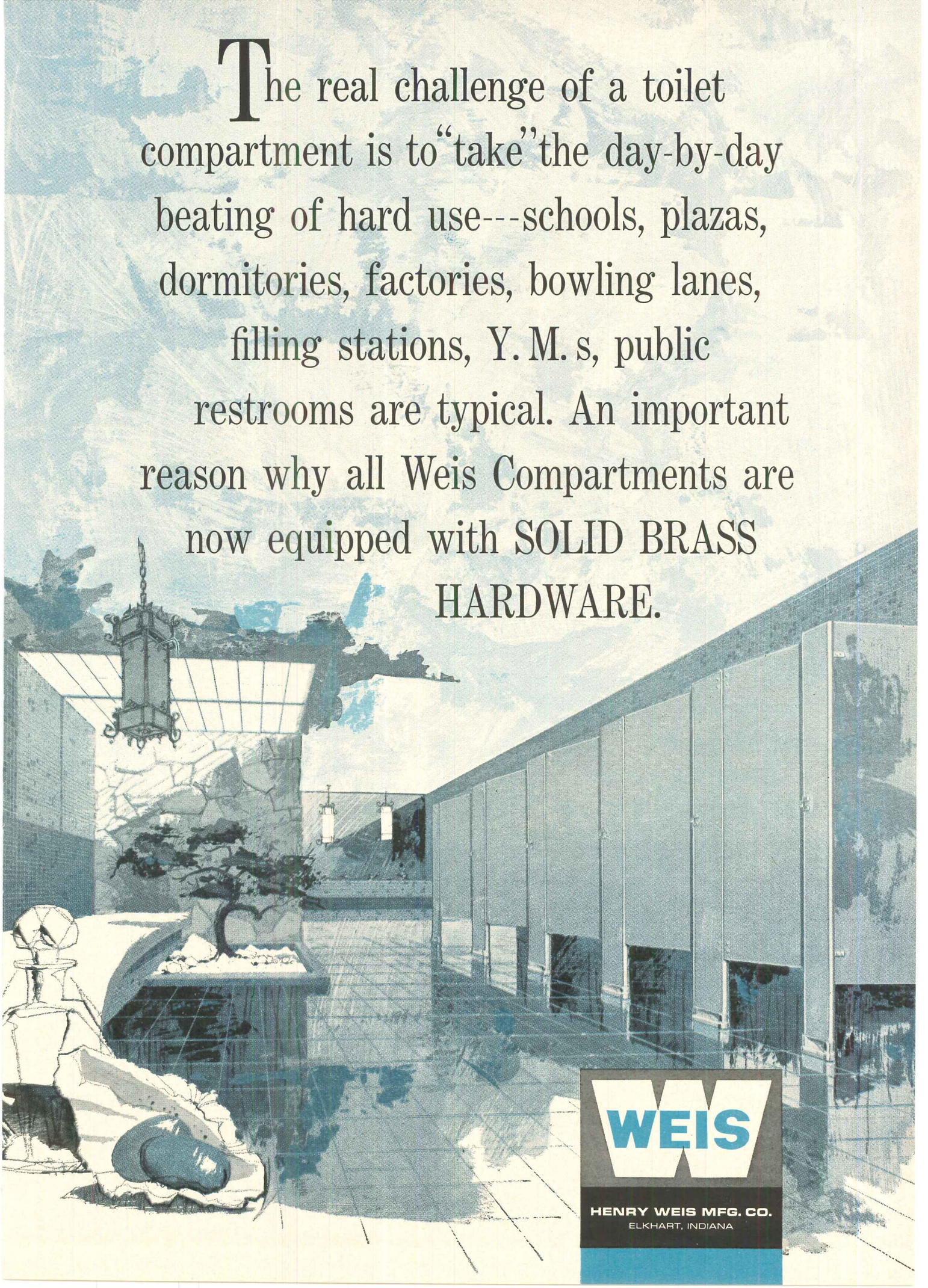
These are the facts and figures of highly significant relative cost studies, Gas vs. Electric. Under these careful control conditions, heating with Gas is proved to cost only one-seventh as much as electricity. And under the requirements of competitive bids, there is no basic difference in first costs.

If you are a school administrator, architect or engineer concerned with the economy and efficiency of school heating systems, you'll want a complete report of these studies. The Heating Sales Engineer of your local Gas Company can provide you with these valuable guides which identify the school systems and report the data in full detail. Call or write him today.

AMERICAN GAS ASSOCIATION, INC.

For more data, circle 90 on Inquiry Card

For more data, circle 91 on Inquiry Card



The real challenge of a toilet compartment is to "take" the day-by-day beating of hard use---schools, plazas, dormitories, factories, bowling lanes, filling stations, Y. M. s, public restrooms are typical. An important reason why all Weis Compartments are now equipped with SOLID BRASS HARDWARE.

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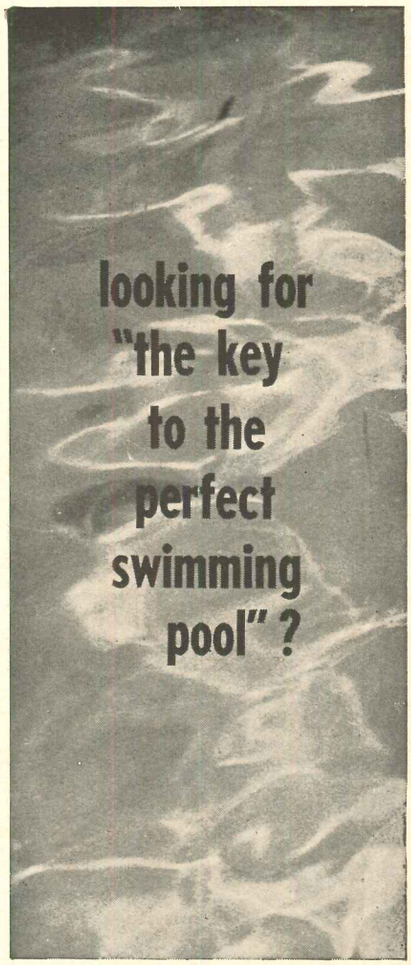

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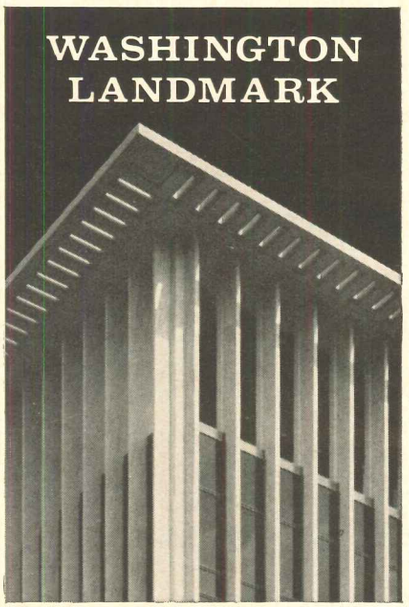
Milwaukee Road Dedicates New Railroad Terminal in Milwaukee

The new Milwaukee Road Passenger Station in Milwaukee, provides an almost ecclesiastical setting for passengers awaiting the 21 trains arriving or departing on an average day. Highlight of the design is a 96-foot-high steel bell tower painted white to blend with pre-cast concrete arches which rise the three stories of the facade. These arches frame recessed panels of brown glazed brick in which are set bronze tinted windows. The bell tower contains an electronic carillon which will strike the hours and sound chimes each quarter hour.

Included in the interior is a 50-foot by 124-foot waiting room, ticket sales and baggage areas, a restaurant, and passenger traffic offices.

B. J. Ornburn, structural engineer, and K. E. Hornung, architect, both of the Milwaukee Road, were basically in charge of the station project. Under their direction the firm of Howard, Needles, Tammen & Bergendoff served as consulting engineers and did the structural work. Associated with the latter firm were Donald L. Grieb, architect; Robert Rodwell, mechanical engineer; and the Pfeifer Construction Company.



In the National Geographic's new headquarters building, architect Edward Durell Stone employed Vermont Imperial Danby Marble throughout the interior and exterior.

To erect the vertical fins, horizontal shelf angles at each level support two marble courses. Matching holes drilled into the upper and lower portion of each fin take ¾" hot-dipped galvanized dowels, to provide a hidden anchor, with each pair mated securely to those above and those below.

• • •

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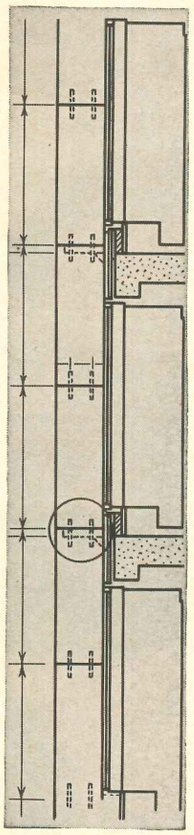

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NATIONAL GEOGRAPHIC SOCIETY BUILDING

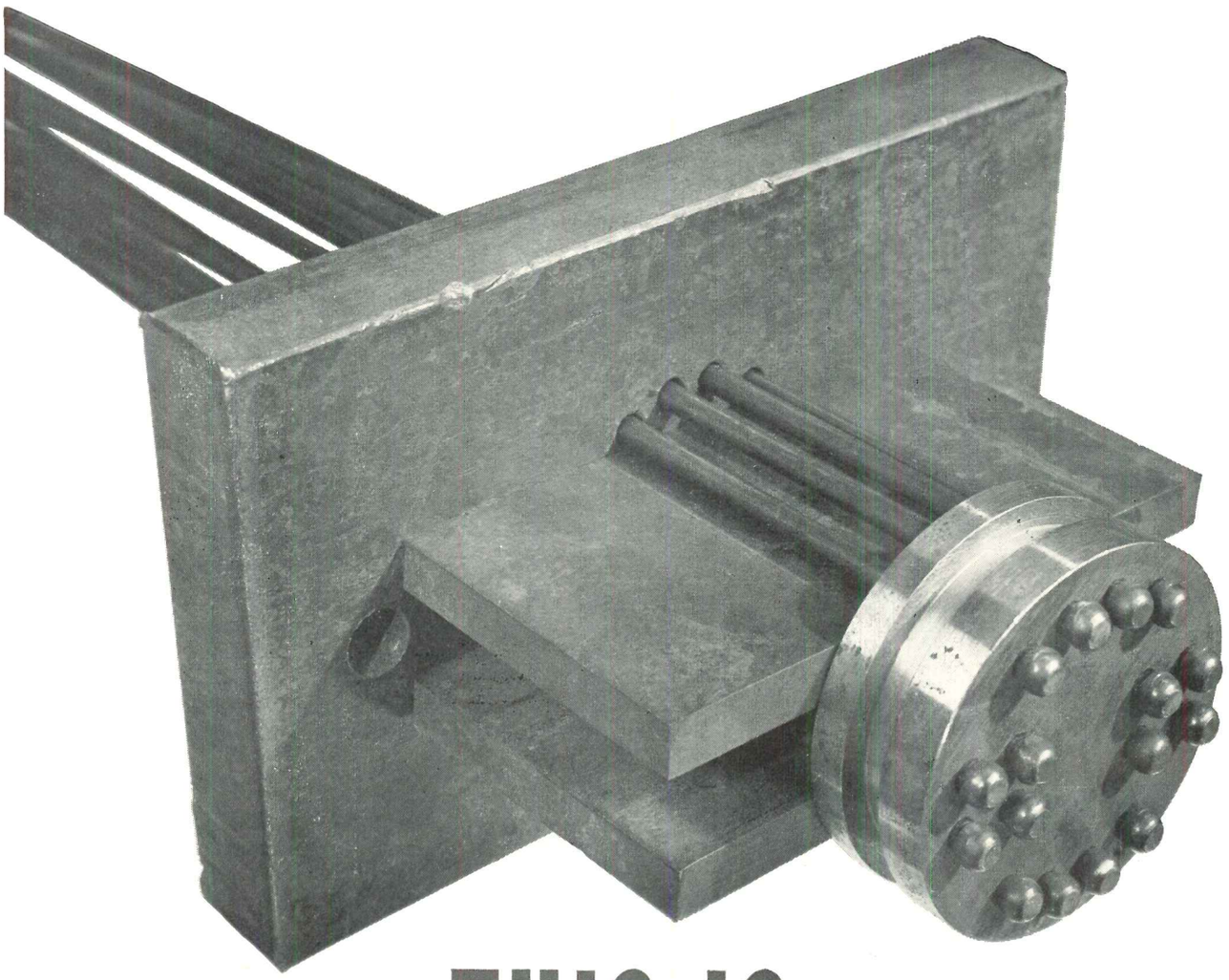
Since its dedication in 1964, it has become a landmark of the Washington scene.

Do you have a landmark on your drawing board? Let us know if we can be of assistance.

Architect Edward Durell Stone employed Imperial Danby Marble for the exterior and for the interior on column facings, elevator lobbies and other applications.

VERMONT MARBLE COMPANY
PROCTOR, VERMONT

All photos ©National Geographic Society. Exterior: Robert S. Oakes. Globe, inside: Emory K. Kristof, Jr. Artisan cutting "Geo": J. Baylor Roberts. Interior, Explorers Hall, Map: by Emory K. Kristof, Jr.



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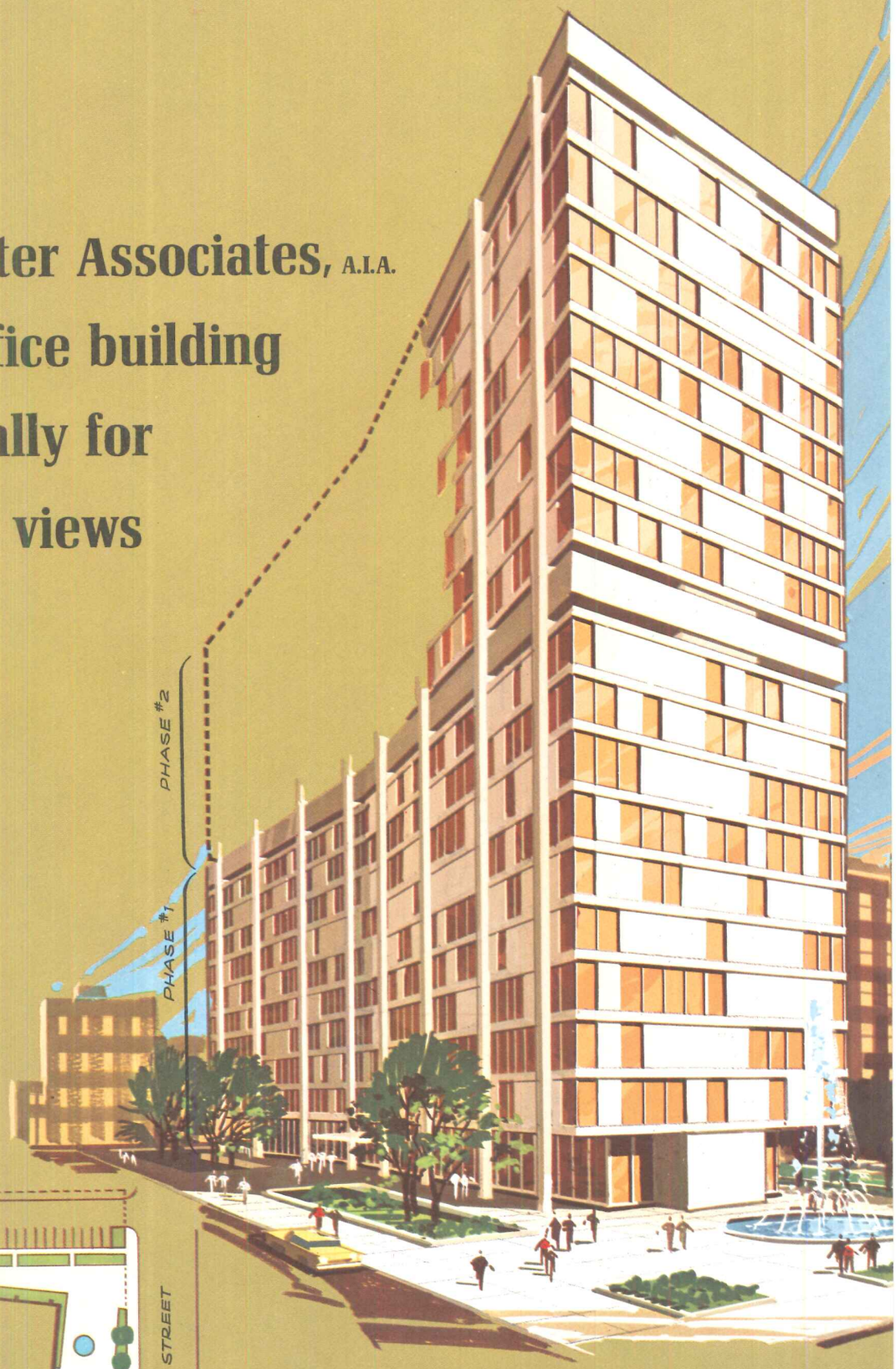
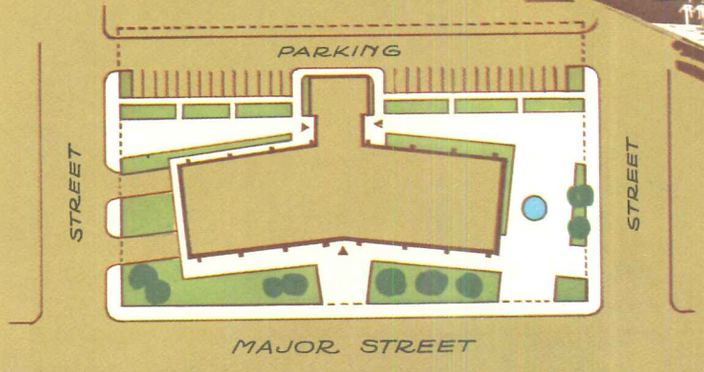
Schweitzer-Slater Associates, A.I.A. pre-plan an office building to grow vertically for Open World views





How do you plan a high-rise office building to be easily expandable, yet retain "Open World" views? This was the problem Libbey·Owens·Ford gave to Architect Robert F. Slater of Schweitzer-Slater Associates, Milwaukee. Here, and on following pages, he outlines the major considerations and suggests a unique solution.

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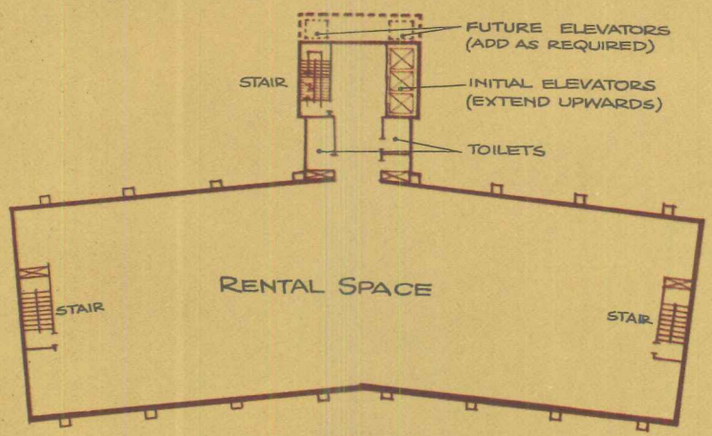
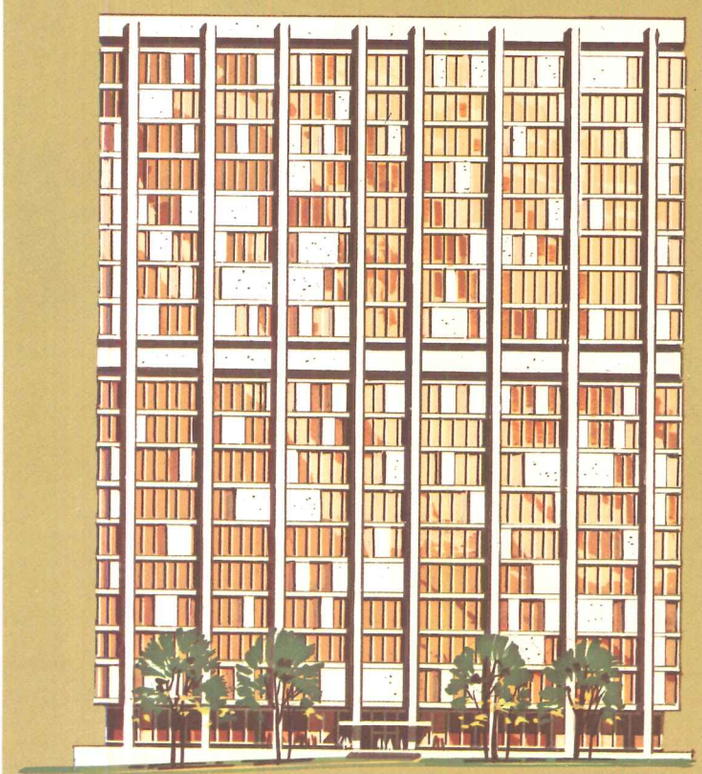


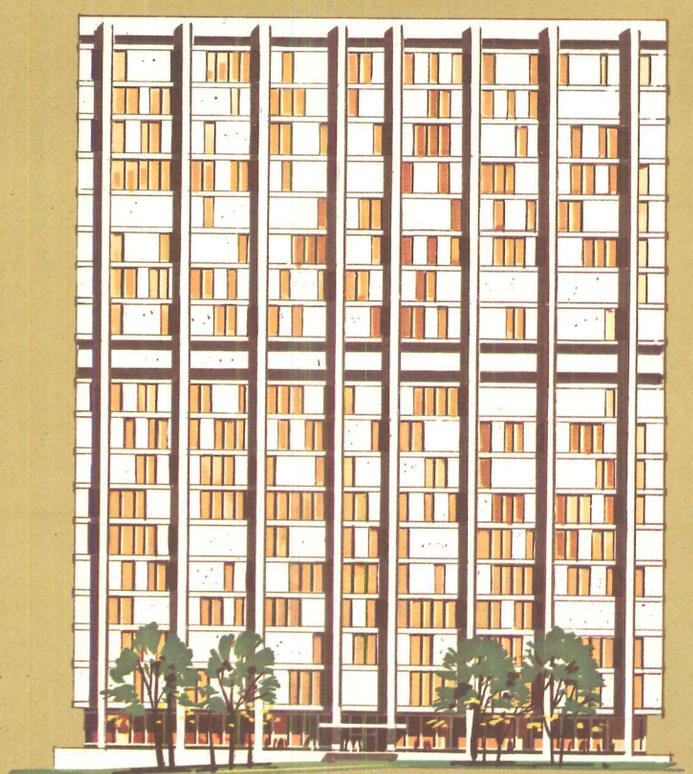
CONSIDER PIPES & DUCTS IN HOLLOW COLUMNS FOR PERIMETER OFFICES. FEED DOWN & UP FROM MECHANICAL FLOOR



ELEVATION STUDY
75% WINDOWS

RANDOM WINDOW PATTERN ALLOWS SATISFYING ANY TENANT'S DESIRE FOR VIEW OR WALL SPACE WITH MAXIMUM FLEXIBILITY IN SUBDIVIDING INTERIOR SPACE.

SPANDREL GLASS CAN BE INTERCHANGED WITH VISION GLASS FOR ADDITIONAL FLEXIBILITY IF NEEDS CHANGE DURING OCCUPANCY



ELEVATION STUDY
25% WINDOWS

Often an owner's budget limitations prevent the initial development of a property to its fullest potential. Architect Slater suggests serious consideration be given to pre-planning for vertical rather than horizontal expansion because: (1) Vertical expansion permits retention of view and daylight for all existing tenants who might move elsewhere if their windows were blocked off later. Thus, there should be less necessity to renegotiate leases. Even vaster views from the new floors above will also attract new tenants faster. (2) Requires

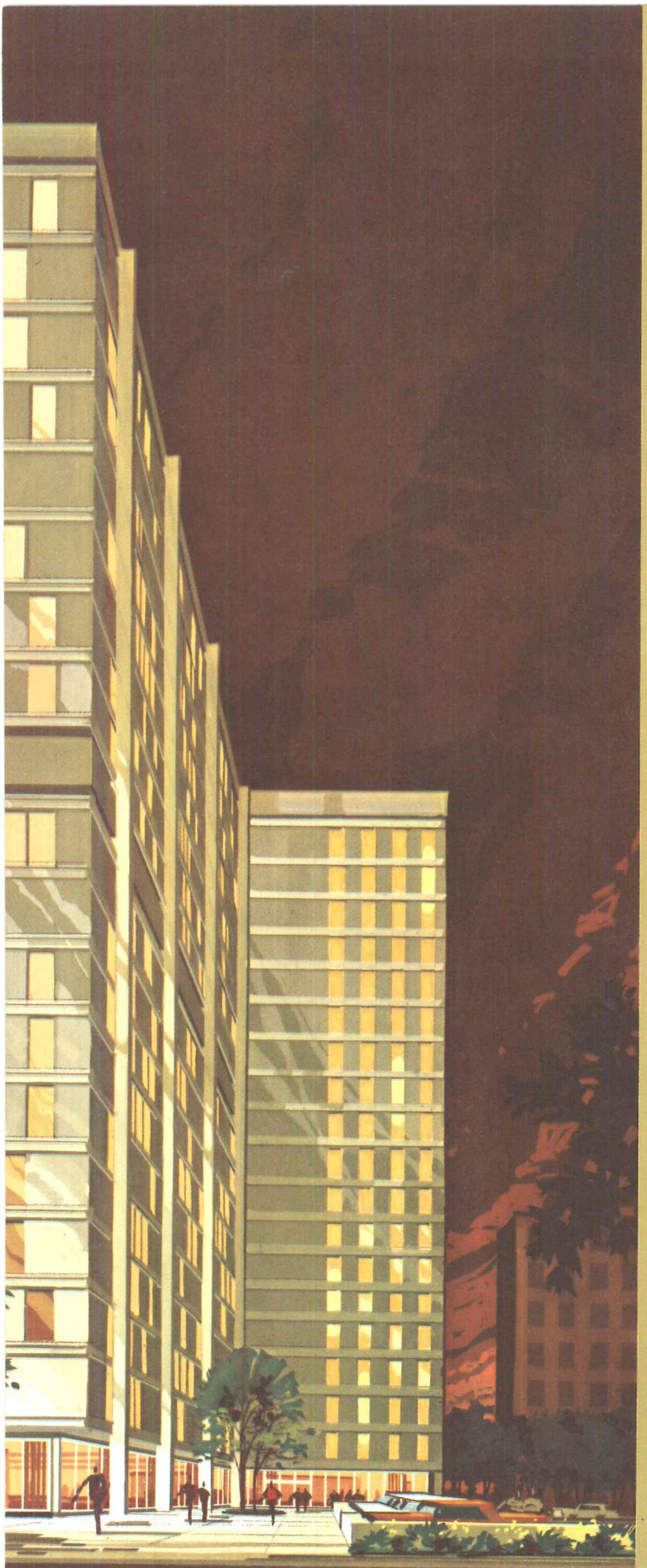
less total circulation, lobby and core area. (3) A better initial and ultimate plan can usually be developed. (4) Less disturbance to present tenants. (5) A lesser amount of expensive site, demolition and remodeling is required.

In this design, the lobby is to be enclosed with large lights of L·O·F Heavy Duty *Parallel-O-Plate®* glass, twin ground for greatest clarity. Extensive use of glass on the entire facade will make it easier to match new and old materials for uniform appearance. Because glass does not age or change color.

Random-width windows, interspersed with panels of *Vitrolux®* spandrel glass with backup material, will give flexibility to interior arrangements. Each tenant can have exactly the amount of window area he wants, where he wants it. And if rearrangement of office space is required at a later date, panels and windows can again be interchanged. Random pattern also allows for more glass on the north side of the building than on south and west where solar heat gain is greater.

Windows would be either *Parallel-O-Grey®* or *Parallel-O-Bronze®* plate glass for further control of solar heat gain and glare. Consideration would be given to the economics of using grey or bronze *Thermopane®* insulating glass for savings on heating and air conditioning.

Delineations by Franzic Associates, Chicago



MOVING LIGHTS ON REAR OF ELEVATOR CABS SEEN THROUGH PATTERNED GLASS GIVES INTERESTING NIGHT EFFECT.

An interesting feature is the expandable elevator core at the rear of the building. It, too, has windows. Not for looking out, but to pick up the pattern of lights affixed to the rear of elevator cabs as they travel up and down during evening hours.

Here, then, is a practical way to pre-plan a building for expansion that should not lose valuable tenants in the process, or wind up looking like a patchwork of old and new materials. Glass makes it possible. L·O·F makes it practical.

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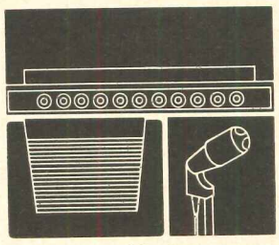
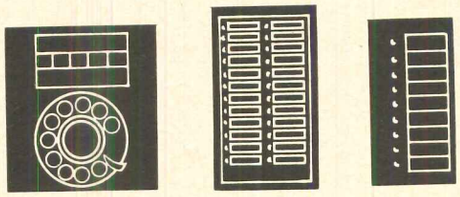
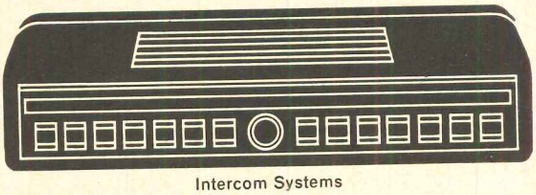


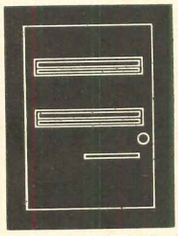
Sound Systems



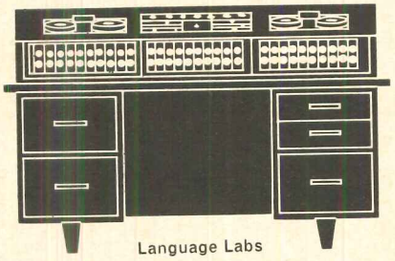
Personnel Registry Systems



Intercom Systems

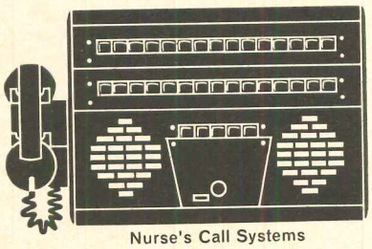


Automatic Fire Alarm Systems

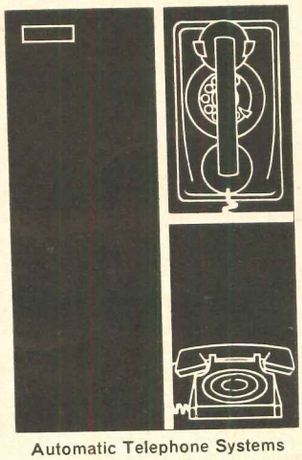


Language Labs

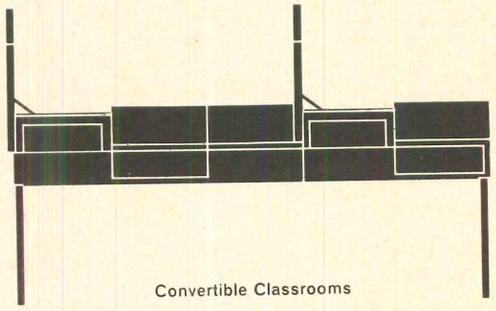
Multi-resident Central Call Systems



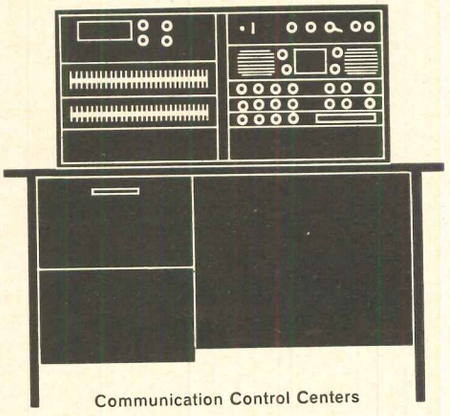
Nurse's Call Systems



Automatic Telephone Systems

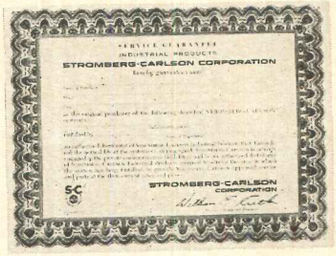


Convertible Classrooms



Communication Control Centers

Communications for hard-to-please consultants



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Unique Barber-Colman air distribution system delivers over 2 million cfm of air to keep two ball teams and more than 50,000 spectators cool and comfortable.

Houston, Texas—Cooperating with the mechanical engineer in designing and furnishing components for an air distribution system for a domed stadium larger than the Roman Coliseum is the type of challenge that Barber-Colman engineers welcome!

At Harris County Stadium, the basic problem was to deliver conditioned air as far as 285 feet across an open playing field without causing turbulence.

Additionally, huge and varying quantities of cool, clean, quiet (50 NC rating) air, had to be introduced throughout the spectator seating zones at velocities in the 75 fpm range.

Barber-Colman application engineers, working closely with their research and development and associated laboratory personnel, solved the problems inherent in the first requirement by designing the Jet-Flo Diffusers that distribute air to the playing field. The air distribution problems in the spectator zones were solved with standard Barber-Colman Air Distribution products. Superior liaison and communication with the architects and mechanical consultants resulted in design, delivery, and installation on exacting schedules.

This coordinated effort extended through balancing check-out. The iron-clad specifications for the Astrodome called for guaranteed performance. Barber-Colman (as successful bidder) became responsible for supervising the balancing of the air distribution system in accordance with the plans and specifications. Factory personnel traveled to Houston and worked closely with the mechanical engineers, sheet metal and mechanical contractors. The entire system was checked and adjusted to assure that sound levels and air velocities met the specifications.

A project of this size shows that selecting the best equipment available is not the entire answer to air distribution problems. Competent design and field engineers backed by R & D laboratory experts and complete development and testing facilities also are necessary to assure optimum system performance and complete customer satisfaction. Barber-Colman is the only manufacturer equipped and staffed to offer *all* these services to meet your specific *air distribution* and *automatic control* requirements.

For more information about Barber-Colman air distribution components and services, call your nearest Barber-Colman field office for literature and application data covering any of our products. Or write directly to us outlining your specific requirements. Address your letter to: E. J. McIntyre, Dept. 2350.

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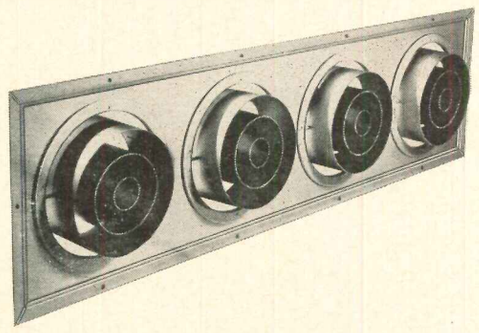
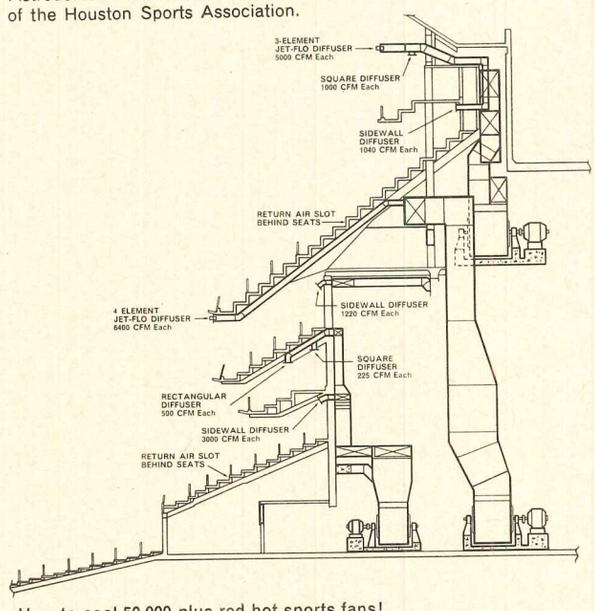


New Jet-Flo Diffuser—now in operation at Houston's Astrodome*
Three- and four-element Jet-Flo Diffusers of this type were specially developed in the Barber-Colman Air Distribution laboratories for the Harris County Stadium. Each unit is capable of delivering up to 6400 cfm of cool air at distances of up to 250 ft.

*Astrodome is the exclusive property of the Houston Sports Association.



How to cool 50,000-plus red hot sports fans!
Distribution for the main seating and playing zones is handled by Barber-Colman three-element Jet-Flo units located near the base of the roof dome above the ninth level balcony and by four-element diffusers placed on the circumference of the main upper balcony.

Two diffusers were required for each 5° segment of the 280° arc comprising the seating area. The space below each balcony is served by standard Barber-Colman aspirating sidewall and ceiling diffusers. Additional Jet-Flo units placed beneath the scoreboard in the centerfield section deliver air to this zone.

Architects: Lloyd & Morgan; Wilson, Morris, Crain & Anderson, A.I.A.
Consulting Engineers: I. A. Naman & Associates; Dale S. Cooper & Associates
General Contractor: H. A. Lott, Inc.; Johnson, Drake & Piper, Inc.
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Neil Doherty Commercial Photographer

New Dormitory For 120 Will Rise at Mount Holyoke College

Ruth MacGregor Hall, a new dormitory at Mount Holyoke College in South Hadley, Massachusetts, will provide equal numbers of double and single rooms, housing 120 students. The new dormitory is attached to Roswell Gray Ham Hall, the language dormitory now nearing completion to share kitchen facilities, and both structures are designed by Hugh Stubbins of Cambridge, Massachusetts. The $1.3 million building is expected to be ready for occupancy in September 1967.

Lawrence S. Williams Photography

New Laboratory Is Completed at Pennsylvania Campus

The Laboratory for Research on the Structure of Matter, recently occupied at the University of Pennsylvania in Philadelphia, was designed by the architectural firm of Martin, Stewart, Noble and Class. The building, which is faced with glass, brick and has massive exterior precast concrete piers, will provide laboratories and offices for the interdisciplinary investigation of the physical and chemical properties of metals, ceramics, and other solids used in nuclear energy and space research. Construction managers for the $2.9 million structure are United Engineers & Constructors, Inc.

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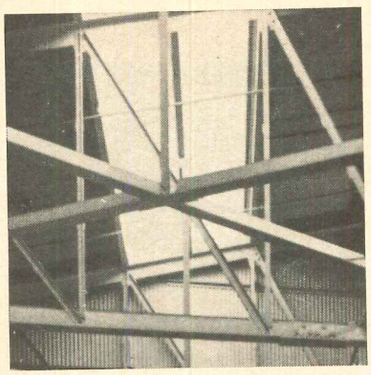
Hetron®-based panels let nature pay the light bill



Daylight floods through these translucent plastic panels and lights up the darkest corners of Pier 94, in Brooklyn.

Artificial lights go on only at night, or on days so overcast there is not enough light even outdoors. As would be expected, savings in electricity are substantial.

The strong, lightweight Hetron-based panels were easy to install and are easy to maintain. Neither storms nor vandals can shatter them. Because they eliminate dark spots, they permit freight handling in the pier at top speed without "blind spot" hazards.

Meet rigid codes. The Hetron-based panels are inherently fire retardant. They have a flame-spread rating of 35 to 60 by the U/L tunnel test and meet the rigid building code and fire-retardant specifications of the Department of Marine and Aviation.

We do not make the panels—just the Hetron polyester resin that helps make them strong, translucent, lightweight, fire retardant, and chemical resistant.

For more detailed information on the excellent properties of Hetron and a list of fabricators, please write Durez® Plastics Division, Hooker Chemical Corporation, 8010 Walck Road, North Tonawanda, N. Y. 14121.

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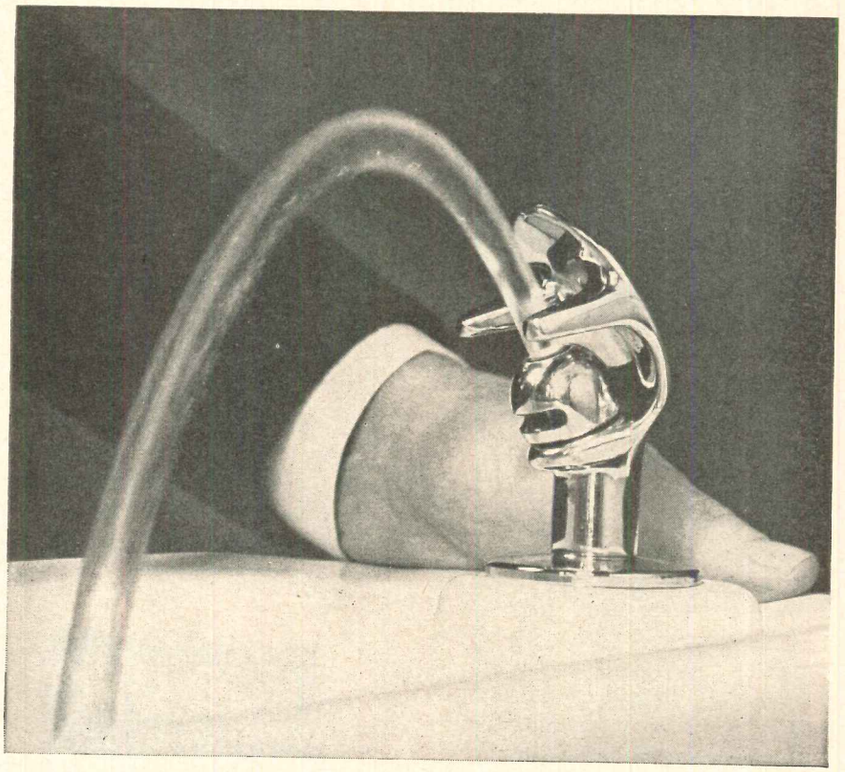
DUREZ PLASTICS DIVISION

Hetron-based panels let in a flood of daylight at Cunard Pier 94. Panel fabricator: Filon Corporation. Engineers and architects: Praeger-Kavanagh-Waterbury.



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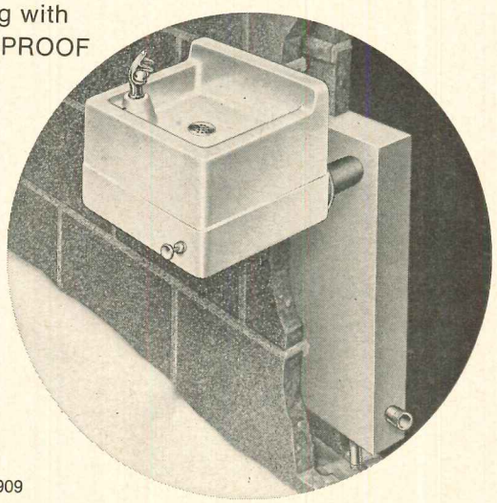
Freezing weather can choke a drinking fountain into uselessness . . . unless it's a Haws FREEZE-PROOF fountain! Haws FREEZE-PROOF valve systems absolutely **prevent** interrupted service and thereby eliminate costly maintenance emergencies. Almost any Haws fountain can be equipped for year-round service in subfreezing climates: write today for your free catalog with details on FREEZE-PROOF units and fountain selection.

Illustrated is Haws Model 7XMK1, one of many distinctive Freeze-Proof fountains available.



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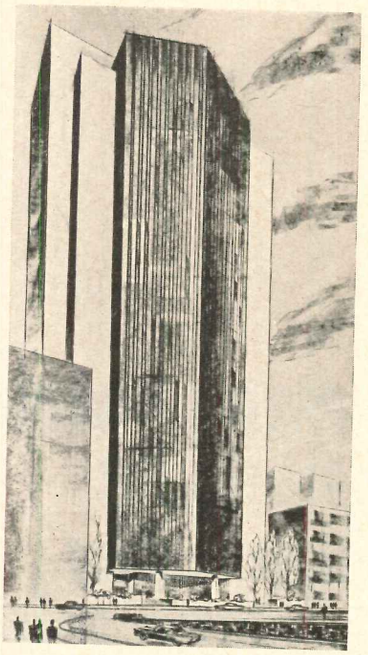

Hexagonal Telephone Building In New York

A $20 million 24-story office building for the New York Telephone Company in New York city will be of hexagonal design with alternating three-foot-wide columns of bronze granite and bronze-tinted windows from street level to roof. Architects for the project are Kahn and Jacobs; structural engineers are Weiskopf & Pickworth; and mechanical engineers are Syska and Hennessy.

Bill Mechnick

New Buildings for CIBA

The three-story Administration building (*above left*) and Cafeteria for the CIBA Corporation were recently dedicated in Summit, New Jersey. Both buildings, designed by Eggers and Higgins, architects, have sand-colored precast concrete panels and have fixed sash windows of bronze-tinted glass. They are shaded by five-foot horizontal overhangs at various floor and roof levels. The sculpture is by Henri Nechemia Azaz. General Contractor was the John W. Ryan Construction Company.

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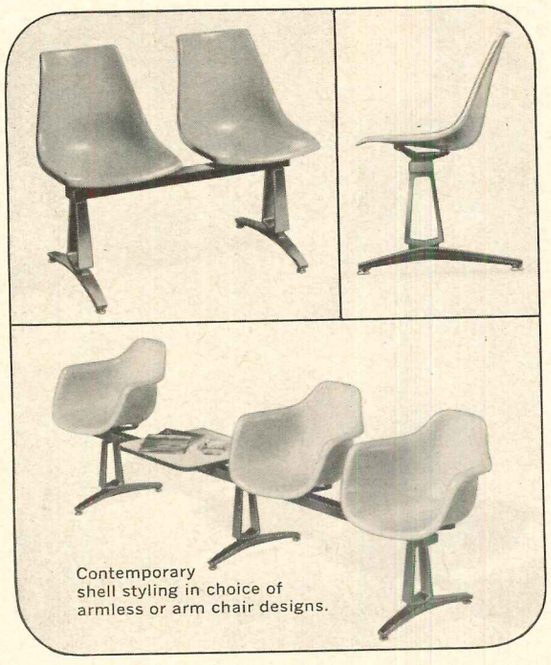

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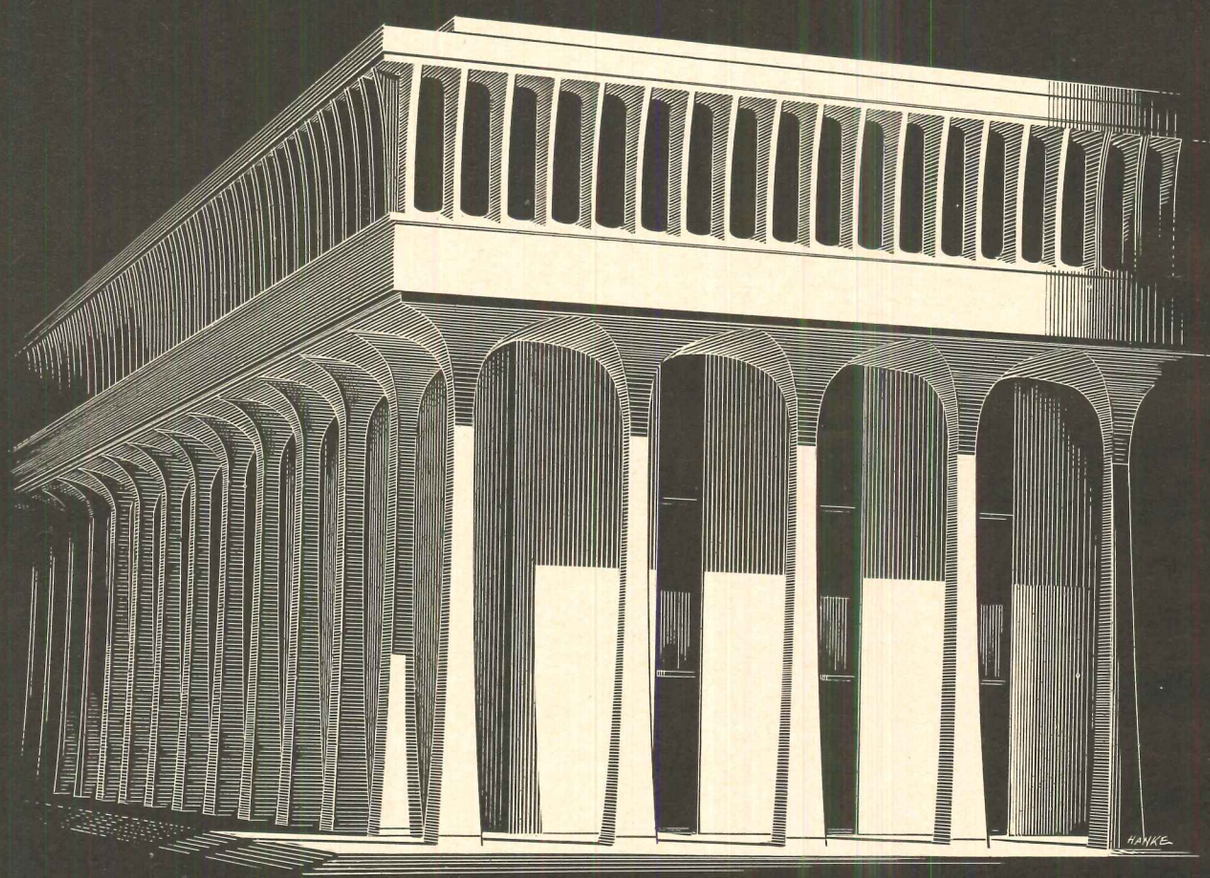

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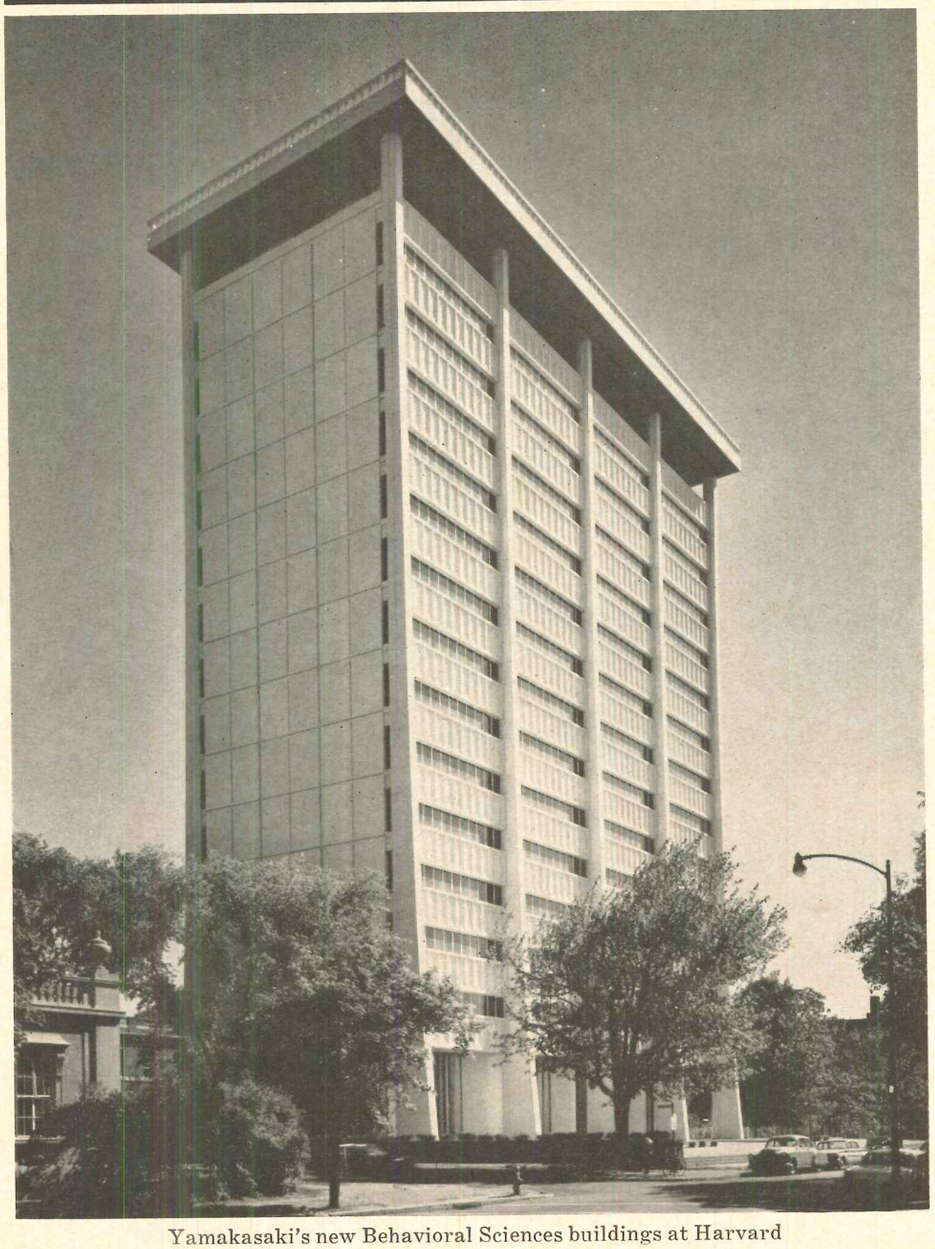

Yamakasaki's new Behavioral Sciences buildings at Harvard

BUILDING TYPES STUDY 351
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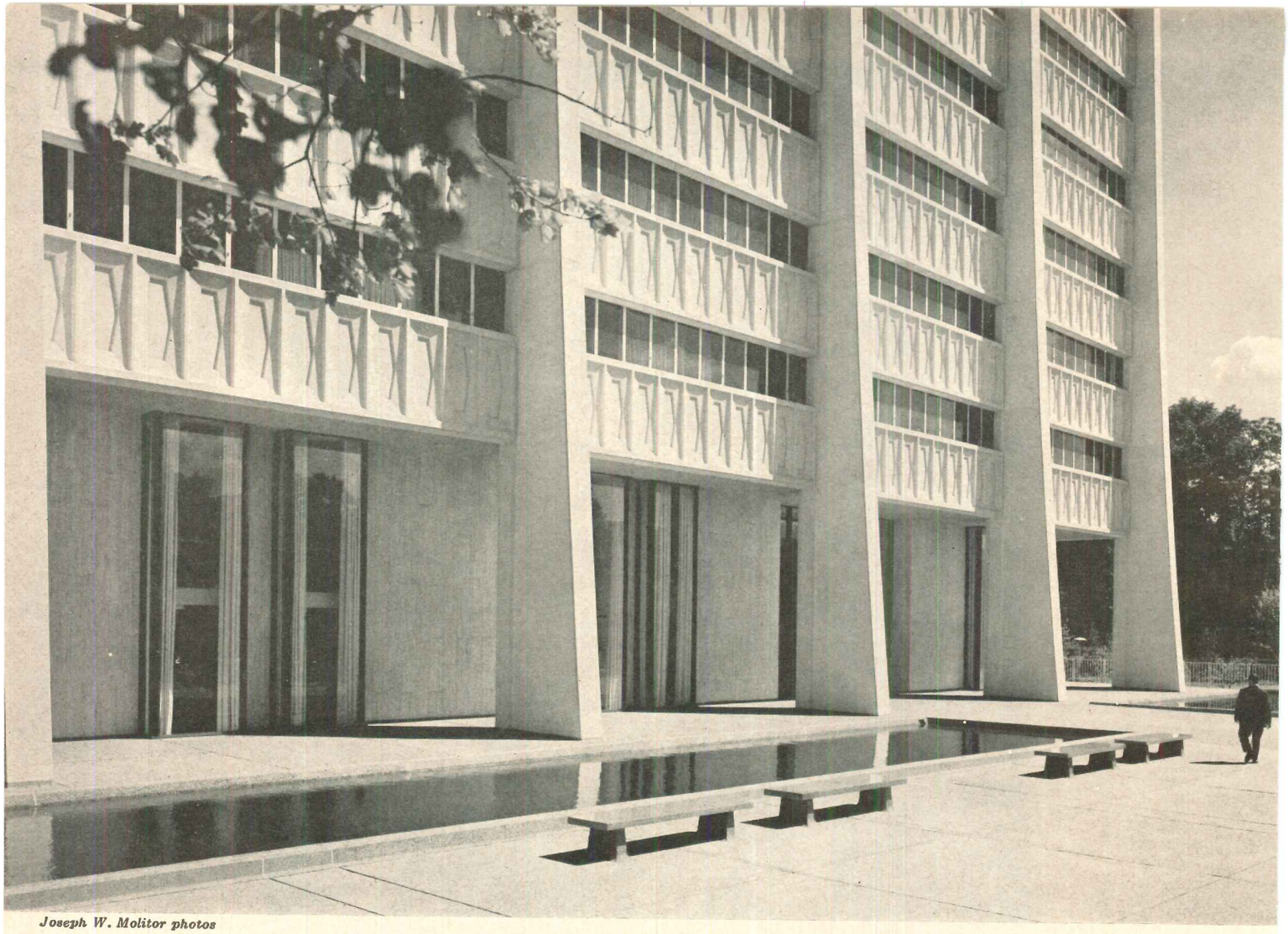
COLLEGE BUILDINGS

Design innovation and thought have seemingly made solid incursions into the burgeoning college construction field. With record expenditures estimated for this year, and even larger ones predicted for the near future, it is enormously gratifying to see that there is high quality in all this quantity. True, there are still leanings toward the neo-Classic, neo-Gothic, even, perhaps, neo-Hatshepsut; but the new buildings tinged by these antecedents are being conceived with a freshness that bears little resemblance to their stolid, more immediate forebears. We have collected here a sampling of some of these new buildings, all of which have a strong stamp of contemporary individuality.



Joseph W. Molitor photos

ADAPTABLE NEW TOWER FOR HARVARD

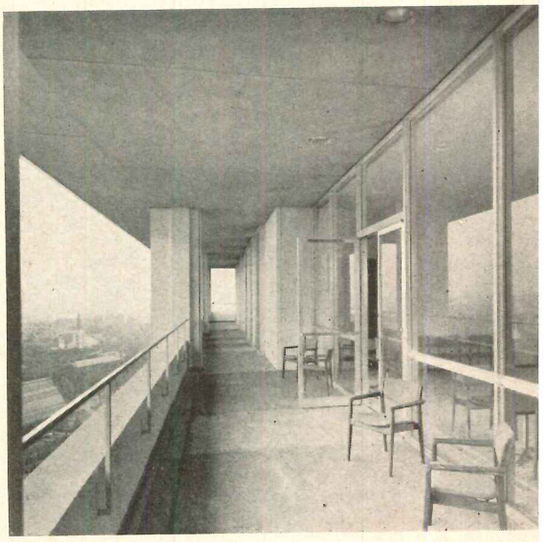
A straightforward, but elegantly conceived structural system provides both distinctive form and 15 floors of highly adaptable space for Harvard's recently consolidated center for research and teaching in the behavioral sciences. One of the first buildings to be designed under the university's new policy to "go up in the air" to make better use of available land, the facility brings together the departments of psychology, social relations and psychophysics, and the centers for research in personality and cognitive studies, which were previously scattered over a dozen locations in Cambridge.

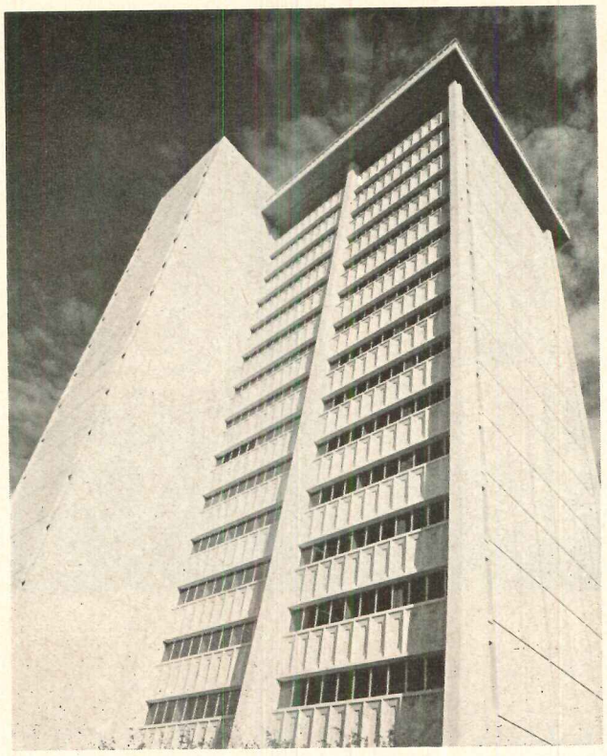
The scheme gives the visual impression of a relatively simple box suspended within a dominant cage of tapering columns, which curve to greater width as the load increases at the lower floors. The sense of suspension is emphasized by setbacks on the first and top floors, and by the vertical lines of the slit windows separating the pre-cast end panels from the columns. A strong, overhanging roof capping the tapering columns tends to give a slight and not unpleasant oriental tinge to the design. A somewhat persistent pattern is cast in the faces of the spandrel girders, but the resulting facets give a much needed sense of scale and lightness to the huge beams. The entire structure is a glistening white, with girders and end panels surfaced with a quartz aggregate, and the poured-in-place columns covered with a layer of blown-on glass chips.

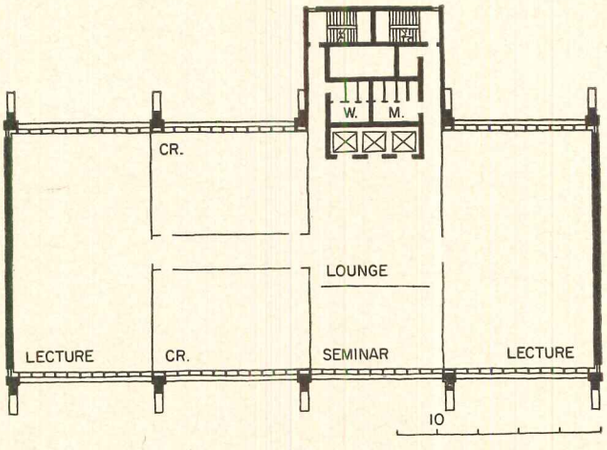
A sort of service tower at the rear of the building consolidates all utilities, and leaves a clear column-free area of 60 by 144 feet on each floor to be subdivided as needed. A three-foot module is used throughout to further the flexibility.

The floor system uses precast, prestressed beams and a poured slab surfaced with carpet, ceramic tile, or resilient tile. Partitions are metal stud and plaster.

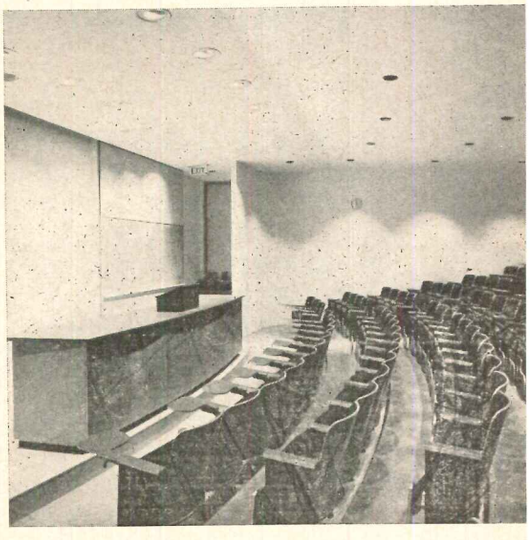
William James Hall of the Behavioral Sciences, Harvard University, Cambridge, Massachusetts. Architects: Minoru Yamasaki and Associates; structural engineers: Worthington, Skilling, Helle and Jackson; contractor: George A. Fuller Company







TYPICAL FLOOR

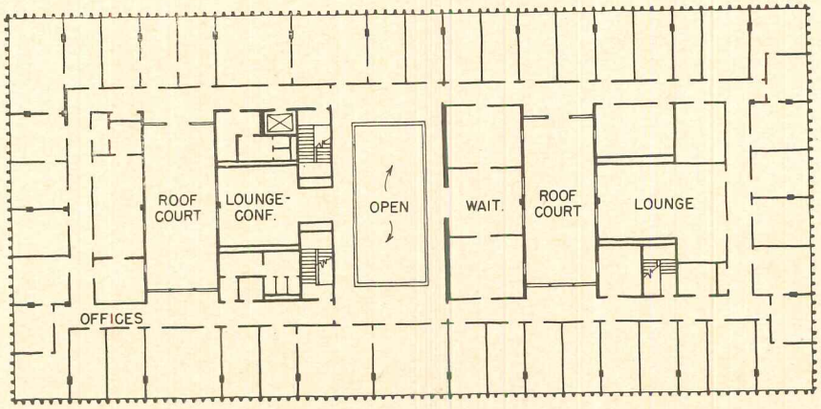


Joseph W. Molitor photos

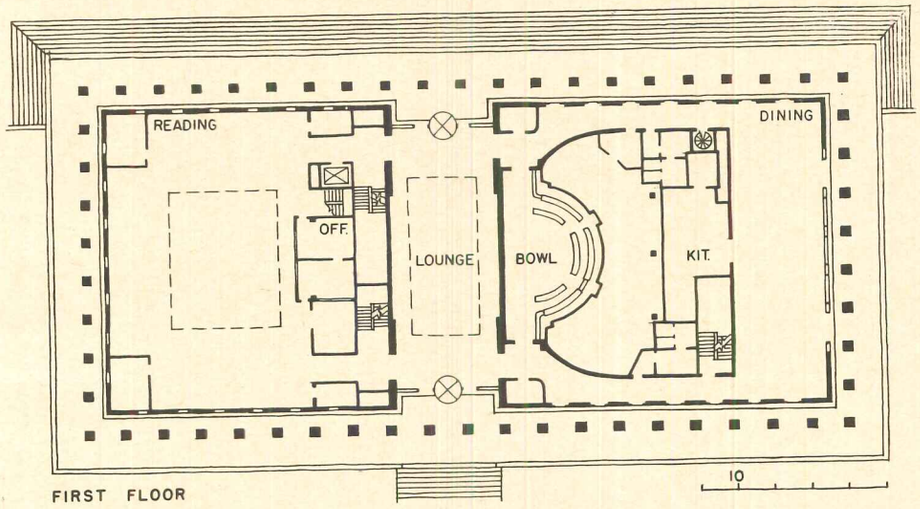
FORMALITY AND COLONNADES FOR PRINCETON

The classic monumentality of this new School of Public and International Affairs has been carried out with a spirit of freshness and simplicity that bodes well for its expressed aim of raising "both the caliber and prestige of government service." Plaza, podium, colonnade, and cornice fall in traditional, ordered sequence; but materials, methods and function are patently contemporary. The 60 quartz-surfaced, precast columns are the primary support for the waffle-slab upper story. This structural scheme eliminates all bearing walls on the 28-foot-high main floor, except for those around stair and elevator cores, which were used for lateral stiffness. Major-sized rooms (library, lobby, auditorium, dining hall) are on this first level. Faculty offices are all on the upper level; their windows and out-curving sun shades form the enlarged-scale, dentilated "cornice". A lower level in the podium contains quiet conference and lecture halls.

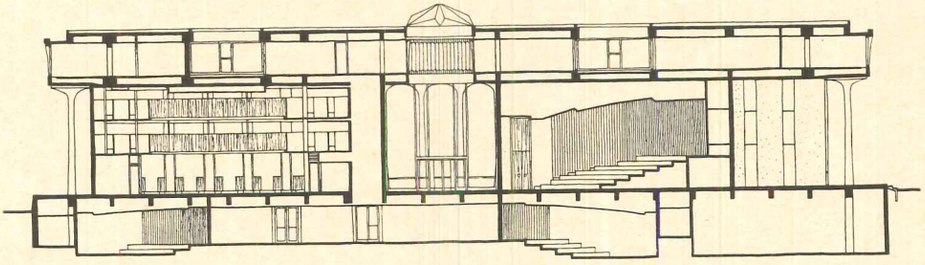
Woodrow Wilson School of Public and International Affairs, Princeton, New Jersey. Owners: Trustees of Princeton University. Architects: Minoru Yamasaki and Associates; structural engineers: Worthington, Skilling, Helle & Jackson; acoustic consultants: Bolt, Beranek and Newman; contractor: William L. Crow Construction Company.

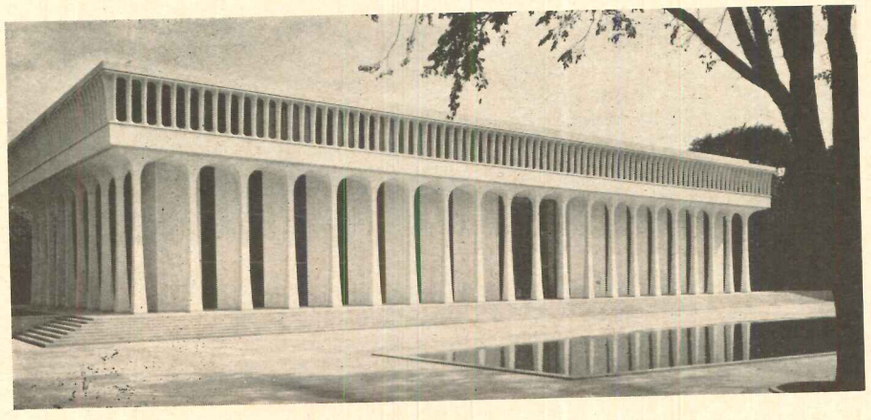


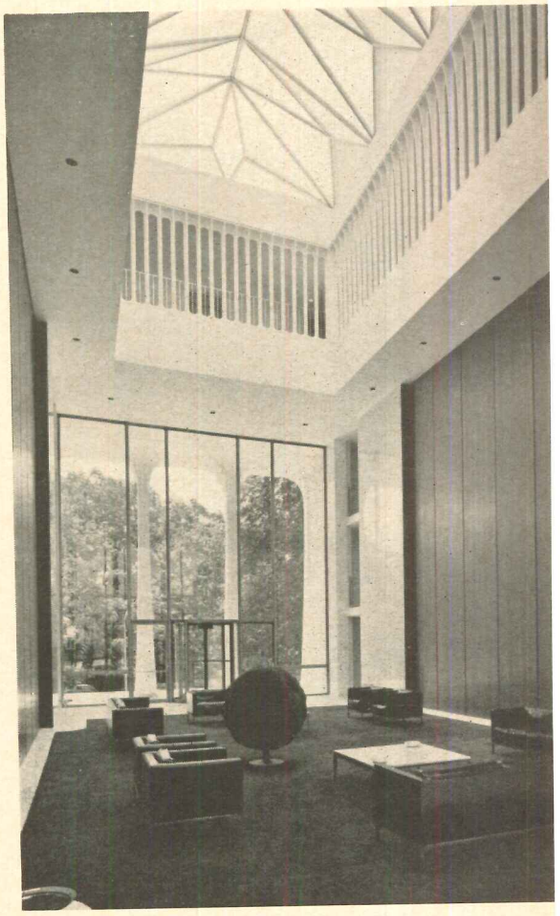
SECOND FLOOR



FIRST FLOOR







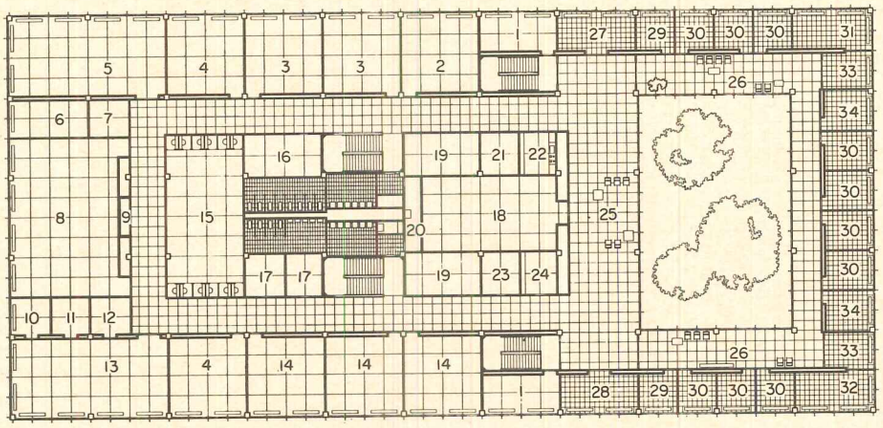
The central hall of the school, which can be entered from either side of the building, runs the full height of the structure and is topped by a skylight. The area doubles as a spacious lounge and reception room. Interior offices on the upper level gain light and view from this skylighted space and two open courts via oval-shaped windows similar to those rimming the periphery.

Bill Hedrich, Hedrich-Blessing, photos

MIES PROVIDES FOR JOURNALISM AT DRAKE

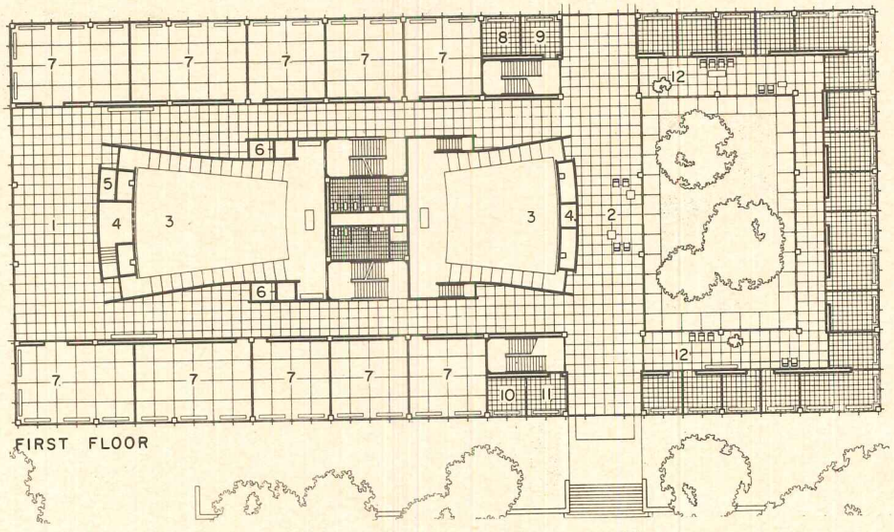
Up-to-the-minute new quarters for Drake's School of Journalism and College of Liberal Arts provide, in addition to general classroom areas and faculty offices, facilities for the university newspaper, radio, television, photography and the graphic arts. The black-painted-steel and glass structure is executed with Mies van der Rohe's typical refinement of detail, and houses a very sensibly zoned plan. Two large auditoriums and utilities are grouped on the interior of the plan, rimmed by lobbies and halls. Classrooms are ranged on the periphery of the building. The 56 faculty offices are somewhat separated from the teaching spaces by a large interior court. Studios for radio and television are in the basement.

Meredith Memorial Hall, Drake University, Des Moines, Iowa. Architect: Mies van der Rohe; engineers: C. F. Murphy and Associates; landscape architects: Sasaki, Dawson, DeMay Associates, Inc.; contractor: Ringland-Johnson-Crowley, Inc.



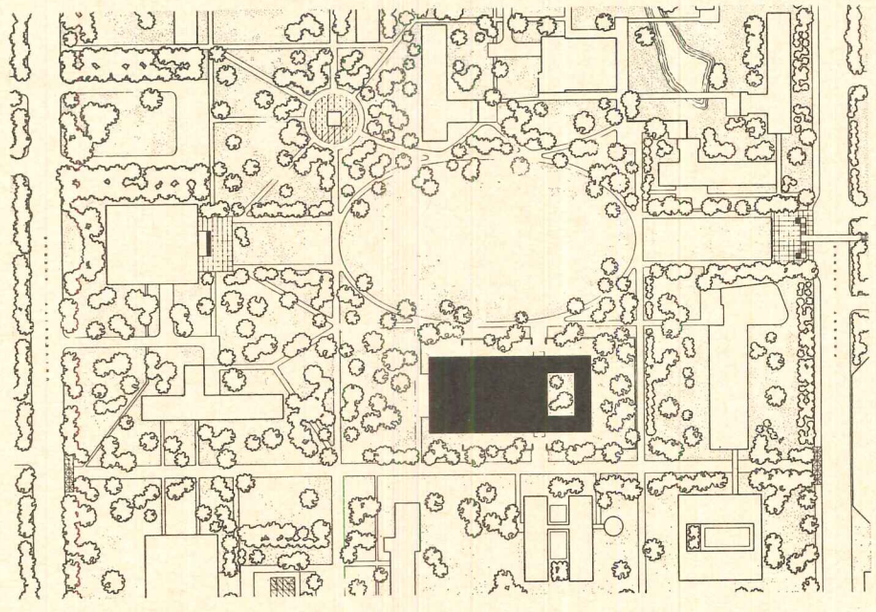
SECOND FLOOR

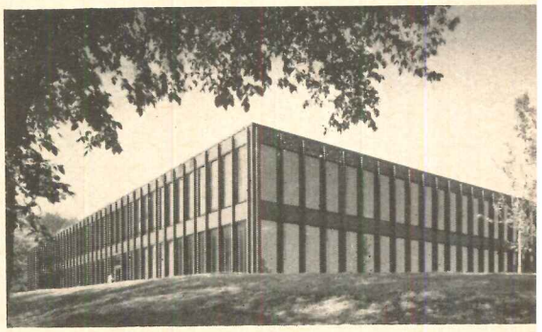
1. Seminar Room
2-8. Classrooms
9. Storage
10-19. Classrooms
20. Storage
21. Classroom
22. Kitchen
23-24. Classrooms
25. Lounge
26. Faculty Lounge
27. Faculty Offices

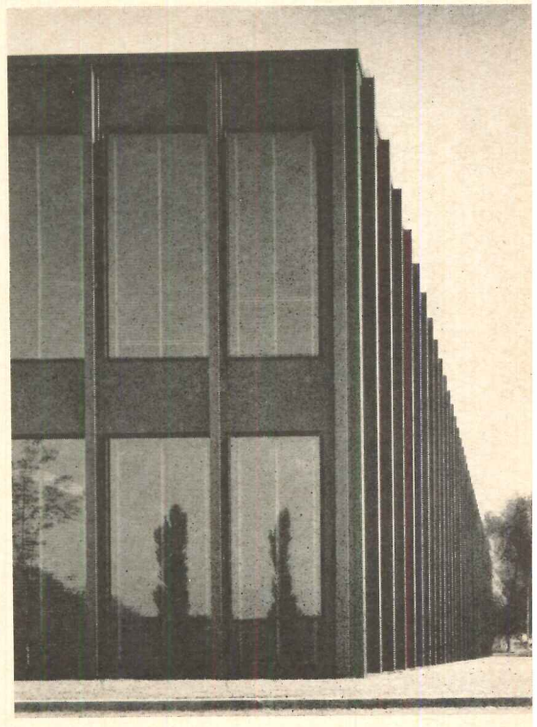


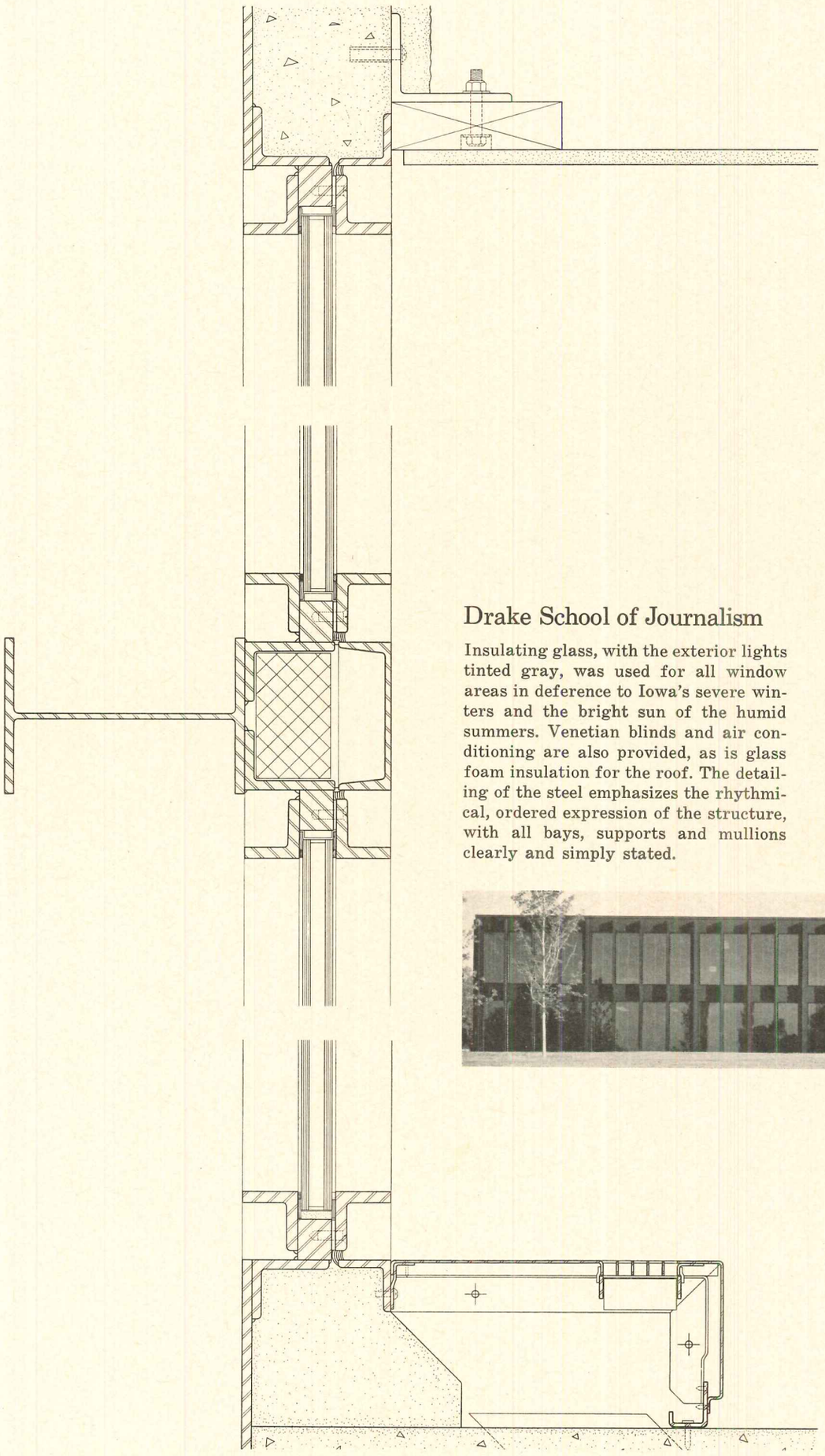
FIRST FLOOR

1. Lobby
2. Lounge
3. Lecture Hall
4. Projection Room
5. Storage
6. Telephone
7. Classroom
8-11. Student Newspaper Office
12. Faculty Office



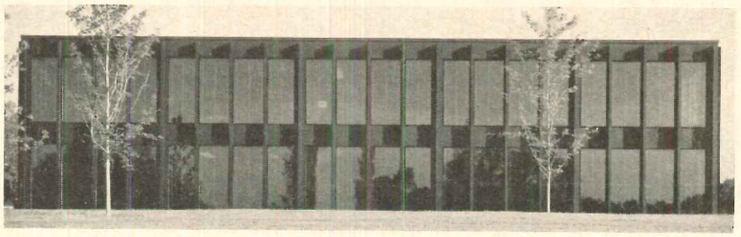


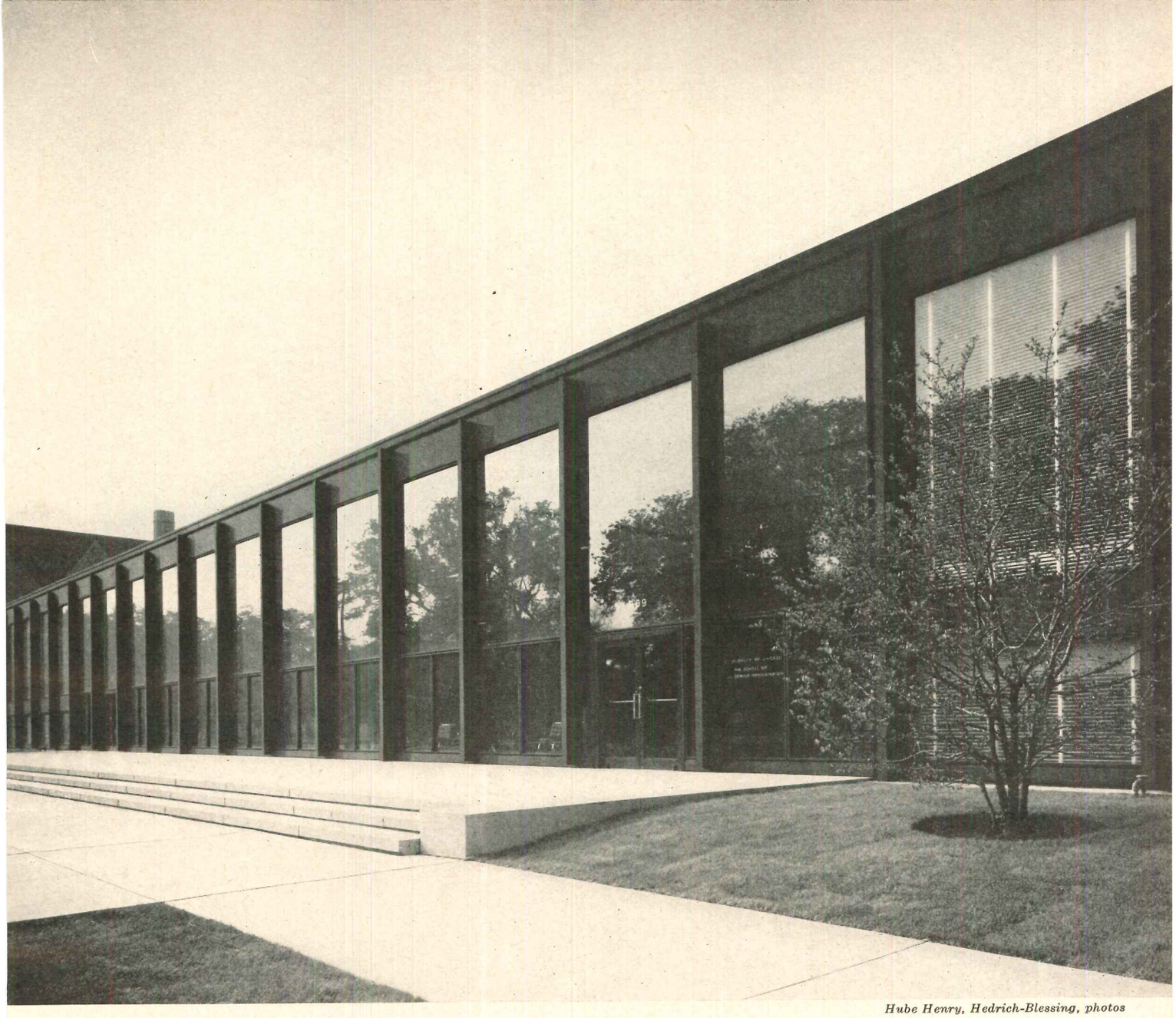




Drake School of Journalism

Insulating glass, with the exterior lights tinted gray, was used for all window areas in deference to Iowa's severe winters and the bright sun of the humid summers. Venetian blinds and air conditioning are also provided, as is glass foam insulation for the roof. The detailing of the steel emphasizes the rhythmical, ordered expression of the structure, with all bays, supports and mullions clearly and simply stated.





Hube Henry, Hedrich-Blessing, photos

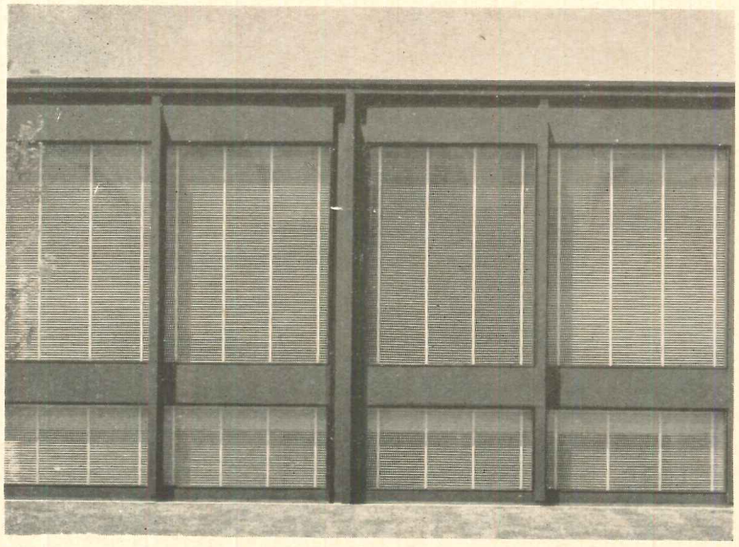
A SPLIT-LEVEL CENTER FOR SOCIAL SERVICE

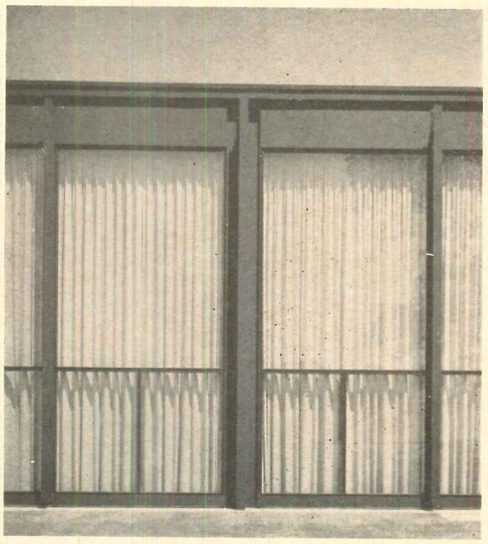
The newest addition to the University of Chicago's Midway Plaisance, dubbed locally the "cultural mile," is this split-level facility for the School of Social Service Administration. Thus Mies van der Rohe stands trimly and simply represented in an area containing, among other buildings, Eero Saarinen's Law School Center, Edward D. Stone's Center for Continuing Education, and Frank Lloyd Wright's Robie House.

The building contains 50,000 square feet of floor space, divided into nine classrooms, 60 offices, four seminar and research rooms, a lounge, a lobby, a library, and utility rooms.

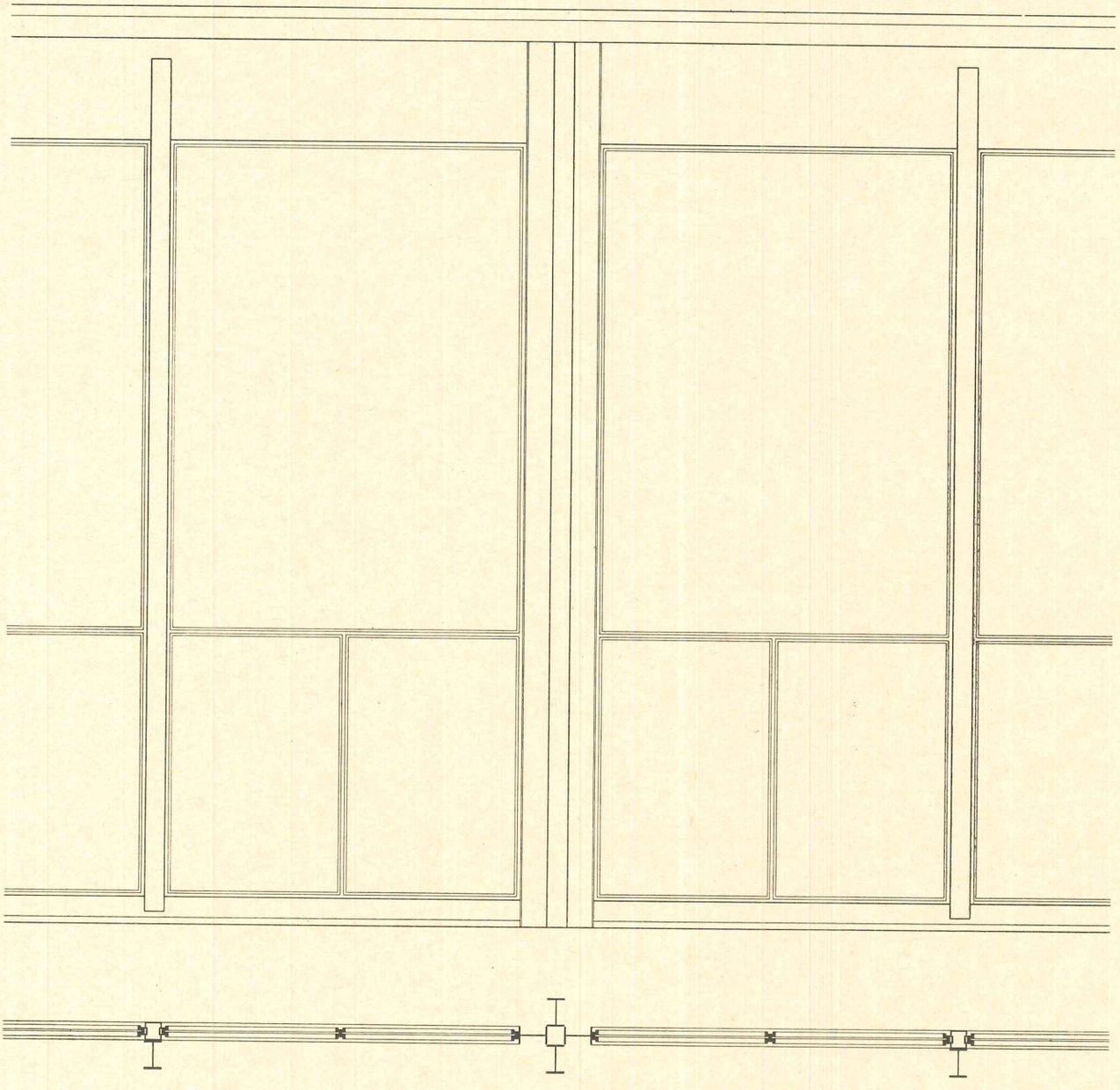
The main level is dominated by the great space of the entrance lobby, which is intended as a multi-use area for meetings, lectures, exhibits and the like. A library parallels this room at the back, and split-level east and west wings housing smaller-sized facilities flank the lobby at either end. In the center of the main floor is a core containing space for student lounge, lockers and a kitchenette. A research center is located below the central hall.

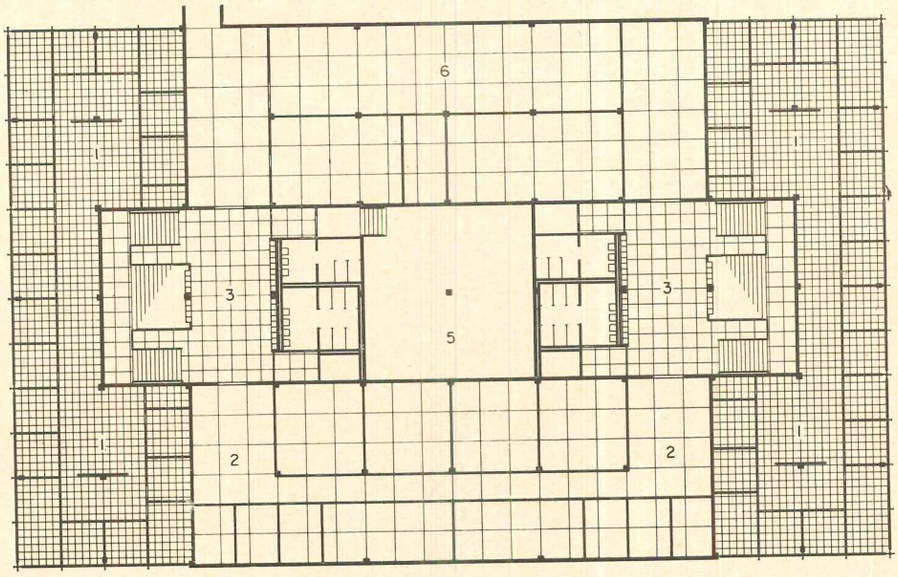
The School of Social Service Administration, The University of Chicago, Chicago. Architect: Mies van der Rohe; associate architect: J. Lee Jones; structural engineers: Nelson, Ostrom, Baskin, Berman & Associates; mechanical engineer: William Goodman; contractor: Fred Berglund & Son, Inc.





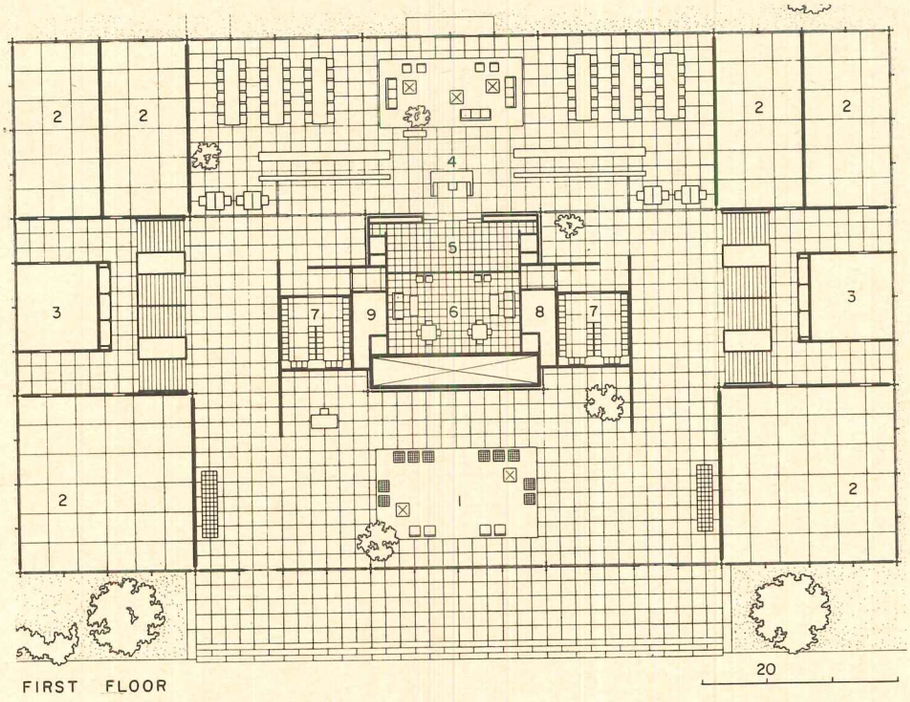
Detail photos show Mies van der Rohe's fenestration treatment of the split-level end wall (*left*), and of library wall





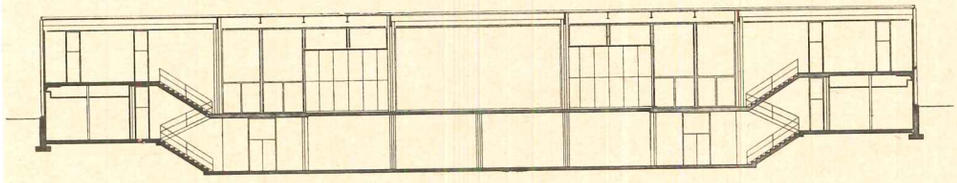
SECOND FLOOR

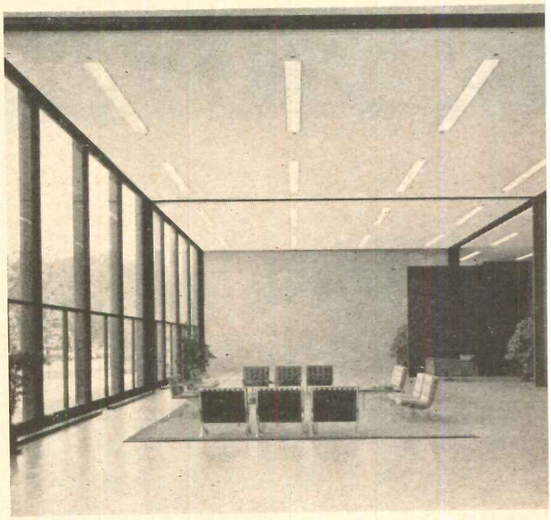
1. Office Area
2. Research Office Area
3. Lobby Area
4. Mimeograph Room
5. Mechanical Room

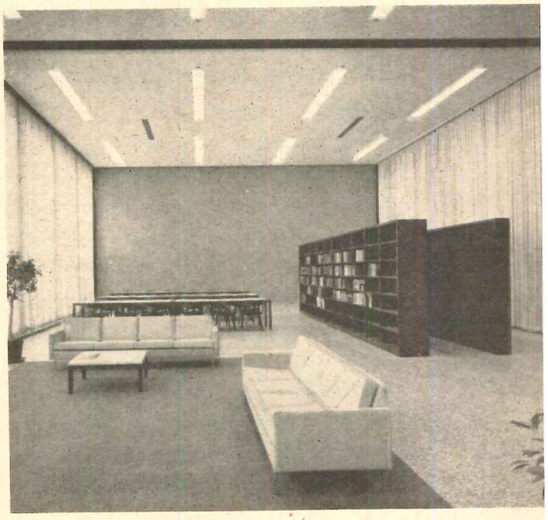


FIRST FLOOR

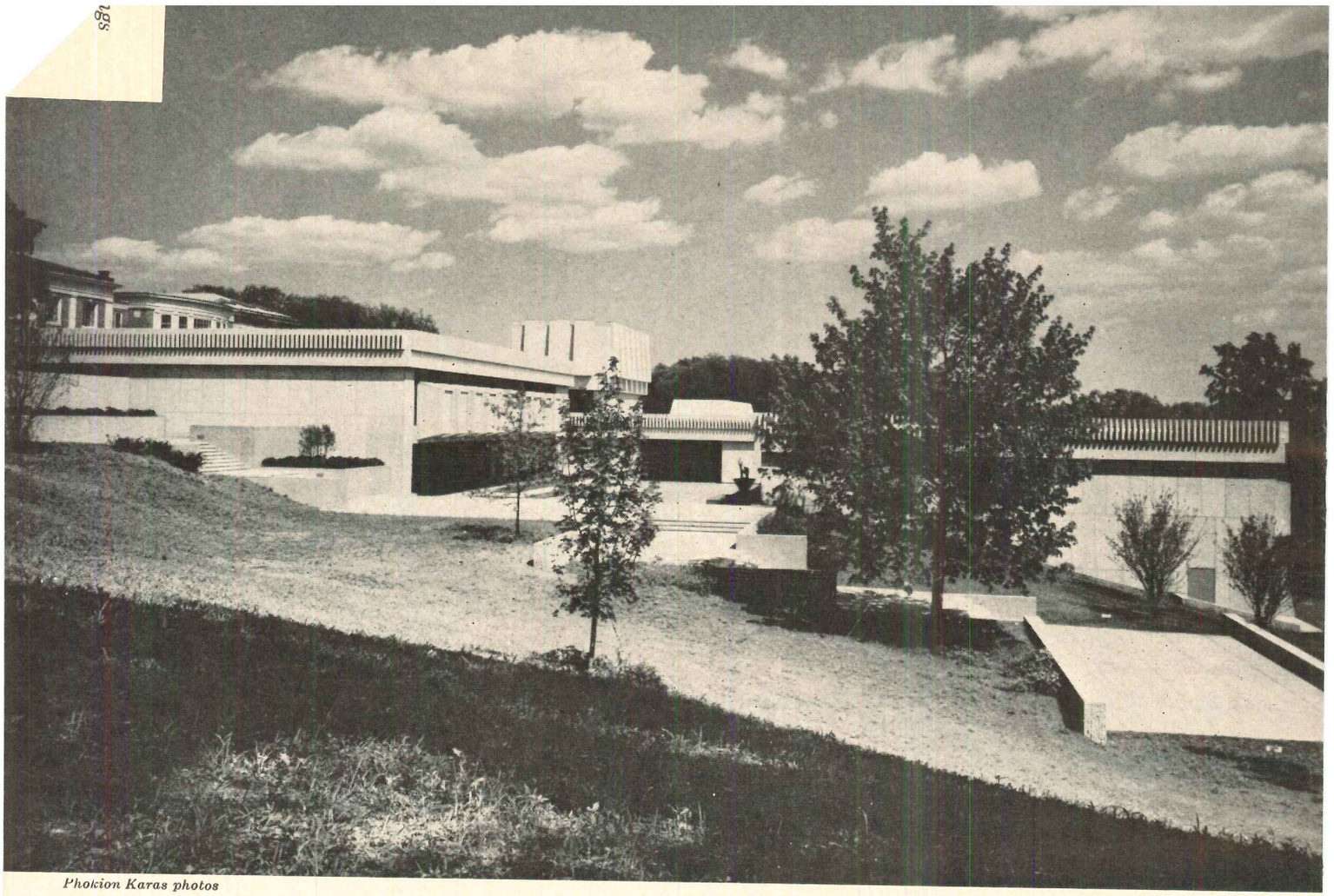
1. Lounge Area
2. Classroom
3. Seminar Room
4. Library
5. Library Workroom
6. Student Meeting Room
7. Locker Room
8. Kitchen
9. Office







Interiors of the School of Social Service Administration are treated as big, uncluttered, neutral-colored space. Walls of the larger rooms are buff brick or fireproofed walnut paneling, with exposed steel structural elements painted flat black; floors are gray-green terrazzo and ceilings are white acoustical tile. Lighting is by recessed fluorescent troffers of the air-handling type. Other areas have black and white vinyl-asbestos flooring, white plaster walls.



Phokion Karas photos

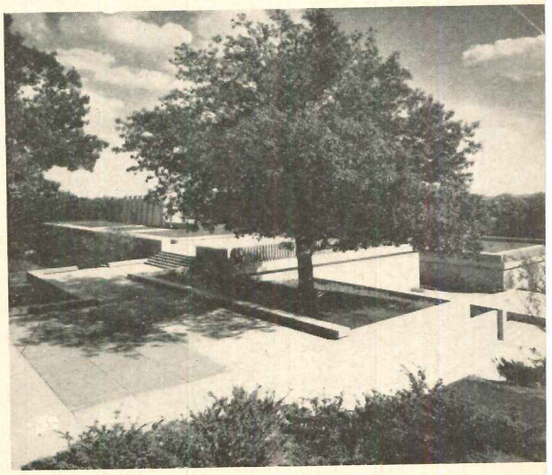
TUFTS LIBRARY TERRACES WITH SITE

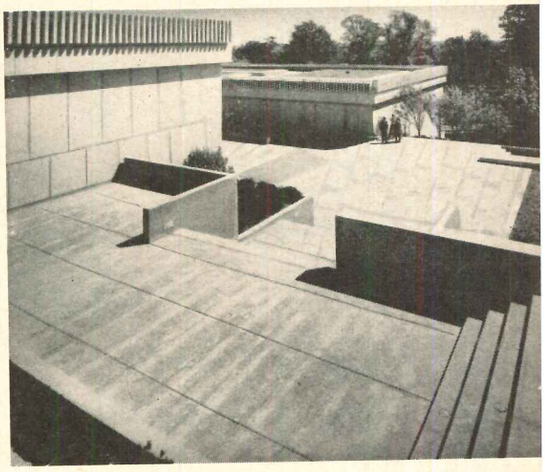
Problems in land use can be quite as diverse in campus planning as elsewhere: at Tufts University ample unbuilt-on land existed, but in the form of a steep slope at the edge of the hilltop campus. The program called for 90,000 square feet of library space to be constructed here without overpowering the scale of the existing buildings or obstructing the view from the hill. The architects came up with a very suitable answer, so ancient that it seems new—to step the three floors of the building down the slope and recess much of their areas into the hillside.

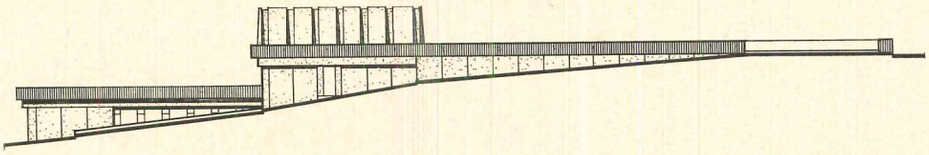
Some have compared the resulting powerful structure with old fortifications, but the architects seem to lean toward an allusion to terraced, rock-cut temples. "As in the temples carved out of the living rock, the line between the architecture and the site becomes purposely blurred and out of focus. The terraced steps, leading to the entrance court, merge with the roof terraces, planted with grass, and shelf off the slope. Where the building juts out from the hillside, the cliff-like corner buttresses anchor its mass to the ground. There has been no attempt to disguise the fact that the large part of the library is carved into the hill; indeed the limited amount of fenestration and the heavy capitals of the interior columns suggest the weight and pressure of the earth. Only the concrete skylights at the entrance open to the sky and spill the daylight on the dark gray carpet."

The strong shapes that pinion and accent the cascade of terraces are largely derived from functional uses. The dentillated cornice is actually a limestone ballustrade for the terraces; the corner buttresses wrap around and define the faculty offices; and projecting study alcoves jut out to strongly punctuate some facades.

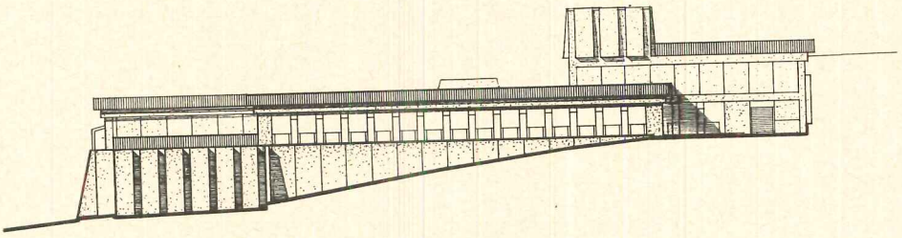
Nils Yngve Wessell Library, Tufts University, Medford, Massachusetts. Architects: Campbell, Aldrich and Nulty; structural engineers: William J. Le Messurier Associates, Inc.; mechanical engineers: Jackson & Moreland, Inc.; interior consultants: Bill Bagnall Associates; contractor: George A. Fuller Company



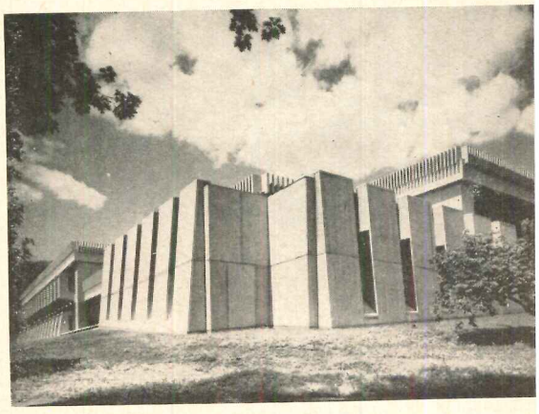


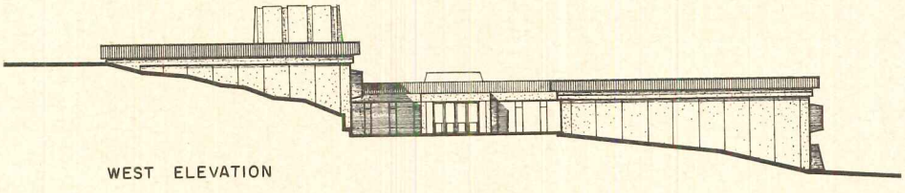


NORTH ELEVATION

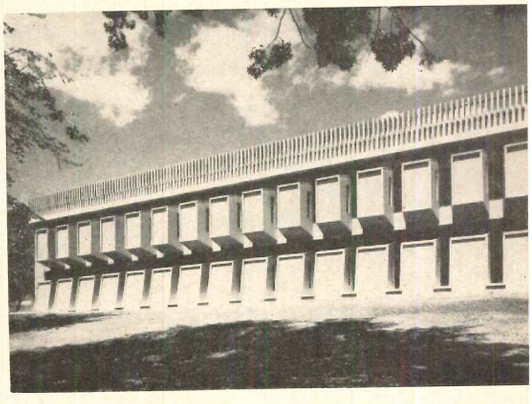


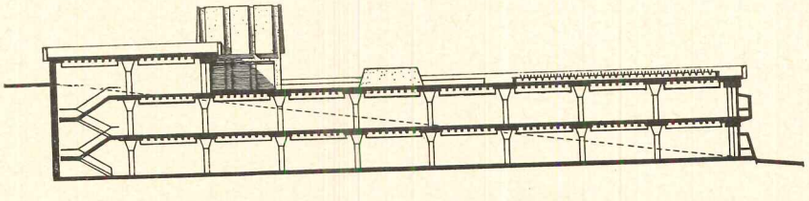
EAST ELEVATION





WEST ELEVATION



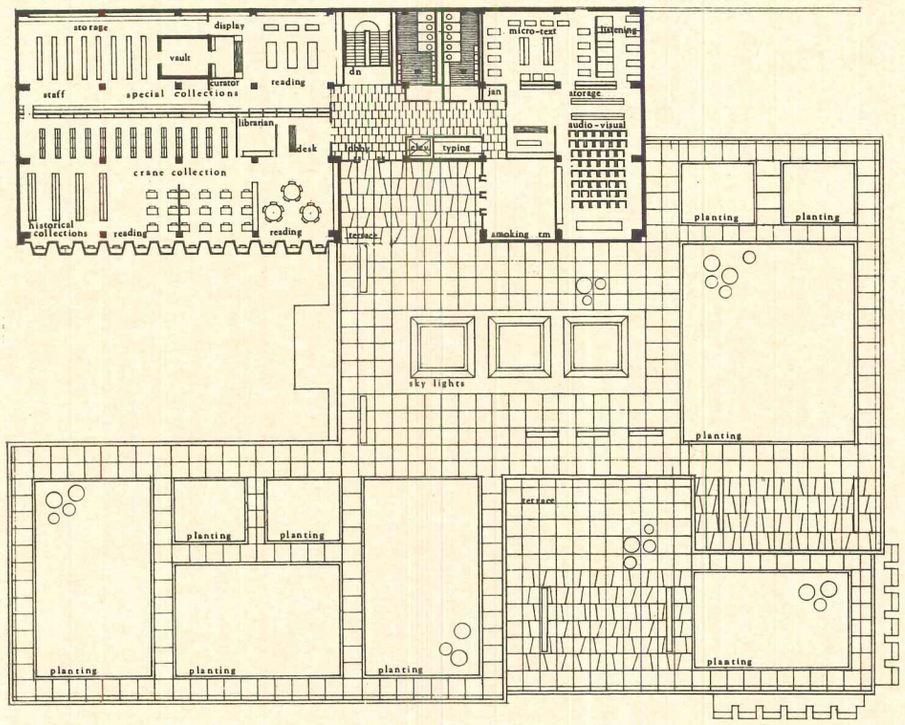


Nils Yngve Wessell Library

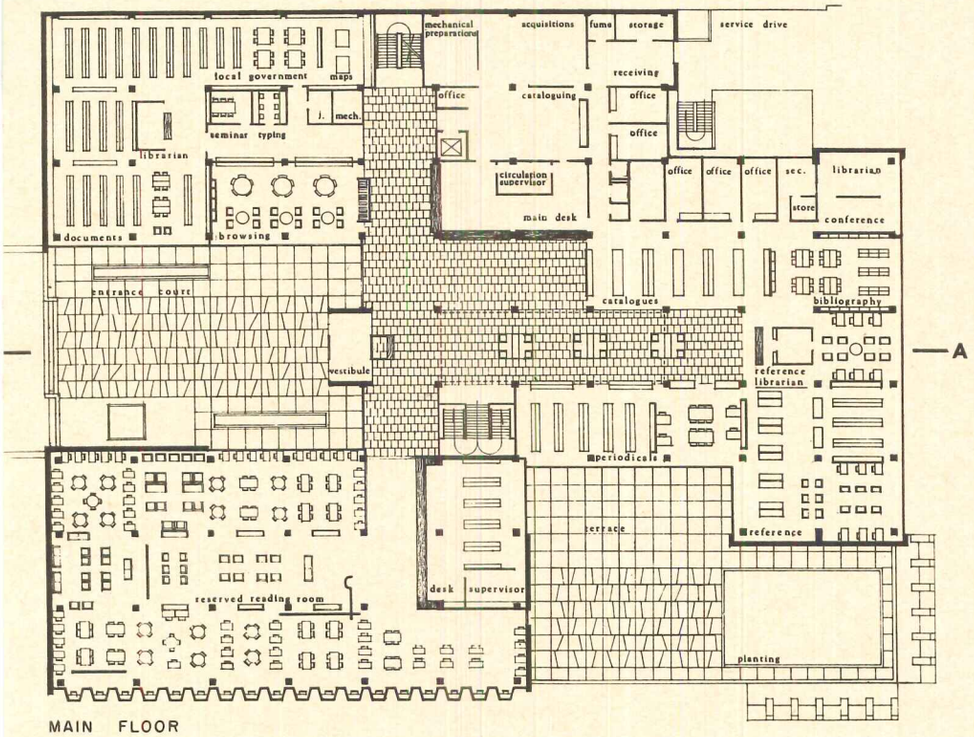
Named for current Tufts president Wessell, the new library had a capacity of about 500,000 volumes. It includes a number of special collections, such as the Crane Theological Library, which have been allocated individual areas in the plan. The main stack areas on the lower level are supplemented by a variety of study, seminar and work rooms.

The building has a concrete frame, surfaced with limestone; interior partitions are mostly metal stud and plaster. The roof terraces, aside from the many planting areas which are to be developed, are surfaced with asphalt paving blocks.

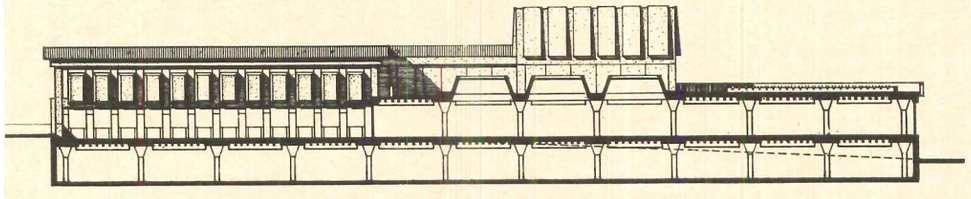
The main entrance to the library is via an entry court on the middle level to reduce the need for elevators. Interiors are clean-lined and simple, with floors of wool carpet or vinyl asbestos, ceilings of fissured mineral. Gray glass is used for all fenestration. The building is air conditioned; mechanical equipment is located in the large central block capping the building. Costs for the building were reportedly $21.95 a square foot, somewhat below the budget.



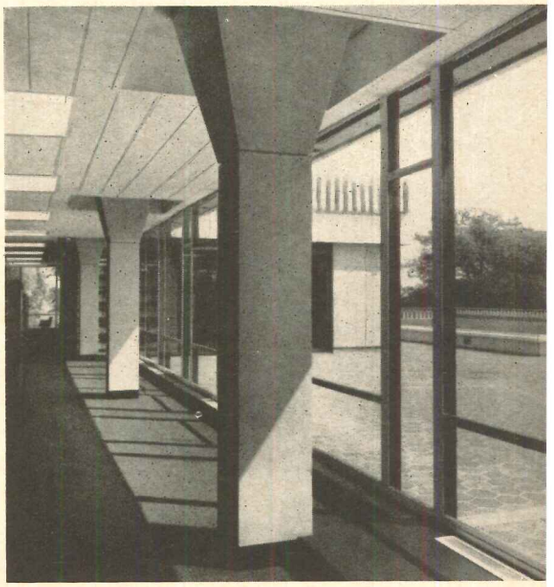
UPPER FLOOR

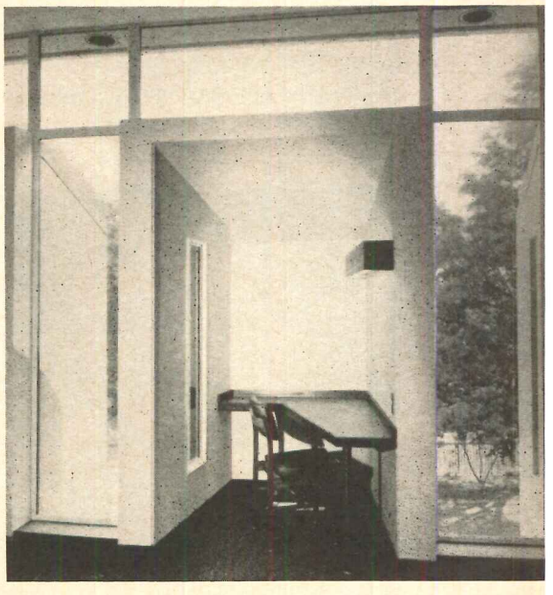


MAIN FLOOR



SECTION A-A

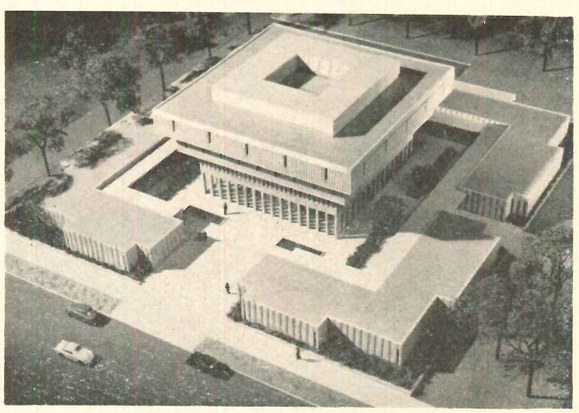




Balthazar Korab photos

CANTILEVERED TIERS FOR HALL OF PHARMACY

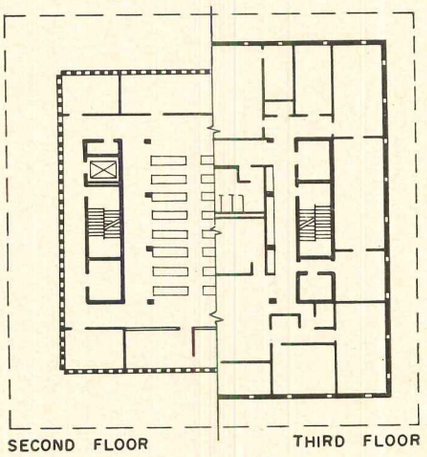
Strong and forthright as a pioneer redoubt, this new facility for the College of Pharmacy at Wayne State University forms the first stage and central block for a future compound as illustrated below. In its final form, the complex balances the outswinging layers of the present unit with a square of low-lying buildings enclosing a plaza.

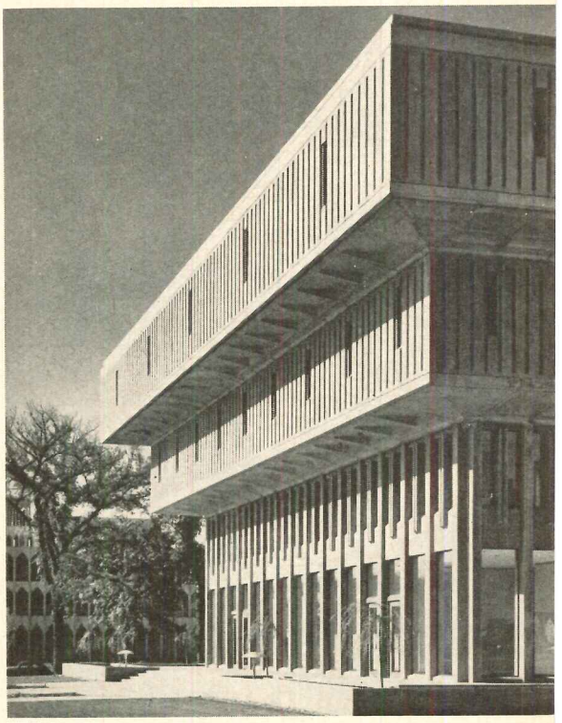


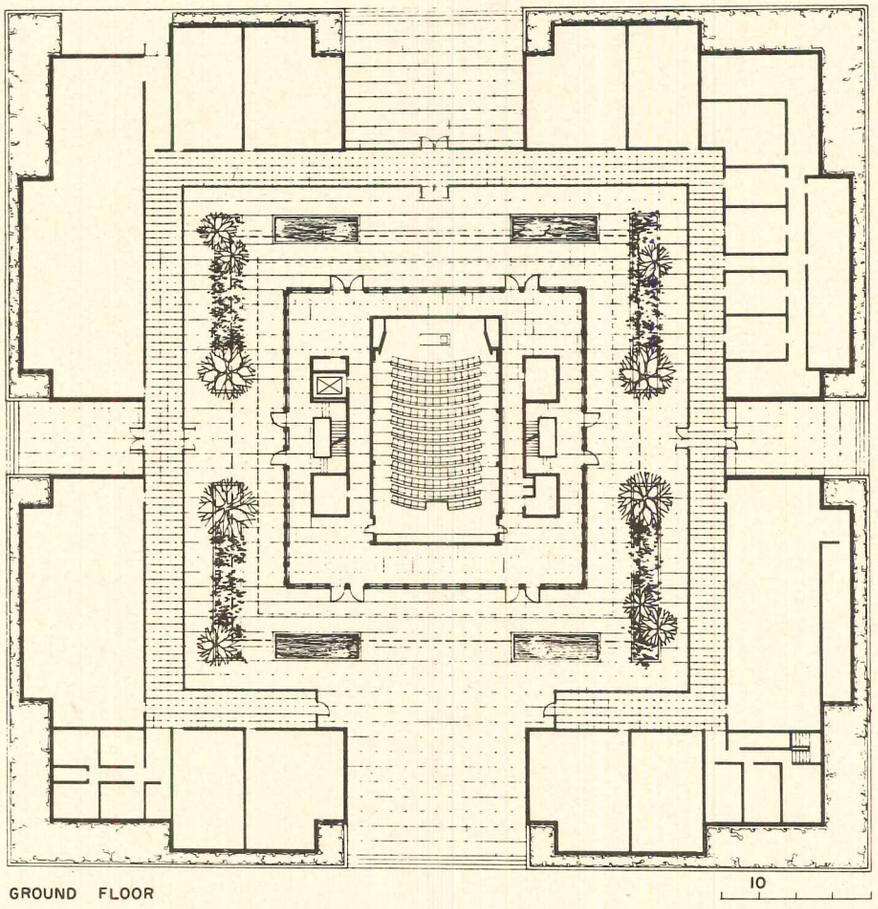
The completed structure transmits what might seemingly be an arbitrary form to a useful exploitation of the cantilever, and sandwiches varying-sized spaces in a logical order. However, its individualistic character was intentional, to give it identity as a memorial building, surrounded as it is by Yamasaki's MacGregor Memorial building, College of Education and proposed College of Law.

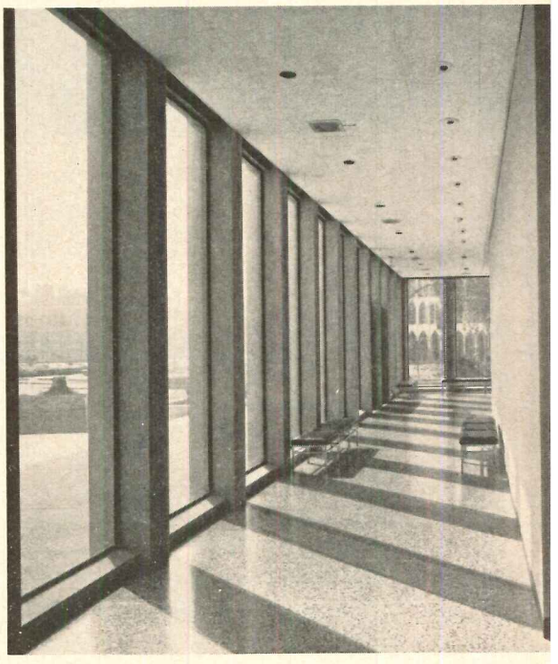
The first two floors are quasi-public, with lobby and lecture room, and dispensing and prescription areas above. The top floor contains laboratories which require greater area and isolation. Stock rooms and offices are on the third level, convenient to the floors above and below. Exterior panels are precast concrete.

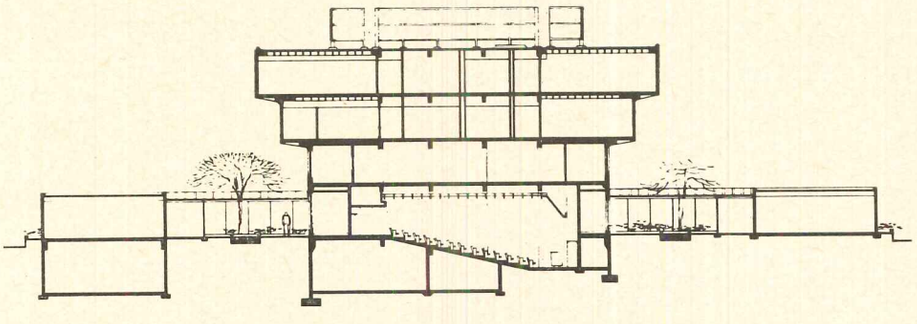
Shapero Hall of Pharmacy, Wayne State University, Detroit, Michigan. Architects: Paulsen, Gardner and Associates; consulting structural engineer: Robert M. Darvas; consulting mechanical and electrical engineers: Hyde and Bobbio, Inc.; laboratory consultant: Richard Melcher; contractor: Lerner-Linden Construction Company

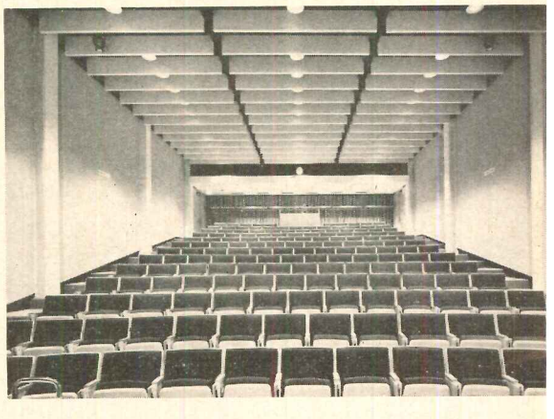

SECOND FLOOR
THIRD FLOOR




GROUND FLOOR
10







Marc Neuhof photos

A PINWHEEL CLUSTER OF CLASSROOMS

The rather free-wheeling shapes of this new classroom building for Robert Morris Junior College result from fanning out classrooms from a central circular core, and expressing each on the exterior.

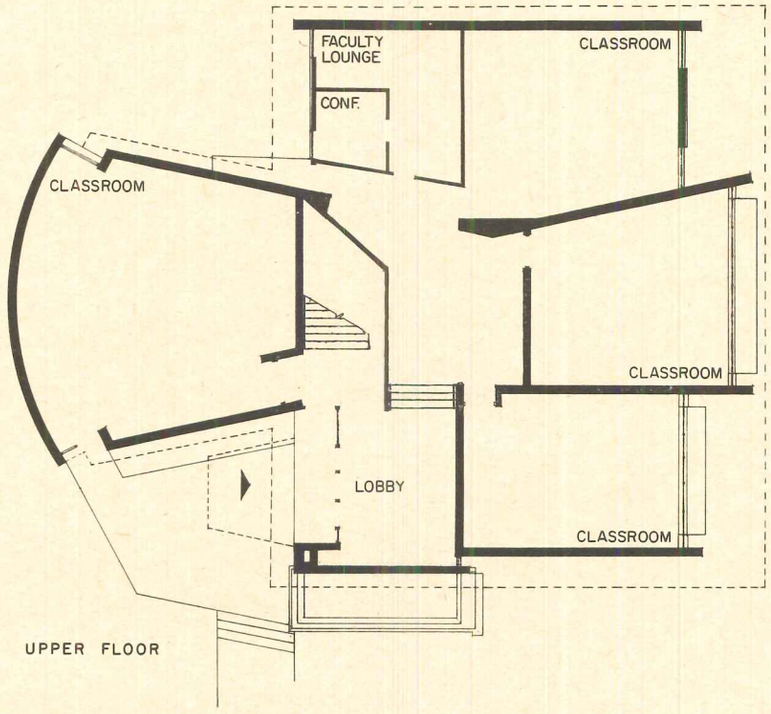
Katselas comments that, "this is the first classroom building of the new campus and must answer not only the basic requirements, but the symbolic requirements of an educational institution. A variety of room sizes, and some flexibility was desirable. Room requirements varied from a small 24-student room to a large 80-student classroom. Soundproofing was essential."

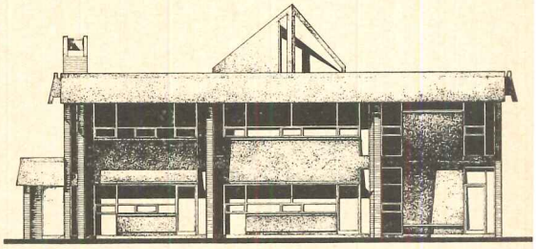
"In addition, compatibility with future classroom units to form an integral complex had to be taken into consideration; and circulation, both internal and external, had to provide for future expansion. The site is a small knoll overlooking the remainder of the campus, and it is oriented so that three similar classroom units may be clustered down the hill leading to the proposed library and student union."

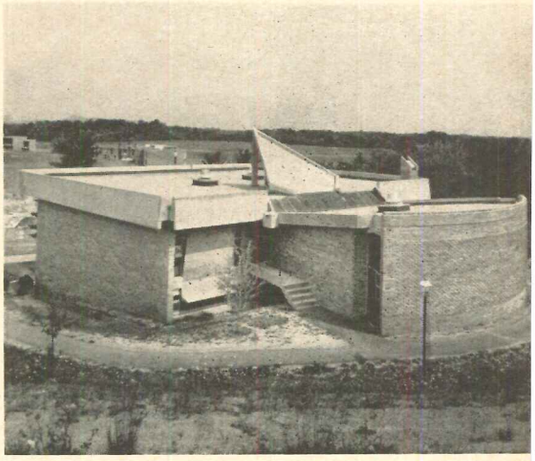
"Brick bearing walls support a coffered floor slab and roof. The various room sizes were grouped around a circulation corridor and were permitted to jut out and form their own patterns and silhouettes. These were then organized as a cluster, with a strong parapet roof, and the internal circulation area covered with a concrete skylight."

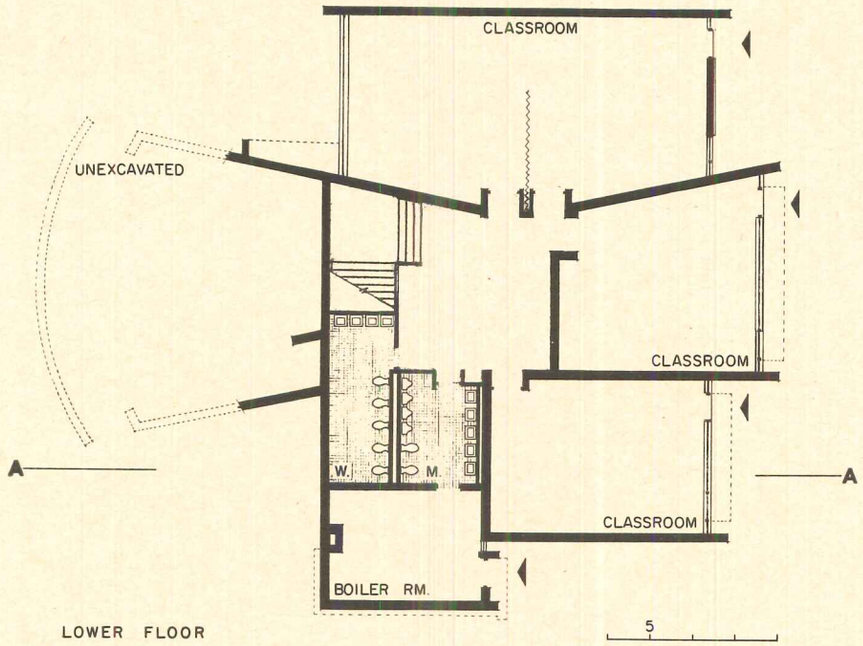
Katselas adds that the building "efficiently handles up to 300 students with a minimum of confusion. Lighting, sound proofing and maintenance have all proved satisfying. The effort to allow circulation from below the hill, as well as above, does work, and it is a fascinating vista to watch at the end of a period as students pour in and out."

Classroom Building, Robert Morris Junior College, Moon Township, Pennsylvania. Architect: Tasso Katselas; structural engineers: R. M. Gensert Associates; mechanical and electrical engineers: Evans & Associates; contractor: Navarro Corporation.


FACULTY LOUNGE
CONF.
CLASSROOM
CLASSROOM
CLASSROOM
LOBBY
CLASSROOM
UPPER FLOOR






CLASSROOM
UNEXCAVATED
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A
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W.
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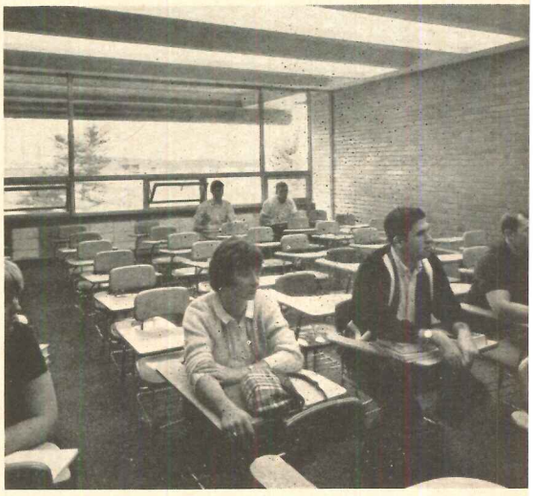
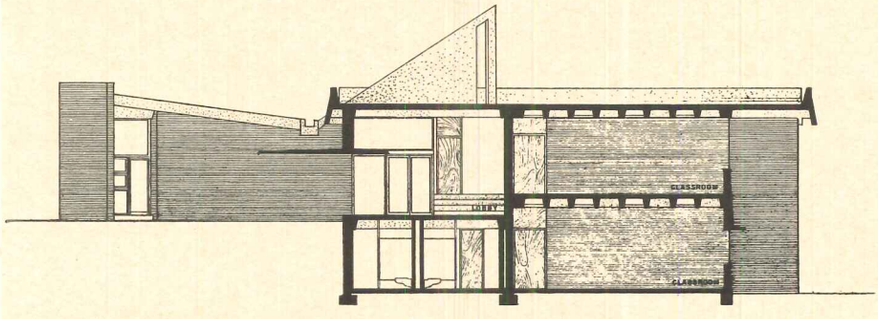
LOWER FLOOR
5





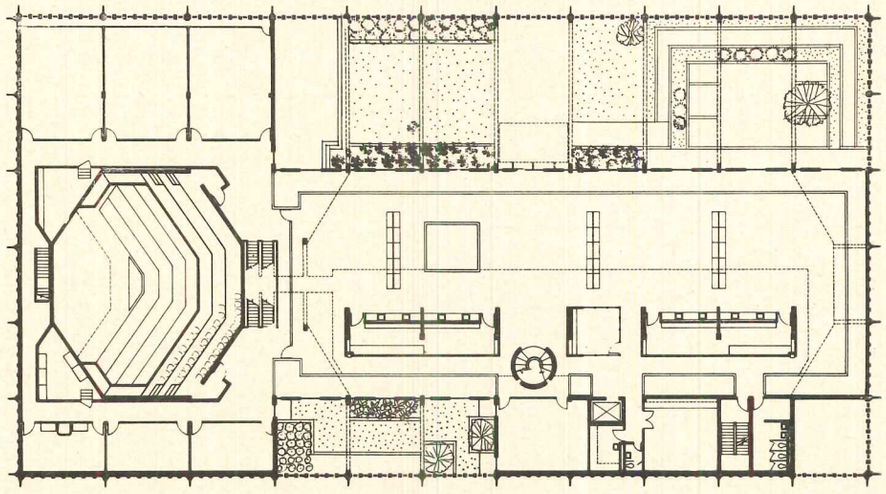
Joseph W. Molitor photos

A MODERN CLOISTER FOR ART STUDIES

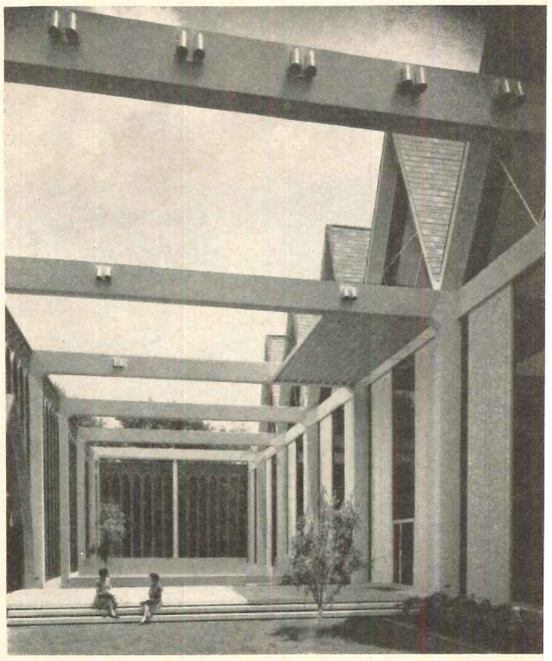
Faced with the problem of providing a contemporary building which would echo the predominant Gothic style of the Agnes Scott campus, Edwards and Portman have come up with a latter day version of a medieval, many-gabled great hall, with platforms layered within for classes and exhibits.

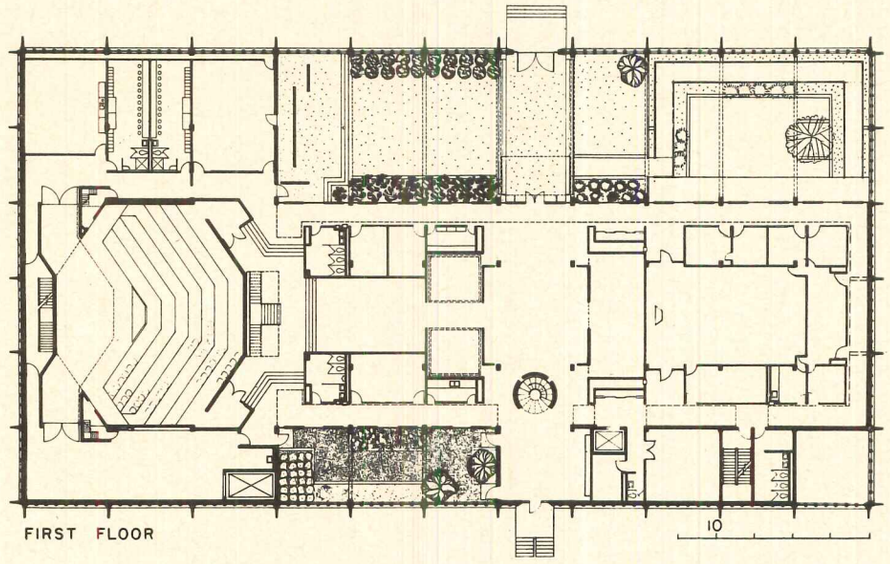
The architects comment that, "the building is basically a cathedral to art, and the Grand Gothic space, which is authentically buttressed, contains the floating platforms or labs, with the gabled roof opened to the north for light. The platforms have further been perforated to reveal space flow and spatial interrelationships. The columns on the exterior are expressed to reveal the buttressing. The exterior courts have many varied uses, such as the work area off the sculpture and ceramics labs on the lower level; other spaces are used for display of student sculpture, rehearsal and student performances by the drama department, and rest and relaxation areas. The ramp from the lower court is for the moving of heavy sculpture as well as student circulation."

Dana Fine Arts Building, Agnes Scott College, Decatur, Georgia. Architects: Edwards and Portman; mechanical engineer: Britt Alderman, Jr.; electrical engineer: Morris E. Harrison; landscape architect: Edward L. Daugherty; contractor: J. A. Jones Construction Company

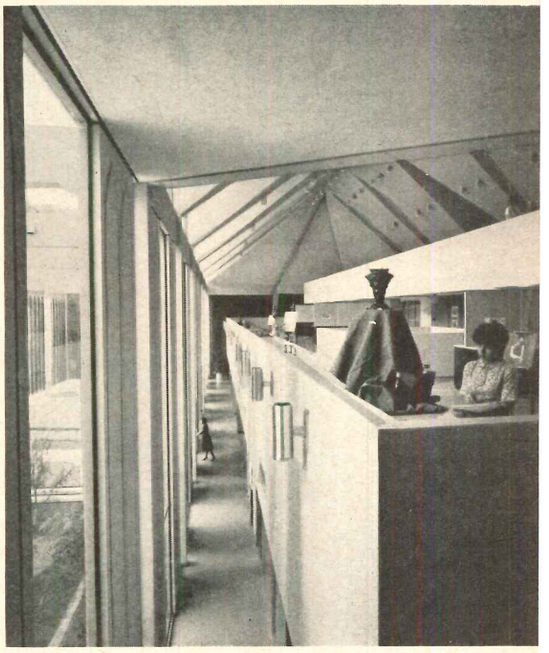


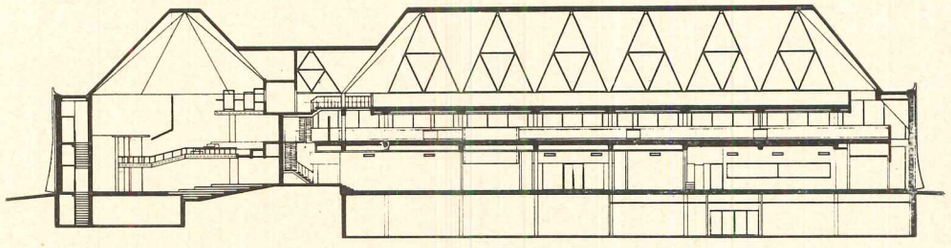
SECOND FLOOR

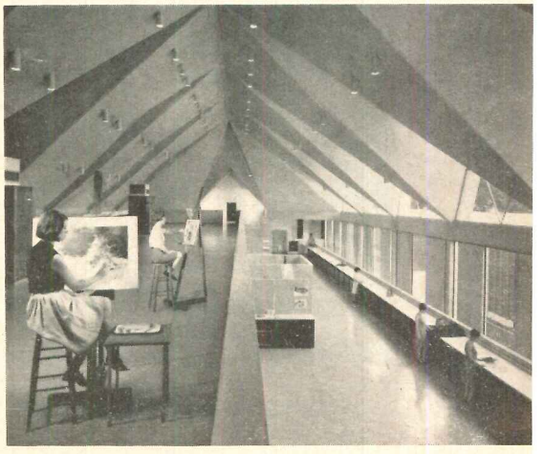


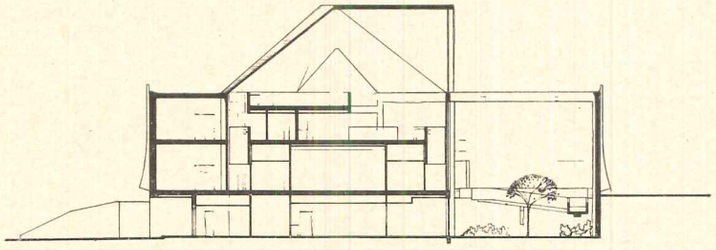


FIRST FLOOR





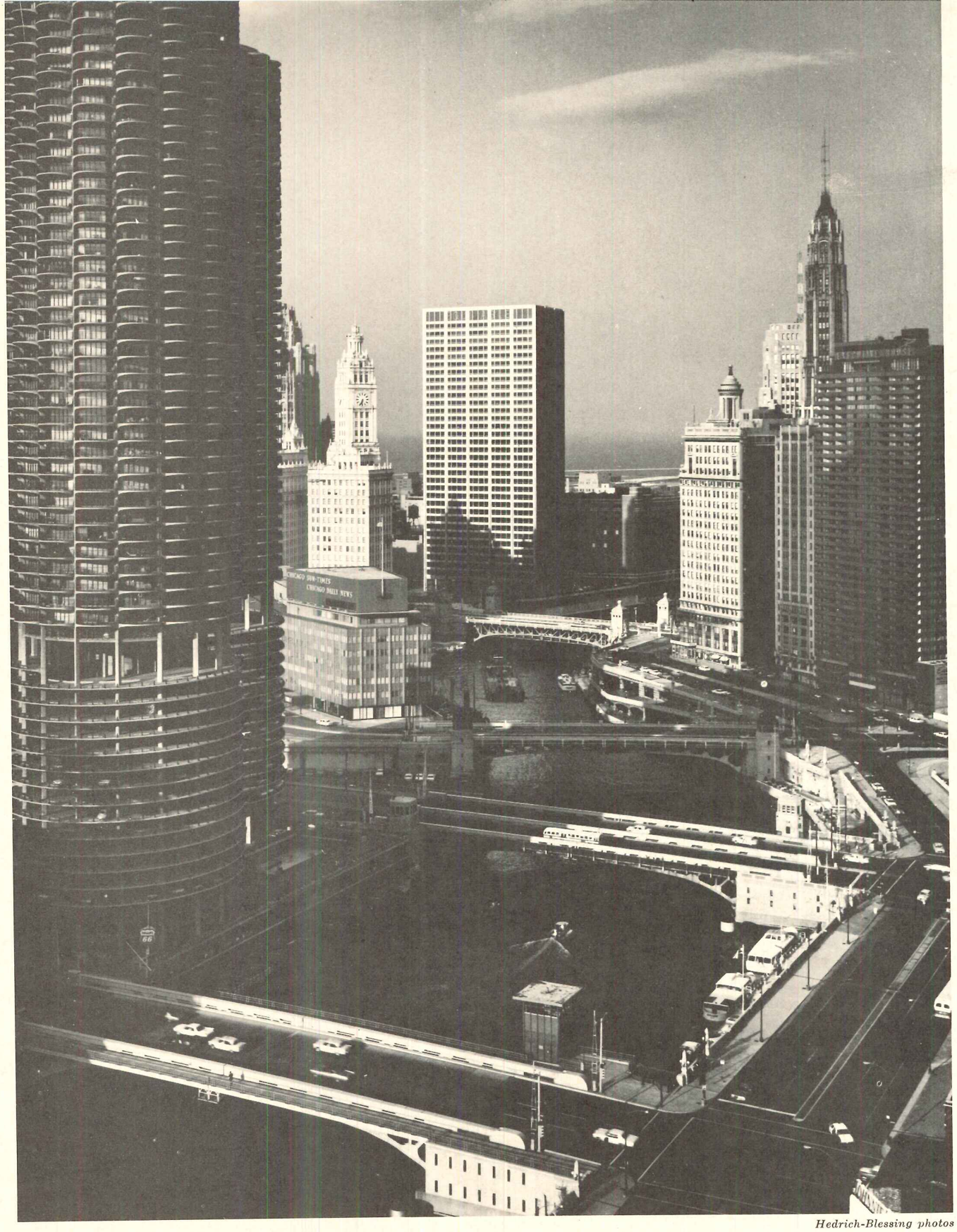




Dana Fine Arts Building

In addition to the studio areas on the platforms, the building provides a variety of galleries for display of painting and sculpture. Interior wall surfaces are painted concrete or block, or plastic covered gypsum board. Floors are covered with carpet or composition.

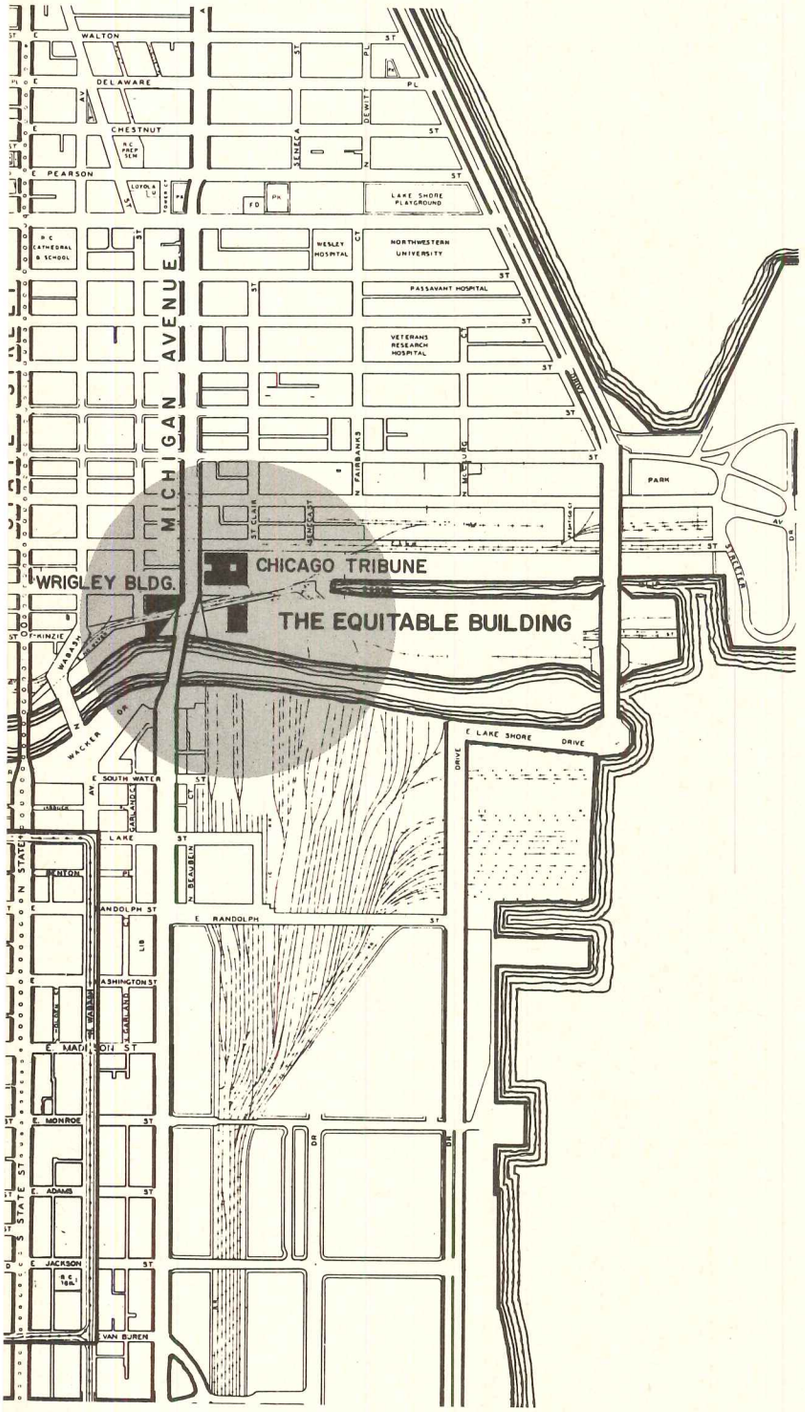
A theater is provided for the Drama Department at one end of the building, with adjacent work and teaching spaces. The building has a frame of reinforced concrete, and exterior walls of concrete and brick; the roof has shingles and built-up roofing.



Hedrich-Blessing photos

TOWER IN A NEW KIND OF URBAN SPACE

Equitable's new headquarters building, designed by Skidmore, Owings & Merrill for a site on North Michigan Avenue at the river, soars upward from a two-level plaza that links streetscape and water below, and creates a new neighborhood focal point



The Tower, The Plaza, The Avenue

A new kind of urban space has been created and Chicago's North Michigan Avenue has acquired a new point of visual interest with the completion of the 35-story Equitable building and its large, spreading plaza. Unlike many of the famous shopping streets—which extend on a straight line with few compelling visual pauses along the way—North Michigan boasts several "stoppers" along its length, and changes direction more than once. This lively avenue (see picture at right) veers right to cross the Chicago River, swings left just north of the bridge, slows its progress several blocks further on for a look at the old water tower, where it veers right again, and eventually ends in a T-trap at Lake Shore Drive—with Lake Michigan straight ahead. Of course such variety and change give the avenue its interest and charm, and the new Equitable tower and plaza are skillfully designed to forward that idea. The new plaza is a defined yet open space, bounded on the east by the new tower, on the north by the Tribune tower, and on the west by the Wrigley building. It opens in spreading fashion to the south and the river; serves as a transitional element for the juncture of avenue space and river space. The feeling of connection with the river is strengthened by the spiral stair and lower level development, where shops and a restaurant overlook the water.

The large property was owned by the Chicago Tribune, and was sold on the condition that a plaza would be provided and the building set back. A deed restriction also limited the height of the new building, but the size and shape of the plot made is possible to achieve optimum floor size and shape, as well as building volume, with no difficulty. The Tribune shared in the cost of the plaza, called Pioneer Court.

The fact that the avenue was on a viaduct 30 feet above ground level at the site—with another street beneath—made it possible to provide lower level parking, accessible to the Chicago expressway system, but not visible from North Michigan Avenue.

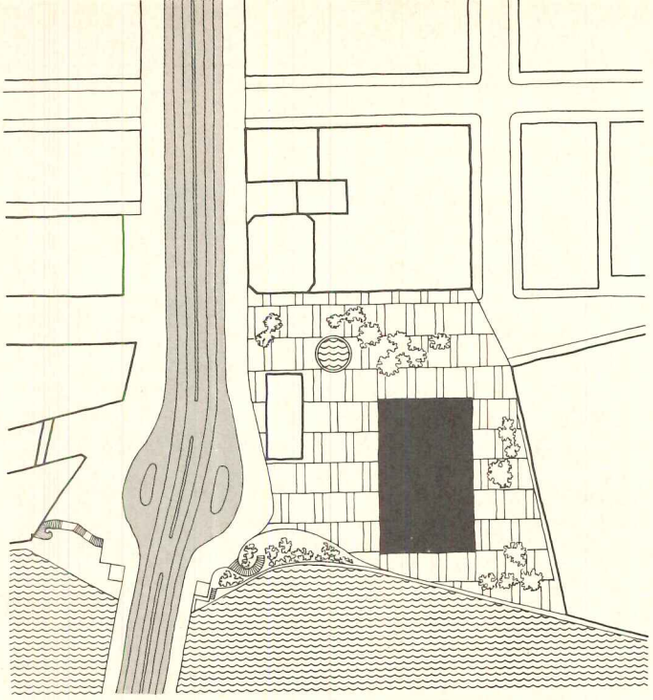
Chicago Tribune

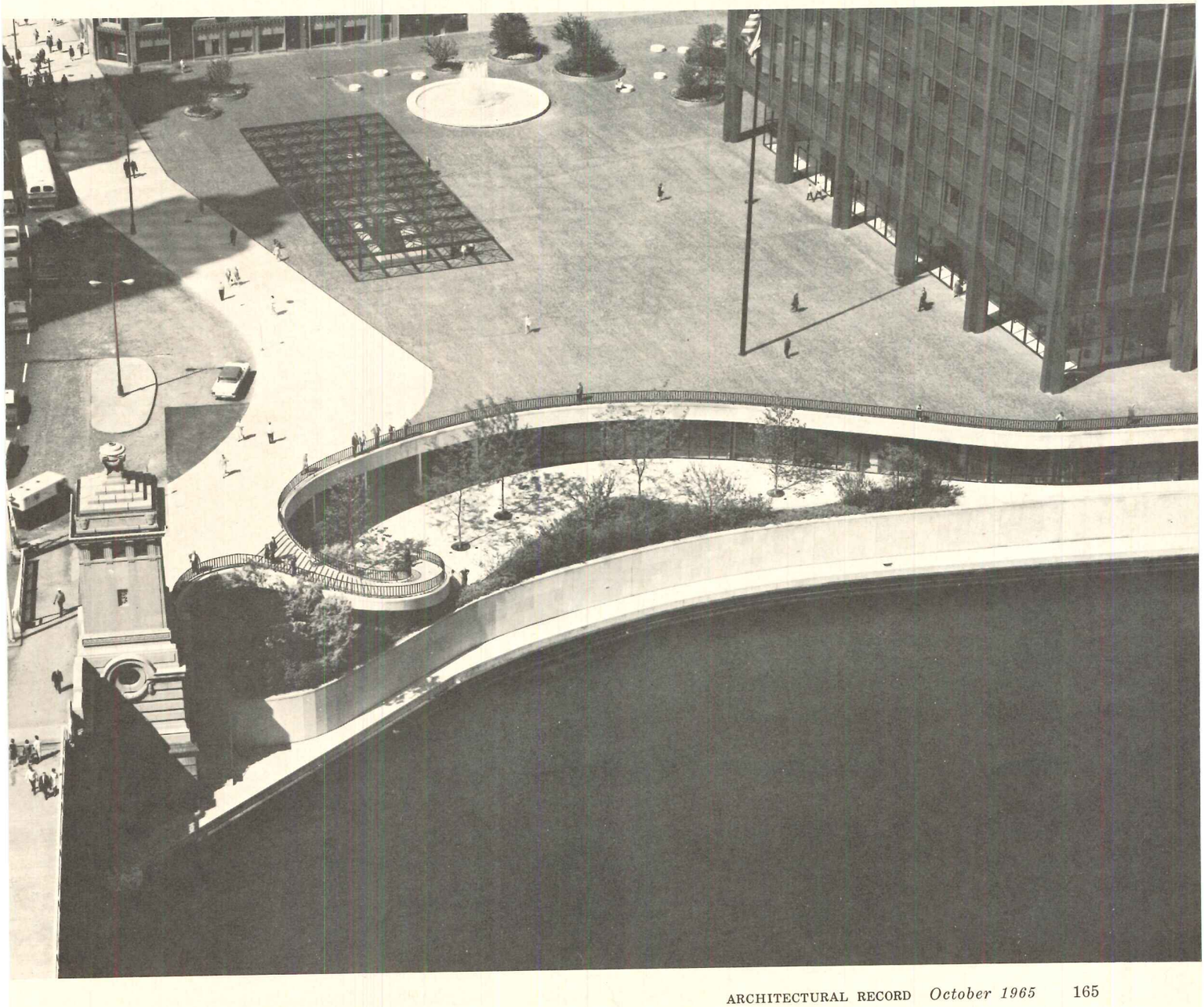
The Plaza and the Tower

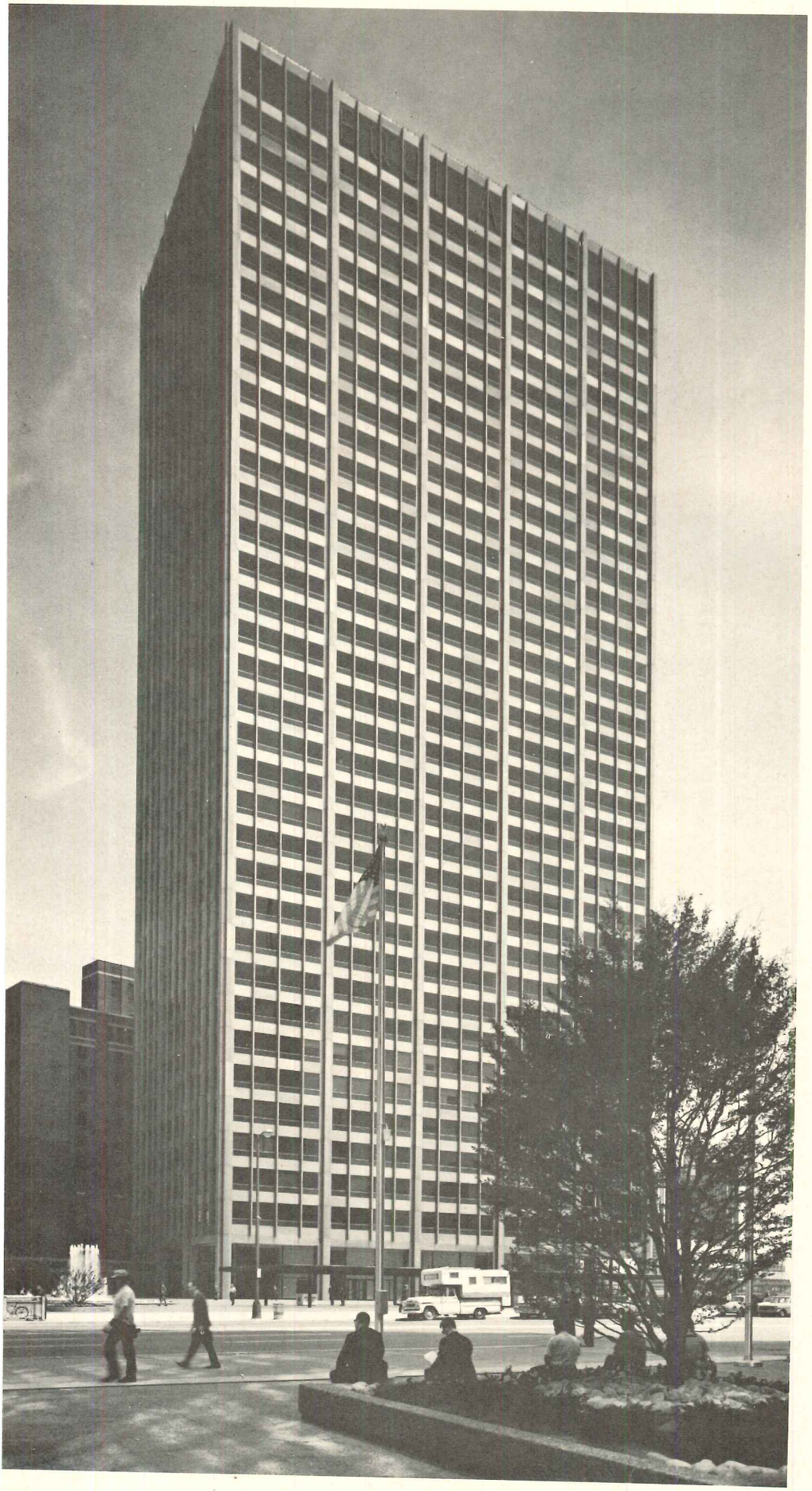
The handling of the building at plaza level is suggestive of the relationship of plaza space and lobby space; the glass plane is recessed several feet at this level to give a feeling of spatial flow. Although typical upper floors are glazed with bronze tinted glass, the lobby is glazed with clear glass to further the same idea. In addition, the plaza paving extends around the building at both ends to flow into a smaller court to the east, which serves as an echo of the large plaza and suggests the flow of the outdoor floor through and beyond the lobby.

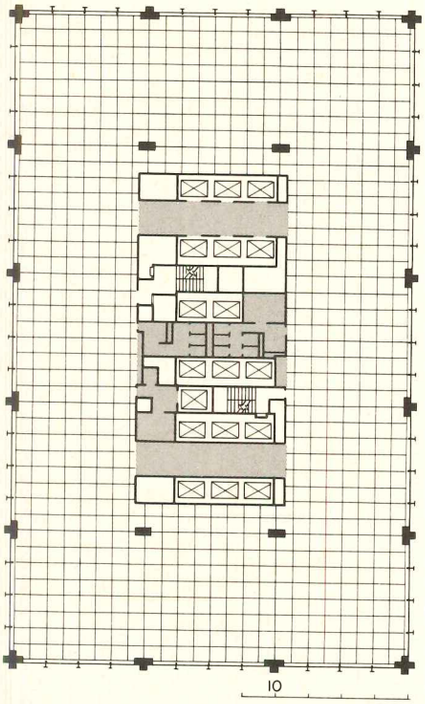
Described as the largest landscaped area in Chicago, the plaza is paved with brick—in a range of dark browns, with iron spots—over most of its 100,000-square-foot area. The brick makes an interesting contrast with the putty-gray of the tower's metal skin, the bronze tinted glass, and the travertine fountain and benches; altogether a handsome effect. The spread of the plaza is interrupted by planting pockets, circular benches, a flagpole, a fountain, and a kiosk. The metal and glass kiosk is located near the sidewalk and a taxi loop; shelters electric stairways connecting the plaza and lower commercial area. One can by this means gain sheltered entrance to the building in bad weather. The circular travertine fountain is 45 feet in diameter and contains 40 jets; the 100-foot flagpole houses an inside halyard and is designed to raise the flag electrically. A portion of the plaza is underlaid with hot water piping for snow melting.

There are three lower levels of shopping, restaurant, parking, and temporary docking facilities; with the restaurant and several shops looking south to the river. The lower commercial area and the plaza are connected by a graceful, spiraling stairway, which was designed by computer in order to locate its coordinates accurately for formwork building. About 150 cars can be parked on two levels immediately beneath the lower commercial area. Access to parking is from the east at ground level.









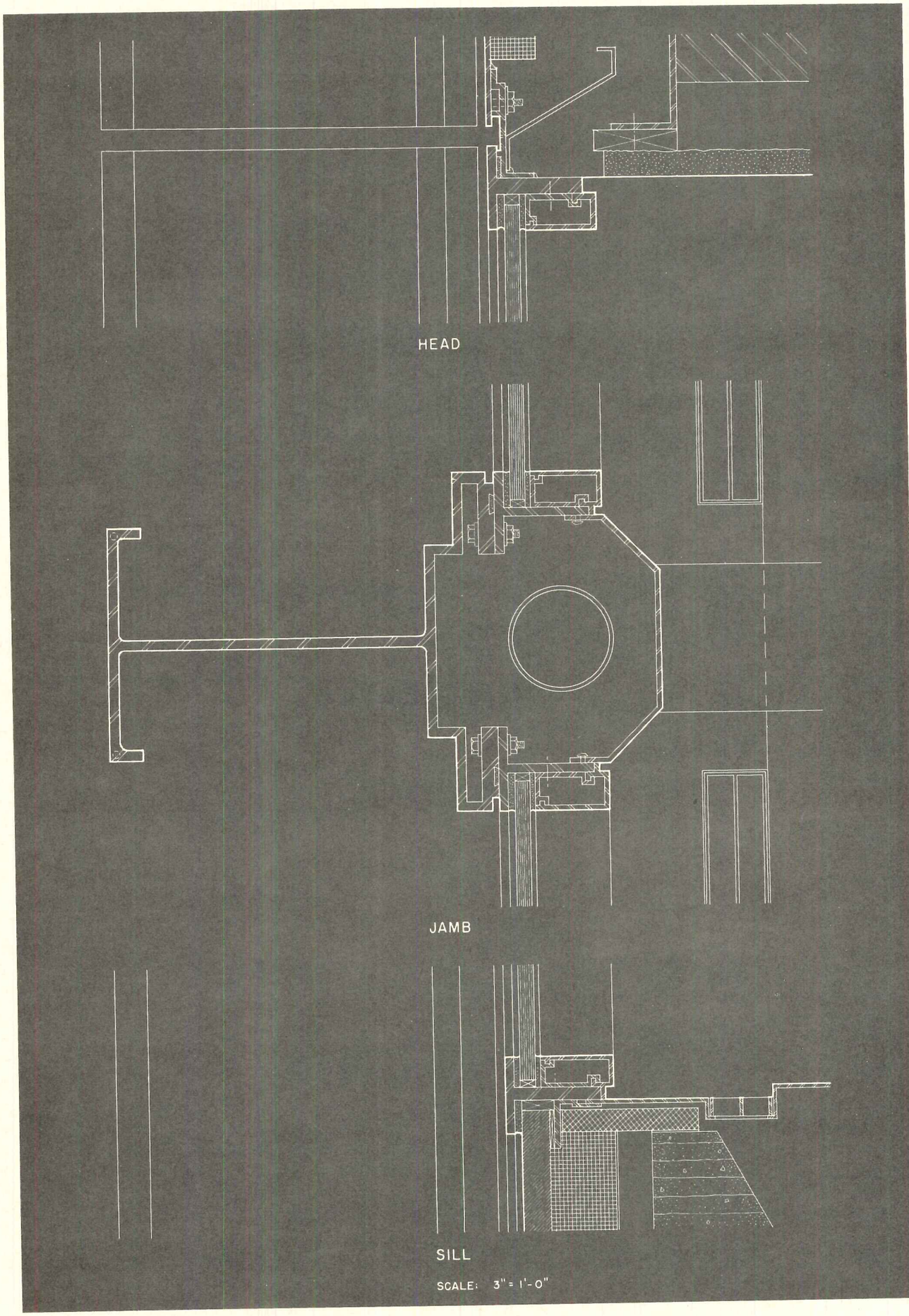
Typical Plan—floors 2 to 16

The Tower

Bruce Graham, SOM partner in charge of design, describes this tower as the "most sophisticated office building structure this office has done." He further explains, "The structure is a continuous welded orthotropic steel frame. The concrete slabs are integrated with the steel members to form the top components of the floor beams. This not only provides a light frame for 38-foot bays, but makes the deck itself easy to form, since the frame is used as scaffolding. Thus, office space is unencumbered by columns at no appreciable cost premium, providing better space per dollar than other buildings can offer.

"The air-conditioning system is a vertically fed, perimetral type with ducts incorporated into the column structure. Piping—of smaller size—is incorporated into the mullions. Such integration, within the configuration of the structure, provided economies enabling us to use finer finish materials and stay within the budget."

Planned on a 4-foot 10-inch module, the 35-story tower has a window wall of aluminum with a hard anodic coating in a green-gray color and is glazed with ⅜th-inch bronze solar glass. Spandrels from sill to floor are of warm gray granite; from floor to ceiling line of bronze glass. The structure rests on 24 caissons reaching down 112 feet below river level to bedrock.

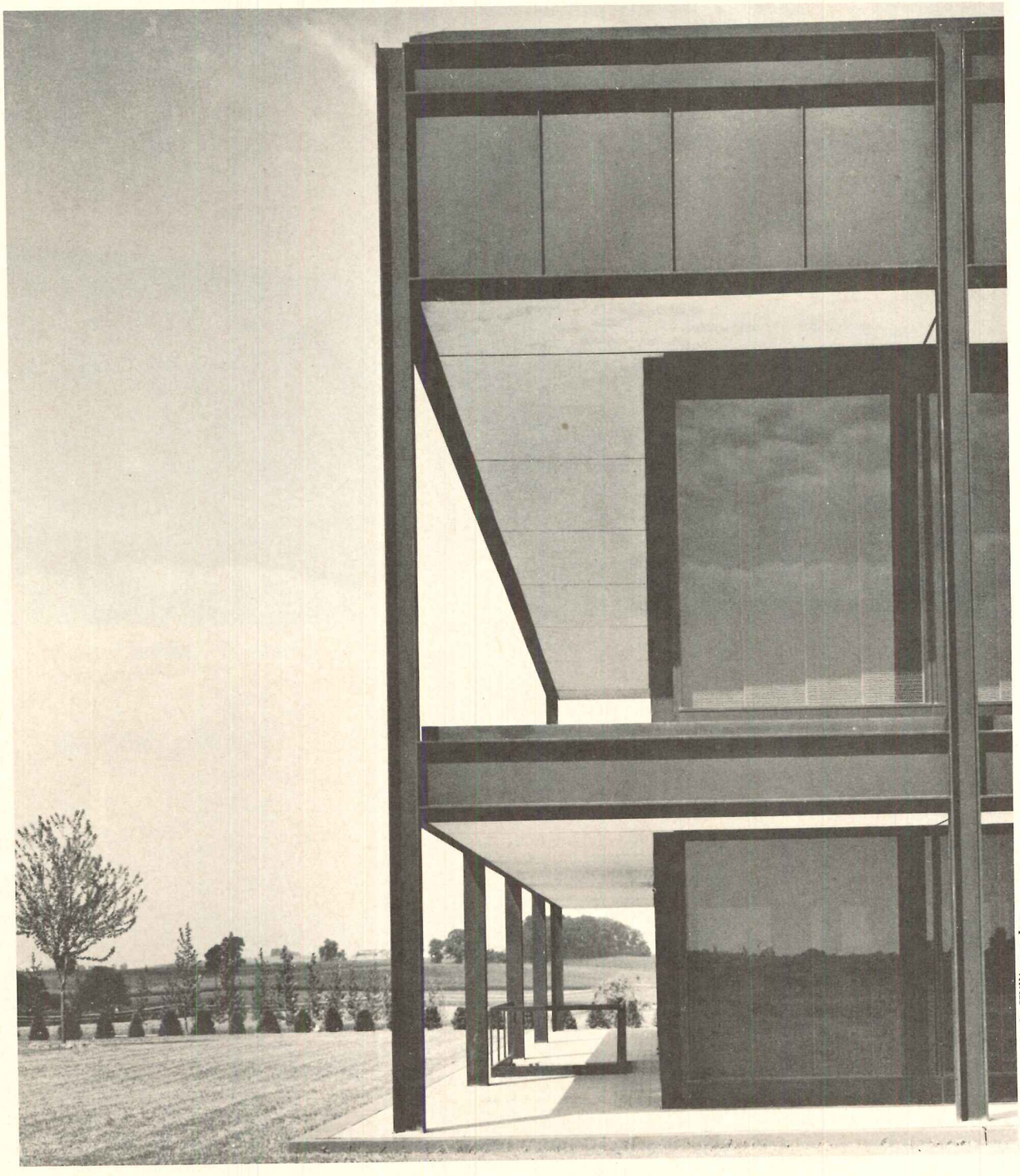

HEAD
JAMB
SILL
SCALE: 3" = 1'-0"

The lobby, above, has walls and floor of travertine marble; is enclosed by large sheets of clear ½-inch plate glass set in frames of aluminum with a hard anodic black coating. The conference room pictured below is part of the Equitable executive complex

The Equitable Building, Chicago, Illinois. Architects and Engineers: Skidmore, Owings & Merrill—William E. Hartmann, partner in charge—Bruce J. Graham, partner in charge of design—Albert Lockett, project manager—Natalie deBlois, senior designer—Edward G. Petrazzio, job captain; consultant architect: Alfred Shaw; general contractors: A. L. Jackson Company.

"AN EXPRESSION OF ENGINEERING"

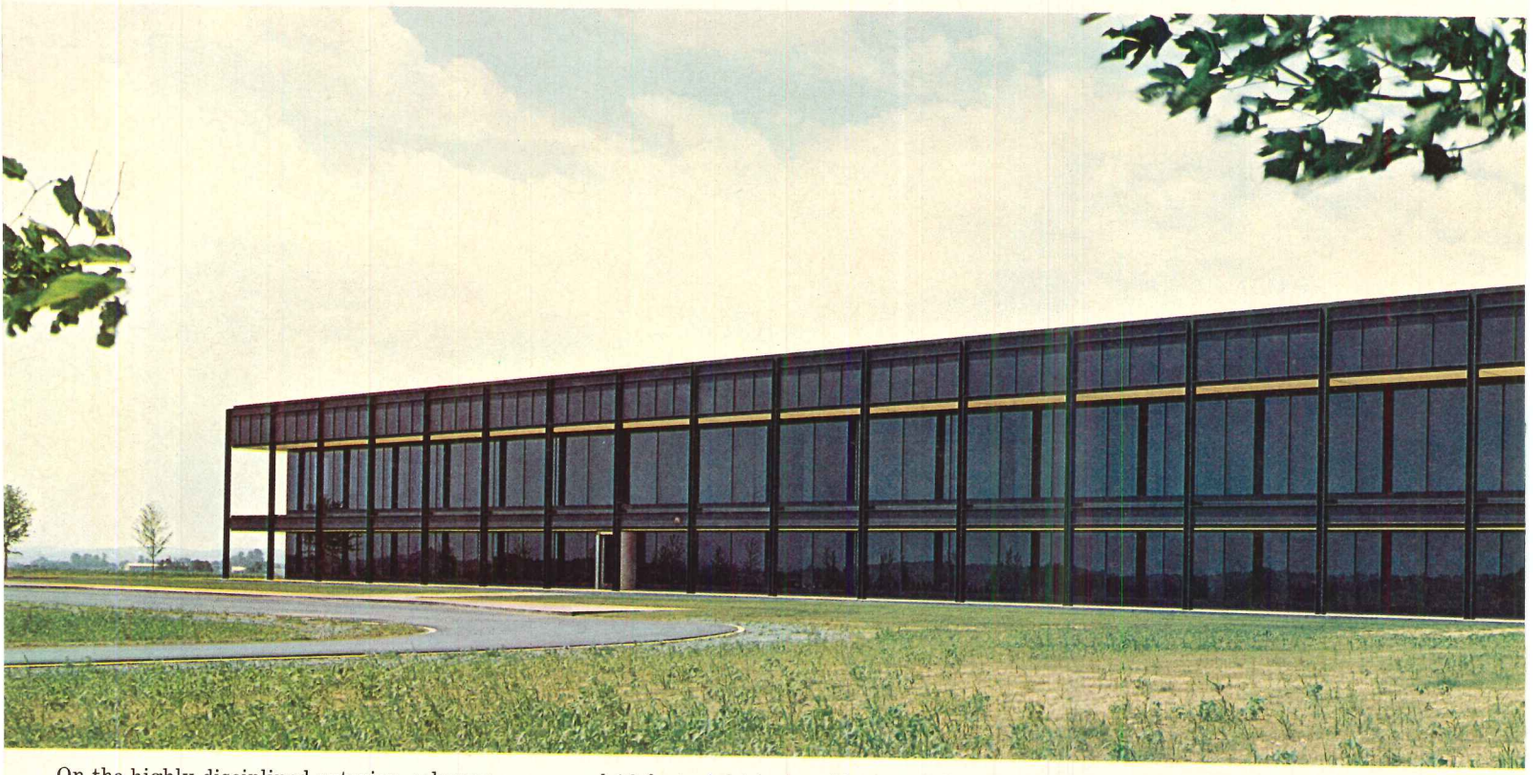
For its new Engineering Building in Lancaster, Pa., Armstrong Cork Company wanted "a design that would relate to the work to be performed there, and strongly express technical creativity." The disciplined steel-and-glass design by Skidmore, Owings & Merrill not only meets this program requirement, but serves as a prototype for a number of new building systems and planning ideas



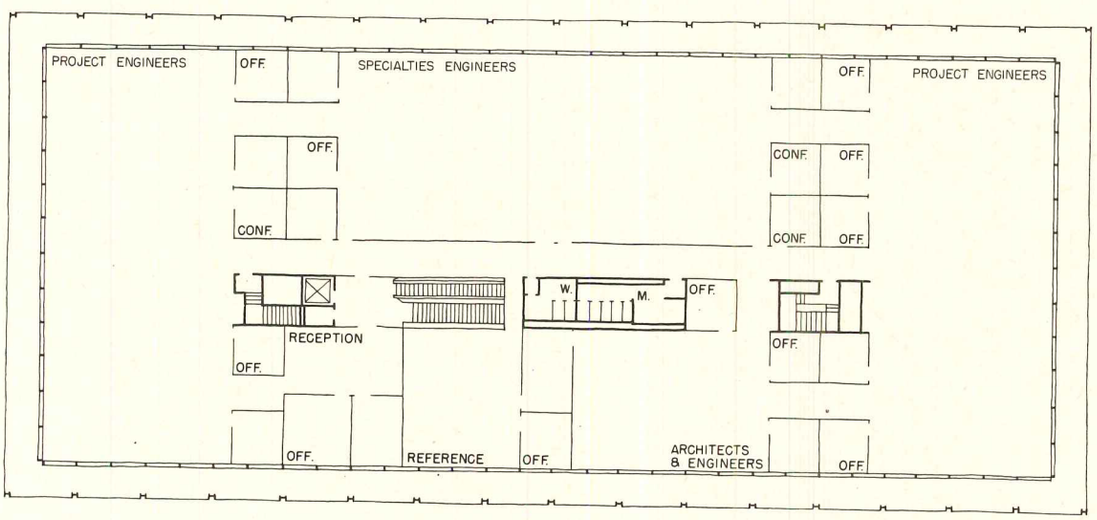
Photos: Lawrence S. Williams, Inc.

The structure is clearly stated, and clearly related to the plan

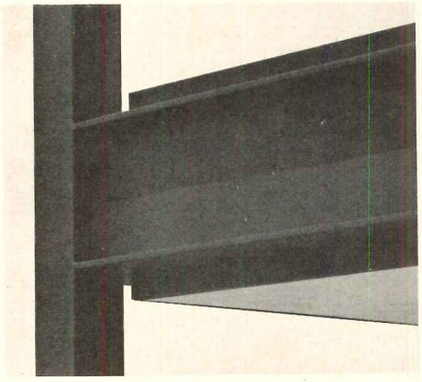
The discipline and precise detailing of the black-painted columns sharply emphasizes the single interruption in the exterior pattern—the seven-foot-deep plate girders spanning a spectacular 117 feet across the end walls. They are a direct expression of the major design concept of the building—to make the entire upper level, to the extent considered practical, one big, column-free workroom for engineers (see plan below). While the panel at the top of the long walls is matched to the girders in depth, the essential structure —18-inch-deep beams spanning between columns—is clearly expressed. The disciplined pattern of the steel structure is strengthened by the deep setback of the window walls, and its basic module (four feet, two inches) is reflected everywhere—in the mullions, in the ceiling pattern, in the layout of partitions.

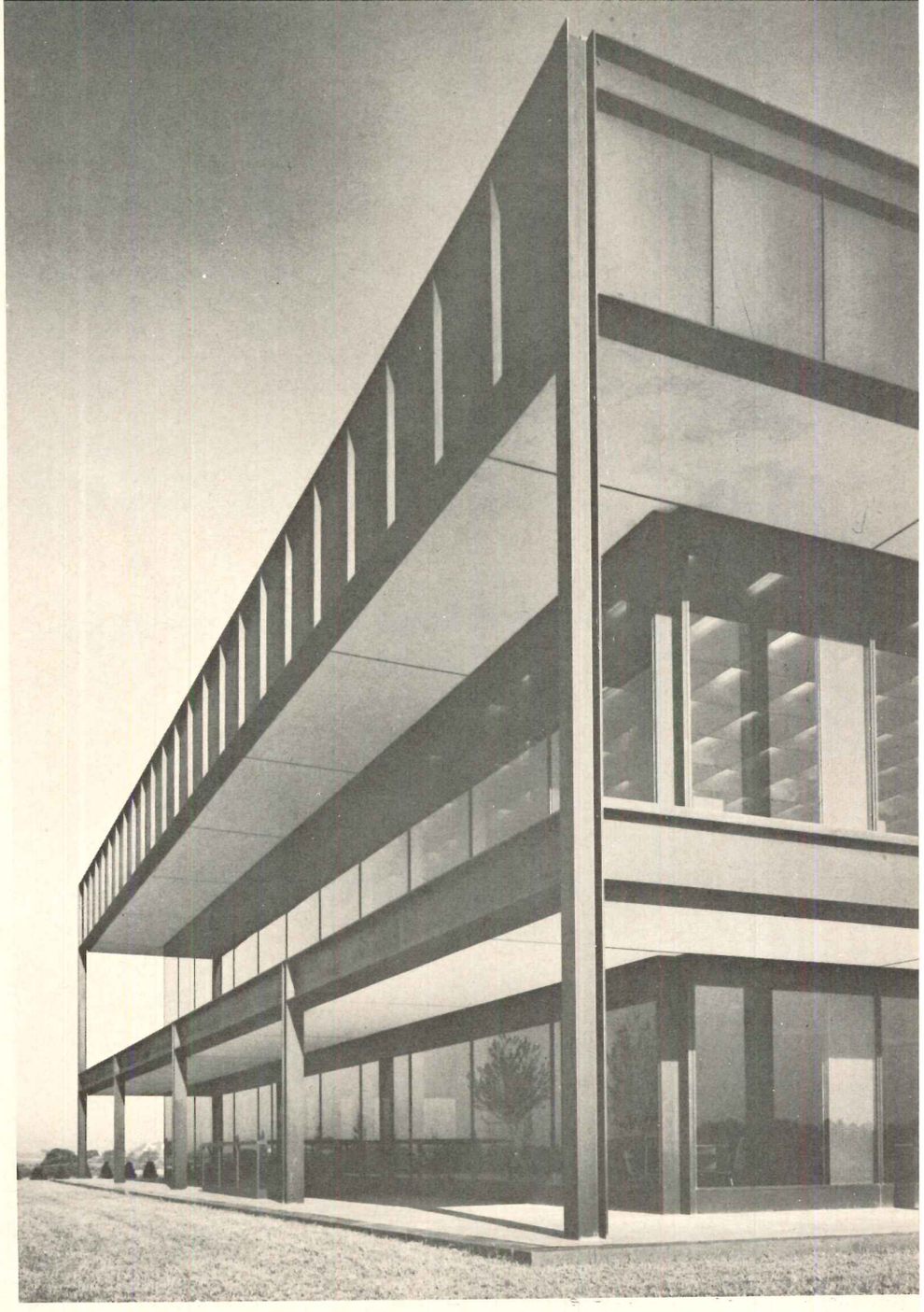


On the highly disciplined exterior, columns are spaced 16 feet, eight inches (four modules) and 29 feet, two inches (six modules) o. c.

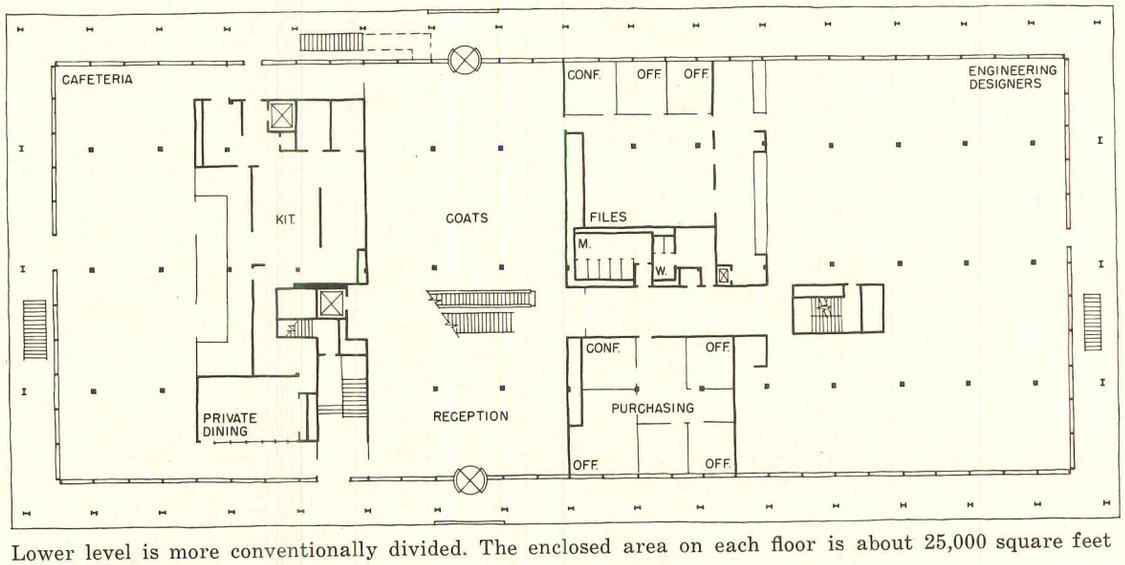


Upper level has almost no solid walls (heavy lines), is divided only by floor-to-ceiling glass partitions





Light cement-plaster soffits set off the black-painted steel and grey glass

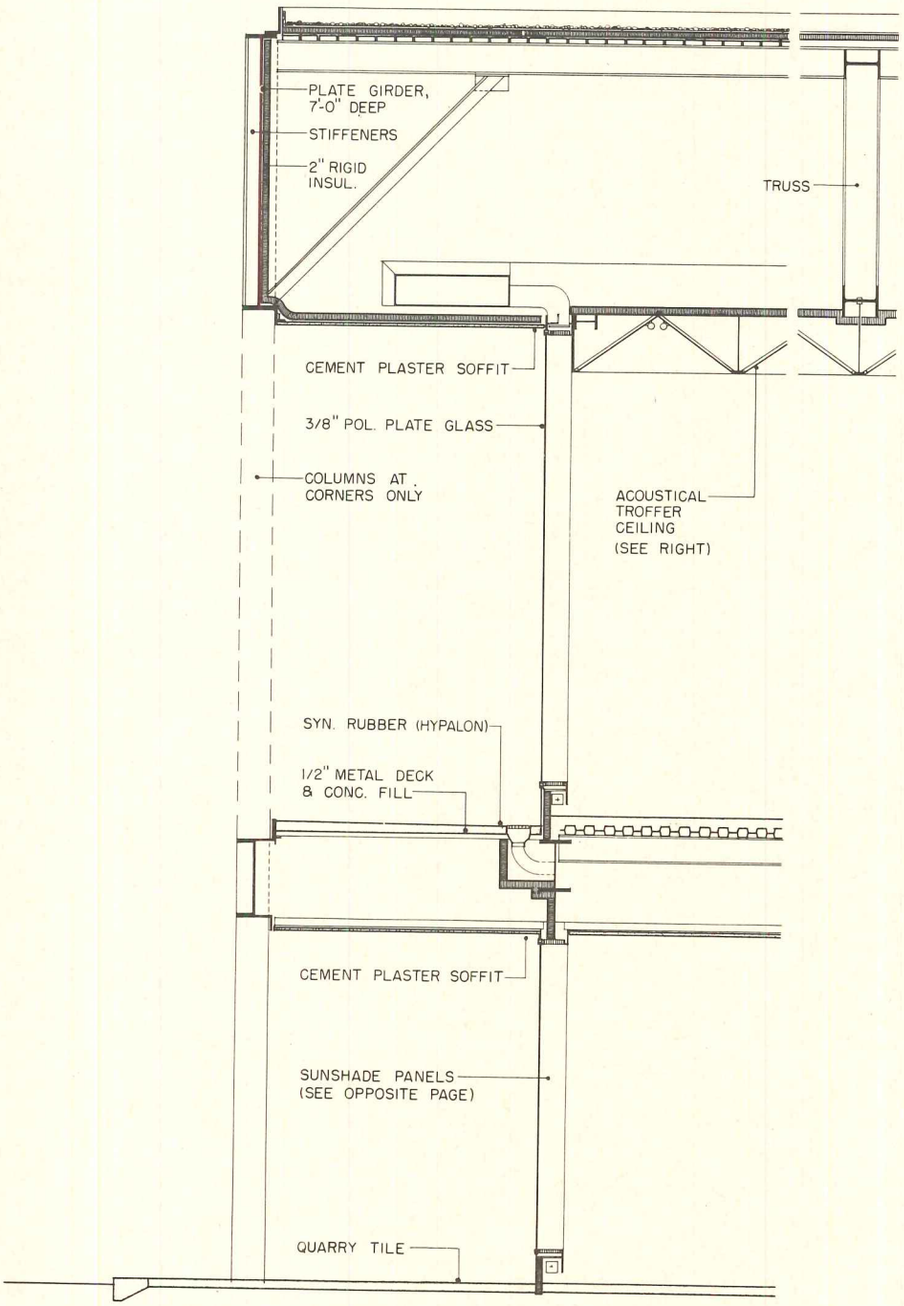


Lower level is more conventionally divided. The enclosed area on each floor is about 25,000 square feet

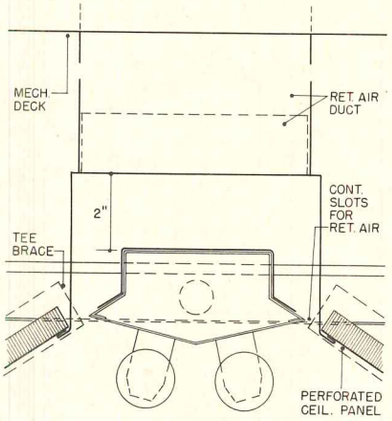
Important design elements: the ceiling and sunshade systems

The upper-level ceiling has acoustical panels suspended to form tent-shaped troughs, a configuration that increases the area of sound absorption, serves as an efficient reflector for the lighting, and sets up a strong grid pattern (on 50-inch, or half-module, centers) that is a major design element in the "one big room" of the upper level. Air is distributed through a random pattern of holes in the panels from a zoned plenum in the truss space above. This ceiling is one of the versions of Armstrong's Luminaire system.

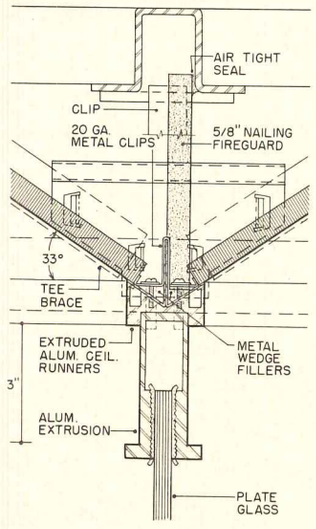
Another important design element used on both levels of the building is the system of sunshades. Closed, the panels give complete shade while permitting a good view of the outdoors; open, they stack into two-foot-wide solid panels against the window mullions.



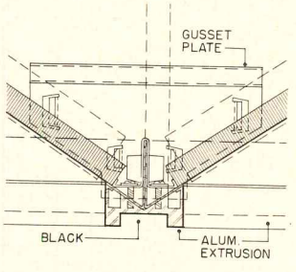
Section through end wall shows deep mechanical and plenum space formed by the girders and trusses, mounting of ceiling system (details right), and placement of sunshades at glass walls (details opposite)



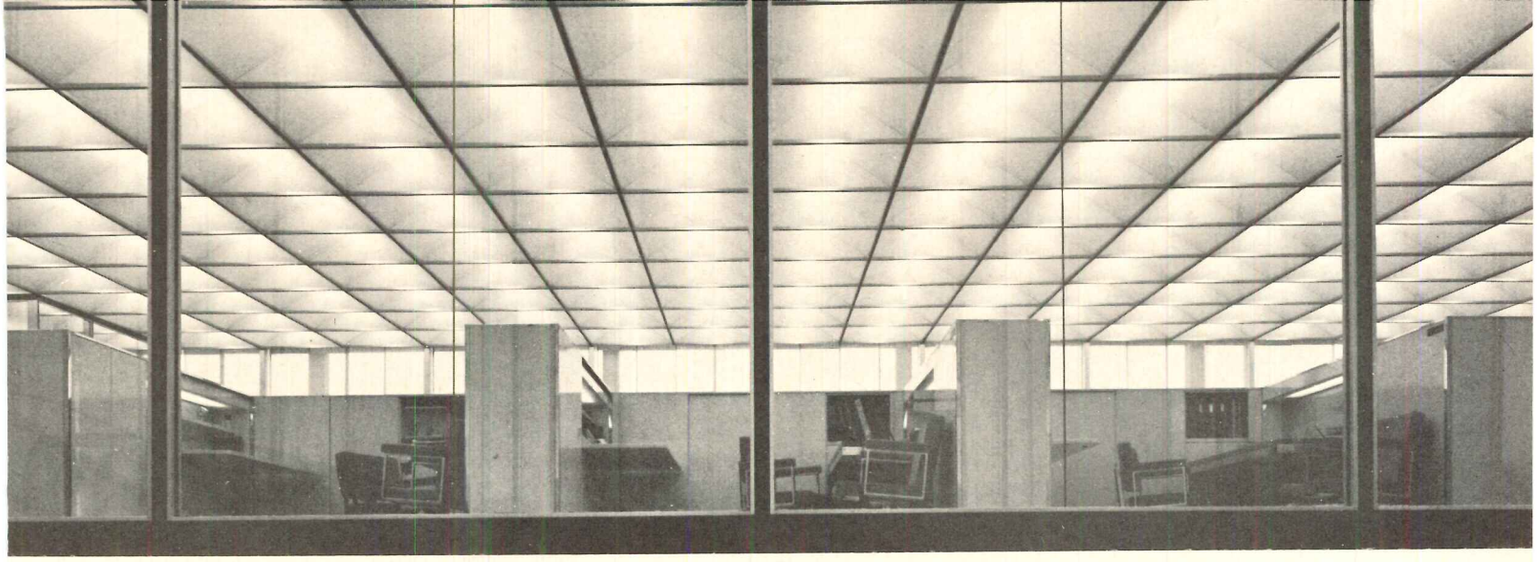
LIGHTING FIXTURE AT RETURN AIR DUCT



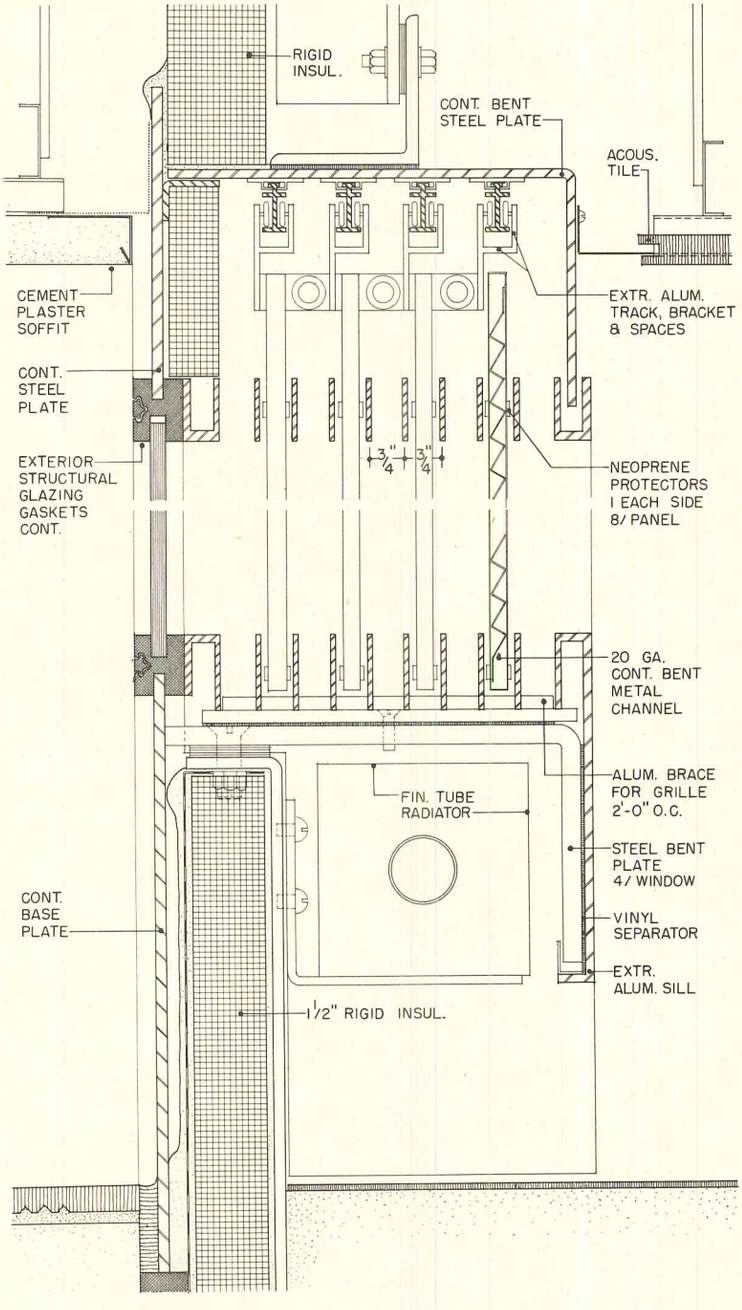
RUNNER AT GLASS PARTITION

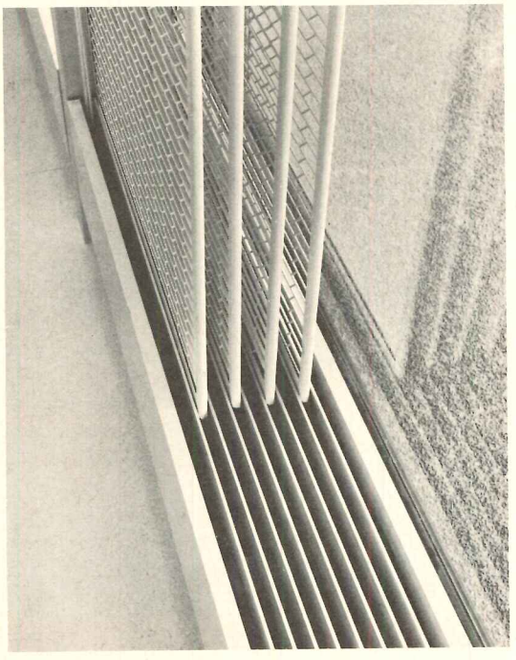


SECONDARY GRID RUNNER



Black-painted grid system of the suspended ceiling emphasizes the openness of the upper level by carrying the eye to the far walls

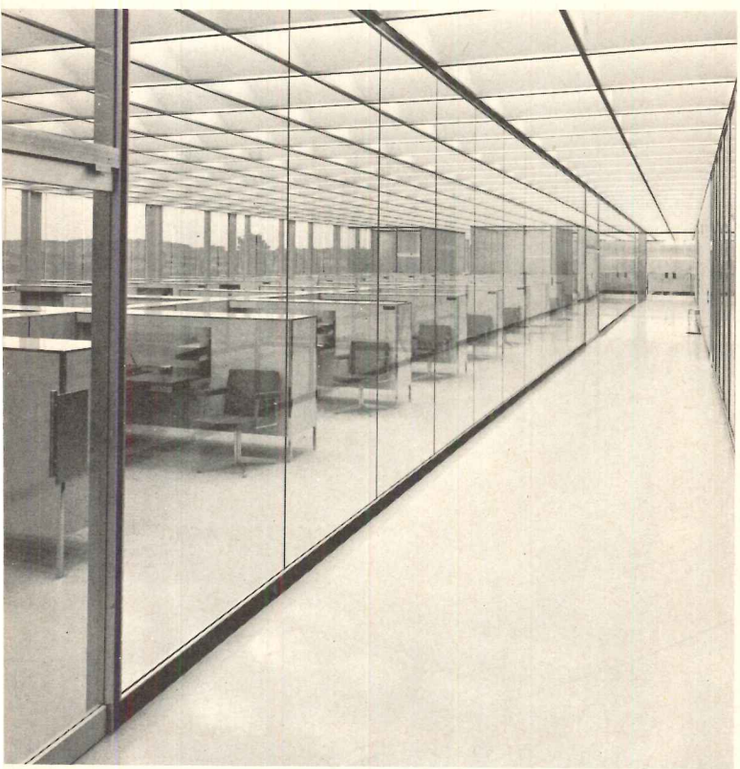




Sunshades—handsome and effective—are formed of 20-gauge steel, hang from tracks in the perimeter return-air grilles, are spaced at the baseboard by grilles for the supplementary radiant-heating system

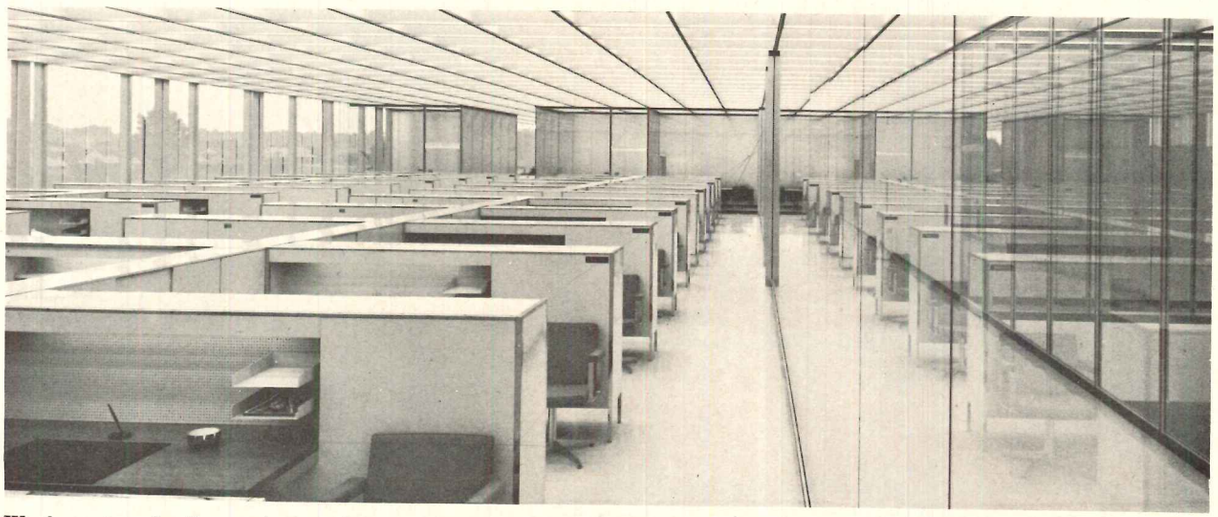
On the upper level: open spaces—but privacy

Both to define work and circulation areas and to create privacy for offices, this level is divided by glass partitions, using one-half-inch-thick plate glass sheets held by extrusions at the floor and on the grid lines of the ceiling system. A black epoxy sealant at the joints again expresses the module. To give privacy between adjacent offices, rough-rolled plate glass is used in some partitions. The "work centers" for engineering personnel (see bottom pictures) are eight feet, four inches on centers, and are adaptations (to fit the module) of units designed by SOM for an earlier building and now manufactured by several companies. They provide excellent visual and aural privacy for a seated man, but he need only stand to share the space and view or "as we all do with these glass walls, get involved with a storm passing by."



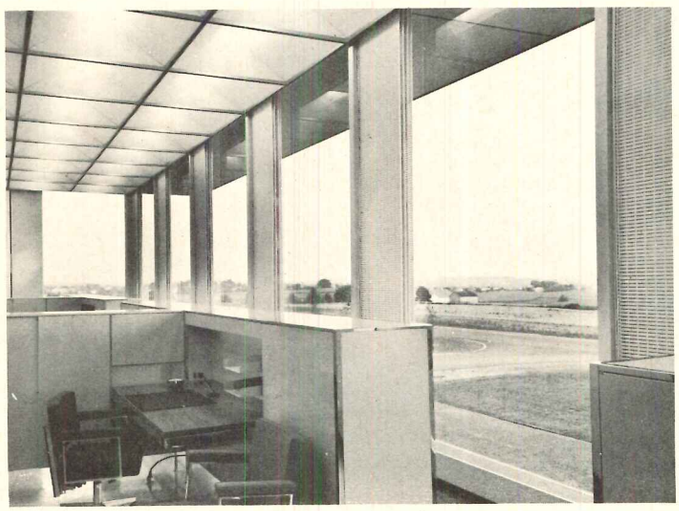
Glass partitions let areas borrow space from each other

Translucent partitions create privacy without blocking flow of space

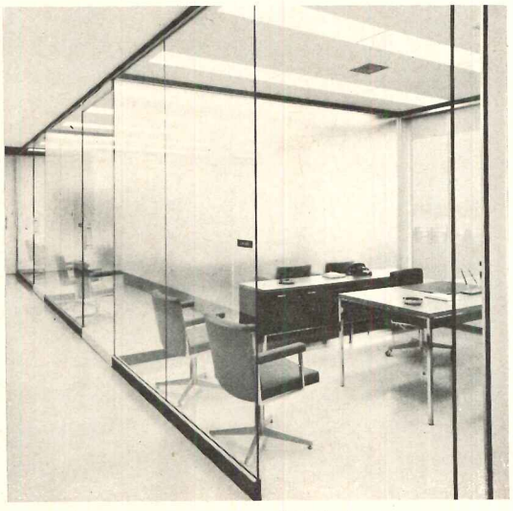


Work centers for the project engineers echo the discipline and orderliness of the entire design concept

Even executive offices are designed completely on the module. Note that view through the doorway extends to the opposite wall



Designers have boards and shelves for drawings

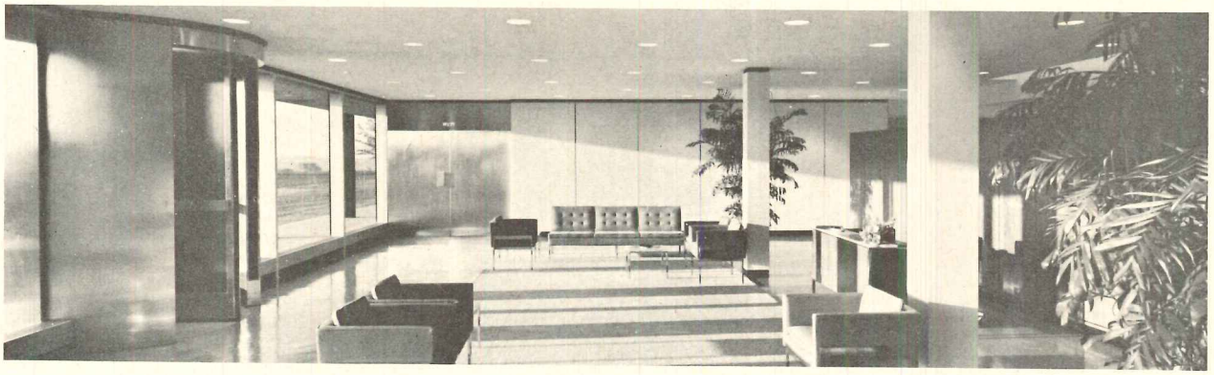


Typical office spaces: note modular planning

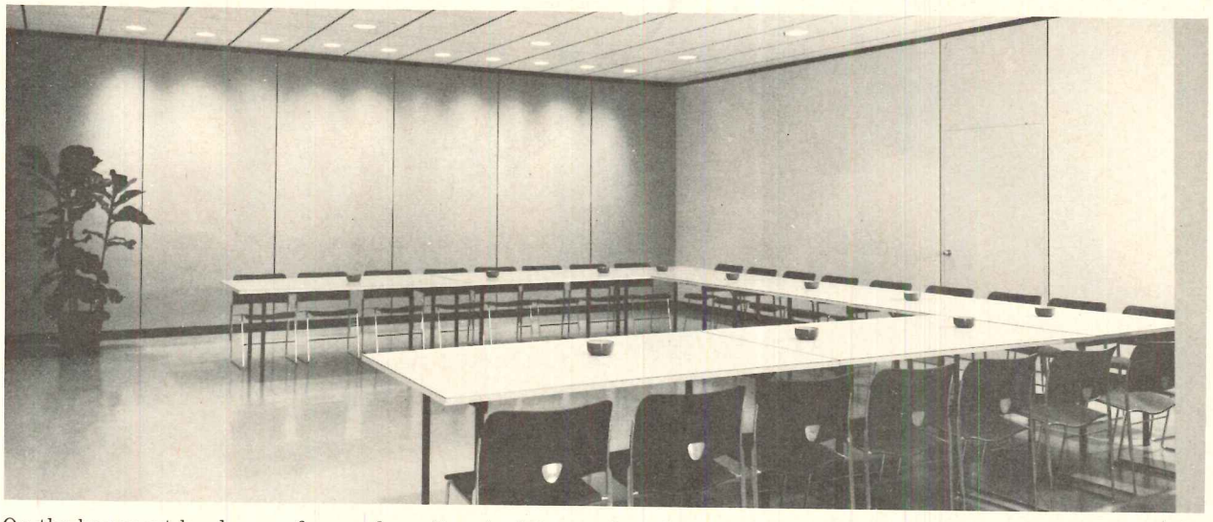
On the lower floors: less openness, but the same discipline

Both the grade-level floor and the basement areas are divided into more conventional spaces. These floors too are used effectively as showcases for the company's ceiling systems, resilient floorings, and wall coverings. Armstrong's chief architect sums up: "The built-in impact of the building is becoming apparent. It is being used as a showcase by all sorts of company groups, and—while you cannot measure the effect of the new environment—there is no doubt our people are responsive to it."

Architects: Skidmore, Owings & Merrill—Roy O. Allen, design partner, Robert W. Cutler, administrative partner; associate architect: Charles S. Conrad Jr., Armstrong Cork Company; structural engineers: Severud-Perrone-Fischer-Strum-Conlin-Bandel; mechanical engineers: Charles S. Leopold, Inc.; general contractor: The Turner Construction Company.



On ground level: the reception area (top) and 224-seat cafeteria. Note the neat stacking of sunshade panels

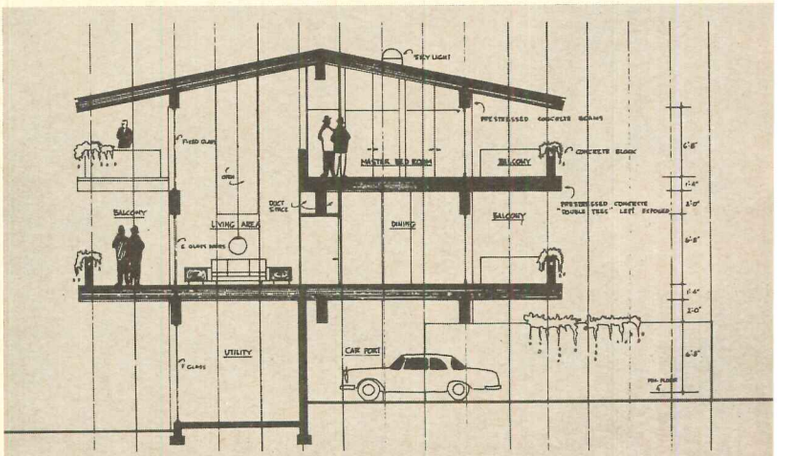


On the basement level: one of several meeting, training, and conference rooms. This level also includes service rooms

BOLD STRUCTURES ENCLOSE LARGE SPACES AT LOW COST

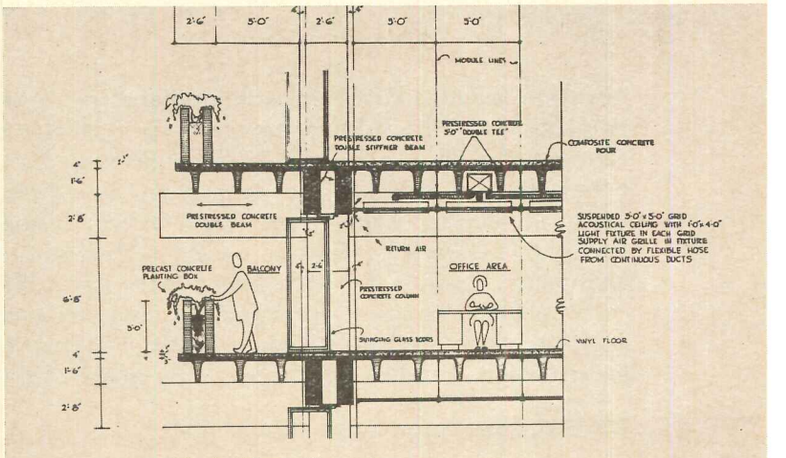
The second in a series of articles
about young architects
who build a successful practice
by doing work of notable quality

Gene Leedy



Versatile T-beam and screen wall system lends itself to a house . . .

Gene Leedy



. . . or an office building with equal success

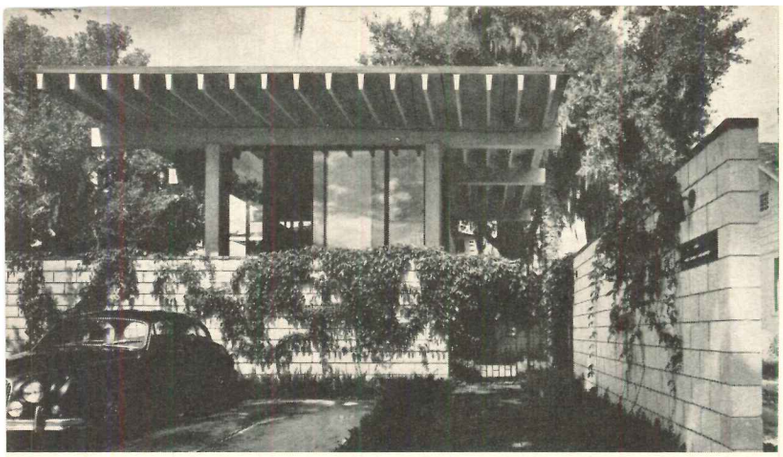
Gene Leedy's system of screen walls and T-beams has proved to be as successful in small houses as it is in office buildings; and the architectural vocabulary he has developed from these two elements seems capable of many variations in meeting the requirements of a small town architectural practice.

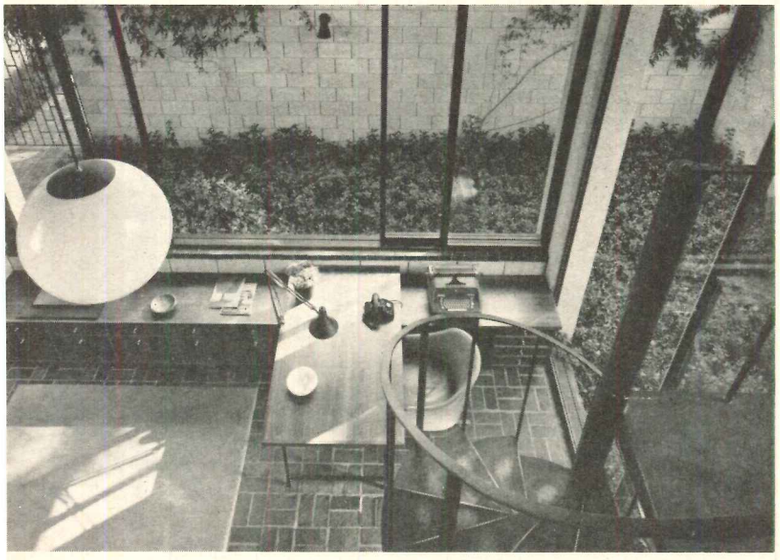
Leedy has had his own office in Winter Haven, Florida since 1954, when he was 26 years old, but he did not begin using the T-beams until a few years ago, when he designed a small office building for a local real estate firm (ARCHITECTURAL RECORD, March 1963). The T structure has enabled him to form large, bold spaces at a relatively low square foot cost; but it has meant the deliberate sacrifice of the delicacy and precision that had characterized much of Leedy's earlier work, such as the Brentwood School in Sarasota, Florida (ARCHITECTURAL RECORD, February 1959). Leedy feels that the search for lightness and transparency is a valuable architectural exercise; but he began to suspect that the appeal of these qualities is mainly to the intellect—and, perhaps, mainly to the architect's intellect. Refinement is worth sacrificing, he decided, in order to obtain large and significant spaces, although, whenever he has the budget, he tries to obtain both.

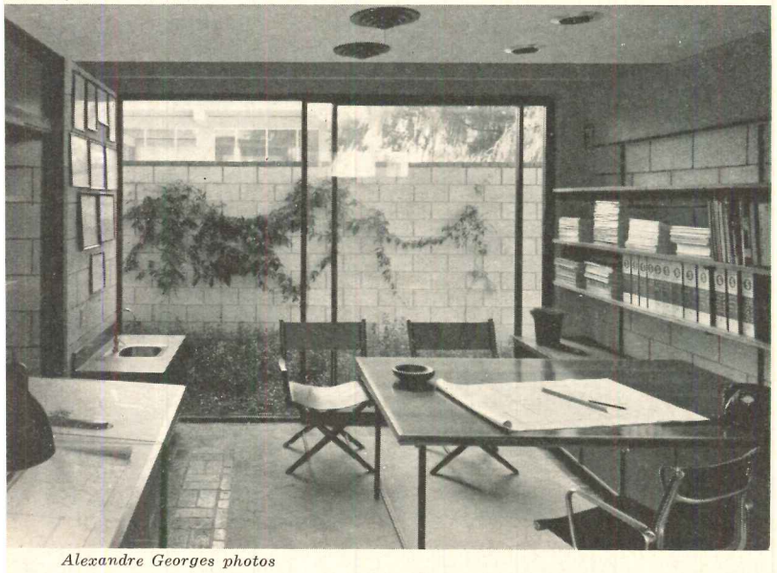
Exposed, rough-finished structures have become fairly widely accepted in institutional buildings, but Leedy's T-beam houses have a tough character not

Gene Leedy's Own Office

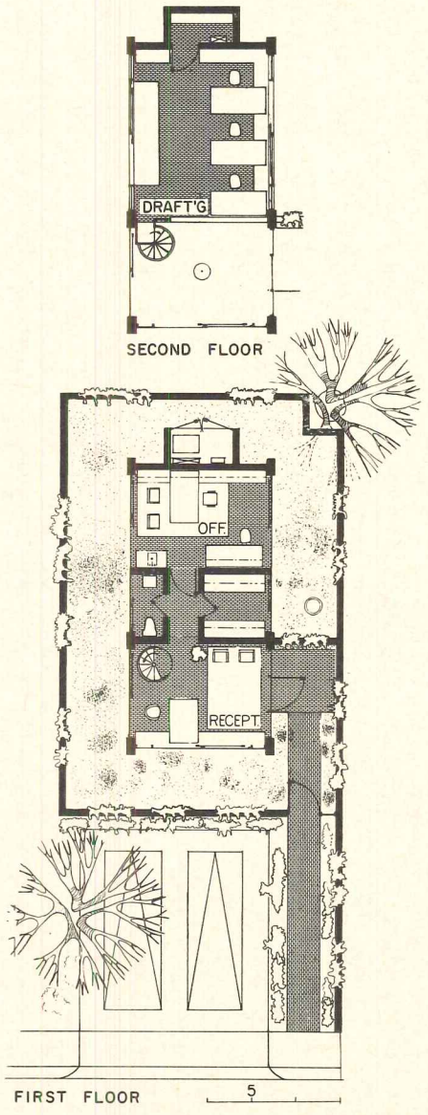
Winter Haven, Florida







Alexandre Georges photos



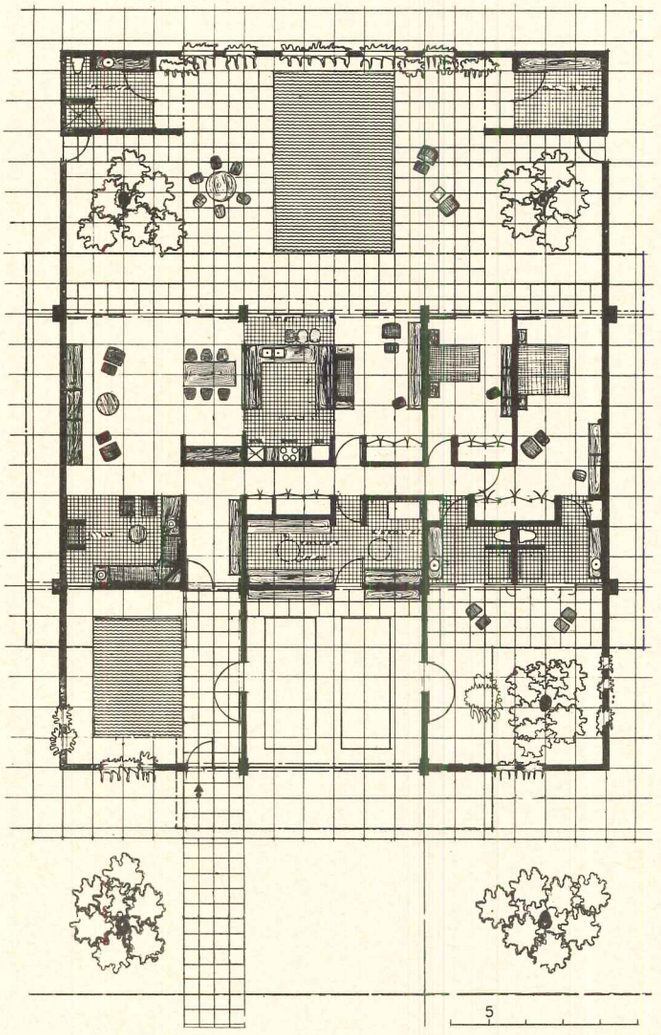
Leedy's own office building has T-beams, screen walls and a double-height reception area. His private office is on the ground floor, and the drafting room is upstairs, reached by a steel circular staircase. The photographs show the entrance viewed from the street, the view down from the drafting room, and Leedy's desk. Cost of the building was around $25,000

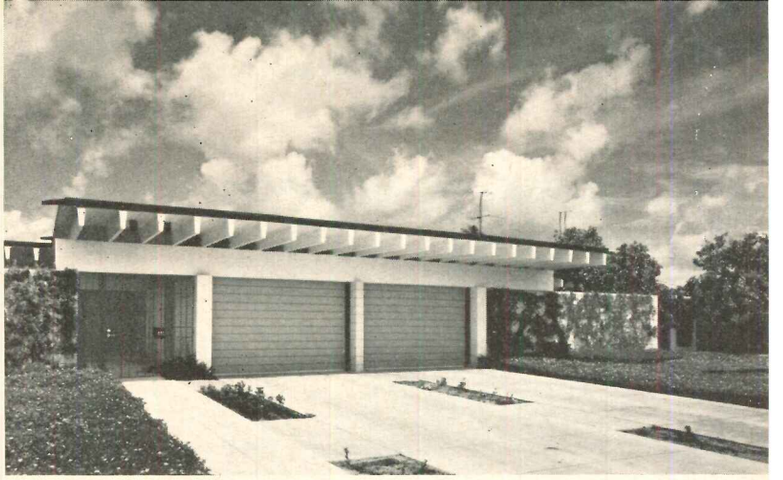
always associated with domestic architecture. Leedy has had very little trouble, however, in winning acceptance for his ideas, has in fact found that many clients immediately like the concept of an aggressively strong and solid house. Part of this acceptance is undoubtedly due to Leedy's presentation techniques. Because he finds that clients have difficulty in understanding drawings, he uses well-constructed scale models as his principal means of presentation. He does not present the model itself, however, as it often becomes too much of a toy, with the clients so intrigued by the model as an object that they are unable to visualize the house at full scale. Instead he shows a series of 10 or 12 model photographs, and can produce the model and the photographs in the time it would take him to do one or two renderings. Leedy himself has become quite an accomplished photographer by following the advice of his friend, the architectural photographer Alexandre Georges.

Gene Leedy

The Clifford Ellison House

Winter Haven, Florida





The screen walls give complete privacy and greatly increase the effective size of the house, which is basically only 36 by 72 feet. The 4-foot module is typical of Leedy's buildings. The photographs show the blank entrance facade, the area around the pool, and the view from the living room. Cost of the house was about $11 a square foot.

Alexandre Georges photos

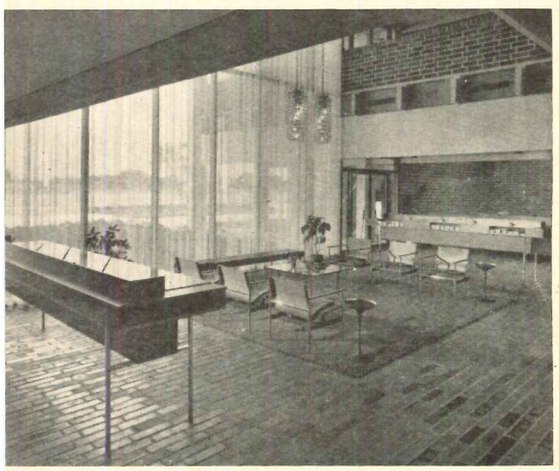
Leedy does the basic calculations for the T's and their final characteristics are worked out by Leedy and the engineering staff of the fabricator, Prestressed Concrete Inc. of Lakeville. The screen walls are of large-size brick or concrete block, because Leedy has found that poured concrete walls do not weather well in the local climate. The buildings are designed so that some of their toughness is softened by planting, and Leedy claims to have discovered plants that will grow downwards from the planting boxes just as they are shown in the drawings and models.

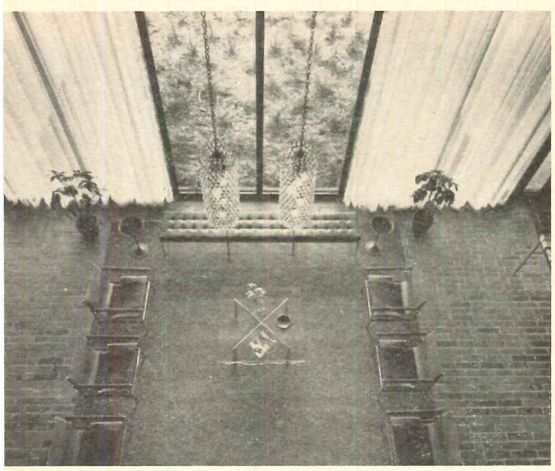
Many architects are specialists, working on certain types of buildings, or for a certain type of client. Leedy has found a way to carry over experience from job to job in a more generalized architectural practice, by means of a flexible but consistent architectural vocabulary. It is an encouraging demonstration that the architect can exert an influence on the whole community.

First National Bank of Cape Canaveral

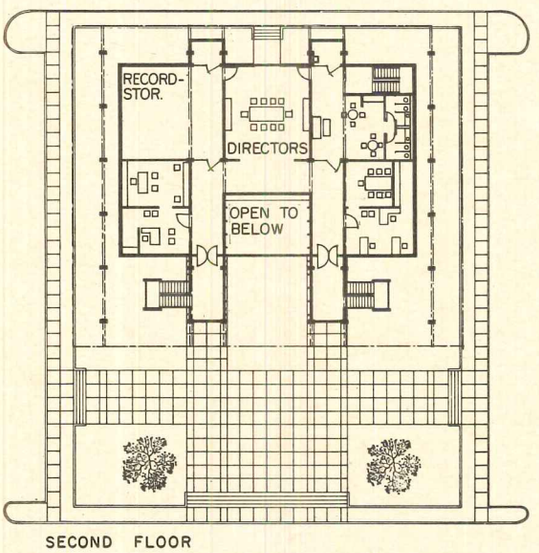
Cape Canaveral, Florida

Gene Leedy

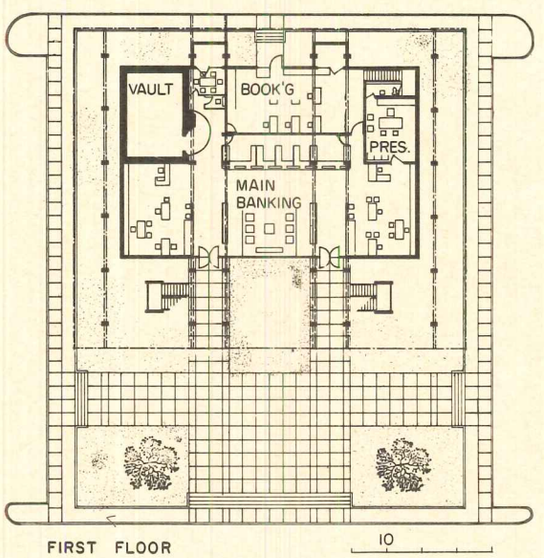




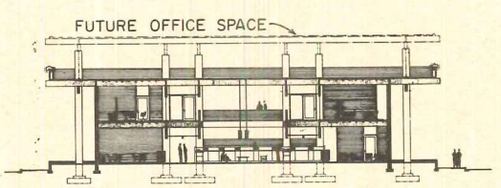
Alexandre Georges photos



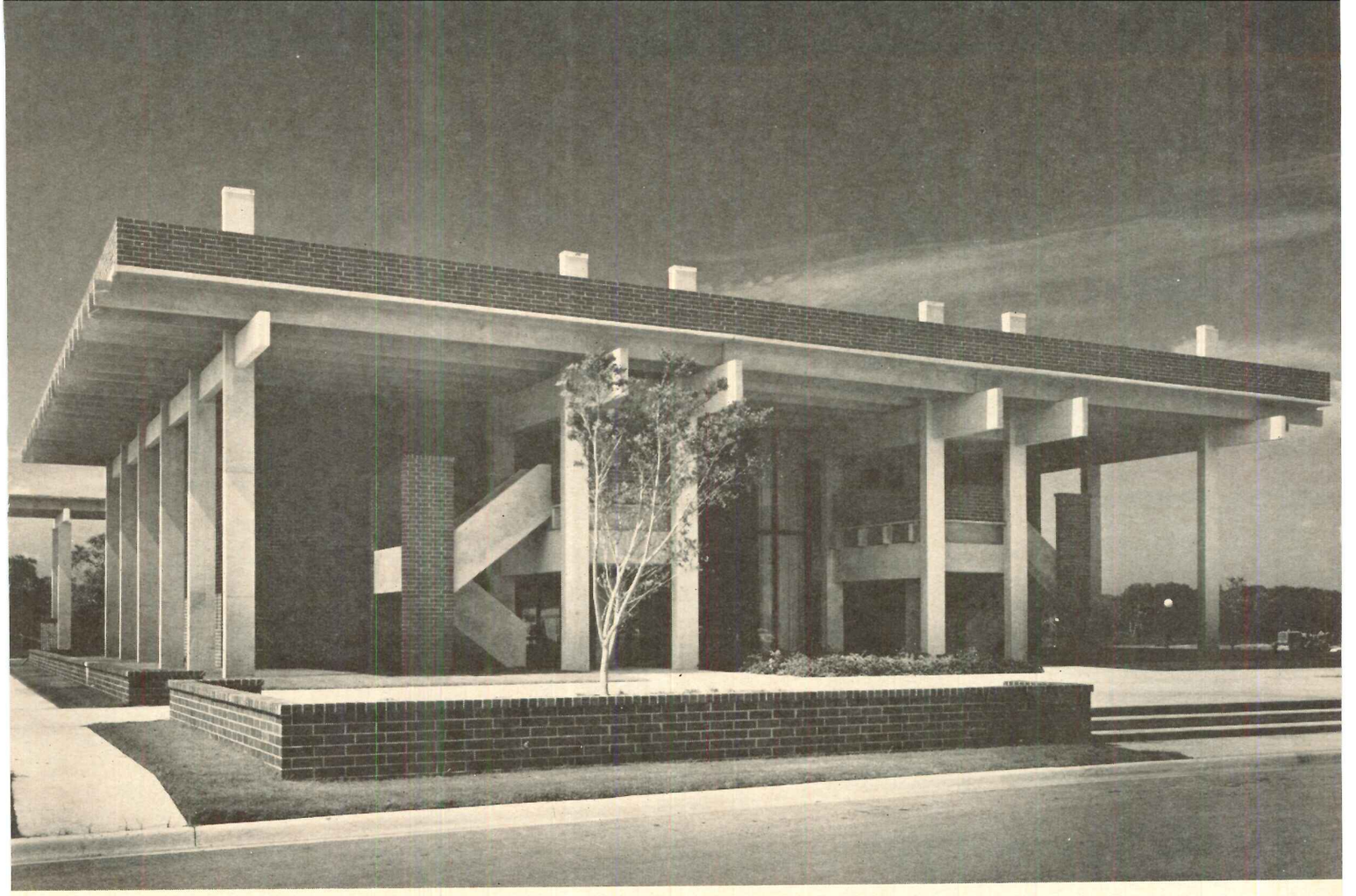
SECOND FLOOR



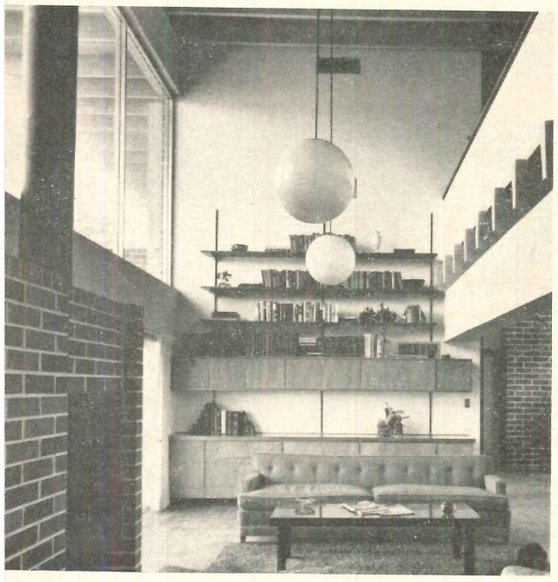
FIRST FLOOR 10

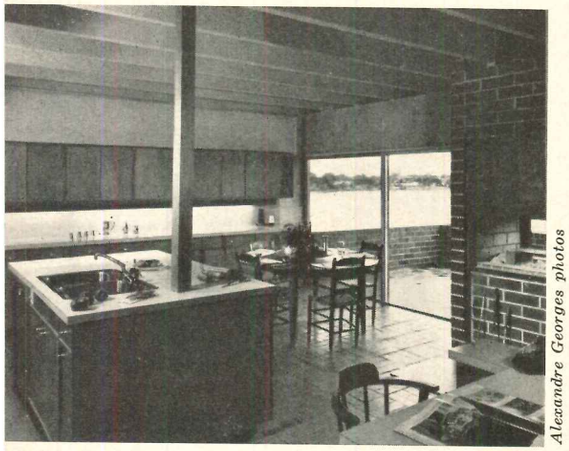


This bank in the town of Cape Canaveral (which did not change its name when the space center became Cape Kennedy) is designed so that another story can be added in the future, as shown in Leedy's model photo, *above, left,* and in the section. The building is on a highway, and the lighting has been designed so that the bold, sculptural shapes read clearly at night. Photographs show view from highway, the main banking floor, and offices. The building cost $240,000, or just under $16 a square foot.



Gene Leedy

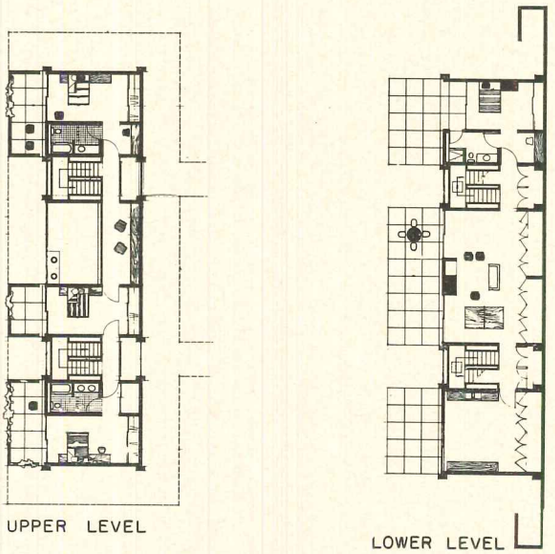


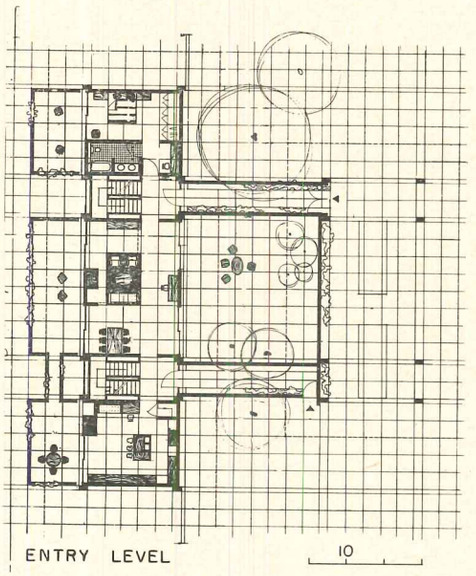


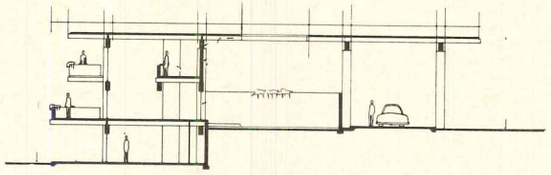
Alexandre Georges photos

Dr. George Dormon House

Winter Haven, Florida



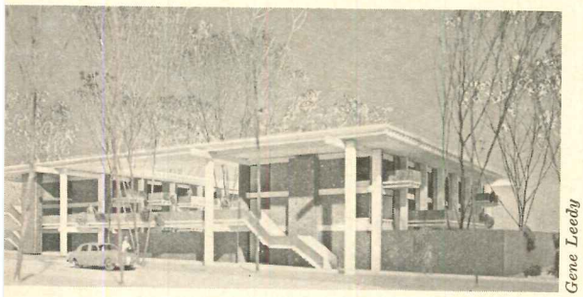




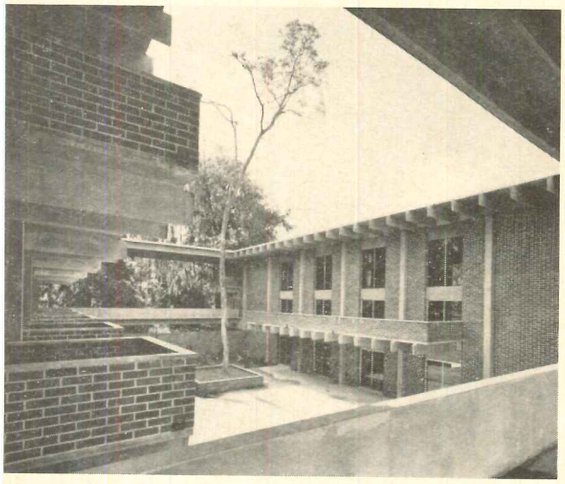
This house beside one of Winter Haven's many lakes provides a really expansive environment at a relatively small expense. There are so many balconies and covered walkways, in addition to a large carport, that they produce a series of outdoor spaces that are really part of the house. Considering only the main block the square foot cost would be about $13.50. Compare Leedy's model photograph, *above, left,* with the appearance of the completed building.

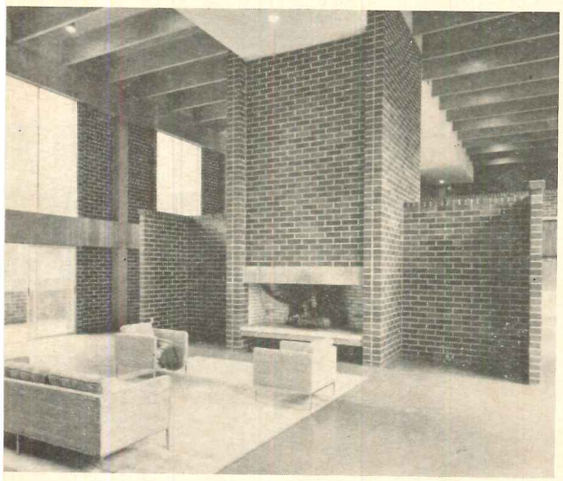
S. A. E. Fraternity House, University of Florida

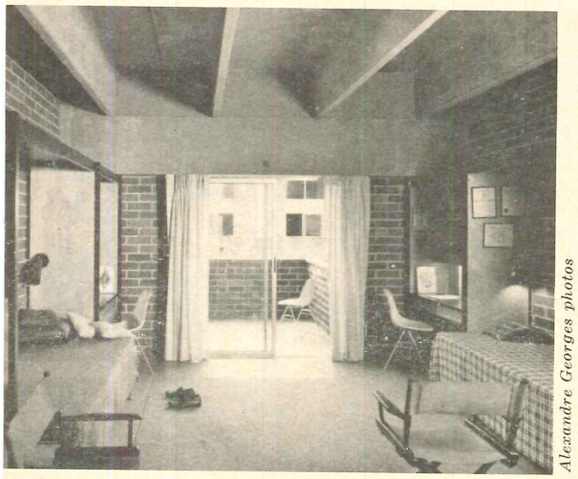
Gainsville, Florida



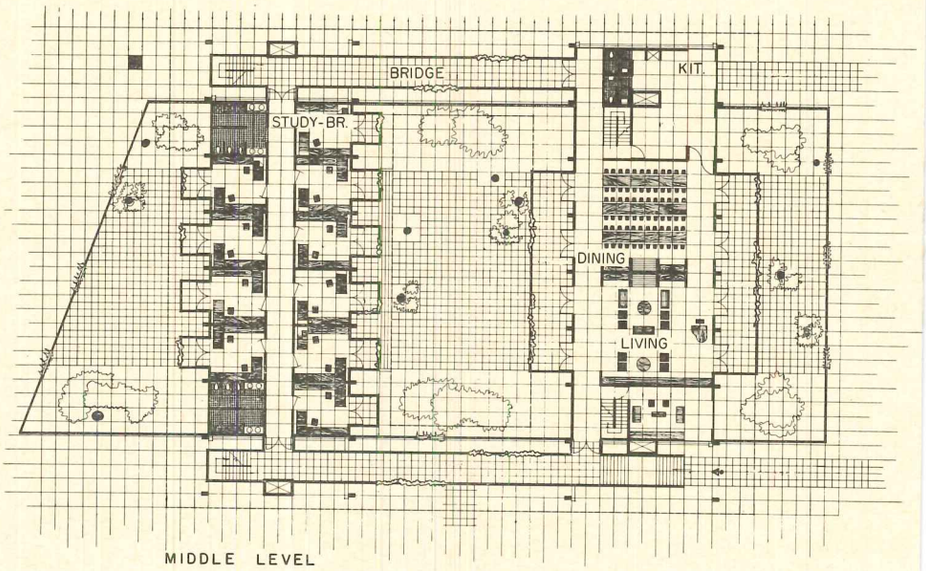
Gene Leedy



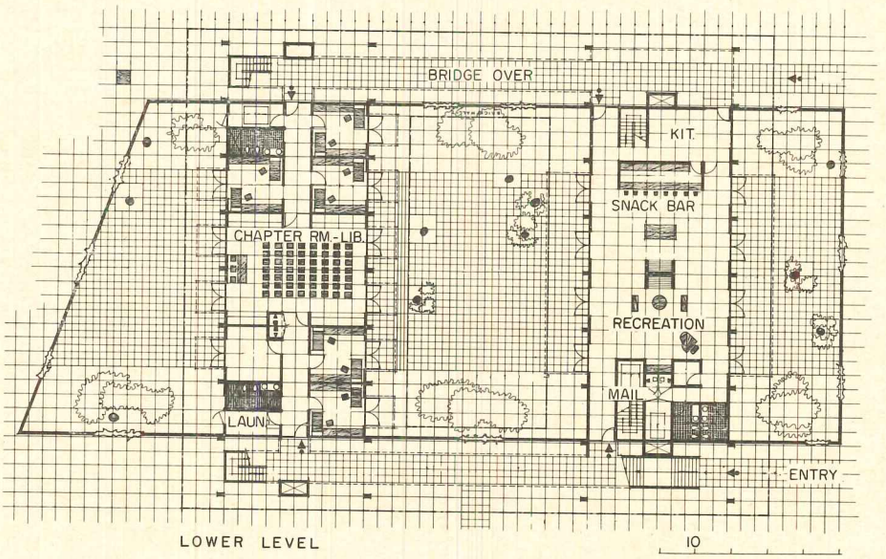




Alexandre Georges photos

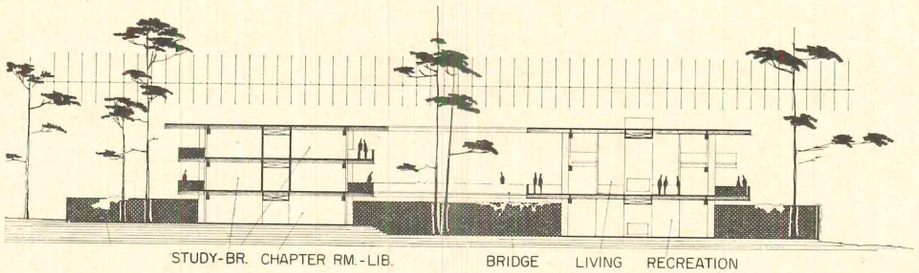


MIDDLE LEVEL



LOWER LEVEL

10



A strong structural system and rugged materials are particularly appropriate for a fraternity house, which receives plenty of hard wear; and this building is easily cleaned and virtually indestructible. Again, accurate model photographs, like the one, *above, left,* explained the design and helped with the fund raising. Public areas are large, and each two man study-bedroom has its own balcony or direct access to a terrace. The basic construction contract was $238,000, or $9.30 a square foot.

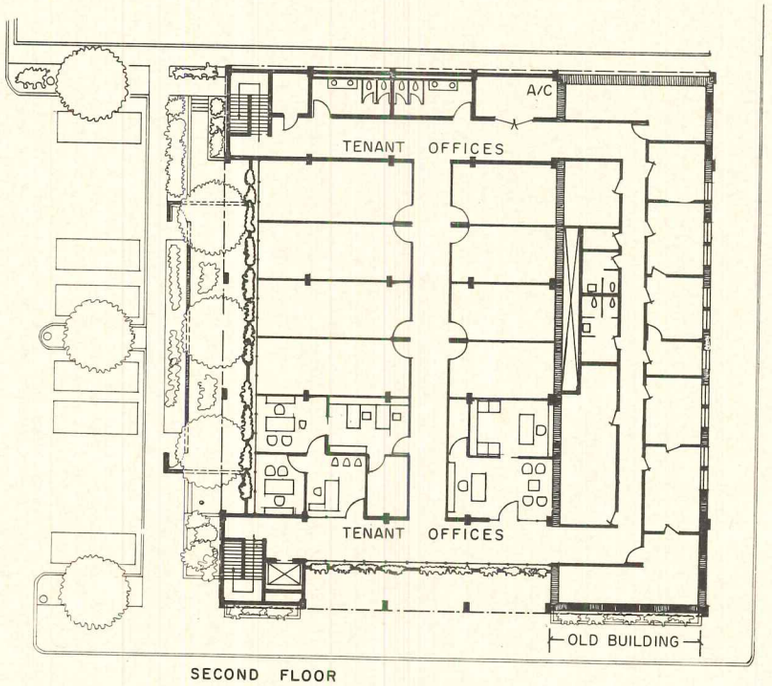
American National Bank

Winter Haven, Florida

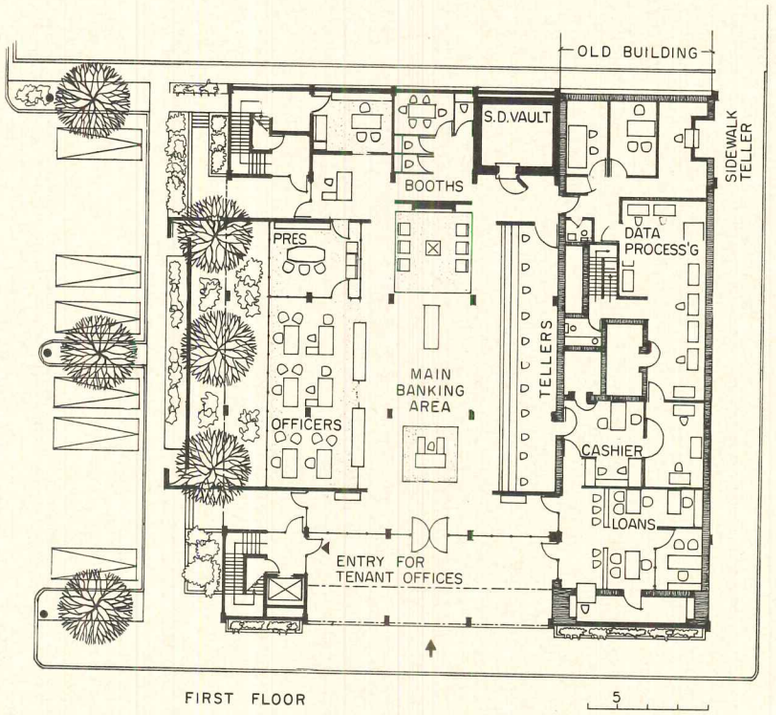
Gene Leedy

Alexandre Georges

Alexandre Georges



SECOND FLOOR



FIRST FLOOR

Leedy's design for the American National Bank in Winter Haven transforms an existing building, shown in the "before" shot, *above, left*, into a much larger and far more significant structure. The ground floor of the original building is now used for offices and data processing, with the main banking floor and executive offices in the new addition. The entire second floor is presently rental office space, with its own entrance. Total cost, including remodeling, was about $195,000.

Alexandre Georges

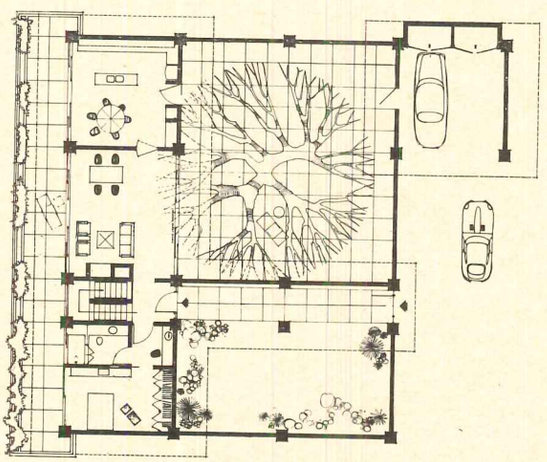
AMERICAN
NATIONAL BANK

AMERICAN
NATIONAL BANK

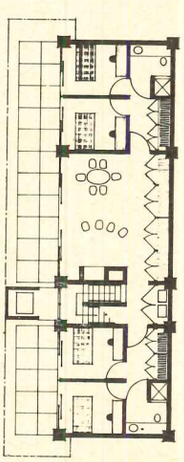
Alexandre Georges photos

Robert F. Lilley House

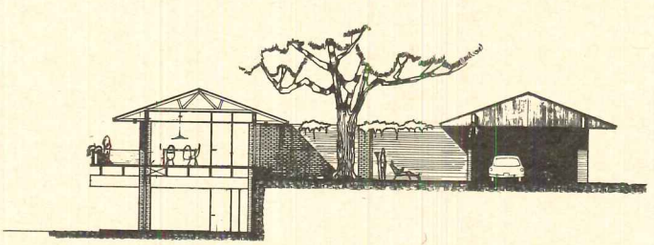
Winter Park, Florida



UPPER LEVEL



LOWER LEVEL



This house combines the T beams and screen walls with the wood roof trusses that Leedy has used on some of his earlier houses (see Leedy's development house for Levitt and Sons, ARCHITECTURAL RECORD, Mid-May, 1965, page 70). The combination is an effective solution for a house that is two stories high on one side, and only one on the other. The main living spaces give on the balcony, with the bedrooms at the lower, terrace level.

This essay is a development from two events. The first was the writing of a series of articles in ARCHITECTURAL RECORD (Architecture as Total Community: The Challenge Ahead. March through September, 1964). In the final chapter on "The Role of the Architect," I cited a number of examples of the development processes and of culmination in design—including Frederick Law Olmsted's great creation: Central Park in New York. When the article appeared, there were sharp letters from prominent landscape architects making the point that in praising Olmsted's work I had referred to him as an architect, and not, as indeed he was, a landscape architect *par excellence.*

My first reaction was surprise that I could have been so careless, and of contrition—which I immediately expressed to the letter writers and to the editor of the RECORD.

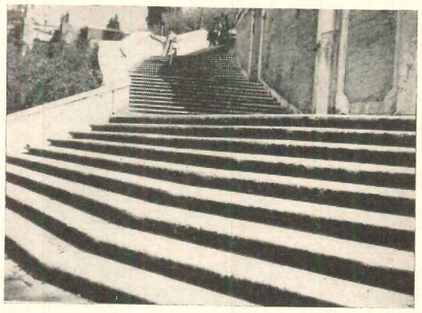
Meanwhile, I had started to think through a book that is to be an extension of the RECORD articles and to appear next year. I inserted a chapter on the peculiar and unique contribution of the landscape architect as the interpreter and realizer of the organic cradle for the created environment. But then I began to realize that the roles and goals of the two professions are inextricably intertwined and much more alike than they are different—and that in calling Olmsted an architect, I had in what at first seemed to me carelessness or error expressed a valid view on a deeper plane—and it is this view which is expressed in this article. —ALBERT MAYER

THE CASE FOR ONE TOTAL PROFESSION

In this important sequel to his series on the crisis in human environment, Albert Mayer develops the idea that "we will get much further more happily" if architect and landscape architect work in the closest collaboration not only with each other, but with a social scientist, from the very beginnings of the design process. And he suggests some strong medicine to encourage this symbiosis.

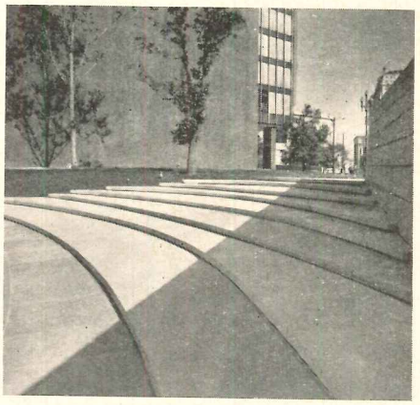
It seems to me that there is (or should be) in this 20th century really one total profession—that of environment-shaper or environment-creator; and that we will get much further more happily with that fruitful concept than with the more fashionable current idiom of sharp distinctions between architect and landscape architect, reflected in mutually exclusive licensing, etc. The more I have analyzed the attributes and talents characteristic of each of these two professions, the more I feel that those they have in common substantially exceed in number and importance those each holds uniquely. Indeed, it seems to me that there is just one, and only one, distinction: The landscape architect thinks and designs in terms of living, growing materials; the architect in terms of structural and inorganic materials. But when you have said that, you have said all. And even that is an overstatement of differentiation.

To take some simple cases: In planting a screen of trees, how far from the building wall should they be, and how dense can they be so as to per-



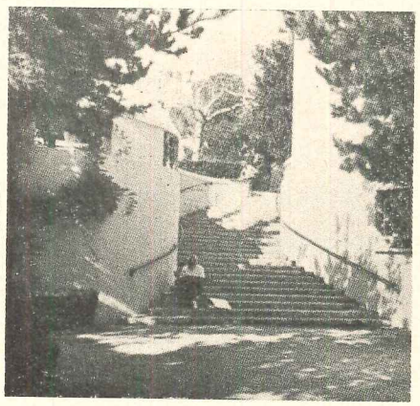
Lawrence Halprin

Spanish Steps in Rome . . .



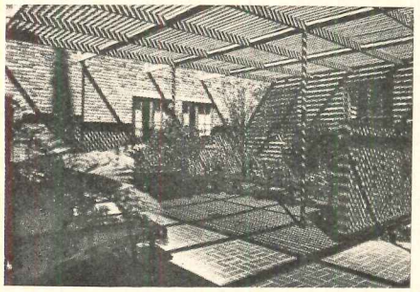
Morley Baer

steps at the Crown Zellerbach Plaza . . .



Edward Huntsman-Trout

steps at Scripps College . . .
. . . by architect or landscape architect?



Harry Drinkwater

A trellised patio:
by architect or landscape architect?

form a maximum of sun-shading and yield a maximum of evaporative cooling without blocking the prevailing breeze? These are delicate involved questions which do not belong to either profession; but involve, inextricably, both. . . . In the proportioning of the three dimensions of an interior patio and in the placing and selection of its planting for maximum cooling, we have again an involuted situation where definition and allocation of design jurisdiction cannot be predicated. . . . What about plazas, or three-dimensional space generally? Is the design of a plaza to be allocated on the basis of how much plant material there is in it? . . . Is the sublimation and incorporation or creation of topography into enhanced design, to be assigned on the basis of the proportion that steps and walls bear to the amount of planting and natural slopes?

Of the illustrations of steps at left—Spanish Steps, Rome: Crown Zellerbach complex, San Francisco; and Scripps College in Claremont, California—any of the three could well have been done by either a landscape architect or an architect. You can have your guess as to which did which.

Another illustration is the trellised patio—a small composition which could equally have been conceived and executed by either.

In their essential design process and feeling, both architect and landscape architect are concerned with color, form, inevitability, surprise. Both are intent on production of functional and visual and psychological satisfactions and durable character. Both seek the most intense three-dimensional site experience. And it is the quality of this experience that is the summit of space achievement.

The fact is that the two fields constitute *a unity or continuum*, and that who does what within this depends more on individual training, inclination and experience than on a generic or over-all professional difference. Indeed, there is a long past and current history of individuals who have transcended the latter-day efforts at sharp demarcations:

Paxton, who was and was known as a landscape gardener, in 1856 created one of the renowned and brilliant structures of the entire 19th century—London's Crystal Palace.

In Philadelphia almost a generation ago, Roy Larsen's designs for Independence Mall as a setting for Independence Hall provided the framework from which grew the later designs for this part of the city. Larsen was an architect. But the nature of the problem and design were equally of the essence of landscape architecture.

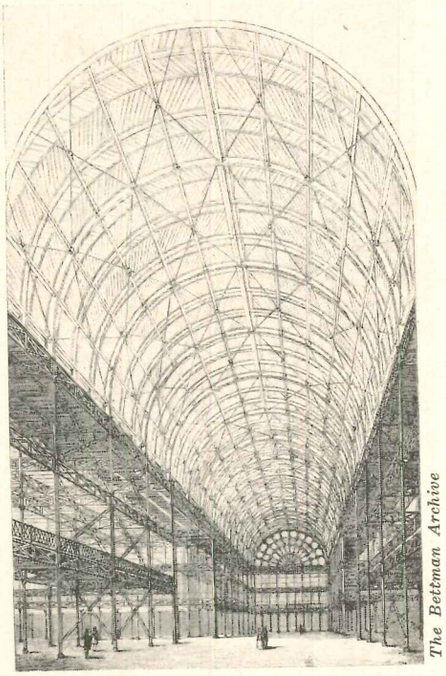
Notice the illustration opposite. Who did this? The free-wheeling complex of road, parking, strip park, apartment, apartment garden and restaurant was composed and sketched for his book, *Cities*, by Lawrence Halprin the landscape architect. It might equally have been done by an architect. Halprin remarks: "The real problem is how to integrate freeways into the fabric of the city without destroying important civic values. It is the fragmentation of outlook, and inadequate attention to integrated over-all environmental planning, rather than the architectural design of the structures that has resulted in serious errors." These words are, I feel, a cogent statement of my thesis herein . . . Note the drawings of the proposed plaza in a large housing development (page 192). By landscape architect or architect? Answer: architect (me).

In making the point that it is pointless to maintain that there is anything like a strict demarcation line between architecture and landscape architecture, and that often either can go far beyond any conventionally agreed norm for each, I do not mean to maintain that either should fully do the totality. But I first wanted to demolish the conventional basis of separate domains. And I want now to assert that in work of any scope, it is only the inextricably meshed *joint conception* and product of the two, that can reach the major heights of excellence.

Symbiosis: Greater Than the Sum of the Parts

It is in my mind not enough for gifted architect and gifted landscape architect to join together and work together newly on specific new assignments as they arise, as is now the case. In the creation of deeply suitable and climactic environment, or any significant portion of it, there should be a real symbiosis in which both elements *continually* affect each other's thinking and feeling and imagination and growth. What we need is a continuing marriage, a permanent alloy or amalgam of architect and landscape architect. This intermeshing totality would be vastly more effective than single-job collaboration, and this greater effectiveness has never been more needed in the explosive scale of planning and design.

> Our cities and metropolitan areas are not only infested with the spiritual and physical stain of slums, and the urban detritus of fringe and roadside honky-tonk; but everywhere asphalt and brick and metal and glass have displaced growing life. Natural terrain has been pushed farther and farther out; bulldozing and rock-blasting have increasingly eliminated topographic character. One would scarcely know any more that Manhattan Island was once quite hilly and rugged—a massive example of insensitivity to terrain and the enthronement of lazy convenience. And I have seen hundreds of contemporary plans and actual developments around the country where this has occurred, each at its own contributing scale. Much of it undoubtedly occurred due to sheer crassness. But much of it is not crass—just not excellent; and I think this is caused by the absence of the interpenetrating symbiosis I am urging.



The Bettman Archive

The Crystal Palace:
designed by a landscape expert

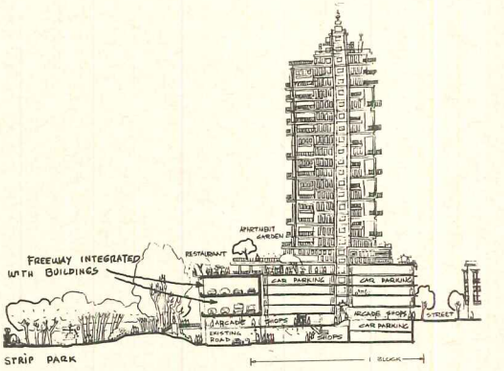
This basic synthesis of architect and landscape architect is the first decisive step needed to achieve greater design, greater spiritual-ecological penetration into the environment. But in this age and in our vast urban design assignments, we are faced by vast numbers of people, of remoteness, of individual and social complexities, of rapid change, rather than familiar and hence more easily understood relative social stability. So design today requires still another constant creative ingredient.

Also Needed: the Insights of the Social Scientist

An insightful human understander and interpreter—a humane social scientist—can both enhance the indispensable human sensitivities of the designers themselves, and systematically further sensitize them.

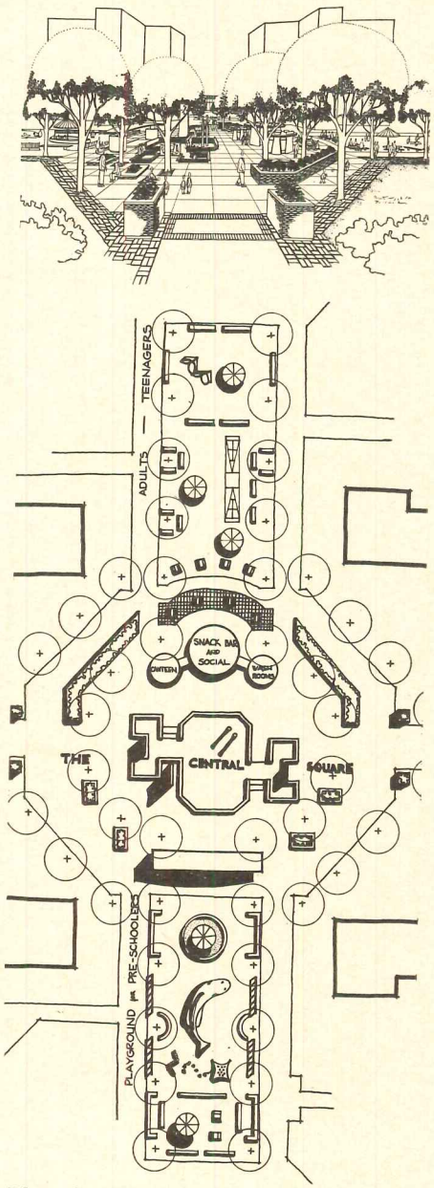
In making this proposal, I do not contend that this new partner has or could find all the answers, or indeed that there are any single ineluctable "answers"; but rather could think through and suggest alternative possible answers that need to be proposed and explored. What are the effects of various architectural environments on human behavior? What arrangements have what advantages socially for what kinds of people? What might be the varied effects of various walkway patterns, or building arrangements, or relationships of spaces?

I do not contend that the designers do not have valid powerful intuitive feelings of their own, or that they can or should replace



Scheme for urban freeways:
sketched by a landscape architect

From "Cities" by Lawrence Halprin, Reinhold Publishing Corporation, 1963



Plaza for James Weldon Johnson Houses: designed by an architect

the warm immediacy of their own first-hand observations and human contacts in the field. These are more than ever necessary, and too little practiced. And I do not claim that handsome and suitable creations cannot be and have not been conceived anyway. What I do say is that the continuing injection of and cross-fertilization with the insights of social science can sharpen impulses and understandings and enhance the human and social satisfactions which the gifted environment-shapers are capable of evoking to a degree in any case. As Catherine Bauer put it: "Abstract personal estheticism is riding high," and the environment shaper, to do a more universal valid work, must absorb the discipline and ambience of social science and insight. An actual committed partnership in a literal sense is not necessarily called for here, and it is perhaps not even appropriate. But continuing and renewing interplay and stimulation—rather than the each-time specific consultancy—definitely is. It is from the results I have both seen and myself experienced of this frequently-renewed stimulation that I have personally become so urgent an advocate of it.

Symbiosis Is Working at Great Scale

One spirited current example is the planning and architectural-ecological design of the projected new town of Columbia, between Baltimore and Washington. There, the developer, James W. Rouse, through Donald L. Michael of the Institute of Policy Studies in Washington, arranged a series of pre-planning studies and repeated conferences involving an interacting galaxy of both the physical and administration technicians as advisers, *and* the specialists in human relations, social structure, adult education and related areas. The social science group continued as critics in the planning stages and were continuingly involved over many months with William Finley, the chief planner, and Morton Hoppenfeld, the chief architect, and their associates, in a close give-and-take relationship, with tangible, intangible, and permeating results.

This is a more elaborate situation than I have described or than would apply in the continuing "partnership" and relationship that I am advocating. But it has continued in a much more intimate and intertwined way than the normal consultancy. What is particularly noteworthy in this case is the full emergence of the principle of the deep and intimate relevance of the social scientists in planning and design. However, my vision of the work and set-up of the environment-shaper is a more compressed partnership. The nucleus is roughly the architect-planner, landscape architect, social scientist; enriched of course by the normal engineering and other consultants.

Bruce Davidson

". . . one would scarcely know any more that Manhattan was once quite hilly."

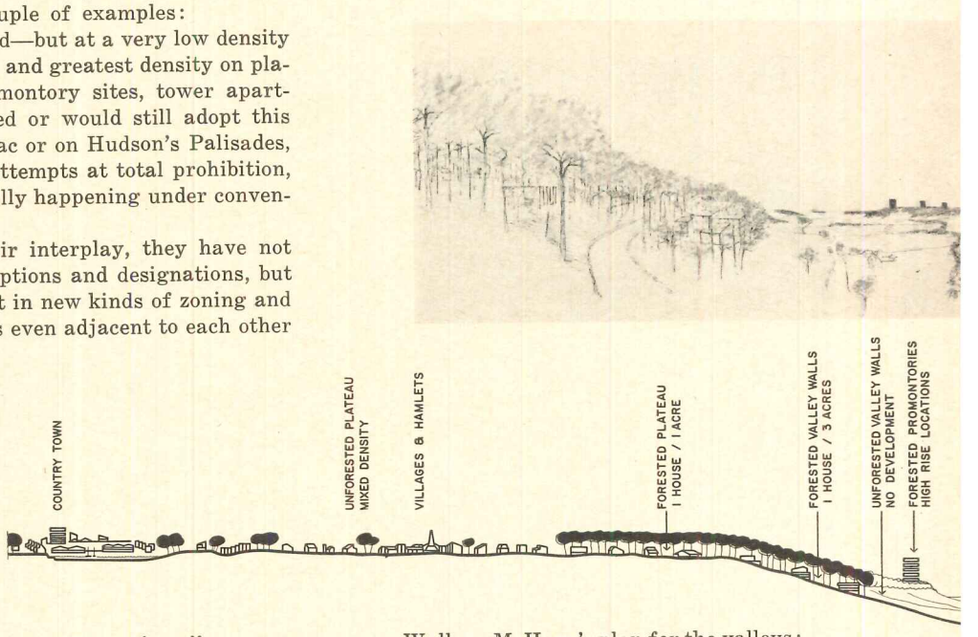
My other current example is an actual partnership: Wallace-McHarg Associates (whose letterhead reads: Architects, Landscape Architects, City and Regional Planners). Their "Plan for the Valleys" is a study and plan for Green Spring and Worthington Valleys, a large semi-rural area athwart the probably imminent next wave of metropolitan expansion in the Baltimore area. What it proposes to accomplish is not the deflection of this wave (estimated

at around 150,000 in this specific area by 1980) but its reception and development in a way to preserve and even enhance its quality—which exactly illustrates the pregnant interplay of the environment-shaping disciplines.

The plan involves decisions to avoid plundering of the two valleys and their walls (the valleys are almost always the prime easy, cheap, and vulnerable objective of the conventional development). The results of the interwined and integrated skills and sensitivities are epitomized in the imaginative zoning, of which I can cite a couple of examples:

Density zoning on cluster basis will be used—but at a very low density in the valleys, higher density on valley walls, and greatest density on plateaus. In addition, on specific selected promontory sites, tower apartments are planned. What if we had adopted or would still adopt this splendid idea on the other side of the Potomac or on Hudson's Palisades, instead of settling for the generally futile attempts at total prohibition, or the disgusting *laissez-faire* which is actually happening under conventional zoning?

As illustrating the further reach of their interplay, they have not stopped with these physical-ecological conceptions and designations, but have felt obliged to grasp the nettle inherent in new kinds of zoning and their differential effect on land prices. Pieces even adjacent to each other will be very differently affected as to type and density of allowed development, with the expectable howls from those who are disadvantaged. In an effort to cope with this characteristic of the private ownership of land, they have outlined an ingenious private-public land syndicate arrangement pooling the ownerships.



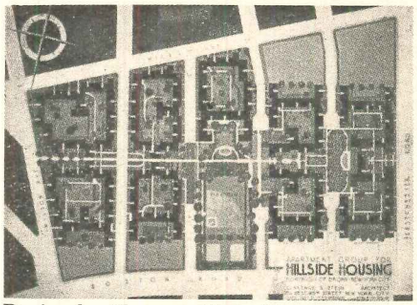
Wallace-McHarg's plan for the valleys: "Symbiosis produces creative zoning that results from joint understanding of land use, topography, ecology."

Both of the cases illustrate the "extra dimensions" or responsibilities of the design professions that result from continuous joint thinking and working.

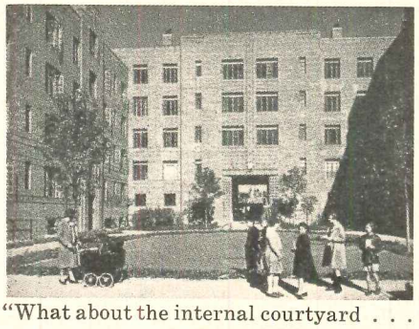
Some Examples on the Daily Scale

There are diverse cases—actual and proposed—at various scales from seemingly small to large that cry out for this symbiotic thinking and handling. While it would indeed have been necessary or at least very appropriate in the past had we then realized it, there are several reasons that make it imperative now. We see the overwhelming evidence all around us and among us of generations of neglects and contraventions. And, with the sharp rise and prevalence of tensions of all kinds in our urban environments, it is incumbent on us to contribute to their resolution by design—and certainly not to multiply them. There are contributions to be made at every scale. What kind of thing should the environment shapers be thinking about and getting our social partners' advice on, and testing out, even on this single scale?

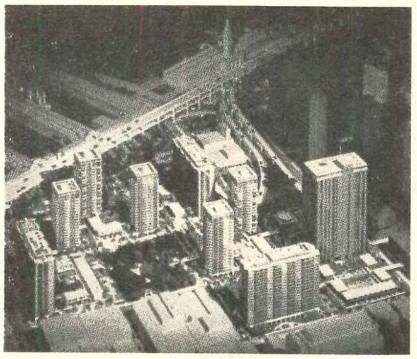
Consider the single office building. Except for the ladies' lounge with sometimes a sofa in it, and the directors' dining room in a prestige situation, we set these high-tension, high-speed structures—without any internal forms of release—into the even more frenetic surrounding business district. What is this doing to us? . . . What about roof space, and solarium-and-conservatory space at various points, for relaxed lunching? It would be nice, of course. But what social-science-buttressed indications



Design by Clarence Stein 30 years ago:



"What about the internal courtyard . . .



. . . as compared with the current universal extraversion."

can we cite for this and other possibilities, to the fact-bound client?

In a housing development, what about the apartment-surrounded internal courtyard quadrangle as compared to the current universal extraversion? What are the sensitive pros and cons, and what is the advice or observed facts as to optimum scale and range of scale of such inward-looking spaces? . . . And while we are on the subject, recall, if you have seen them, the delightful presence of internal garden courts in the office buildings of Zurich and other continental cities; the momentary refreshment of spirit in just passing by them four times a day. Surely in our increasingly strident suburbs at least, where stiff and citified office buildings are springing up all over, we should humanize and turn inward.

In short, what can our social scientist colleague—given the total issue and problem to consider—cogently suggest as to arrangement or inclusion in various planning situations that may not have occurred to us at all?

The effect of space—quantity, three-dimensional proportions, arrangement—on human well-being has over the past 10 years been increasingly the subject of study by psychologists. Their questions are as provocative for us as some of their emerging answers. For an introduction to their approaches to space and spaces, and human reaction to it, see "The Language of Space" by psychologist Edward T. Hall in the February, 1961 issue of *A. I. A. Journal.* Understanding and steeping ourselves in these sharpened insights is an enriching injection into our realm of design; more essential and rewarding and regrettably less current than, say, the more fashionable accretion of the computer in our work.

It is in response to this kind of formulated challenge that I have personally received perceptive and adaptable suggestions from the social scientist uninhibited by design or cost stereotypes or preconceptions.

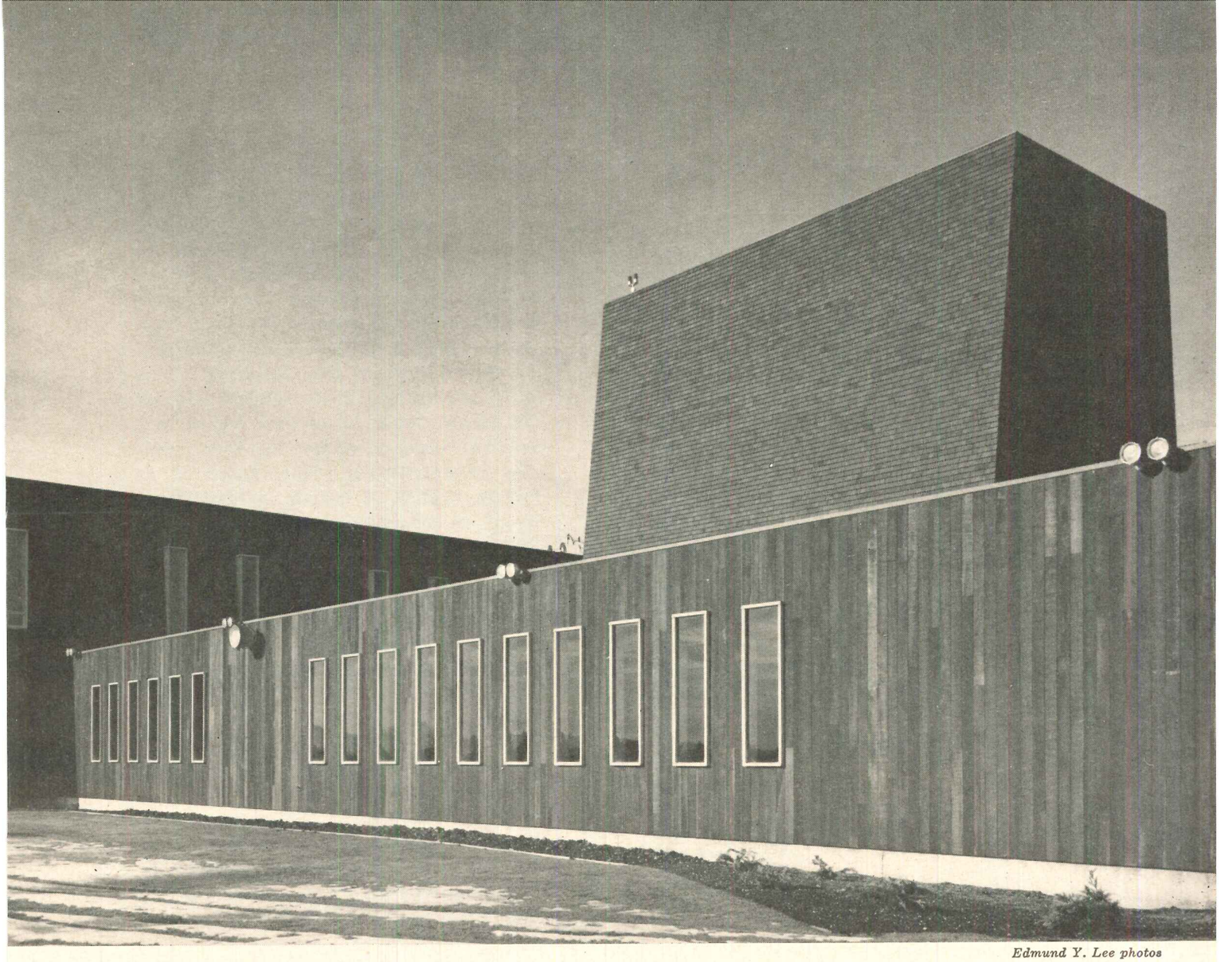
One could and should multiply almost endlessly the opportunities and challenges of this joint outlook, at all scales. So, it seems to me there should be set up some basis implementing the analysis and implications of this essay.

If Symbiosis Is Sound, Should It Be Enforced?

One proposal: because of the growing and explosive scale of planning and design now needed, perhaps it should be required that only the joint or symbiotic office should be licenseable, especially for large-scale undertakings.

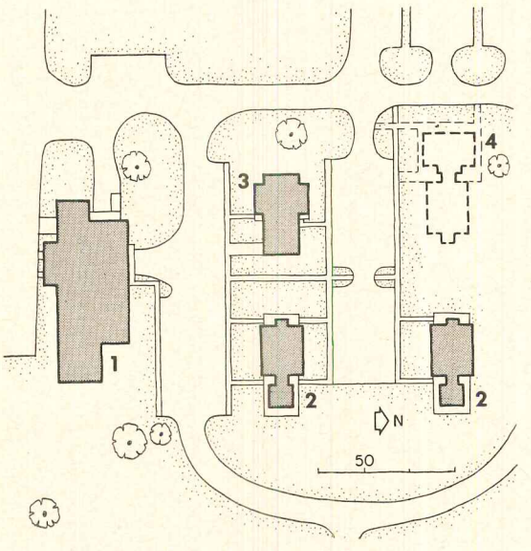
Further: as of now, any building operation must, of course, be approved as to its technical and code adequacy and zoning compliance by the building department, fire department, etc. So I would suggest that in addition to this bread-and-butter type of examination and approval, let us set up a "symbiotically composed" commission which can require the infusion of the human-social-ecological elements which this 20th century so urgently requires.

Perhaps both of these proposals sound excessively drastic. But we have got to expand the characteristics and dimensions of our social-physical environment both outwardly and inwardly, in the great elements and in the daily permeating characteristics and operations. We must do it quickly, thoroughly, imaginatively; and we must leave no stone unturned or unexplored.



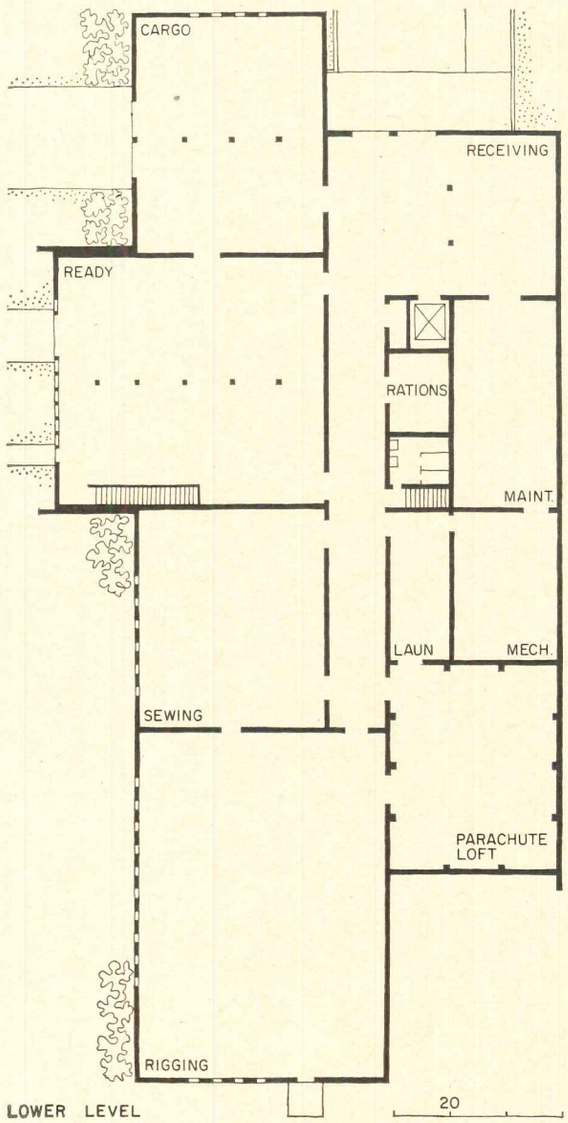
Edmund Y. Lee photos

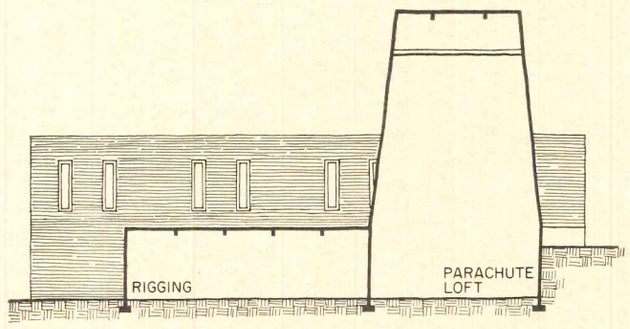
BASE FOR SMOKE JUMPERS GIVEN ROOF-LIKE FORMS



1. Parachute Loft Building
2. Barracks
3. Mess Hall
4. Future Barracks and Training

The United States Forest Service chose Redmond, Oregon as the center for its forest fire fighting operation in the northwest region because it is equidistant from all the major forests in the area, and the flying weather is normally excellent. The site is adjacent to Roberts Field, formerly an air base and now the Redmond city airport, on a semi-arid plateau about 3,000 feet above sea level. The Redmond Air Center will ultimately accommodate all administrative and communication facilities for ground and parachute fire fighting crews, as well as their housing, and maintenance and storage installations. The facilities will also be used throughout the year to train "smoke jumpers" and "fire suppression" ground crews.





PARACHUTE LOFT BUILDING

This building is the center of fire fighting activity and must be completely accessible to airplane, truck and foot traffic. The building was therefore set into the lava wall that runs across the site, to allow for delivery on both levels simultaneously, as well as passenger and cargo loading at the runway apron level. The tall room shown in section is a loft in which parachute canopies are hung for drying and inspection. Total area is 20,780 square feet and the cost was $187,120.

The site lies among some splendid scenery, with the snow-capped peaks of the Cascades only thirty miles away. The Forest Service naturally wanted the buildings to be made primarily of wood, and the budget available was a limited one. In order to produce a sense of harmony with the landscape, the architects chose to express the buildings as a series of strong, simple shapes; and, as the shapes were to be inexpensive and made of wood, chose to make them roof-like in appearance. This choice is, of course, a piece of design sophistication, as all the buildings are essentially simple and rectilinear. It does, however, provide the necessary sense of form.

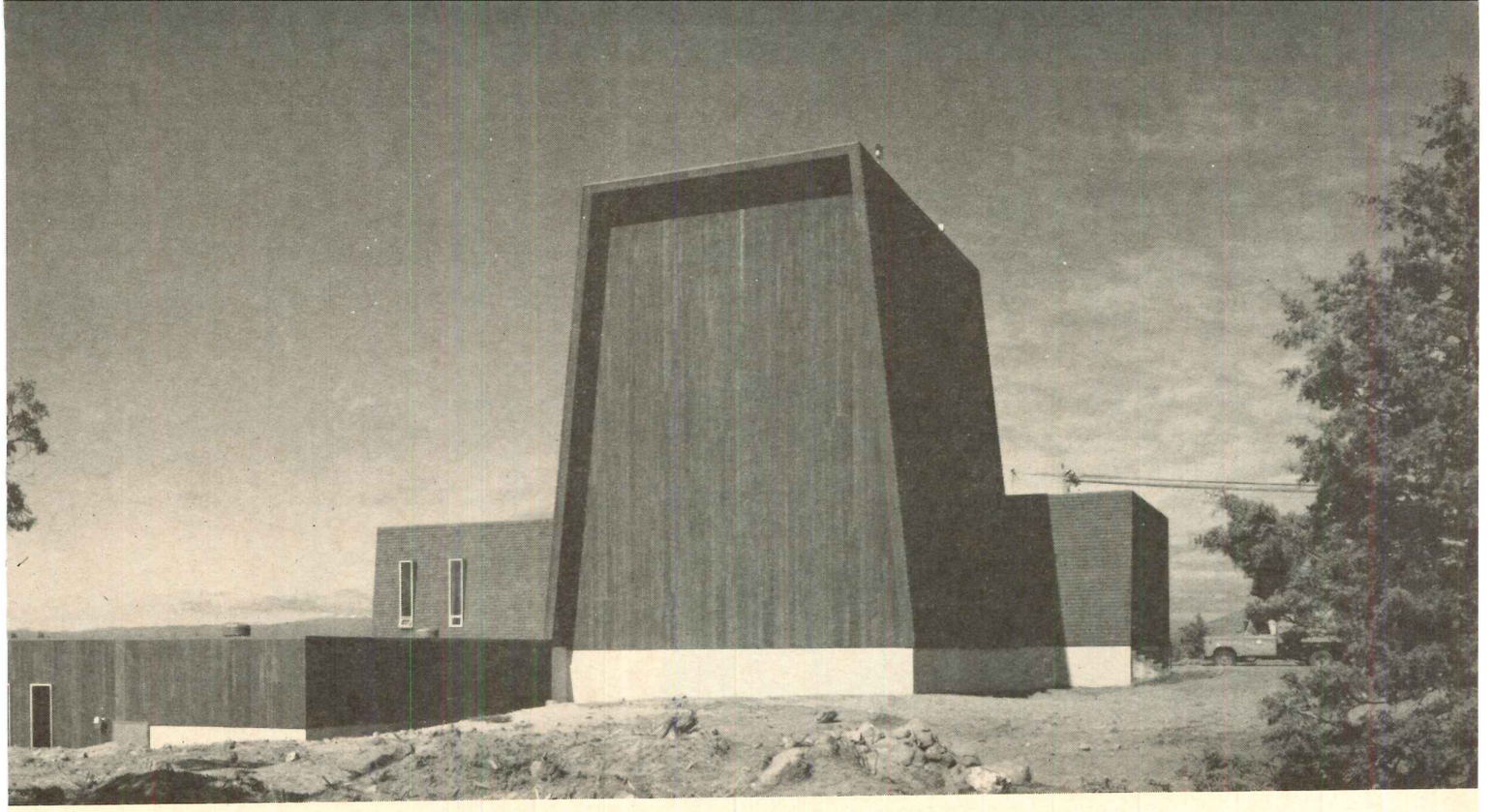
The tallest element in the composition is the drying and inspection loft for parachutes, which is also the most successful architectural shape as it requires no fenestration. The parachute loft building is set into the lava rock of the base site to diminish its apparent size in relation to the other structures. The barracks and mess hall, in turn, are actually set on low platforms; making them seem larger and reducing the need for expensive blasting and excavation.

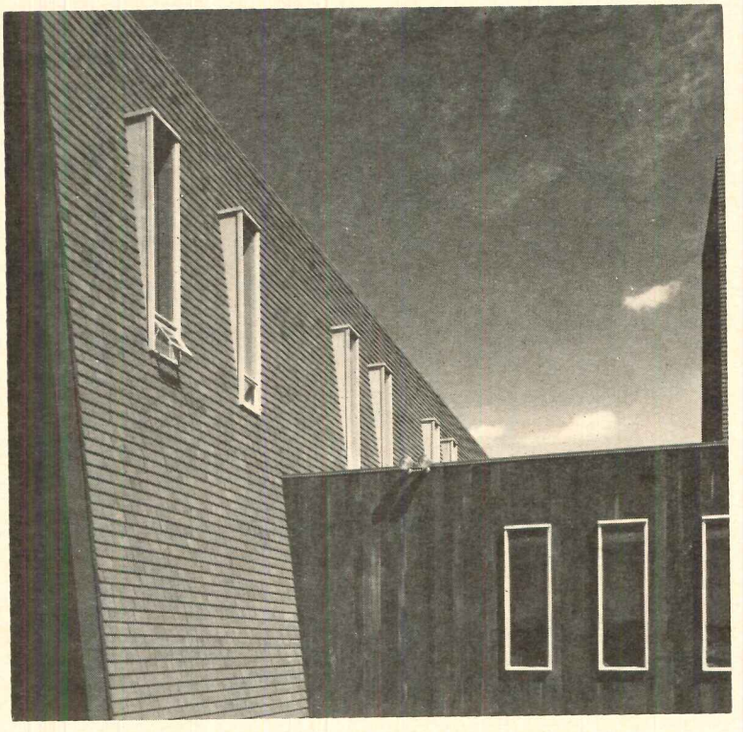
The upper level of the parachute loft building is accessible from grade on one side, and the lower level is at grade on the other. This circumstance permits a flow of material through the building, with storage and an office on the second floor and cargo disbursement and rigging room below, at the same level as the runway.

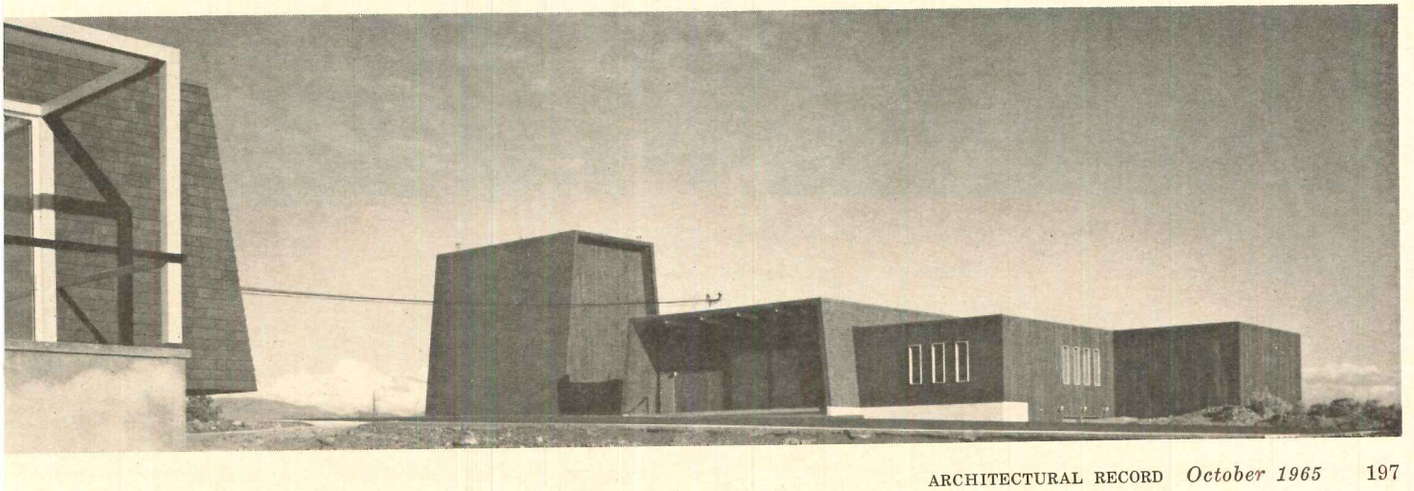
The barracks house 25 men each and have a double corridor system which assists the fire fighters to leave quickly and smoothly in the event of an alert. The lounge area at the end of the buildings is oriented to the mountain view.

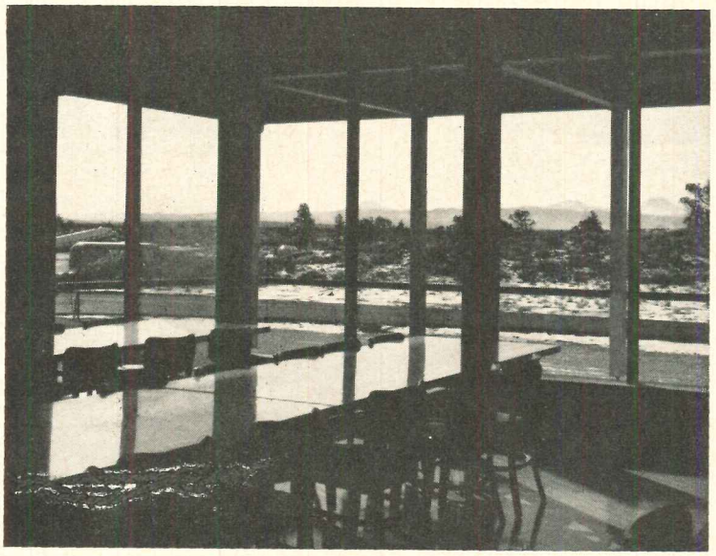
The mess hall must be able to serve up to 100 men and prepare meals to be taken along on aerial drops. As these meals may be called for at any and all hours, living quarters for the kitchen staff are provided within the mess hall.

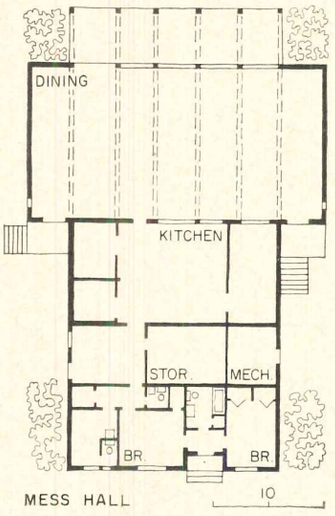
All foundations and main floor slabs are of reinforced concrete, with heavy timber and wood frame walls and roof. The second floor of the loft building is constructed of laminated 2 by 4's, with a plywood and masonite wearing surface for fork-lift trucks. The loft and rigging room are air conditioned to control humidity and static electricity.





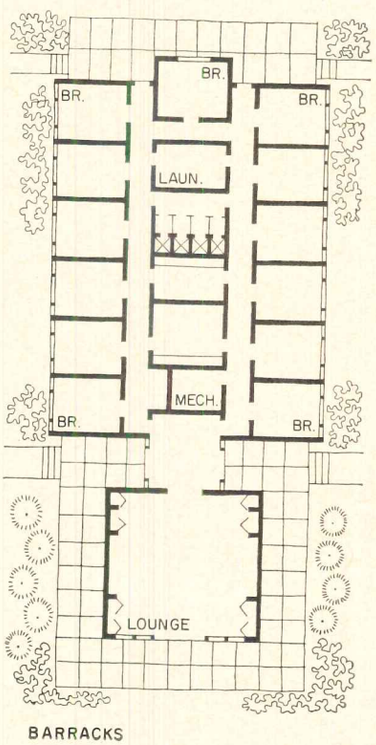






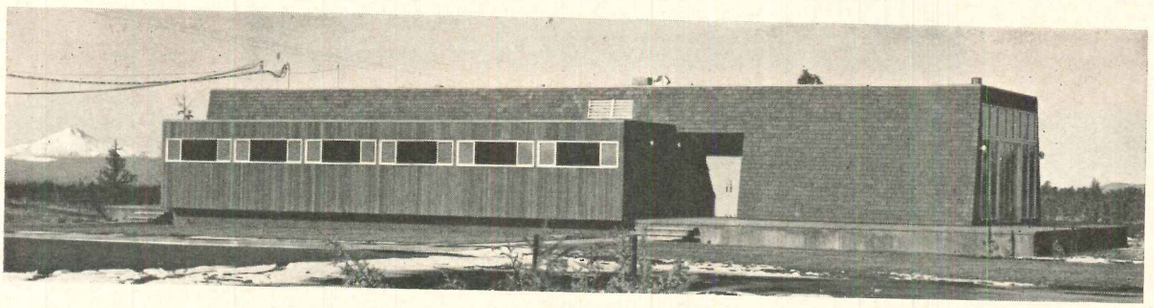
MESS HALL

The mess hall must function continuously, preparing meals for aerial drops, in addition to serving up to 100 men in the dining room. Because of probable calls at all hours, separate living quarters are provided for the kitchen staff within the mess hall. The building area is 3,445 square feet and the cost, including equipment was $80,750.



BARRACKS

Each barracks building houses 25 men, with most of the fire fighters in two-man rooms. The double corridor system aids quick dispersal in the event of an alert, and permits a centralized utility core. Each barracks building is 3,260 square feet in area and costs about $70,000.



Redmond Air Center, Roberts Field, Redmond, Oregon

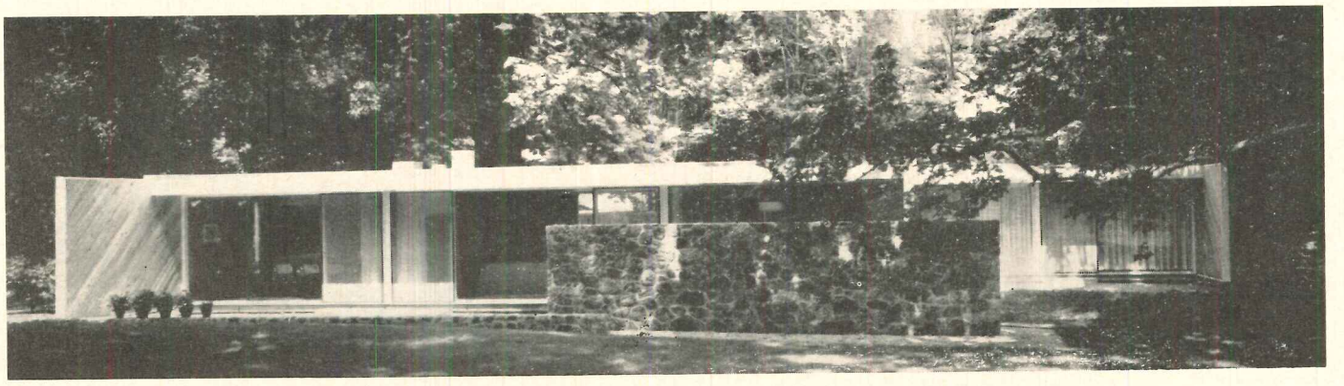
ARCHITECTS: *Franks and Norman*

STRUCTURAL ENGINEER: *Carl Rohde*

MECHANICAL ENGINEERS: *Bruce Morrison & Associates*

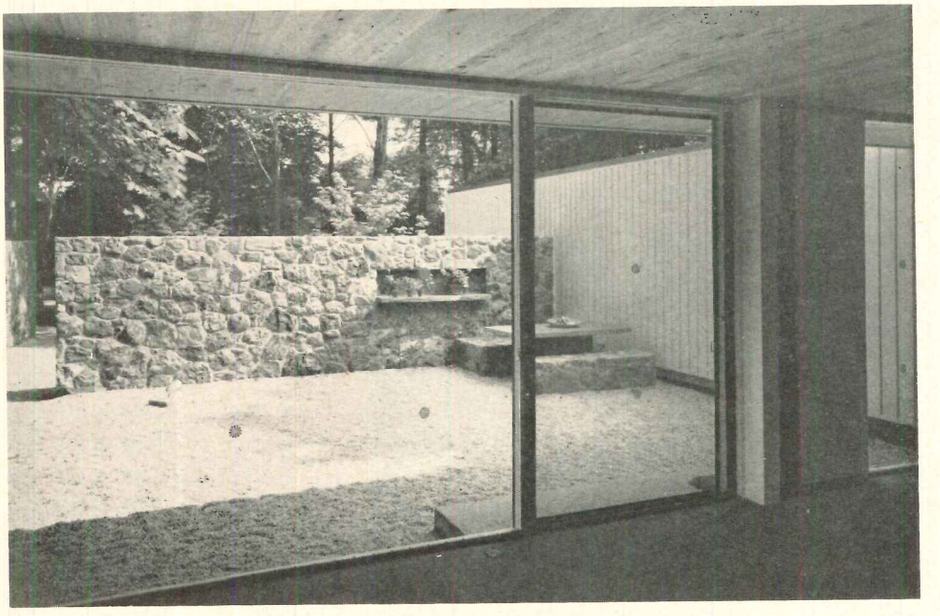
ELECTRICAL ENGINEERS: *Grant Kelley & Associates*

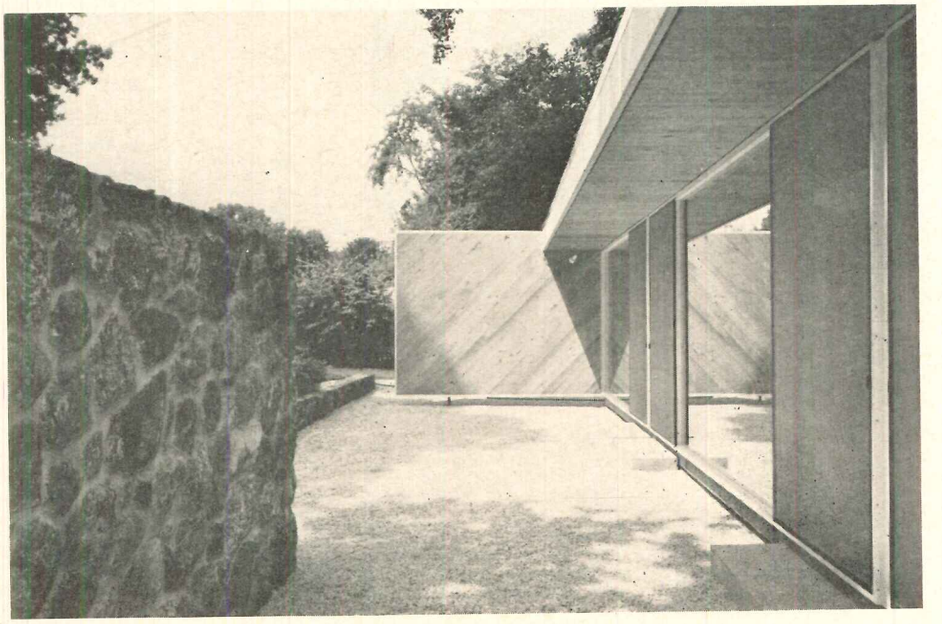
GENERAL CONTRACTORS: *DeGree Construction Company, and Bend and Kyle Construction Company*



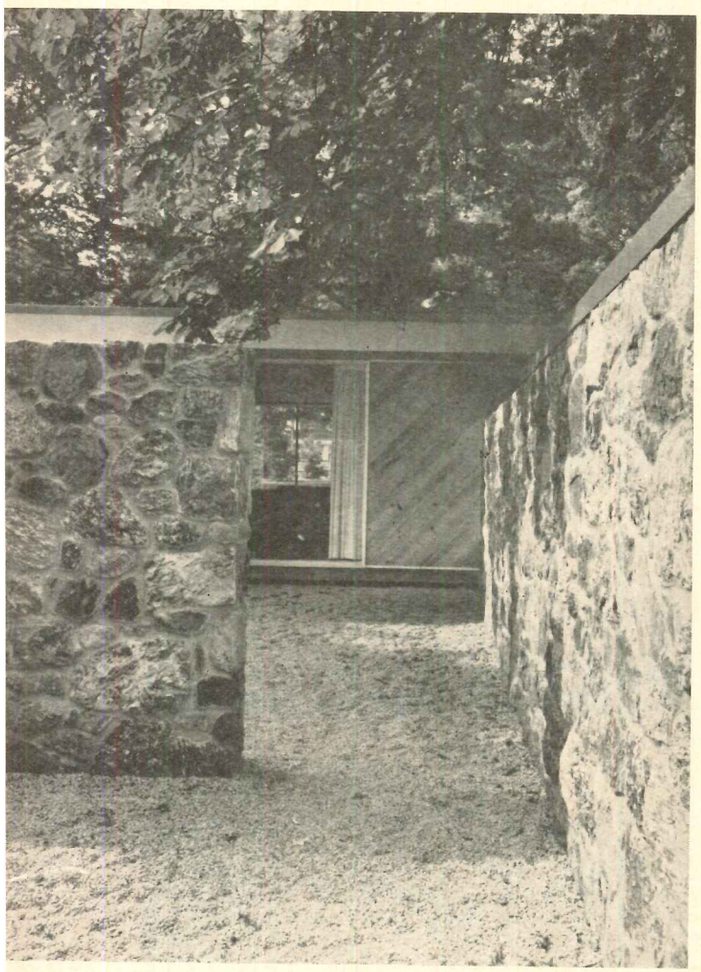
STRENGTH ACHIEVED BY HORIZONTAL EMPHASIS

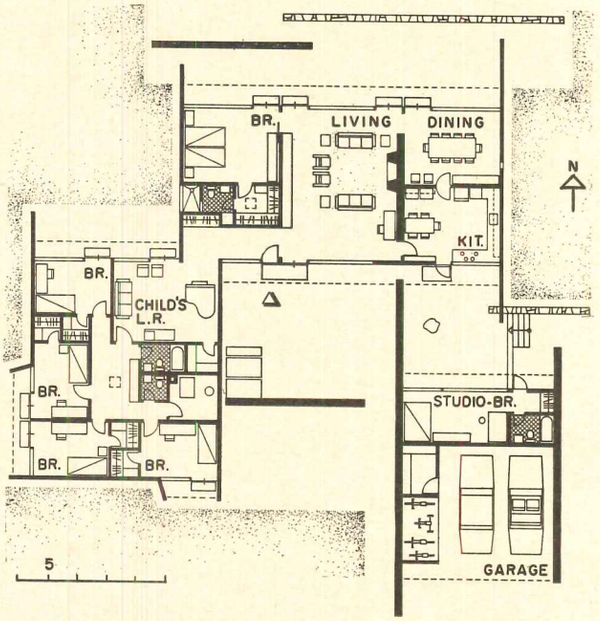
Sensitive use
of natural materials
in Herbert Beckhard's
house complements
wooded site





Residence for
Eleanor and Herbert Beckhard
Glen Cove, Long Island, New York
ARCHITECT: *Herbert Beckhard*
CONTRACTOR: *Eilart Frerichs*

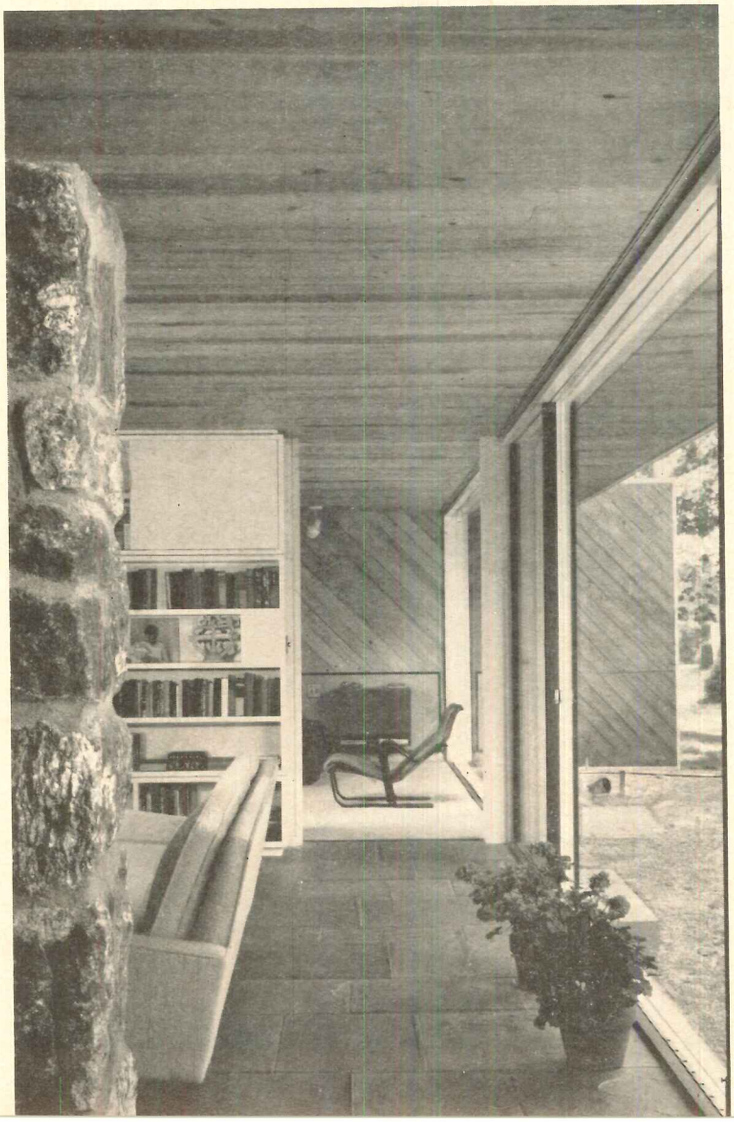


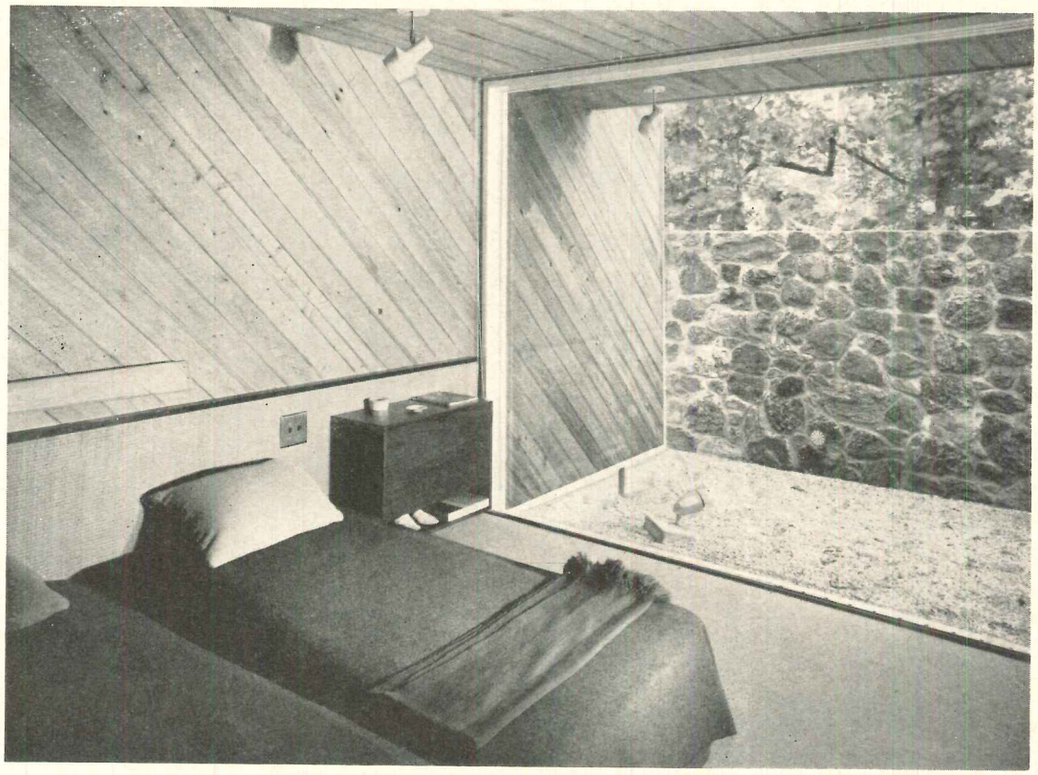


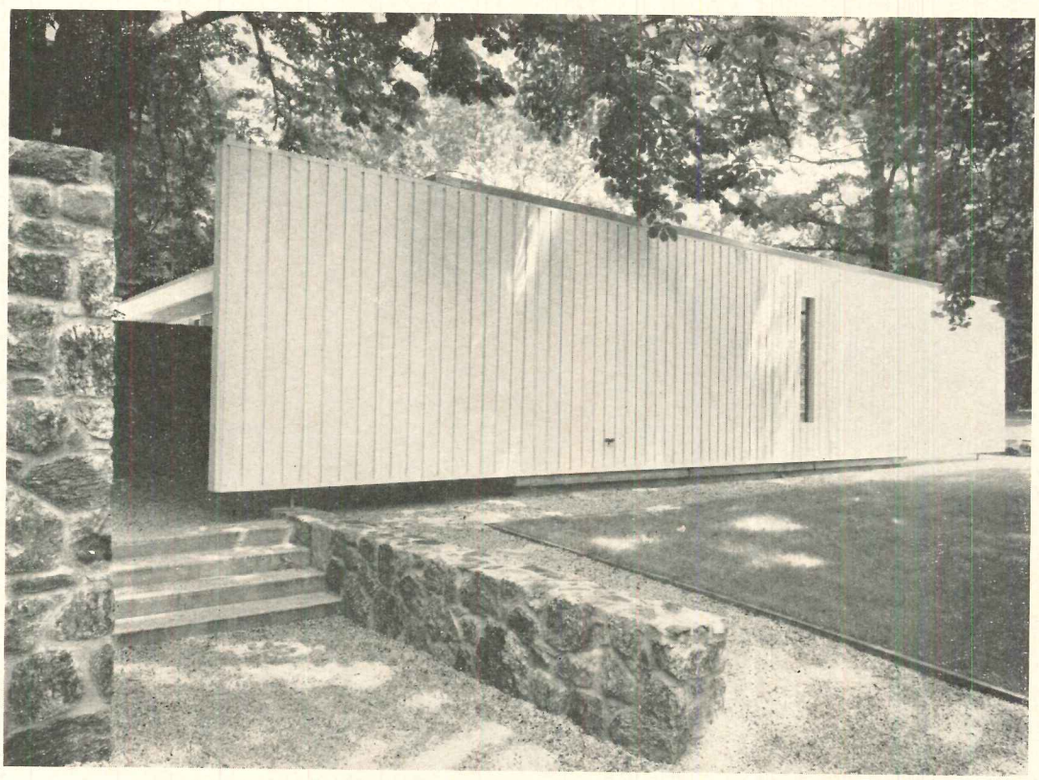
The strong, horizontal statement made by this house contrasts with and, by so doing, heightens the effect of some magnificent old trees, which are the outstanding feature of the site. It is not easy to design a relatively large house for such a site without either destroying trees or in some way detracting from their beauty. Herbert Beckhard's house seems to achieve just the right "deference to the sculptural forms of the trees" without being in any way dominated by them. It is a matter of some pride to the architect that only one tree—which was in any case diseased—had to be destroyed.

The house was designed around the needs of a family of two adults and four small children. A special requirement was the provision of a studio for Beckhard himself. The plan is divided into three distinct parts, a children's wing, master bedroom and main living areas, and a studio-guestroom which is combined with a carport. The main approach to the house is through an entrance court, which is screened by a rough stone wall and contains a built-in table and stone bench for outdoor meals.

Although the house has large glass areas—all major rooms have frameless sliding glass windows extending from floor to ceiling—Beckhard says that "an important consideration in the design was the desire to use glass, normally a most aggressive material, in a manner that would subdue this often unpleasant characteristic. In no case is a significant glass surface allowed to project to the fore, and courts and screening walls, of both wood and stone, are used to afford privacy to the glass areas of the house."







Ben Schnall photos

Clean, uncluttered lines, beautiful detailing and sensitive handling of materials, characteristic of so much of the work of Marcel Breuer's office, can be seen in the way in which Herbert Beckhard, a partner in the firm, has treated the design of his own house. White painted board and batten exterior surfaces are subtly balanced by diagonal natural Cypress facing on the extended screen walls and adjoining interior spaces, where they are combined with gypsum board surfaces. Most of the gypsum board is painted white, but in some cases a strong red or blue is used. The major part of the house is wood frame construction with two-inch by four-inch stud bearing walls, except the studio-carport where bearing walls of rough stone are used.

Architectural Engineering

New M.I.T. Computer Will Run 200 Programs Simultaneously

M.I.T. has announced plans to install a new $6-million time-sharing computer complex at the M.I.T. Computation Center within the next 18 months which will be 15 times more powerful than the computer system they now have. The new computer, designed specifically for time-sharing, will be able to serve simultaneously more than 200 people working with different programs from remotely located terminals. In making the announcement, M.I.T. president Dr. J. A. Stratton said that the whole character of instruction in many fields is changing because of the availability of a time-shared computer facility, an outstanding example being civil engineering.

Where Underground Power Is Practical

Underground power distribution has received considerable publicity since the White House Conference on Natural Beauty. While the cost of burying new distribution lines in residential areas is practical now, the cost of underground transmission for most high-voltage, high-capacity lines which run long distances is prohibitively high. (For example, underground high-voltage cable costs 10 times as much as overhead lines.)

A new regulation by FHA requires that the developer provide underground wiring in a subdivision unless he can prove that the system is not economically feasible. In residential areas some utilities are promoting a "common trench" program for water, gas, electricity and telephone conduits to spread the cost.

Possible techniques for increasing the power carrying capacity of high-voltage underground cables, according to an article in the August 23 issue of Electrical World, are using pressurized gas in a pipe to insulate conductors, or superconducting transmission lines using liquid helium to cool the superconductors.

In New York City Consolidated Edison has a 345 kv line which is run in a welded steel pipe line insulated by oil pressurized to 200 psi.

Softwood Lumber Standard Closer to Reality

A revised system of proposed dry and green softwood lumber sizes has been approved by a subcommittee of the American Lumber Standards Committee in an effort to end the extended controversy which has divided the industry. The principal change is that the 8-in., 10-in., and 12-in. nominal widths are ¼-in. narrower for dry widths and 3/16-in. narrower for green widths. This change is expected to make the size schedule more acceptable to the producers of green lumber, particularly those who make a sizeable volume of timbers.

Steel in the Residential Field

When a major steel company opens a new research and development center to develop steel components for the residential building fields, the outsider is justified in asking whether research and development on such a large scale indicates new trends in the building field, or merely the company's answer to competition from other sources?

A visit to U.S. Steel's Residential Tech Center at Monroeville, Pa. suggests that the program is geared to the genuine needs of the building industry; research is carried out in the spirit of finding the best uses for steel in the residential field, rather than pushing the exclusive use of steel as a building material. While U.S. Steel does not seriously envisage selling all-steel houses to everyone, it does foresee a substantial increase in the steel content of the average house.

Considerable emphasis is placed on the use of steel in conjunction with other building materials. Work is going ahead on steel and wood flooring systems, steel and fiberboard exterior and interior wall systems, a composite steel-wood beam and steel siding coated with polyurethane foam insulation. Side by side with product development, the evolution of new techniques in building processes is an important function of the center. One of the most intriguing is a method of attaching steel to plywood by embedding barbed steel studs into the wood. An 8-ft barbed steel stud can press 32 "nails" into an exterior wall panel with one stroke of an hydraulic press. Rigorous testing methods are used to establish resistance of all products to wind loads and the various kinds of stresses they are liable to encounter.

A serious undertaking of this kind at the very least makes durable, well-tested, functional components available to the building industry. It may do much more. By evolving new techniques it may substantially speed up the construction process; by developing new components, it may indirectly influence building design.

A New Way to Gold Plate the Roof of a Church

Two domes of a Long Beach, Calif. church were given a gold finish by electroplating rather than through use of gold leaf or paint. The domes, one 75 ft in diameter and the other 23 ft, were sheathed in copper "shingles" which, after being polished to a satin finish and nickel plated to prevent diffusion of the gold into the copper, were given the electroplated finish.

All of this operation was performed with the metal in place. The largest area previously electroplated was a 16-ft diameter antenna reflector manufactured for the Philco Corporation for the University of Texas. It also has been used by North American Aviation for plating large areas on space vehicles.

The process used for the Long

Beach Saint Germain Foundation and Sanctuary was developed by the French; equipment for the process is manufactured by Sifco Metachemical, Cleveland; application of the Saint Germain domes was performed by Piddington & Associates of Pasadena.

Corps of Engineers Will Use C.S.I. Format

The Army Corps of Engineers is the second major Federal agency to adopt the Construction Specification Institute's specifications format, the first being the Navy's Bureau of Yards and Docks. The format with its 16 divisions will be mandatory for all military construction projects advertised after July 1, 1966. For civil works conformity with the C.S.I. format is being encouraged, but will not be made mandatory.

Engineers to Discuss Contamination Control

The second annual seminar on An Engineering Approach to the Control of Contamination will be conducted this month, October 18-22, at the Rochester Institute of Technology. The seminar is for administrators, engineers and supervisors representing companies and organizations where control of contamination is a requirement for protection of product, processes and persons. It will be attended by representatives of the space, automotive, aeronautical, pharmaceutical, photographic, optical, food, instrument, electronics and health fields.

Some Uncertainties in Fire Testing

There are a number of "gray" areas in fire testing of interior finishes, according to Calvin H. Yuill, Manager of the Fire Research Section of Southwest Research Institute.

Speaking at the Armstrong Cork Company Symposium of Fire Testing last June, Yuill noted that even defining what should be included as an interior finish is becoming a rather complicated undertaking. For example, furnishing and movable equipment are not accounted for, except for hospitals and similar institutions. It may not be too long, however, when efforts to reduce fire losses may result in much tighter occupancy controls, Yuill stated.

Another problem is the testing of duct materials. In an investigation sponsored by the FHA, Southwest Research Institute found that duct materials, when tested in a tunnel furnace, flat, showed very low combustibility or flame spread, but if tested in duct configurations, these same materials could be made to burn quite vigorously due to the effects of magnified radiation.

In yet another area, combustion gases, there are many conflicting opinions as to what the relative hazards are—carbon monoxide, other toxic compounds, or oxygen depletion.

Other speakers from industry, research institutions and government discussed test equipment and methods, structural requirements, methods of determining performance requirements, dwelling entrance doors, and methods of applying fire test data.

Plastic Design in High-Rise Structures

Plastic Design of Multi-Story Frames was the subject of an eight-day conference at Lehigh University last August. Intended primarily to encourage educators to introduce plastic design concepts into their teaching as early as possible, the conference also was directed to practicing structural engineers. The program, sponsored by the American Iron and Steel Institute and the National Science Foundation, consisted of lectures and laboratory demonstrations covering plastic design concepts, behavior of structural components, analysis of subassemblages, frame stability, design of braced and un-braced frames, use of high-strength steels and composite design.

Meetings Abroad on Special Structures

Shear walls and thin shells will be discussed at meetings next year in England and Russia. A Symposium on Tall Buildings (employing shear walls) will be held April 13-15 at the University of Southampton. A meeting on Long-Span Shells will take place September 6-9 in Leningrad.

Proposed New Standard for Safety Glazing

A proposed American Standard covering performance specifications and testing methods for safety glazing materials in buildings is now in draft form, sponsored by the National Safety Council. This proposed standard is one of several efforts of a National Study Group on Glass Door Safety to minimize accidents associated with sliding glass doors and their adjacent panels.

Falls through glass doors, frequently resulting in serious and sometimes fatal injuries, began to be reported with increasing frequency in the early '60's.

The National Study Group included the Architectural Aluminum Manufacturers Association, glass producers and processors, the Public Health Service, the National Safety Council and other interested organizations.

Another accomplishment of the study group was a "guideline" for communities contemplating amendments to local building codes, which later was used as a basis for a revision to the FHA Minimum Property Standards. Also the National code writing organizations have adopted amendments to their codes requiring safety glass for large glass areas.

While three types of glass qualify as safety glass—wired, laminated and tempered—tempered glass is recommended by manufacturers for sliding doors and adjacent panels because it is four times as strong as ordinary glass, and less expensive than the other safety glasses.

This Month's AE Section

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Mail Conveyors in High-Rise Buildings, page 209.

Heating and Cooling for Housing, page 211.

Building Components: A Guide to the Use of Acrylic Paints, page 217.

Product Reports, page 219.

Office Literature, page 220.

MECHANICAL SERVICES FOR A LARGE COURTHOUSE

A dual-duct system provides individual temperature control for a wide variety of spaces

By Alfred Schroeder, Caretsky & Associates, Consulting Engineers

The design of mechanical services for a monumental courthouse poses unique problems because of the wide variety of spaces involved and the fluctuating nature of the population load.

Architects and engineers gaining such commissions may benefit from some of the analyses and solutions developed by Caretsky & Associates with the architects, Chapman, Evans & Delehanty, for the Nassau County Supreme Court Building in Mineola, Long Island, now under construction.

Courthouse design combines two special challenges—the long projected useful life of the building and the large number of spaces with intermittent loads—which are the dominant factors in mechanical systems planning. In the Nassau County Supreme Court, the minimum useful life of the building was projected for 50 years, and the structure contains 24 separate courtrooms with an even larger number of jury processing and deliberation rooms, as well as judges' chambers, the County law library, offices and miscellaneous rooms for court personnel and building maintenance and operation.

The building is large, four stories in height and rectangular in shape, with over-all dimensions of 328 by 162 ft. It was designed with the courtrooms themselves all as interior spaces, primarily for reasons of privacy. They range in size from smaller units, accommodating only 20 spectators, to spaces with 20-foot ceilings for occupancy by as many as 300 persons.

HEATING AND AIR CONDITIONING

Selecting the Plant

At the outset, the architects and engineers were informed by the County Department of Public Works that the proposed building must be designed with emphasis on long-term building and equipment life, as well as economical first costs and operating costs.

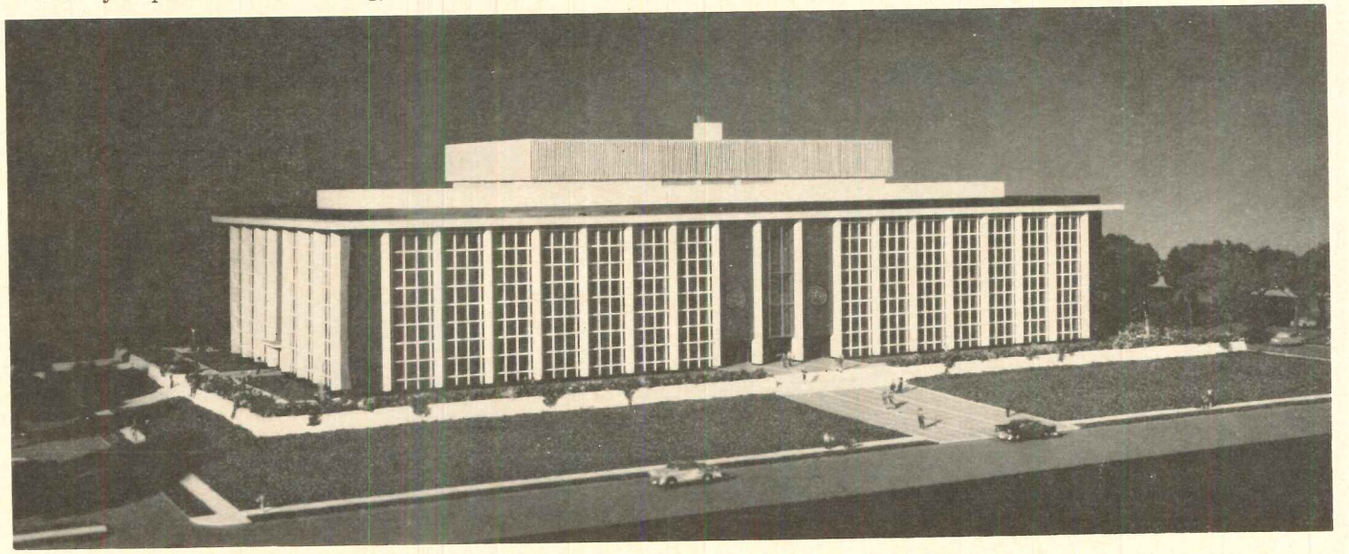
As a result, the first step by the engineers was a comparative analysis of the many available building systems and their components against these criteria.

For the 1,000-ton refrigeration plant, three alternatives were considered—electric drive centrifugal machines, absorption machines and steam-driven centrifugal machines. Since two of these would require steam as the energy source, the boiler plant had to be included in the combined study. In the interests of long life and high efficiency, fire-tube steel boilers were selected as the low pressure steam source for the absorption system and also as the heating plant for the electric drive scheme. For the steam turbine driven refrigeration machines, the water-tube high pressure type was chosen for long useful life.

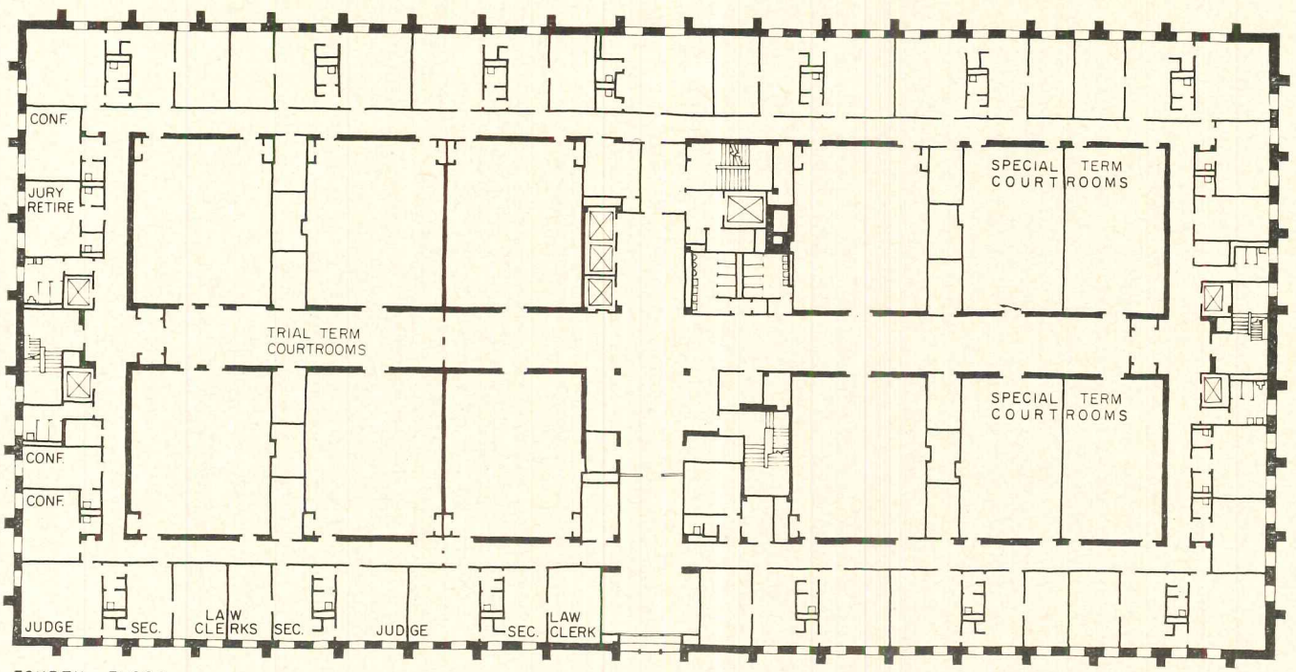
The study first listed the initial costs of all of the equipment that differed among the various schemes. Then, the operating costs were compiled. These were based on electric rates from the utility for the electric drive machines and on the steam rate converted into oil costs for the steam turbines and absorption machines. Owning costs for the various plants were tabulated using five per cent interest over 25 years.

The various manufacturers were called upon to provide historical evidence and engineering predictions as to the useful life of all equipment under consideration. The steam-turbine-driven centrifugal refrigeration machines with the high pressure boiler plant were chosen be-

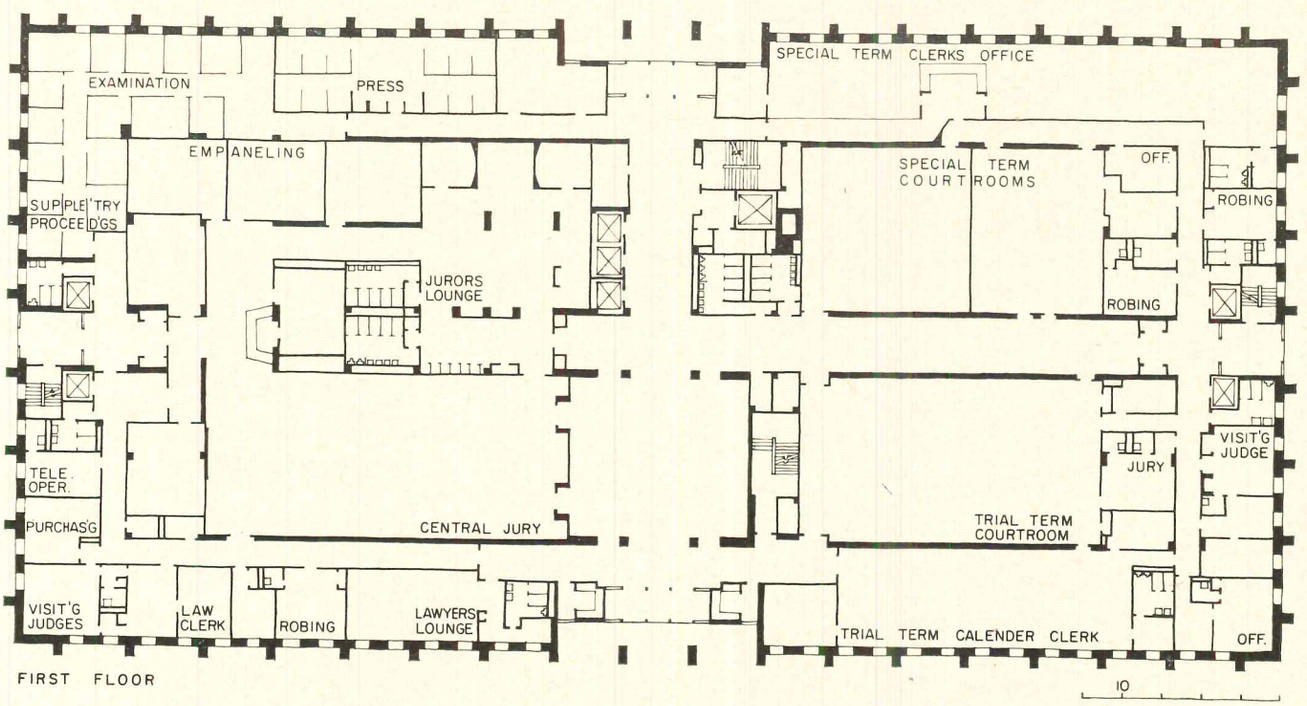
Four-story Supreme Court Building, Mineola, Long Island designed by Chapman, Evans & Delehanty, Architects & Engineers.



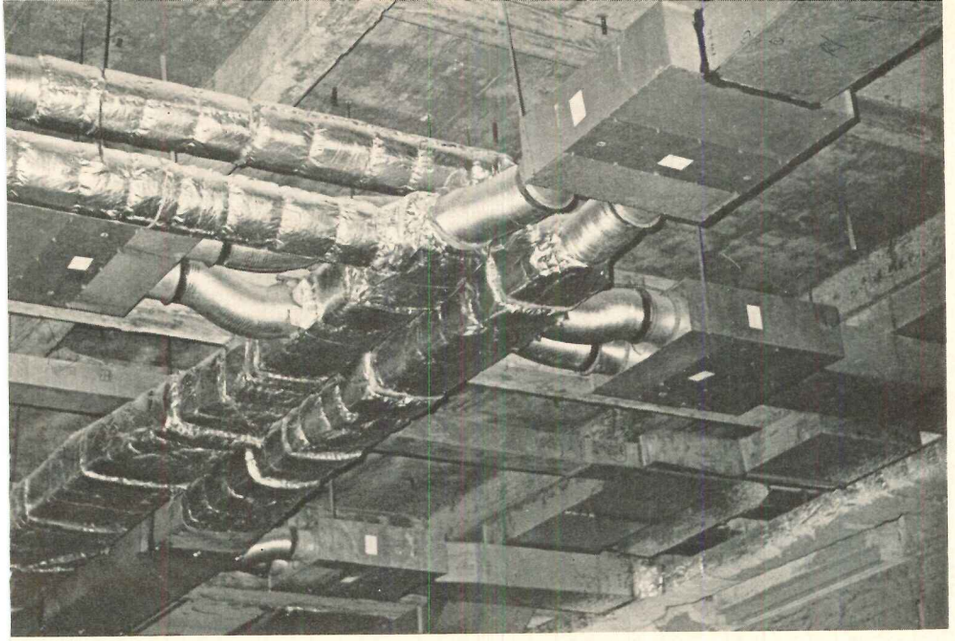
The extremely large number of spaces in the courthouse requiring individual temperature control led to the choice of a dual duct distribution system for both interior and exterior. Since the exterior has only 25 per cent glass, an all-air exterior system was deemed feasible. The dual duct system avoids a multiplicity of coils, valves and piping for each room required with a single duct system. Exemplifying the extent of controls throughout the building is the fourth floor with 12 courtrooms and 30 rooms for judges' chambers, conference rooms and jury deliberation rooms. Many additional zones are required for offices, corridors and miscellaneous spaces. The interior and exterior dual duct systems are shown in the photos across page.

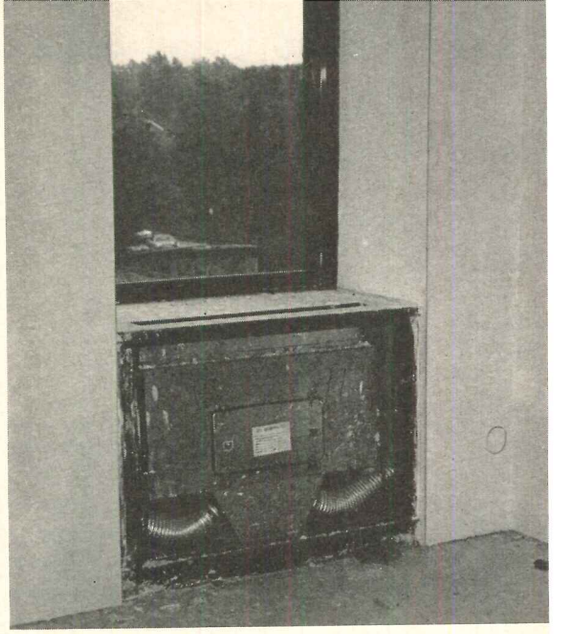


FOURTH FLOOR



FIRST FLOOR





cause of the greater useful equipment life of the steam turbine machines and water tube boilers, after operating and owning costs were found to be nearly equal for the steam energy schemes. The operating and owning costs of the electric driven equipment were higher. The initial cost of the selected system was higher than the other two, but for a building of this monumental character a small over-all saving in initial cost could not overcome the advantage of the system with the proved longest equipment life.

Selecting the Air-Conditioning System

In studying the building for the best possible air-conditioning system, these criteria were established:

a. All courtrooms must be treated as auditoriums, with individual temperature control.

b. All judges' chambers must be treated as conference rooms with individual temperature control and good ventilation.

c. Law library must have individual temperature control.

d. The jury rooms must have individual temperature control and good ventilation for smoke removal.

In this connection the following air changes per hour were agreed on for the different types of spaces:

jury rooms—15
judges chambers—10
courtrooms—10
offices—8

It was also decided that an all air exterior system was feasible since the exterior wall construction used only about 25 per cent glass.

A single duct, conventional velocity system with reheat coils at the various rooms was compared to a high velocity dual duct system with mixing boxes for the required rooms. The large number of rooms needing individual control forced the single duct reheat system to approach the dual duct system in cost. With the single duct system, the ceiling would contain a heating coil, valves and piping for each room, all of which require maintenance and access. The dual duct system demands mixing boxes in the ceiling with a small access door for each box. The piping system needed for the single duct system is eliminated with the dual duct system.

The dual duct system was chosen for the building because of its greater flexibility in providing individual room temperature control at any location within the system. A dual duct system was chosen for the building perimeter because of the small glass areas and the requirements of air for the high number of air changes called for in the many judges' chambers and jury rooms.

The interior dual duct systems have horizontal distribution ductwork on each floor. The perimeter dual duct system has vertical risers in each bay. The exterior system and the interior system are separate so that hot deck temperatures for the exterior system can be raised as required for heating and the interior system can be turned off when the building is not occupied. In the large courtrooms, both low and high return are taken to insure complete air turnover.

To insure complete privacy, acoustically insulated transfer ducts are used in place of the usual louver or undercut door. Such transfer ducts are used for example, between a jury room and an adjacent toilet room. Direct duct connections are furnished to each return register.

Central Controls

A supervisory data center was provided to enable the operating engineer to control his building to meet the requirements of changing room loads and individual desires of the various building occupants. Temperature indication and reset is provided for every major room in the building. This enables the operating personnel to change room temperatures without disturbing the room occupants during such use as a trial or conference in a judge's chamber. The data center enables the operating engineer to increase fresh air above a minimum of 25 per cent whenever outdoor temperatures permit, thus providing at least 50 per cent fresh air to all rooms except during extremely hot or cold weather when the minimum fresh air will be used.

Three Fan Rooms

The building has three fan rooms. One large room at the roof level

serves the building exterior and second, third and fourth floor interior. The basement contains two small fan rooms, serving the air-conditioned basement areas and first floor interior, plus the ventilation systems. The total conditioned air supply is 270,000 cfm.

The boiler plant consists of two 20,000 lb/hr packaged high pressure water tube boilers arranged for dual gas or oil firing. Gas will be the primary fuel with No. 4 oil as standby. Condenser water flows to a receiver from which it is pumped to a deaerating heater. Boiler feed pumps, drawing from deaerator, supply boilers with water. The raw water makeup passes through duplex softeners. The pumping systems are a combination steam turbine and electric motor drive.

ELECTRIC SYSTEM

The electrical system design criteria, of course, also emphasized long useful life and minimum maintenance of equipment and components. Design required selection of switches and fixtures to blend harmoniously with the architecture. The assignment also involved provision of the signal and communications systems required by a major modern court house operation.

Against these standards, the electrical system design necessarily produced no startling engineering innovations, but rather stressed a standard of high quality in the choice of all equipment and materials, in keeping with a prestige building of unusual durability.

Distribution System

The distribution system involves a total connected load of 2,000 kva. Transformer vaults are located below grade at the building line. All service equipment has been sized to allow for possible future expansion of the court building itself. The vaults are large enough to accept larger transformers at some future date so that they can serve other new municipal buildings which will eventually be erected as part of the same complex.

A 277/480-volt basic building distribution system was selected after analysis of the lighting requirements and motor loads, as well as the relatively large floor areas. All distribution is by means of cable and conduit. Each floor is served by three electric closets. The bulk of the overhead lighting is handled directly by the 277 volt system and dry-type transformers located in electric closets provide 120/208 volt circuits for incandescent lighting and floor receptacles.

All distribution for mechanical plant power is handled by motor control centers served with 480-volt feeders. Motor control centers are grouped in accordance with the layout of machine rooms throughout the building.

Emergency Power

A complete system of emergency light and power is provided by a standby diesel generator set, with a capacity of 250 kw.

The general philosophy of the emergency layout is that it should permit safe evacuation of the building in the event of a power failure, rather than provide full capacity to carry the entire building during a prolonged outage. However, in addition to allowing orderly egress from the building, the system gives special attention to detention areas and jury deliberating rooms which cannot readily be evacuated. These spaces have adequate emergency light, heat and power to keep their occupants comfortable and safe for as long as is required.

Lighting

The lighting systems for the building were broken down into four categories—courtrooms, offices, corridors and exterior.

The location of all courtrooms as interior spaces made it possible to eliminate the distraction and discomfort of glare and shadows. The courtrooms are illuminated by means of recessed 2 by 4 fluorescent troffers, with incandescent downlights used to accent the areas around the judges' benches. All fluorescent fixtures are modular types with low brightness acrylic plastic lenses. Courtroom lighting levels are at 80 footcandles.

All offices use the same modular fluorescent fixtures, giving a lighting level of 75 footcandles with a high degree of visual comfort and freedom from glare.

Corridor lighting has been designed to emphasize the natural color and texture of the tan travertine walls. Each corridor wall is washed with a continuous row of light which, while it is the only illumination source, maintains a pleasant and reasonable lighting level. The wall wash units are continuous fluorescent troffers, using specially designed Alzak reflectors and asymmetrical glass lenses.

In the selection of exterior lighting, the architects requested that tall, double-arm standards not be used for area lighting. Their desire was to create a park-like setting rather than a more commercial atmosphere. All parking areas are illuminated by low aluminum standards with black anodized aluminum mushroom-type tops.

Courtroom Speech Amplification

Most new, large courtrooms have electronic speech reinforcement systems, which ordinarily consist of basic microphone and amplifier packages. However, in the case of the two largest courtrooms at Nassau County, which have double-height ceilings and accommodate several hundred persons, systems were designed that are of special interest.

Fixed microphone inputs are furnished at the immobile stations, such as the judge's bench, the court clerk's station and the witness stand. However, for the use of the attorneys, who move about the courtroom, small wireless, frequency-modulated transmitter microphones are provided. Their output is picked up by an antenna hidden above the courtroom's hung ceiling and connected to a receiver mounted in the sound console. The microphones are worn around the neck and are free of trailing cables. Loudspeakers were specially selected and placed to give normal voice level throughout the courtrooms.

OTHER SYSTEMS

An anti-freeze system of snow melting is provided for the ramps leading to the service areas.

An automatic lawn sprinkling system is provided for grass areas and all shrubbery.

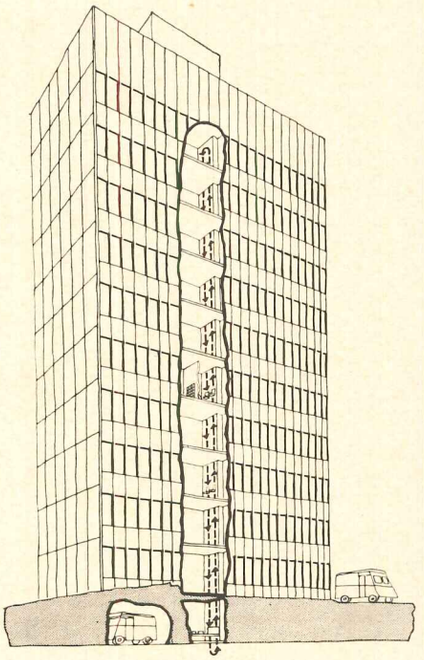
The building is equipped with a central vacuum cleaning system. Because of the large floor area of the building, an individual system is provided in each area, keeping horizontal piping at a minimum.

The loading dock, service area, shops and storage spaces have sprinkler systems for fire protection.

MAIL CONVEYORS IN HIGH-RISE BUILDINGS

In an effort to keep pace with the vertical growth of office buildings in this country, as well as the enormous increase in the volume of business mail, the U.S. Post Office Department is sponsoring a new system of mail delivery for multi-tenant buildings called VIM, Vertical Improved Mail. Although, as the Post Office itself readily admits, the system has been long in coming, it is in fact a surprisingly simple scheme and one which promises to be quite effective.

Basically, VIM consists of a conveyor system carrying locked mail trays from a central postal depot or mail room to service mail rooms throughout the building. The basic idea can quite easily be adapted to suit variations in building size or plan and in the number and distribution of tenants throughout the building. Advantages of the new system are easy to see, the most obvious being speed. The elimination of a fleet of mail carriers who have to go from floor to floor delivering mail by hand means that tenants of an office building could all expect to receive their mail first thing in the morning regardless of their particular location. Mail can be delivered to as many as 100 tenants in less than 15 minutes where a VIM conveyor is provided. Outgoing mail can be deposited in the conveyor throughout the day, providing a continuous mail collection service. As well as increasing the speed of mail distribution, the VIM conveyor system has the added advantage of eliminating the litter and clutter of mail handling from the lobbies and corridors of a building and of reducing standard elevator traffic. An increase in the number of outgoing pickups by the Post Office will help to speed mail to its destination.



VIM system in a high-rise building, showing control and service mail stations and, *below right*, proposed VIM system for a building complex in Main Place, Dallas, Texas.

The Post Office is naturally anxious that as many new high rise buildings as possible should be designed for the inclusion of VIM and has issued a number of notes and specifications for architects in connection with this. Postal specialists are also available to consult with architects, developers or investors interested in improving postal service. Even if a building is too small to warrant the installation of a special mail conveyor, the inclusion in the plan of a central mail room for postal operations, as well as a truck platform for off-the-street pick up and delivery, would substantially improve the efficiency of the mail distribution system. The main mail room should be located at the truck platform level, if possible with its own access door to the platform. A 30-in. security door and standard security windows should be provided.

Post Office service will of course vary depending upon the size and occupancy of the building, but the following general criteria and building sizes as related to delivery and manpower requirements have been issued by the Post Office for the guidance of architects and planners:

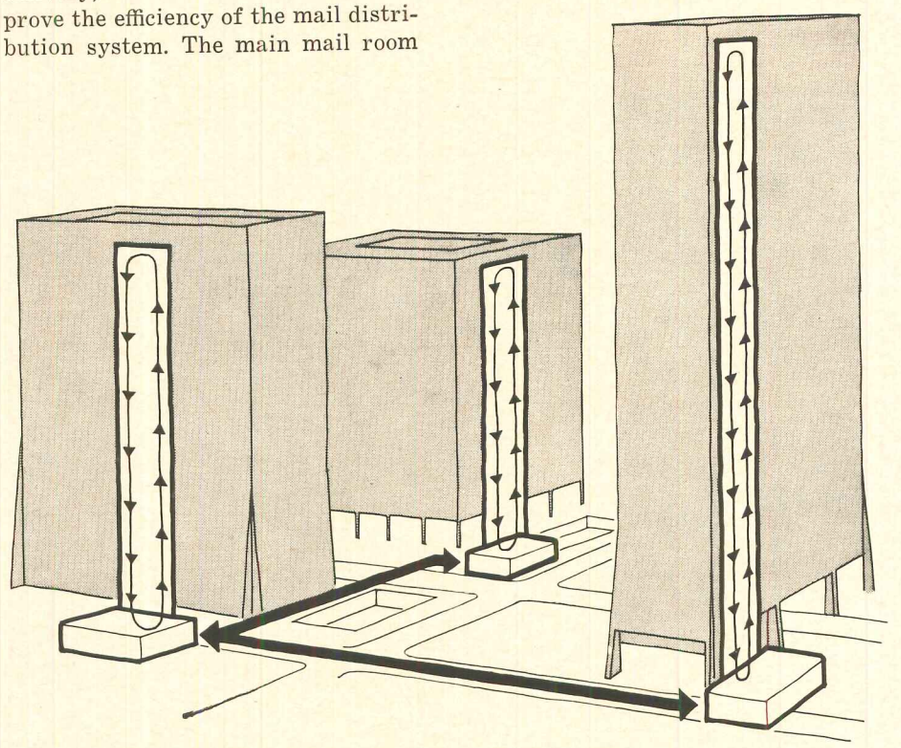
Small—100,000 sq ft or less of leasable office space

Medium—100,000 to 250,000 sq ft of leasable space

Large—Over 250,000 sq ft and six floors (levels)

In a small building the mail room may be merely a security area where mail is received prior to distribution. It may also house bundle mail drop and serve as a terminal for letter drop chutes. A planning factor of 0.5 sq ft of mail room for each 1,000 sq ft of leasable office space is generally adequate with a minimum size of 24 sq ft. A lock box section should be considered when there are more than 20 tenants.

In a medium size office building the planning factor for the mail room



size is 1.5 sq ft for each 1,000 sq ft of leasable space.

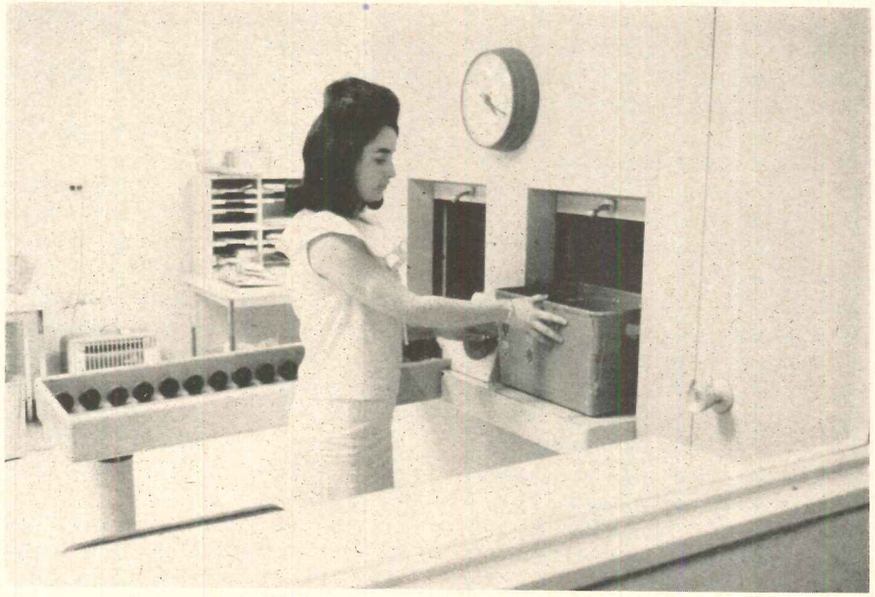
In a large office building the main mail room will provide additional services and the planning factor should be approximately 3 sq ft per 1,000 sq ft of leasable space. This may be reduced substantially where there are several single-tenant floors or multi-floor tenants. Additional small areas will be required on each multi-tenant floor for servicing by a vertical conveyor. The central mail room at the truck platform level would house the vertical conveyor terminal.

Although vertical conveyors are already in use in quite a large number of single occupancy buildings, their use for tray mail conveyor service in multi-tenant high-rise buildings is quite new. By last month, there were five multi-tenant office buildings operating VIM conveyor systems. By the end of 1966 this number is expected to increase to about 20. More than 75 buildings have planned to provide some type of VIM facilities. The use of the VIM conveyor enables the Post Office to operate a much improved service. Mail can be made available to tenants either by locked tray or locked box at the conveyor discharge point, and outgoing mail can be deposited at these same points. A chain speed of conveyor of approximately 80 ft per minute is recommended. Carriage spacing should be about 10 ft apart on the chain. As each mail container is placed in the input position on the conveyor for distribution to the building tenants, the floor selector is dialed and a button is pushed to activate the input mechanism. This input mechanism automatically transfers the containers to the moving carrier of the conveyor at a rate of 12 to 14 per minute. As the chain conveyor moves around, containers are picked up by the carriers on the upward movement and delivered on the downward movement. Containers are automatically lifted off the carrier at the correct floor and transferred to a short run-off conveyor. Input and discharge points on multi-tenant floors should be enclosed in small service mailrooms measuring about 5½ ft square to 5½ by 7 ft according to the size of the building.

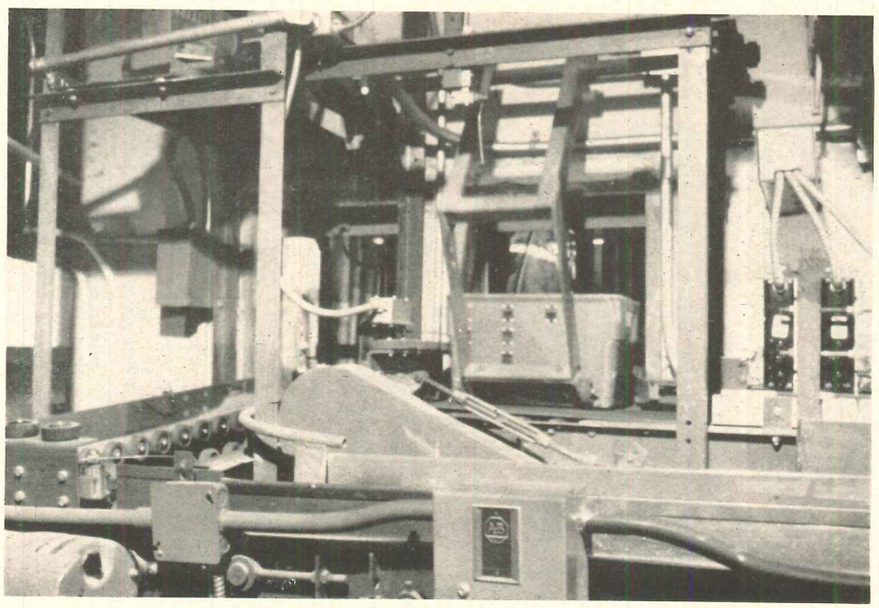
Outgoing mail is placed by the tenant in a container in the input position in his service mailroom. A button is pressed and the input mechanism draws the container into the system, and the conveyor transports it to the main mailroom.

The per square foot cost of installed conveyor equipment is surprisingly nominal—about $5,000 per floor.

Lamson photos



A service mail room on the 15th floor of the Penney building. Trays are dispatched on the right and delivered on the left; the floor selector is between the hatches.



A tray being swept into the vertical conveyor after traveling on a horizontal conveyor from the main sorting area at a rate of between 120 and 150 ft per minute.

Single Occupancy Buildings

Although the VIM system as such has been advocated by the Post Office Department for multi-tenant buildings, vertical conveyors have been in use for some time by a number of companies which occupy the whole or a major part of their own buildings. This is particularly true of insurance companies and other organizations which are involved in a great deal of paper work. Two recent examples are the C.B.S. building and the J. C. Penney building in New York where chain conveyor systems are being successfully operated for the distribution of incoming, outgoing and inter-office mail.

HEATING AND COOLING FOR HOUSING

By Fred H. Kluckhuhn *

Recent flurries of enthusiasm for district cooling-heating plants have carried this concept beyond the high rise cluster to the individual private home—when there are enough homes or additional load to warrant a relatively large plant, and when these homes are of sufficient density to make the cost of chilled and hot water distribution competitive with individual central residential equipment.

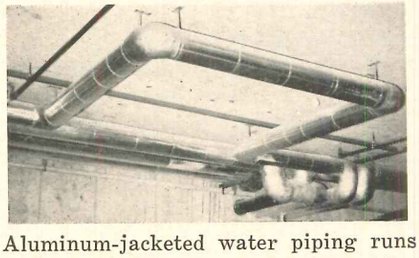
Tiber Island, a recently opened urban community of four high rise apartment buildings and 85 town houses in Southwest Washington, D.C. is one of the first residential complexes to employ both the district and individual approaches to climate control.

The apartment buildings contain 368 units; 21 town houses are being rented, the remaining 64 town houses are to be sold.

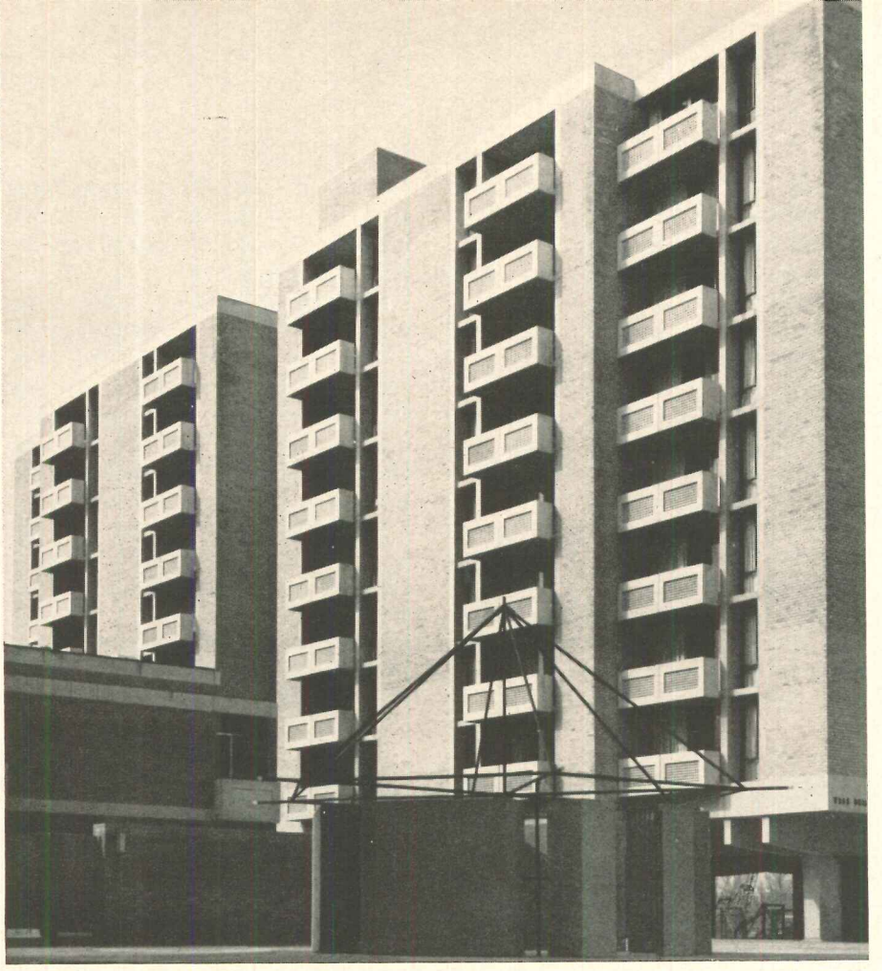
The sale town houses are equipped with individual central residential systems consisting of gas-fired forced air furnaces and individual roof-mounted condensing units. The rental town houses and apartments are conditioned by fan-coil units supplied with chilled or hot water from a central cooling-heating plant.

There were several reasons for specifying separate systems for the sale houses. All utilities except water are metered to each house. Since each owner pays his own utility bills, he can regulate the cost of occupancy by operating the system as he wishes. And there are different

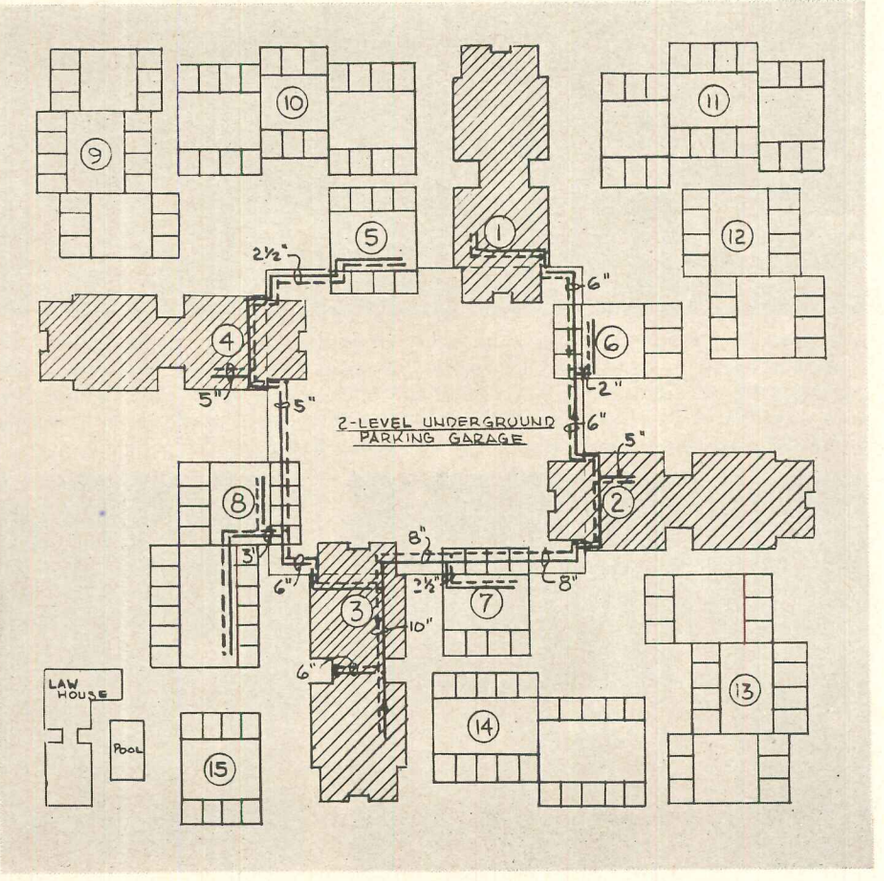
*Kluckhuhn & McDavid Consulting Engineers.



Aluminum-jacketed water piping runs around the edge of the lower parking garage to serve all the rental units.



View of one of the high rise apartment buildings from the central plaza with a rental town house on the left. *Below*, site plan of the Tiber Island project showing the piping distribution from the central plant in the basement of building no. 3. Buildings 1-4 are high rise, buildings 5-8 are rental town houses, and buildings 9-15 are sale town houses. Architects for the scheme are Keyes, Lethbridge and Condon, who won a national competition for the project.



methods of financing involved. The sale houses are privately financed, whereas the rental houses and apartments are financed by FHA and subject to different rules.

The four high rise buildings and all 21 rental houses are grouped around a 1¼-acre paved plaza. The central plaza serves as more than a focal point for residents. Beneath it is a two-level, 307-car garage for residents. Basements of the rental town houses and high rise structures back up to the garage walls. And circling the periphery of the lower parking level is 1,800 feet of supply and an equal amount of return piping that carries either hot or chilled water to and from the rental units.

None of the aluminum-jacketed steel main, ranging from 5 to 10 inches, is buried. This offers easy access for maintenance.

The central plant is in the basement of one high rise building, with a 4-cell cooling tower on the roof. Since piping was necessary to supply the other three apartment structures, it was relatively easy to loop the piping around the underground garage and run short lengths of 1¼-in. and 1½-in. copper wire through the garage wall into the central fan-coil unit in the basement of each rental town house. Serving the sale houses from the district plant would have involved far greater lengths of pipe. Furthermore, metering and charging for utilities would be involved.

A 750-ton hermetic centrifugal unit cools 1,780 gpm of water from 54 to 44 F. Three oil-fired boilers produce water ranging from 70 to 180 F depending on outdoor temperature.

The use of individual plants for each high-rise building was discarded because of the higher maintenance costs of four separate 130-ton plants, the need for four equipment rooms, and the required cooling tower on each roof.

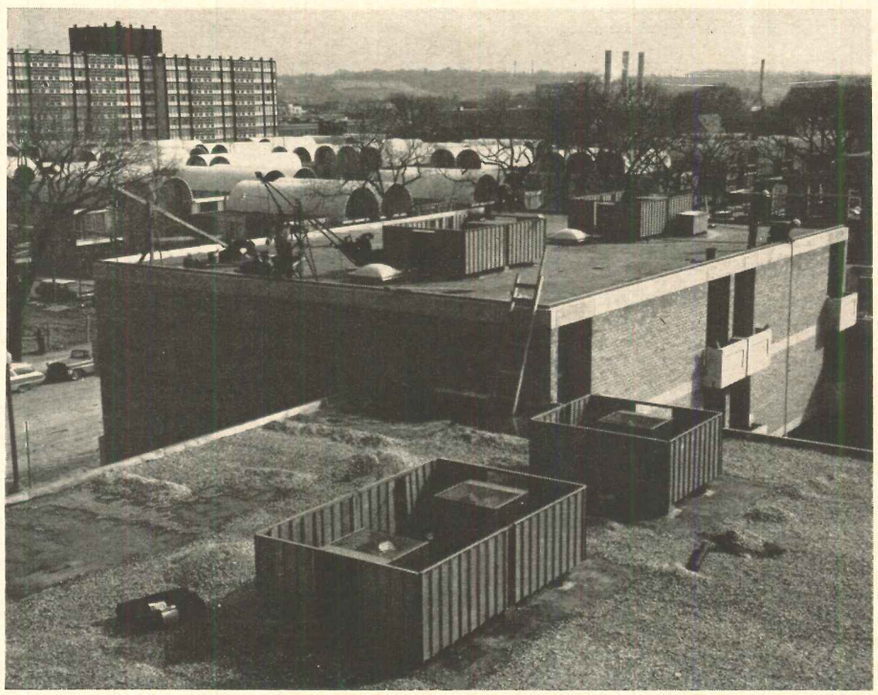
Elimination of outdoor condensing units in the rental town houses was architecturally advantageous. Central fan-coil units in the basement of each house range from 1,330 to 2,200 cfm on the cooling cycle, depending on house size. Conditioned air is ducted to each room of the 2-story and 3-story homes, with floor outlets to sweep window walls at each end of the house.

Duct arrangement is similar in the 2-story, 3-story, and 4-story sale town houses. These are equipped with furnaces ranging from 64,000 to 126,000 Btu output. Plenum-mounted cooling coils are connected to roof-mounted condensing units ranging from two to five tons capacity.

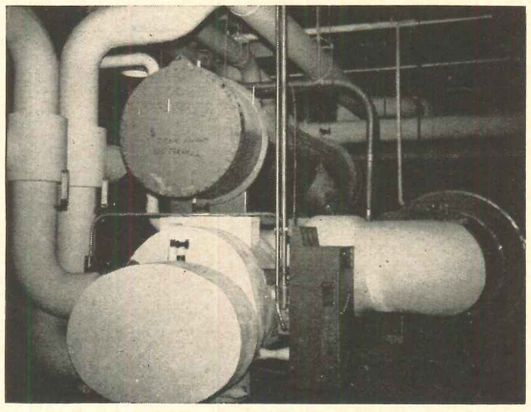
Apartments in each high rise building are served by a two-pipe system with reverse return. Under window fan-coil units and thermostats in each room provide individual temperature control. The units range from 400 to 1,000 cfm. Each living room and one bedroom of two-bedroom apartments has a unit equipped with a fresh air intake for ventilation. There are exhaust fans in each kitchen and bathroom. A large fan-coil unit conditions the lobby of each building.

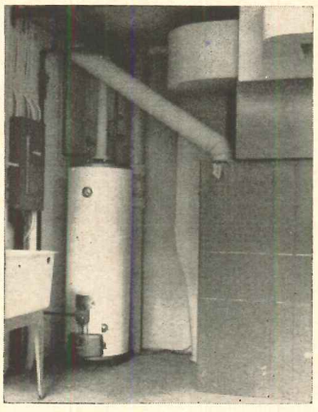
Apartment house corridors are supplied by a roof-mounted fan-coil unit that operates on 100 per cent outdoor air year-round. Exhaust fans pull tempered air through each corridor at about the same pressure as inside the apartments, in conformance with local codes.

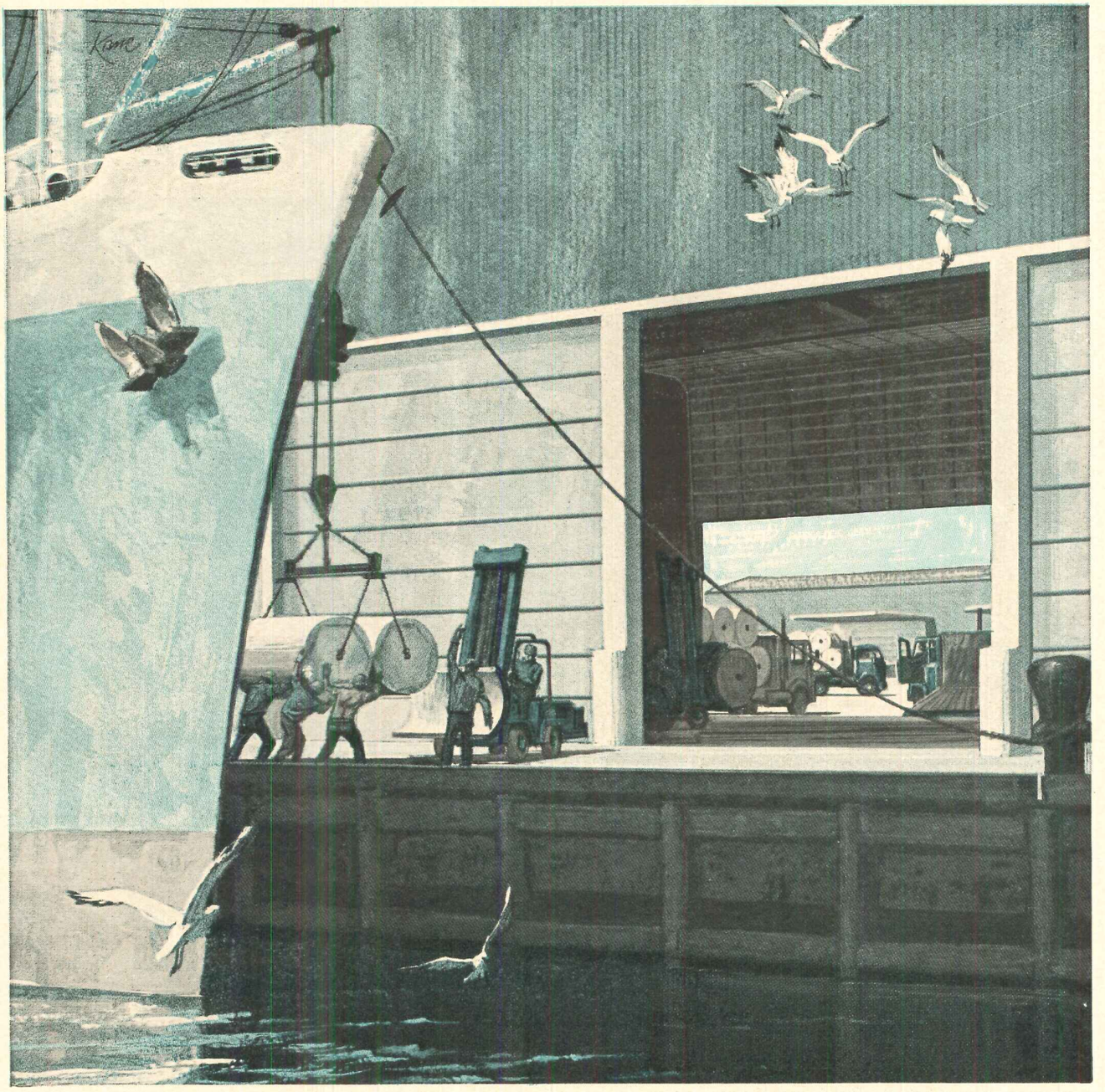
Corridor exhaust air is then pulled down into a crawlspace between the partly exposed, partly glassed-in ground floor and the first occupied floor, thus warming floors in the lower apartments above open outdoor areas. This same air is then used to ventilate storage areas in the basement.



Sale town houses each have their own roof-mounted condensing units. *Below left,* A 750-ton hermetic centrifugal unit in the basement of one of the high-rise buildings provides chilled water for air conditioning the rental units. *Below right,* Gas fired furnaces in the basements of the sale town houses are equipped with cooling coils which are connected to the roof-top condensing units.







City of New York Newsprint Terminal. Architects: Tippetts-Abbett-McCarthy-Stratton

How The "OVERHEAD DOOR" takes the sting out of salt spray and waterfront winds

6 by land. 26 by sea. 32 durable doors in all—specially-fitted to defy the corrosive effects of salt spray whipped by high winds. A big order, but one exactingly met with The "OVERHEAD DOOR" for this City of New York newsprint terminal. And, while covering the waterfront may not be in your present plans, you're sure to sail into some stiff closure problems. When you do, our Architect Design Service can help you solve them.

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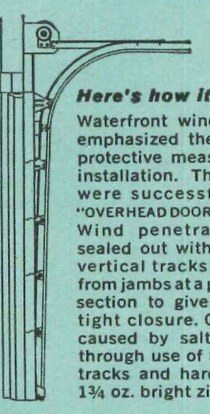
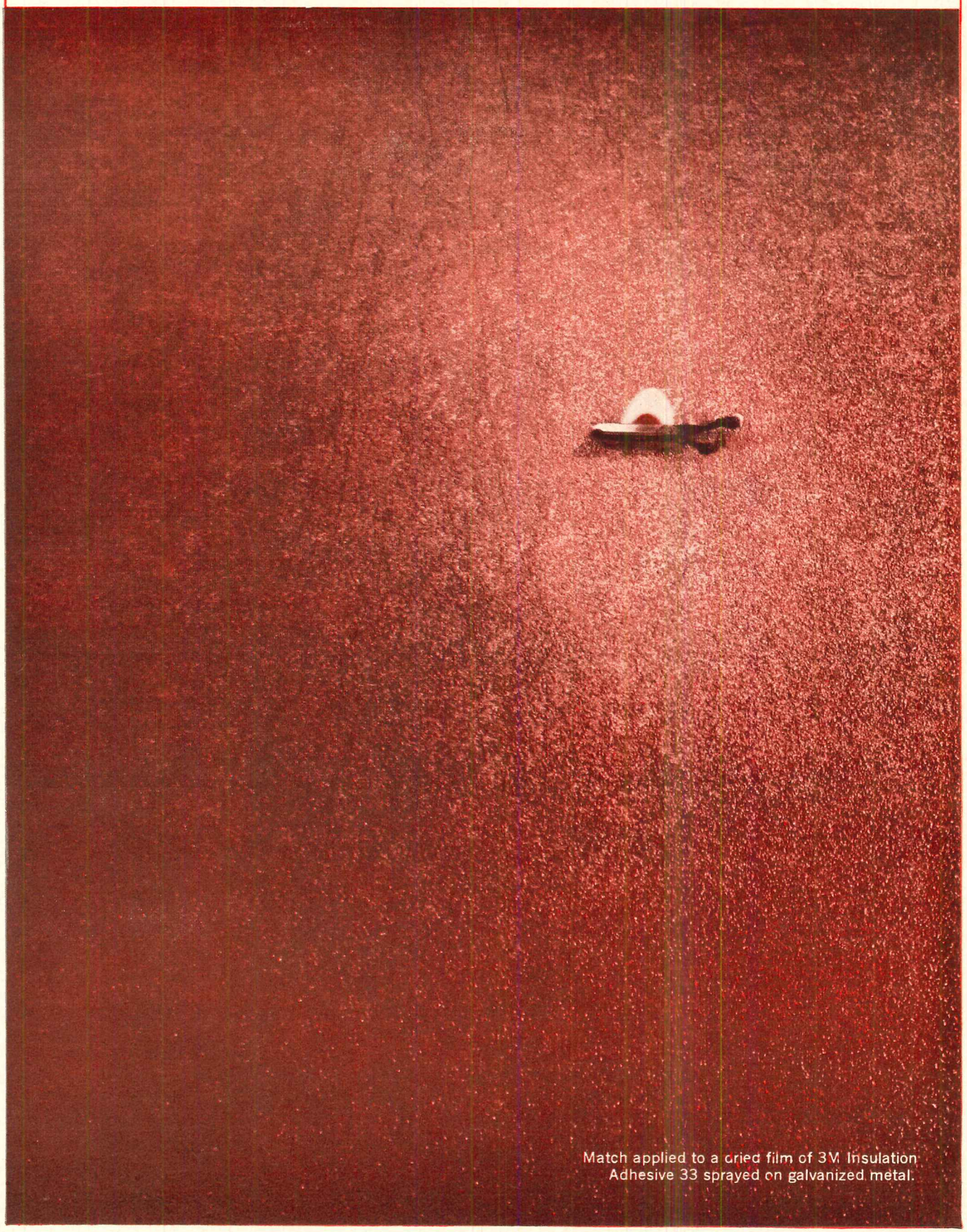


Here's how it was done...

Waterfront winds and salt spray emphasized the need for special protective measures in this huge installation. These requirements were successfully met by The "OVERHEAD DOOR" in 16-gauge steel. Wind penetration completely sealed out with MIRACLE WEDGE®—vertical tracks that incline away from jambs at a pitch of ¼" per door section to give a snug, weather-tight closure. Corrosion damage caused by salt spray minimized through use of Salt Spray Steel®—tracks and hardware coated with 1¾ oz. bright zinc per square foot.

For more data, circle 103 on Inquiry Card

ALL LIT UP AND NO PLACE TO GO!



3M Brand Insulation Adhesive 33 rates zero on flame spread factor when tested against NBFU Standard 90-A ...the first of many reasons for specifying it!

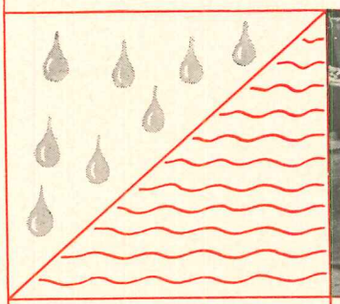
This zero we're proud to brag about. The flame spread rating of 3M Brand Insulation Adhesive 33 (Red) when applied to galvanized sheet metal and tunnel-tested against the National Board of Fire Underwriters Standard 90-A. Zero! The same score as for asbestos cement board! In this same test, Insulation Adhesive 33 rated a modest 3 both for smoke density and as a fuel contributing factor. Fact is . . . you won't find any rival insulation adhesive that equals these low scores.

Results of test conducted in accordance with ASTM E 84-61

	Insulation Adhesive 33	Maximum accepted limits
Flame spread factor	0	25
Fuel contributed factor	3	non-propagating
Smoke density factor	3	50

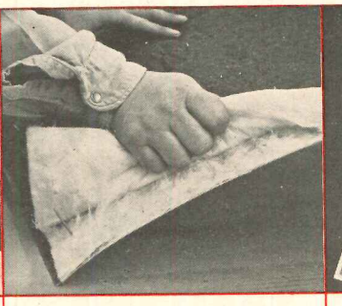
And you won't find any rivals that compare in performance, ease and economy of application. Nubby spray texture, as shown in photograph, provides thousands of tiny dots of adhesive that penetrate into the insulation, grab hold for keeps. This spray pattern, plus high solids content, assures uniform high strength throughout bonded surfaces. Low-pressure spraying with Insulation Adhesive 33 cuts application time 10 to 1 over brushing, 5 to 1 over roll-coating.

Check the additional advantages below, then send for complete data on new, improved Insulation Adhesive 33 and the full line of insulation adhesives and duct sealers from 3M—originators of low-pressure sprayable insulation adhesives. Write 3M AC&S Division, Dept. SBD-105, St. Paul, Minnesota 55119.

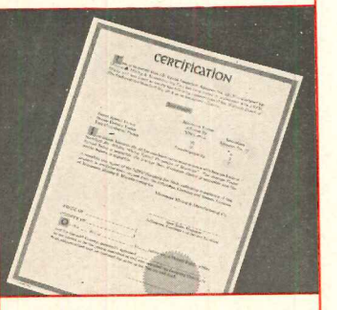


FULL-RANGE HUMIDITY, TEMPERATURE RESISTANCE. Insulation Adhesive 33 withstands high pressures, high velocities in ducts carrying both air conditioned and heated air. Long-term resistance to high humidity in temps from −20 to +250° F.

HIGH COVERAGE, MINIMUM LABOR! Using 3M-recommended spray system, a gallon of Insulation Adhesive 33 effectively bonds about 600 square feet of duct liner. Open time of 5 to 7 minutes permits spraying large areas quickly, conveniently.



IMMEDIATE TACK. Right-now strength. Here, just seconds after the bond was completed, the insulation delaminates, but the adhesive holds tight. It continues to hold tight even after extensive aging at high temps, does not become brittle.



CERTIFICATION ON REQUEST! 3M will be glad to provide signed certifications that Insulation Adhesive 33 satisfies the requirements of NBFU Standard 90-A wherever desired to fulfill job, architect or code requirements.

Adhesives, Coatings and Sealers Division 3M COMPANY

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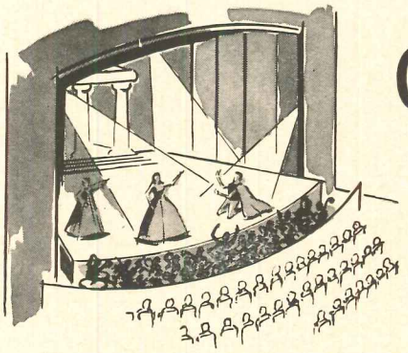
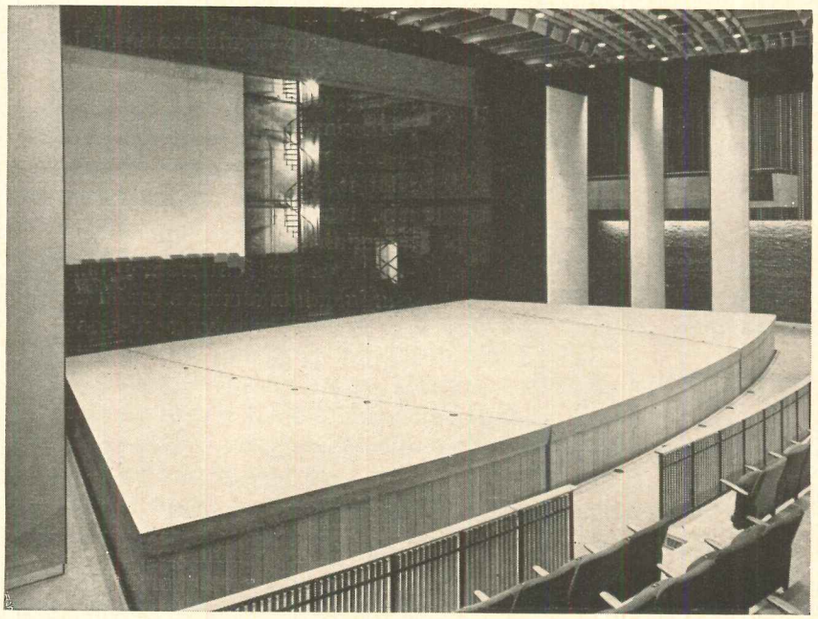
Stage Lifts



Orchestra Pit Lifts

Organ Lifts

Special Theatrical Lifts



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A GUIDE TO THE USE OF ACRYLIC PAINTS

*By Gerould Allyn**

PART 1: Paint Composition, Definitions, Types

First introduced 12 years ago, acrylic latex paints have evolved to a position of importance in both exterior and interior applications as architectural finishes. These paints—formulated from water-dispersible acrylic resins—are in the latex or emulsion family of the so-called "water-base" paints.

Latex paints—based on synthetic resins dispersed in water—were developed following World War II.

Previously the only water-base paints were casein paints, and the emulsion oil paints (containing alkyd resin and water) which were developed shortly before the War. Latex paint containing butadiene-styrene, introduced in 1948-1949 in the U.S., was known as rubber base paint and marketed almost exclusively to the consumer.

However, the early butadiene-styrene latex paints lacked the rugged properties needed for commercial and institutional service. The resin forms the binder of latex paint and it is the binder which produces the film—the backbone of the paint coating. In the late '40's and early '50's there was much research in the chemical industry to develop improved binders which would upgrade the adhesive and aging properties of latex paints and increase their toughness for better "scrubability." Not only were improved butadiene-styrene binders developed but also entirely different types of latex binders.

Several years after the introduction of the first butadiene styrene latex paints to the consumer home market, the latex paints began to be used in exterior masonry work, primarily because of their good alkali resistance. On the West Coast, polyvinyl acetate—which had originally been developed in wartime Germany—was introduced as a masonry paint. P.V.A. interior wall primers and sealers also became popular.

At about the same time, early in 1953, a new type of water-thinned latex paint—the acrylic resin emulsion type—was introduced by paint manufacturers. These paints made recoating possible in 30 minutes and provided unexcelled color retention. Acrylic emulsion paints also gave outstanding resistance to alkali and excellent durability out-of-doors, particularly on masonry surfaces. Water-based house paints for exterior wood surfaces were in use by 1957, many of them newly developed acrylic emulsion types.

A universal advantage of water-based paints, the elimination of the fire hazard and potential toxicity of organic solvents, also stimulated their introduction in industrial applications.

What the Labels Mean

Water-base, water-thinned, aqueous and other general terms are often used to refer to paints containing water. They can be misleading when used without further description. To avoid confusion, it will be helpful to define three distinctly different types of water-base paint: (1) *latex or emulsion* paints made with synthetic resins, such as acrylic, polyvinyl acetate or butadiene-styrene resins; (2) *emulsified oils or alkyds;* and (3) *water-soluble oils or alkyds.* Because these types refer to the binder component of paint, let us briefly discuss paint composition first and then go on to definitions.

The two basic ingredients in paint are the *pigment* and the *vehicle* (containing binder and thinner). The *pigment,* consisting of small particles of opaque materials, gives the paint its color and hiding power, and helps protect the paint film (or binder) from deterioration. Hiding power, referring to the ability of the paint to obscure a surface—varies with the color and amount of the pigment. Extender pigments, frequently used in conjunction with the opaque pigments, have little hiding power, but can aid in developing low sheen, improved flow, reduced pigment settling or other desirable properties.

The *vehicle* is the liquid portion of the paint and contains two basic components—the *thinner* and the *binder.* The *thinner* is the volatile component which evaporates leaving behind the solid paint film. It reduces the viscosity of the paint so that it can be spread on easily and uniformly. In the solvent-base paints, the thinners are organic materials, such as turpentine, mineral spirits and naphtha. The water-base types, including latex paints, are thinned with water.

The *binder* is the non-volatile component of the vehicle. It has the important functions of binding the pigment particles into a uniform paint film and adhering to the surface painted. The nature and amount of the binder determines most of a paint's important service properties —washability, toughness, adhesion and aging stability. In solvent-thinned paints—linseed oil, soya oil, dehydrated castor oil and alkyd resins made from these oils are commonly used binders. The three major binders for synthetic emulsion paints, as mentioned previously, are butadiene-styrene, polyvinyl acetate and acrylic resins. New binders made with oil or alkyd emulsions have come onto the market in recent years.

The latex and emulsified oil or alkyd paints consist of particles of binder dispersed in a water vehicle. An *emulsion* or *latex* can be defined as dispersion of organic resin particles within an aqueous medium.

In *water-soluble* paints, oil or alkyd type binders are used with surfactants and organic solvents to produce

*The author is with the Coatings Department of Rohm & Haas Company, Philadelphia, Pennsylvania.

paints which can be reduced or thinned with water. These are not latex paints.

How the Film Forms

In water-soluble paints, individual polymer or resin molecules separated by molecular dimensions are surrounded and plasticized by the water-solvent system. Upon evaporation of the solvent, the shrinking system compacts and forms a film, which then must oxidize in order to dry.

In contrast, the latex and emulsified oil or alkyd paints are not homogeneous on a molecular scale. As manufactured, resin emulsions are usually fully polymerized molecules of high molecular weight. They consist of a separate polymer phase in the form of individual spheres dispersed in a liquid medium. Achievement of a resin film, without voids, depends ultimately upon deformation of these spheres.

The polymer particles, prior to deformation, form a close-packed phase with water filling the voids of this spongy structure. As the water continues to evaporate, "capillary pressure" is exerted to deform the spheres in a direction perpendicular to the water-particle interface. In a sense, the deforming polymer fills the space vacated by the water which moves to the surface where it is lost by vaporization.

The factors which affect film formation are time, temperature, relative humidity, porosity of the substrate, particle size, quality of the dispersion and chemical composition. These factors are taken into consideration by paint manufacturers in their design of latex paints.

Water-Base Paints Compared

The *water-soluble* type has the advantage of simple formulation and ease of manufacture, good film continuity, high pigment binding, good gloss, and stability. However, most water-soluble paints are slow to dry and not very water-resistant for a number of days after application.

Alkyd emulsion and *oil emulsion* types are intermediate in their properties between the latex types and the water-reducible types.

Other water-base paints have not achieved the major importance of the latex paints which have shown astounding growth, due primarily to the application advantages of the latex paints. In general, the advantages of *latex paints* include ease of application and clean-up, good leveling, rapid air drying and development of washability, low odor, good color retention and durability. Latex paints, of course, also have certain limitations.

Because emulsion paints contain water, it is necessary to formulate them to give protection against freezing. Most emulsion paints on the market today can withstand freezing but in general such paints should be protected against freezing.

Emulsion paint films are somewhat permeable and while this is an important advantage, it can be a disadvantage in certain cases. These films "breathe," allowing moisture vapor to pass through.

The latex and resin emulsion paints show less penetration on porous surfaces than solvent paints. Low penetration can cause difficulties on poorly prepared surfaces. For example, old chalky or dirty paint surfaces should be cleaned to avoid premature failure due to lack of penetration at the chalky interface.

While it has for a long time been considered difficult to produce gloss paints from water-dispersion systems, recent break-throughs have been made in this area with acrylic emulsions. At this time such paints are recommended for interior use only.

Interior Acrylics

An acrylic resin emulsion for the manufacture of interior water-based paints and primer sealers was first introduced in January, 1953. This represented a major breakthrough in paint technology. In the emulsion was a tough, flexible acrylic polymer-color retentive and resistant to alkali, moisture and ultra-violet light. In the same year, acrylic interior paints and primer sealers, based on the new emulsion, with fast, dry, easy application properties, minimum odor and excellent durability were on the market.

These interior paints proved particularly useful on porous, alkaline surfaces such as plaster, cinder block, concrete and dry-wall construction. The acrylic latex paints provided tough, non-glossy, adherent, washable coatings.

In the fall of 1964, a new acrylic emulsion designed for interior wall paints was introduced. It is the first emulsion paint vehicle to combine superior flow and leveling properties with outstanding adhesion to old painted surfaces, to provide the best possible formulation of top quality semi-gloss, thixotropic (gelled) and other flat formulations. Semi-gloss paints made with this vehicle exhibit excellent gloss uniformity, at minimum brush wash—properties that have hitherto been difficult to obtain in emulsion paints.

Acrylic emulsions are used in a great many different types of interior surface coating formulations. These range from clear and pigmented primers and sealers to tint bases and topcoats in white, light tints and deep tone colors.

Exterior Acrylics

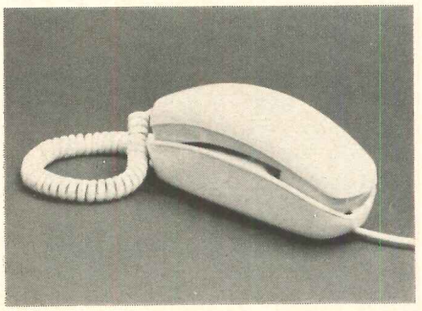
The acrylic latex paints developed early in 1953 were found to be ideally suited for masonry surfaces.

The acrylics were easily applied over rough masonry surfaces, giving excellent holdout and uniform appearance. Their alkali resistance was so good that the paint could be used over damp, new masonry surfaces. Moreover, these new coatings had excellent color retention, resistance to outdoor weather conditions and adhesion to either new or previously painted masonry. Acrylic emulsion paints have shown unusually good resistance over the years to the effects of rain, frost and sunshine.

In late 1958 and early 1959, water-base latex paints began to gain widespread acceptance for a new application—exterior wood. The majority of these paints were made with acrylic emulsions—either 100 per cent acrylic or with some modification such as acrylic-polyvinyl acetate copolymers. Paints based on butadiene-styrene latices were not used for this application because of their poor adhesion to bare wood. The acrylic paints were soon firmly established as outdoor coatings for wood surfaces, but at that time an oil primer was recommended as a basecoat on both new wood and for repaired wood.

In 1961, a new 100 per cent acrylic emulsion polymer, designed specifically to be used as a vehicle in paints for exterior wood, was introduced. The new emulsion retained the advantages of the earlier acrylic emulsion while imparting improved adhesion properties to paints used on outdoor wood surfaces. Oil primers are not needed either for base wood or for repaint work.

For more information circle selected item numbers on Readers Service Inquiry Card, Pages 319-320

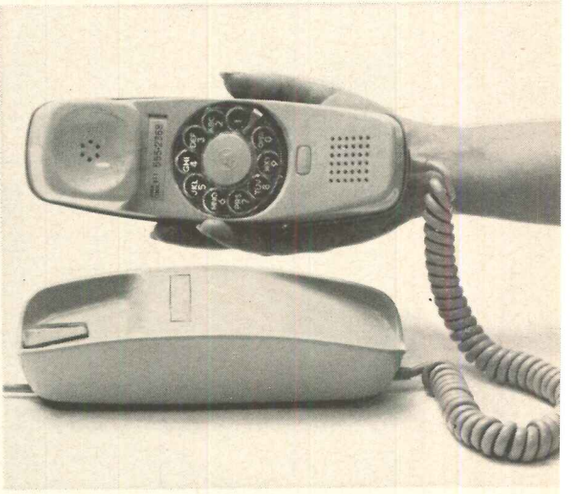


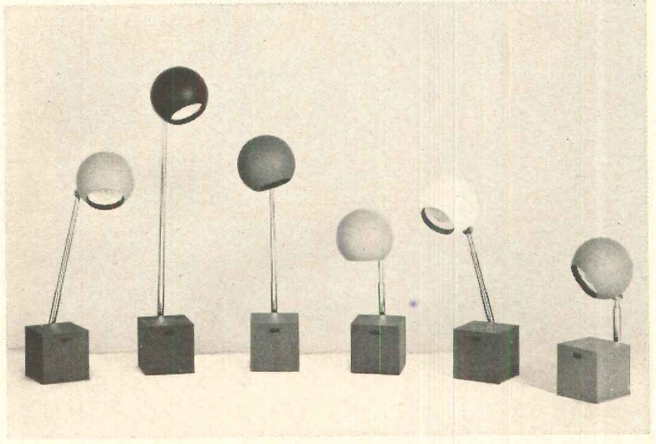
A DIAL IN THE HAND

By setting the dial in the handpiece, which in turn fits neatly into the base when not in use, the designers of this compact telephone have enabled the dial, receiver and transmitter to be completely concealed when the phone is not being used. The resulting clean-looking design makes this the first telephone to be selected by the Museum of Modern Art for its Design Collection.

A recall button placed next to the dial, enables the line to be cleared between calls and any number of calls to be placed without the need to reach to the base of the instrument. The new *Trimline* phone has a base measurement of only 3 ins by 8 ins and takes up less than half the space required by conventional phones. *Bell System, American Telephone and Telegraph Company, New York City*

CIRCLE 300 ON INQUIRY CARD





HIGH INTENSITY LAMP HAS FLEXIBILITY OF SIZE AND USE

Designed by Michael Lax, Lightolier's new *Lytegem* high intensity lamp has considerable flexibility in use. With a retracted height of only 6 ins, but a polished chrome telescoping arm which gives it an extended height of 14¾ ins., the lamp can fit into small places to give concealed lighting effects, or can be used as a desk, tabletop spot or surface light. The extreme mobility of the shade allows further flexibility in directing the beam of light. When the lamp is extended, a sliding counterbalancing device, permits the shade arm to be positioned at extreme angles. A wall-mounting attachment is also available. The 3-inch shade with 2-inch aperture is provided with a black Multigroove anti-glare band inside. *Lightolier, Jersey City, N.J.*

CIRCLE 301 ON INQUIRY CARD

CUBES FOR EVERYTHING

Multi-Cube storage units in walnut, teak, or rosewood can be used in a wide variety of floor-standing, stacked and wall-hung combinations. The units can be stacked vertically or horizontally, and can be used to give additional room seating, or as file cabinets, room dividers, end tables or open chests. Designed particularly for the audio furniture market, the *Multi-Cube* system has unrestricted air circulation on all sides and is available with a wide range of fittings for speakers, turntable, electronic equipment, tape recorder and record storage. Speaker units can be supplied on rotating bases if desired. Dimensions of the cube are 24 ins. wide, by 17 ins. high, by 21 ins. deep. *Toujay Designs, Inc., New York City*

CIRCLE 302 ON INQUIRY CARD

more products on page 248

For gymnasiums, stages, shop floors, bakeries, manufacturing plants

Robbins LOCK-TITE is an improved mechanically-fastened wood floor system at lower cost. Dimensional stability results from completely integrated design of 33/32" MFMA Northern Hard Maple flooring locked into steel channels anchored to slab. Asphalt-impregnated insulation board isolates the slab, improves rebound action through more uniform resilience, and reduces sound transmission. All installations of LOCK-TITE Floors are made and jointly guaranteed by Robbins and authorized Robbins floor contractors throughout North America. Mail coupon for complete data.

ROBBINS FLOORING COMPANY
Dept. AR-1065
White Lake, Wisconsin 54491

☐ Send complete information on the Lock-Tite floor system
☐ Advise name of authorized installer in this area

Name_____

Firm_____

Address_____

ROBBINS flooring company BRUCE®
Subsidiary of E. L. Bruce Co.

For more data, circle 106 on Inquiry Card

For more information circle selected item numbers on Reader Service Inquiry Card, pages 319–320

LIGHT AND INTERIOR FINISHES

The importance of considering the colors and reflectances of sidewalls, ceilings and floors when planning a lighting system is emphasized in a new technical publication. A two-page reflectance value chart in color presents figures for the percentage of light reflected from a wide variety of wall colors, laminated plastic and wood finishes, chalkboards and desk tops. The booklet shows how this chart may be used to achieve efficient lighting without visual discomfort. The importance of the color of light sources is also discussed, and specific recommendations are made for reflectance values in various areas of office, school, factory and home. *General Electric, Large Lamp Dept., Nela Park, Cleveland, Ohio**

CIRCLE 400 ON INQUIRY CARD

PERFORATED MATERIALS

A 60-page publication lists, describes and illustrates more than 200 patterns in perforated metals and other materials. The catalog also includes information on design, how to order, and suggests a wide range of applications. Materials covered include mild and alloy steels, copper and copper alloys, bonded, clad and plated metals as well as wood and paper products, plywood and plastics. *Charles Mundt and Sons, Jersey City, N. J.*

CIRCLE 401 ON INQUIRY CARD

ARCHITECTURAL APPLICATIONS OF HEAVY DUTY PLATE GLASS

A loose-leaf folder designed to give information on the use of heavy duty plate glass in contemporary buildings, contains five four-page inserts, each one dealing with the use of this glass in well-known buildings throughout the country. In addition to a color photo and description of the building, each insert contains sectional drawings of the glazing details. The folder also contains a strength test chart to enable architects to determine the correct glass thickness. *Public Relations Dept., Libbey-Owens-Ford Glass Company, Toledo, Ohio**

CIRCLE 402 ON INQUIRY CARD

NOISE CONTROL SYSTEMS

Structural systems designed to meet increasing noise control problems in residential, commercial and institutional buildings are covered in a new manual, entitled "Sound Advice." Cut away drawings, detailed material lists, sound and fire test ratings and technical data on methods of isolating and controlling sound are included in the brochure. Wood, steel, and gypsum stud construction is covered as well as double and triple solid partitions. A partition selector guide lists types of wall construction needed to meet various decibel levels and degrees of sound control desired. A glossary of terms is printed on the inside back cover. *Georgia-Pacific Corporation, Portland, Ore.**

CIRCLE 403 ON INQUIRY CARD

USES OF PARTICLEBOARD

A "Design and Use Manual" gives details of the properties and uses of mat-formed wood particleboard. The 14-page brochure has sections which deal with its applications in the architectural, home construction, and furniture manufacturing fields. A chart is given which lists the physical properties of various types of particleboard. *National Particleboard Association, Washington, D. C.*

CIRCLE 404 ON INQUIRY CARD

DOORS, WALLS AND PARTITIONS

Three new brochures give details of the company's modular interior wall, and modular partition systems as well as its range of honeycomb core aluminum, steel and plastic-faced doors. The booklets contain details, drawings and product descriptions. *United States Plastics, Inc., North Miami, Fla.*

CIRCLE 405 ON INQUIRY CARD

DUPLICATING PROCESSES

Applications and equipment for all major duplicating and copying processes are illustrated and described in a 16-page brochure. Included are mimeograph, offset, fluid duplicating and high speed electrostatic printing. *A. B. Dick Company, Chicago, Ill.*

CIRCLE 406 ON INQUIRY CARD

CERAMIC TILE

The full range of *Vico* ceramic tile is on display in a comprehensive, well illustrated color catalog. Glazed and unglazed floor and wall tiles in a wide variety of colors, patterns and applications are included in the brochure. *Amsterdam Corporation, New York, N. Y.*

CIRCLE 407 ON INQUIRY CARD

PARTITIONS IN REINFORCED CONCRETE STRUCTURES

As a result of research into the way in which partitions in reinforced concrete buildings are damaged by structural movement, National Gypsum has developed a new flexible partition construction, based on the "control joint." In control joint construction, the core or framing of a partition is erected to allow horizontal and vertical movement of the structure without stressing the partition facings. The partitions are isolated from the adjoining structural elements by a compliant material such as caulking compound or vinyl foam.

A new technical bulletin has been issued which gives detailed drawings to show control joint application in a range of partition systems. The systems include Holostud, screw stud, and nailable steel stud framing with both plaster and drywall. *National Gypsum Company, Buffalo, N. Y.**

CIRCLE 408 ON INQUIRY CARD

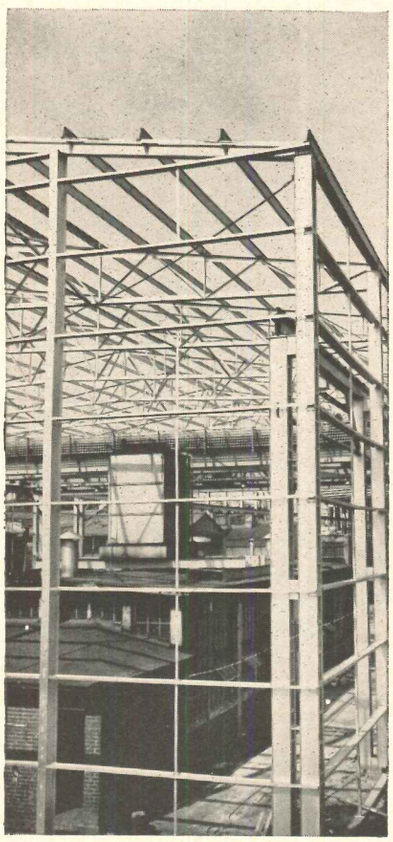
EFFECTS OF THERMAL SHRINKAGE ON BUILT-UP ROOFING

This new monograph, no. 89, price 10¢, by William C. Cullen, explains how thermal movement of built-up membranes can cause failure in built-up bituminous roofs in both hot and cold climates. The author describes laboratory tests for determining the amount of such movement and also makes suggestions for reducing maintenance, repair and replacement costs resulting from premature roof failure. *U. S. Department of Commerce, National Bureau of Standards, Washington, D. C.*

CIRCLE 409 ON INQUIRY CARD

**Additional product information in Sweet's Architectural File*

more literature on page 264



J&L lightweight structural steel used by Holston Steel Structures, Inc., Bristol, Tennessee, reduced the steel weight in the composite crane and building columns by 26 tons.

SYMBOL OF STRENGTH, LONG LIFE AND ECONOMY

You don't have to "put up" with J&L lightweight structurals just because everybody else does

We can give you some much better reasons.

Putting up a building with J&L lightweight structurals solves a lot of architectural and construction problems. More important, it prevents them. That's why you'll find them used so widely, wherever you go.

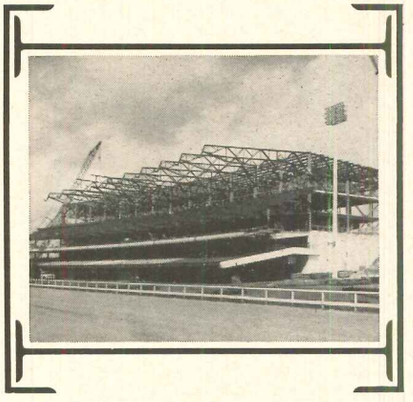
Light weight means minimum dead loads, therefore important savings in structural support and foundations. It also makes possible faster, easier construction, requiring less manpower . . . and man hours.

Flexibility? J&L lightweight structurals are available in high strength grades, too, so you can choose from several carrying capacities within each beam size.

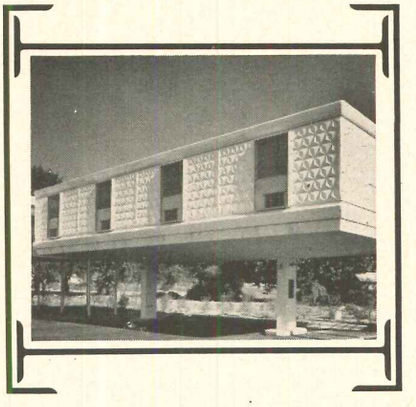
Simplicity? There are fewer pieces to handle when you use maximum length lightweight structurals as continuous members. And simplified end connections keep fabricating requirements to the barest minimum.

Versatility? Architects enjoy an unusual degree of design freedom when they work with J&L lightweight structurals, since they are compatible with other building materials.

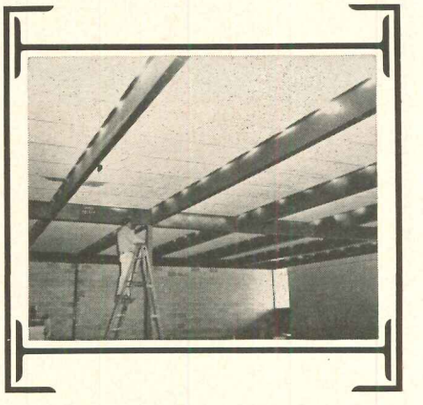
Check into these and other advantages of J&L lightweight structurals. When all the facts are in, we're sure you'll "put up" with nothing less!



Florida race track grandstand roof, designed to withstand 72 lbs. per sq. ft. uplift, uses J&L lightweight structurals provided by Peden Steel Company, Raleigh, North Carolina.



Holiday Inn Jr. Motel, Memphis, Tennessee, has a J&L lightweight structural framework to resist deflection both for cantilever loading when in place and for over-the-road hauling.

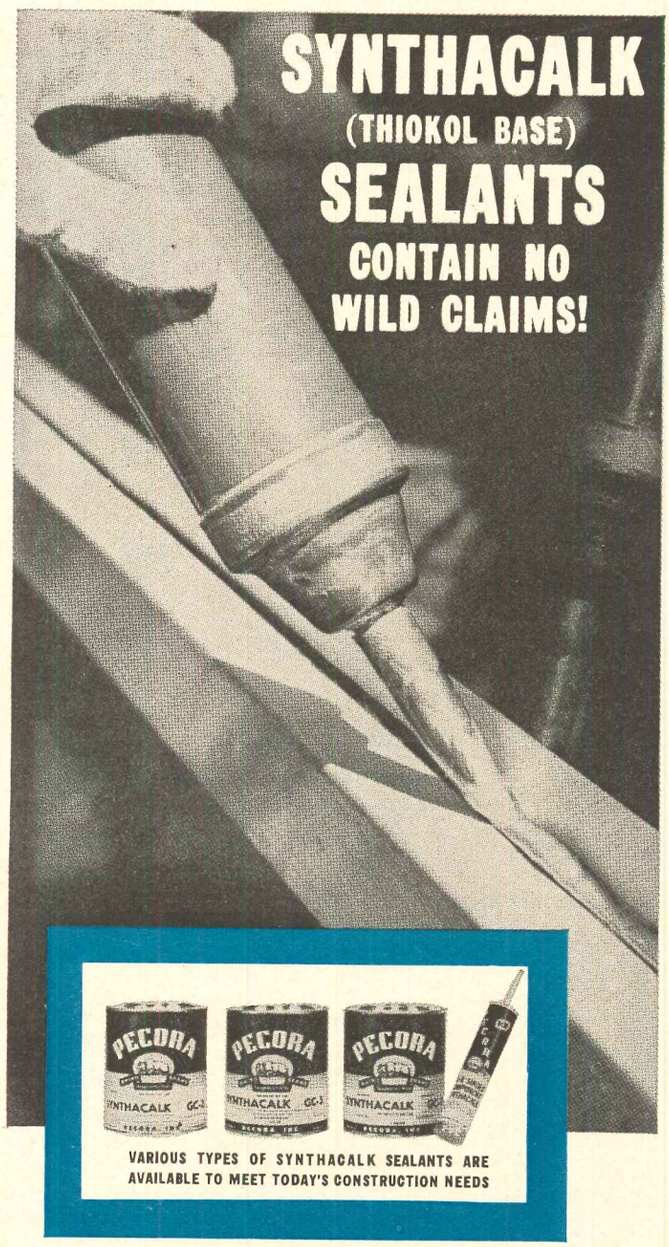


These exposed J&L lightweight structurals, fabricated by Ray Steel Company of Fort Worth, Texas, for the Eagle Mountain-Saginaw Junior High School blend in with the interior decor.

Jones & Laughlin Steel Corporation
3 Gateway Center, Pittsburgh, Pennsylvania 15230 J&L STEEL

For more data, circle 107 on Inquiry Card

PECORA



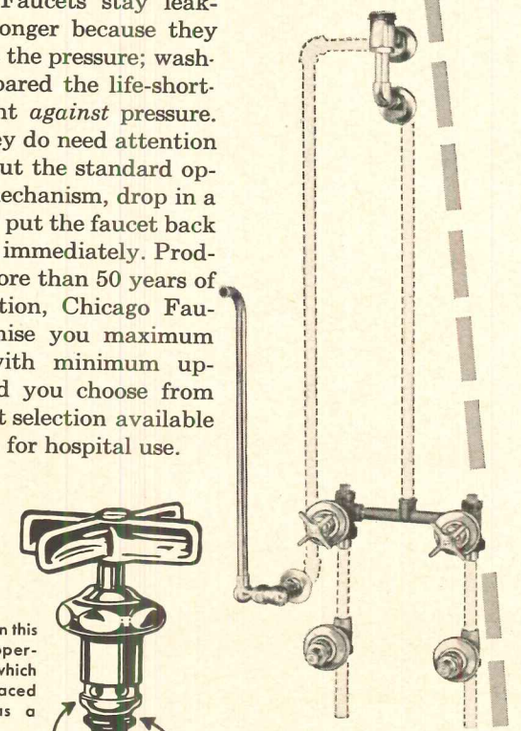
The basis of our reputation as a leading construction sealant manufacturer rests on giving truthful facts. Pecora Synthacalk contains no wild claims . . . just plain excellent Thiokol Polysulfide Base sealant formulation. It **will not perform satisfactorily** when applied over water, frost, dust, etc. **But,** it **will** give the best adhesion, cohesion, elongation and maximum years of trouble free performance possible when applied in a properly designed, clean and dry joint. What more could you ask for in a sealant job? Get the true facts and application instructions. Write today. **Pecora**

Pecora, Incorporated / Over 100 years of Quality Products for the Building Industry
300-400 W. Sedgley Ave., Philadelphia, Pa. 19140; Oakland Avenue, Garland, Texas.

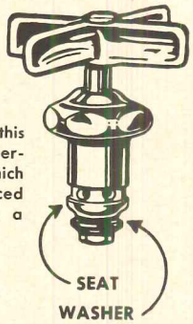
For more data, circle 108 on Inquiry Card

Why Chicago Faucets ask less "*time-out*" for repairs

Operating records prove it. Chicago Faucets stay leak-free far longer because they close *with* the pressure; washers are spared the life-shortening fight *against* pressure. When they do need attention just lift out the standard operating mechanism, drop in a spare and put the faucet back in service immediately. Products of more than 50 years of specialization, Chicago Faucets promise you maximum service with minimum upkeep. And you choose from the largest selection available of faucets for hospital use.

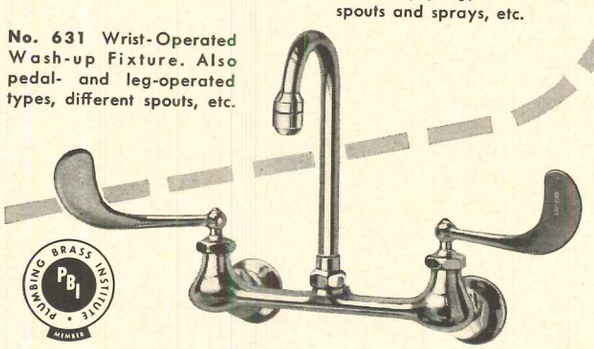


The secret's in this standard operating unit which can be replaced as easily as a light bulb.



No. 904 Bed Pan Flusher with integral vacuum breaker. Others with concealed piping, different spouts and sprays, etc.

No. 631 Wrist-Operated Wash-up Fixture. Also pedal- and leg-operated types, different spouts, etc.



PLUMBING BRASS INSTITUTE PBI MEMBER

The Chicago Faucet Co.
2100 S. Nuclear Drive, Des Plaines, Ill.
(A suburb of Chicago)

HERE'S HELP—
If you buy or specify faucets for hospital use write for complete catalog . . . or new Sketch Book of engineering data on special faucets.

CHICAGO® FAUCETS
Last As Long As the Building

Distributed through the plumbing trade exclusively

For more data, circle 109 on Inquiry Card

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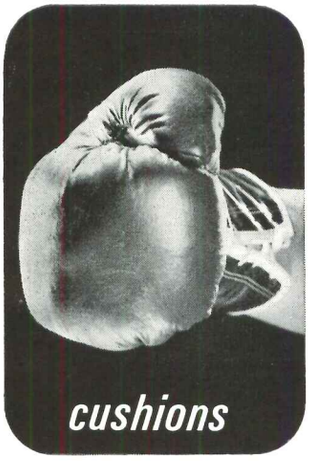
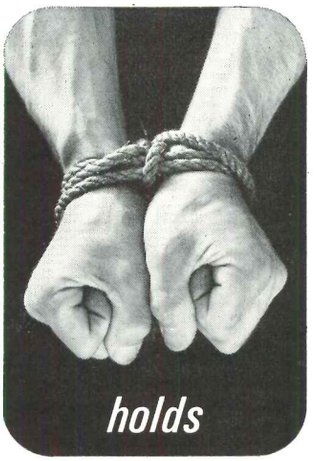
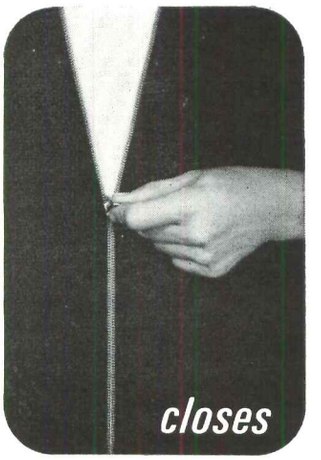
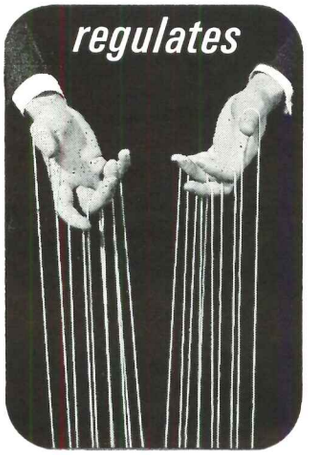
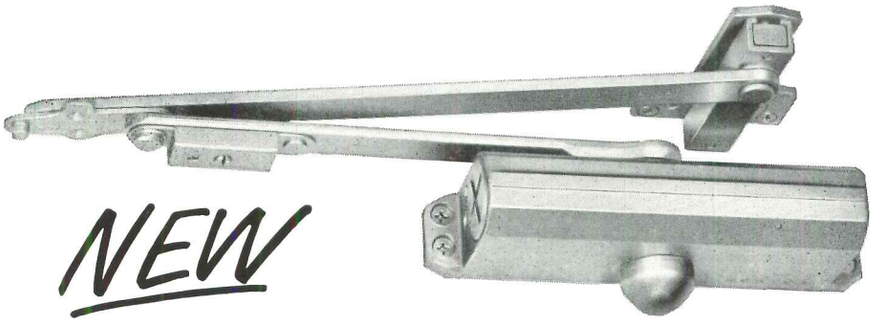






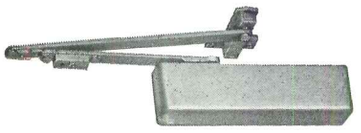
ALL FIVE DOOR CONTROL FUNCTIONS IN A SINGLE UNIT



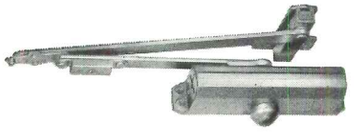


NEW

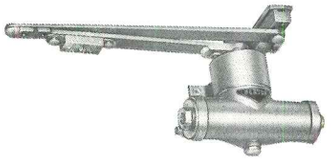
Norton Series 6100 Uni-Trol Door Control



Series 6110



Series 6120



Series 6130

A DOOR CLOSER AND A DOOR HOLDER—
A SINGLE UNIT ENGINEERED AND COORDINATED
TO PERFORM COMPLETE DOOR CONTROL

CUSHIONS the opening of the door; STOPS the door;
HOLDS the door open; CLOSES the door;
REGULATES the door closing and latch speed.

ATTRACTIVE DOOR APPEARANCE

You eliminate the necessity of two products at the door. Norton Uni-Trol, unitized door control, is an attractive single unit. There's only one installation at the door for a more esthetic, uncluttered appearance.

SIMPLIFIED SPECIFICATION

You only have to specify one product. You have only one catalog number and only one template to be concerned with. You completely eliminate the possibility of the mix-up of installing the wrong holder with the wrong door closer.

COMPLETE CONTROL

The coordinated control obtainable only with the Norton Uni-Trol assures perfect control under all conditions. Since the combined door holder and door closer are functioning as a unit, there's less strain on each, far less strain on the door and frame.

For complete details, write for Manual "U", or contact your Norton representative.

1106

NORTON® DOOR CONTROLS

372 Meyer Road, Bensenville, Illinois 60106

For more data, circle 111 on Inquiry Card

For more data, circle 112 on Inquiry Card ➔

W. Bill Ltd. of Bond Street

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DIRECTORS:
A. M. BILL, B. W. BILL, G. D. BILL, D. B. BILL, E. A. BARRINGTON, A.C.A.
SECRETARY: J. F. SOWARD

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Exclusive Tweeds
Worsted suitings and Cashmeres
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REF. MAIL ORDER DEPT RH/RJR

13th October, 1964.

Messrs. KNOLL ASSOCIATES, INC.,
320, Park Avenue,
New York, N.Y. 10022,
U.S.A.

Dear Sir,

Thank you for your letter of the 6th October which we have received today.

Please be assured that we have not forgotten about you. We have only one weaver making this cloth. He is rather more of an artist than a practical man and he has an artists temperament. In other words he makes the colours that he wants to make and not necessarily the colours we want to have from him, and if it is a nice day he will go fishing or shooting leaving the weaving for another day. You will agree that this is not very business-like and from our point of view it is impossible, but the fact is that if we want this cloth, which we do very much, we just have to put up with it.

From past experience we would say that it is no use our asking him to submit patterns of his future colourings as he will be unable to tell us what these are to be. The sort of thing that happens is that we get a letter from him saying that yesterday he saw a piece of rock covered with Lichen in a most beautiful colour. Sure enough in a few weeks we will get a Brown/Green mixture tweed of this colouring and this is what we mean when we say that he is an artist rather more than a weaver.

With the colder winter weather approaching perhaps this man will get down to doing some work to keep himself warm, we can only hope.

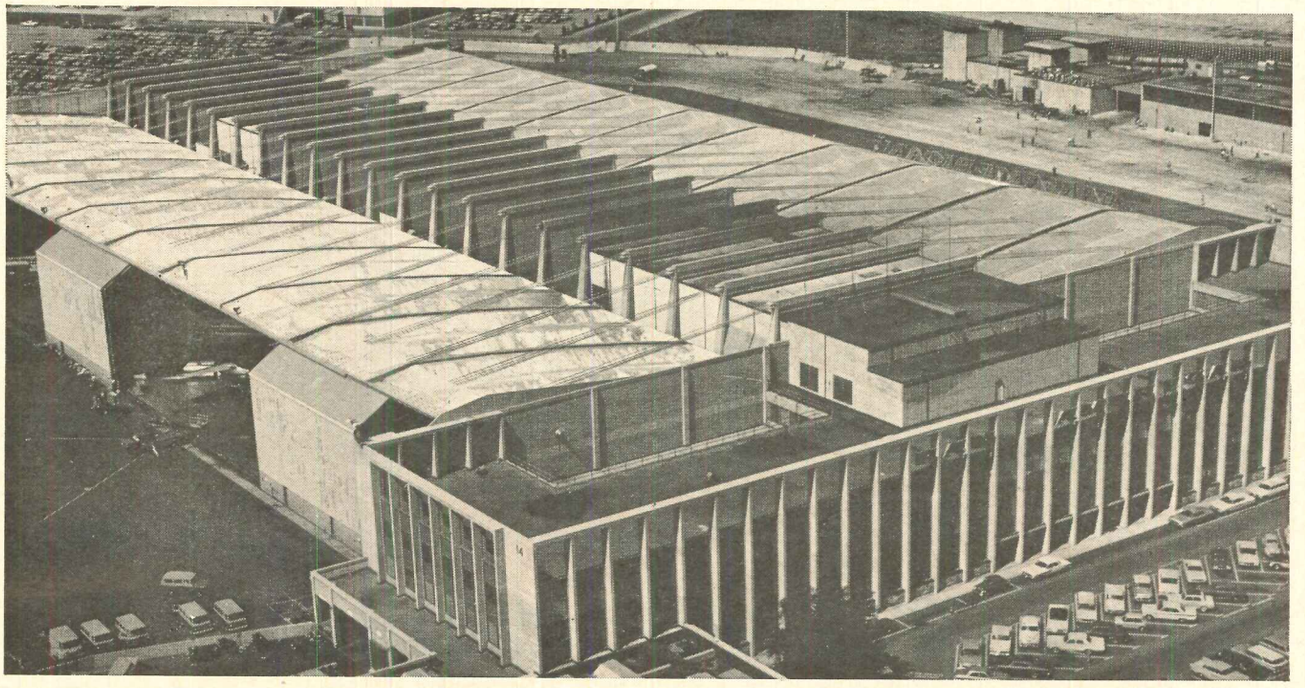
Yours sincerely,
for W. Bill, Ltd.

Hammett

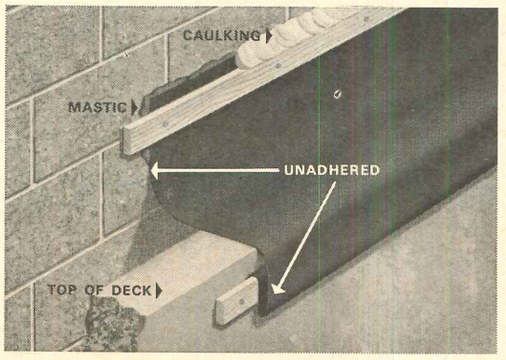
IT'S WORTH WAITING FOR A GOOD CATCH

KNOLL ASSOCIATES, INC., 320 PARK AVENUE, NEW YORK. FURNITURE AND TEXTILES

Showrooms in: Atlanta Boston Chicago Cleveland Dallas Detroit Los Angeles Miami Philadelphia St. Louis San Francisco Seattle Washington, D.C. • International: Argentina Australia Austria Belgium Brazil Canada Finland France Germany Greece India Iran Italy Mexico Netherlands Norway Philippines Spain Sweden Switzerland Tunisia Uruguay Venezuela



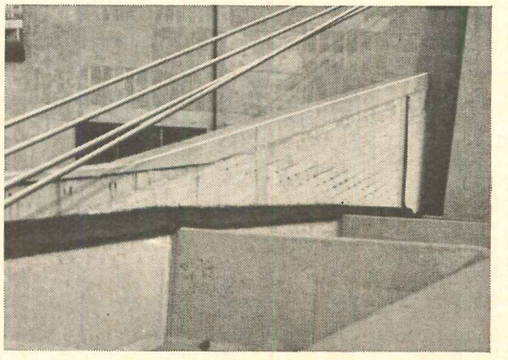
FLOATING ROOF CREATES WATERPROOFING PROBLEM...



TOP: Pan American Airways Hangar 14, John F. Kennedy International Airport, Jamaica, N. Y.

LEFT: Unadhered loop of BFG Flashing, mechanically fastened at top and bottom, spans gap between roof and wall to allow for movement.

RIGHT: The finished job . . . neatly installed and completely watertight regardless of movement.



BFG FLEXIBLE VINYL FLASHING SOLVES IT!

Shown here is one of Pan Am's Hangars at Kennedy International Airport. Its roof, covering nearly five acres, is of folded plate design, suspended by steel cables anchored to center columns. To accommodate anticipated movement, a six-inch opening was provided between deck ends and adjacent walls, creating a hard-to-flash area.

The original flashing, which failed after two years, was replaced with BFG FLEXIBLE VINYL FLASHING. This installation has been completely satisfactory and even now shows no evidence of deterioration. It's easy to understand because BFG Flashing is extra tough, flexible over a wide temperature range and weathers extremely well.

The same desirable characteristics that make BFG Flashing the ideal choice for the "tough" jobs apply equally to everyday applications. Specify and install BFG Flexible Flashing for that extra margin of safety.

Need help with your flashing problems? Call on BFG's technical service team. Write BFG Building Products Dept. RE-14, The B.F.Goodrich Company, Akron, Ohio 44318.

BFG
FLEXIBLE VINYL FLASHING

BUILDING PRODUCTS DEPT. RE-14
The B.F.Goodrich Company
Akron, Ohio 44318

Please send technical data on:

- ☐ BFG FLEXIBLE VINYL FLASHING
- ☐ BFG VINYL WATER BARRIERS
- ☐ BFG ONE-PLY ROOFING SYSTEM
- ☐ BFG VINYL WATERSTOPS
- ☐ BFG FLEXIBLE INSULATION TUBING

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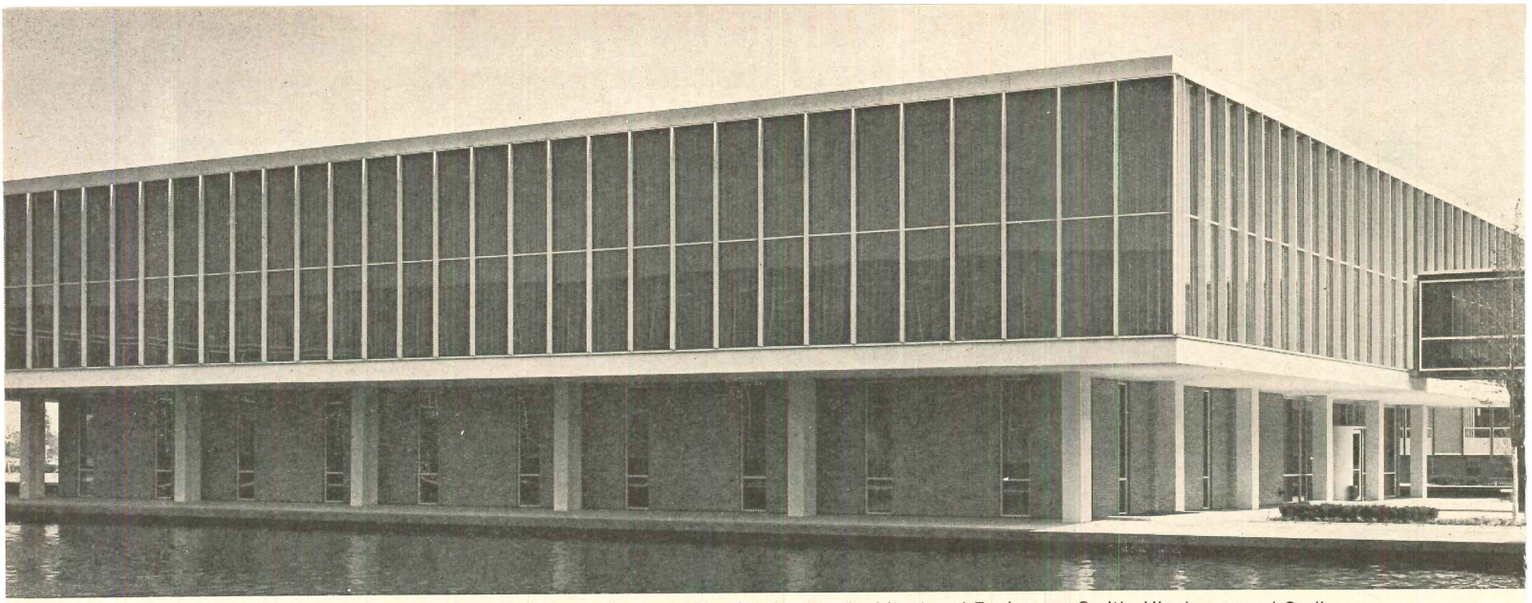
City_____ State_____ Zip Code_____

For more data, circle 123 on Inquiry Card

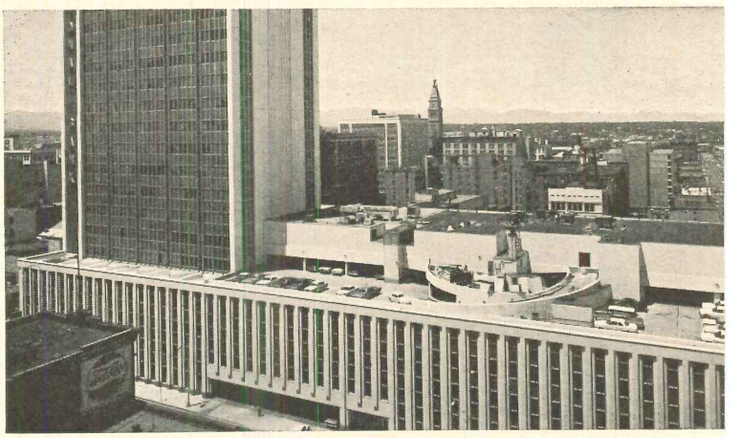


Detroit, Michigan: Michigan Bell Telephone Company Service Center; Architect and Engineers: Smith, Hinchman and Grylls.

PROBLEM: Provide conditioned air over cantilevered slab to large glass areas at perimeter.

Albuquerque, New Mexico: Kistler-Collister; Architect: William H. Ellison & Associates.

PROBLEM: Provide: 1. Level floor to compensate for uneven structural slab. 2. In-floor electrification. 3. A means to insulate exposed structural slab.



Denver, Colorado: First National Bank of Denver; Architects: Piel, Slater, Small and Spenst. Engineers: Anderson, Koerwitz and Hawes.

PROBLEM: Install level floor for office addition over sloping parking deck, holding dead load to minimum. Provide power, telephone distribution at desired module.

The problems are different, but the solution is the same: GRANCO A-E FLOOR

A-E Floor provides air, power and telephone distribution *above* the structural slab.

A thin, high-strength floor is supported above a clear plenum of optional height. Optional in-floor electrification provides a versatile system readily adaptable to the unique problems of today's architecture.

That's why A-E Floor is an answer when you need to run air and electrical services out into cantilevered or mezzanine floors. That's why the A-E Floor system even lets you compensate for uneven structural slabs. That's why A-E Floor is a solution where dead load is limited.

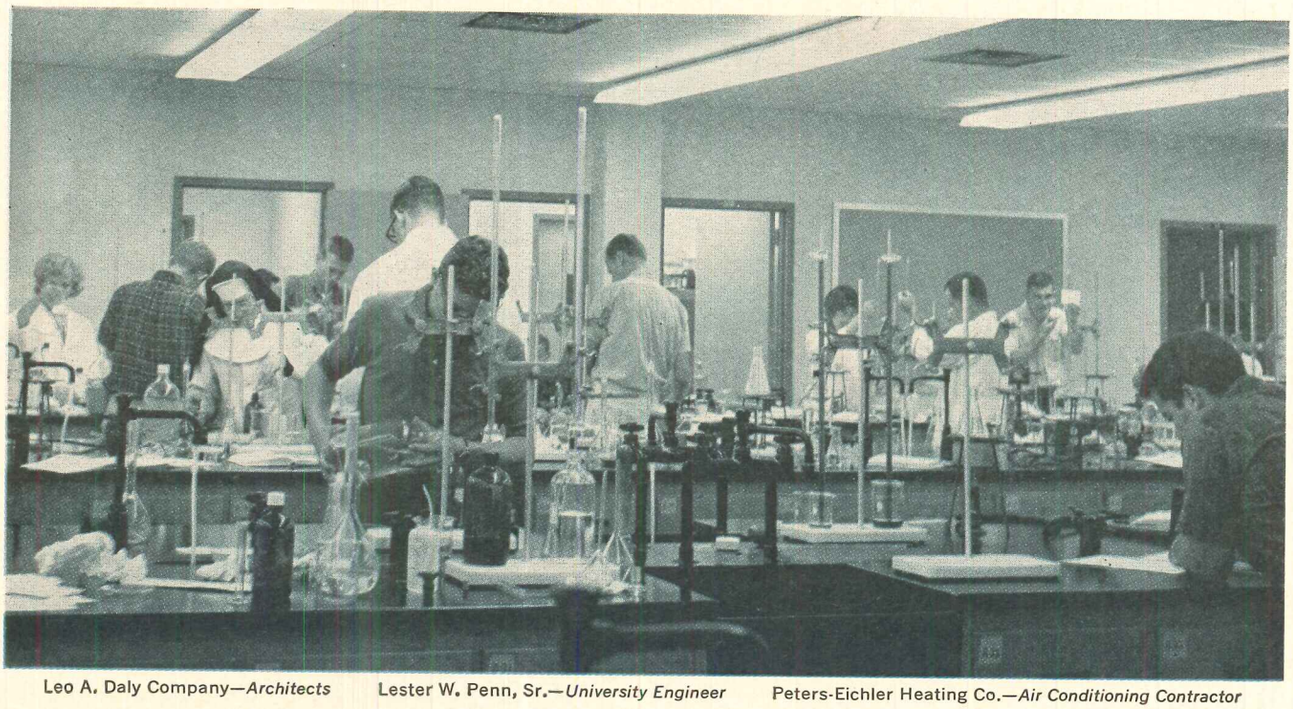
The complete story of A-E Floor's problem-solving capabilities is in our Catalog A-E-641. Write for your copy today: Granco Steel Products Company, 6506 North Broadway, St. Louis, Mo. 63147.
A subsidiary of Granite City Steel Co.

GRANCO

GRANCO / **IMAGINATION IN STEEL**

FOR THE NEEDS OF TODAY'S ARCHITECTURE

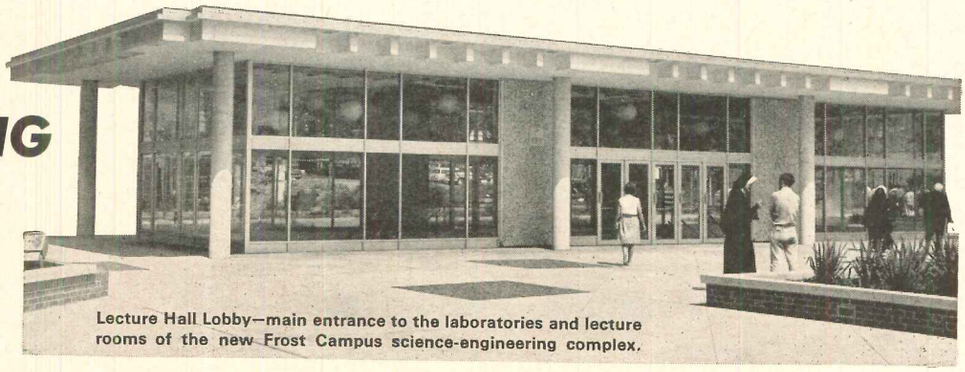
For more data, circle 124 on Inquiry Card



Leo A. Daly Company—*Architects* Lester W. Penn, Sr.—*University Engineer* Peters-Eichler Heating Co.—*Air Conditioning Contractor*

What's BOHN doing in St. Louis University's new Chemistry Building?

COOLING IT!



Lecture Hall Lobby—main entrance to the laboratories and lecture rooms of the new Frost Campus science-engineering complex.

Heating it, too! Creating a comfort environment for academic achievement. In this ultra-modern facility, dependable BOHN central station and fan coil air conditioning units satisfy the comfort requirements essential to effective teaching and learning.

The new Chemistry Building is only one segment of St. Louis University's 150th Anniversary $53 million development program which will reach its climax in 1968.

In the oldest university west of the Mississippi, BOHN equipment supplies time-proven reliability. BOHN—the progressive name in air conditioning.

BOHN ALUMINUM & BRASS COMPANY
Heat Transfer Division • Danville, Illinois
A DIVISION OF UNIVERSAL AMERICAN CORPORATION

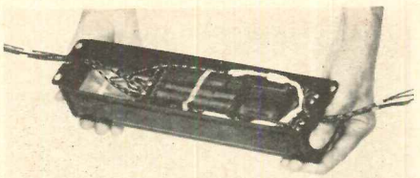
For more data, circle 125 on Inquiry Card

Product Reports

continued from page 219

FLUORESCENT LAMP BALLASTS

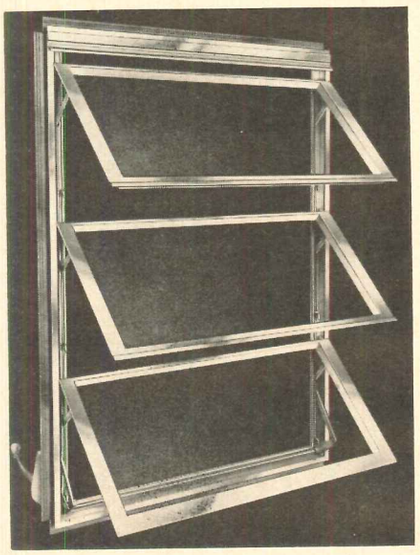
A new line of fluorescent lamp ballasts, developed primarily for use in industrial facilities where lighting systems are subject to high temperature and continuous operation, are said to have an average life expectancy 2½ times greater than conventional units. Engineering tests on the new *Extended Life* ballasts indicate that a user can anticipate only 4% failure rate during a 20-year period, by comparison with conventional ballasts which would require replacement within 10 years. The new ballasts are available for use with 800-ma and 1500-ma fluorescent lamps with input voltages of 120-, 208, 277-, and 480-volts. *General Electric Company, Ballast Department, Danville, Ill.*



CIRCLE 303 ON INQUIRY CARD

ALUMINUM AWNING WINDOWS

A new line of anodized aluminum awning windows features an automatic self-locking device, complete weatherstripping, nylon bushings and an integral fin trim. The integral fin trim eliminates the need for accessory fastening devices and saves installation time by avoiding fitting and notching; the window is simply nailed in place. The windows, which can be used with all types of exterior finishing materials are available in 2-, 3-, 4- and 5-vent models, in eight standard over-all widths. *Remington Aluminum Window Corporation, Garden City, N.Y.*



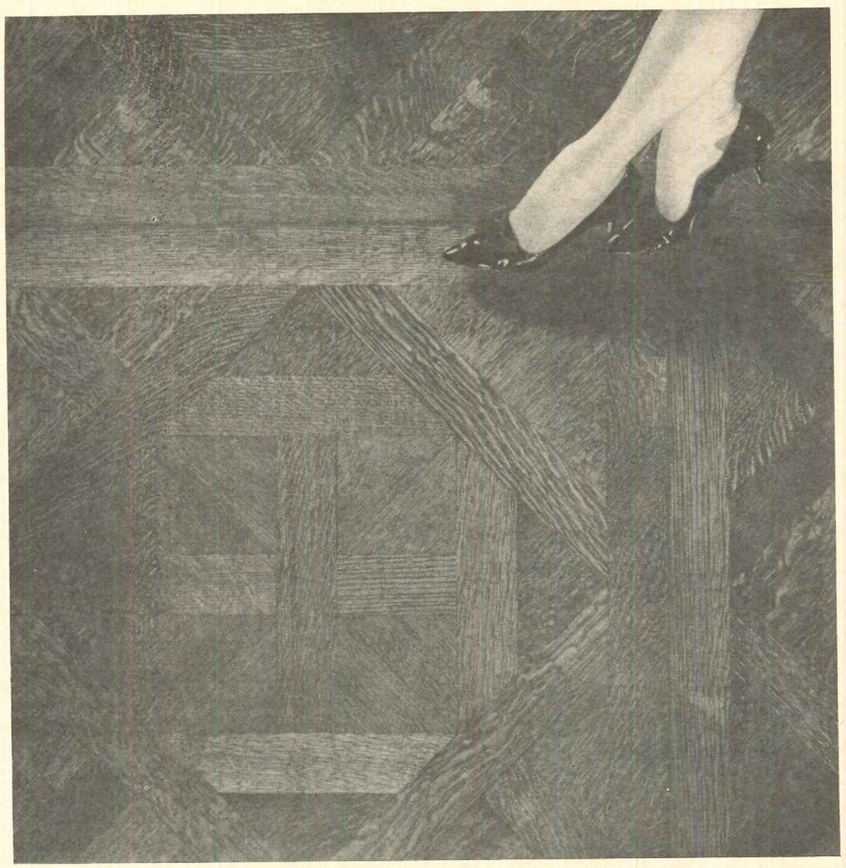
CIRCLE 304 ON INQUIRY CARD

WEATHERING STEEL

Mayari R weathering steel incorporates the high-strength qualities of ASTM A242 steel, but is said to have a much higher degree of corrosion resistance. As it ages, *Mayari R* develops a protective coating, similar to paint, which is permanent and maintenance free. In its advanced stages, the protective coating is a deep brown color. *Press Relations, Bethlehem Steel Corporation, New York City*

CIRCLE 305 ON INQUIRY CARD

more products on page 252



if you want elegance, buy a castle . . . or specify Bordeaux

Floor coverings come and go, but elegance in wood like this Bordeaux pattern will be as unmistakable in the 23rd century as it was in the 17th. Based on a design in one of the great French castles, Bordeaux is one of many Wood-Mosaic masterpieces for those who believe every fine home should be unique. These floors last for generations with little upkeep, flatter every decor. And they cost no more than other fine floor coverings! Write for brochure showing all patterns.

Look for us in the Yellow Pages.

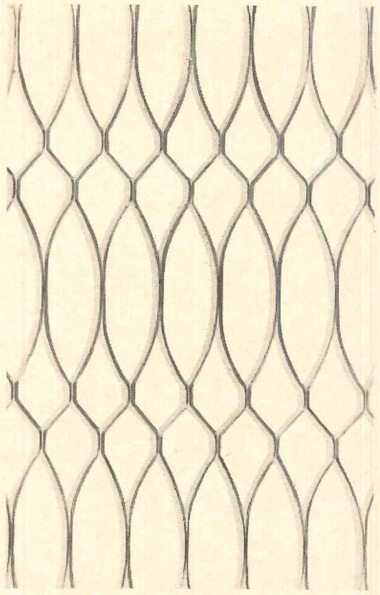
SINCE 1883

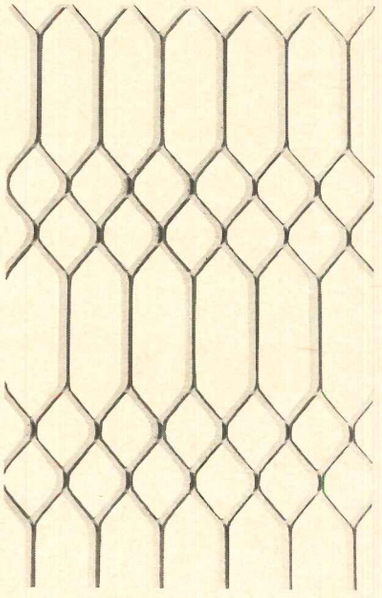
Wood-Mosaic

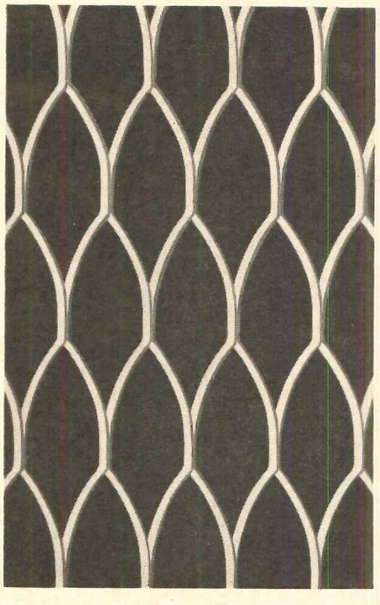
CORPORATION

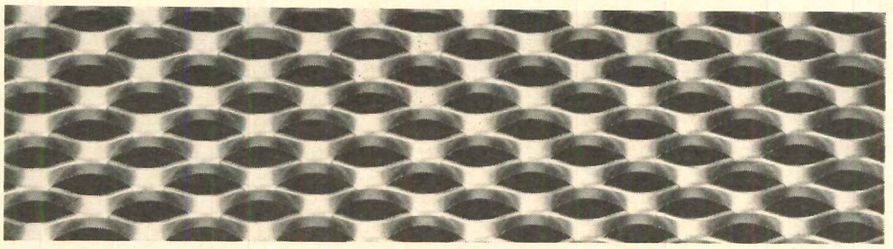
5000 Crittenden Drive, Louisville, Kentucky 40221

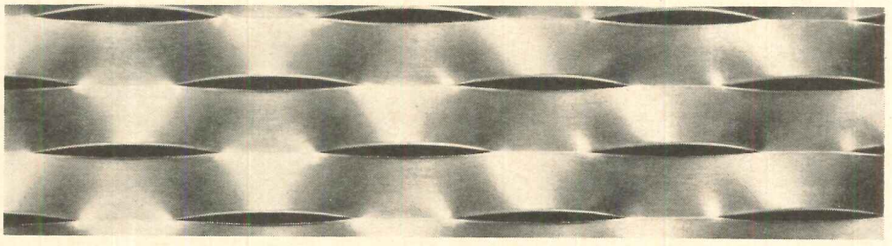
For more data, circle 126 on Inquiry Card

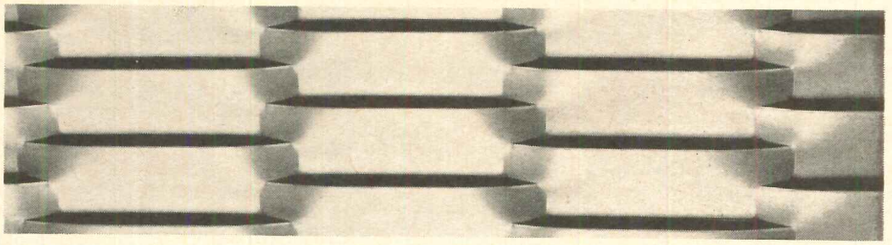


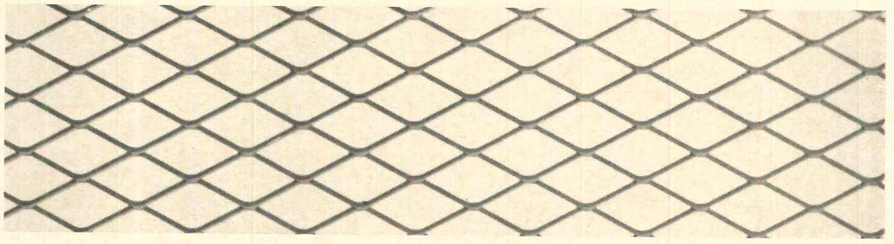


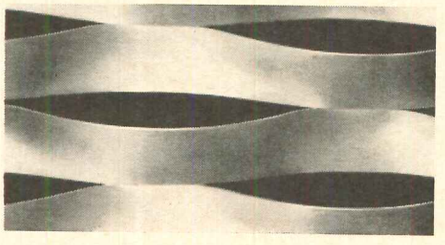


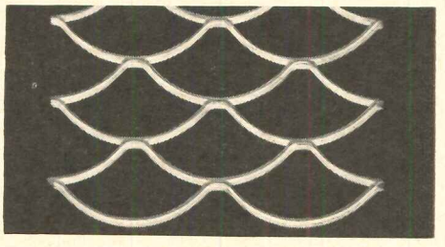












Wheeling gives you nine new ways to create a new look.

Couple your imagination with Wheeling's nine fresh new ideas in decorative expanded metal. Use these new patterns vertically... horizontally... offset them ... combine them. You'll create fresh new designs for room dividers, stairway enclosures, balcony railings, facades. Use them as sun barriers for warmer climates to reduce air conditioning costs.

Wheeling's new decorative patterns are available in both carbon steel and aluminum. Contact your nearest Wheeling sales office for descriptive literature and application data.

Steel

Wheeling Corrugating Company
Wheeling, West Virginia

Wheeling Steel

IMMEDIATE DELIVERY ON ALL STOCKED ITEMS FROM THESE WAREHOUSES: BOSTON, BUFFALO, CHICAGO, COLUMBUS, DETROIT, KANSAS CITY, LOUISVILLE, MINNEAPOLIS, NEW YORK, PHILADELPHIA, RICHMOND, ST. LOUIS. SALES OFFICES: ATLANTA, HOUSTON, NEW ORLEANS.

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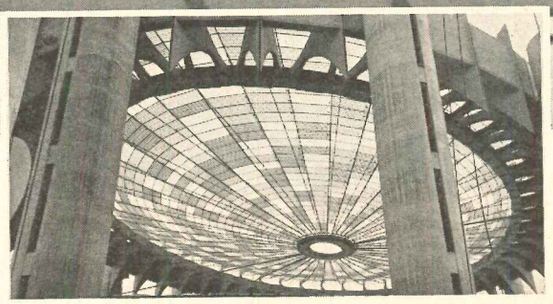
40,000 FEET OF PRESSTITE TAPE



Architect: Philip Johnson, A.I.A. / Gen. Contractor: Thompson-Starrett
Sub-Contractor: Winner-Whelan/ Translucent Skyroof by Kalwall Corp.

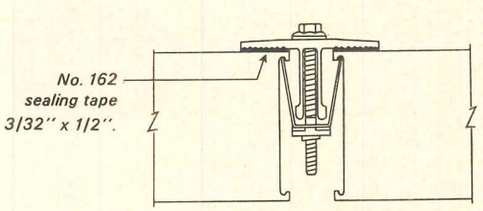
Seals New York State's Floating Skyroof . . . *Without a Leak*

PRESSTITE's No. 162 Elastic Compound Tape gave "just right" adhesiveness, consistency, and dimensional uniformity—completely eliminated problems of application and clean-up, too!

Only a preformed sealing tape could provide the weather-tight, flexible seal installed around every inch of the 1500 Kalwall translucent fiberglass panels used in this unique cable-suspended roof . . . world's largest of its kind.

The world's largest selection of architectural sealants comes from PRESSTITE . . . soft general purpose PERMAGUMS®, tough tapes with controlled compressibility like No. 162, Thiokol®-base curing types, and specialties like rubber rod joint filler.

Whether you're designing a conventional building or an unusual structure like the New York State Exhibit, there's a specific PRESSTITE sealant for your application. Write us, or see our catalog in Sweet's.



Specially designed Kalwall Clamp-Tite System

6327

Interchem Presstite Products

INTERCHEMICAL CORPORATION □ PRESSTITE DIVISION □ 39th & CHOUTEAU □ ST. LOUIS, MO. 63110

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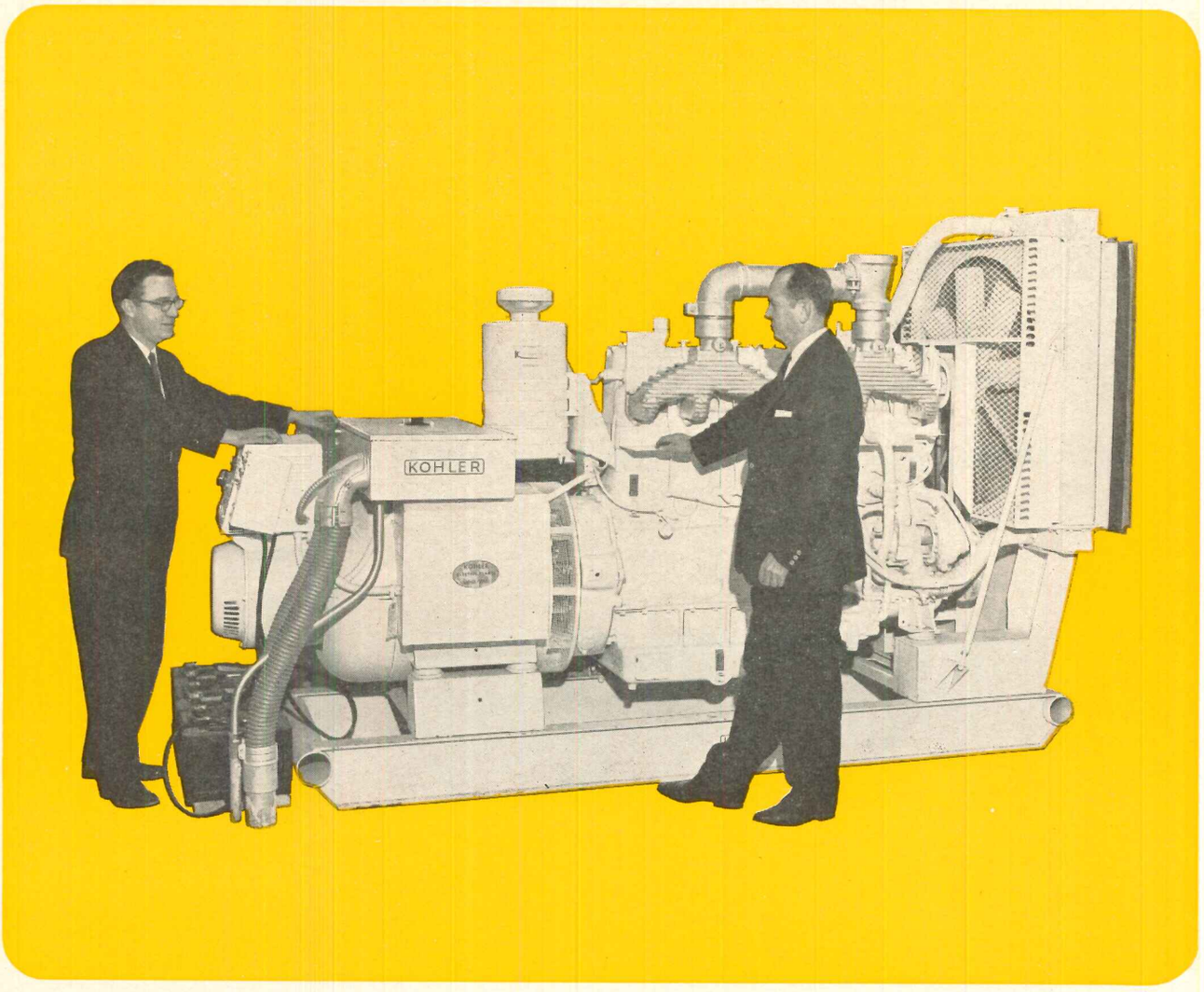


A Kohler Distributor—A Kohler Technician
A Kohler Electric Plant
3 steps to stand-by power you can count on

When you're planning a stand-by power installation Kohler Distributors stand ready and able to survey your requirements—will recommend the Kohler Electric Plant or plants best suited to them.

And to make absolutely sure your needs are being met, Kohler technicians assist Kohler Distributors in estimating those needs, in supervising installation. Your Distributor and Kohler men work together to assure traditional Kohler performance for long years ahead.

As for the Kohler Electric Plant itself, the "Kohler Check Marks of Value" below give you some idea of Kohler quality. For more information see your Kohler Distributor or write Dept. EP5-510, Kohler Co., Kohler Wis.

KOHLER

MARKS OF VALUE

- ✓ **One source responsibility—the complete plant is backed by Kohler**
- ✓ **Nationwide sales and service—performed by Kohler-trained mechanics**
- ✓ **Unitized design—plants are completely assembled and tested at the factory**
- ✓ **Built in vibro-mounts...for quiet smooth operation**
- ✓ **Heavy duty design—Kohler plants have capacity beyond their rated output—2 hp per KW.**
- ✓ **Automatic voltage and speed regulation—maintain power at even level**
- ✓ **Gas, Diesel and Gasoline fuel options**
- ✓ **Integral exciter, starting—quickest, simplest, most positive, trouble-free engine starting available.**

KOHLER OF KOHLER

Kohler Co., Established 1873, Kohler, Wisconsin

ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS • ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS

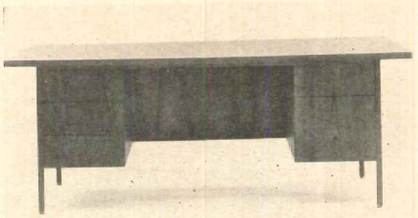
For more data, circle 129 on Inquiry Card

Product Reports

continued from page 248

WIDE RANGE OF LEGS AND DESK CHASSIS

All the models in the company's rectilinear desk line are now available with a choice of legs in rosewood, teak, walnut, ebonized walnut, satin or mirror polished aluminum. Any of these leg choices can be used with full chassis in walnut, teak, rosewood or ebonized. In each case, the wood leg is the exact size of the metal member and fits completely flush with the desk chassis in all directions.

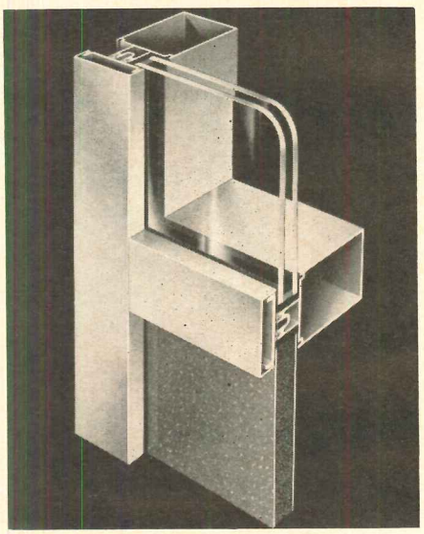


The photo shows an oiled teak conference desk 36 ins. by 72 ins. with oiled teak legs. *JG Furniture Company, New York City*

CIRCLE 306 ON INQUIRY CARD

ALUMINUM CURTAIN WALL

Designed to give a thermal performance matching that of 1 in. double glazing, this new aluminum curtain wall has just been introduced after extensive testing in Canada. The new wall system, called *Series 1600,* is said to eliminate inside frost and condensation problems on the metal and also greatly reduces heat loss through the metal framing. High thermal performance of the system is attributed



to the fact that the major structural elements of the system are inside the building and to the presence of a vinyl insulator between inside and outside metal surfaces. *Kawneer Company, Inc., Division of American Metal Climax, Inc., Niles, Mich.*

CIRCLE 307 ON INQUIRY CARD

VEIL FOR BUILDING CONSTRUCTION

Pellomac is a new non-woven surfacing veil for use in exterior and interior building construction, which is said to prevent hairline, wind and other related cracks in newly plastered walls. When applied to old walls, *Pellomac* will prevent cracks and other blemishes showing through after paint is applied. When a primer is used on a wall, *Pellomac* can be laid directly on the wet primer. Otherwise paperhanger's glue will fix *Pellomac* to the wall's surface. *Pellon Corporation, New York City*

CIRCLE 308 ON INQUIRY CARD

more products on page 256

THE FINISHING OF INTERIOR REDWOOD

When FactriSawn redwood is given a clear finish, it harmonizes beautifully and naturally with other materials. On the other hand, a dark stain is often used to provide a handsome background for the owner's prized possessions. To receive your copy of "REDWOOD INTERIOR FINISHES", write Dept. 63-A, California Redwood Association, 617 Montgomery Street, San Francisco, Calif.

The Tongue and Groove paneling shown is FactriSawn® a trademarked Certified Kiln Dried product of these mills... UNION LUMBER CO. • THE PACIFIC LUMBER CO. • WILLITS REDWOOD PRODUCTS CO. • SIMPSON TIMBER COMPANY MILLER REDWOOD COMPANY • GEORGIA-PACIFIC CORPORATION • ARCATA REDWOOD COMPANY . . . which form the CALIFORNIA REDWOOD ASSOCIATION.

For more data, circle 130 on Inquiry Card

"VIM" goes High...Wide...and LAMSON with Selective Vertical Conveyors

The Post Office has developed a farsighted Vertical Improved Mail (VIM) System for fast, continuous service in high-rise buildings. At the heart of this system is the selective vertical conveyor.

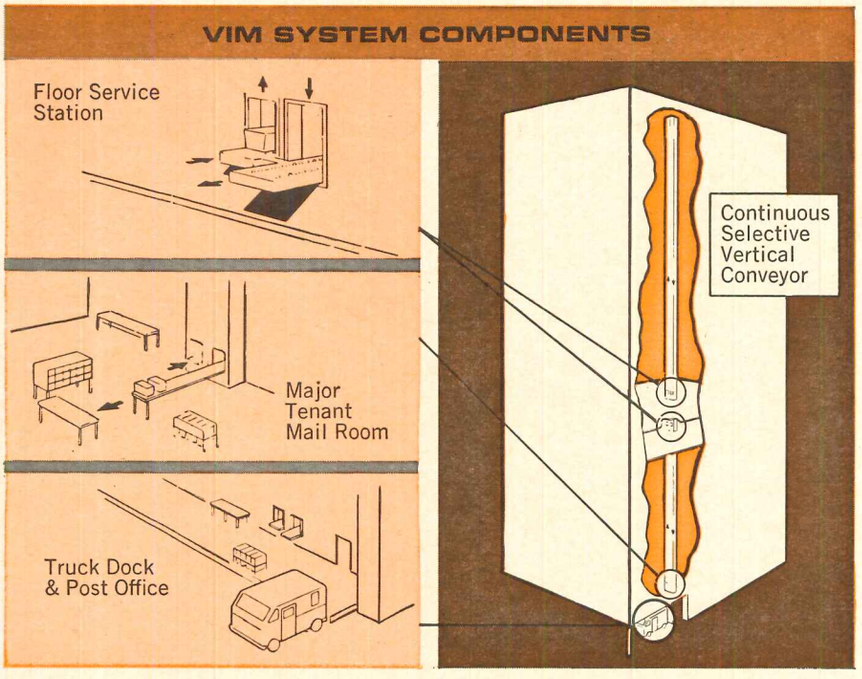
LAMSON, pioneer in mechanized communications systems, has designed, built and installed a large majority of the world's vertical conveyors, including the highest and largest systems.

In addition to the selective vertical conveyor, a VIM System also includes a truck dock and a Post Office operated mail room at street or basement level. Here, incoming mail is sorted and locked in tenants' trays for automatic dispatch to all floors via the conveyor. Tenants pick up trays at floor service stations. Outgoing mail may also be sent down to the Post Office mail room from these points.

VIM offers many advantages: mail is delivered early to all floors . . . security is improved . . . congestion from bags and carts in building is relieved . . . day-long mailing permits faster processing to and through the main Post Office . . . contract messenger service is reduced. Equally important: major tenants occupying several floors can use conveyors for their own interoffice distribution of mail, supplies, EDP tapes and cards, etc.

Continuous, high-speed mail service is the lifeline of any business. In designing new high-rise buildings, consider carefully the additional income, efficiency and utility value provided by making provision for a VIM System. For full details on selective vertical conveyors, write to: LAMSON CORPORATION, 183 Lamson Street, Syracuse, New York 13201.

First VIM Installation:
Crown Zellerbach Bldg., San Francisco



master of mechanized motion

LAMSON CORPORATION

Lamson Street, Syracuse, New York
Also: San Francisco and Toronto, Canada
Offices in All Principal Cities

For more data, circle 131 on Inquiry Card

COMMUNITY EFFORT RESULTS IN MODEL JUNIOR HIGH

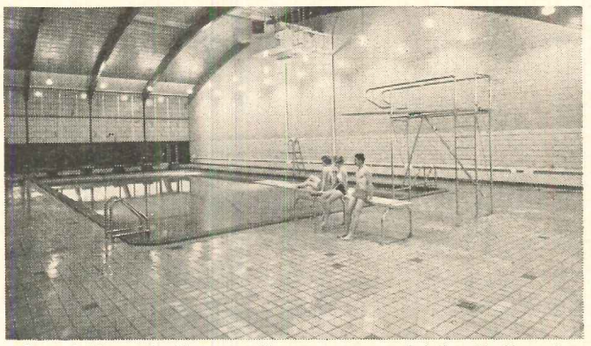
The new junior high school in Eaton, Colorado, a town of only 1,200, is proof of what can be accomplished when the citizens, school board, the superintendent and his staff, and the architect all work together. The result—a unique, well-planned school facility.

Visitors marvel at how both community and school needs have been accomplished in planning the entire facility. Movable walls and folding partitions not only provide for present flexibility, but for future expansions, also.

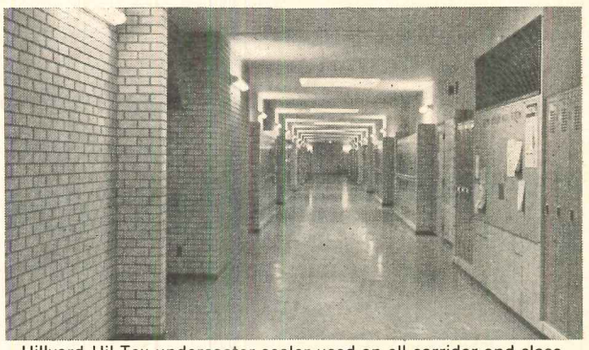
Planned, preventive maintenance was carefully considered for this building, too. Experience gained from the use of Hillyard products in the grade school, completed in 1955, led to the selection of Hillyard products for the new junior high school building.

There's a Hillyard architectural consultant near you and he'll gladly consult with your specification writers on proper, approved procedures and materials for the original treatment of any floor you specify. Follow-up "job captain" service protects your specification. Write, wire or call collect.

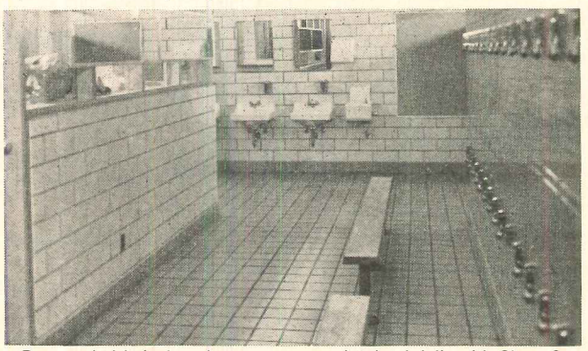
Truly a floor of champions . . . Hillyard Trophy Seal and Trophy Finish used to finish gym floor.



Ceramic tile pool with quarry tile aprons mopped daily with Clean-O-Lite as a disinfectant for maximum sanitation and for prevention of athlete's foot.



Hillyard Hil-Tex undercoater-sealer used on all corridor and classroom floors (resilient). Super Hil-Brite carnauba wax used for floor protection and easy daily maintenance.



Boys and girls locker-shower rooms maintained daily with Clean-O-Lite, a synthetic cleaner, deodorizer, sanitizer and disinfectant.

Architect: Claude A. Nash
Contractor: Hensel Phelps Construction Co.

SEE OUR CATALOG IN SWEET'S ARCHITECTURAL FILE OR WRITE FOR COPY

Since 1907

HILLYARD FLOOR TREATMENTS

St. Joseph, Missouri, U.S.A.
Totowa, New Jersey • San Jose, California

The Most Widely Recommended and Approved Treatments For Every Surface

For more data, circle 132 on Inquiry Card

Architect solves complex roof problem with

REVERE COPPER

PROBLEM: To find a roof covering . . .

1—That must be on a warped surface, with a slope varying from 3/12 to 36/12

2—That has a texture and pattern which will complement a dramatic shape

3—Whose color will complement a natural wooded surrounding

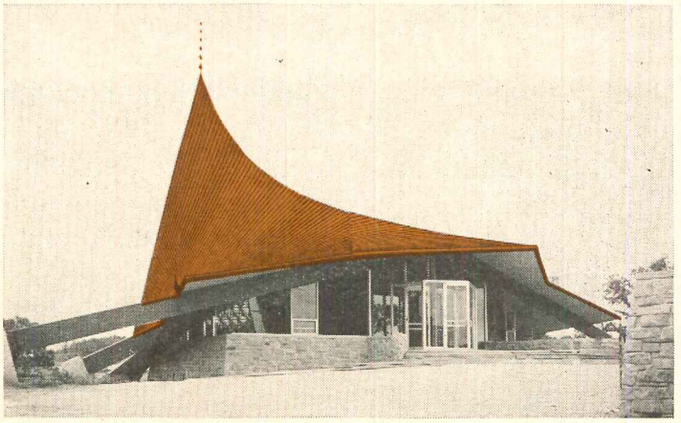
4—Whose nature would be compatible with other permanent materials used, i. e. stone and glass

SOLUTION: COPPER—with standing seam pattern of lines running at right angles to the curving ridge to dramatize the changing slope.

This roof is yet another example of how you have so much more flexibility in expressing your ideas when you "Design with Copper in Mind."

Add to this the appearance of copper, with its distinctive patina, its long, maintenance-free life, and it becomes readily understandable why copper, man's oldest metal, is having a glorious renaissance in modern building construction.

As to the preference for Revere copper, Mr. Leo Muza, Muza Sheet Metal Company, contractor, had this to say, "We specialize in copper work and like to deal with people who know their business. We use Revere copper exclusively, and have had consistently good results. Revere also can provide technical assistance to the architects and to us . . . and they maintain good jobber relations."



ALL-FAITHS CHAPEL, State of Wisconsin's New Kettle Moraine Boy's School, Plymouth, Wisc., where 20,000 lbs. of Revere 16 oz. cold rolled copper were used for the unique, standing seam roof and fascia.

Architect: DAVERMAN ASSOCIATES, INC., Grand Rapids, Michigan. *General Cont.:* HUTTER CONSTRUCTION COMPANY, Fond du Lac, Wisc. *Sheet Metal Cont.:* MUZA SHEET METAL CO., Oshkosh, Wisc.

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Offices in Principal Cities • Distributors Everywhere

FIRST AND FINEST IN COPPER AND BRASS—FULLY INTEGRATED IN ALUMINUM

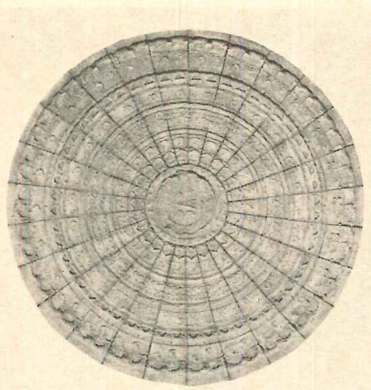
For more data, circle 133 on Inquiry Card

Product Reports

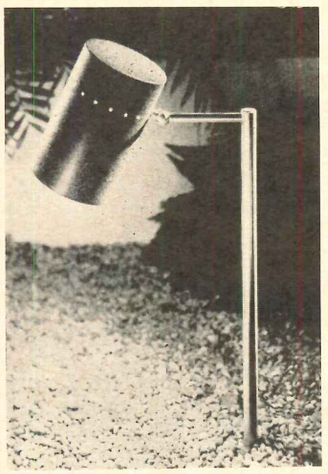
continued from page 252

SCULPTURED SUN

Designed by Bjorn Wiinblad, this new wall sculpture can be obtained in a wide range of sizes, finishes, materials and central face motifs for exterior and interior use. Sizes range from 2 ft to 10 ft in diameter; finishes include: glazed bisque, glazed terracotta and stone. Originally designed for production in concrete and gypsum cement only, the Sun is now being made in a new plastic compound called *Nova-Stone. Arts for Architecture, Inc., Garden City Park, N.Y.*



CIRCLE 309 ON INQUIRY CARD



GARDEN LIGHT

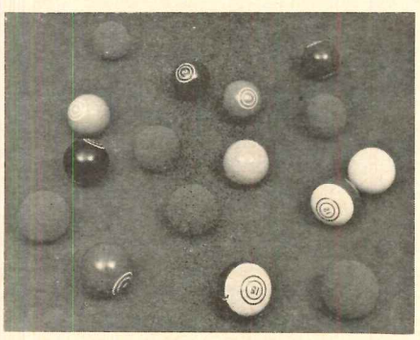
One of a collection of new designs, the *NS1011* garden light consists of a cylindrical reflector which swivels on a solid brass column that can be easily spiked into place. *Nessen Lamps Inc., New York City*

CIRCLE 310 ON INQUIRY CARD

NON-REFLECTIVE ENAMEL FINISH

A new enamel of the alkyd melamine type contains special substances which give it a non-reflective, suede-like finish and make it a suitable interior finish for restaurants, offices, and other areas where minimum glare is required. The enamel is being produced in 12 colors. The gray billiard balls in the photo have been painted with the new *Cycleweld* enamel, which makes them blend into the felt background. *Chemical Division, Chrysler Corporation, Trenton, Mich.*

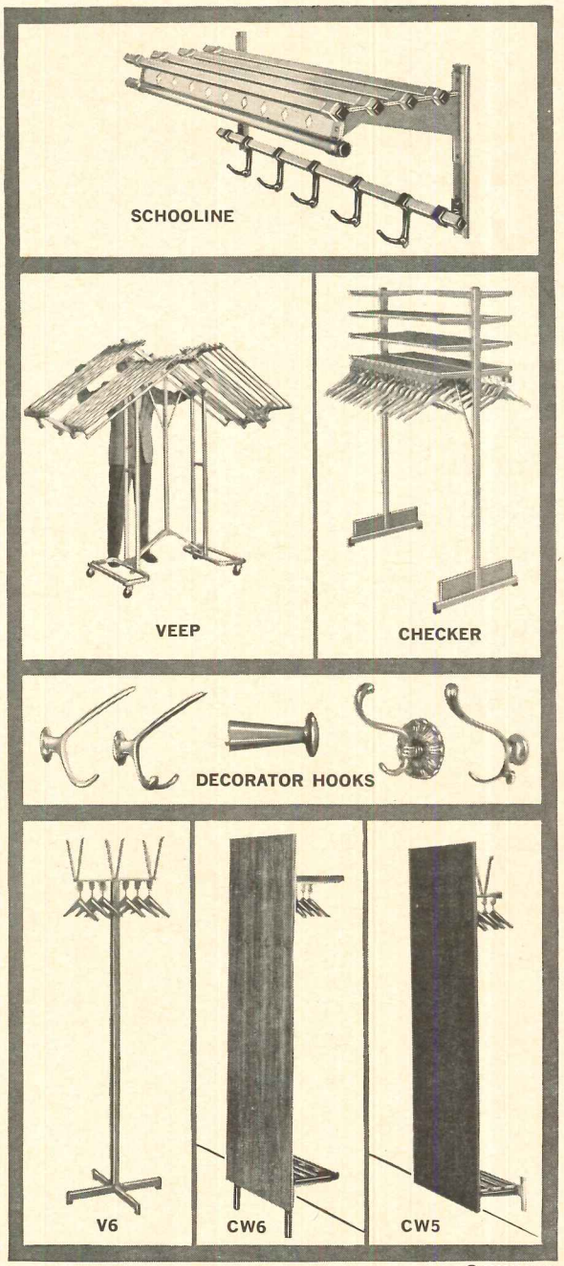
CIRCLE 311 ON INQUIRY CARD



more products on page 260

THE CORRECT RACK FOR YOUR EVERY NEED

T.M.



Vogel-Peterson is not a "one-type-for-all" company. Rather it provides complete lines of superior wardrobe units, specifically designed to exactly meet specific needs. Each rack illustrated represents a complete line of matching units. *Top to bottom:* The indestructible "Schooline," self-cleaning, square tubular steel. Fold-Away Veeps. Smartly designed Checker racks. Garment hooks of sculptured brass or cast aluminum with (cloisonne-like) enamel inserts. Modern costumers and sensational wall-mounted hidden wardrobes.

Patents Pending

© 1965 V.P. Co.

Write for Architects Catalog FL-52 with (styles, finishes and specifications). Requirements studies, layouts, load factors, etc. furnished to architects.

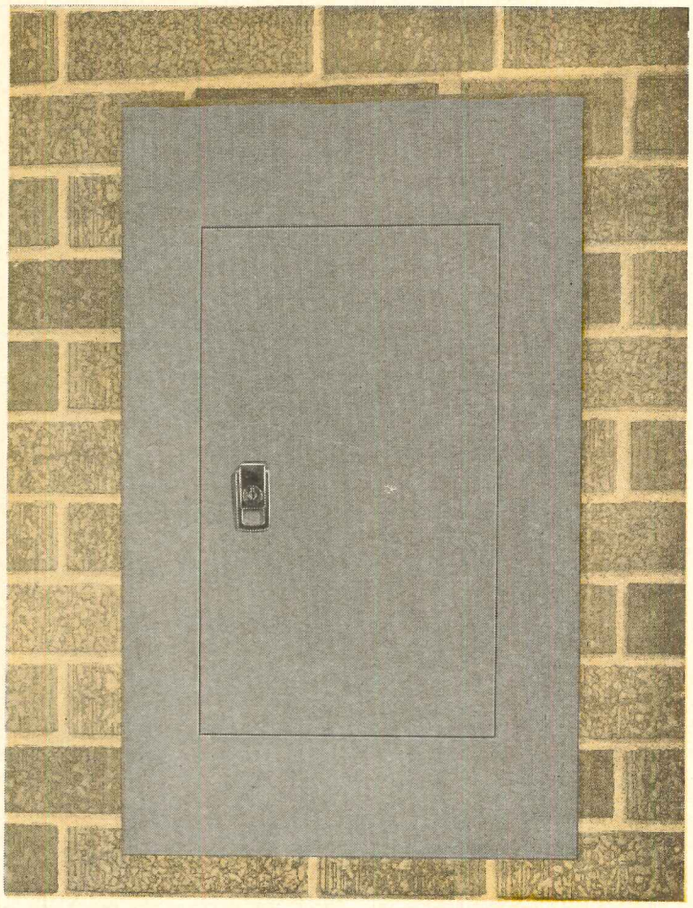
VOGEL-PETERSON CO.

"The Coat Rack People" ELMHURST, ILL.

For more data, circle 134 on Inquiry Card

from Square D—

NEATER APPEARANCE



Completely Concealed Trim Clamps
and Hinges on Standard Panelboard Fronts—
AT NO EXTRA COST!

Until now, panelboard fronts like the one above were built only on special order. They cost more and it took longer to get them. Even then, only the hinges were concealed. Now, in this new lighting panelboard cabinet, both hinges and trim clamps are completely concealed. No extra cost . . . and prompt delivery from stock!

This new design gives you more than new eye appeal. It is the only design which can be locked for positive security because the panelboard front cannot be removed while the door is locked.

Square D sells more panelboards than any other manufacturer. This latest design innovation adds significant strength to that position of leadership.

GET THE COMPLETE STORY *from your Square D Field Office*
Or write Square D Company, Mercer Road, Lexington, Kentucky 40501

SQUARE D COMPANY

products sold through Square D electrical distributors everywhere

For more data, circle 135 on Inquiry Card

Permalite does what?

New Super-Bond Surface

This new integrally formed surface grips asphalt like glue, forming a solid, uniform bond of insulation board to roofing membrane. Resists bitumen soak-up. Establishes a uniform tackline between insulation board and roofing membrane. Now, more than ever, this moisture-resistant, non-combustible, mineral board is, in total, the ideal roof insulation for Class 1 metal deck construction.

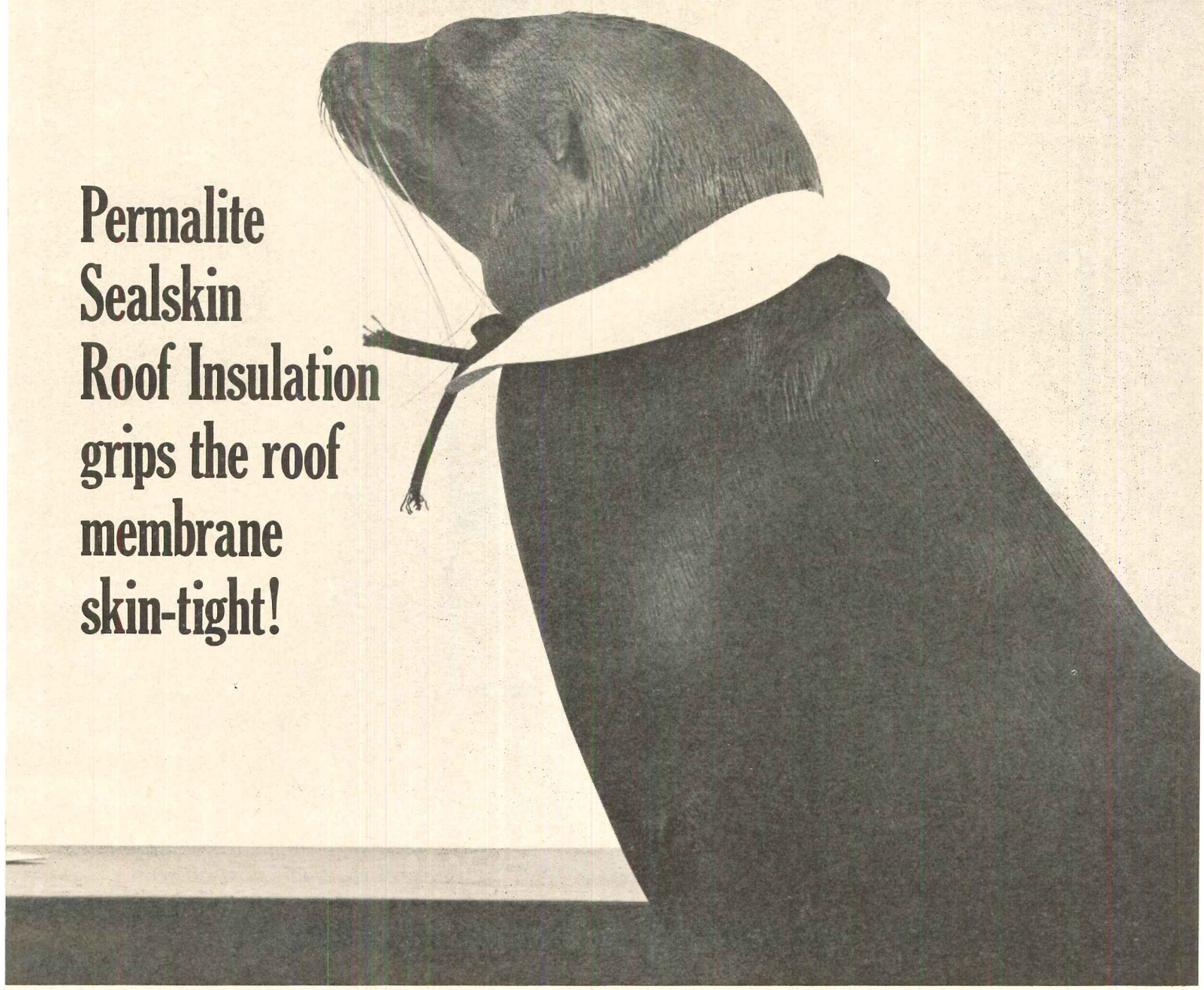
P.S. (Permapak System): GLC provides three permanent, U.L. and F.M. listed roof elements which combine to provide high efficiency thermal and vapor control for Class 1 metal deck construction:

1. Permalite Mineral Roof Insulation Board.
2. Permalite Aluminum PVC Vapor Barrier.
3. Permalite Cold Adhesive.

All carry U.L. and F.M. labels and are available from one source, insuring undivided responsibility for delivery and performance. Write for samples and literature.

Request "THE GLC STORY," a brochure covering the many products, services and facilities of Great Lakes Carbon Corporation.

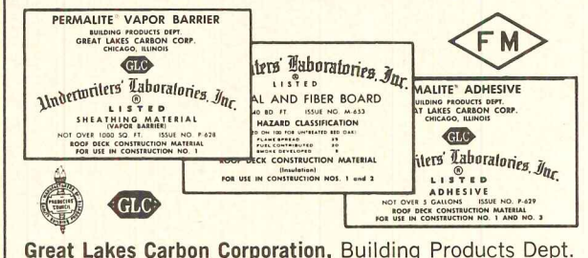
Permalite Sealskin Roof Insulation grips the roof membrane skin-tight!



PHYSICAL DATA:
Permalite Rigid Insulation Board

C (Conductance Value) 1″ Nominal Thickness . 0.36
Water Absorption (% by Volume)
. . . 1.5 @ 2 Hrs. Total Immersion (No Capillarity)
Vapor Permeability
. . 15 Perms @ 73° F. and 51% Relative Humidity
Concentration Load Indentation . 1/16″ @ 77 lbs.
Compression Resistance 185 PSI (50% Consolidation)
Fungus Resistance . . . . . Complete
Flame Spread . . . . . 25 (Non-combustible)
Smoke Developed 5
Wt./Sq. Ft./1″ Thick . . . . 0.8 lbs. Approx.

RIGID
Permalite®
ROOF INSULATION



Great Lakes Carbon Corporation, Building Products Dept.
333 N. Michigan Avenue, Chicago, Illinois 60601

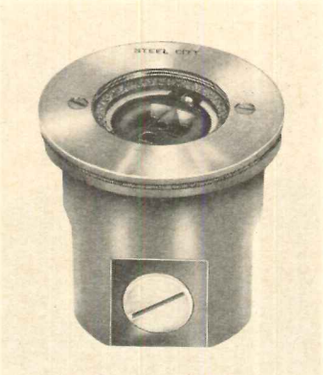
For more data, circle 136 on Inquiry Card

Product Reports

continued from page 256

NEW ELECTRICAL FLOOR BOX

The *672* electrical floor box, recently introduced in the company's cast iron floor box line, is equipped with receptacle and floor cover plate. The new model has a standard $2\frac{15}{16}$-in. diameter, a one-piece cast-iron body and a $3\frac{1}{2}$-in. diameter bronze floor cover plate. The floor plate includes



a 2-in. diameter threaded insert plug for access to the mounted receptacle. The model *672* adapts to almost any normal electrical requirement in any type of floor construction, but is especially suitable in wood floors where water-tight features are necessary and leveling adjustments not required. *Steel City Division, Midland-Ross Corporation, Pittsburgh, Pa.*

CIRCLE 312 ON INQUIRY CARD

PITLESS UNIT FOR SEALED WATER SYSTEMS

The new *Monitor PS* Custom Pitless Unit, is the first one to be engineered for large submersible pumps. The unit, which can be installed in less than a day, is recommended for installation in schools, hospitals, factories, motels and any institutions where a steady sanitary supply of water from a sealed water system is needed. *Baker Mfg. Company, Evansville, Wis.*

CIRCLE 313 ON INQUIRY CARD

CHAIR DESIGNED TO SAVE SPACE

The *Astro Compact* chair is said to be 2 ins. narrower than comparable seating units, but its 15-in.-wide seat of flexible thermoplastic is designed to mold to the body shape for individual comfort. The seat is available in a wide range of colors, and the frame can be obtained in eight finishes. Chairs can be stacked 20 high and still be within easy reach. Child and adult heights of 13 ins., 15 ins. and 17 ins. are obtainable. *Fixtures Manufacturing Corporation, Kansas City, Mo.*

CIRCLE 314 ON INQUIRY CARD

the intercom with the "built-in brain"

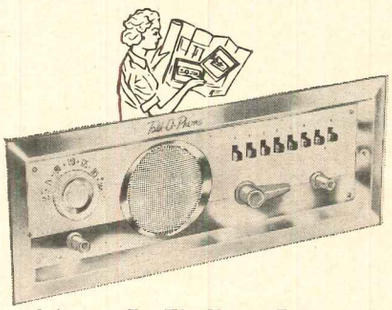
for office and industry

New **TALK-A-PHONE**

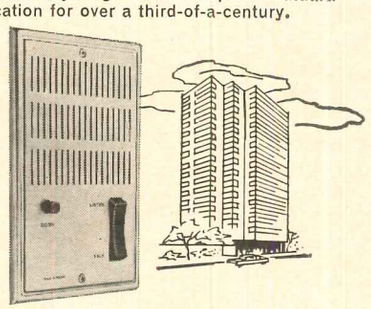
Distinctively styled, with more dependability and higher efficiency than any Intercom ever developed . . . yet sensibly priced. Meets every Intercom need of office and industry. Proportioned like a book to lie flat on the desk . . . only 3 inches high. Combines the look and feel of fine grained leather with the strength and rigidity of steel. Beautifully finished in charcoal gray with brushed chrome side panels From a 2-station system to an elaborate installation, you can do it better and more economically with Talk-A-Phone. Pays for itself many times over.

•

TALK-A-PHONE . . . "Has Everything. Does Everything." The accepted standard of quality and dependability in Intercommunication for over a third-of-a-century.



Intercom For The Home. Enjoy comfort, convenience and peace of mind. From any room you can . Listen-in on baby, children or sick room . Answer outside doors . Talk to anyone—upstairs or downstairs, inside and out . Enjoy radio. Distinctively styled. Beautifully finished. Easily installed.



Intercom For Apartment House. Provides instant and direct 2-way conversation between any Apartment and Vestibules—in buildings of any size, Greater performance with these exclusive Talk-A-Phone features: • Ample volume without "boom" • Automatic privacy • Individual volume selection for each apartment • Built-in Buzzer.

Send for Free Catalogs... Dept. AR-10

TALK-A-PHONE CO., 5013 N. Kedzie Ave., Chicago, Illinois 60625

For more data, circle 137 on Inquiry Card

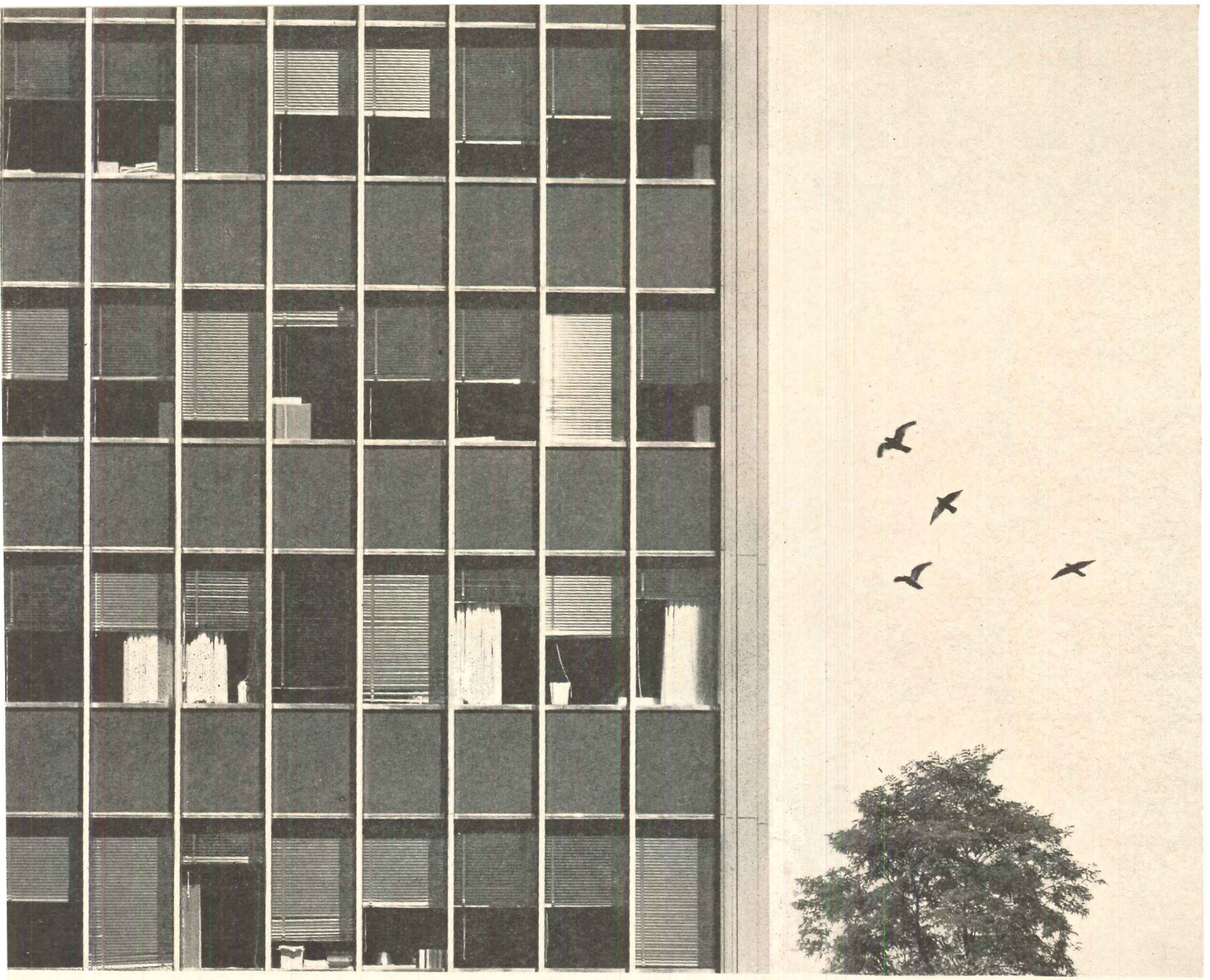
A NEW CONCEPT IN METAL: OVERLY ACOUSTICAL DOORS

Got some noise to shut out of a computer room? TV or radio station? Theater? Music room? At a missile site? Airport? Check with us. We have a complete certified line of acoustical doors (1¾", 2½", 3½", 4½" and thicker) in full-flushed designs, glazed units, and a special louvered door. U/L fire-rated up to three hours. Sound absorption rating range 35-62 db STC loss. Riverbank Acoustical Lab test reports are available on request. The thicker doors require compression type hardware and double seals. All doors have concealed hardware. All units furnished complete: doors, frames, seals, hardware. It's a new concept in metal: Overly Acoustical Doors.

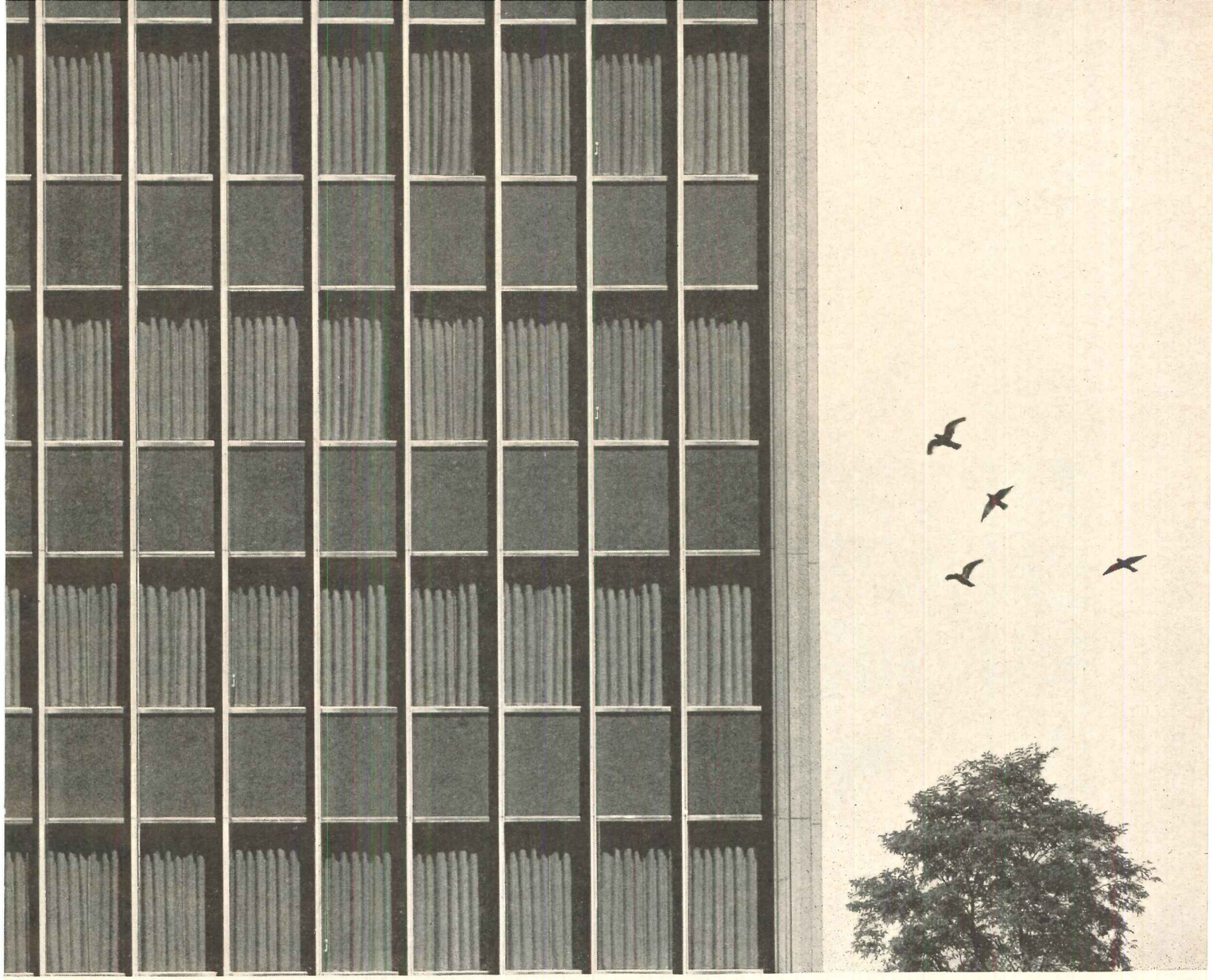
For more information, write to the Manager of Product Development, Overly Manufacturing Company, Greensburg, Pennsylvania 15601.

Overly

For more data, circle 138 on Inquiry Card



You can make any building look better



with PPG Feneshield® fabrics

Does that scene on the left look familiar? It should. It's typical of a building where window treatment has gotten out of hand. Result: an unfortunate mixture of shading devices, loss of clean architectural lines, compromise of building design, a generally unattractive impression.

The exterior appearance of any building . . . new or old . . . can be improved immensely through the specification of Feneshield fabrics, made of PPG Feneshield® fiber glass yarns, such as those shown above.

Feneshield fabrics can be obtained in a wide variety of weaves, colors, and patterns to complement any building design. These fabrics present a pleasing appearance at every window, permit a bold flow of line from street level to top floor, eliminate random vertical settings, and enhance the total architectural concept of any building.

But that's just one of Feneshield fabrics' advantages. These same fabrics can also control interior environment. Through PPG research, all Feneshield fabrics are performance-rated according to fabric characteristics. Through this Feneshield system, drapery fabrics can be chosen to subdue radiant heat, control glare, improve sound control, enhance a good view or modify a bad one.

What about costs? Over a five year period, total initial and maintenance costs for Feneshield fabrics are less than those for mechanical shading devices.

Get more facts. Participating drapery converters have authorized Feneshield presentations showing the wide range of beautiful fabrics now available.

Through the use of PPG technical data, they can help you select fabrics for specific installations. Write directly to PPG for names of converter representatives near you and for technical information. Use the coupon.

Pittsburgh Plate Glass Company
Fiber Glass Division, Dept 501
One Gateway Center
Pittsburgh, Pennsylvania 15222

☐ Please send me technical information on Feneshield fabrics.

☐ Please send me names of authorized Feneshield converters.

Name_____

Title_____

Company_____

Address_____

City_____

State_____ Zip Code_____

PPG® *fiber glass*
...the fiber glass for finer fabrics

PPG makes the Feneshield fiber glass yarns only, not the fabric.

Office Literature

continued from page 221

PLUG-IN STRIP WIRING SYSTEM

Plug-In-Strip, a preassembled, multi-outlet electrical wiring system, is described in a new catalog. The booklet shows two basic types of strip with complete lines of fittings; drawings give details of the method of installation. *Electrical Division, H. K. Porter Company, Pittsburgh, Pa.**

CIRCLE 410 ON INQUIRY CARD

TRACKLESS LOUVER CEILING SYSTEMS

Two new brochures announce the introduction of trackless louver ceiling systems. One booklet describes a trackless plastic louver ($^{9}/_{16}$ in. cube) in which every 2 ft by 4 ft section hinges for easy access to plenum areas. In this system, the open louver prevents the collection of dirt, and the open light shields permit free use of the plenum for air movement. The second trackless system is a parabolic aluminum louver ($^{3}/_{4}$ in. cube) in which alternate 3 ft by 3 ft panels nest into each other to form an unbroken ceiling. The walls of the cells of these panels are optically perfect mirrors of parabolic shape designed to reflect maximum light in the 0°-45° range and to shield all light in the 45°-90° zone. This allows high footcandle levels with low surface brightness. *Luminous Ceilings Inc., Chicago, Ill.**

CIRCLE 411 ON INQUIRY CARD

COMMERCIAL LIGHTING

Some 230 items in the company's range of lighting fixtures for offices, apartment houses, hotels and school dormitories as well as outdoor lighting, are described and illustrated in a well produced catalog, no. 200. A number of charts and tables are included to show dimensions, specifications and rapid illumination estimates. *Progress Manufacturing Company, Inc., Philadelphia, Pa.*

CIRCLE 412 ON INQUIRY CARD

CERAMIC MOSAIC TILE

A 20 page handbook illustrates the company's complete line of ceramic mosaic tile and shows notable design applications. A special product called *Conduct-O-Tile,* which is a permanently conductive ceramic tile providing controlled electrical conductivity in hospital areas that are subject to static-sparked explosions is fully covered. A number of diagrams are included to assist architects and designers in the creation of individual ceramic mosaic patterns. *Department AO-119, American Olean Tile Company, Lansdale, Pa.**

CIRCLE 413 ON INQUIRY CARD

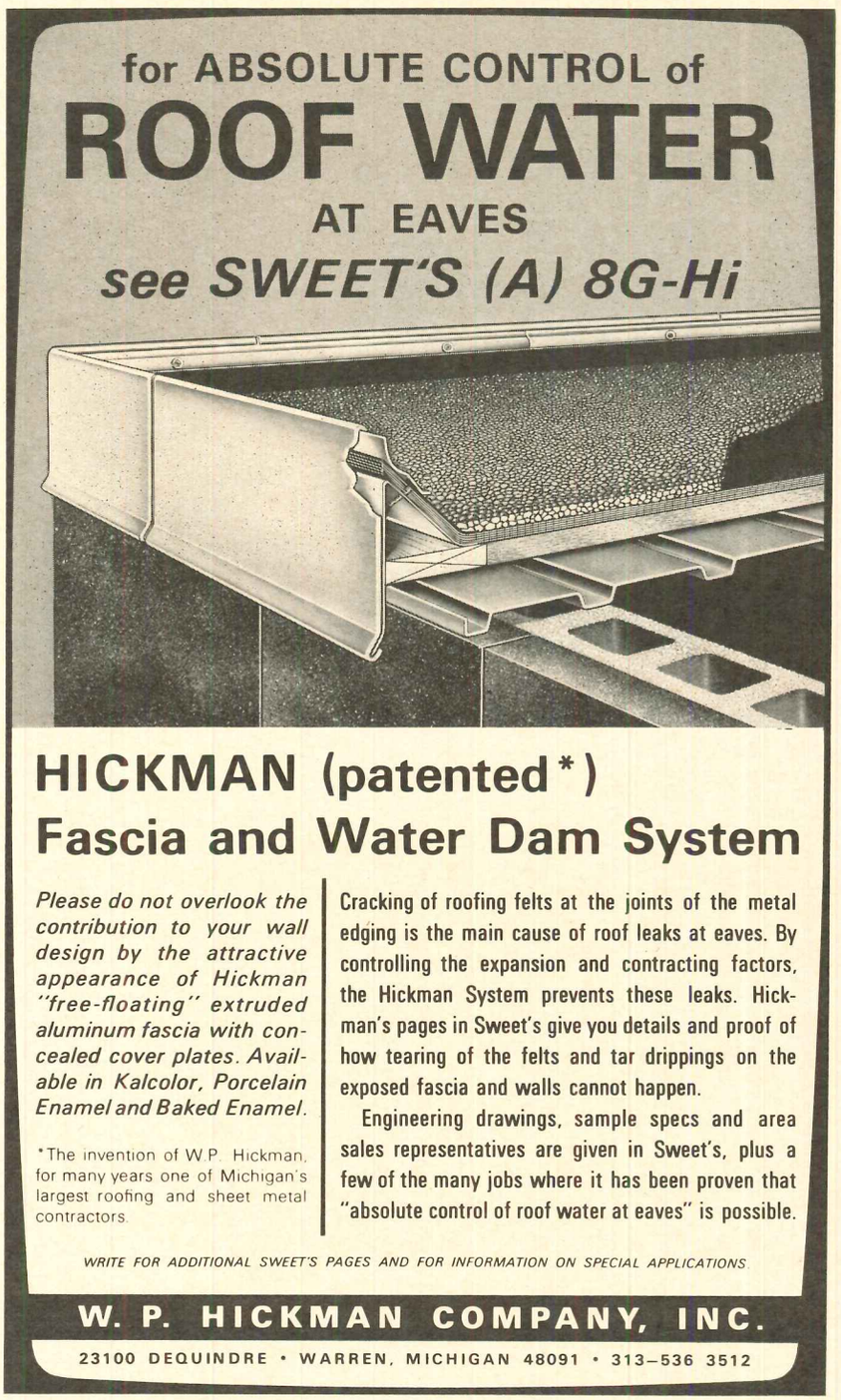
HIGH PRESSURE INDUCTION CIRCULATORS

A wide variety of illustration graphs and charts which provide a means of selecting any one of the company's high pressure induction circulators is contained in a 38-page engineering bulletin. A new simplified selection method is incorporated based upon BTUH/CFM of primary air. A capacity table is based on a secondary coil capacity at 25 deg. temperature difference. Immediately following the thermal ratings, sound level ratings are given. *Worthington Air Conditioning Company, East Orange, N.J.*

CIRCLE 414 ON INQUIRY CARD

**Additional product information in Sweet's Architectural File*

more literature on page 272



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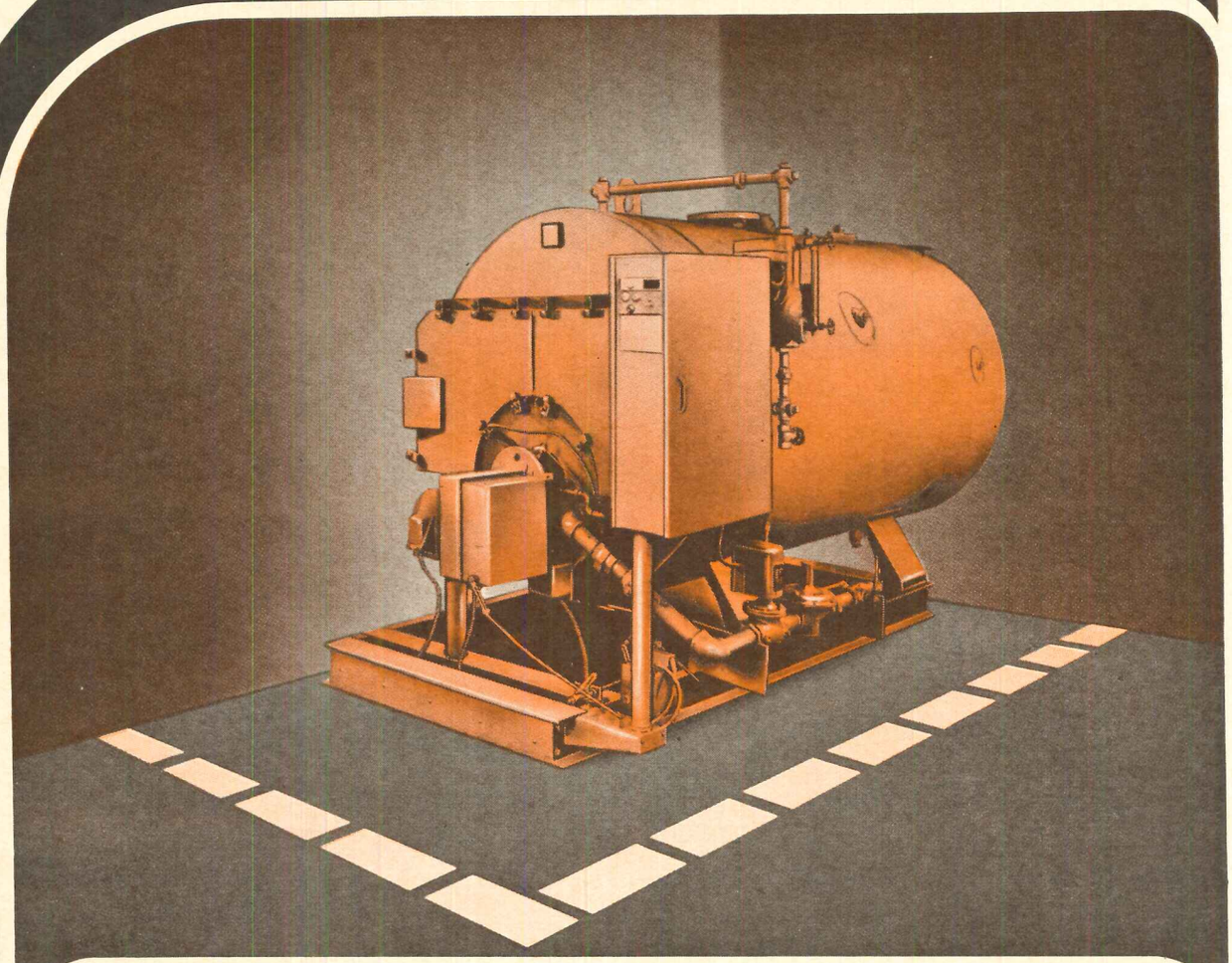


PACIFIC NATIONAL CORNERS A NEW BOILER

Pacific National's versatile new wet-back boiler corners nicely. There's no refractory-lined, space-hogging rear door. The PS Packaged Boiler fits snugly with its wet-back to the wall, giving you the design freedom of dozens and dozens of additional square feet.

Your customer will like Pacific National's wet-back construction, too. It eliminates refractory baffles that fall out, causing short circuits which increase fuel costs and decrease boiler output. There's no rear refractory to reflect heat back to the tube ends, causing them to burn off and leak. Unitized steel, full wet-back construction of this three-pass generator insures a lifetime of smooth, trouble-free operation.

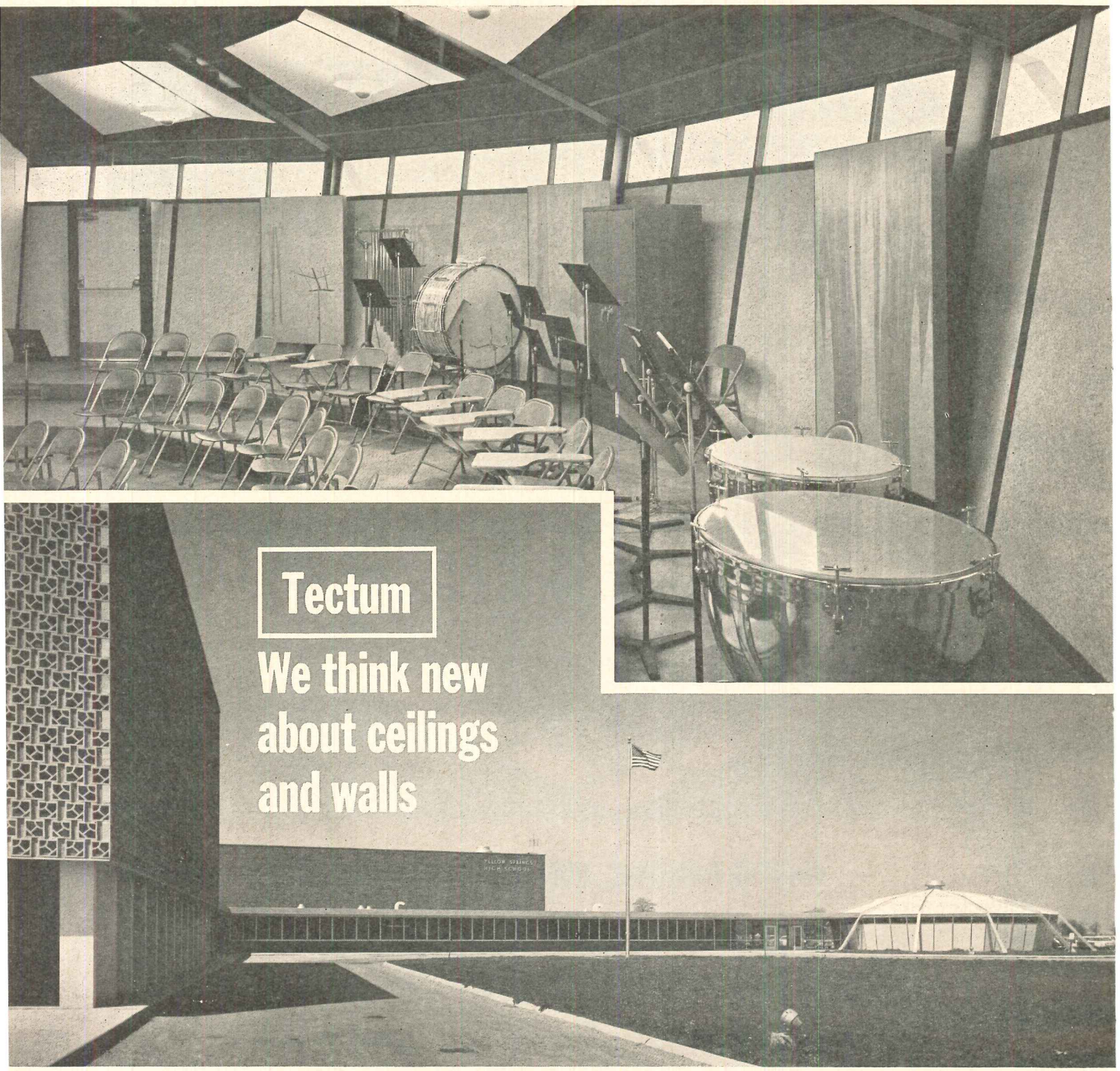
He'll also appreciate the flexibility you've provided in fuel selection. The integrated burner converts from gas to oil simply by throwing a switch. PS Series boilers are available—completely packaged and factory tested—from 80 to 350 hp; 15 psi steam working pressure and up to 125 psi water working pressure. Guaranteed fuel-to-output efficiency of 80% or greater.

For details, write Commercial Heating and Air Conditioning Sales, Crane Co., Dept. 008 4100 S. Kedzie Ave., Chicago 60632.

PACIFIC NATIONAL

COMMERCIAL STEEL BOILERS CRANE

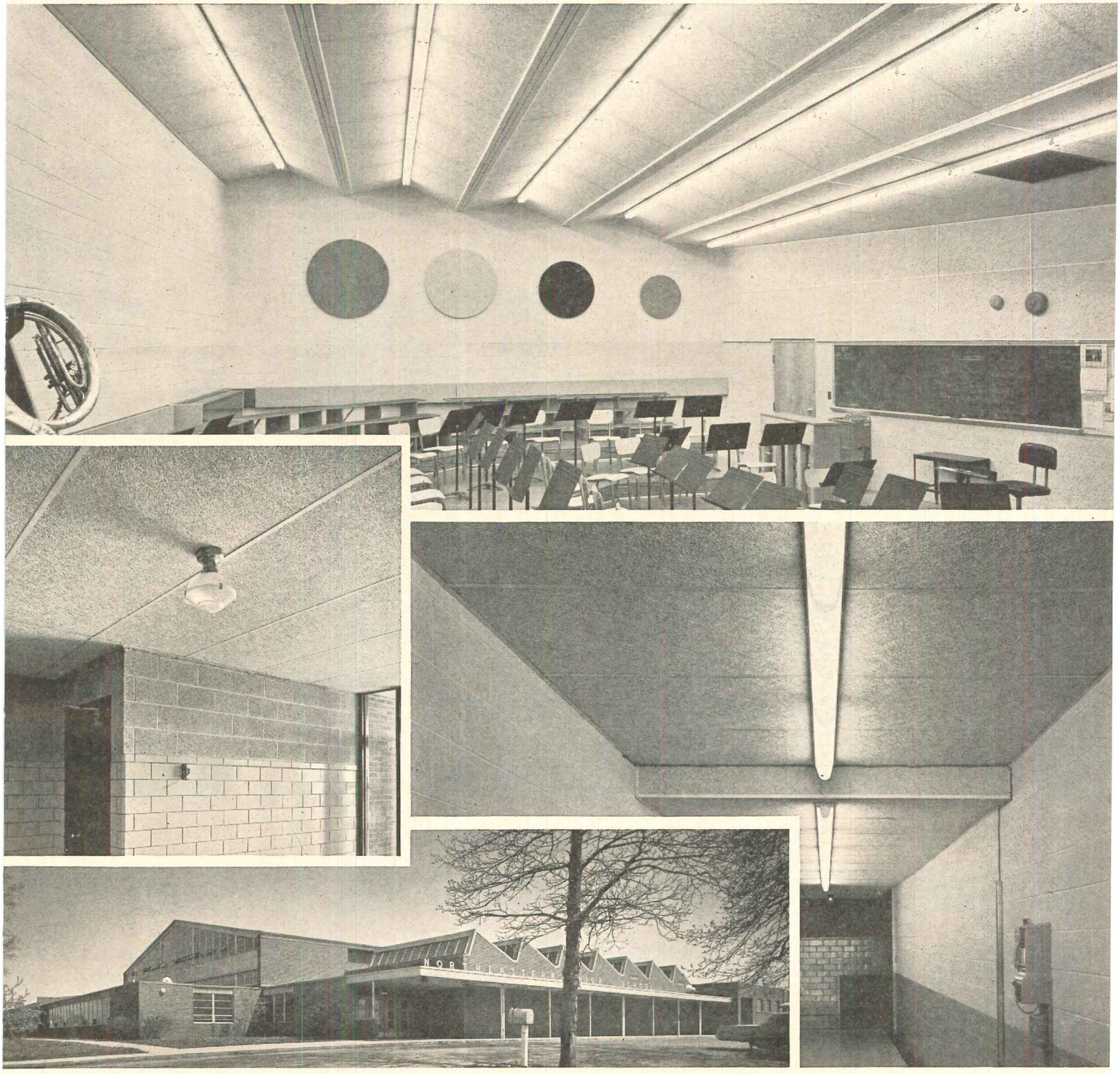
For more data, circle 140 on Inquiry Card



Yellow Springs High School, Yellow Springs, Ohio. Architect: John L. Kline. General Contractor: Rodgers Construction, Springfield. Tectum Erector: Field & Associates, Springfield.

Architect uses unique Gold Bond

There were other reasons, too. Appearance, structural strength, insulation, fire protection. At the Northeastern High School, room framing for the 44' band room was steel joists. Architect Kline achieved a folded plate effect by using a layer of Tectum between bar joists. Another layer of Tectum served as roof deck. At the Yellow Springs Public School, he used 2" Tectum backed up to structural building panels to create the entire exterior walls. Tectum, made of specially treated long-strand wood fibers, has a deep,



Northeastern High School, Northeastern Local School District, Springfield, Ohio. Architect: John L. Kline, Springfield. General Contractor: E. M. Redington Inc., Springfield. Tectum Erector: Field & Associates, Springfield.

Tectum to mute noisy school band rooms

rich, random-swirl texture. Has excellent sound-reduction coefficients. (Up to .90 for 3" material.) An insulating "k" value of 0.55. Lightweight. Noncombustible. Dimensionally stable. Thinking about acoustical ceilings and walls? Think new with Tectum. Ask your Gold Bond® Representative about Tectum,® or write National Gypsum Company, Dept. AR-105, Buffalo, New York 14225.

Gold Bond®
TECTUM

One of many fine products that come from 40 years of thinking new

NGC NATIONAL GYPSUM COMPANY

For more data, circle 141 on Inquiry Card

Hospital floor space expands, engineers again choose Arkla low cost Gas cooling.

Opelousas General Hospital, Opelousas, La., began operations in 1957 with three steam-energized Arkla Gas water chillers. Several years later, additions resulted in double the floor space to be cooled and heated.

Solution: one more Arkla steam-fired chiller (with an added boiler). At the same time, three Arkla Gas-fired Chiller-Heaters were placed outdoors.

Chillers produce chilled water only when required. But the direct-fired units, operating independent of boilers, deliver chilled water year-round for special temperature control of critical areas. Converters produce hot water from the steam for heating the entire hospital.

Get the quiet, trouble-free operation of Arkla equipment. Plus the clean, safe, dependable and economical benefit of Gas Energy. Call your local Gas Company sales engineer. Or write: Arkla Air Conditioning Company, 810 East Franklin, Evansville, Indiana. AMERICAN GAS ASSOCIATION, INC.

For heating & cooling... Gas is good business

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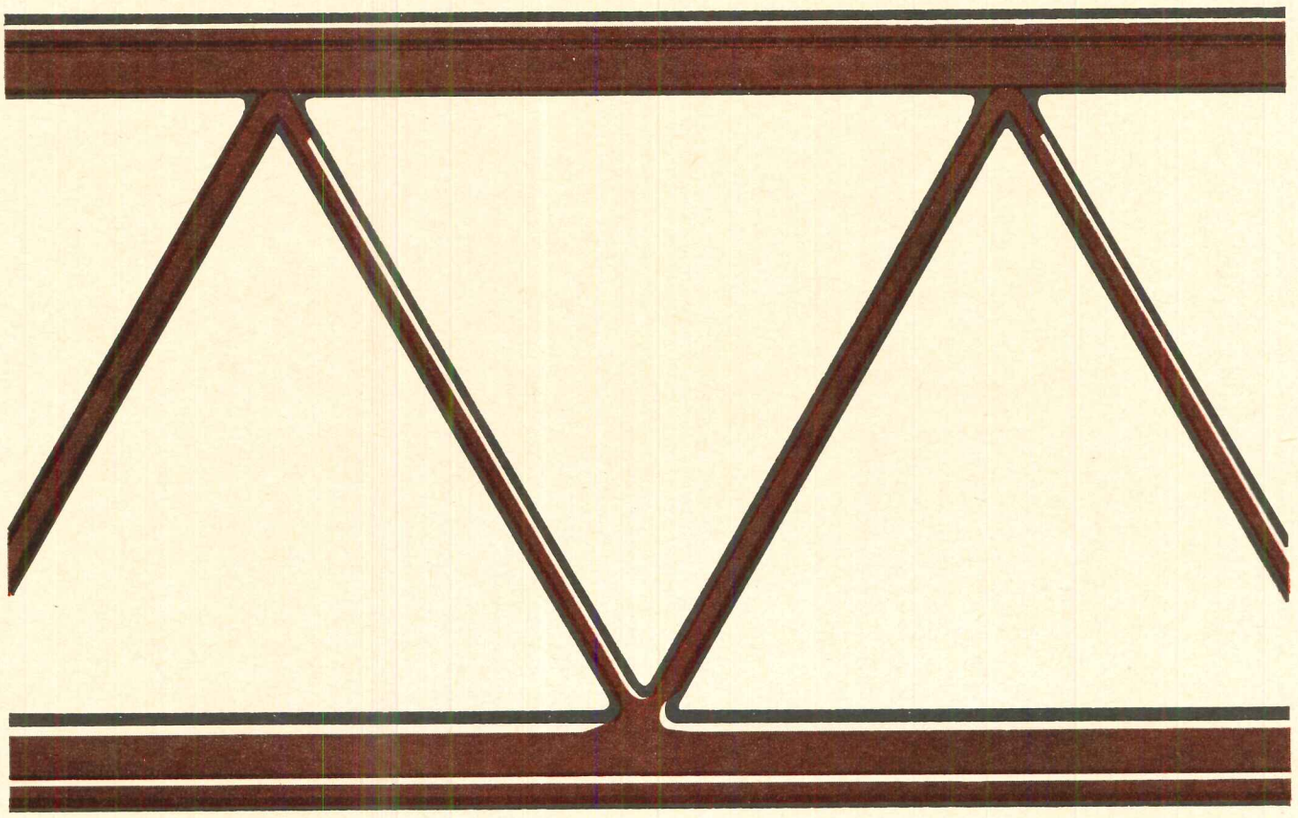


It's tough to find a better primer than the one we use for Sheffield Steel Joists

Any other primer you specify would cost you more, too. The red oxide primer applied on Sheffield Steel Joists was especially formulated to meet Federal Specification TTP-636. Considering both economy and efficiency, this time-proved red oxide primer is the best that can be provided. Then too, it is non-bleeding, which simplifies the application of a finish coat of paint.

This red oxide primer provides protection, at no additional cost, when you specify a shop coat of paint on Sheffield Steel Joists.

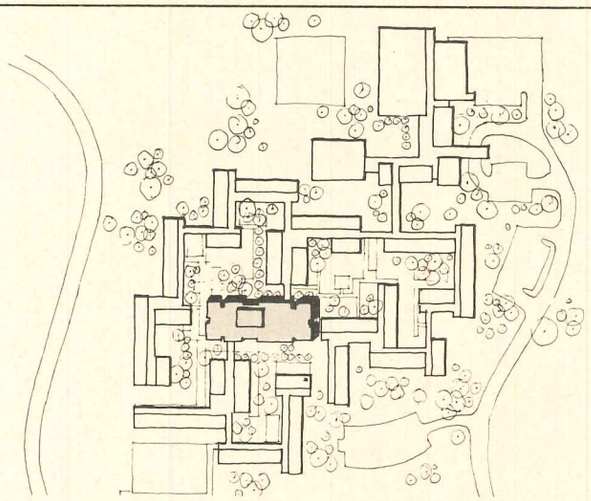
Demonstrating the value of this primer, a test was performed, by an independent testing laboratory, with salt spray (under Federal Test Method Std. 141). After 200 hours exposure to a 20% salt spray the sample showed *"no apparent change."*

All Sheffield Shortspan and Longspan Steel Joists, made to the widely-accepted specifications of the Steel Joist Institute, are supplied with this durable and economical red oxide primer. Write us for our newest catalog. Armco Steel Corporation, Department W-1975, 7000 Roberts Street, Kansas City, Missouri 64125.

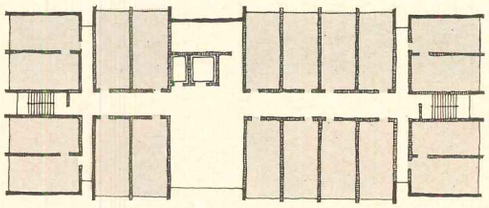
ARMCO STEEL

For more data, circle 143 on Inquiry Card

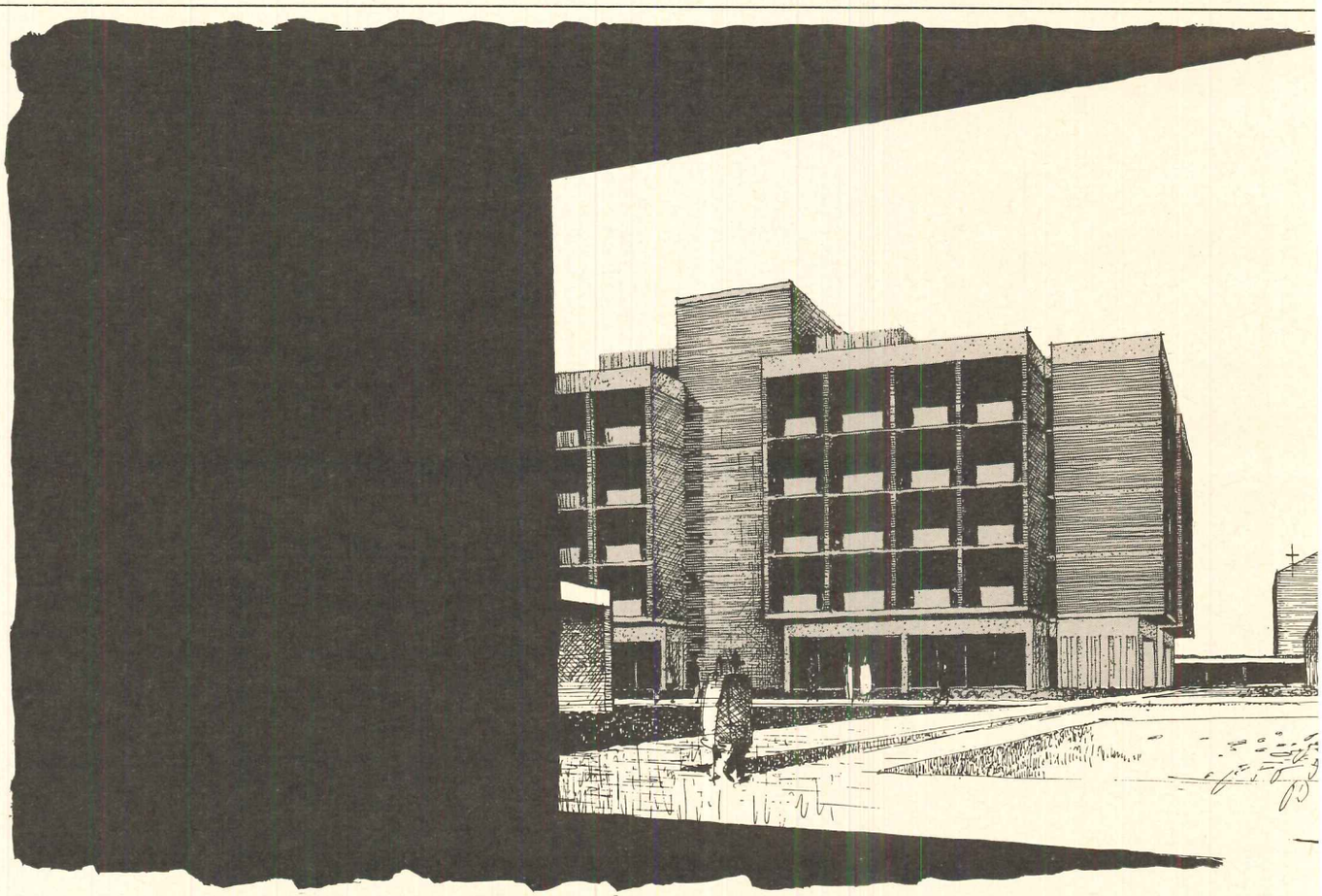
THE CONTEMPORARY CLAY BEARING WALL as designed by Gyo Obata, AIA

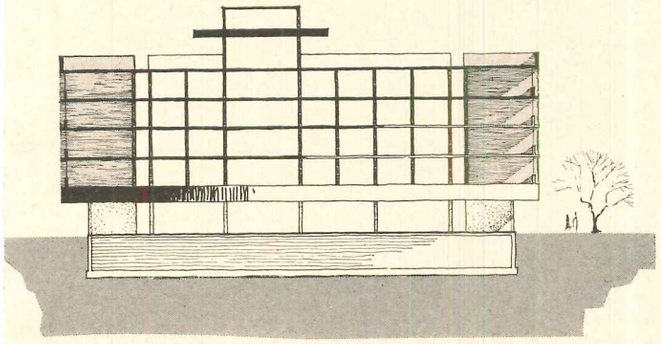


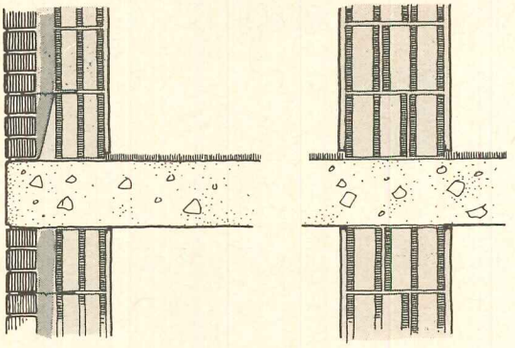
Our goal in designing the Apartment Community of Our Lady of the Snows was to create a self-sufficient community in which retired persons might live in dignity and comfort in beautiful surroundings. We were given 11 acres on the crest of a hill on the 200-acre site of the National Shrine of Our Lady of the Snows near Belleville, Illinois, to plan residential accommodations for 250 persons. To provide beauty, privacy, and a pleasant scale, we created a cluster of single-story cottages grouped around landscaped courtyards and connected to a central five-story structure.



The five-story building was designed to house recreational facilities on the lobby floor with 64 small apartments above. This is the plan for the 2nd, 3rd, 4th, and 5th floors. The nature of the project, the desire for a workable scale, and the need for visual and acoustical privacy suggested the use of clay products for walls and corridors. This became a definite decision when we considered the compressive capabilities of brick and tile and the economies possible in a load-bearing masonry structural system. All of the hatched walls shown here are bearing walls of structural clay tile. Corridors and stair wells are faced with exposed brick. Other interior walls are plastered and painted. All are 12 inches thick. Exterior walls at corners and in core areas, shown by heavy dark lines, are brick and tile cavity walls insulated with water-repellent vermiculite.

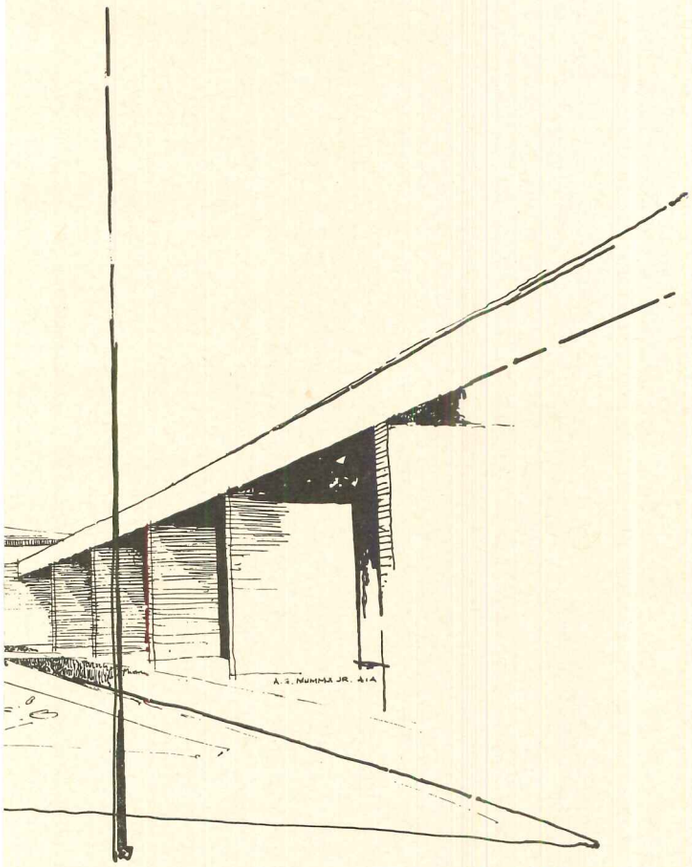






This section tells the rest of the story. The foundation is 12-inch ongitudinal bearing walls of structural clay tile resting on a concrete slab. Concrete columns and beam support the first floor because we wanted long clear spans for recreation areas and multipurpose rooms. Above are the structural tile bearing walls. Floors are poured-in-place concrete slabs. In this case, we found them less costly than precast floors. Bearing walls and floor slabs project to reveal the structure.

At left is a detail of an exterior wall—4 inches of brick, 2 of vermiculite, and 6 inches of structural clay tile. At right is a detail of a typical interior wall; 4- and 8-inch tiles are alternated for maximum strength. In this particular case, we found the structural clay bearing wall system to be a natural and economical solution to our problems. It had the further virtue of offering functional and aesthetic benefits peculiar both to these materials and the needs of this project.



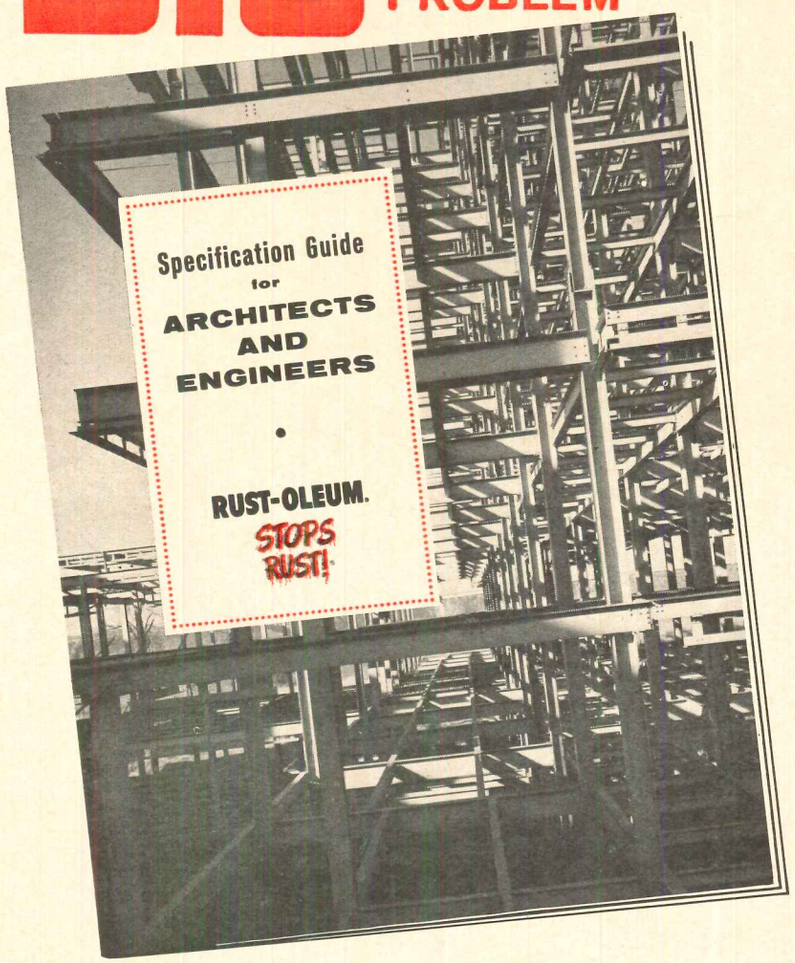
Project: **Apartment Community of Our Lady of the Snows**
Architects: **Hellmuth, Obata & Kassabaum**
Engineers: **The Engineers Collaborative**
Owner: **The Oblate Fathers**

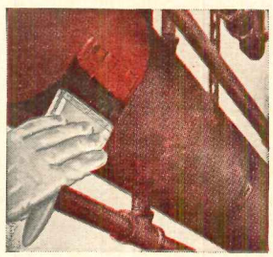
BRICK:
For
Bearing
And
Beauty

Structural Clay Products Institute, 1520 18th St., N.W., Washington, D.C.

scpi

BIG ANSWER TO A BIG PROBLEM





ALL NEW! This Specification Guide will help architects and engineers achieve *long life* and *low maintenance costs* in structures they design. The handy Selector Chart recommends the proper Rust-Oleum Coating Systems to protect steel, concrete and masonry surfaces from dampness, coastal atmospheres, submersion, chemical fumes, spillage, abrasion and heat. Rust-Oleum is available from Rust-Oleum Distributors everywhere. Get your copies of the new Rust-Oleum SPECIFICATION GUIDE for Architects and Engineers *today!*

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Gentlemen: At no cost or obligation, please send me_____ copies of the Rust-Oleum "Specification Guide for Architects and Engineers," and _____ copies of the Rust-Oleum "Long Life Facts" booklet.

For more data, circle 144 on Inquiry Card

Office Literature

continued from page 264

PRODUCTS AND SYSTEMS FOR WATER-PROOFING AND DAMP-PROOFING

A new catalog of water-proofing and damp-proofing systems and products contains installation drawings and typical specifications. Careful definitions of the terms are given as well as detailed descriptions of the most suitable products for both processes. *Philip Carey Manufacturing Company, Cincinnati, Ohio**

CIRCLE 415 ON INQUIRY CARD

FILING CABINETS

The *1700* line of filing cabinets, available in four heights—two-, three-, four- and five-drawer—are featured in an illustrated brochure. Photographs are used to explain progressive suspension systems on drawer capacities and case construction. A specifications chart on the back cover lists model numbers, cabinet and drawer dimensions to simsimplify the ordering process. *Steelcase, Inc., Grand Rapids, Mich.*

CIRCLE 416 ON INQUIRY CARD

HANDBOOK ON PLASTIC STRUCTURAL SHAPES

A new 24-page architectural and engineering guidebook lists allowable loads for all standard *eXtren* fiber glass shapes and connections. Tensile, compression, flexural and impact strengths; specific gravity; chemical resistance; heat effects; standard tolerances; and fabrication data are all included in the brochure, no. 80-51. *Joseph T. Ryerson & Son, Inc., Chicago, Ill.**

CIRCLE 417 ON INQUIRY CARD

LABORATORY FUME HOOD CATALOG

Complete information on all types of fume hoods manufactured and supplied by the company is given in a comprehensive 76-page catalog. A special feature of the brochure is the newly designed auxiliary-air type airflow hood for use in air-conditioned laboratories. *Kewaunee Manufacturing Company, Adrian, Mich.**

CIRCLE 418 ON INQUIRY CARD

**Additional product information in Sweet's Architectural File*

more literature on page 276

Whatever You Need –
Wherever You Are –
You Can Count On Bradley T. Potts To Come Through

Bradley Potts will go to great lengths – like half-way around the world if needed – to give you the extra service you need on Flintkote Floor Tiles.

He knows from experience – and nobody in the business has had more than Flintkote – that his most important job is to see that you continue to get the superior quality . . . the fresh new design ideas . . . and the imaginative support that have been a Flintkote hallmark over the years.

So whoever you are, wherever you are, when you need a helping hand with Flintkote Floor Tiles, call on Bradley Potts. He'll be there by the next train, plane or caravan.

Potts Points With Pride

At the new University of Illinois campus in Chicago, the heavy flow of student traffic is carried smoothly over 500,000 square feet of Flintkote floor tiles. Designed by Skidmore, Owings, and Merrill, the complex of buildings makes unique use of Designer Solids in functional and colorful floor design.

FLINTKOTE®

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30 Rockefeller Plaza, New York, N.Y.

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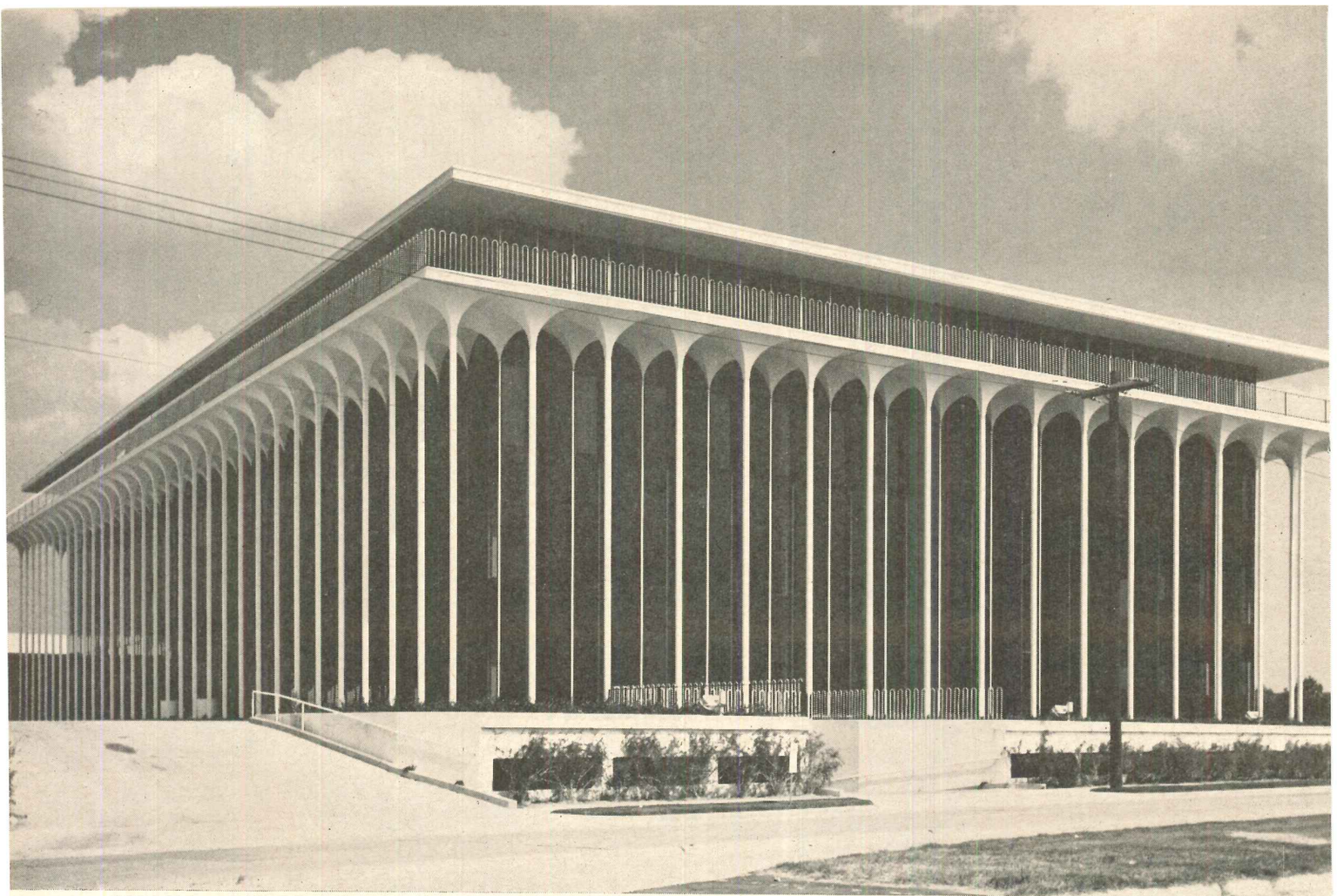
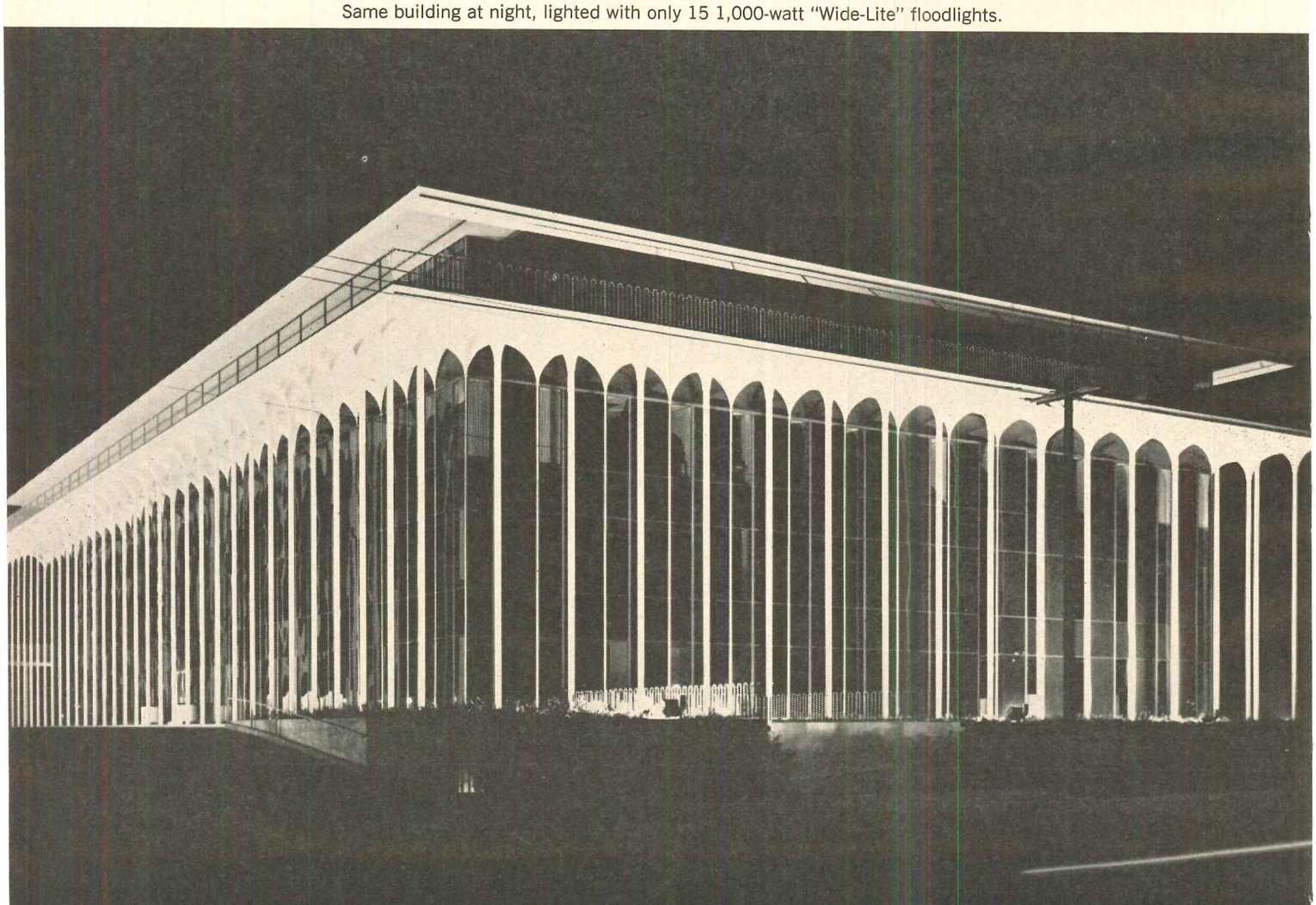


3336 Richmond Building, Houston, Texas Architect: Neuhaus & Taylor, AIA General Contractor: Manes Construction Co., Inc.

Same building at night, lighted with only 15 1,000-watt "Wide-Lite" floodlights.

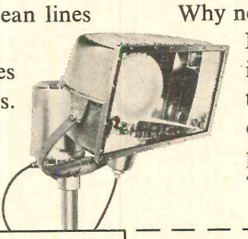


Wide-Lite* floodlights can give your buildings dimension at night!

During the daylight hours, it's easy to perceive dimension and depth in a building, to see and appreciate its beauty. But at night, without exterior lighting, a building becomes little more than a dark silhouette.

This building is a superb example of how "Wide-Lite" floodlighting can light up your building during hours of darkness. During the day, the beauty of the building is apparent. And at night it is "painted with light" to transform what might have otherwise been just a dark mass into a brilliantly illuminated structure that reveals all its aesthetic qualities—from the towering colonnades to the clean lines of the cornice.

This dramatic effect is produced on three sides with only fifteen 1,000-watt "Wide-Lite" fixtures. The architect specifically chose "Wide-Lite" fixtures to get the maximum amount of light desired with the very minimum number of fixtures and to achieve a broad, smooth light pattern that eliminated shadows and "hot spots" to bring out all the beauty the architect put into the building.



"Wide-Lite" floodlight's exclusive reflector design has proven ideal for decorative lighting jobs like this. And "Wide-Lite" fixtures are built for rugged outdoor lighting, with a sturdy cast aluminum body . . . tempered glass lens to protect reflector and lamp . . . deep cooling fins . . . patented Stabilux socket to grip the lamp at its upper end to prevent lamp breakage.

Why not give your buildings dimension—24 hours a day. Bring out and enhance the beauty of your buildings at night! Contact your "Wide-Lite" representative. He'll be glad to work with you on your decorative lighting applications. Just mail the coupon, or send details of your lighting problem. There's no obligation.

WIDE-LITE

FLOODLIGHTS • POLES • INDOOR LUMINAIRES • BALLASTS • TRANSFORMERS • LOW VOLTAGE LIGHTING

Wide-Lite Corporation, A Division of Esquire, Inc., 4114 Gulf Freeway, Houston, Texas. *In Canada:* Wide-Lite Division, Wakefield Lighting Limited, London, Ontario — *In Europe:* Van Oostenryck, S. A., 9, rue de Formanoir, Bruxelles 7 (Belgium) — *In Mexico:* Inter-Lux, S. A., Apartado Postal No. 1586, Monterrey, N.L., Mexico

*Trademark of Wide-Lite Corporation

WIDE-LITE CORPORATION
A Division of Esquire, Inc.
4114 Gulf Freeway, Houston, Texas Dept. 24A-178

Please send me more facts about "Wide-Lite" floodlighting for buildings.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

For more data, circle 146 on Inquiry Card

St. John's Mercy Hospital, St. Louis, Mo. Architect: Bernard McMahon & Assoc., St. Louis, Mo. — Consultants: Gordon A. Friesen Assoc., Inc., Washington, D. C.

Call TROY® for the most efficient laundry plans!

Take advantage of the TROY Laundry Planning Service that can save your time . . . your client's money. Find out how Hospitals, Motels, Nursing Homes and other institutions often can save 3¢ or more per pound of laundry per day with a TROY on-premise laundry.

Then, just specify the space available for a laundry and the number of beds involved . . . TROY will do the rest. We will analyze your needs. We will plan the entire laundry and prepare floor plans and equipment specifications that will take best advantage of the space for maximum efficiency at minimum cost.

With TROY, your clients are guaranteed installation supervision, system follow up and nationwide mechanical service for the life of the equipment. Use TROY planning facilities on your next job. Just write or see your local TROY representative for the facts.

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For more data, circle 147 on Inquiry Card

Office Literature

continued from page 272

WOOD FLOOR PRESERVER

A penetrating one-step seal and finish for wood floors, which is said to eliminate varnishing and waxing and to cut maintenance costs, is described in a 4-page brochure. The brochure explains the polymerization process by which the finish is able to seal and harden the wood in one application. Complete technical and application data for all types of wood floors is given in the booklet. *Watco-Dennis Corporation, Santa Monica, Calif.*

CIRCLE 419 ON INQUIRY CARD

FIRE DOOR SELECTOR

A 4-page selector for *Amweld* UL fire doors with A,B, and C labels is now available. Doors with 3-hour, 1½-hour, and ¾-hour ratings are described in chart form, with elevation drawings, suggested applications and other product data. Information is also given on UL labeled frames, manufactured specifically for use with *Amweld* UL listed fire doors. *Amweld Building Products, Niles, Ohio**

CIRCLE 420 ON INQUIRY CARD

DURABLE CARPETING

Fortress nylon carpeting, which incorporates 3-ply yarn constructed by the newly developed *Rhino-Tuft* technique, is described in a 4-page colored brochure. The carpeting, which is said to be resilient and hard-wearing, is shown installed in a school, an office, and other buildings, where extra strength and durability are required. *Contract Carpet Engineering, Aldon Rug Mills, Inc., Lenni, Pa.*

CIRCLE 421 ON INQUIRY CARD

ASBESTOS-CEMENT SHEETS FOR LABORATORIES

A 12-page brochure gives details of the company's *Colorith* and *Colorceran* asbestos-cement sheets for use in laboratory table tops, sinks, fume hoods, shelving and other laboratory working surfaces. Installation details, chemical resistance, physical properties, sizes, specifications, bonding and maintenance suggestions are given. *Johns-Manville, New York City**

CIRCLE 422 ON INQUIRY CARD

**Additional product information in Sweet's Architectural File*

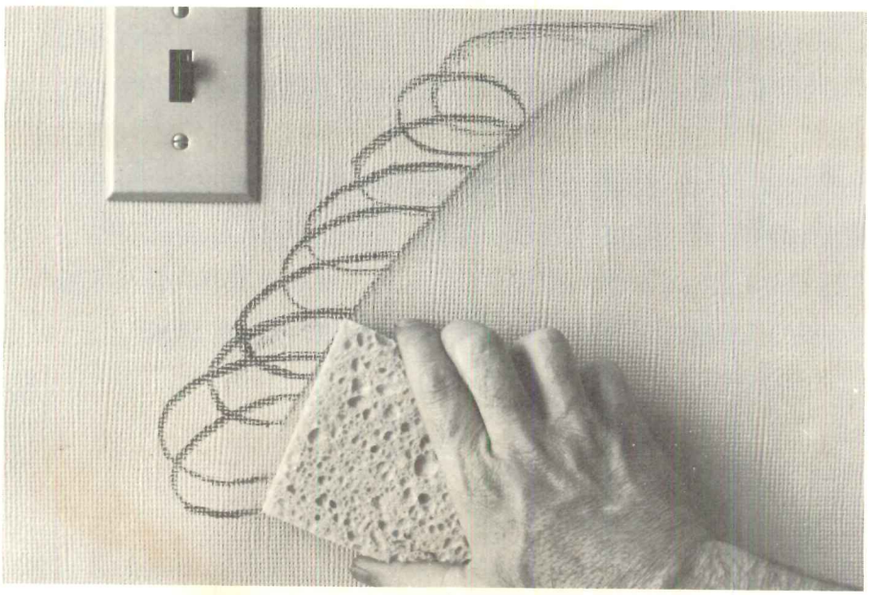
For more data, circle 148 on Inquiry Card ➔

This new vinyl wallcovering is surfaced with TEDLAR®. It is as stainless as ceramic tile. Please try to stain it. Try crayon, mustard, ballpoint pen, iodine, shoe polish, coffee, tar, lipstick—even blood. Then wipe it away without a trace. Use powerful cleaning agents if you like—caustic soda, paint-remover, even MEK. None can harm this new wallcovering. Stain it, if you can.

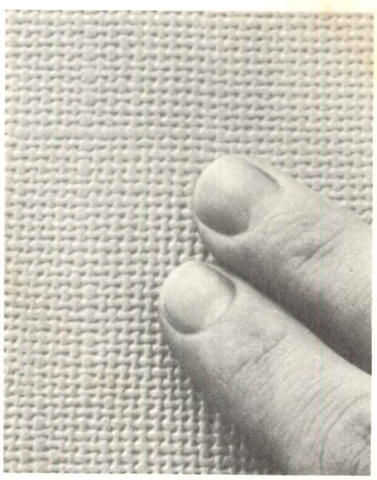
This new vinyl wallcovering is as stainless as ceramic tile. Its surface of Du Pont TEDLAR* PVF film is so inert to chemicals that stains lie on the top, and can be wiped away. This wallcovering will stay new-looking—its colors fresh—for many years. For illustrations and more details, turn the page.

*Du Pont registered trademark.

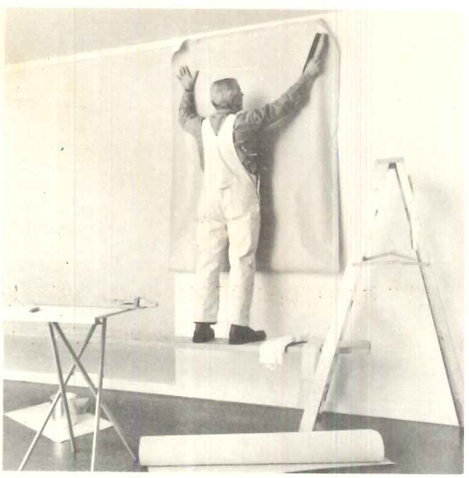
This new vinyl wallcovering, surfaced with Du Pont TEDLAR®, is as stainless as ceramic tile. Already, it's in wide use.



Even ink lies on face of vinyl wallcovering surfaced with TEDLAR, and can be wiped away. Neither severe stains nor harsh cleansing agents can harm appearance of material.



Surface of TEDLAR gives wallcovering durable, stain-resistant finish, yet preserves warmth and appeal of textured vinyl.

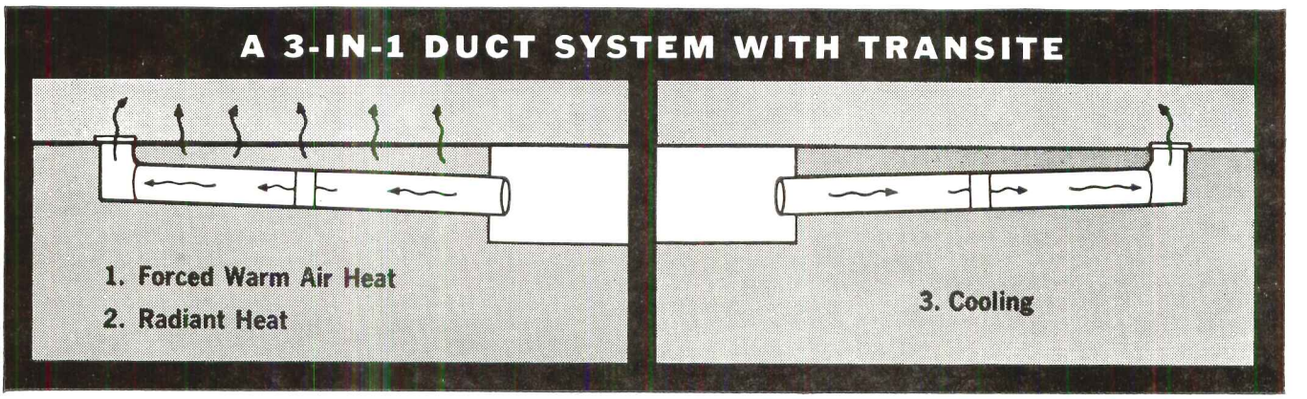


Installed as easily as conventional vinyl wallcovering, products surfaced with TEDLAR provide lasting beauty, easier cleaning and lower maintenance costs.

Vinyl wallcovering surfaced with TEDLAR is now available in many colors, patterns and gauges, from leading manufacturers. For case-history information and samples, write Du Pont Company, Room 2681, Wilmington, Delaware 19898.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING ... *THROUGH CHEMISTRY*



Everybody benefits... client, architect, engineer, contractor

When underground Transite* air heating-cooling ducts are used, much valuable space in residential and non-residential buildings can be saved or utilized. And when the underground ducts are Transite, the air heating-cooling system can be more economical, more efficient and easier to install. Here's why:

CLIENT, ARCHITECT, ENGINEER BENEFITS...

MORE FREEDOM IN BUILDING DESIGN – An out-of-the-way Transite Air Duct system gives more opportunities for flexibility in exterior and interior design.

MORE EFFICIENT AIR DISTRIBUTION – With long lengths and smooth bore, Transite conveys air with 30% less pressure drop as compared to sheet metal. Smaller ducts or blowers may be used. Transite is a quiet duct, no "cracking" or "booming."

Transite ducts radiate heat in winter–put warmth into the slab to counteract floor chill. Deliver a full flow of air to registers...provide balanced air conditioning, eliminate need for supplementary heating.

Wide range of sizes (3"-36") with all needed fittings provide for complete design flexibility.

CONTRACTOR BENEFITS

FAST INSTALLATION – Many installation steps are eliminated. Transite needs no blocking-up or tieing down. No extra concrete needed to provide encasement.

Long 10′ and 13′ lengths mean fewer joints. Watertight joints are made quickly with J-M's unique couplings. Transite fittings are factory-fabricated of the same material as the ducts. No time lost in on-site fabrication of fittings.

TOUGH, DURABLE, EASY-TO-HANDLE DUCTS – Transite asbestos-cement ducts don't have to be "babied;" may be stored on the site exposed to the weather. Won't dent, deform or collapse when the concrete is poured. Can't rust, rot or burn; not affected by corrosive soils.

FIND OUT THE FULL STORY

The full Transite story provides more good reasons why slab-on-grade homes, schools, churches, commercial and industrial structures are better built when Transite is the underground duct for an air heating or cooling system. See our catalogue in the Mechanical Products Specification File or mail in the coupon below.

*TRANSITE IS JOHNS-MANVILLE'S REGISTERED TRADEMARK FOR ITS BRAND OF ASBESTOS-CEMENT PIPE AND OTHER PRODUCTS.

JOHNS-MANVILLE PIPE PRODUCTS

JM PRODUCTS

Johns-Manville, Box 362, AR-10, New York 10016
In Canada: Port Credit, Ont. Cable: Johnmanvil

Please send me your manual on J-M Transite Air Duct.

Name_____

Title_____

Company_____

Address_____

City_____ Zone_____

County_____ State_____

For more data, circle 149 on Inquiry Card

Stock Andersen Windows complement the orderly, disciplined patterns of a policemen's school

Minnesota Highway and Civil Defense Training Center Architect: Bettenburg, Townsend, Stolte & Comb, St. Paul. Windows: Andersen Casements and fixed glass.

Fittingly, this building expresses in its design the environment in which it will be used.

It exudes strength, masculinity. It is bold, yet disciplined in its conception . . . befitting its role as a training center for the Minnesota Highway Patrol and Minnesota Civil Defense.

There's harmony here . . . an artful blending of individually dominant shapes, materials and textures.

Not surprisingly, Andersen Casement Windows readily become a part of this design scheme. Almost like they were made especially for the job. Not stock windows at all.

But they are. And that's the way all **six beautiful types** of Andersen Windows (hundreds of sizes) perform in every design. They complement the most sophisticated architecture. But they never steal the limelight. Never become obtrusive.

And they're so protective. **Extra-weathertight** to save on heating costs and to keep these patrolmen in draft-free comfort even when the winter winds howl at 30 degrees below.

Could it be that getting all involved in custom millwork is an uneconomical use of time?

See Andersen in Sweet's File instead. Or call your Andersen distributor for a Tracing Detail File.

Litho in U.S.A.

Andersen Windowalls*

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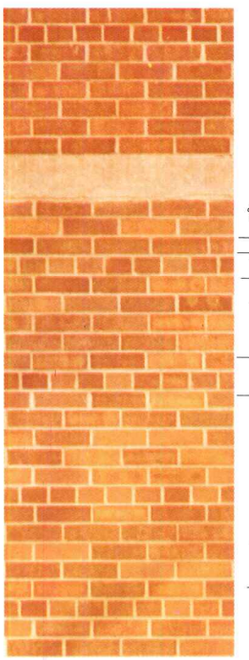
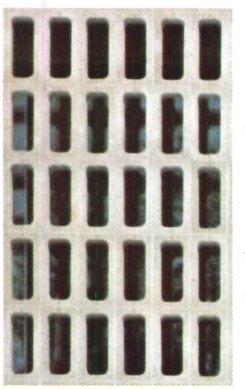
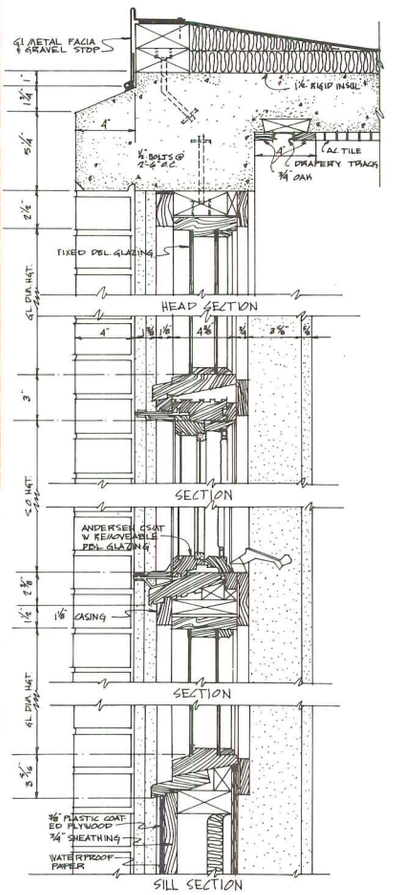
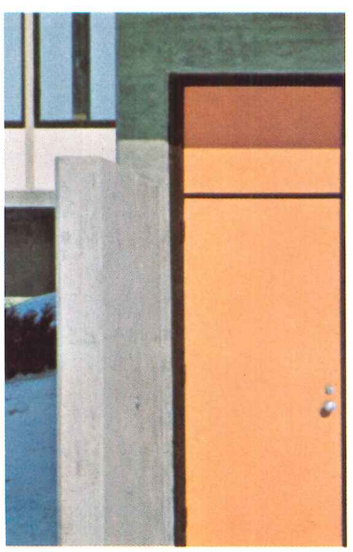
Window Beauty is Andersen






6" METAL FACIA & GRAVEL STOP
1½" RIGID INSUL.
½" BOLTS @ 4'-0" OC
CAC TILE
DRAPERY TRACK
¾" OAK
FIXED DBL GLAZING
6" DIA. HAT
HEAD SECTION
4"
3"
SECTION
5.0 HAT
ANDERSEN CSOAT W REMOVEABLE DBL GLAZING
2⅛"
1½"
1⅛"
CASING
SECTION
6" DIA. HAT
3⅝"
⅜" PLASTIC COATED PLYWOOD
¾" SHEATHING
WATERPROOF PAPER
SILL SECTION



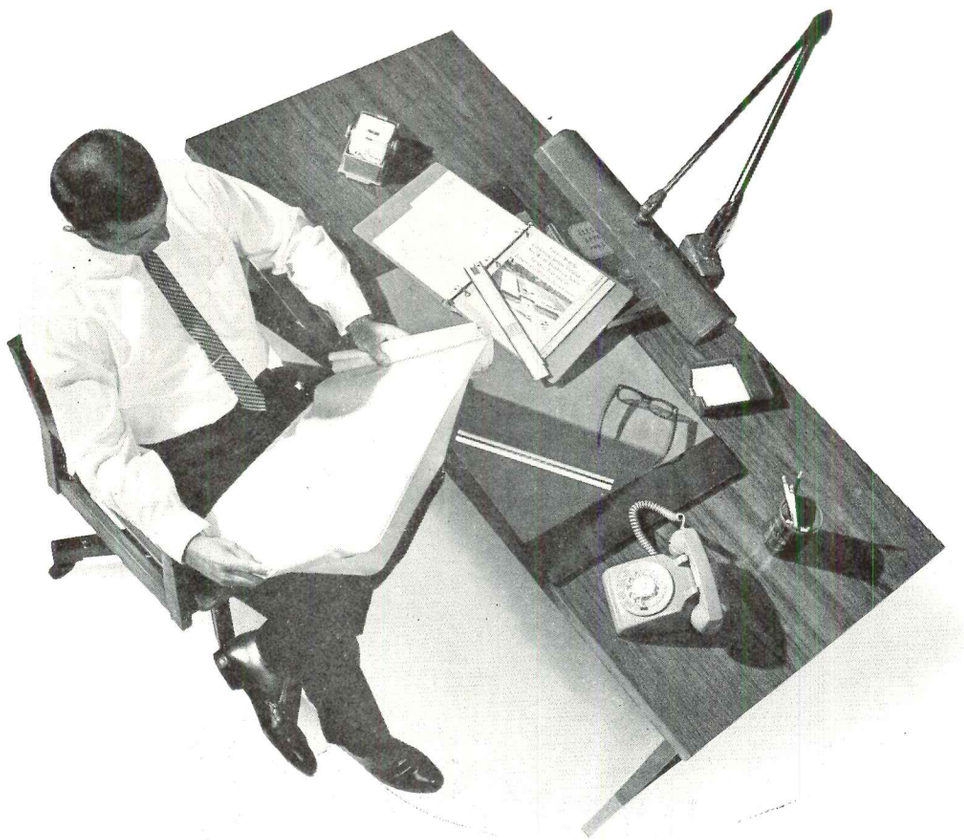
OK. You've made the move to electric heat...

Choose an electrical contractor to install it.

Electric heat is an electrical function and should be installed by a qualified electrical contractor. That way, you've got the one man who can see the job through from plans to permit to operating guarantee.

How can you be sure a qualified electrical contractor will install your next electric heating system? That's easy.

Put the heating specs into the electrical section of your building plan.



Your Qualified Electrical Contractor

NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, 610 Ring Building, Washington, D.C. 20036

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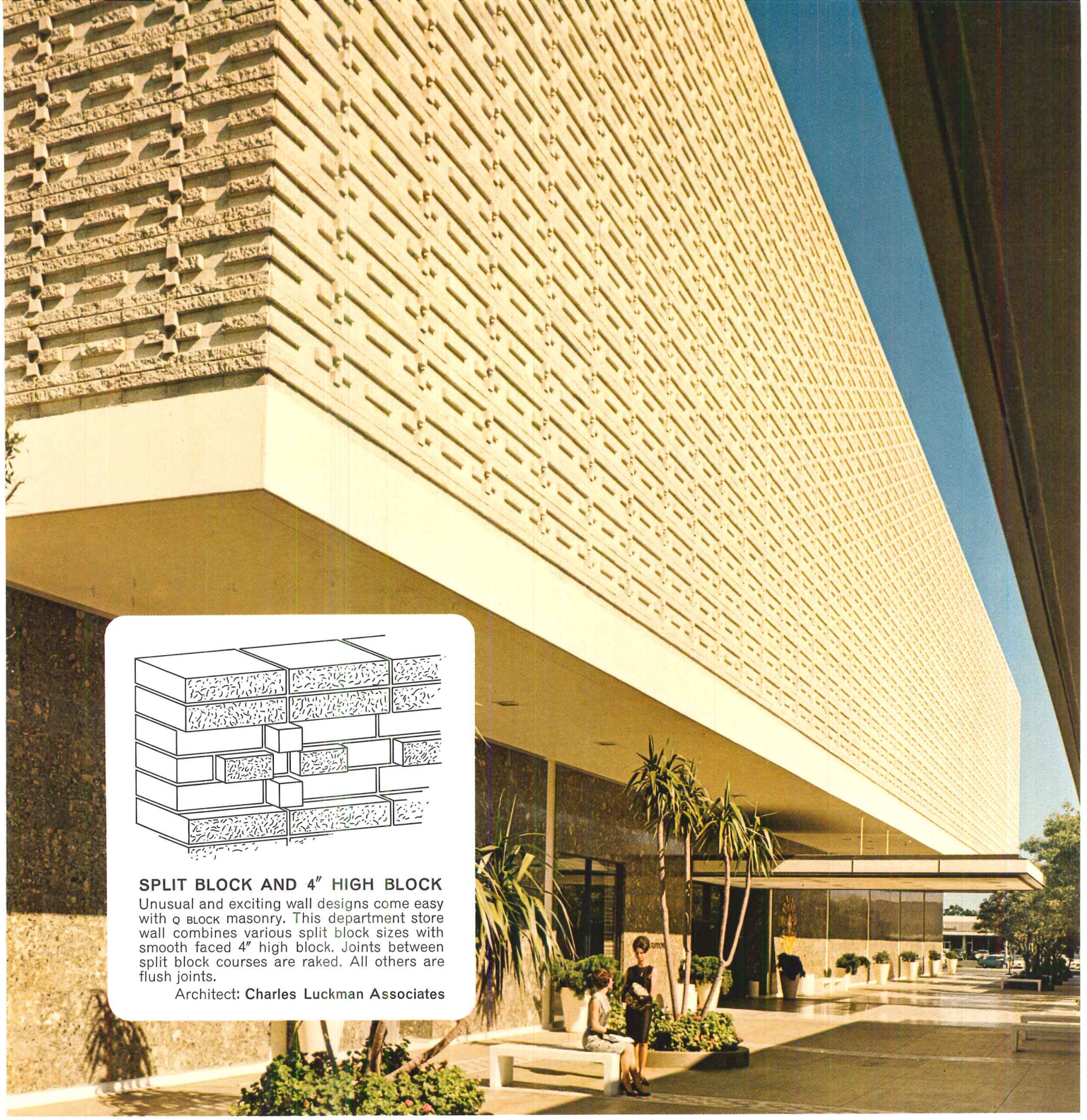


SPLIT BLOCK AND 4″ HIGH BLOCK

Unusual and exciting wall designs come easy with Q BLOCK masonry. This department store wall combines various split block sizes with smooth faced 4″ high block. Joints between split block courses are raked. All others are flush joints.

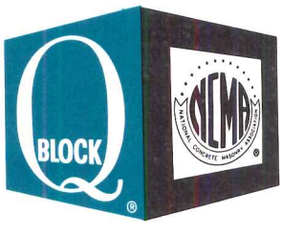
Architect: **Charles Luckman Associates**

Q BLOCK® wall creations

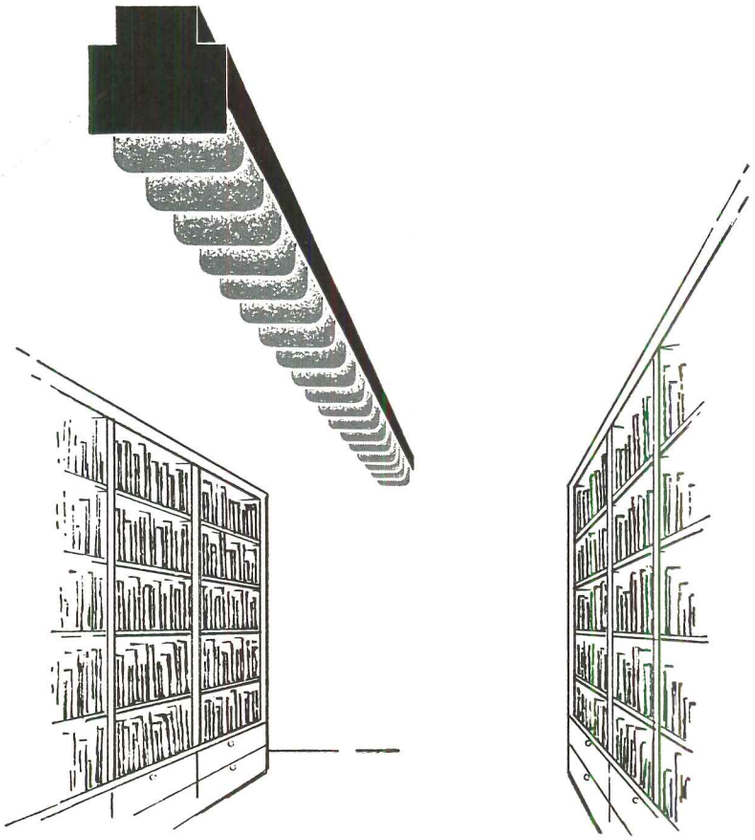
today's smartest way to put quality into every wall!

Q BLOCK masonry, as you know, is the new standard of excellence for concrete block established by the National Concrete Masonry Association. Q BLOCK masonry enables you to design and build with new quality and greater confidence. Only NCMA members can make Q BLOCK masonry, and their products are tested at regular intervals by accredited laboratories to assure that Q BLOCK standards are maintained. Write for the name and address of your nearest Q BLOCK producer.

Look for this Q BLOCK Certification wherever you specify or purchase concrete block.



NATIONAL CONCRETE MASONRY ASSOCIATION • 2009 14th STREET NORTH, ARLINGTON 1, VIRGINIA

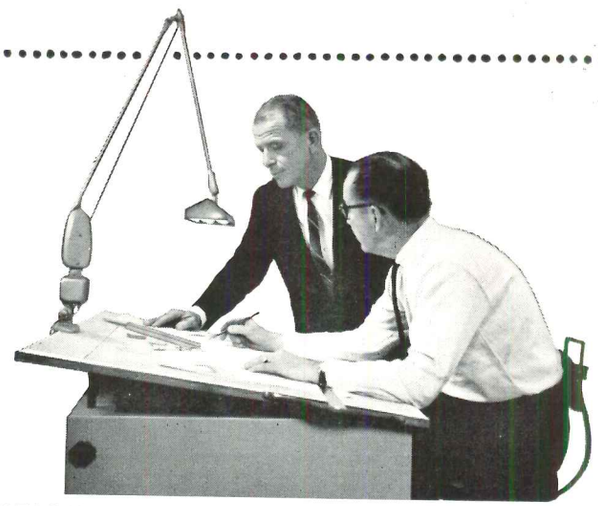


The **"Black Stacklite"** by Litecontrol keeps light where it's needed in libraries and other areas where concentrated lighting is desirable. Book stacks are bathed from top to bottom with glare-free reading light. Removable flat black baffles minimize end brightness. The look is contemporary . . . the effect is extraordinary. Ask your Litecontrol representative for details or write us direct.

Another New Lighting Idea

From

LITECONTROL



LITECONTROL CORPORATION • 36 PLEASANT STREET • WATERTOWN, MASSACHUSETTS

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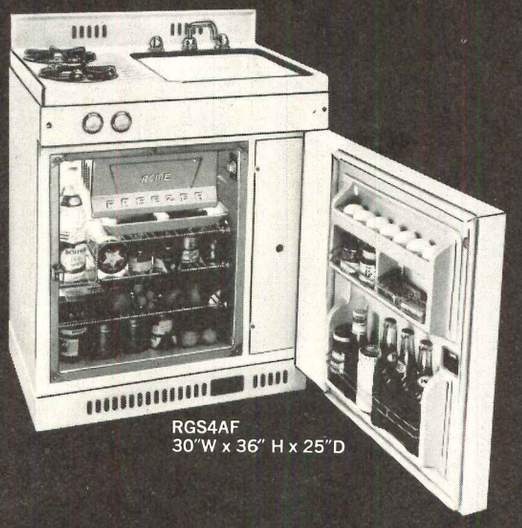
SD51F
24"W x 34½"H x 25"D

ACME *America's most complete line of compact kitchens*

Made by the oldest and largest manufacturer of compact kitchens to the exacting standards required for rugged institutional use.
Write for catalog.

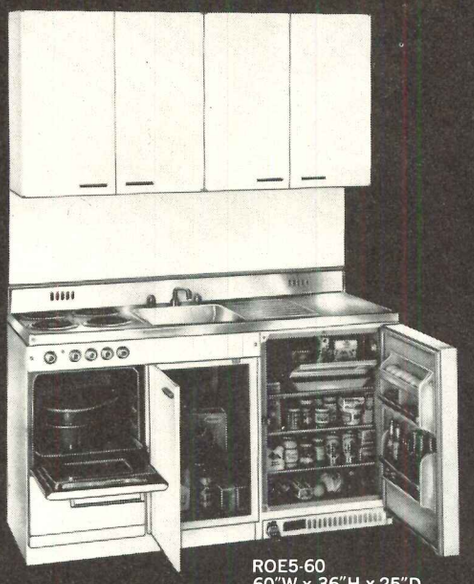
see our catalog in Sweet's

RE5F
27"W x 36"H x 25"D



RGS4AF
30"W x 36" H x 25"D

ROE5
48"W x 36"H x 25"D



ROE5-60
60"W x 36"H x 25"D

ACME NATIONAL REFRIGERATION CO., INC.

Offices and Factory: 19-26 Hazen Street, Astoria, N.Y. 11105 • Mailing Address: P.O. Box 188, Astoria, N.Y. 11105

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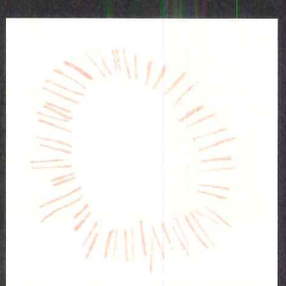
textured wall tile.

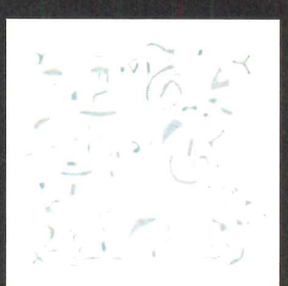
ROMAN COINS
41-801

SPRING LEAVES 40-800

OLIVE TREE 42-811



SUNBURST 43-804



PERSIAN CARPET 44-805

. beautiful . . . exciting . . . inexpensive!

CHOOSE FROM 6 NEW AND ORIGINAL DESIGNS BY MAX SPIVAK, RENOWNED CERAMIC MURALIST

Just looking at these beautiful new Spivak Ceratile Designs might easily give you the impression that they're expensive...but they're *NOT*. They fit even a modest building budget since they actually cost but a few cents more per sq. ft. than standard, solid color wall tiles.

Architects, decorators and builders who are looking for something interesting and different...something new and exciting in ceramic tile will find it in Spivak Ceratile Designs. Here in a modern new, textured tile is a touch of luxury without ostentation. The attractive designs, the interesting "engraved" texture and the soft muted colors of these new tiles combine to give an overall effect of tasteful elegance that will please the most discriminating client.

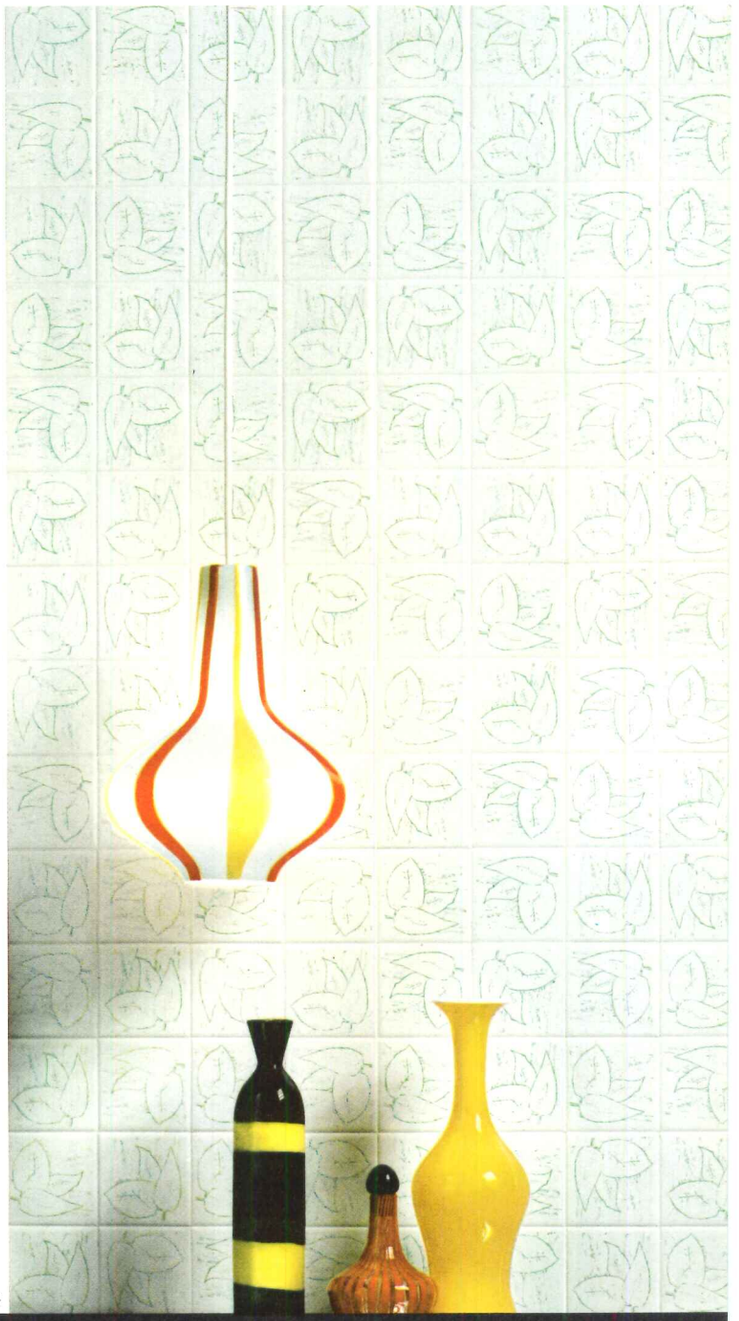
In creating these six new designs, Max Spivak, one of America's outstanding ceramic muralists, designed them primarily for their "total" effect in a wall. By setting them in a random pattern, as he recommends, repetitive monotony is not only avoided but the overall effect becomes even more exciting as the area size increases.

Spivak Ceratile Designs are ideal for use in motel, hotel, apartment and commercial lobbies, in bathrooms, powder rooms and kitchens. They can be used for light-duty floors as well as walls; for an entire room or for a single wall area with equal effectiveness.

Spivak Ceratile Designs are produced in 4¼" x 4¼" flat units in soft, muted colors that coordinate perfectly with solid colors of Suntile and the colored bathroom fixtures of most manufacturers.

If you are an architect, decorator or builder and would like free sample tiles, write us on your professional or business letterhead. Address your request to The Cambridge Tile Mfg. Co., Cincinnati, Ohio 45215.

◀ **The CAMBRIDGE "ROMAN BATH" SUNKEN TUB,** shown at left, adds glamour to any bathroom. This one-piece, precast, reinforced concrete tub is delivered to the job ready for easy installation, plumbing connections and tiling. Only minor modifications in floor framing necessary. No drop ceilings required. Costs considerably less than conventional sunken tub. For details and complete information write Dept. RB65.

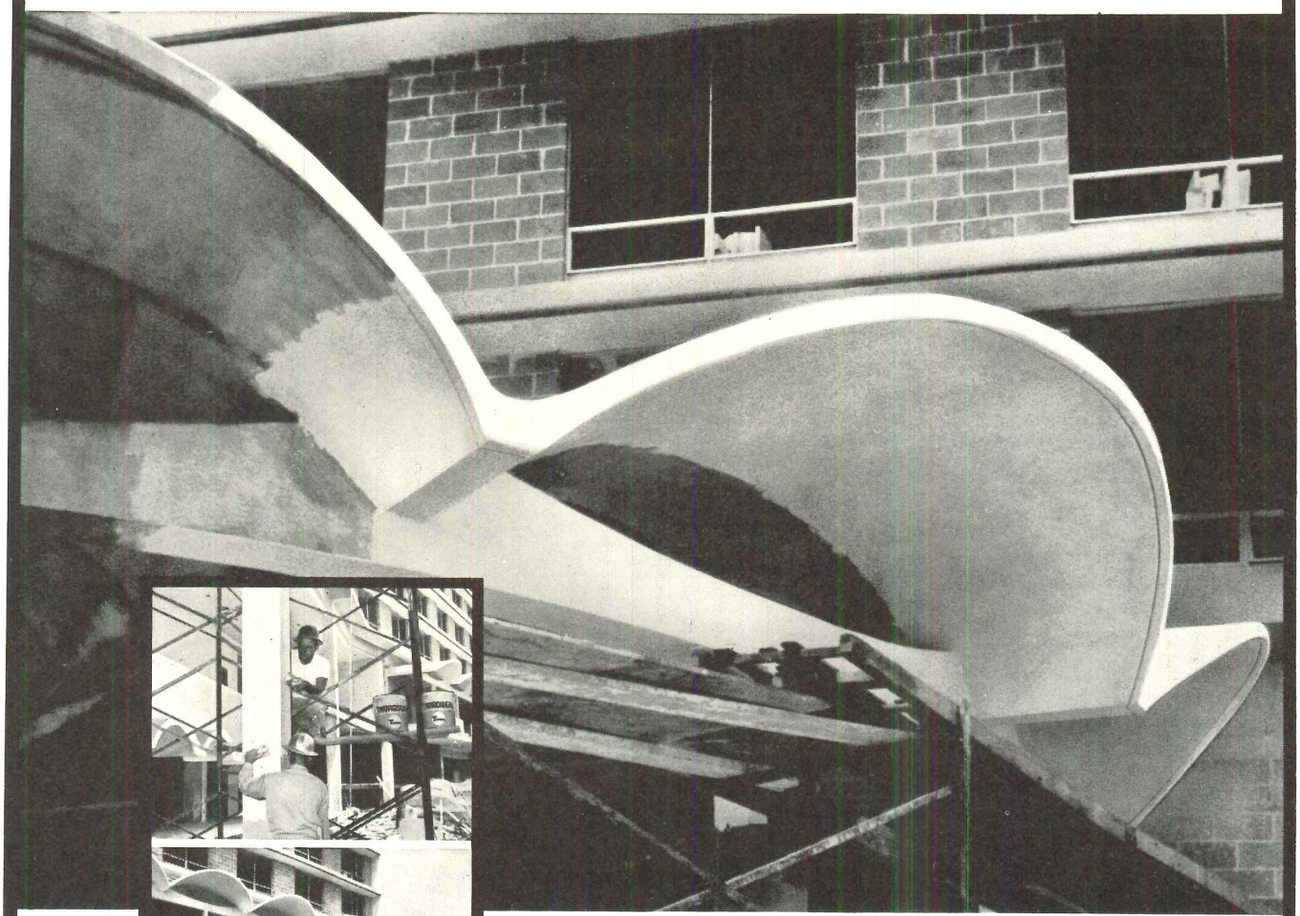


Spivak Ceratile Designs, Copyright 1964

METEOR 45-807

SPIVAK CERATILE DESIGNS by Cambridge Tile

THOROSEAL applied as concrete rub cuts costs and WATERPROOFS as it adds finished beauty...



Parliament House Motor Motel, Birmingham, Ala. Gen. Cont.: Brice Bldg. Co., Birmingham, Ala.

THOROSEAL plus Acryl 60—a job-proven, lifelong waterproofing—the **only** complete finish for concrete and masonry surfaces that makes sense—saves dollars! Creates no drag or crazing, permanently fills and seals all surfaces becoming part of the surface itself!

Visitors to Birmingham will be impressed by the clean look, the uniform whiteness of the attractive Motor Motel pictured above—thanks to the remarkable qualities of THOROSEAL plus Acryl 60, applied here by trowel and float on exposed concrete.

For more information about Thoro System Products, write for Circular #17.

S T A N D A R D D R Y W A L L P R O D U C T S, I N C.

DEPT. 65 AR-6 NEW EAGLE, PA

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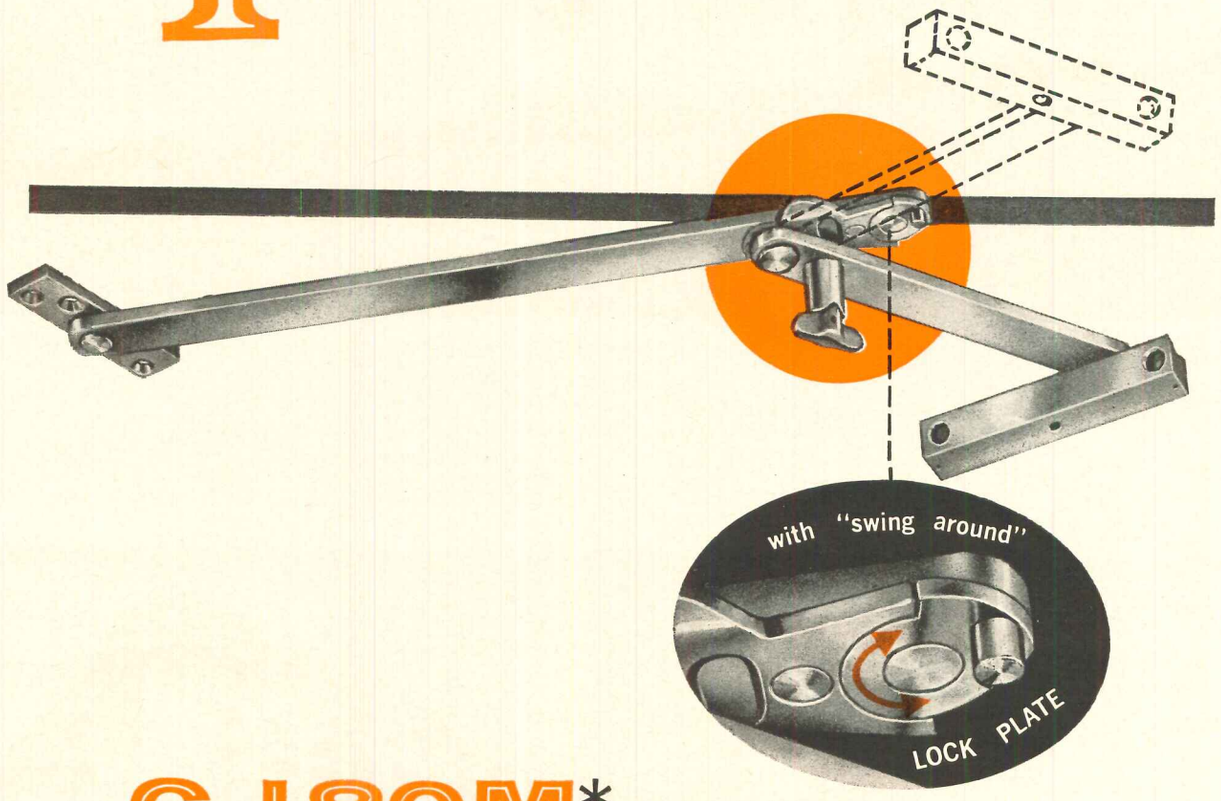
1 DOOR HOLDER suitable for either right or left hand doors



GJ 80M* non-handed
OVERHEAD DOOR HOLDER

for entrance, vestibule and heavy traffic interior doors

***M** as in Modernized

- No need to specify hand of door
- Extended arm reach plus longer spring increases shock absorbing efficiency
- Extruded bronze housing (choice of standard plated finishes)
- On-off hold-open—with safety release

GJ 80M HD *available for heavy duty use on interior and exterior doors*

Send for complete details

GLYNN-JOHNSON CORPORATION

4422 north ravenswood ave /chicago, illinois 60640

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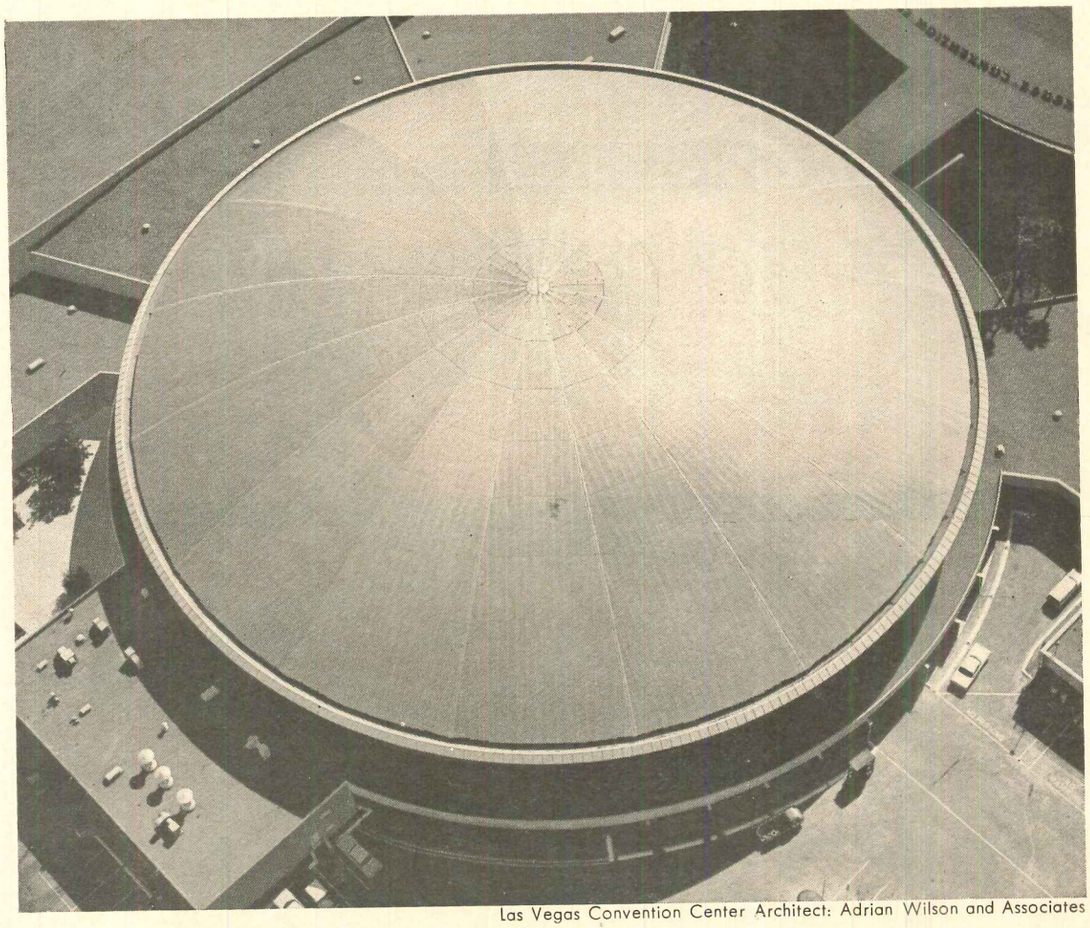


Las Vegas Convention Center Architect: Adrian Wilson and Associates

*4-Inch Rib was specified for the Las Vegas Convention Center.

Do wonders...

or do functional, hard-working designs. Both look better longer with highly corrosion resistant Reynolds Aluminum Roofing and Siding

One of the most important materials you have to specify is roofing and siding—usually the most noticed parts of buildings. With Reynolds Aluminum roofing and siding you can be certain of better performance than with most other materials. There are no chips or cracks to mar your design whether you specify a mill finish or a Colorweld® baked enamel finish. Aluminum is highly corrosion resistant, too. Streaks and stains won't ruin a building's appearance.

Design flexibility is greater, too. There is a large selection of configurations, thicknesses and finishes.* Panels adapt from single skin to insulated wall systems quickly, easily. Aluminum's reflectivity is higher . . . heating and cooling costs lower. Lighter in weight . . . less time and effort to erect. See your Sweet's File, Section 8b/Rey or AIA File Number 12-C for more information. Or write: *Reynolds Metals Company Building Products and Supply Division, Dept. AR-1065, 325 West Touhy Avenue, Park Ridge, Illinois 60068.*

REYNOLDS
where new ideas take shape in
ALUMINUM

Watch **"The Red Skelton Hour,"** Tuesdays, CBS-TV

CONTRACK® BLUEPRINT

DRAPERY FIXTURES APPLICATION IDEAS AND DETAILS

Graber Contrack helps solve read-through problem for National Guardian Life building

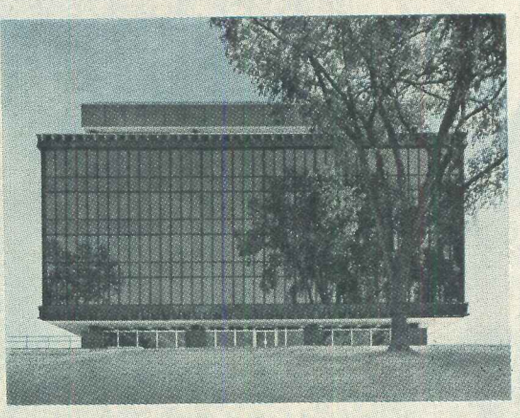
The new home office of National Guardian Life Insurance Company in Madison, Wisconsin is a striking example of achieving cube expression by use of reflective glass. The architect used dual-glazed bronzed glass, disguising the spandrel panel, yet allowing light entrance at vision panels. The structure is flat plate reinforced concrete with electrified floors.

The Interior Designer wanted to maintain the uniformity in exterior appearance inherent to the architect's design. He had effective sunlight control as a secondary end.

Several drapery track brands were tested. Graber Contrack extruded aluminum architectural track was selected for its superior ease in traversing and its capability to meet exacting needs. One of these was minimizing read-through.

Since standard white batons for traversing the draperies could be seen from the outside, Graber brass finish fiber glass batons were selected to eliminate the problem. Graber engineering assistance was credited with providing an installation which solved the read-through problem.

On the inside, the installation blends in as part of the building. The decorator cited the track as providing the longevity which the installation demanded. Replacement in later years need never be considered and maintenance is minimal.



Write for samples of six Contrack cross sections, Architect's File with Catalog, Specifications, and Price Information Dept. D

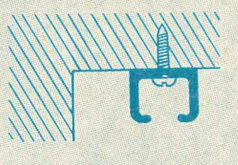
ARCHITECT
John J. Flad & Associates, A.I.A.
Madison, Wisconsin

INTERIOR DESIGNER
Don Reppen & Associates, A.I.D
Madison, Wisconsin

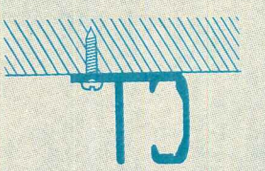
GENERAL CONTRACTOR
J. H. Findorff & Sons
Madison, Wisconsin

INSTALLER
Connie Gruebling
Madison, Wisconsin

MATERIAL AND INSTALLATION DATA



No. 5807 Contrack Hand Traverse on smaller windows in cafeteria and at ground level, within aluminum window frames.

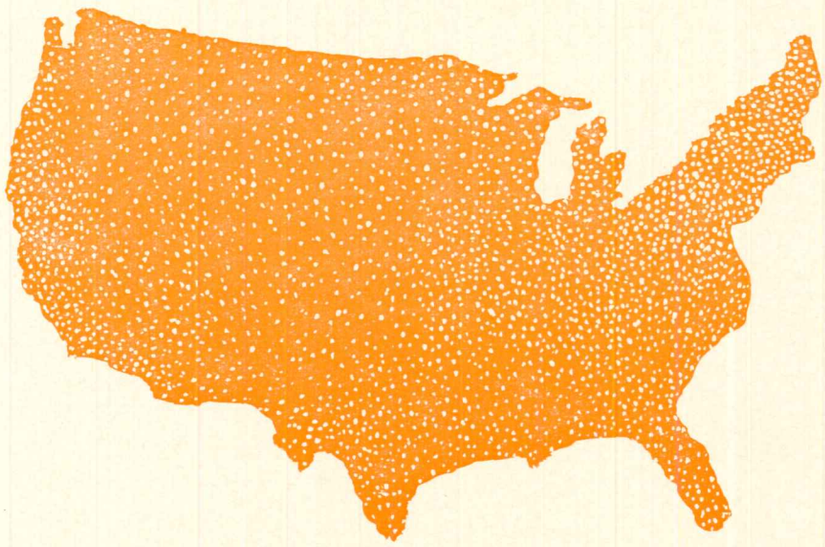


No. 5805 Contrack Hand Traverse with batons on all floors. Installed flush to white painted drapery track nailer along perimeter of fenestration. Continuous track installation wall-to-wall incorporating end-stops every 9' average, allowing for two-way draw between 9' segments.

Graber drapery fixtures
CONTRACT DIVISION
MIDDLETON, WISCONSIN

DESCRIPTION	NATIONAL GUARDIAN LIFE
LOCATION	MADISON, WISCONSIN
TRACK STYLES	Nos. 5805-5807
FILE NUMBER	C-1003

For more data, circle 164 on Inquiry Card



4,280 Continental boiler installations and 4,280 satisfied customers. This remarkable record is possible because Continental is unmatched in high boiler-burner efficiency and low operating cost year in and year out. What's more, 16% of current production is going to customers who already own one or more Continentals. Write for latest catalog.

Continental
Boiler Division

BE
BOILER ENGINEERING
& SUPPLY CO., INC.
PHOENIXVILLE, PENNSYLVANIA

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Imperial Palace Architect Quits in Japan

Architect Junzo Yoshimura, designer of the new Imperial Palace in Tokyo, has angrily submitted his resignation from the project because he charges that the Imperial Household Agency, which hired him in the first place, has introduced changes without consulting him.

The Agency takes the view that it is responsible for the working design and that Yoshimura's original conception was intended from the outset to be only a "rough guide." The Agency also feels that the original plan contained extravagances that would have run the project over budget. Cost estimates for the project have already increased from $25 million to $33.5 million.

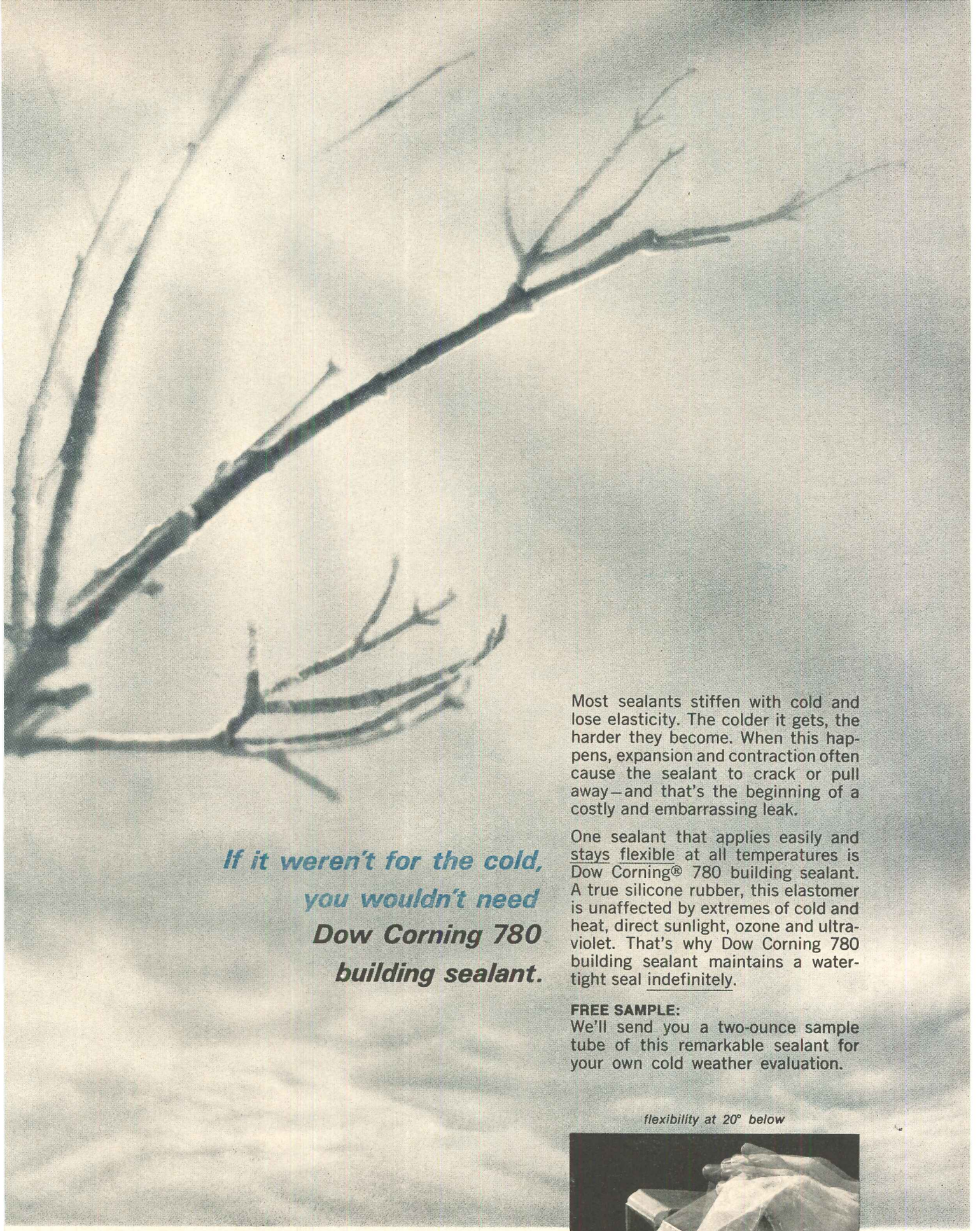
The new palace is being built on the site of the existing palace grounds. The former palace was damaged during World War II and the Imperial family has been living in other buildings on the grounds, having vowed not to rebuild until Japan itself had been rebuilt.

The new palace complex will consist of four major buildings linked by passageways and will include a number of auxiliary structures. Completion is expected by March, 1967.

The Imperial Household Agency has stated that it would want to continue consulting Yoshimura, but the architect sees little point in offering advice that goes unheeded.

Eugene Civic Center Cited by A.I.A.

The American Institute of Architects presented three Citations for Excellence in Community Architecture to the Eugene, Oregon, Civic Center area, with the awards going to the city, Lane County and the State of Oregon. The citations, previously awarded to Detroit and Shreveport, are part of an A.I.A. program started in January to honor those cities having planned projects which "successfully realize the objective of creating vital environments" for their core. The citations were presented by Institute Vice President Robert L. Durham and by Robert B. Martin, director of the A.I.A.'s Northwest Region.



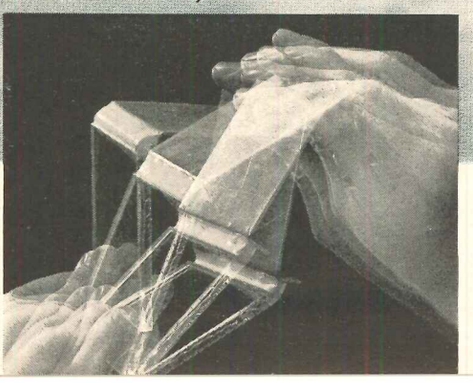
If it weren't for the cold, you wouldn't need Dow Corning 780 building sealant.

Most sealants stiffen with cold and lose elasticity. The colder it gets, the harder they become. When this happens, expansion and contraction often cause the sealant to crack or pull away—and that's the beginning of a costly and embarrassing leak.

One sealant that applies easily and stays flexible at all temperatures is Dow Corning® 780 building sealant. A true silicone rubber, this elastomer is unaffected by extremes of cold and heat, direct sunlight, ozone and ultraviolet. That's why Dow Corning 780 building sealant maintains a watertight seal indefinitely.

FREE SAMPLE:
We'll send you a two-ounce sample tube of this remarkable sealant for your own cold weather evaluation.

flexibility at 20° below

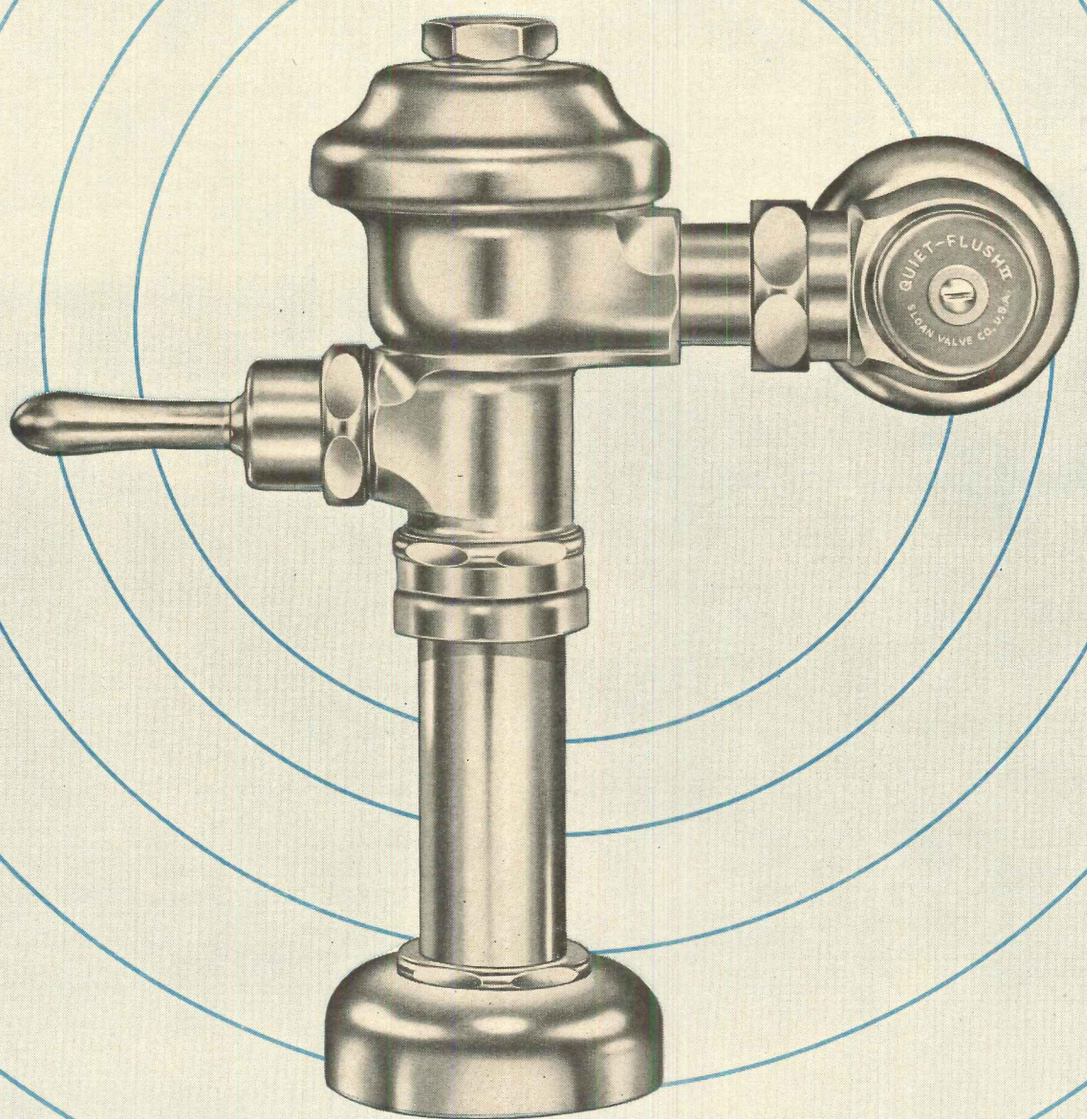


Write Dow Corning Corporation, Dept. 0622,
Chemical Products Division, Midland, Michigan, 48641.
For nearest distributor, see Sweet's Architectural File.

For more data, circle 166 on Inquiry Card

BIG NEWS!

Once Again....



SLOAN raises the standards of flush valve quality and performance

Never before has Sloan research and engineering been more productive in building into its Flush Valves so many new and significant improvements all at one time.

These improvements are of interest to everyone on the decision-making team who selects flush valves—whether Owner, Architect, Engineer, Plumbing Contractor or Wholesaler. They are improvements that assure quality of product—years and years of satisfactory trouble-free service—new ease of installation—low maintenance cost—smart appearance of a more accurate installation every time—and more. Here is your Flush Valve of Tomorrow—Today.

QUIET-FLUSH VALVES. Yes, Sloan Flush Valves are now all quiet—so quiet you actually have to listen to hear them in operation.

THE CONTROL STOP, a part of every Sloan Flush Valve, is of a completely new design. Not only does it contribute to "Quiet" action, but its simplicity of construction bespeaks an even longer trouble-free service life.

THE TAILPIECE, which connects the Flush Valve with the Control Stop, is now adjustable—½-inch IN or ½-inch OUT from the standard roughing-in dimension. A big time-saver, the Sloan Adjustable Tailpiece assures that every flush valve can be installed plumb and true—smart looking workmanship every time.

THE VACUUM BREAKER, a sentinel protecting public health against back-siphonage, is also newly designed—not only to perform faultlessly, but with a minimum of back pressure; it allows the flush valve to operate efficiently and quietly even at the lowest allowable working pressures.

SLOAN'S HANDLE DESIGN, further improved, has a new smoothness of action that even a child will find effortless; and its one-piece packing is dependable and trouble-free.

FOR SWEAT-SOLDER INSTALLATIONS, which appear to be gaining in popularity, Sloan's new Sweat Solder Kit is guaranteed to be a boon to the installing Plumber, as well as appealing to Owner, Architect and Engineer.

• New packaging and new labels will soon follow to complement Sloan's **BIG NEWS** story.

Our object, of course, is to improve our product—to renew and fortify your confidence in Sloan as the very best—and thereby to merit your continued specification and preference of Sloan Flush Valves.

Write for new Descriptive Catalog

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Did you include a laundry facility in your hotel plans?

You did?

Shame on you!

How impetuous! Like a few other well-meaning planners, you assumed that a laundry facility is vital, that it actually saves money, that *every* hotel has one.

Are you in for a surprise!

Hotel laundry facilities are definitely *out*. They occupy vital space that could provide income—like guest rooms, dining or lounge space, meeting rooms. They also consume money, almost as fast as your guests bring it in. They require personnel, electricity, expensive equipment, supplies and maintenance.

Linen supply services are definitely *in*. Your local linen supplier delivers all your linen needs as often and as plentifully as needed . . . for one low monthly charge, based on actual linens used. He's listed in the yellow pages under "Linen Supply" or "Towel Supply."

FREE DESIGN GUIDES!
They give case histories and suggestions for providing more efficient linen supply service in hospitals, motels, hotels, schools and restaurants, as well as for commercial firms, professional offices and various institutions. Write today.

LINEN SUPPLY ASSOCIATION OF AMERICA
975 Arthur Godfrey Road, Miami Beach, Florida 33140

For more data, circle 168 on Inquiry Card

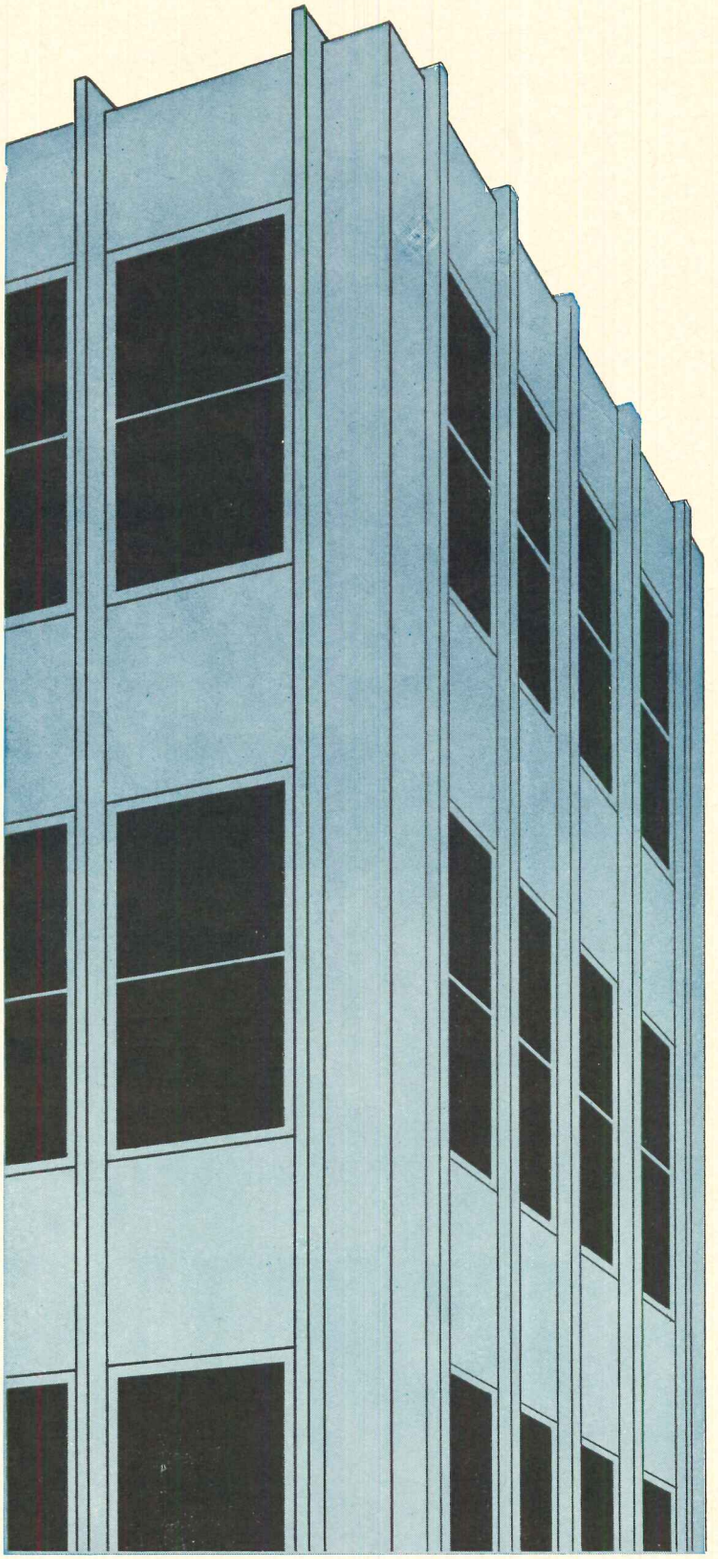
Plans Unveiled For Pet Milk Headquarters

The headquarters for the Pet Milk Company in St. Louis, overlooking Eero Saarinen's Gateway Arch, will be a 15-story, 300,000 square-foot building. "I think of it as a sculpture," said project architect A. L. Aydelott, "framing one side of a new and exciting skyline." Exterior precast concrete columns will support the tower section of the structure. The use of prestressed, precast concrete tees to provide floor support will allow for maximum interior flexibility. Underground parking will be provided for 100 cars.

Housing for Aged Rises in Pennsylvania

The Residence for Senior Citizens in Monessen, Pennsylvania, is a wall bearing structure which will contain 72 one, two, and three bedroom apartments in four and five upper stories, with utility and recreational facilities located on the ground level. The brick-faced structure, designed by architect J. James Fillingham, will rise 59 feet and will have overall ground dimensions of 220 by 60 feet. Structural engineer is Richard M. Gensert and the general contractor is Tempest Construction Company.

Four sound reasons for specifying finishes of KYNAR* 500



1. Perfect color match: That's because finishes of Kynar 500 are liquid . . . can be roller coated on to flat metal stock and post formed . . . the same color finish can be sprayed on to metal parts. You can now color-match mullions, trim and curtain wall.

2. Long life: Tests by Pennsalt and leading paint manufacturers project 30 or more years of useful, maintenance-free life for finishes of Kynar 500 on architectural metals. This performance is comparable to that of porcelain enamel and high-performance anodized protection.

3. Complete range of colors: Paint manufacturers offering finishes of Kynar 500 have white and standard colors. Custom colors to fit your requirements can be formulated depending on the size of the job.

4. Lower cost: Finishes of Kynar 500 cost less per square foot than any other type of metal protection in the 30-year range. What's more, your clients save on cost of maintenance, refinishing.

Take full advantage of the long life and new flexibility in design provided by finishes of Kynar 500. Write today for details plus names of fabricators supplying building components protected by finishes of Kynar 500. Plastics Department, Pennsalt Chemicals Corporation, 3 Penn Center, Philadelphia, Pa. 19102.

*Kynar is a registered trademark of Pennsalt Chemicals Corporation. Kynar 500 is the fluorocarbon resin used by leading paint manufacturers in new long-life finishes.

PENNSALT
CHEMICALS EQUIPMENT

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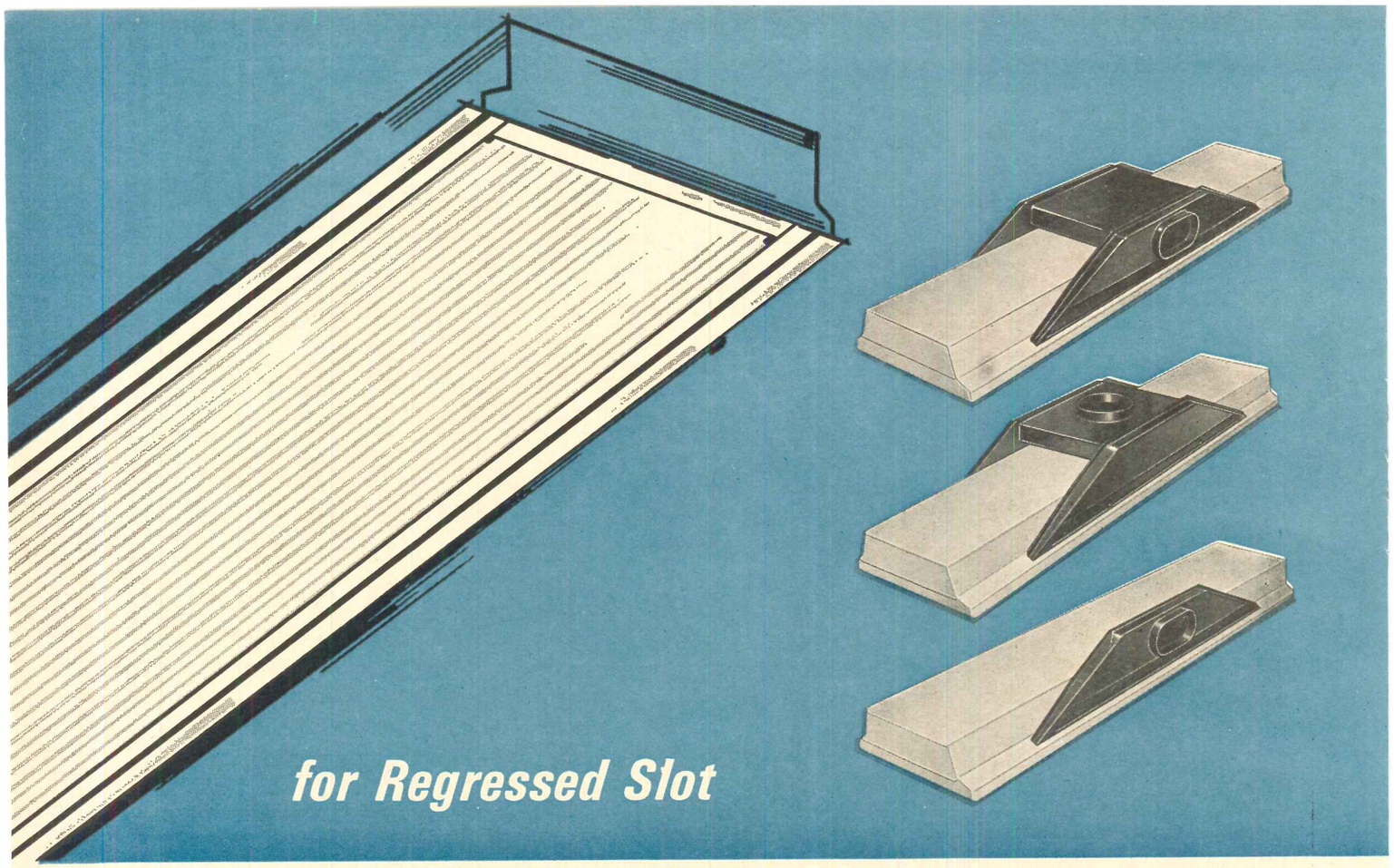


NOW – today's only complete line of high

No longer are you limited in your selection of equipment combining lighting and air handling!

Titus' new wide selection, including the *new line of Titus Air Diffusers for regressed slot troffers,* now makes it possible for you to specify an air diffusion unit (in conjunction with a wide range of makes, types and sizes of light troffers) — that *exactly* meets your specifications.

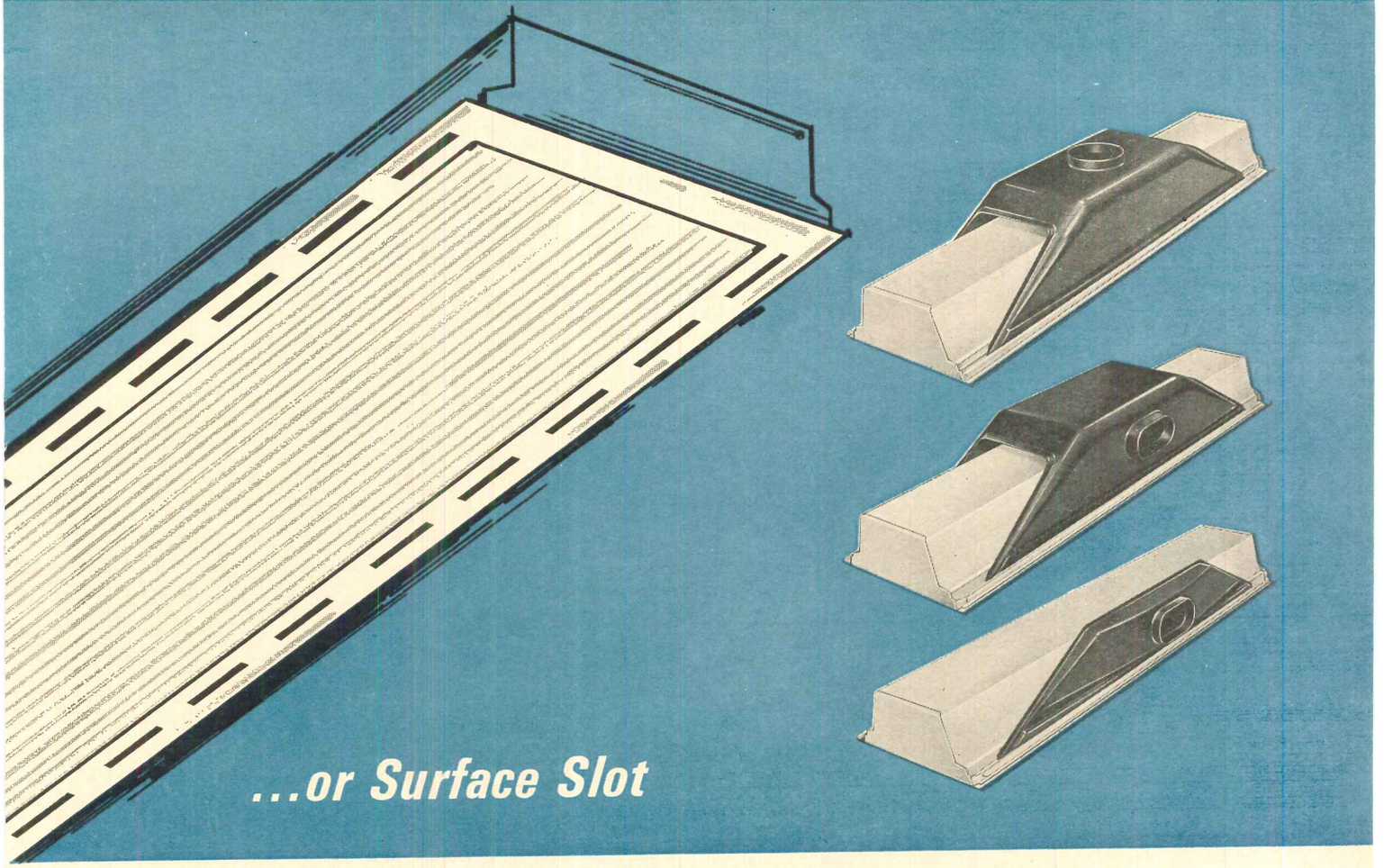
Think what this means! Now even problems like critical space requirements, heat removal, complex air distribution requirements — *CAN BE SOLVED AS SIMPLY AS SPECIFYING TITUS.*

Titus was the original manufacturer of air distribution units for universal use with many different makes of light troffers. Consequently, Titus has had the wide experience of working very closely with many light troffer manufacturers, has performed many troffer heat removal tests, UL tests — and has assisted troffer manufacturers in developing their heat removal units. This background of valuable experience, plus today's largest line of extremely efficient Air Diffusing Units for troffers, is the best reason in the world for *YOU* to specify *TITUS!*

Remember — *air distribution* is Titus' business — Titus' *only* business. When you select Titus you're *SURE* of the most soundly-engineered air distribution money can buy!

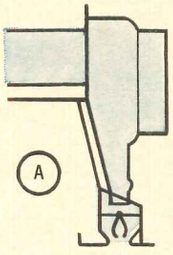
by TITUS®

MEMBER / AIR DIFFUSION COUNCIL

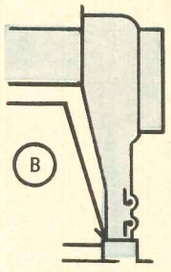


efficiency air diffusers for troffers!

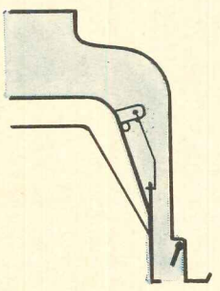
NEW TITUS LTS SERIES DIFFUSERS FOR REGRESSED SLOT TROFFERS. Special compact, low-profile design — plus side feed — make these the perfect diffusers for use in tight plenum spaces. Provide superior Titus air distribution, greatest efficiency. Smaller surface area assures minimum heat exchange between diffuser and plenum, diffuser and troffer (no insulation required!) **AVAILABLE 2 BASIC MODELS** in saddle-type with side feed, single units with side feed, and alternate saddle-type with top feed.



MODEL LTS (drawing "A" at left) has special Titus-designed linear air controllers that are built into the troffer (by troffer manufacturer) and used in conjunction with Titus Air Diffuser that snaps onto troffer. Provides full 180° adjustable air pattern, plus volume control. Complete height, with side-feed unit, only 6⅜".



MODEL LTS (drawing "B" at left) features Titus Air Diffusion Unit with built-in linear air controllers and volume controller. Provides 90° adjustable air pattern. Unit simply snaps onto troffer. Complete height, with side feed, generally under 7 inches.



TITUS LT SERIES DIFFUSERS FOR SURFACE SLOT TROFFERS. The most widely accepted units in the industry! For use with many makes , types, sizes of troffers. (Contact Titus for names of qualified light troffer manufacturers).

Simply snap onto troffer. Air pattern controller provides full 90° adjustable air pattern. Dampers give complete air volume control. Both adjustable from face of diffuser — before, during or after diffuser installation.

Saddle type with top or side feed, and single unit side feed models.

NEW CATALOG--MAIL COUPON

TITUS MANUFACTURING CORPORATION • WATERLOO, IOWA

☐ Send new Catalogs on Titus complete line of Air Diffusers for light troffers. ☐ Have Titus representative call.

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COMPANY .....

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CITY ..... STATE .....

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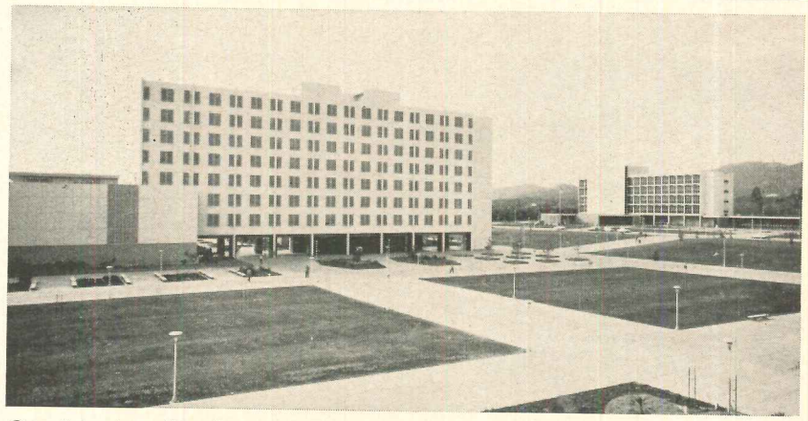
ALTEC SOUND SYSTEMS PASS COMPETITIVE EXAMS FOR QUALITY AT MODERN SAN FERNANDO VALLEY (CALIF.) STATE COLLEGE

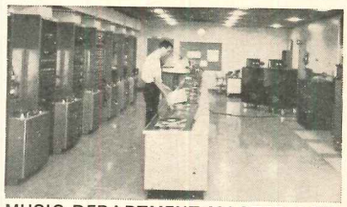
ALTEC SOUND CONTRACTOR:
CALIFORNIA SOUND, INC., LOS ANGELES



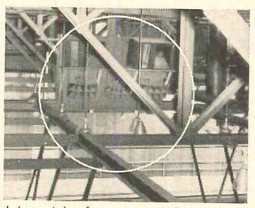
Consistent quality, flexibility to meet specific needs, single-source responsibility—these are some of the reasons SFVSC is using Altec sound systems throughout its campus. Reasons, too, for Altec's excellent reputation in schools and colleges for more than a quarter of a century.

Unlike "multipurpose" systems, Altec school sound systems are designed to your specific needs, whether for clear voice coverage of a noisy gymnasium or for consummate clarity in the auditorium.

With Altec sound systems, you're assured of single-source responsibility—Altec designs and manufactures each and every component that goes into your system. And, an Altec-authorized and trained sound contractor plans, installs, and services the system.



MUSIC DEPARTMENT MASTER CONTROL. Here Altec solid-state amplifiers, sensitive FM tuners, professional "Voice of the Theatre"® speakers, and other components meet the demands of serious musicians for perfection in playback.



GYMNASIUM. Powerful trouble-free amplifiers and rafter-mounted multicell horns and low frequency speakers, rugged microphones, and drift-free FM tuners provide the solution to message clarity despite high-level crowd noise.

MAIN THEATRE. Altec's "Voice of the Theatre"® speaker system provides whisper-to-roar sound to every seat with equal clarity. System is same as used in most of the nation's theatres and auditoriums.

SPEECH-DRAMA RECORDING CENTER. Altec stereo console offers extreme flexibility through use of newly designed miniature plug-in preamplifiers, program amplifiers, and utility input devices.

ENROLL AN ALTEC SOUND SYSTEM IN YOUR SCHOOL PROJECT!

Call your nearest Altec Sound Contractor (listed in the Yellow Pages under "Sound Systems"). Or, for the Altec brochure on School Sound Systems, write Dept. AR 10.

ALTEC LANSING®

ALTEC LANSING
A Division of LTV Ling Altec, Inc.
ANAHEIM, CALIFORNIA

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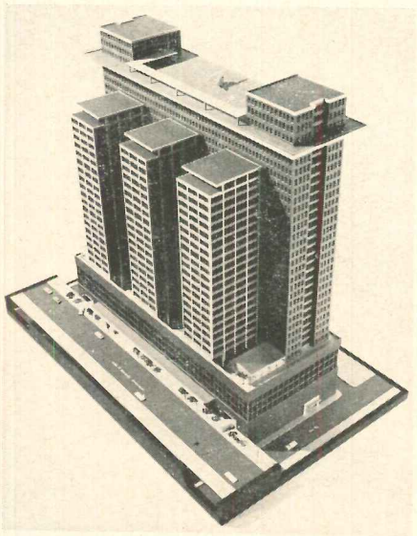


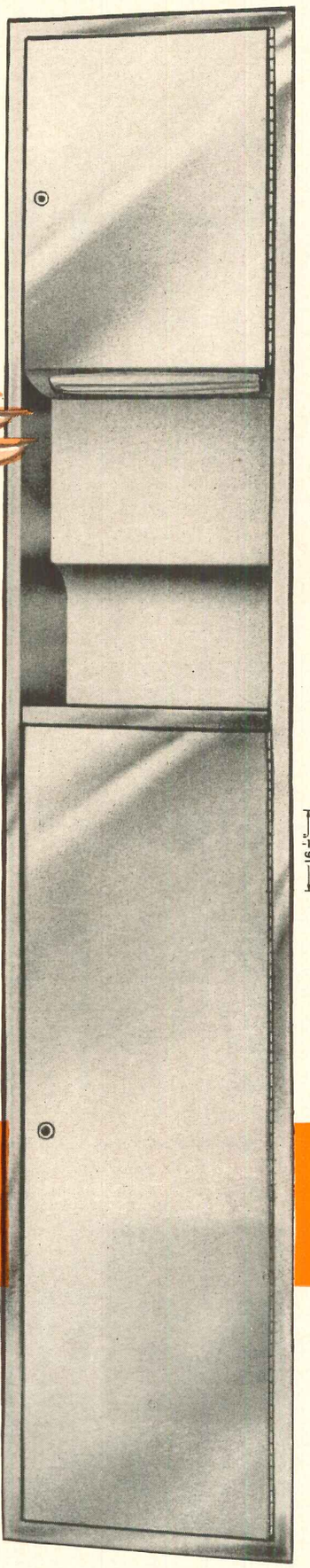
Multi-purpose Structure Has "Desk-side" Parking

The World Trade and Design Center in Philadelphia will consist of six floors of exhibit space at the base, a 24-story office and parking tower, and three 20-story cooperative apartment towers. The office tower will feature desk-side parking provided by automatic highspeed car and passenger elevators that will enable a tenant to park his car in a fireproof parking tower across the hall from his office. The apartment towers will provide 300 one-bedroom, two-bedroom and studio apartments. Designers of the project are Associated architects. A heliport is planned for the roof of the office tower.

Student Union Is Planned for Buffalo

The $2.9 million Student Union Building at the State University College at Buffalo, New York, will include a new addition to the existing Student Union Building and the rehabilitation of the present structure. The new building and the renovation project were designed by the Perkins and Will Partnership, White Plains, New York. The new structure will consist of three stories and a basement and will provide recreational facilities.

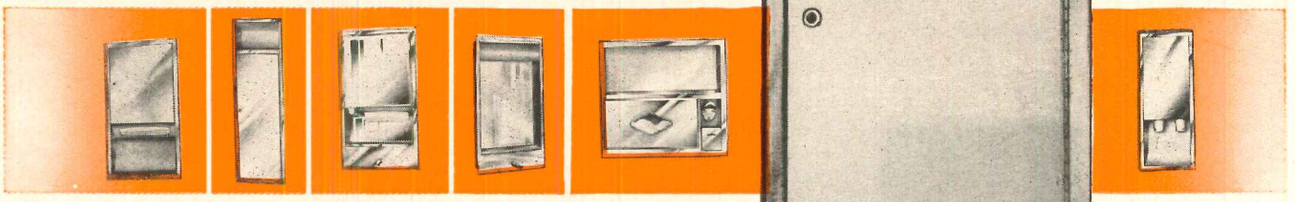
5 GOOD REASONS WHY



MOST ARCHITECTS SPECIFY D. J. ALEXANDER

Regardless of decor, these gleaming, Slim-Line units add a distinctive, modern touch to any washroom. They can be installed in a background setting of tile, glass, brick, paint or any of the newer wall materials. On your next project, turn the washrooms into glamor-rooms. Specify . . . D. J. Alexander.

1. Sleek, modern styling in all units for perfect mix and match.
2. Beveled edges hug the wall tightly and uniformly for customized "built-in" look.
3. Exclusive towel dispenser for use of C fold, multifold or single fold. No adapters, special trays or tools needed.
4. Stainless Steel throughout including removable waste receptacle. All visible surfaces have architectural satin finish, 22 gauge, type 304.
5. Smoother, non-mitred corners, no snags or burrs. All doors are warp free and piano hinged.



See our complete assortment of other matching units. Consult Sweets Catalog 26e/AL or write for our catalog. We manufacture everything we sell.

D J ALEXANDER CORP.

2944 EAST VENANGO STREET, PHILADELPHIA, PENNA. 19134

World's Leading Manufacturer of Stainless Steel Receptacles

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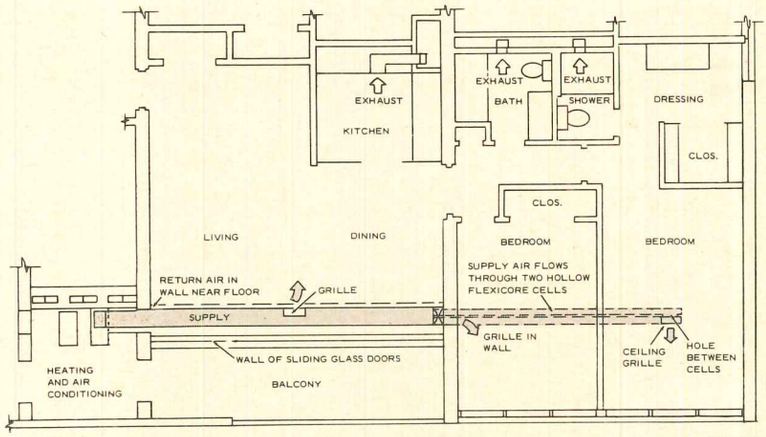
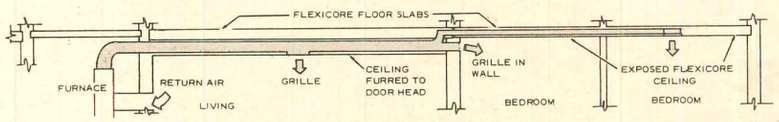


PLAN

SECTION



Heating And Cooling Thru Hollow Concrete Floor Cells At New Americana

One 25-foot length of metal duct, which serves the living room and feeds into hollow Flexicore ceiling cells, will be the complete air distribution system for each of the 2000 apartment units at Americana Landmark, Baltimore.

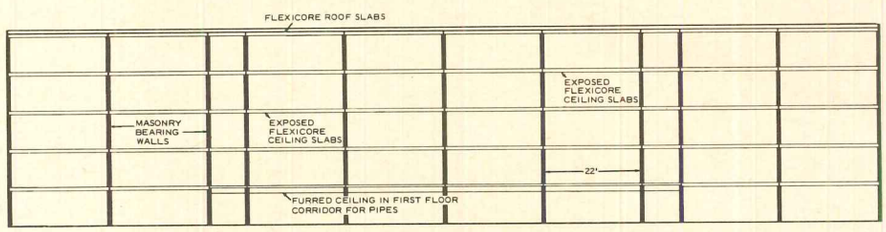
Each unit has its own heating and cooling system in an adjoining equipment closet. Return grille is in living room wall, and feeds directly into the heating-cooling unit.

Exhaust fans in kitchen and bath provide circulation to these areas.

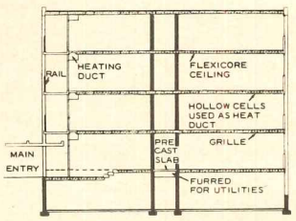
Hi-Stress Flexicore slabs, prestressed with high-tensile 7-wire stress-relieved stands, clear span 22 feet between bearing walls and give fast erection, firesafe structure, and attractive panelled ceilings. Hollow concrete decks, plus ½" rigid insulation, wood parquet flooring and wall-to-wall carpet kill floor-to-floor sound.

Americana Luxury Apartment Communities now operate over 5000 rental units, principally near Baltimore and Washington.

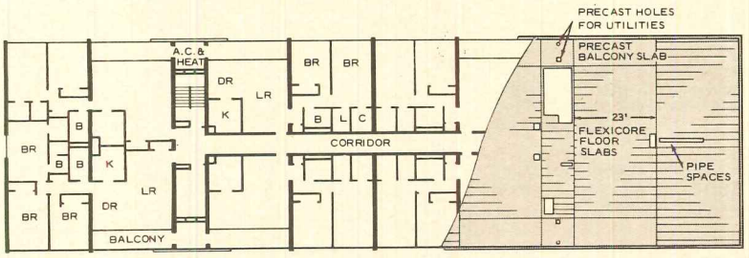
Ask for Flexicore Fact 101 for complete report on this project. Write The Flexicore Co., Inc., Dayton, Ohio 45401, or look under "Flexicore" in white pages of phone book.



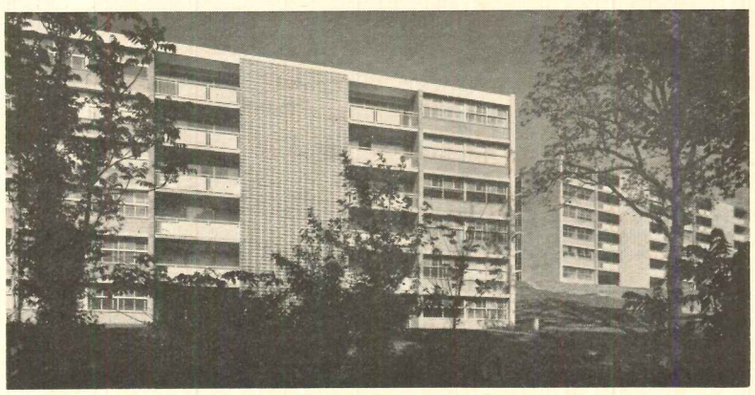
LONGITUDINAL SECTION. Flexicore decks clear-span 22 feet between bearing walls, which are located to separate individual apartment units.



CROSS SECTION. Precast decks, balconies simplify construction.



FRAMING AND FLOOR PLAN. Most apartment units are two bedroom. One and three also available.



All Americana Apartments are located in parklike surroundings.

flexicore®
PRECAST CONCRETE DECKS

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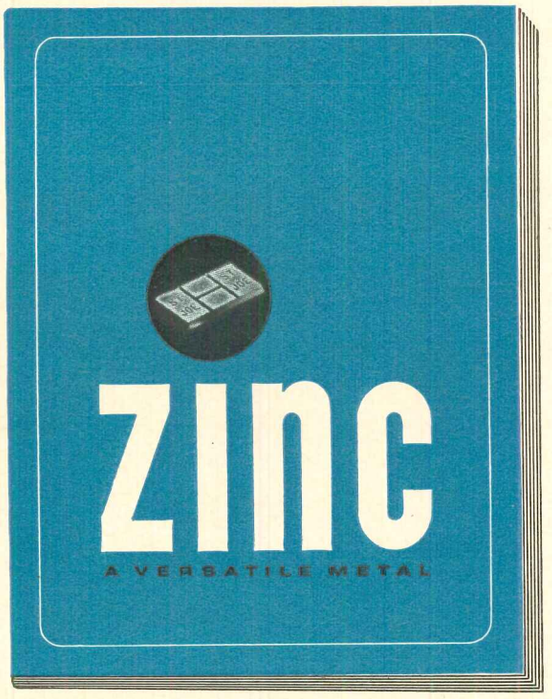
NEW REFERENCE BOOK

For All Who Must Know Materials



This new 52 page St. Joe reference book puts a wealth of useful data on practically every aspect of zinc at your fingertips.

It begins with basic metallurgical data on the metal itself and then gives extensive information on zinc's major uses — galvanized steel and die casting. Subsequent sections cover zinc as a galvanic anode, zinc in brass, and wrought zinc.

Tables and graphs include: Basic Properties of Zinc, A.S.T.M. Specifications for Slab Zinc, Life Expectancy of Galvanized Sheets in Various Environments, Correlation Between Coating Thickness and Life, Average Service Life Before First Painting of Galvanized Transmission Towers and Substations, Impact Test of Galvanized Steel Vs. Aluminum, Standard Specifications for Zinc-Base Alloy Die Castings, Approximate Dimensional and Weight Limits for Die Castings in Different Alloys, Comparative Selection Factors for Die Casting Alloys, Chemical Composition of Zinc Die Castings, Typical Properties of Zinc Die Castings, Useful Data on Zinc as a Galvanic Anode and Practical Anode Sizes and Shapes.

For your free copy, just send a brief request on your company letterhead.

ST. JOE

ST. JOSEPH LEAD COMPANY

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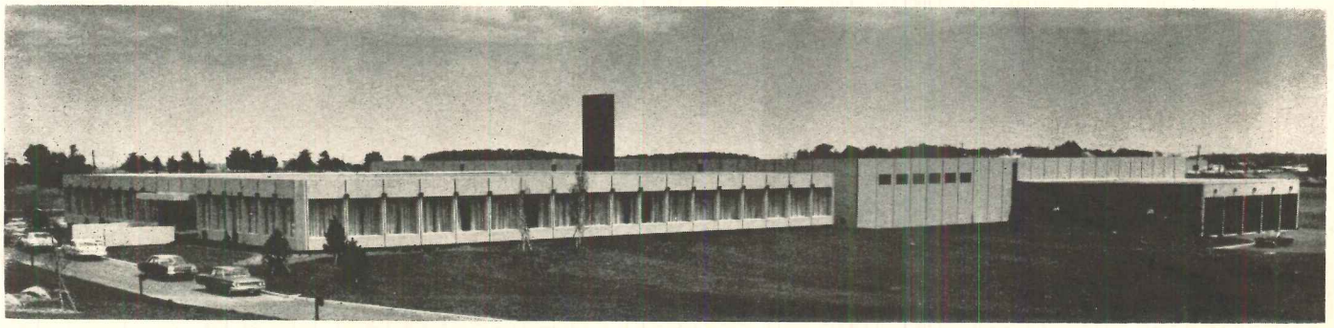
Mcgraw-Hill Opens New Office Building and Warehouse in Toronto



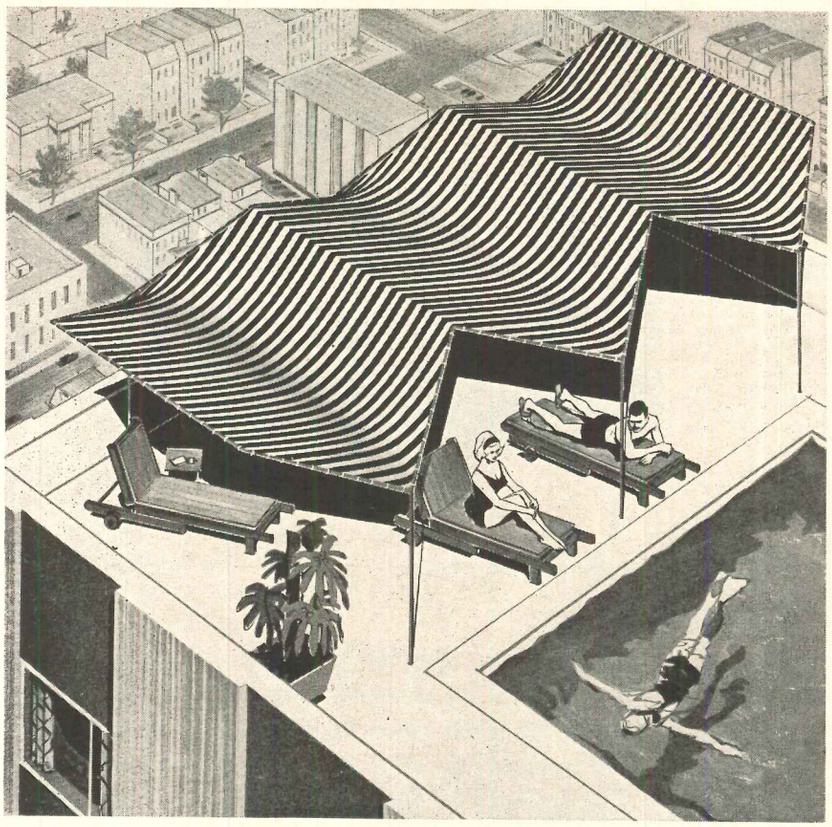
The new McGraw-Hill Office Building and Warehouse in Toronto is located in a large landscaped park, allowing for future expansion, and has depressed parking areas to maintain the park-like atmosphere.

According to the architects, Crang and Boake, "the plan has been developed as two separate units—office and warehouse—connected by a pedestrian link, the large chimney being freestanding and framing a vertical backdrop to the office section." The office section contains 35,000 square feet and the warehouse contains 100,000 square feet. The wall panels on the facade are quartzite-faced precast concrete, and the architects report that use of these panels contributed to rapid construction.

The office area is laid out on one large floor with a central service core and basement mechanical space. According to the architects, "the recessed fluorescent lights are laid out in such a manner that a high light level and maximum partition flexibility are obtained. . . . The five-foot planning module is continued in the ceiling grid and window mullions."

Associated architects were Alfred Easton Poor, architects; structural engineer was M. S. Yolles Associates, Ltd.; mechanical engineer was R. T. Tamblyn & Partners, Ltd.; electrical engineer was G. E. Mulvey & Company, Ltd.; landscape architect was Associated Landscaping, Ltd.; and general contractor was the Dineen Construction Company, Ltd.

Forget upkeep twenty stories up!



Sunbrella's® guaranteed five years. It's the architect's asset that lets you design a practical parabola . . . a carefree cabana, and forget all the regular outdoor fabric worries. Forget mildew. Forget rotting, fading, shrinking. Sunbrella's 25 colors and patterns are guaranteed five years, because it's 100% Acrilan* acrylic fiber. Color lasts. Strength stays. Sunbrella stays up safely year-round. The soft non-glare finish has the same color underneath. For free new 1965 design idea booklet write: Glen Raven Mills, Inc., Glen Raven, North Carolina.

Glen Raven

ACRILAN acrylic fiber CHEMSTRAND

*Reg. TM of Chemstrand

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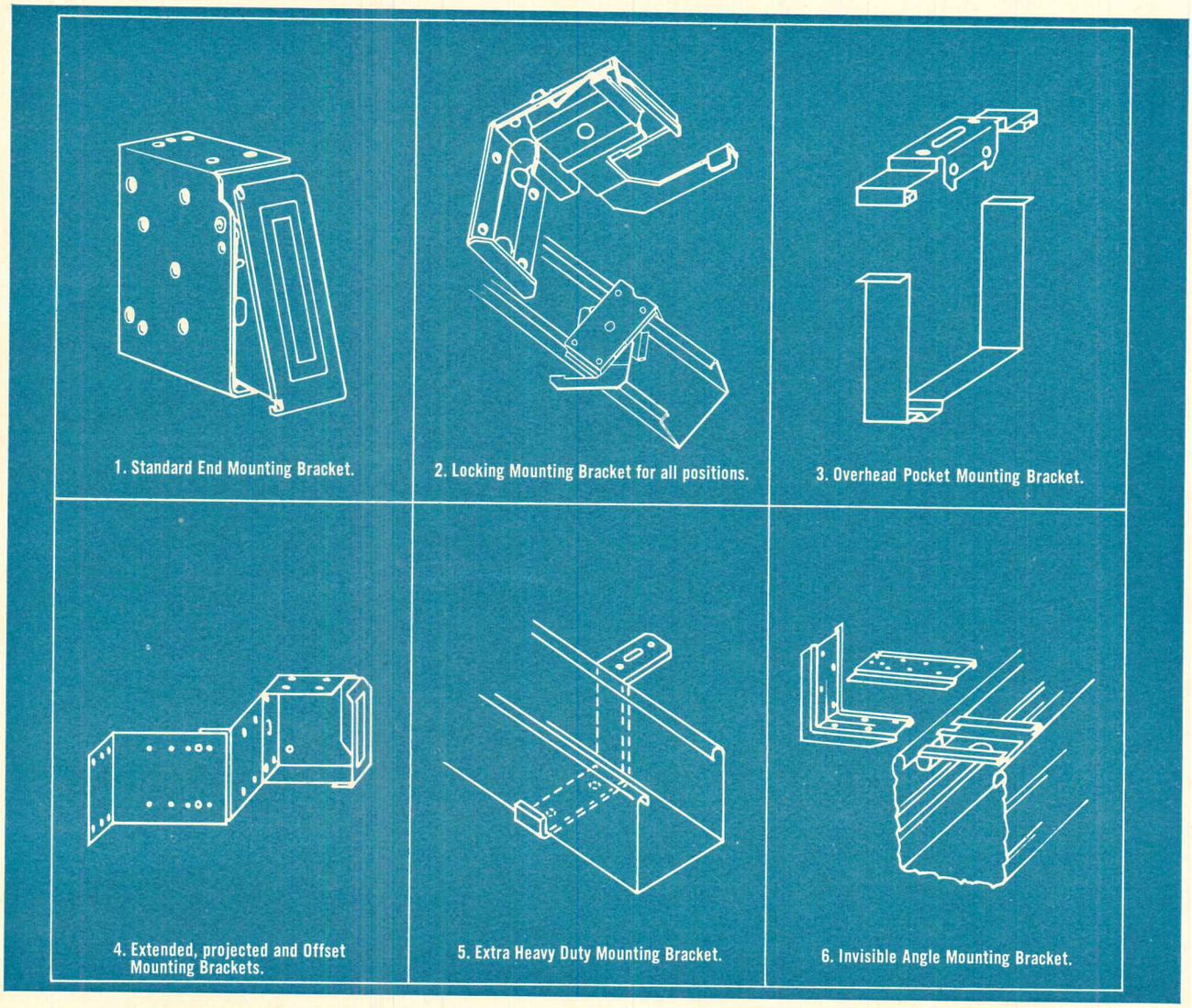
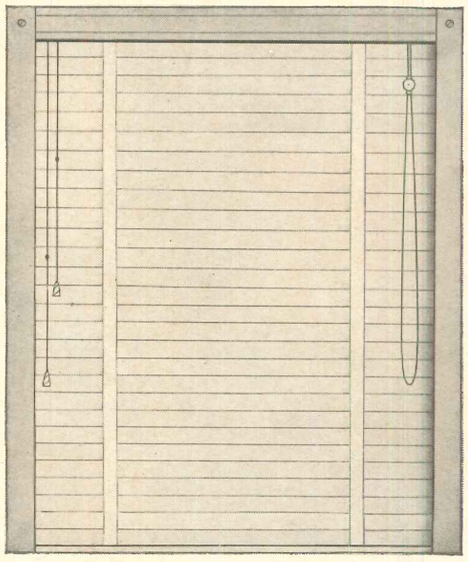
For more data, circle 175 on Inquiry Card →



How many ways are there to install a Venetian Blind?



Of course we don't expect the architect, specifier or contractor to burden himself with the details of installing Venetian Blinds. But, isn't it sensible to award the contract to a company who manufactures a full line of specialized hardware that can guarantee a perfect installation and overcome those unforeseen obstacles without delay?

LEVOLOR manufactures and stocks the largest and most complete line of Venetian Blind hardware in the world. If you are interested in further details write to: LEVOLOR LORENTZEN, INC., 722 MONROE ST., HOBOKEN, N.J.

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Conventional . . . Audiovisual . . . Motorized . . . Special Designs

ENGINEERED VENETIAN BLINDS FOR 33 YEARS

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..for style

monolithic reinforced concrete is the architects' design material

■ Architecture has come of age in America! In this architectural evolution, monolithic reinforced concrete is the preferred construction material. It can be molded freely into any contour and shape, and eliminates the many design restrictions imposed by all other construction methods. Through the use of reinforced concrete, architects can exercise complete freedom in the achievement of style, elegance, and individuality. Decide now to utilize the great design opportunities of monolithic reinforced concrete in your next building.

CRSI
FOUNDED 1924

Edens Theater, Northbrook, Illinois
Architects: The Perkins & Will Partnership
Engineers: The Engineers Collaborative
General Contractor: Chell & Anderson

CONCRETE REINFORCING STEEL INSTITUTE
228 North La Salle Street • Chicago, Illinois 60601

5-64

HOW TO STOP WATER PENETRATION YET LET MASONRY "BREATHE"

By Joe Lifland, Technical Group Leader
Sonneborn Building Products, Inc.

Water penetration can shorten the life of masonry and concrete structures. Wet freeze-thaw conditions cause masonry to deteriorate; mortar to crumble. Water soluble salts leach out, causing unsightly efflorescence. Moisture may even penetrate inside walls, causing failure of plaster and paint.

You can prevent water penetration and provide positive protection for masonry walls by using either Hydrocide Colorcoat or Super Colorcoat, both of which contain silicones to repel water.

Both Colorcoats Protect, Fill, and Decorate in One Application

One application of *either* Colorcoat or Super Colorcoat provides ten to twelve mils of flexible film protection against rain penetration. This heavy, textured layer fills pores and bridges hairline cracks, yet still permits a vapor transmission rate of 3.5 grams per 100 square inches per 24 hours. Thus masonry can breathe, and vapor pressures within the wall are relieved.

Super Colorcoat for Damp or "Green" Surfaces

Unlike Colorcoat, which is used only on dry, cured surfaces, Super Colorcoat goes on easily over "green" or slightly damp surfaces. Compounded on an acrylic emulsion base, Super Colorcoat contains low chalking pigments and ultra-violet light absorbers that assure long life and color stability. In nine colors and white.

15-Year History Proves Durability

The IBM Building at the New York World's Fair is a recent project protected by Hydrocide Colorcoat. During the past 15 years almost all of the nation's top 500 companies have used either Colorcoat or Super Colorcoat in some phase of construction. For further information check the Yellow Pages, Sweet's Architectural File (9/So), or clip the coupon.

SONNEBORN Building Products, Inc.
1700 South Mt. Prospect Road
Des Plaines, Illinois AR-10

Please send me complete technical information on Hydrocide Colorcoat and other Sonneborn Building Products.

Name_____ Title_____

Company_____

Street_____

City_____ State_____ Zip Code_____

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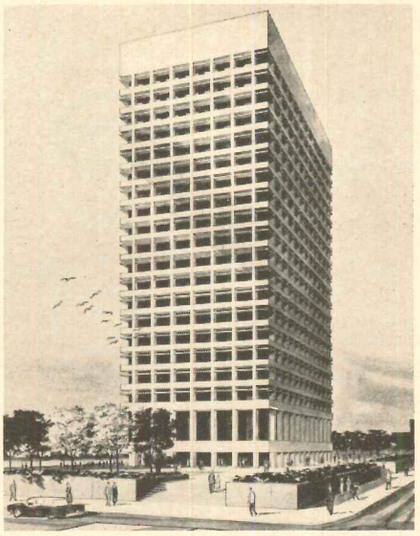
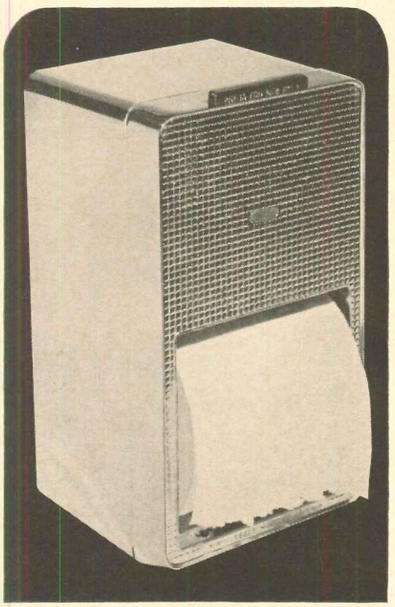


New Office in Norfolk

The 24-story, $12 million office building for the Virginia National Bank in Norfolk will have precast concrete columns with windows of bronze-tinted glass set back six feet to reduce heat and glare. Architects for the project are the New York office of Skidmore, Owings and Merrill and Williams and Tazewell and Associates of Norfolk. The tower will contain 410,000 square feet. The general contractor is the Basic Construction Company.

Prototype Health Center

The John F. Kennedy Institute for Habilitation of the Mentally and Physically Handicapped Child, built for the Children's Rehabilitation Institute, Inc., an affiliate of the Johns Hopkins Medical Institutions in Baltimore, is the first university-affiliated center of its type to be financed with federal funds. The Institute is a prototype for similar federally financed centers which will be built under the Mental Retardation Facilities and Community Mental Health Centers Construction Act of 1963. Maurice L. Medcalfe, architect, designed the five-story, 90,000 square foot, 60-bed facility. Engineer and general contractor for the structure is Walter Kidde Constructors, Inc.



RESERV-A-ROLL AUTOMATIC TISSUE DISPENSER

SOLVES TISSUE CONTROL PROBLEMS

Custodians find that the easy-to-load Reserv-A-Roll toilet tissue dispenser can be serviced during regular rounds, eliminating special trips and complaints. This handsome wall mounted unit is completely automatic and can be recessed. When the first roll is exhausted, just push the bar, the empty core disappears into the Reserv-A-Roll and the second roll locks into place. Both rolls are safe from vandals. No more stopped up plumbing from empty cores. A fine custom fixture, utilizing standard commercial rolls, the automatic Reserv-A-Roll tissue dispenser will solve many of your restroom problems.

See listing in Sweet's Catalog 26e/Re or contact

THE RESERV-A-ROLL CO.
602 Sul Ross • P. O. Box 66069
Houston, Texas 77006

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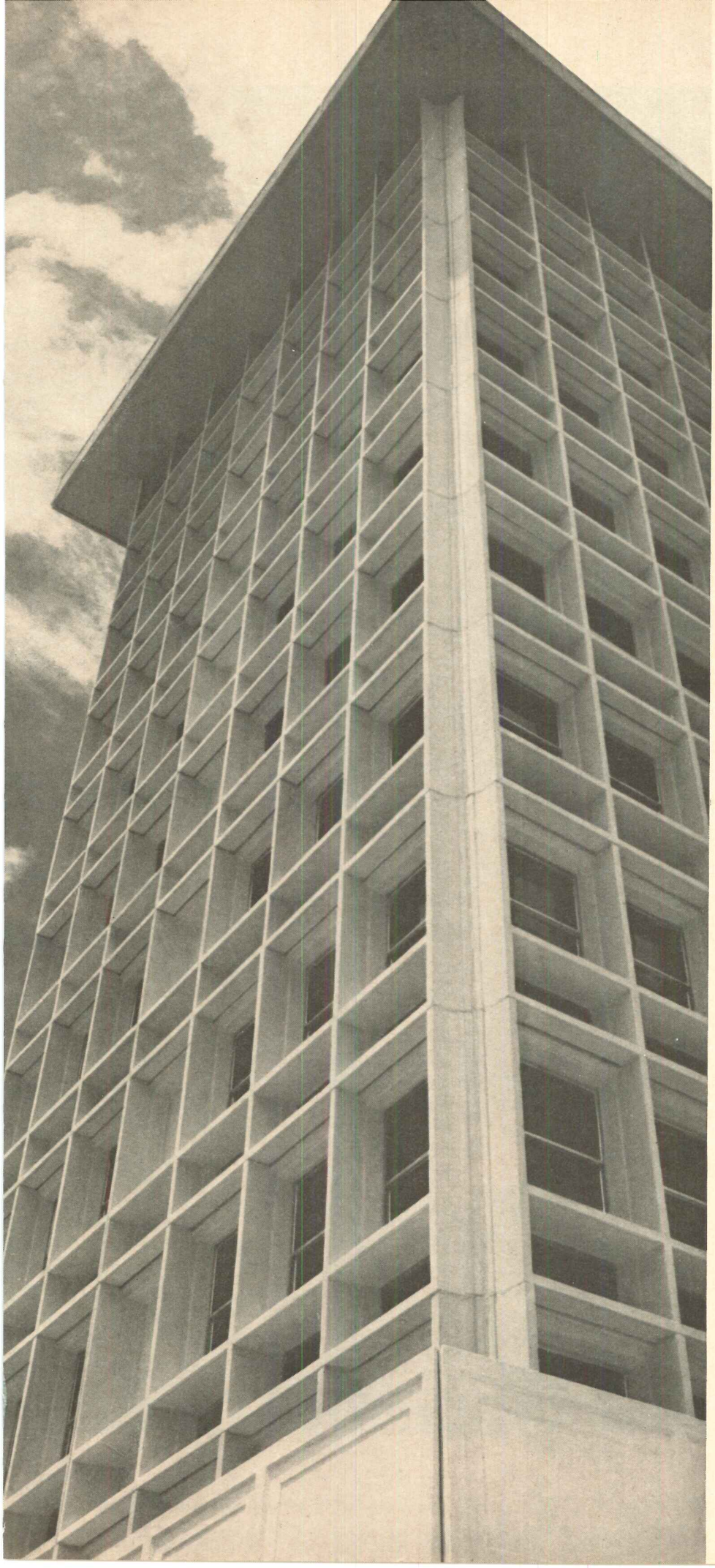

Roof-mounted Garrett Gas turbines supply all the cooling, heating and electricity for Florida apartments.

The new 200-unit David-William apartment/hotel is elegant Florida living at its best. What gives the Coral Gables building special distinction is the energy system. All of the electricity, cooling, and heating needs are supplied on-site by Gas.

Two Garrett-AiResearch Gas turbines are the energy source. They drive generator sets to provide electric power. And turbine exhaust heat is recovered and put to work energizing cooling equipment and supplying heat and hot water needs.

What about economy? That's the big reason for a Garrett and Gas total energy system. The building costs less to operate than with purchased power. Learn more about the total capabilities of Garrett and Gas. Call your local Gas Company Sales Engineer. Or write: Garrett-AiResearch Manufacturing Div., 180 North Aviation Blvd., El Segundo, Cal.

AMERICAN GAS ASSOCIATION, INC.

For total energy...
Gas makes the big difference

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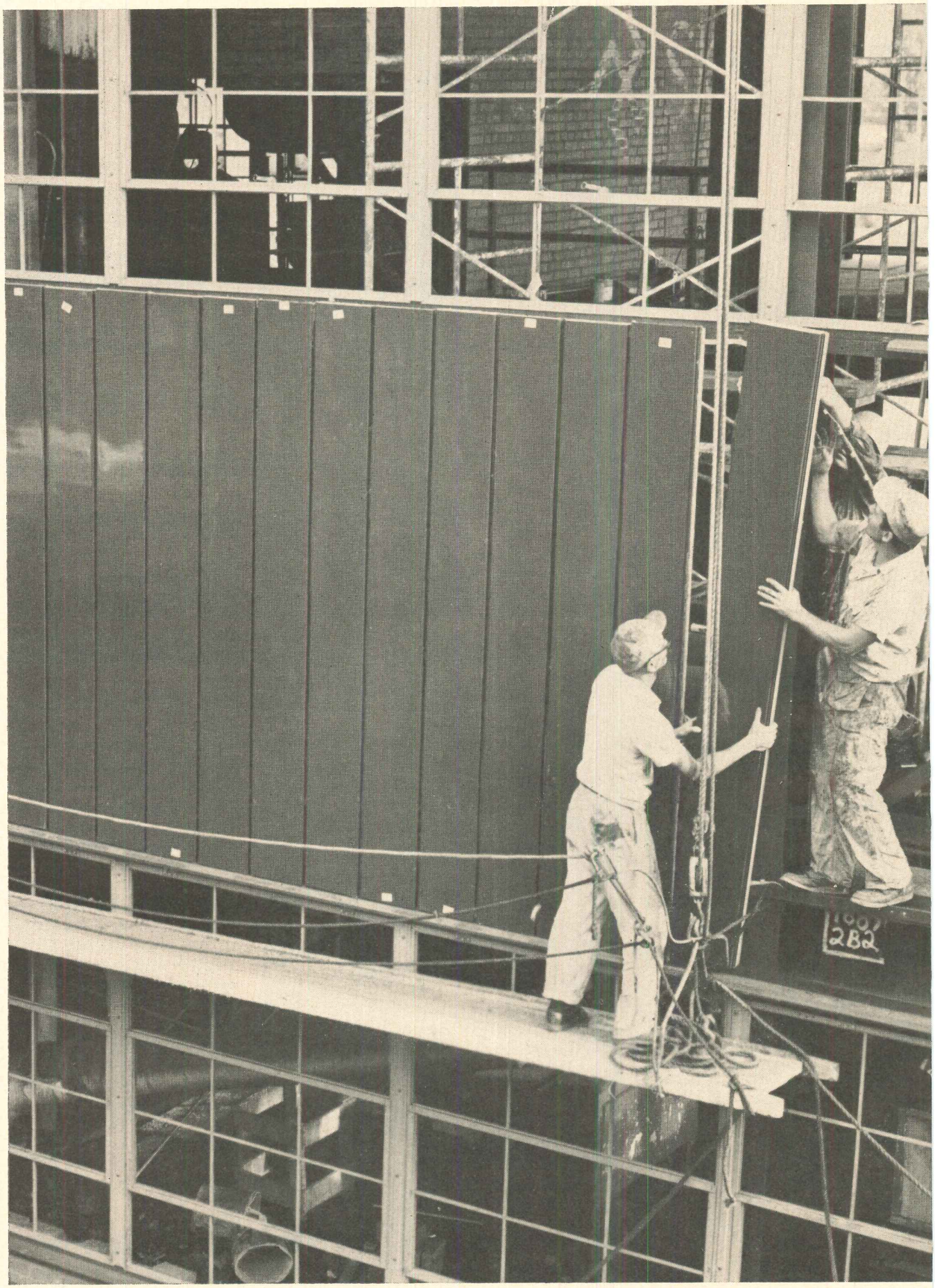

more stories... new walls... same footings...

How would you add two stories to a steel and brick building without adding to the footings?

Two inches of Hetrofoam*-based polyurethane, foamed between aluminum skins, solved the problem for the 36' 9" x 44' 6" x 25' 9" factory you see here.

The Hetrofoam/aluminum fabrications, named Permawall,† make a lightweight non-load-bearing curtain wall.

Consequently, this new construction required no new footings. Equally important, there was no interruption of production in the original building.

Exceptional thermal rating. The two-inch Hetrofoam-based polyurethane core has a "U" factor of .11, equal to the insulation value of a 36" masonry wall. It has a closed-cell structure that creates a weather and vapor seal, and a tight bond that holds the skin and insulation firmly together.

Nonburning. Hetrofoam-based polyurethane foam is rated nonburning by ASTM-D-1692-59T.

For more information, including suggested uses and a comparison chart of typical properties, please write for our brochure on Hetrofoam.
Durez® Plastics Division, 8010 Walck Road, North Tonawanda, N. Y. 14121.

*Registered trademark of Hooker Chemical Corporation.
†Registered trademark of Hunter-Douglas Limited, Pointe Claire, Quebec, Canada, for their wall system. Canadian, U. S. and foreign patents applied for.

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DUREZ PLASTICS DIVISION

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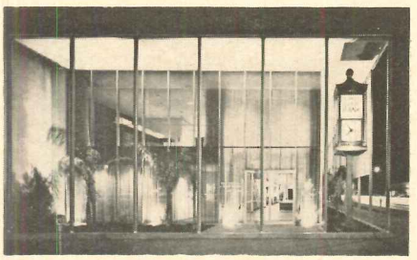
Familiar Buildings Win A.I.S.C. Awards

Eleven buildings, eight of them familiar to readers of ARCHITECTURAL RECORD, have been selected winners in the Architectural Awards of Excellence program sponsored by the American Institute of Steel Construction. The A.I.S.C. sponsors the architectural awards program "to encourage and recognize outstanding esthetic design in structural steel."

Serving on the jury were Richard M. Gensert, Cleveland, Ohio, structural engineer; Arthur G. Odell, Jr., F.A.I.A., Charlotte, North Carolina, at the time of the judging president of the American Institute of Architects; Dr. Ralph G. Owens, Dean of Engineering and Physical Sciences, Illinois Institute of Technology, Chicago; John Lyon Reid, F.A.I.A., San Francisco; and Hugh Stubbins, F.A.I.A., Cambridge, Massachusetts.

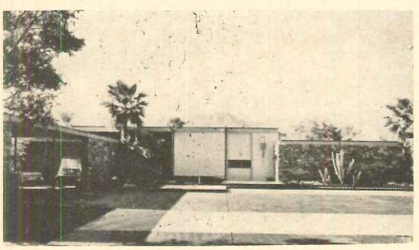


First State Bank & Trust Company, Edinburg, Texas. Architect: Neuhaus and Taylor; structural engineer: Vogt & Clouse Engineers; general contractor: Koen Construction Company.

"A simple and modest steel panel building that is appealing to the eye. It uses local materials that lend a certain richness and indigenous character to the building. While it is not completely unique, it is a kind of architecture that is delightful and refreshing in its discipline and restraint."

Emery Air Freight Terminal, O'Hare International Airport, Chicago. Architect: Hammond and Roesch, Inc.; structural engineer: The Engineers Collaborative, Ltd.; general contractor: Erik A. Borg & Company.

"Obviously a steel building with simple, careful detail and a pristine quality. It shows what an architect can do with a small industrial building. It is clean and attractive. It should serve as an image builder for the occupant and a prototype for many low rise industrial buildings on the outskirts of cities."



Shamel Residence, Palm Desert, California. Architect: William F. Cody; structural engineer: William Porush; general contractor: Design Development Corporation.

"Its design reflects the infinite variety of life that takes place in a house of this kind. It is an unpretentious and straightforward solution to a beautiful location—simple, direct, straight to the point."

continued on page 350

For more data, circle 196 on Inquiry Card

THE EXPERTS* SAY:

"Ceramic Tile Costs Less"

*McKEE-BERGER-MANSUETO, INC., NEW YORK, N.Y. independent construction and maintenance cost consultants for one billion dollars of construction annually.

HERE'S WHY: Some highlights from the M-B-M, Inc. independent study

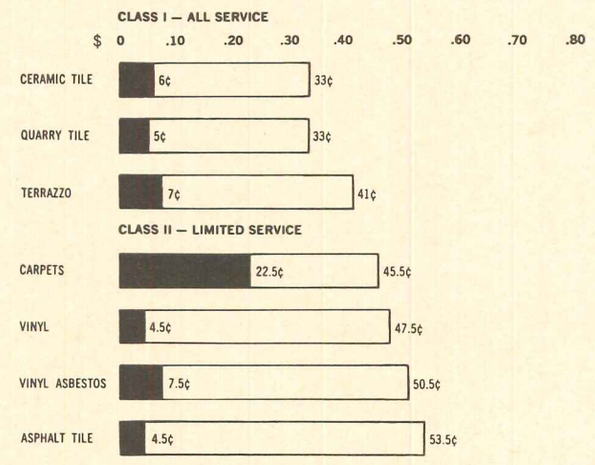
Insist on ceramic tile that is certified by the Tile Council of America and identified by this certification mark.

TOTAL ANNUAL COST PER SQUARE FOOT

FLOORS

Ceramic Tile most economical of materials tested

Long life and easy, infrequent maintenance make the total investment in ceramic tile less than that for other materials after ten years. Savings become still greater every year thereafter.

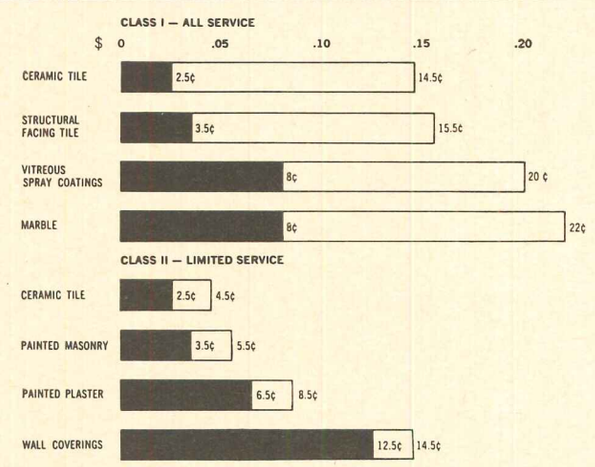


LEGEND: Installation and Replacement; Custodial Maintenance. Based on a 60-Year Building Life

WALLS

Ceramic Tile has lowest annual cost

In both heavy-duty and light-duty applications, tile is more economical. In light duty, tile costs only 4.5 cents per square foot per year. Even in heavy-duty applications, tile costs only 14.5 cents per year.



AT LAST, definite answers to the true cost of tile in the long and short run. McKee-Berger-Mansueto, Inc., used actual records in their findings. They're detailed to the half-cent. A copy is yours for the asking. You'll want to study it closely. It's the best set of reasons yet for specifying ceramic tile, the material you've always known is best.

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MEMBER COMPANIES: American Olean Tile Co., Inc. • Atlantic Tile Manufacturing Co. • Cal-Mar Tile Company • Cambridge Tile Manufacturing Co. • Carlyle Tile Company • Continental Ceramic Corporation • Florida Tile Industries, Inc. • General Tile Company • Gulf States Ceramic Tile Highland Tile Company • Huntington Tile, Inc. • International Pipe and Ceramics Corporation Jackson Tile Manufacturing Co. • Jordan Tile Manufacturing Co. • Lone Star Ceramics Co. • Ludowici-Celadon Company • Mid-State Tile Company • Monarch Tile Manufacturing, Inc. • Mosaic Tile Company Oxford Tile Company • Pacific Tile Company • Pomona Tile Manufacturing Co. • Redondo Tile Company • Ridgeway Tile Company • Sparta Ceramic Company • Stylon Corporation • Summitville Tiles, Inc. • Texaramics Inc. • United States Ceramic Tile Co. • Wenczel Tile Company • Winburn Tile Manufacturing Co.

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GENTLEMEN: I'd be most interested in a copy of your cost study, "Cutting Maintenance and Costs with Ceramic Tile," for my reference files.

Name_____

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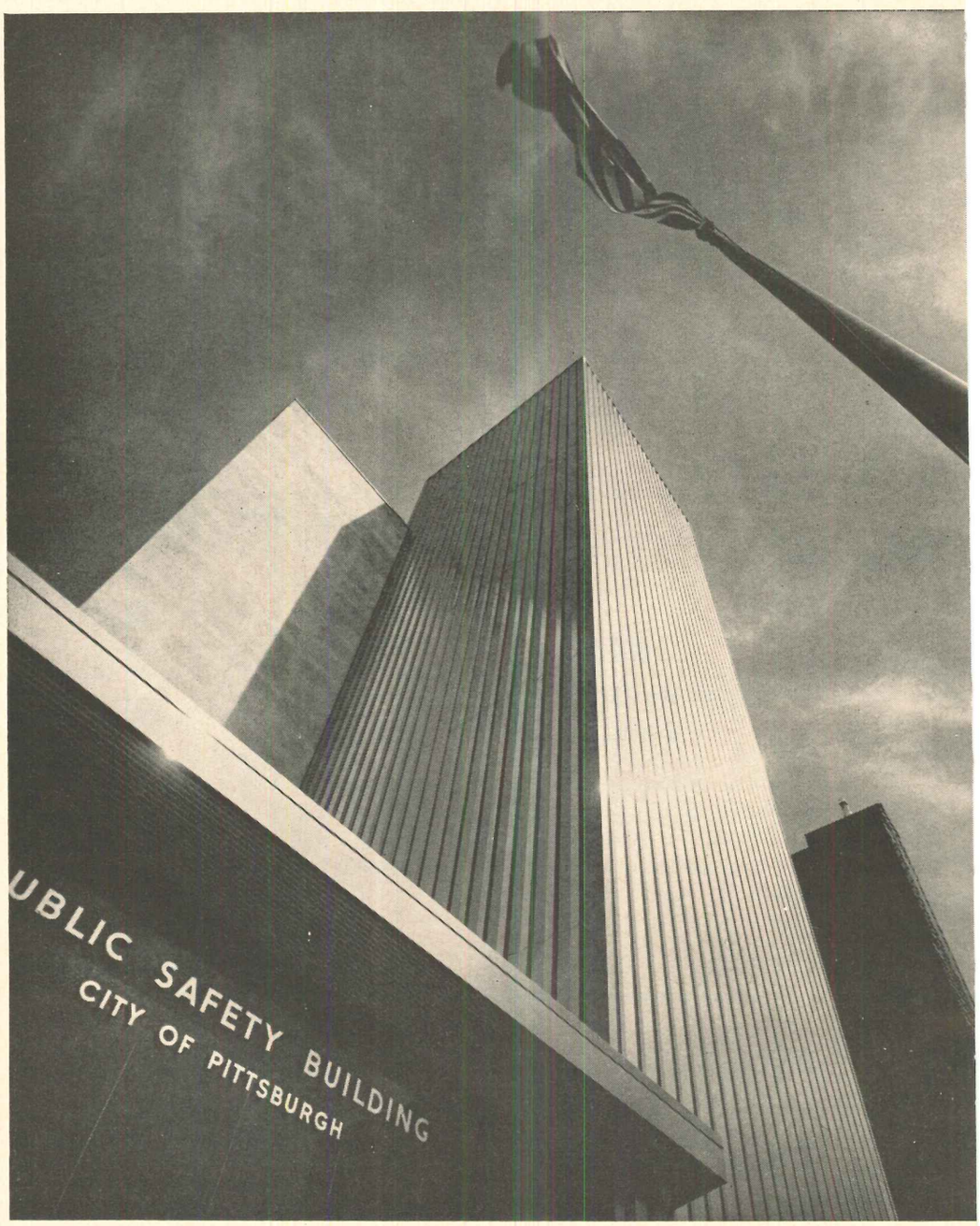
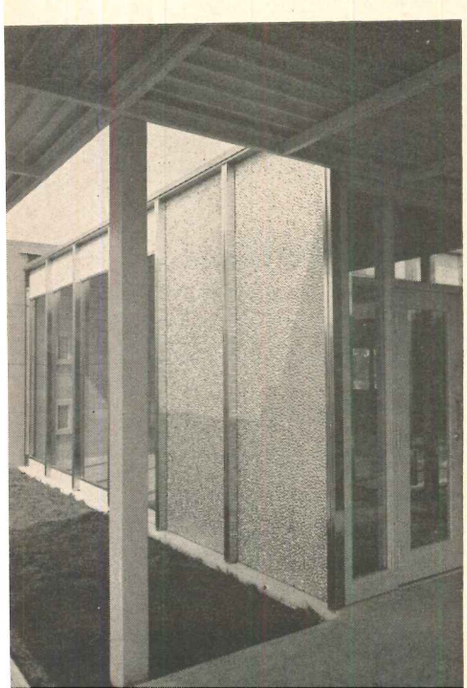
Now the excellence of stainless steel curtain walls can fit every budget.



In this modernization effort, a 30-year-old structure was stripped to the columns and four stories added. A new utility tower, entirely sheathed in stainless steel, dominates the building and adds an important note of contrast.
Public Safety Building, City of Pittsburgh.
Architect: Alfred M. Marks, Pittsburgh, Pa.
Stainless Steel "Versatile Wall" curtain wall:
H. H. Robertson Co., Pittsburgh, Pa.
and Connersville, Ind.



Stainless steel mullion covers, windows and pebble-textured panels combine to form a unit panel type of curtain wall of unusual flexibility for low-rise structures.
Merritt Industrial Park Building No. 2,
Fishkill, N.Y.
Architect: Louis Battoglia, AIA, Fishkill, N.Y.
Stainless steel "Series 100" curtain wall:
American Bridge Div. of
United States Steel Corp.,
Pittsburgh, Pa.

These versatile systems combine elegance with the economy of pre-engineered components.

Now you can give your buildings the beauty and prestige of nickel stainless steel curtain walls and still stay within your budget. Modern production methods, such as high-speed roll forming of components, help keep costs competitive with other materials. They enable you to use standard curtain wall components and assembly techniques by adapting them to your own design variations.

Stainless steel has many design advantages. There's no danger of corrosion products streaking or staining adjacent materials. Stainless is corrosion resistant in virtually all atmospheres and climates. The high strength of stainless permits uses of lighter, more economical gauges than usually needed with other architectural metals. Allows large glass areas where desired. The soft, permanent luster of stainless steel complements, reflects and highlights surrounding materials, too. Doesn't overwhelm or intrude on other design or color elements.

Curtain walls of nickel stainless steel cost less to maintain than any other kind. Savings that accrue from the low cost of maintaining stainless can often make up any difference in cost between components of stainless and other materials.

For your next design, consider the advantages of nickel stainless steel curtain walls—as well as doors, windows, hardware, fascia and railings. And write for Inco's informative "Suggested Guide Specifications for Stainless Steel Curtain Walls." Their format follows AIA Specification Worksheets.

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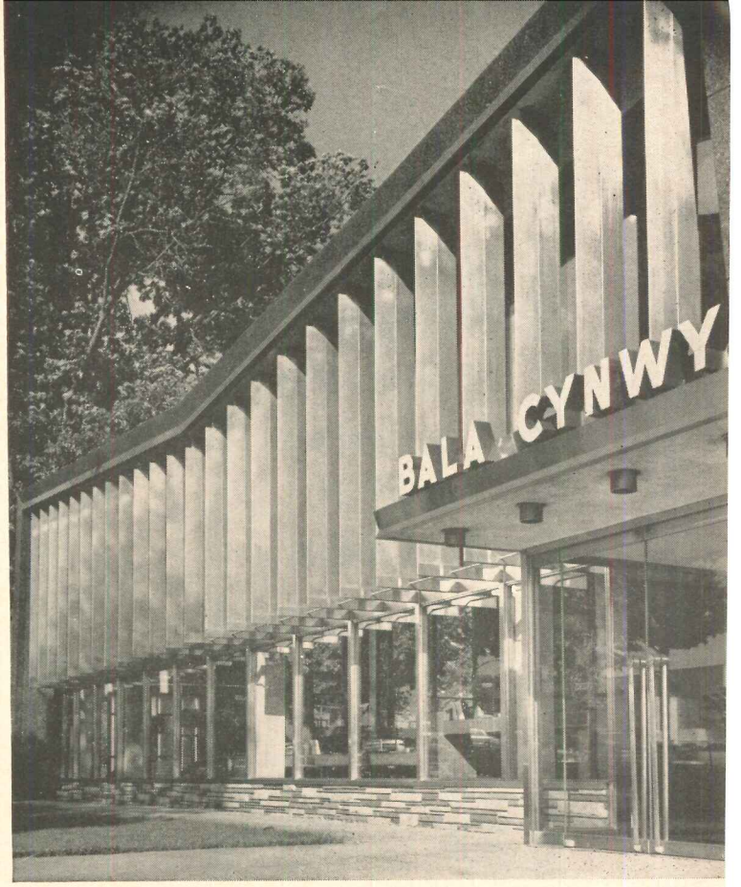
Nickel . . . its contribution is Quality



Striking structural effects are possible with standardized components. Here, the addition of deep-louvered, stainless steel sunshades serve both function and appearance and become an integral part of the total exterior effect.
Cayuga Federal Savings and Loan Association, Philadelphia, Pa.
Architect: Philip Mastrin, AIA, Philadelphia, Pa.
Stainless steel "Type 82-X" curtain wall: Pittco Architectural Metals, Pittsburgh Plate Glass Co., Pittsburgh, Pa.

A light stainless steel clad facing grid supports a decorative pattern of stainless steel panels on this remodeled bank. A background screen of black porcelainized expanded metal hides the old surface and adds deep dimension.
Jefferson Trust and Savings Bank, Peoria, Ill.
Architect: Lankton, Ziegele & Terry, Peoria, Ill.
Stainless steel "Fenmark" curtain wall: Fenestra Incorporated, Lima, Ohio.

For more data, circle 198 on Inquiry Card

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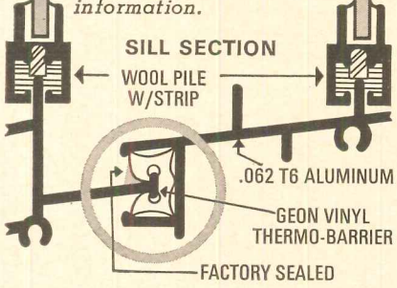

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Familiar Buildings Win A.I.S.C. Awards

continued from page 346

In addition to the three winners shown, which have not previously appeared in ARCHITECTURAL RECORD, the winners are:

Chancery for the Embassy of the Federal Republic of Germany, Washington, D.C. Architect: Professor Egon Eiermann; structural calculations and American working drawings: Lublin, McGaughy & Associates; general contractor: Wm. P. Lipscomp Co., Inc. (December, 1964, page 13).

Curtis Residence, New Orleans, Louisiana. Architect and structural engineer: Curtis and Davis; general contractor: Jolar Corporation (Record Houses, Mid-May 1964, pages 116-120).

Deere & Company Administrative Center, Moline, Illinois. Architect: Eero Saarinen and Associates; structural engineer: Ammann and Whitney; general contractor: Huber, Hunt & Nichols, Inc. (July 1964, pages 135-142; December, 1964, page 142; July 1965, page 43).

General Electric Progressland Pavilion, New York World's Fair. Architect: Welton Becket and Associates; structural engineer: Richard Bradshaw; general contractor: Turner Construction Company (February 1964, page 138; July 1964, page 149).

New Jersey Tercentenary Pavilion, New York World's Fair. Architect: Philip Sheridan Collins; structural engineer: Professor Norman J. Sollenberg; general contractor: Harold A. Brandt, Inc. (February 1964, page 141; July 1964, page 145).

Phoenix Mutual Life Insurance Building, Hartford, Connecticut. Architect: Harrison & Abramovitz; structural engineer: Edwards & Hjorth; general contractor: George A. Fuller Company (July 1961, page 14; March 1964, pages 177-188).

Rosen House, West Los Angeles, California. Designer: Craig Ellwood; structural engineer: Robert Marks; general contractor: Gattmann & Mitchell (Record Houses, Mid-May 1964, pages 48-53; March 1965, page 10).

Seattle Center Colliseum, Seattle. Architect: Paul Thiry; structural engineer: Peter H. Hostmark and Associates; general contractors: Howard S. Wright Construction Company and Wick Construction Company (July 1959, page 15; June 1962, page 146; February 1963-Western page 32-3; March 1965, page 10).

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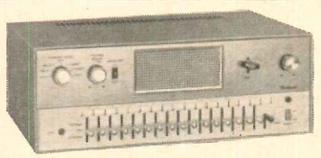

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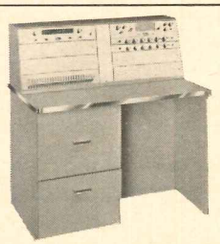

S4867 3-Channel Control Console

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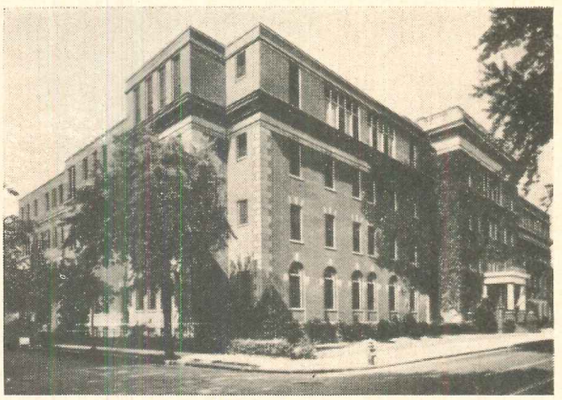
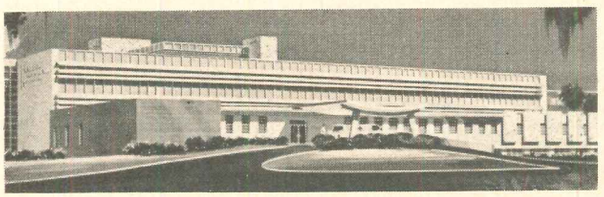
for hospital walk-in

Maryland Veterans
Administration Hospital

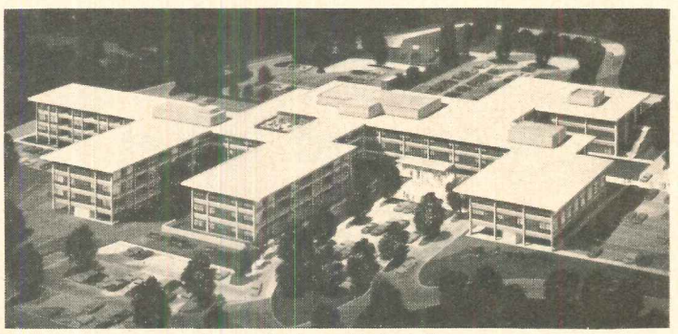


Mercy Hospital
Wilkes-Barre, Pennsylvania



Florida Sanitarium and Hospital
Orlando, Florida

Eastern State Hospital
Williamsburg, Virginia

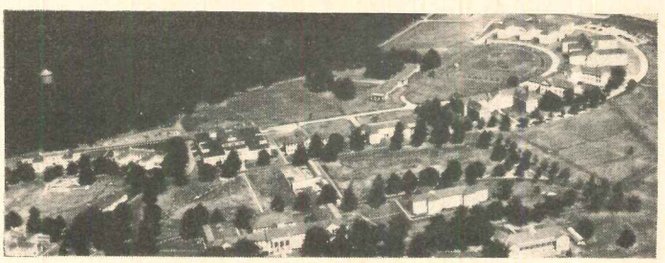


Greater Baltimore Medical Center
Baltimore, Maryland

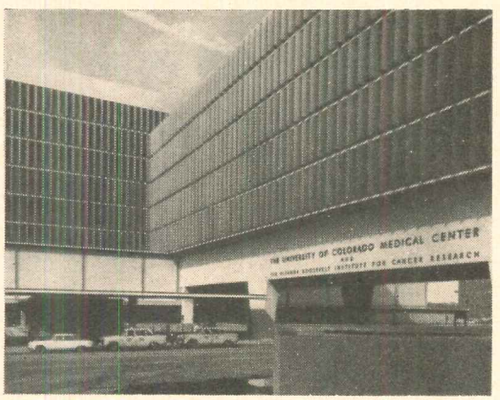
Norristown State Hospital
Norristown, Pennsylvania

New York State Rehabilitation Hospital
West Haverstraw, New York

John F. Kennedy Memorial Hospital
Stratford, New Jersey

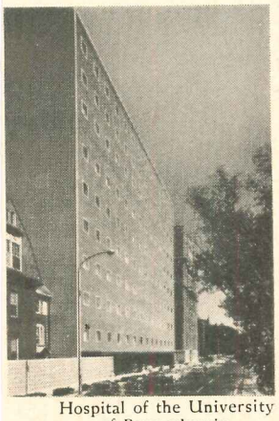


Veterans Administration Hospital
Perry Point, Maryland



University of Colorado Medical Center
Denver, Colorado

refrigeration needs... specify Bally prefabs



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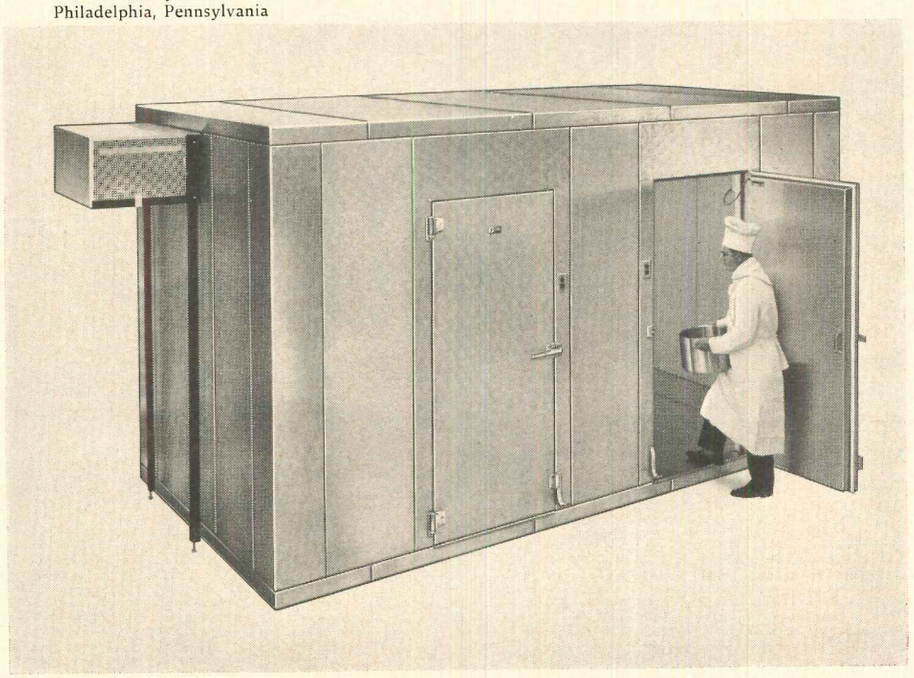
of Pennsylvania
Philadelphia, Pennsylvania

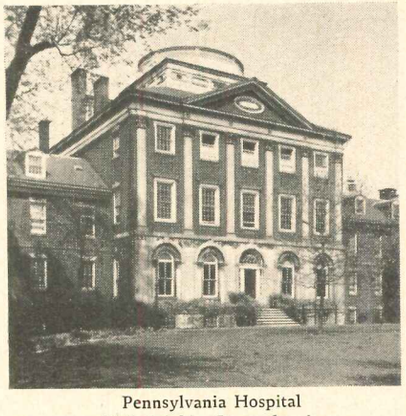
These hospitals, like many other institutions and places of business, are benefiting from Bally Walk-In coolers and freezers with revolutionary construction techniques and design features. Bally has set a new high in refrigeration efficiency.

When you specify Bally you can be sure that your clients will get many advantages not found in conventional prefab Walk-Ins... never available in on-the-site "built-ins"... and at far lower cubic foot cost than "reach-ins". There is never a need to accept an "or equal" or a substitute. Bally Walk-Ins are available to all dealers everywhere at uniform published prices. *Write for Fact File with new brochure, specification guide and sample of urethane wall.* *See Sweet's File 25a/Ba.*



Bally

Bally Case and Cooler, Inc.
Bally, Pennsylvania



Pennsylvania Hospital
Philadelphia, Pennsylvania

Sinai Hospital of Baltimore, Inc.
Baltimore, Maryland

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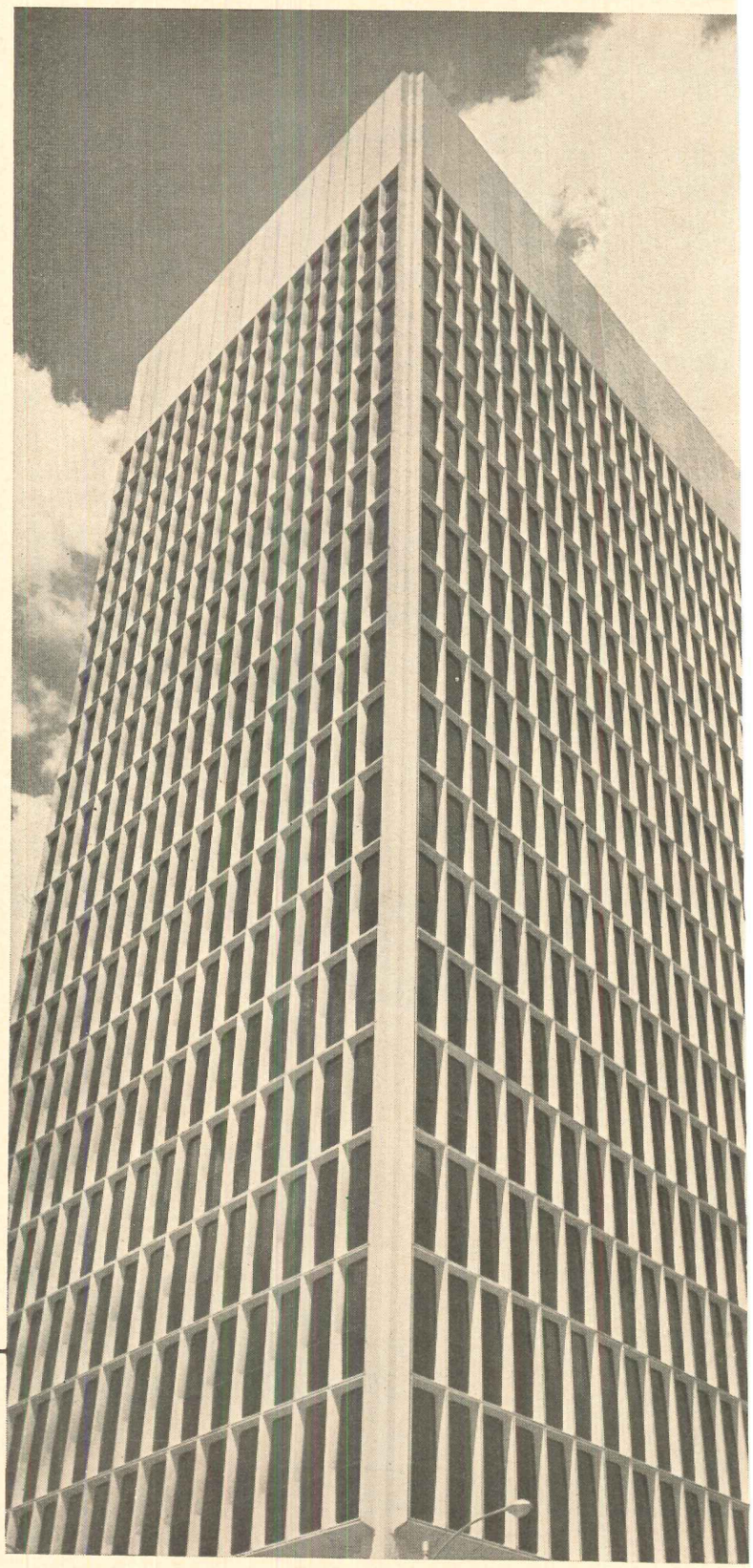
For more data, circle 202 on Inquiry Card

No.20/CONCRETE CURTAIN

The joints of all exterior walls are generally subject to the same forces and considerations and have certain specific prerequisites. Two important considerations for joints in concrete curtain walls are (1) understanding the volume changes which occur before and after the erection of concrete units and (2) establishing functions for the joint.

Like most materials, concrete expands as temperature rises and contracts as temperature falls. Concrete also expands and contracts with gain or loss in moisture. However, the contraction of concrete due to moisture loss while drying is usually greater than any subsequent expansion. Since concrete exposed to the atmosphere loses some of its original water, it normally exists in a somewhat contracted state compared to its original dimensions.

This is an important consideration when designing joints for concrete components. If the joint design relies entirely on a positive bond between panels to waterproof the wall, then the joint sealer must be capable of expansion and contraction as well. For this reason, the elastic sealants such as polysulfide and silicone rubber have been satisfactory for panels of all sizes. Such flexible sealants (even if applied over mortar joints which act as setting beds) can absorb the movement in a joint due to volume changes of the panels.



500 Jefferson Building, Houston, Texas. Architect: Welton Becket & Assoc., Los Angeles, California.

WALL JOINTS

Clip for a.i.a. file 4-a

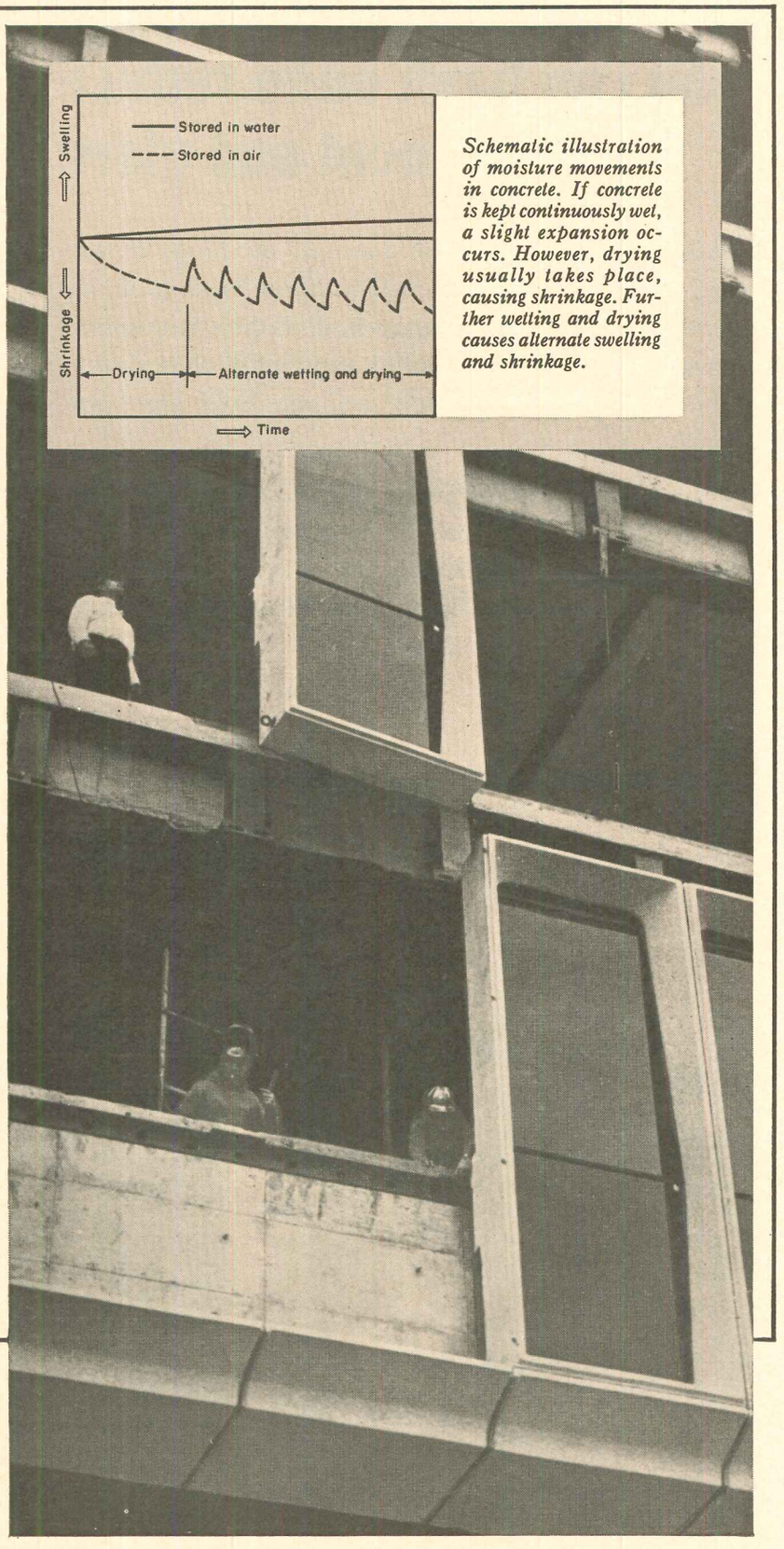
Prepared as an industry service by Portland Cement Association

To minimize volume changes in concrete wall panels, the following construction methods are effective:

1. Limit the water content of concrete to the minimum required for proper placement.
2. Avoid conditions that increase the water demand of concrete such as high slumps and high concrete temperatures.
3. Use the largest total amount of aggregate in the mix that is practical.
4. Use the largest maximum size coarse aggregate to fit the job conditions.
5. Use fine and coarse aggregates that exhibit low shrinkage characteristics when used in concrete.
6. Avoid use of aggregates that contain an excessive amount of clay.
7. Provide a period of air drying before placing units in a wall.

The production of concrete panels should always be scheduled well ahead of erection and should include ample time for thorough curing, air drying and inspection.

For additional technical data, write for free literature. (U. S. and Canada only.)



Schematic illustration of moisture movements in concrete. If concrete is kept continuously wet, a slight expansion occurs. However, drying usually takes place, causing shrinkage. Further wetting and drying causes alternate swelling and shrinkage.

PORTLAND CEMENT ASSOCIATION

Dept. A10-8, 33 West Grand Avenue, Chicago, Illinois 60610

An organization to improve and extend the uses of concrete, made possible by the financial support of most competing cement manufacturers in the United States and Canada

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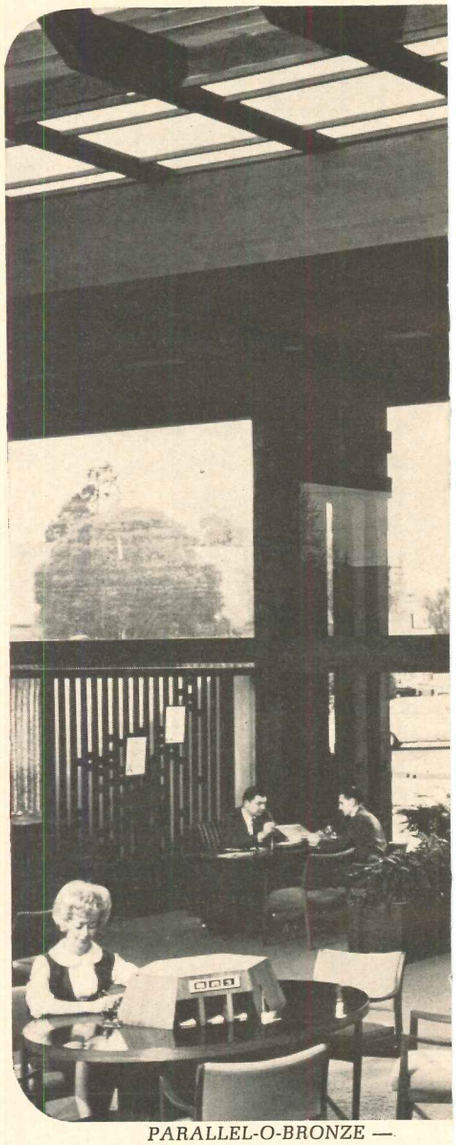
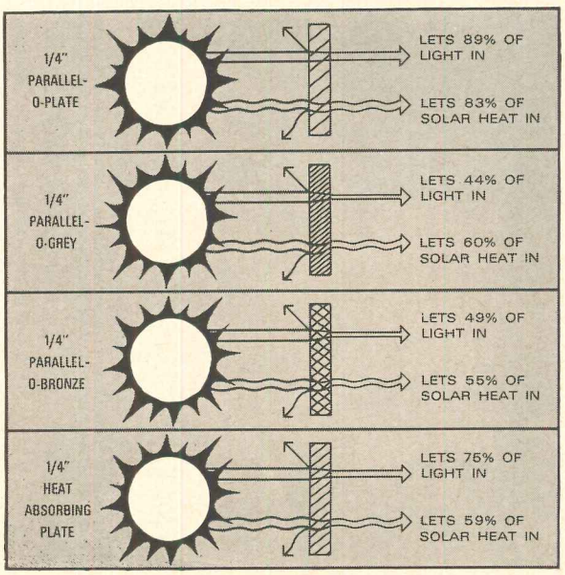
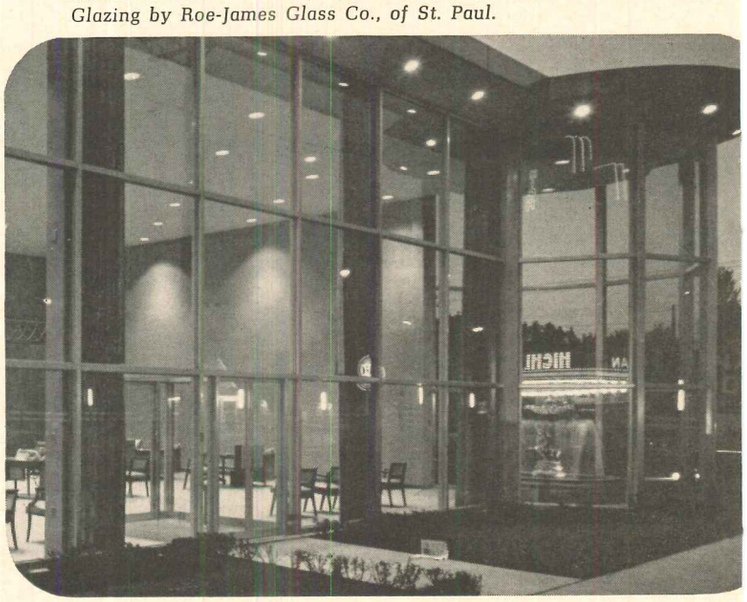


PARALLEL-O-BRONZE —

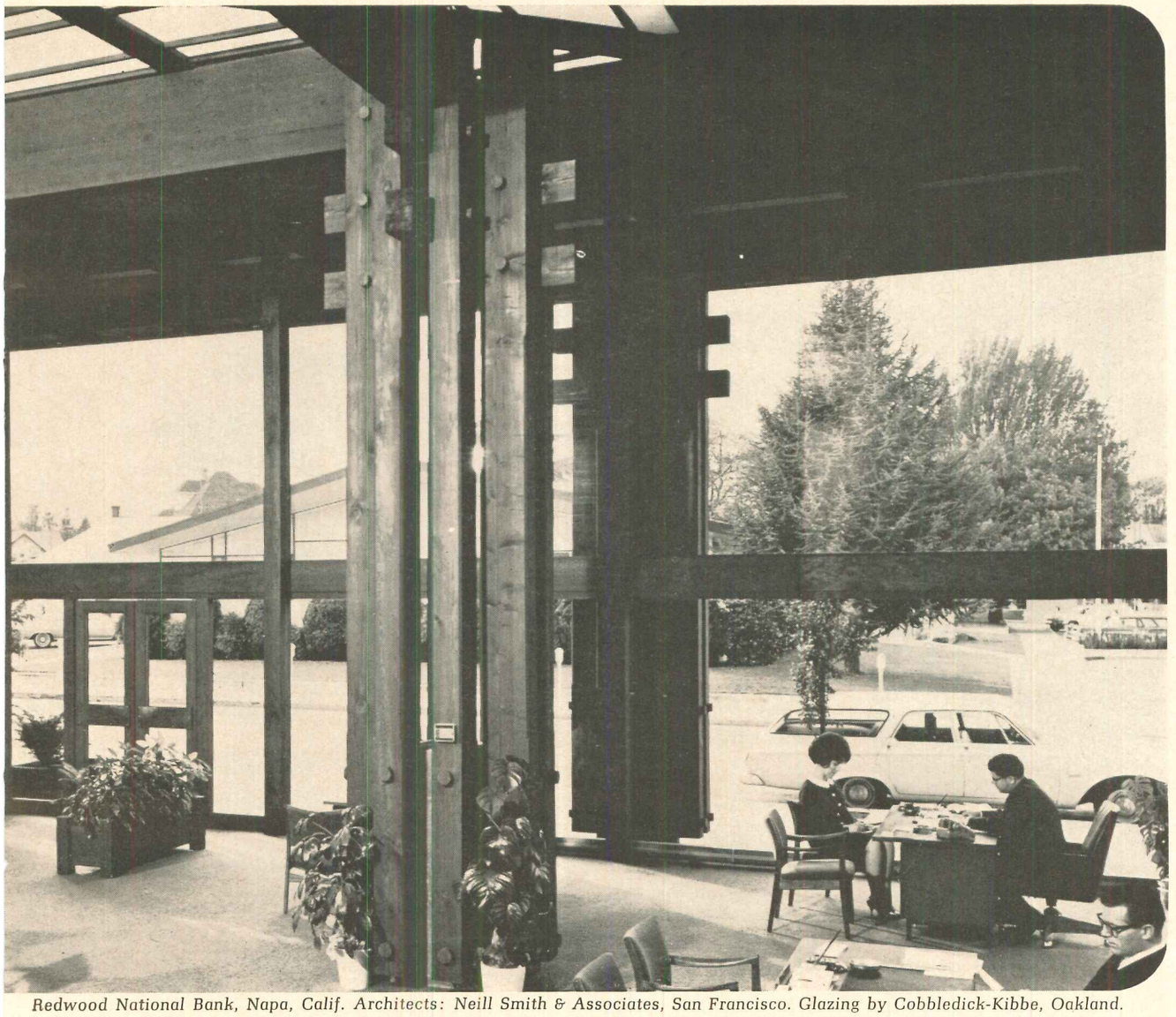
These diagrams, in simplified form, illustrate the differences between three kinds of tinted plate glass as compared to clear plate glass.



HEAT ABSORBING PLATE — Northern Federal Savings, St. Paul, Minn. The Canneen Co., of Philadelphia, designed the building. Glazing by Roe-James Glass Co., of St. Paul.

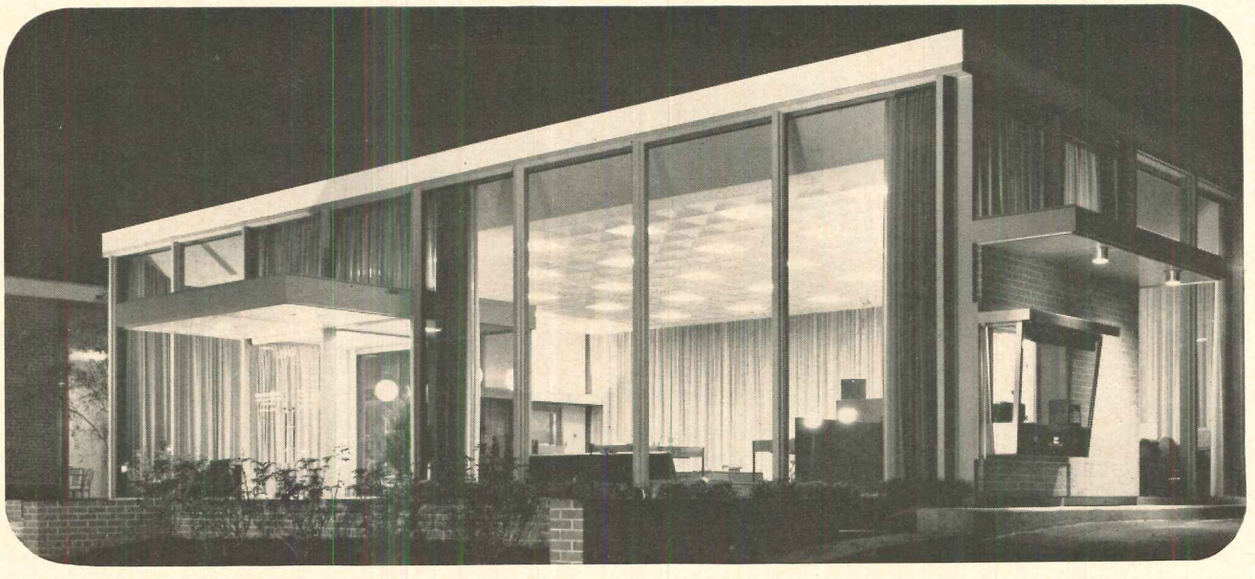


For more data, circle 204 on Inquiry Card



Redwood National Bank, Napa, Calif. Architects: Neill Smith & Associates, San Francisco. Glazing by Cobbledick-Kibbe, Oakland.

PARALLEL-O-GREY — Decatur Federal Savings & Loan, Decatur, Ga. Architect: Pope H. Fuller, Decatur. Glazing by Binswanger Glass Co., Atlanta.



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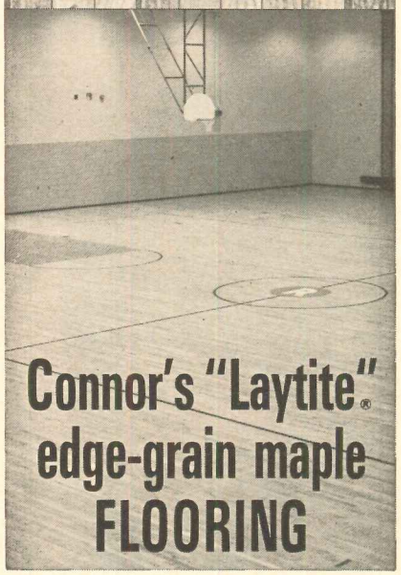

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Longer wear and lasting satisfaction are built into every Connor "Laytite" installation. Edge grain (quarter sawn) hard rock maple flooring means 50% less expansion*, helps prevent any warping or buckling. Specify Connor's "Laytite" for your next job . . . get details today.

"Laytite" is also available in *REZILL-CUSH** System; "CONTINUOUS STRIP" or regular strip — all sizes and grades.

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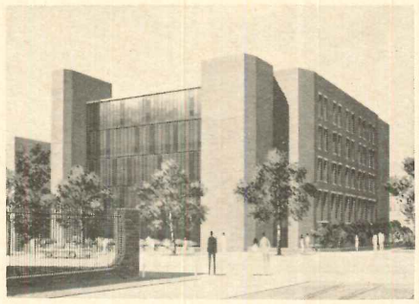

Research Center Planned at Pennsylvania

The Graduate Research Center at the Moore School of Electrical Engineering at the University of Pennsylvania in Philadelphia is a glass and brick structure containing 41,000 square feet. Architects are Geddes, Brecher, Qualls and Cunningham.

The building, which will cost more than $2 million when fully operative, is partially financed by a $493,000 grant from the National Science Foundation and a $257,000 grant from the National Institute of Health. The building is expected to be completed in October, 1966.

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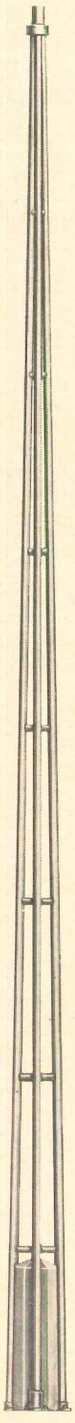

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Architect: VanEvera Bailey, A.I.A.

Duraflake core stock was specified.

From an architect's viewpoint, this custom kitchen has everything. Its specially built cabinets, counter and sink tops, and cutting boards are constructed exclusively of Duraflake, which enhances the walnut veneers carefully selected to match the natural wood decor of the rest of the home.

Duraflake was specified as core stock for its workability, strength, and superior edge and face screw-holding properties. It's available in panel sizes up to 5′x16′ or 4½′x18′—plus standard counters, tables and special cabinet sizes. Thickness ranges from ¼″ to 2″, with a tolerance of plus or minus 0.005.

The floor underlayment used in this roomy 156-square-foot kitchen is Duraflake. Duraflake underlayment is guaranteed to provide a smooth, flawless surface for applying resilient floor tile, linoleum, wall-to-wall carpet, and other floor coverings. Thickness tolerance is plus or minus 0.010. This product meets FHA and VA requirements. Uniform, smooth 4′x8′ sheets are available in ¼″, ⅜″, ½″ and ⅝″ thicknesses.

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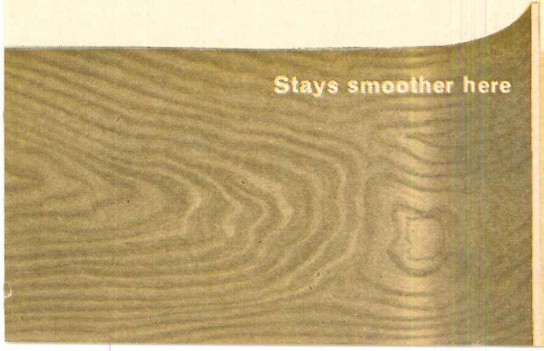


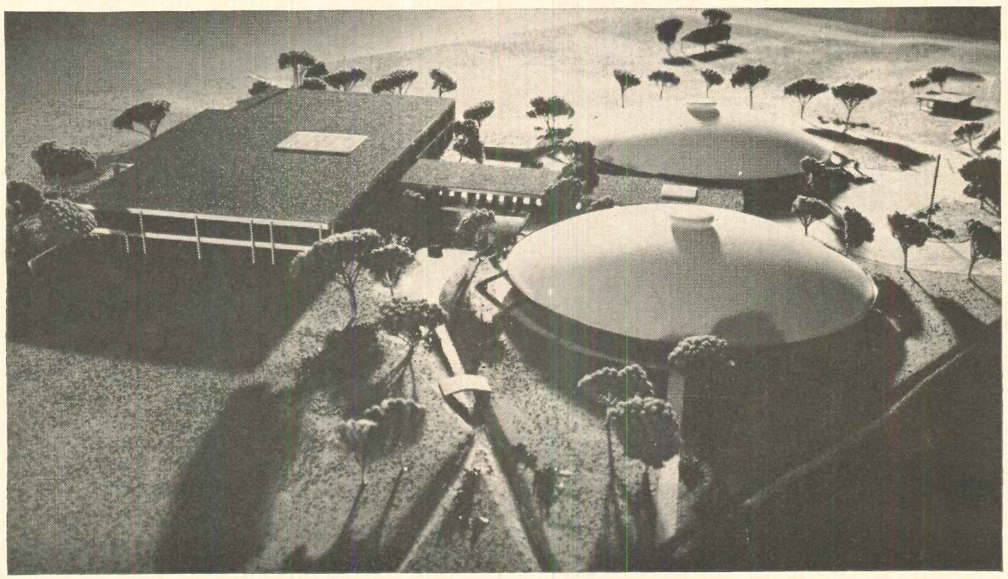
with Duraflake here

Duraflake

Duraflake makes only particleboard and only the best!

TWIN DOMES WITH 200-FOOT SPANS are distinctive architectural features of this Iowa school complex. One dome covers the field house; the other a fine arts building. Each is supported by 16 wooden arch segments, which meet a steel compression ring at their apex. At their base, a concrete tension ring post-tensioned by the Ryerson BBRV system efficiently and economically compensates for the horizontal thrust—thus relieving the foundation of this load.

Warren G. Harding Junior High School, Cedar Rapids, Iowa; Architects: Kohlmann-Eckman-Hukill; **Structural and Foundation Engineers:** Shive-Hall-Hattery Engineering Services; **Contractor:** Abell-Howe Company.



NEW STRUCTURES SHOW ADVANTAGES OF

PUERTO RICO'S LARGEST, MOST MODERN OFFICE BUILDING will be Banco Popular Center, a 19-story tower now being built at San Juan. The builder wanted maximum areas of unobstructed, column-free floor space, and this was achieved economically with post-tensioned one-way joist slabs—maximum spans are about 40 feet. Ryerson BBRV post-tensioning also made it possible to build each floor (slab, joists and girders) as a monolithic structure with elements combined to achieve shallowest possible structural depth.

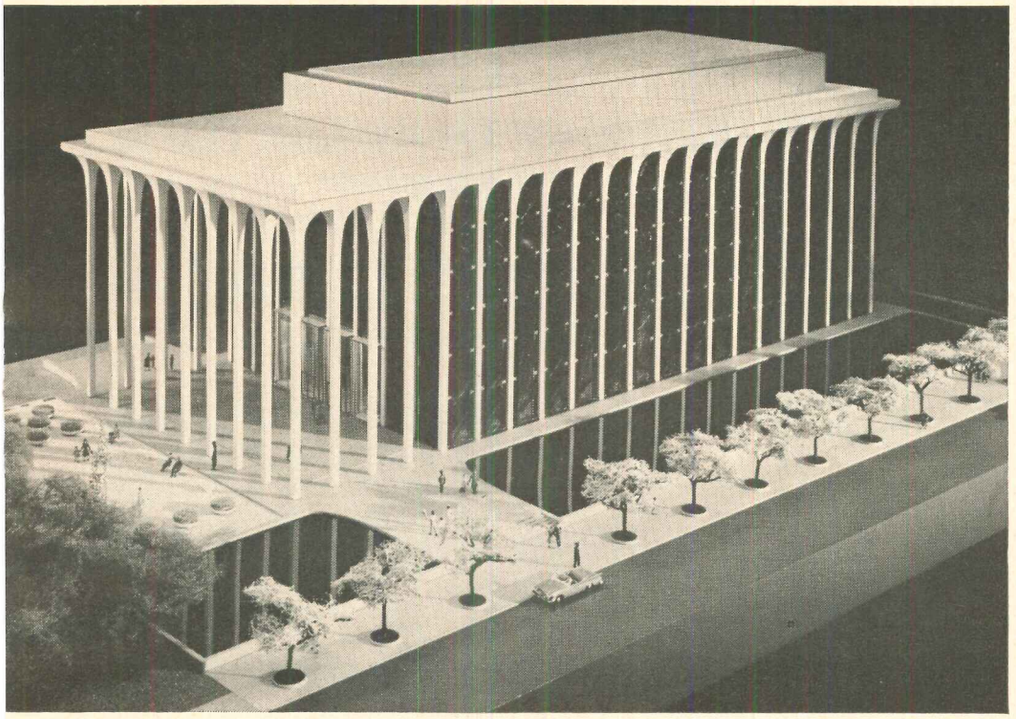
Banco Popular Center, San Juan: Project Manager and Rental Agents: Cushman & Wakefield, Inc.
Architects: Toro-Ferrer, and Kahn & Jacobs
Structural Engineers: Dinos & Vafi, and Lev Zetlin & Associates
General Contractor: George A. Fuller Company of Puerto Rico
Subcontractor for Concrete Work: Pavarini Construction Co., Inc. of Puerto Rico
Subcontractor for Rebar & Post-Tensioning: G & H Steel Service, Inc.

When you specify Ryerson post-tensioning you deal with one of the nation's largest suppliers of construction steels —a company with the resources and facilities to provide a complete service package.

For architects and engineers this package includes assistance in feasibility studies on use of post-tensioning in specific projects...preliminary cost data...sharing of experience in structural design and layout...plus specification information and detailing.

For contractors Ryerson delivers tailor-made tendons, completely assembled and ready for placement. Also provided: equipment for stressing and grouting, technical jobsite assistance, architect-approved drawings, stressing data and reliable labor estimates.

For more information or help on a current project, call the nearest of Ryerson's 20 plants or write Box 8000-A, Chicago Illinois 60680

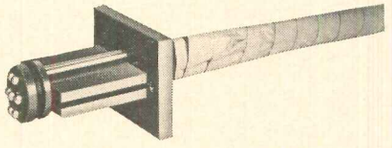


THE 63-FOOT SPAN REQUIRED BY A DEEP COLUMN-FREE PORTICO was achieved here without affecting the striking appearance of structural lightness by the use of post-tensioned concrete. Six interior beams spanning the portico at roof level each contain four 30-wire Ryerson BBRV tendons. Stressing of exterior beams is accomplished with two 40-wire units.

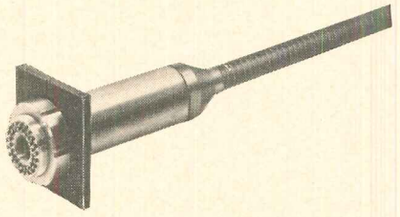
Office Building for Northwestern National Life Insurance Co., Minneapolis, Minnesota; Architects and Engineers: Minoru Yamasaki and Associates; **Structural Engineers:** Worthington, Skilling, Helle & Jackson; **Contractor:** George A. Fuller Company.

BBRV POST-TENSIONING BY RYERSON

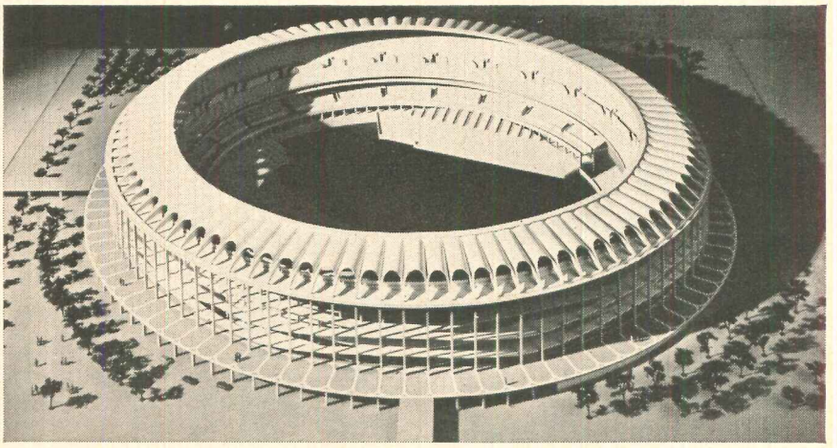
BONDED OR UNBONDED TENDONS ...LOCKNUT OR SHIM-TYPE ANCHORAGE...FOR POSITIVE END ANCHORAGE AND RELIABLE APPLICATION OF FORCES



Typical movable end anchor of Ryerson BBRV *unbonded* (greased and wrapped) tendon after stressing.



Typical movable end anchor of Ryerson BBRV *bonded* (grout type) tendon after stressing.



NO ONE ENDS UP BEHIND A POST in this handsome 50,000-seat sports stadium. Extreme cantilevers, made possible by Ryerson BBRV post-tensioning of the concrete girders, will keep columns back out of sight lines. The outer edge of the oval roof canopy extends 50′ over the upper seating deck. And the upper deck, in turn, cantilevers 40′ over the lower deck. Roof and deck each have 96 beam lines and the girders, 75′ and 67′ long respectively, are each post-tensioned by 6 tendons of 42 or 43 wires.

Civic Center Busch Memorial Stadium, St. Louis; Engineers & Architects: Sverdrup & Parcel and Associates, Inc.; **Architect-Designer:** Edward Durell Stone; **Associate Architects:** Schwarz & Van Hoefen; **Contractors:** Fruin Colnon Contracting Co.; Millstone Construction Co.

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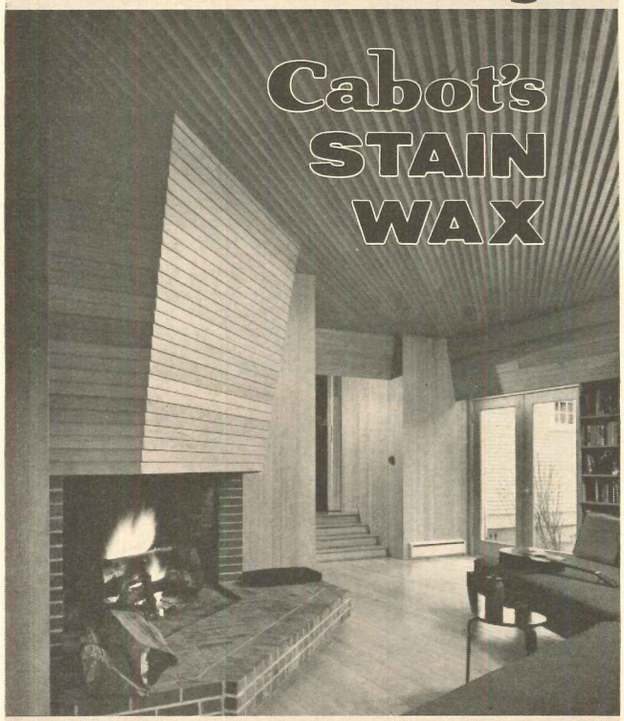
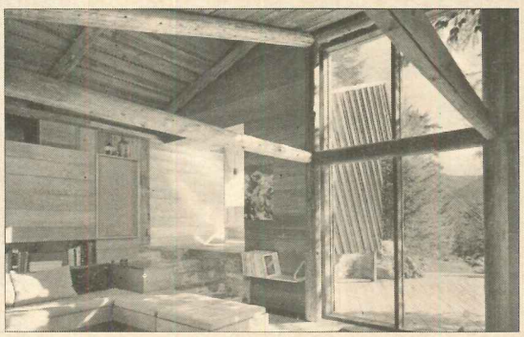


Home in Tacoma, Wash.; Architect: Liddle & Jones, Tacoma, Wash.; Cabot's Stain Wax throughout.

Stains, Waxes, Seals in One Operation

The two interiors depicted here are the accomplishments of the same architectural team . . . one breathtakingly modern; the other warmly rustic. In both instances, Cabot's Stain Wax was specified for the interior finish. Suitable for all types of wood, Cabot's Stain Wax protects the wood, enhances the grain, combines the pleasing color of a stain finish with the soft luster of a wax.



Cabin on Mt. Rainier, Wash.; Architect: Liddle & Jones, Tacoma, Wash.; Cabot's Stain Wax throughout.

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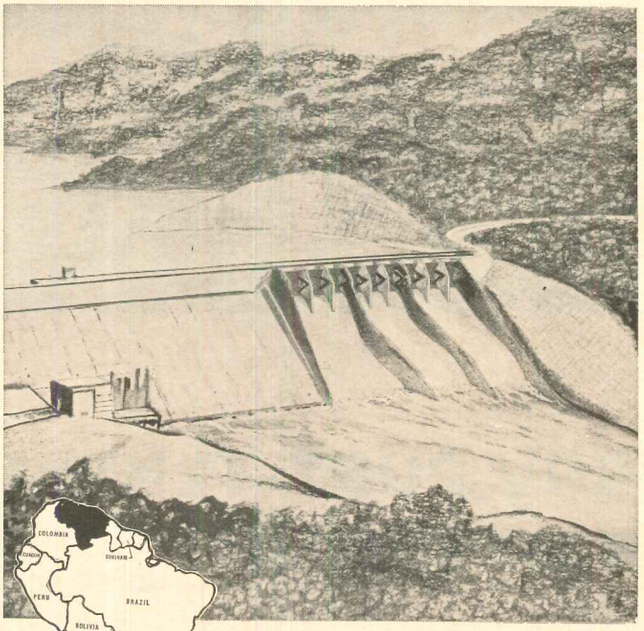
IN VENEZUELA



Construction has started on the great Guri Project on the Caroni River in Venezuela — a hydroelectric program which anticipates that nation's progress and power needs to the end of this century. The first part of Stage One, in which MARACON MC Concrete Admixture is being used, is scheduled for completion in 1968 and provides for a concrete gravity dam 348′ high and 1040′ long, a spillway capacity of 1,250,000 cu. ft. per second and a powerhouse capable of producing 527,250 kilowatts.

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(3) As he neared the bidding stage, he took advantage of Dodge's Bid Date Counseling Service to avoid possible conflicts in bid dates. He was able to schedule the best time for contractors and suppliers to zero in on his job.

(4) Placing plans on file at the closest Dodge Plan Room brought him the widest possible range of bids from qualified subs and suppliers. At the same time, traffic in his office was reduced and plan reproduction costs were kept to a minimum.

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(6) His Dodge Reporter wound up the call by mentioning two jobs in the area for which designers had not yet been selected.

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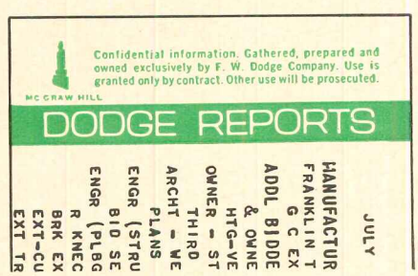
If you practice in Southern California, Arizona or Nevada, watch for the announcement of Dodge Reports Plan Rooms and Construction News Services coming your way soon.



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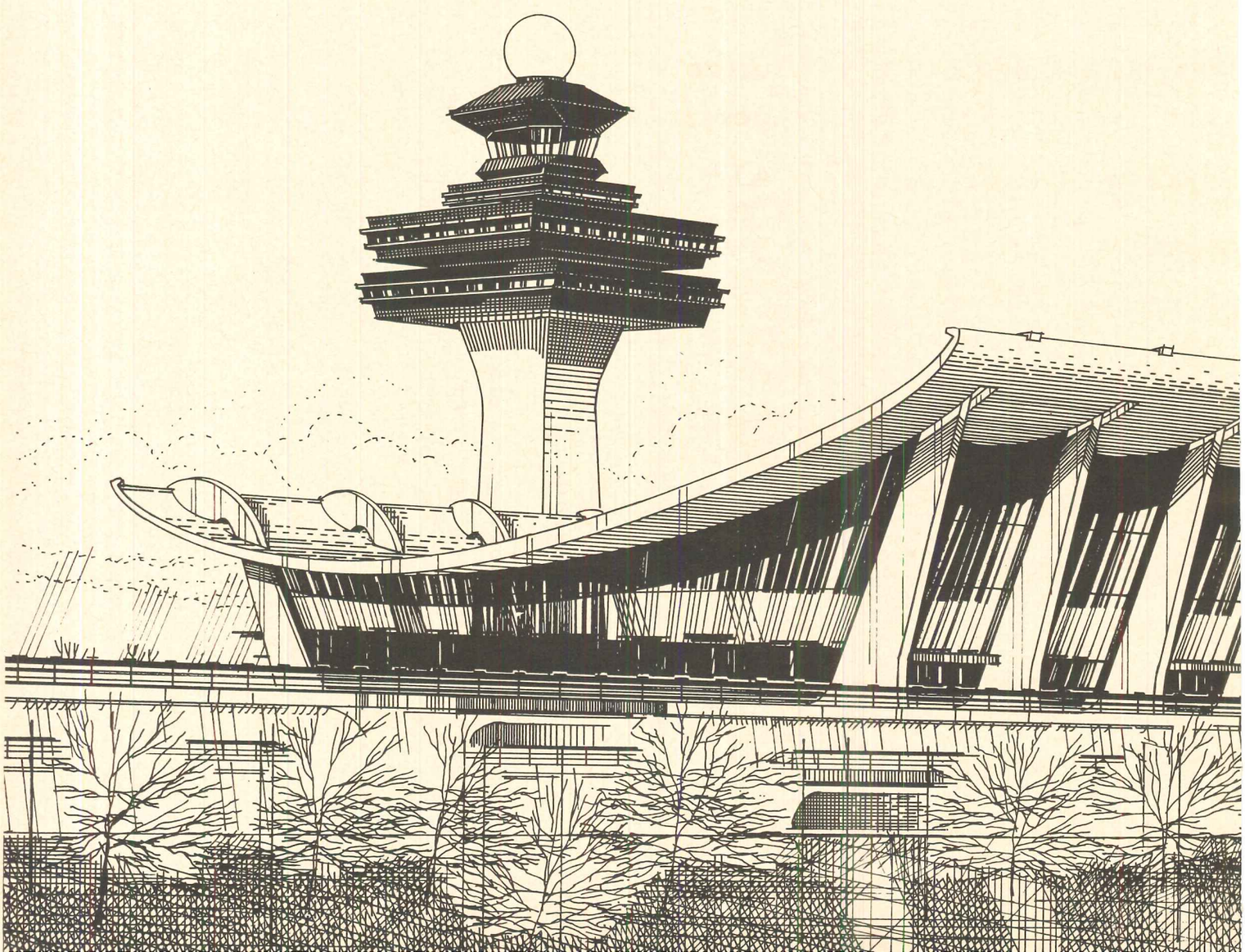

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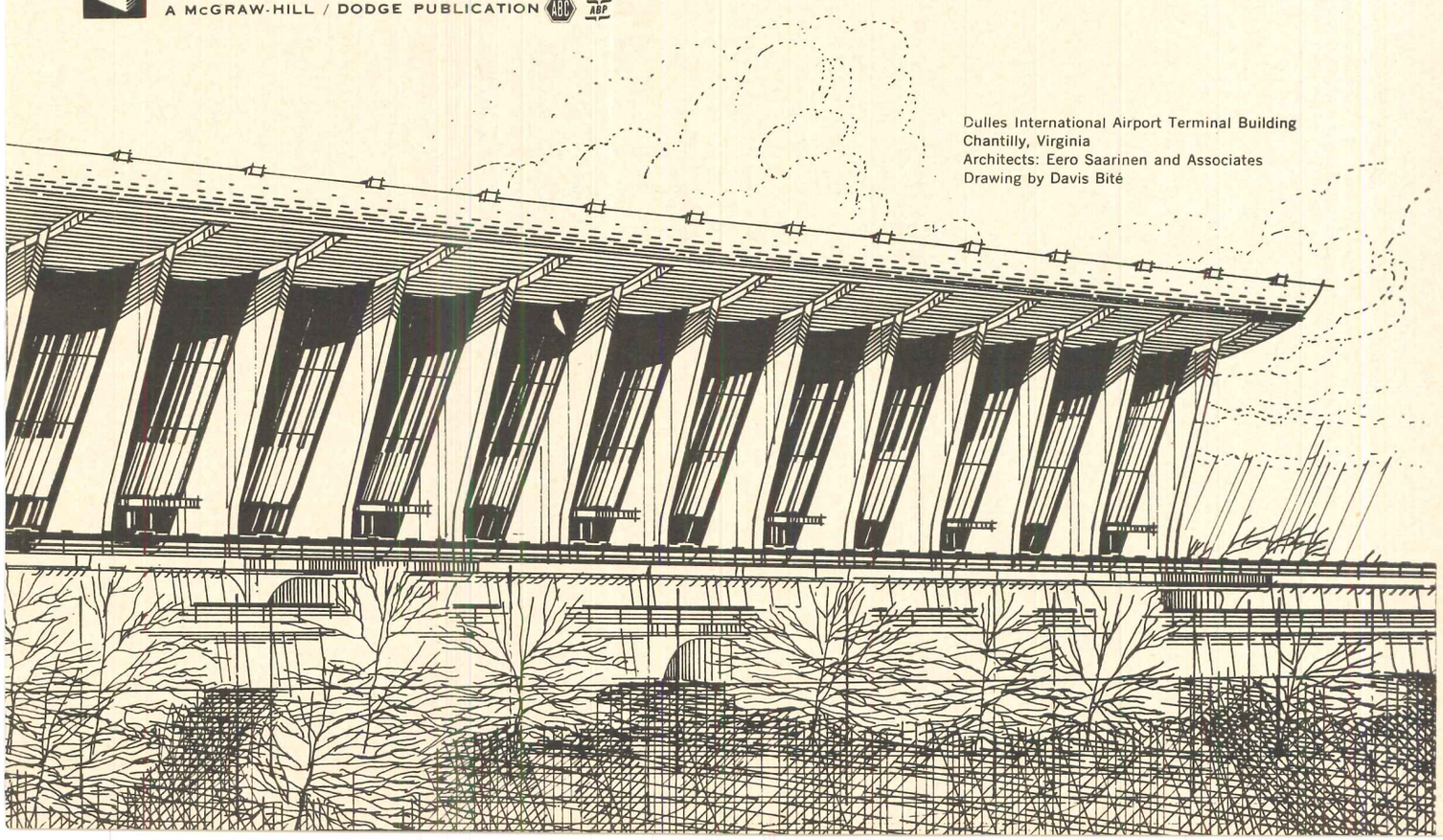

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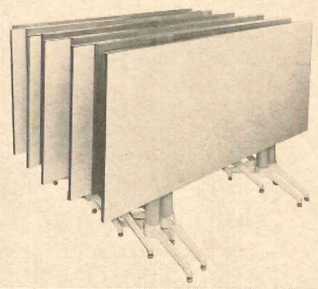

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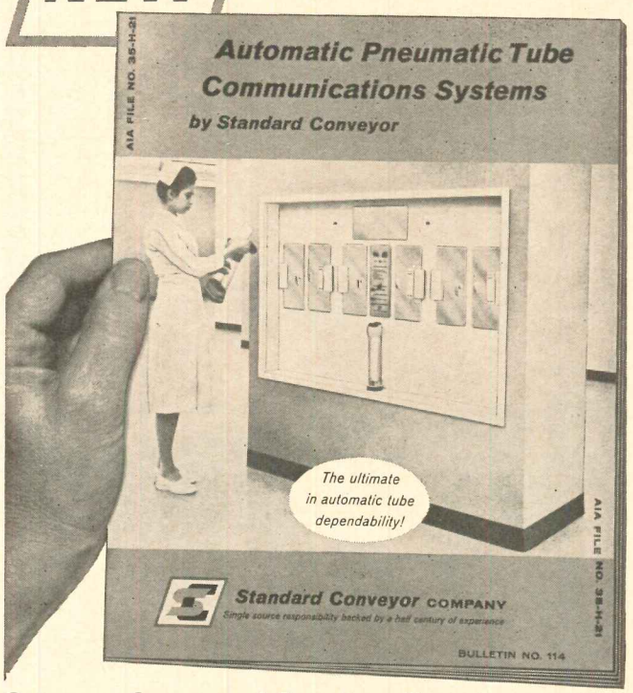

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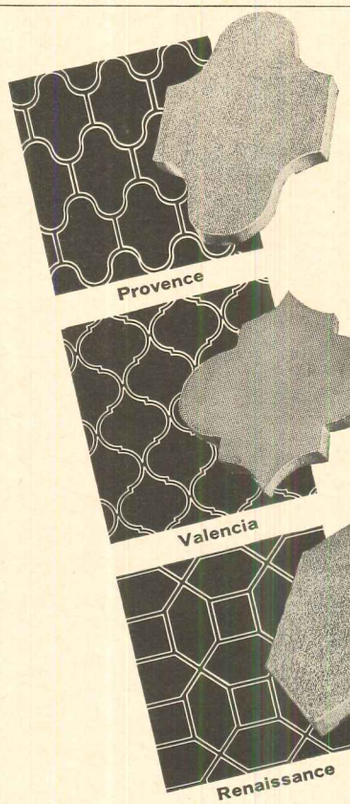

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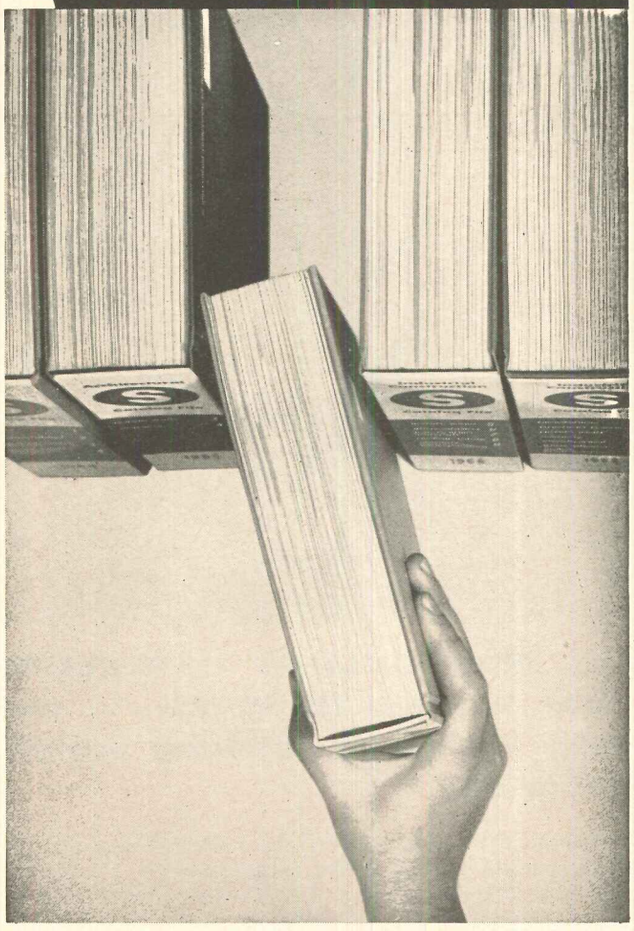

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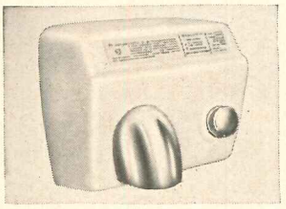

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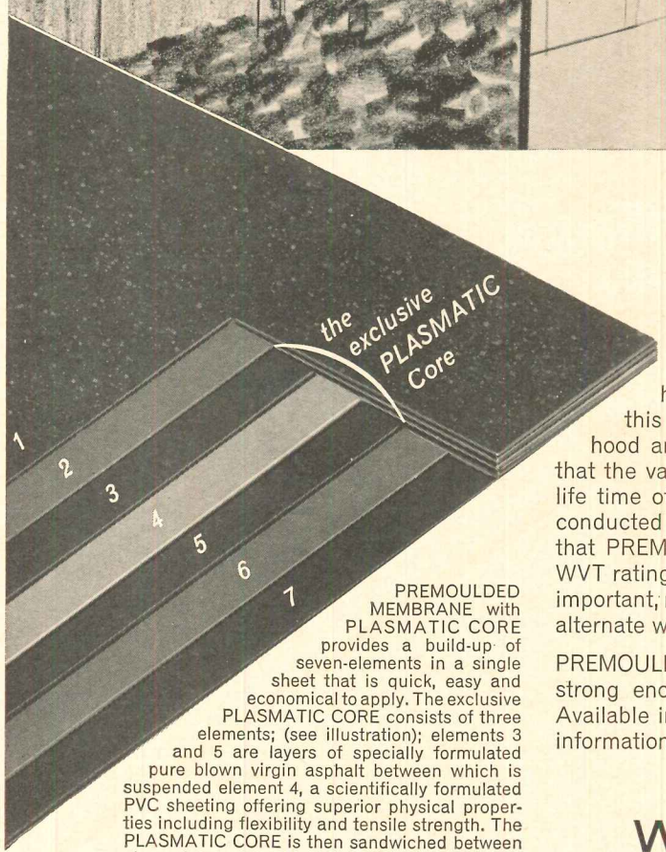

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