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SHOWROOM INTERIORS CONCEIVED AS ARCHITECTURE

APARTMENT COMPLEX THAT COMBINES TOWER AND GARDEN UNITS

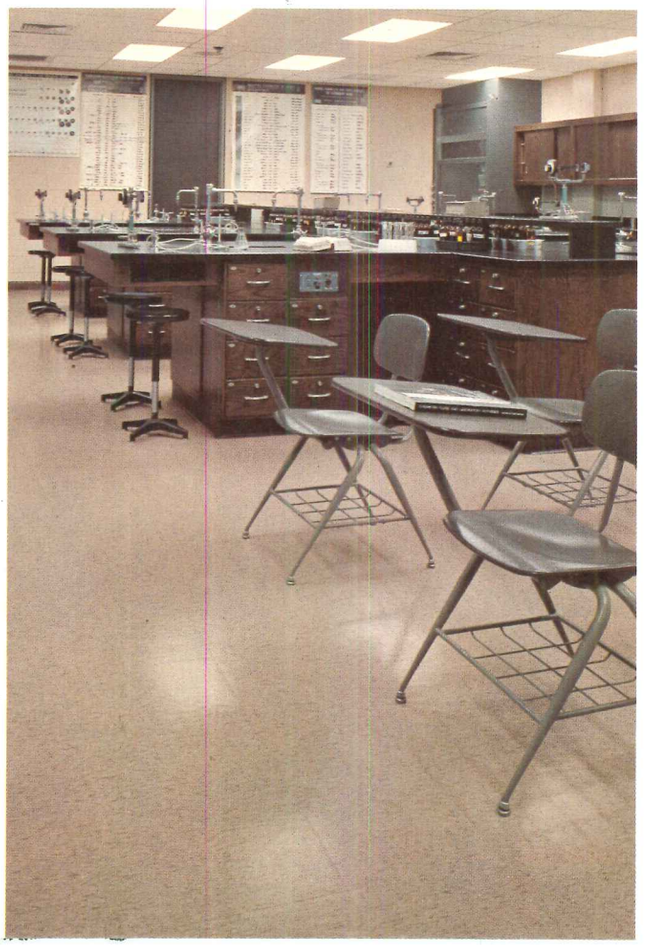
SPECIAL REPORT: SOME PARTICULAR PROBLEMS OF NOISE CONTROL

BUILDING TYPES STUDY: COLLEGE BUILDINGS

FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

SEPTEMBER 1968 **9** A McGRAW-HILL PUBLICATION TWO DOLLARS PER COPY



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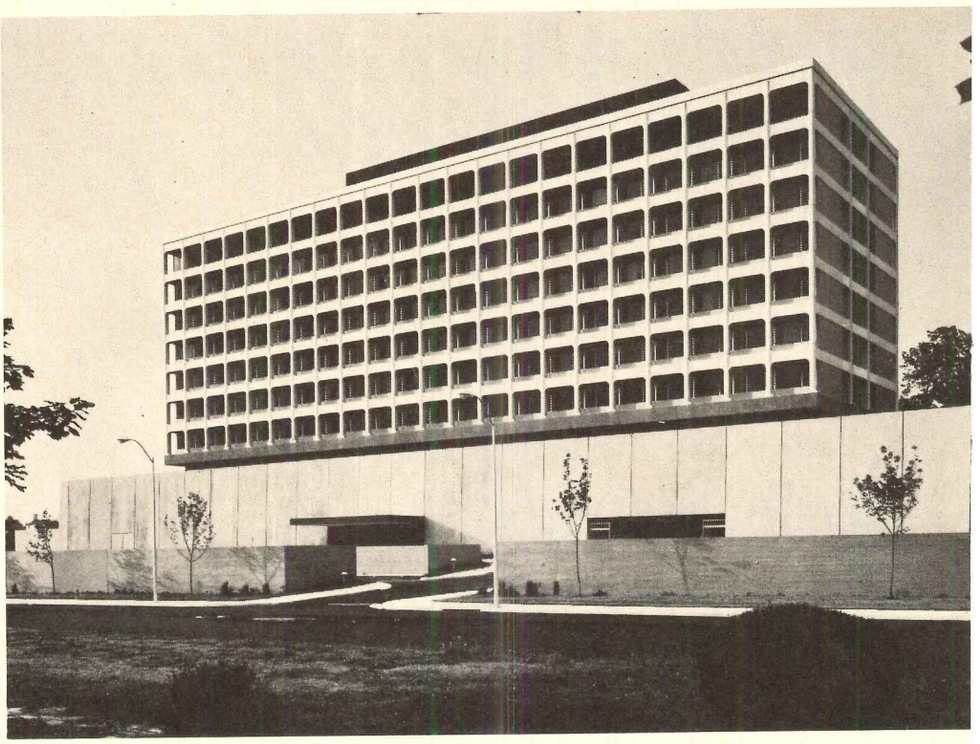
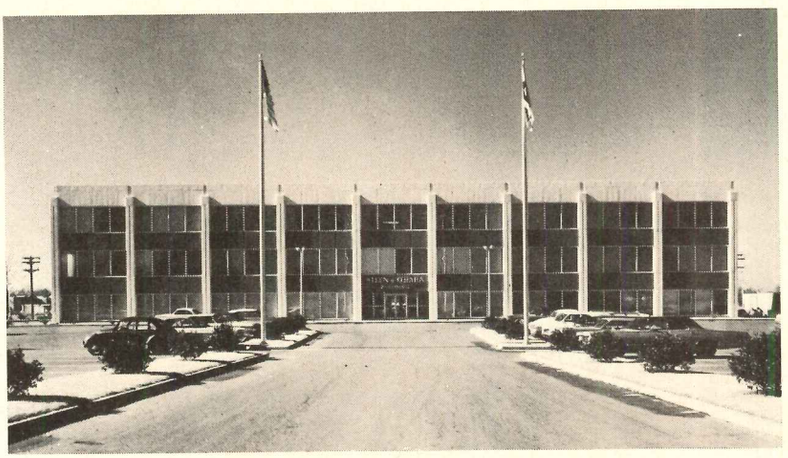
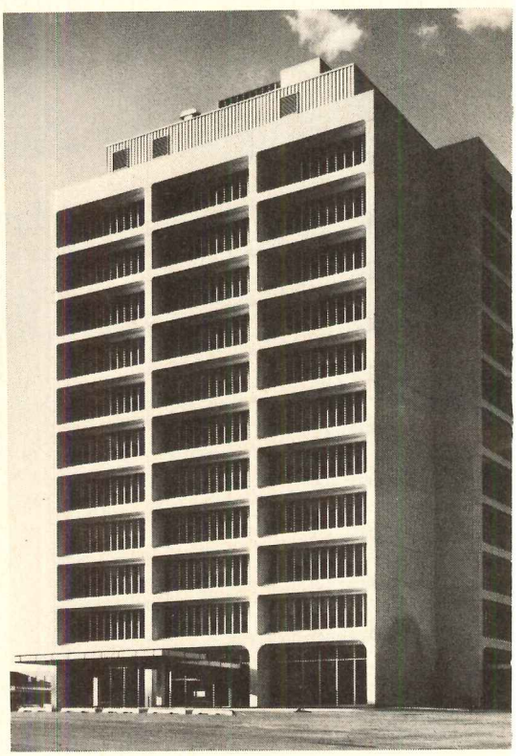


ROANOKE COMMUNITY HOSPITAL,
Roanoke, Virginia.
Architects and Engineers:
Hayes, Seay, Mattern & Mattern,
Roanoke, associated with Skidmore,
Owings & Merrill, New York. General
Contractor: Basic Construction Co.
Six Dover Electric Traction Elevators
with Computamatic control; one
Dover Oildraulic Elevator, installed
by Dover Elevator Co.



ALLEN & O'HARA BUILDING,
Memphis, Tennessee.
Architects: Robert Lee Hall Associates, Inc.
General Contractor: Allen & O'Hara, Inc.
Three Dover Oildraulic Elevators
installed by Dover Elevator Co.



PHYSICIANS & SURGEONS BUILDING,
Oklahoma City, Oklahoma.
Architects: Coston, Frankfurt &
Short. General Contractor:
Manhattan Construction Co.
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with Computamatic control and
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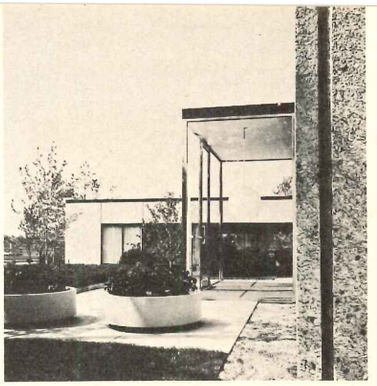

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Troy, Michigan.
Architects: Minoru Yamasaki and Associates
Photographer: Bill Hedrich, Hedrich-Blessing

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© Ezra Stoller Associates, Inc.

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Orlando R. Cabanban

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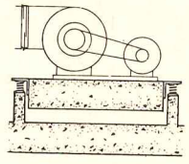

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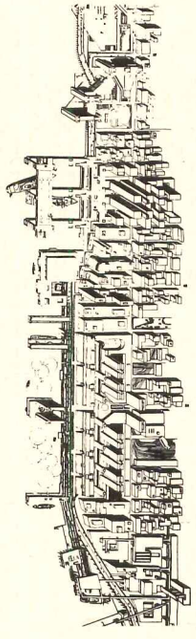

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COMING IN THE RECORD

BUILDING TYPES STUDY: HOSPITALS

Some of the confusion about comparative hospital costs and some of the design expedients for controlling costs will be covered in the October Building Types Study in an article from the U.S. Public Health Service. Institutions displayed will include some examples of inventive room configurations, nursing unit layouts and general circulation patterns.

THREE NEW CAMPUSES BY GUNNAR BIRKERTS

Tougaloo, Glen Oaks and a Vocational Technical Institute for Southern Illinois University demonstrate this architect's fresh approach to the design of systems of architectural order whch permit flexible expansion to meet changing educational needs.

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Kassabaum takes on the tough, real problem of professionalism

Probably every incoming president of the American Institute of Architects has said, in his inaugural speech, something about the perils and pressures of the "fast-changing world." In his inaugural speech two months ago, incoming president George Kassabaum said: "Perhaps the pressures on the profession are no more profound in 1968 than they were in other years, but I believe they are at least new and different." And he went on to give a pretty realistic recital of what 1968's new and different problems are.

The most meaningful example of the "new realism" in Kassabaum's thinking was his strong argument that "we must re-examine the meaning of professionalism, for our concept is under attack and will survive only if it is right for our time." This statement alone is enough to cause a number of practitioners to drop their pipes onto their tweed jackets, but the new A.I.A. president went on to spell out the problem clearly: "In a day when there is so much to do and not enough money to do it, picking the lowest bidder is the easiest solution for men who are too harassed to foresee the end result. . ."

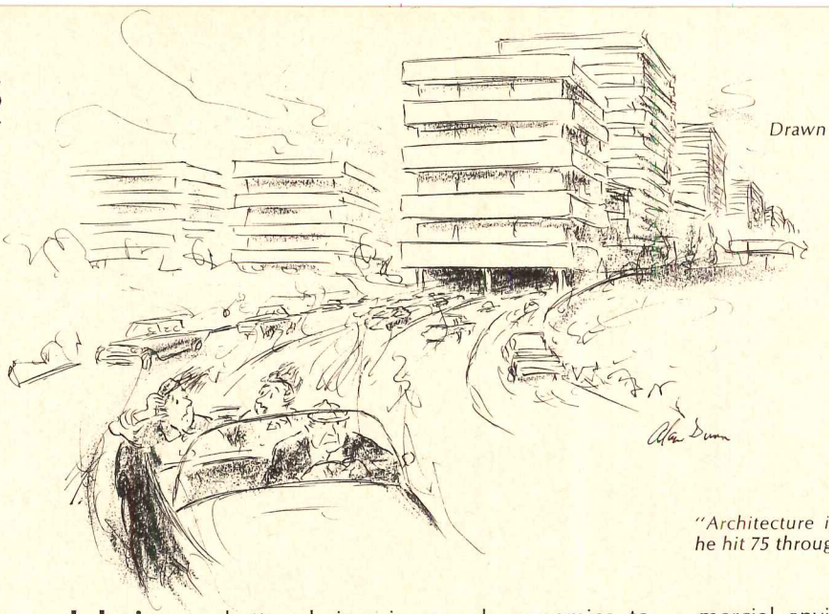
He didn't say it, but implicit in this statement is the fact that more and more clients are "too harassed" to give the traditional kind of attention to the building process. One example: part of the growth of the so-called package deal has been its appeal of simplicity to the client—who makes one decision and goes back to his normal work. Another example: the city official charged with getting 50,000 housing units underway before the next election really doesn't want the same kind of involvement in the design process as has the traditional client. Another example: the simplicity of choosing architectural and engineering firms by the process of competitive bidding has proven almost irresistible to many government agencies—to whom, and for good reasons, competitive bidding is the traditional process.

Another reason the "meaning of professionalism must be re-examined" is that there are new kinds of work for which there is little traditional precedent and therefore no clear professional standards. There is, for example, no traditional way for an architectural firm to apply for a $4.9-million Federal contract to recommend specific housing experiments and choose the cities in which those experiments will be carried out. There is no precedent and no fee structure to follow when, as has happened recently, one architectural firm is retained by a government body to supervise the work of many other firms involved in city redevelopment. And if the idea of architect acting as developer has caused some fuss and furor before, the feathers will really fly if a few more architects take the path Charles Luckman has taken in selling his firm to an industrial corporation. Since that news hit, no fewer than four major industrial corporations have asked editors of the RECORD if this would be a good investment for them. The appeals on both sides are easy to understand and tempting, and the profession badly needs a firm ruling on this kind of involvement.

At any rate, the traditional rules long used to define professionalism are, as Kassabaum said, "under attack" for the simple reason that there are problems to be solved and work to be done not covered under the old rules. These new rules should make it possible for the architect to involve himself, from the start, in solving today's immediate design and development problems—make it easier for the architect to be involved when the basic decisions are made, instead of waiting quietly until someone calls and asks him for advice. "We must find out how we can remain professional while becoming more aggressive and dynamic. . . . We will have failed the future if our timidity allows billions of dollars to be spent in building things in the next few years only to find that the world is a worse place to live."

His attack on this real problem seems a realistic one: The Board of the A.I.A. has already funded a fresh look at the problems of professional ethics, and this time the study will be made by an outside consultant with experience in setting up professional standards in other professions. In other words, and it seems most appropriate, this time the study starts from scratch.

There are, on this as well as other matters before the A.I.A. board and membership, fine lines to be drawn between traditional and honored attitudes and values of the profession, and today's problems. New definitions of professionalism will not be set without careful study and considerable disagreement between honorable men. But the management of the study seems—with Kassabaum—to be in good, professional, practical hands. —*Walter F. Wagner, Jr.*



Drawn for the RECORD *by Alan Dunn*

"Architecture is just lost on Joe—he hit 75 through Linear City . . ."

Housing bill gives good design a push in the right direction

I suppose it is unrealistic to hope for too much, but it is encouraging to see that the new $5-billion Housing and Urban Development Act includes a section (sponsored by Congressman Thomas L. Ashley, Democrat of Ohio) stating that "emphasis should be given to encouraging good design as an essential component of [Federally-aided low- and middle-income] housing, and to developing housing which will be of such quality as to reflect its important relationship to the architectural standards of the neighborhood and community in which it is situated, consistent with prudent budgeting." Congressman Ashley has pointed out that this is the first time the Congress has stated its intent about design quality, except—in the 1937 act—to insist that housing built under Federally-sponsored programs shall not be "of elaborate or extravagant design." This statement of course has led many nervous local FHA officials and the watchdogs of the General Accounting Office to look upon balconies and closet doors as frills, and certainly discouraged any fresh design ideas for fear that they might turn out to be frills. The new Section at least gives architects trying to respond to real problems instead of restrictive regulations a talking point.

"In order to foster more attractive new development . ."

. . . a new report of the (New York) City Planning Commission begins, "the Commission drafted a planned unit development to the Zoning Resolution."

There is, of course, nothing new about Planned Unit Development. What is new is that a planning commission, having decided that PUD "encourages more productive use of open space, the preservation of the best features of the natural environment, more varied and better design, increased economies to the builder and prospective homeowner, and greater safety", has done an absolutely first-rate job of explaining and selling a new idea it wishes to foster.

The 40-page guide, prepared by the City Planning Commission's Urban Design Group, explains what PUD is and how it works (with, sensibly, considerable emphasis on the benefits to the developer), explains the basic design principles (street patterns, pedestrian ways, utility placement, use of land contours, and placement of lots and houses on lots), and explains how a developer can apply for approval of a planned unit development (with examples of required drawings and written material).

The "Provisions of the zoning regulations governing Planned Unit Development"—full, as in most such documents, of definitions, requirements, regulations, and whereases—are sensibly confined to the last six pages of the report.

In short, what the City Planning Commission has done is not just decide on a new policy, but to present this new policy to developers in a form that makes it seem appealing, and makes the process of gaining approval understandable and straightforward. Other planning commissions please copy.

You can't do much to make a service station beautiful

. . . but Mobil Oil Corporation continues to try. In May 1967, RECORD applauded the company's prototype design program—a redesign of service building and pump canopy by Eliot Noyes and Associates with graphics by Chermayeff & Geismar Associates. The company has now issued, for distribution to all its dealers, a 24-page landscape manual prepared by landscape architect Robert T. Steinholtz with drawings by architect David W. Scott. Its purpose: ". . . to help discharge our obligation to help create an acceptable and pleasant commercial environment wherever our stations are situated." The introduction also points out that "pleasant stations are a factor in attracting new customers in our highly competitive industry."

Would that more service station operators believed that.

Response to Whitney Young

Last month on this page, I commented on Whitney Young's moving speech to the Portland convention: "You are not a profession that has distinguished itself . . ." AIA President George Kassabaum has formed a six-man committee to consider Young's challenge, and it has formulated a 13-point program which has been sent to the chapter presidents for their comments. Among other points, it is suggested that each chapter examine its membership policy and actively encourage membership by Negro architects; and Negro members of chapters be urged to become active in chapter affairs, so that in due course they may become involved in national AIA matters. The AIA plans to actively search for qualified Negroes to fill two Washington posts: in the Urban Affairs Center and on the Institute's housing staff. Further, the Board has funded $15,000 in scholarships for Negro students, and plans an active program of visits to secondary schools to encourage young Negroes to enter the field of architecture. The program also suggests that each local architect: 1) hire qualified members of minority groups in their own firms; 2) try to encourage general contractors to use qualified subcontractors of minority races; 3) refer jobs that they cannot take on to Negro architects; and 4) include equal-opportunity clauses in contracts for private as well as public work.

This program is a start. Some real effort in all local chapters to implement it would be a giant step.

—*W.W.*

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Columbian Elementary School, Kokomo, Indiana. Three additional school buldings in Kokomo by same architect, general contractor and masonry contractor: Maple Crest School, Haworth High School and Sycamore Jr. High School Addition.

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General Contractor: Modern Structures, Inc., Indianapolis
Masonry Contractor: B.E.C.T. Co., Indianapolis
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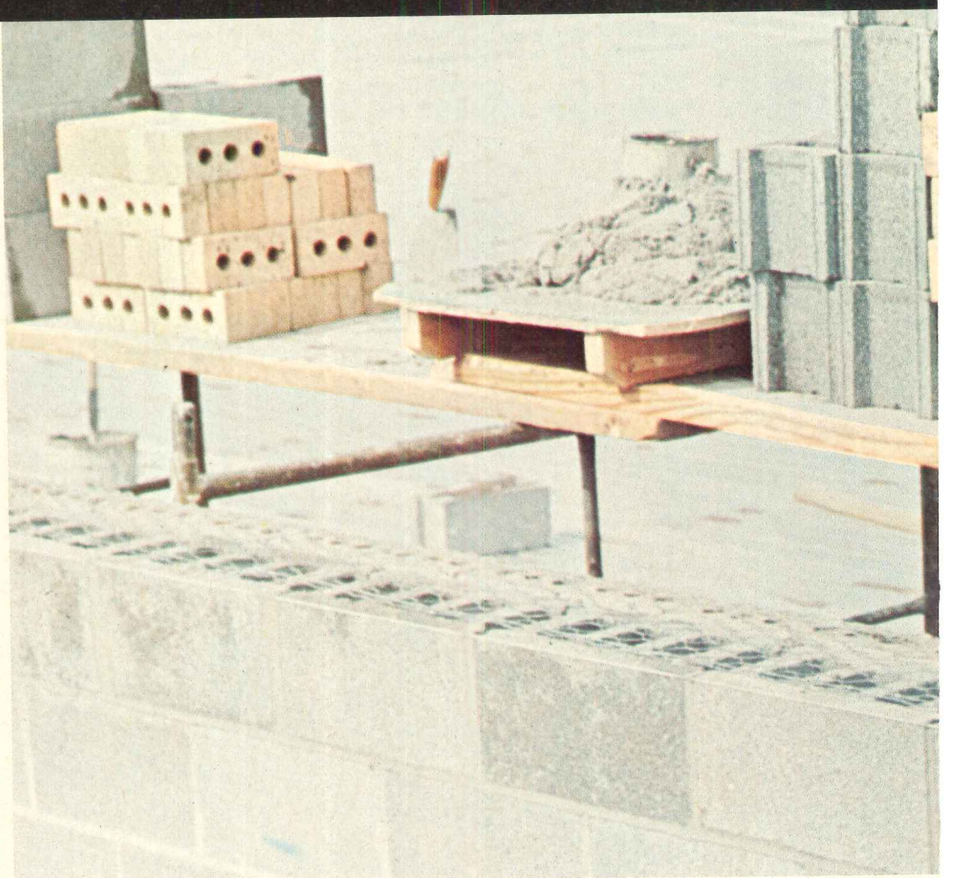

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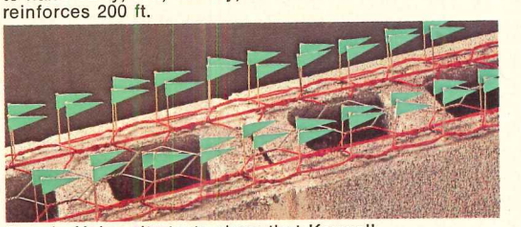
In walls subject to high stress, it is good practice to specify high strength mortar and our Keywall Truss-Type Reinforcement every other course. The tremendous bonding power of high strength mortar makes excellent use of the extra steel in our truss-type reinforcement, as shown by lateral pressure tests conducted at the University of Toledo. Tests also showed that reinforcing every *other* course is as effective as reinforcing each course.

Keywall Multibond comes in rolls that are easy to hand carry, roll, convey, or wheel. One roll reinforces 200 ft.



Toledo University tests show that Keywall Multibond is unsurpassed when used with regular mortar. Multibond gives you 96% more bondling surface than 9 gauge truss, 55% more than 3/16″ truss. Plus 28 mortar locks per 8″ block.

Use Keywall Multibond with conventional types of mortar

Easily cut to fit any building situation with just a pair of tinsnips. Snip to make cut-outs for structural framing. Snip to make pieces exactly the right length for corners and pilasters.

Conventional mortars need the extra bonding surface, mortar locks and mechanical anchors provided only by Keywall Multibond. Together they work to better control thermal movement and resist cracks.

For specific answers to any reinforcement problem, call your Keystone man or write Keystone Steel & Wire Company, Peoria, Illinois 61607.

inner strength
ROOFS · WALLS · FLOORS

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

For more data, circle 6 on inquiry card

"You mean I could have narrowed the hoistways by 3 inches on every floor?"

An exclusive Otis development—Otispace-Saver doors—gives you the option of extra car capacity or extra floor space. When you're planning a building, let us fill you in on the latest in elevator technology.

Otis
ELEVATOR COMPANY

St. Charles builds storage to match your needs. As in this sales and estimating office.

"St. Charles"®

CUSTOM CASEWORK . . . *solves complex storage problems . . . beautifully.*

To solve unique storage problems—even the most vexing, complicated problems—St. Charles can suggest a solution. St. Charles casework is custom-designed, tailor-made to beautifully fulfill each client's specific requirements. For every conceivable storage need, call on St. Charles.

The employee coffee-lounge St. Charles designed for a Chicago advertising agency. Pleasing. Practical. And comfortable.

CUSTOM CASEWORK

St. Charles Manufacturing Company, St. Charles, Illinois

30 YEARS OF LEADERSHIP IN CREATING CUSTOM CASEWORK

Write Dept. 400 for complete information

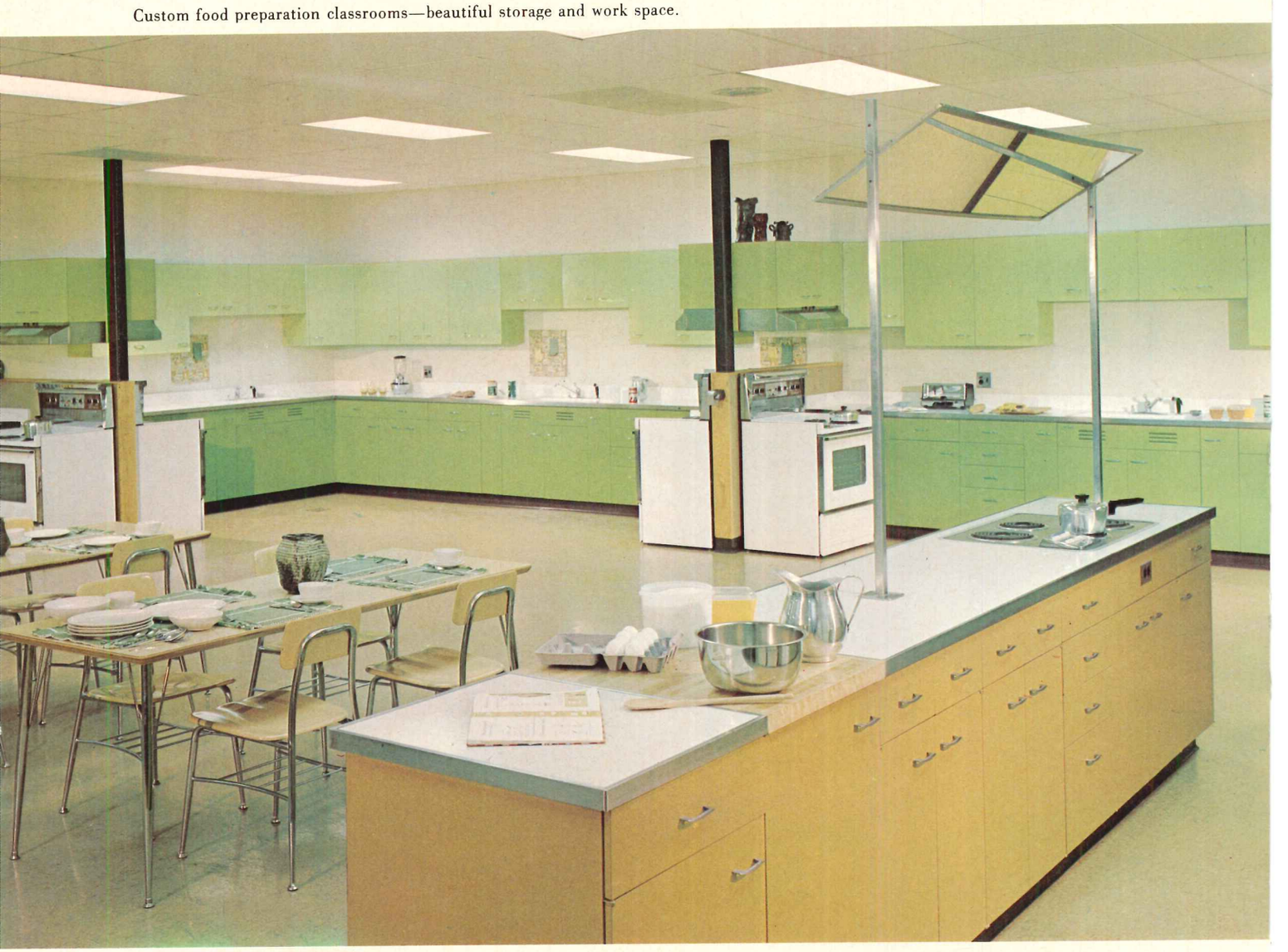
Classroom sewing area—efficient, colorful, creative.

"St. Charles"®

COLORFUL CUSTOM CLASSROOMS *work wonders!*

Students and teachers are stimulated by classrooms that are handsome, colorful, practical and neatly organized . . . which describes every custom-classroom designed by St. Charles. Here is superb casework. Here is matchless efficiency. Here is an inspired choice of colors, materials and textures. Consider your food and sewing laboratories, arts and crafts classrooms, and all other special rooms requiring casework . . . and consider calling St. Charles.

Custom food preparation classrooms—beautiful storage and work space.



CUSTOM SCHOOL STORAGE FURNITURE

St. Charles Manufacturing Company, St. Charles, Illinois

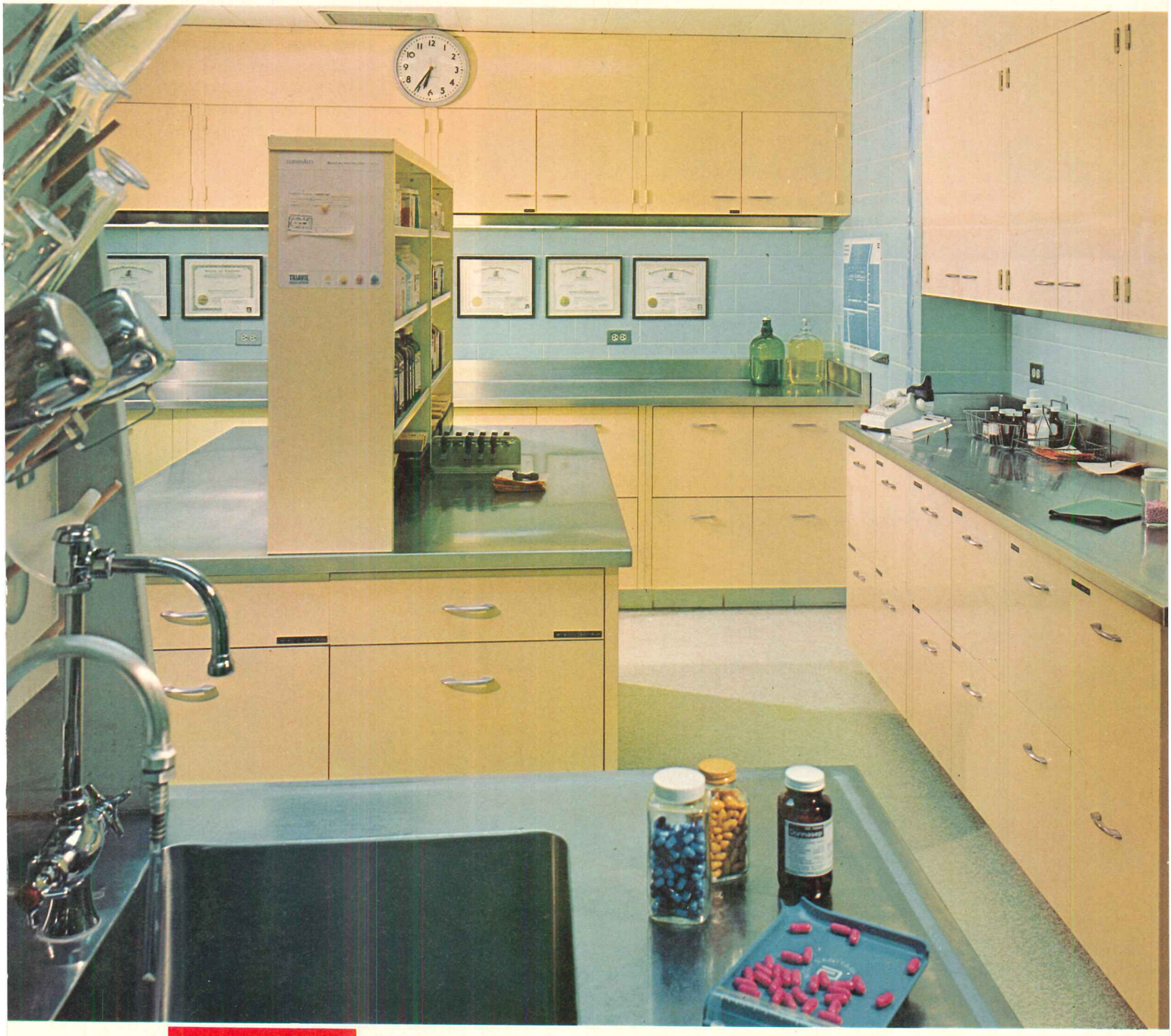
30 YEARS OF LEADERSHIP IN CREATING CUSTOM CASEWORK

Write Dept. 300 for our School Storage Furniture Catalog

"St. Charles" HOSPITAL CASEWORK

. . . custom-blends efficiency with lasting beauty

Creating an air of spaciousness beautifully—yet efficiently—in a new hospital or remodeling project is a matter of putting the specialized experience and talent of St. Charles to work. Here is custom-designed casework to answer unique, specific requirements as in this pharmacy or any area of the hospital. For a lifetime of convenience, economy and easy maintenance, call on St. Charles.



HOSPITAL CASEWORK DIVISION

St. Charles Manufacturing Company, St. Charles, Illinois

30 YEARS OF LEADERSHIP IN CREATING CUSTOM CASEWORK

Write Dept. 200 for our "St. Charles Hospital Casework" Catalog

"St. Charles"®

CUSTOM KITCHENS . . . fo

individualists who like having things their own way!

Creativity has no limitations when you work with a St. Charles dealer-designer. He believes in giving people their own way—in *everything!* Concept, colors, materials, dimensions, textures—without you or your client having to make annoying concessions. He can also free you of numerous details and expedite your concept to completion—from the unique custom features you specify to the preferences (and even whims) of your client.

Space-saving storage wall dramatizes St. Charles design, planning, workmanship.

In this custom kitchen, rich antiqued cherry doors are accented by colorful textured cabinets.

StC

CUSTOM KITCHENS

St. Charles Manufacturing Company, St. Charles, Illinois

30 YEARS OF LEADERSHIP IN CREATING CUSTOM KITCHENS

Write Dept. 100 for complete information

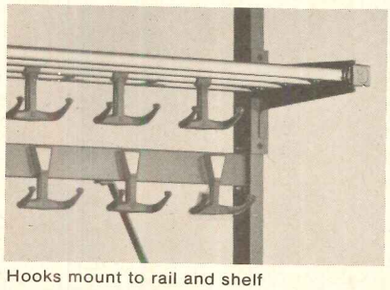
DIPLOMAT Floor Rack

HANG IT ALL!

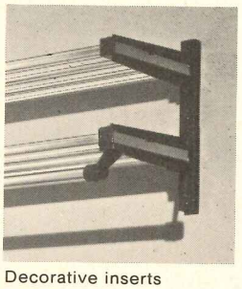
. . . on Krueger's decorative new Hat and Coat Racks

. . . Accent on Style . . . Accent on details

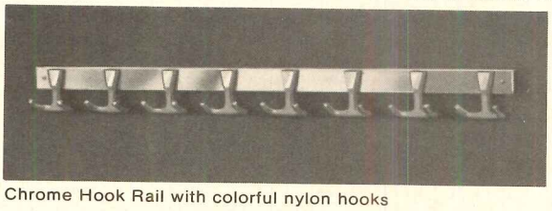
Modern interiors everywhere are getting the "hang" of Krueger's practical ways of solving hat and coat storage problems with a stylish flair. Our extensive Hat and Coat Rack line includes Single and Double-Face Floor models and Wall Racks with 1, 2 or 3 shelves in 3, 4 or 5-foot lengths plus add-on units. 2-Foot models also available in some lines. Striking accents in chrome, brushed aluminum, woodgrain vinyl, colorful plastic and enamel enrich any decor. Hung up by hanging problems? *Hang it all with Krueger!*



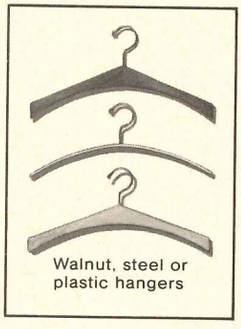
Hooks mount to rail and shelf



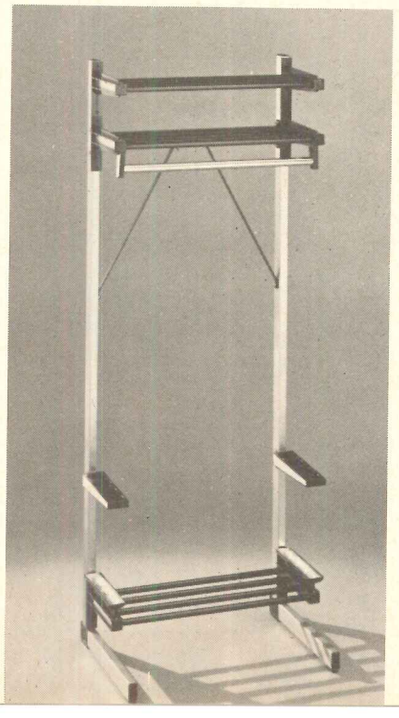
Decorative inserts



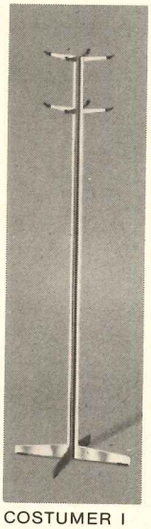
Chrome Hook Rail with colorful nylon hooks



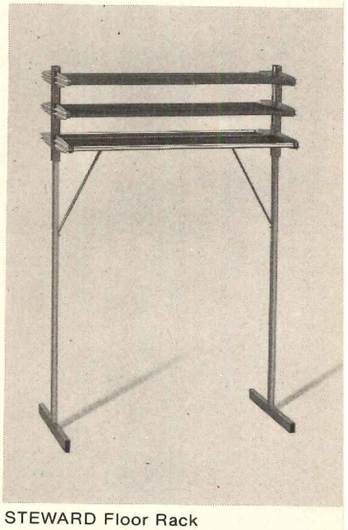
Walnut, steel or plastic hangers



2′ DIRECTOR Floor Rack



COSTUMER I



STEWARD Floor Rack

KRUEGER

METAL PRODUCTS COMPANY • GREEN BAY, WIS • 54306

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Send for our latest Complete Line full color Catalog—*on your letterhead, please.*

SHOWROOMS—

New York: 20 E. 46th Street/10017
Chicago: 1184 Merchandise Mart/60654
Dallas: 3270 La France Street/75226
Los Angeles: 8815 Beverly Boulevard/90048

the Stylon·Mosaic merger

It's filled with good things for you

We've just joined two fine old names in the tile business to bring you some exclusive new benefits. Like . . .

12 Plants — strategically located throughout the U.S. to give you a unique combination of local product preference and faster service.

More than 40 Regional Branches — carrying complete tile inventories plus all the necessary tools, grouts, adhesives and other materials for complete "one-stop" ceramic tile shopping service.

Over 150 Independent Distributors — with tile stock on hand and ready to supply you with "instant service."

Complete Design Service — a large staff of professional design people to help you create murals or complete installations.

The Broadest Ceramic Tile Line in the Industry — Now you can choose from a wider variety of conventional and designer tiles: colors, shapes, sizes and textures . . . than ever before.

Service Representatives in Every Major Marketing Center — available for help and consultation on anything that has to do with tile.

We hope you'll call us soon . . . by our new name: The Mosaic Tile Company
Division of Stylon Corporation
Post Office Box 341
Milford, Mass. 01757.

MOSAIC® MOSAIC TILE COMPANY
A DIVISION OF STYLON CORPORATION

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Q: How does this "hidden persuader" make the Titus T-LINE Air Diffusing Ceiling 100% more functional, yet give it greatest architectural beauty of any ceiling?

A:

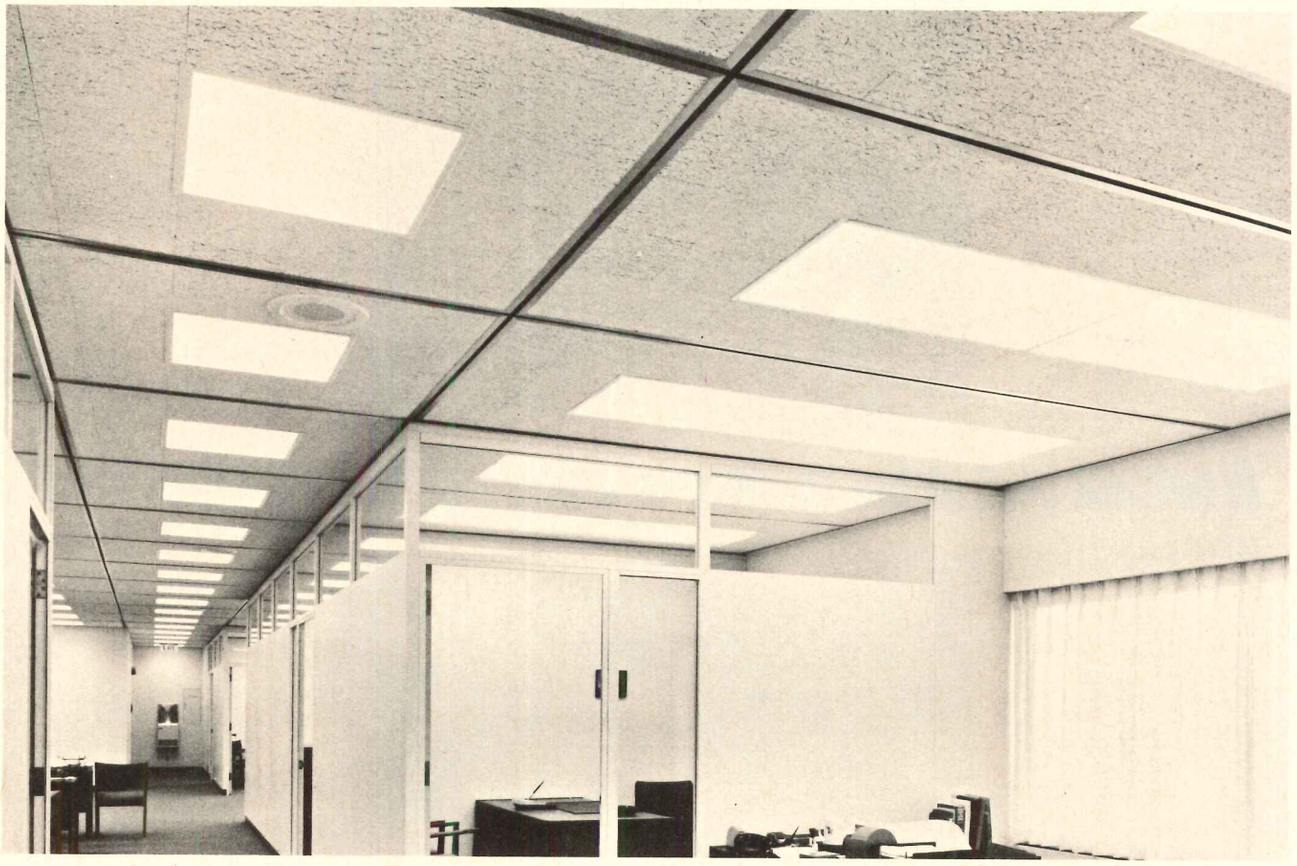
It nestles (out of sight) above the air slot of T-LINE, *gives greatest air distribution control of any ceiling system.* Look what T-LINE'S "hidden persuader" can do: *Adjust the air pattern a full 180°. Full horizontal discharge, left or right. Full vertical discharge. Or any pattern in between. And provide complete air flow rate control — even blank-off!*

WHAT DOES THIS MEAN? When you use T-LINE, you can be sure it will provide the efficiency and flexibility of air distribution to fully satisfy any present or future room requirements.

FOR EXAMPLE: If movable partitions (which quickly, easily affix to T-LINE channels for support) need to be rearranged to meet changed space requirements, T-LINE can provide the necessary air distribution to fully meet the new requirements *without disturbing the ceiling in any way!*

No other ceiling system allows such freedom of architectural ceiling design. T-LINE can be furnished in any size module — can be used with any kind or size ceiling panels, or any type lighting.

REMEMBER: *You don't gamble or compromise on the air distribution when you use Titus!* T-LINE Ceiling Systems are performance proven. First, by testing in the Titus Air-Diffusion-Council-Certified Research Laboratories — and then in many, many installations throughout the United States and Canada.



T-LINE air diffusing/ceiling suspension system

MEMBER ADC AIR DIFFUSION COUNCIL

SPECIALISTS IN AIR DISTRIBUTION FOR OVER 22 YEARS

by TITUS®

TITUS MANUFACTURING CORPORATION, Waterloo, Iowa 50704

☐ Rush new Catalog on Titus T-LINE air diffusing/ceiling suspension systems.

☐ Send names of Titus T-LINE Installations, also photos.

NAME .....

TITLE .....

COMPANY .....

ADDRESS .....

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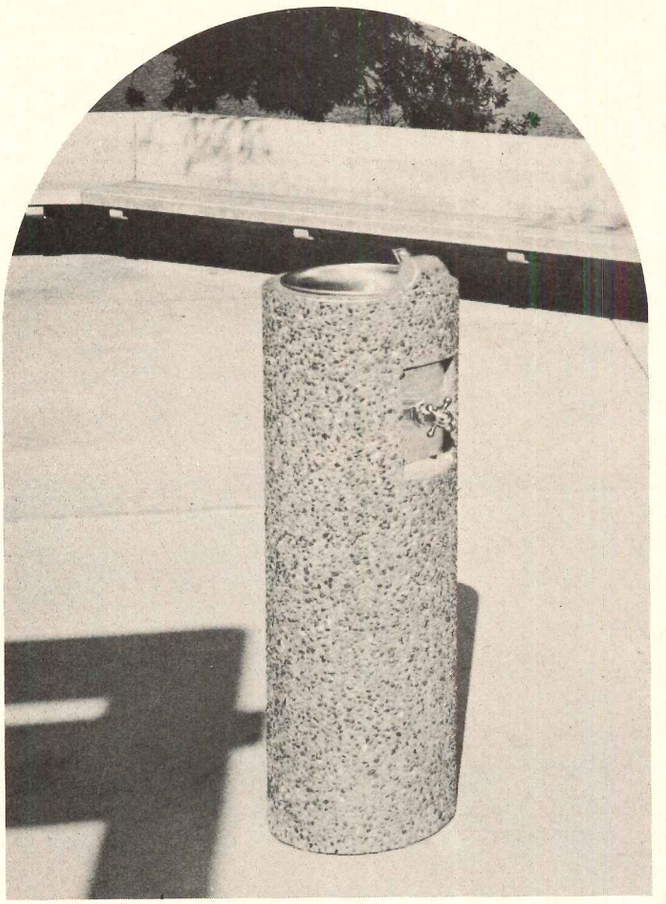

A natural part of the scenery in a drinking fountain that lasts

Beauty and brawn in an outdoor drinking fountain . . . available at last! A Haws Model 30 harmonizes with its environment—even enhances the creations of the architect. The beautiful precast stone pedestal is reinforced to withstand all the familiar outdoor ravages —rough weather, mischievous kids, vandalism, even the erosion of time itself! It's available in three convenient heights and a variety of aggregate finishes. Full freeze-proofing can be provided, too.

Don't let a poor substitute jeopardize the elegance of your next project. Insist on Haws Model 30—the harmonizing "toughie." Write today for your free catalog.

Haws Drinking Faucet Company, 1441 Fourth Street, Berkeley, California 94710.

HAWS® Since 1909

DRINKING FOUNTAINS

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For more data, circle 11 on inquiry card ➧

The Patient Carpet

Get a professional opinion. Ask your favorite veterinarian about carpets of HERCULON* olefin fiber. Soilage stays at near-surface level. Moisture, stains and dirt are treated with endless, smiling patience, even in a vet's waiting room. Easier-than-normal maintenance cleans them up—beautifully. To find out why this new breed of carpet is winning best of show contact: Fibers Merchandising, Hercules Incorporated, Wilmington, Delaware 19899.

Since when? Since Herculon®.

*Hercules registered trademark

HERCULES

The popular Frantz Filuma® Series Garage Doors are now available with pre-finished aluminum panels.

Since its introduction in 1959, the Frantz Filuma fiberglass/aluminum garage door has gained remarkable acceptance. To give you even more flexibility, we are now offering pre-finished aluminum panels as optional at no extra cost. You can specify all panels of the door in aluminum or as many panels in aluminum as you wish, with the balance in fiberglass (white, green, tan; plus the new Wood Grain Filuma in residential models). The textured surface of the Alcoa aluminum panel is finish-coated white on the outside and grey on the inside. The long, sweeping horizontal rib design not only adds extra strength to the door but blends perfectly with the fiberglass panels for continuity when mixing panels. For maximum service, consider these famous Frantz features which are incorporated in all Filuma doors: 2″ galvanized steel track; continuous jamb angle mounting (on all commercial and industrial series); ball bearing wheels and sheaves; panels pressure sealed to rails by a special (patented)* process; bolted hardware; spring door holder that engages automatically to hold door securely to header; pliable vinyl bottom weatherstrip that conforms to uneven floors; and a Multi-Function Security Lock that locks and unlocks from either side (inside without a key). You can specify Frantz with confidence. See your building materials dealer or write

U. S. Patent Nos. 194094, 3104699, 3169612

FRANTZ MANUFACTURING COMPANY
Department 40 • STERLING, ILLINOIS 61081

WORLD FAMOUS FOR HIGH QUALITY GARAGE DOORS

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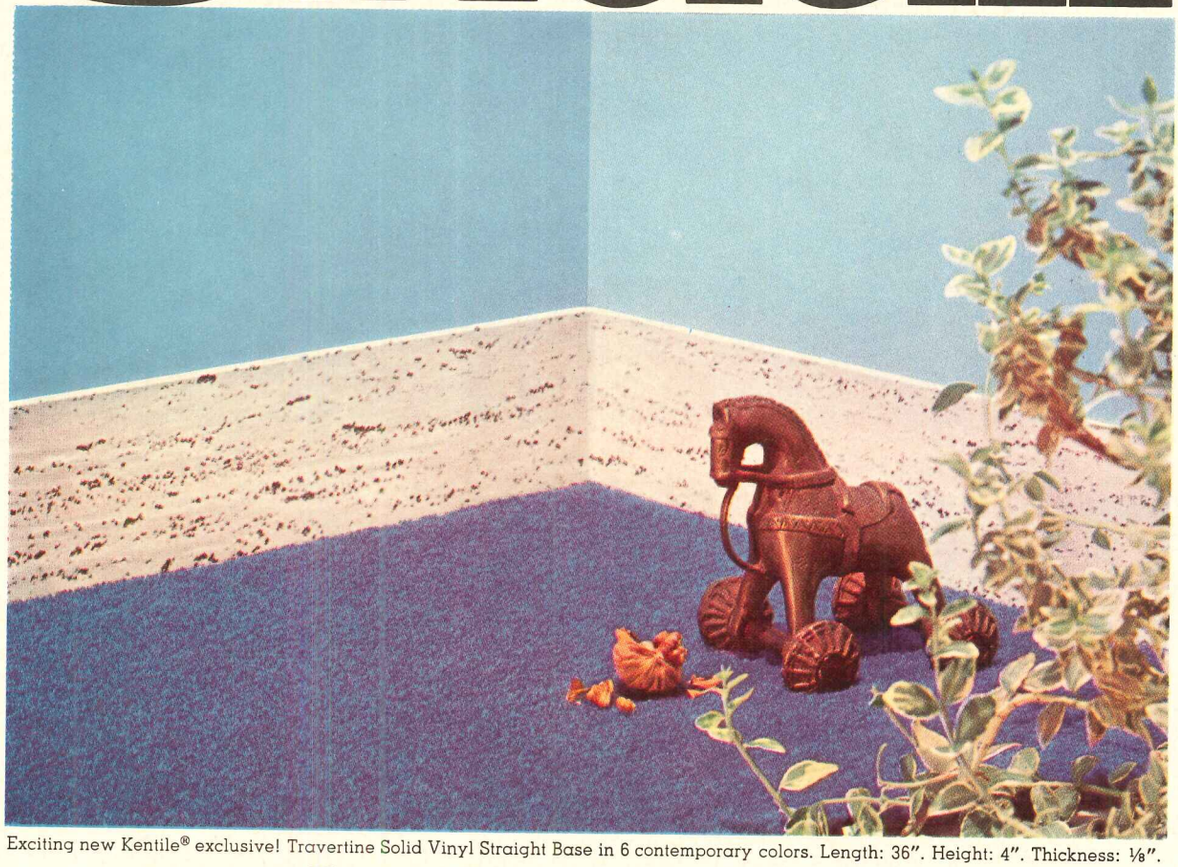
Undull



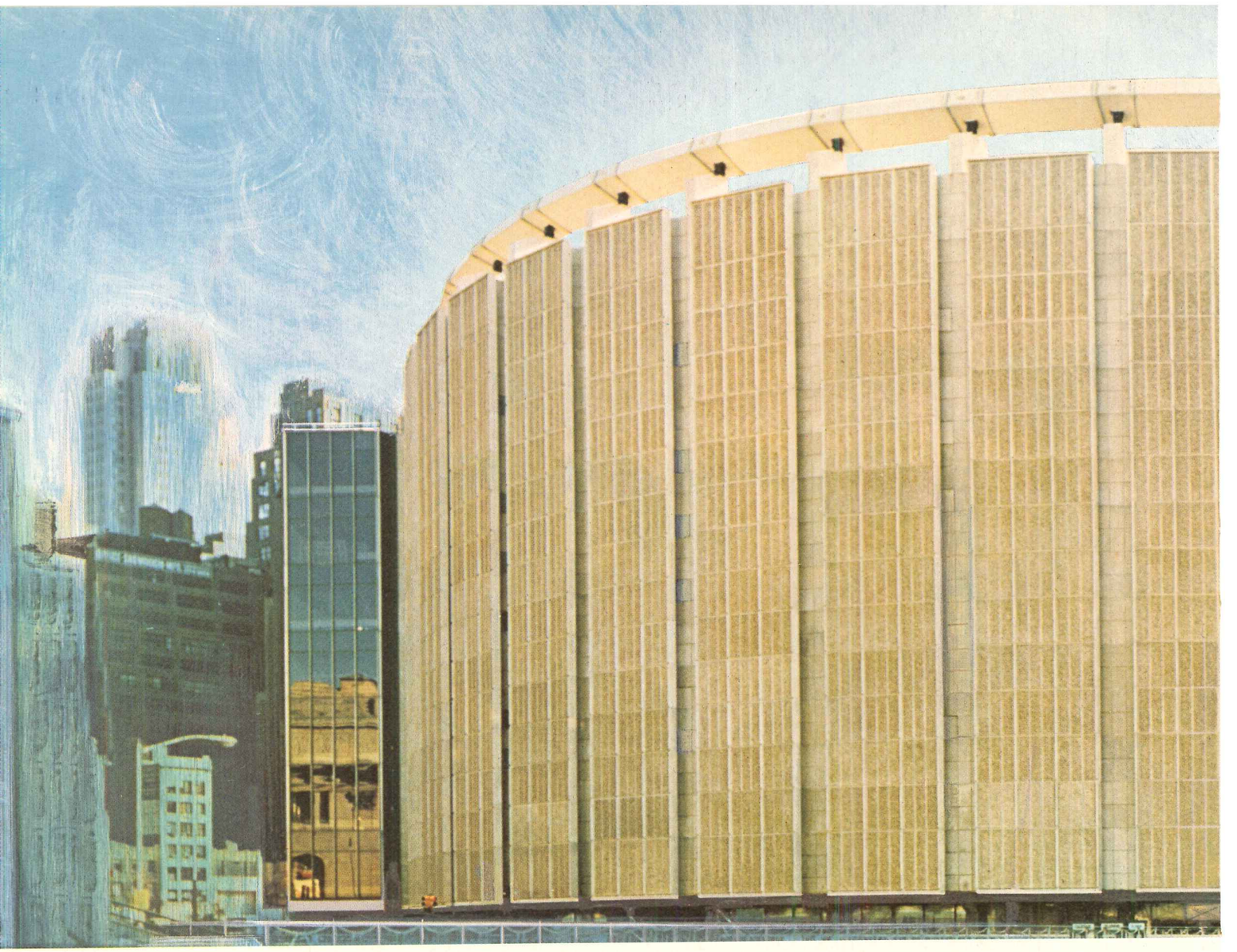
Exciting new Kentile® exclusive! Travertine Solid Vinyl Straight Base in 6 contemporary colors. Length: 36". Height: 4". Thickness: ⅛".

straight base is here...

. . . and your Kentile Representative has it! Luxurious new Travertine Solid Vinyl Straight Base, alive with the textured, dimensional look of ageless marble. Helps hide wall irregularities beautifully. Specially formulated to make smooth, tight, wrap-around corners—right on the job. Want to see for yourself what new Kentile Travertine —the undull straight base—looks like? A set of color samples is yours for the asking.

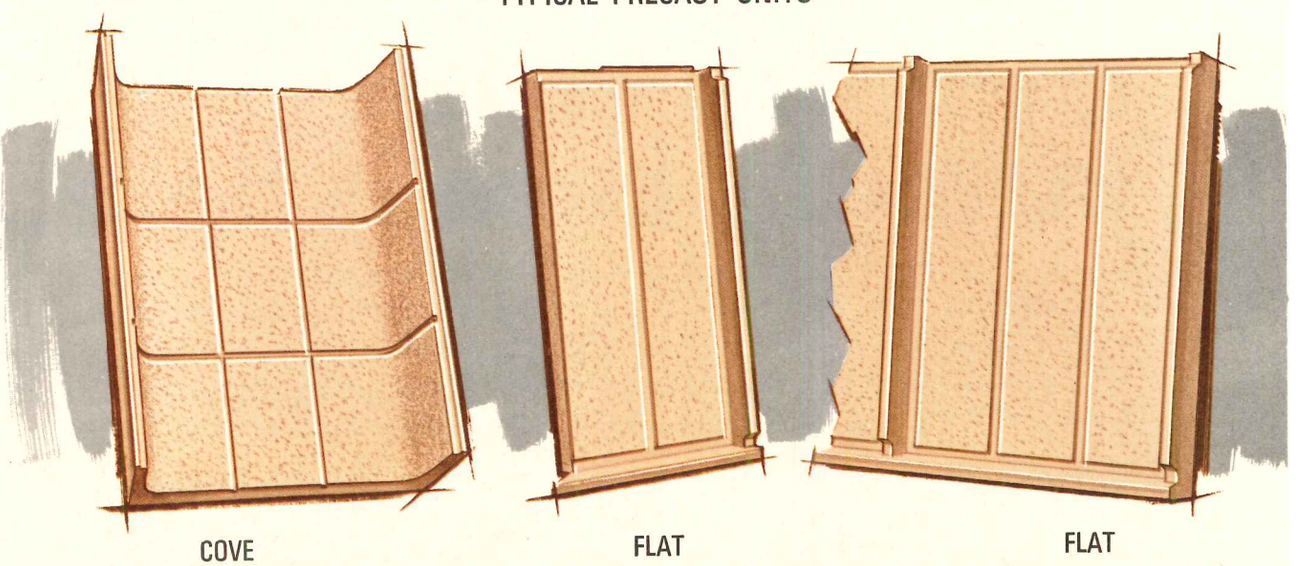
KENTILE FLOORS

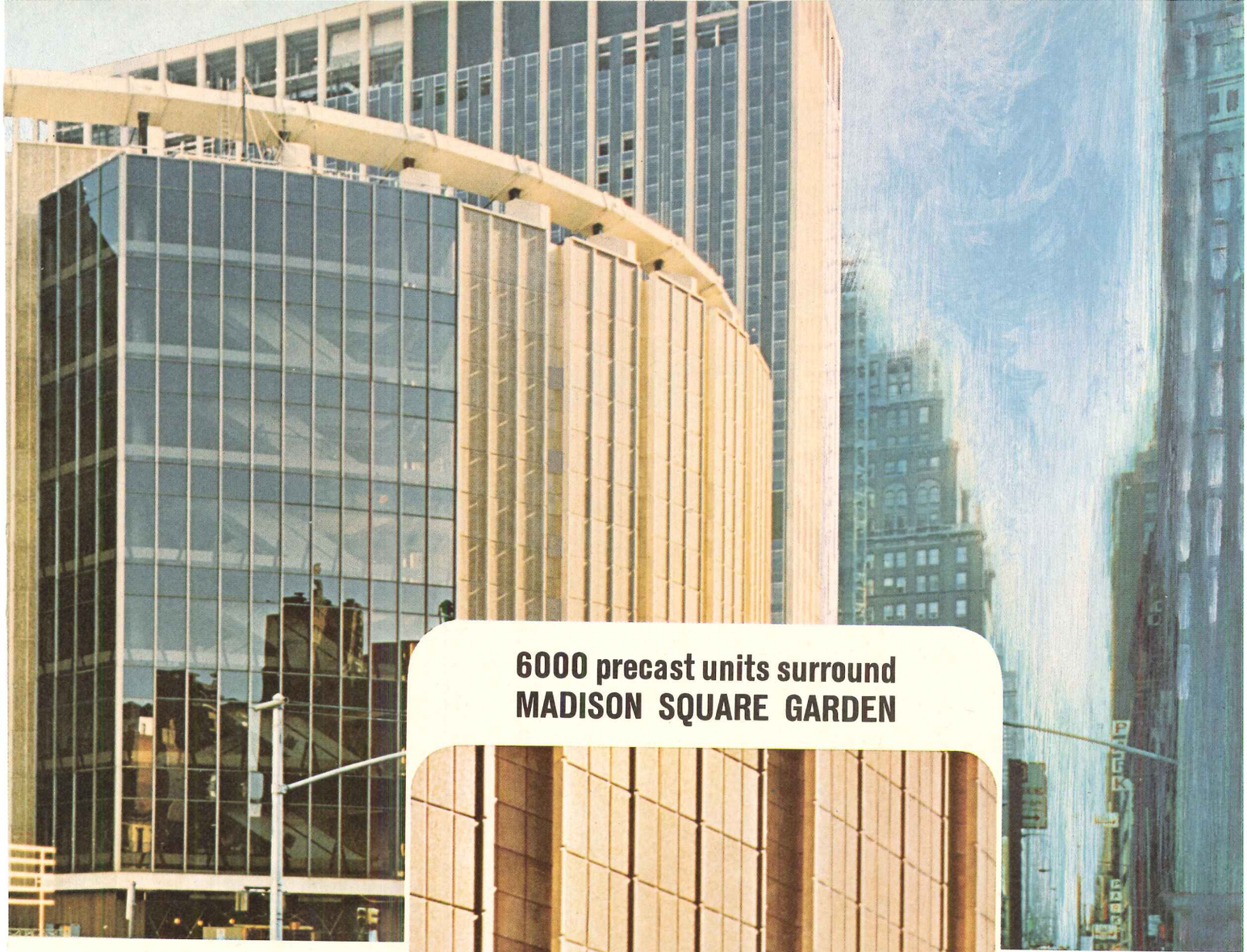
Brooklyn, N.Y. 11215



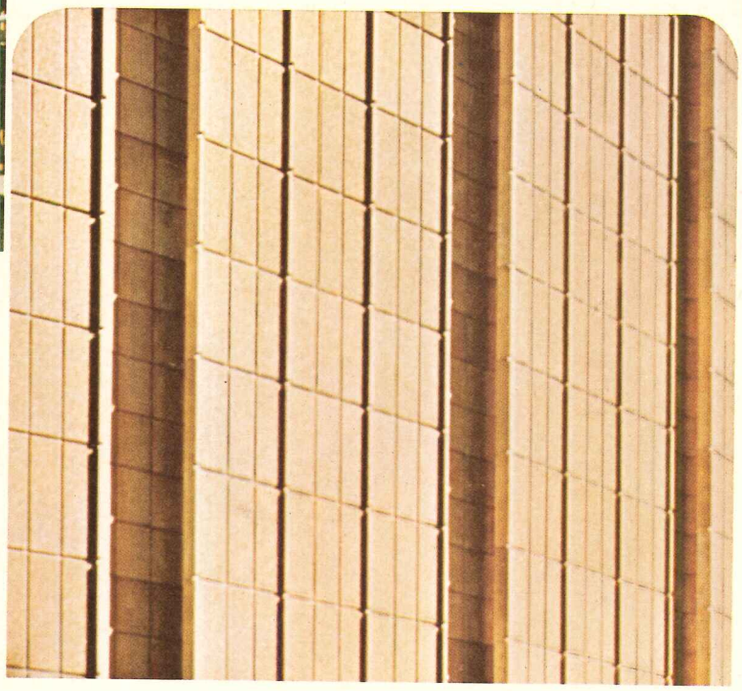
MEDUSA WHITE rounds out a bold

TYPICAL PRECAST UNITS





6000 precast units surround MADISON SQUARE GARDEN



new "square"

Architect: Charles Luckman & Associates, New York, N. Y. General Contractor: "Turner-Del Webb" Agents For The Owner, New York, N. Y. Precast Producer: Plasticrete Corporation, Hamden, Conn.

Three basic types of precast units in the Madison Square Complex are flat, cove-shaped and column cover panels. **Sizes** are: Flats, 8′-0″ x 21′-0″; coves, 8′-0″ x 9′-0″; and column covers of various sizes. **Colors** are light beige and dark brown. **Textures** are acid etched and exposed pebble aggregate. Whatever the architect's design objective in color, shape or texture, precast units of Medusa White help bring it to full reality. For details, talk to your precast producer or write Medusa at P. O. Box 5668, Cleveland, Ohio 44101.

MEDUSA PORTLAND CEMENT COMPANY

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

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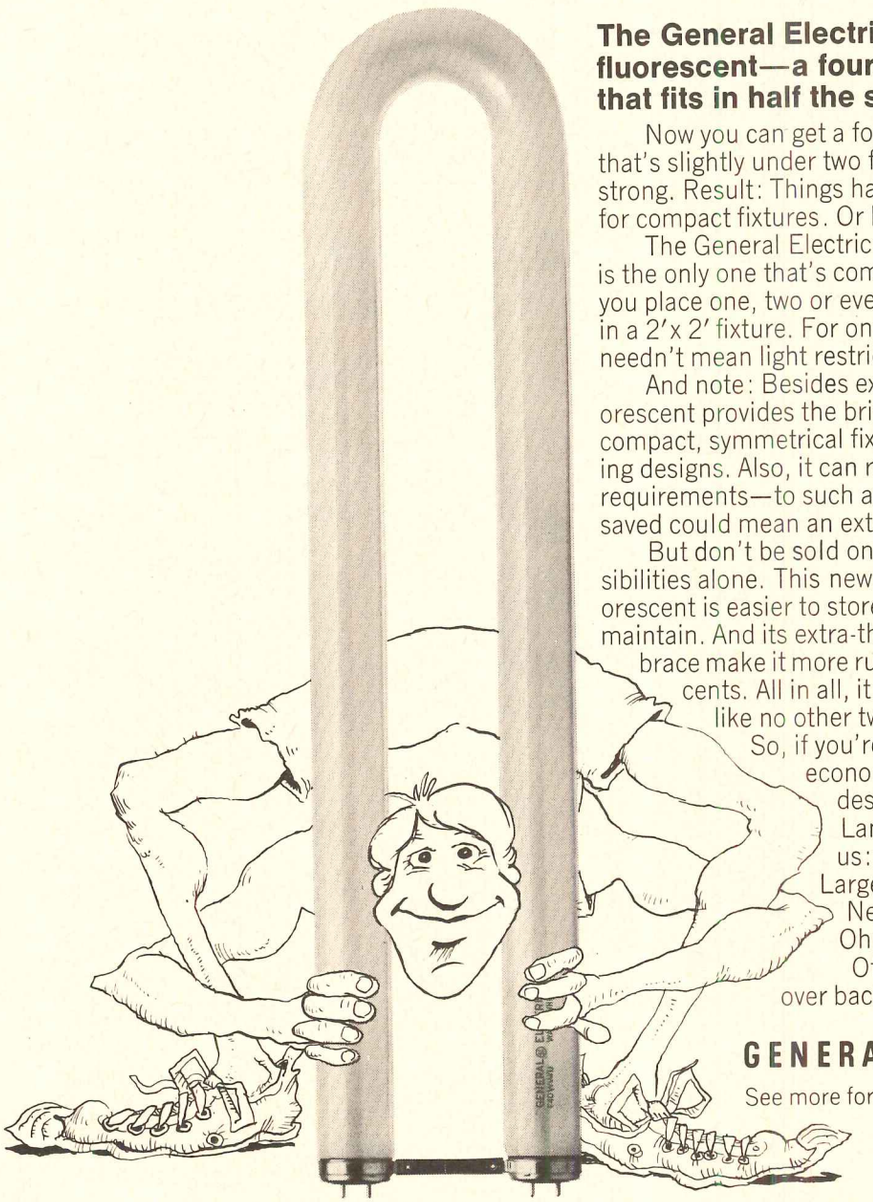
This new fluorescent will bend over backwards to solve space problems.



The General Electric Mod-U-Line* fluorescent—a four-foot fluorescent that fits in half the space.

Now you can get a four-foot fluorescent that's slightly under two feet long. And 40 watts strong. Result: Things have never looked better for compact fixtures. Or brighter.

The General Electric Mod-U-Line fluorescent is the only one that's compact enough to let you place one, two or even three 40-watt lamps in a 2′ x 2′ fixture. For once, space restrictions needn't mean light restriction.

And note: Besides extra light, our new fluorescent provides the brightest answer for very compact, symmetrical fixtures for modular ceiling designs. Also, it can reduce ceiling headroom requirements—to such an extent that the space saved could mean an extra floor on a skyscraper.

But don't be sold on its exciting design possibilities alone. This new GE Mod-U-Line fluorescent is easier to store, handle, install and maintain. And its extra-thick glass plus a cross brace make it more rugged than most fluorescents. All in all, it will curb lighting costs like no other two-foot lamp.

So, if you're interested in a new economical twist in lighting design, see your GE Large Lamp Agent. Or write to us: General Electric Co., Large Lamp Dept., C-810, Nela Park, Cleveland, Ohio 44112.

Of course, we'll bend over backwards to help you.

GENERAL ELECTRIC

See more for your dollar with GE lamps.

*TRADEMARK OF THE GENERAL ELECTRIC CO. MADE IN WEST GERMANY.

For more data, circle 14 on inquiry card

CUSTOM COMFORT.

That's what Anemostat mixing boxes give every worker in this huge new information center—

The massive new headquarters of the Chemical Abstracts Service has an air control system that would normally serve a building many times its size—and there's a good reason why.

Here, a large force of skilled, highly-educated specialists collects, digests and indexes chemical literature from all over the world. To create optimum conditions for this painstaking work, more than 1000 Anemostat high velocity mixing boxes were installed in the 190,000 sq. ft. building.

The Anemostat units enable workers in every one of hundreds of offices to tailor temperature and air flow to their individual needs. That means maximum personal comfort, and maximum working efficiency.

And—like all Anemostat high velocity equipment—the mixing boxes will perform smoothly and reliably for years despite constant heavy use.

Find out how this kind of durability and dependability can contribute to your next job. Write for our new product catalog. It contains specifications on the complete Anemostat line of air distribution equipment. Dept. A-2, Anemostat Products Division, P.O. Box 1083, Scranton, Pa. 18501.

DCA

ANEMOSTAT® PRODUCTS DIVISION
DYNAMICS CORPORATION OF AMERICA

®

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Headquarters of the American Chemical Society's Chemical Abstracts Service, Columbus, Ohio
Architect: Potter, Tyler, Martin & Roth, Cincinnati, Ohio • Mechanical Engineer: Kramer, Comer & Passe, Columbus, Ohio
Sheet Metal Contractor: Limbach Company, Columbus, Ohio • General Contractor: Garwick & Ross, Columbus, Ohio

Maybe your roofing problem can use the help of a nearby J-M engineer.

Pin one down.

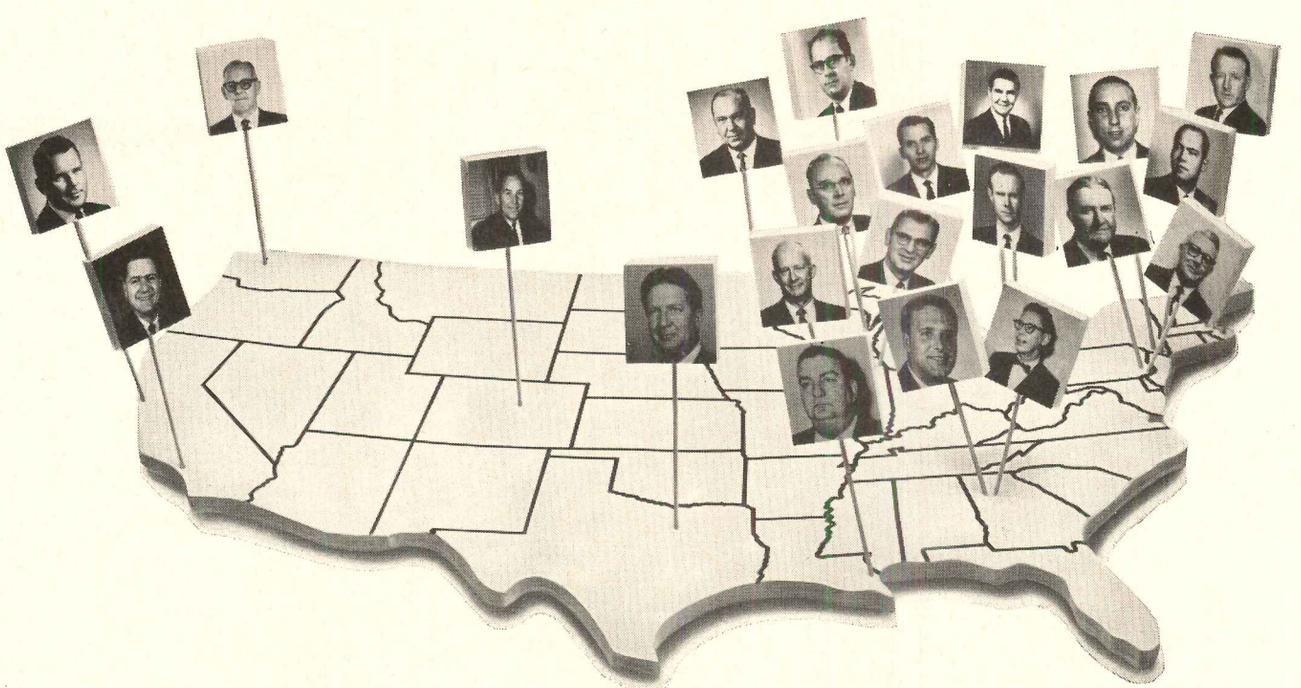
Only Johns-Manville has 21 experienced roofing specialists spotted across the land. To help you.

They're up on the latest materials and methods. They'll gladly help analyze and advise—from the starting concept through specifying, installation, and the entire life of the finished job.

And these engineers are backed up by J-M's range of proved roofing materials (the widest) and J-M's Roofing Research and Development facility (the largest).

Whenever you say the word, we'll put you in touch with our District Engineer nearest you. Ask your J-M salesman, or write: Johns-Manville, 22 E. 40th St., N.Y., N.Y. 10016.

Johns-Manville



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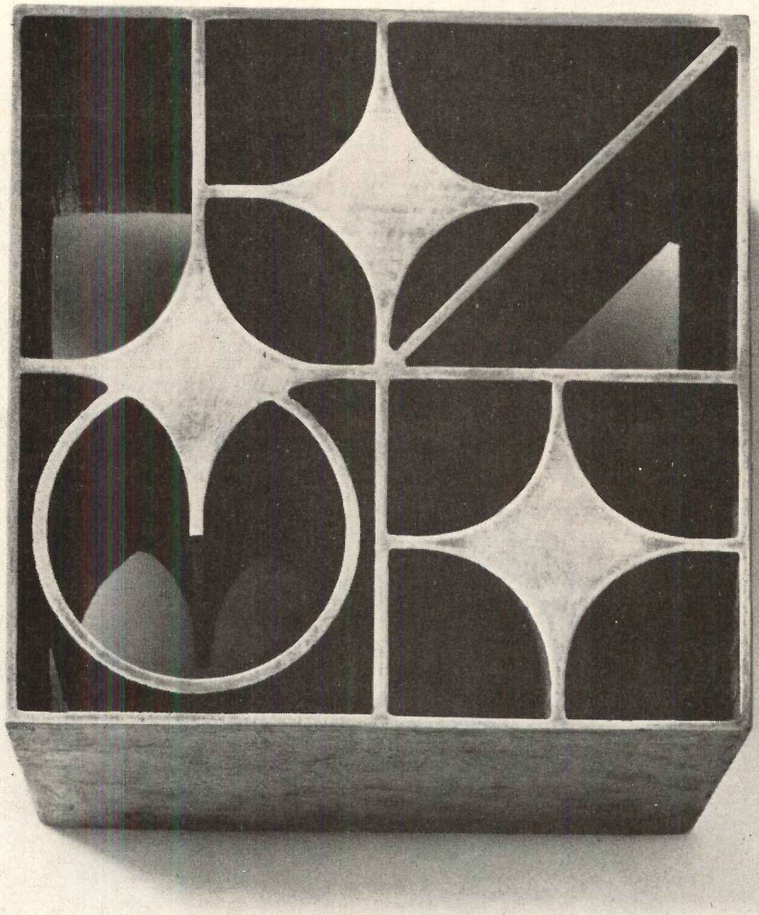


American Iron and Steel Institute announces the 1968-69

Design In Steel Award Program

For designers, architects, engineers, artists.

Eligibility—
The 1968-69 Design In Steel Award Program offers nationwide recognition to individuals or teams of professionals practicing in the fields of design, architecture, engineering or art in the Americas.

Award Categories—Two awards are offered in each of eight classes of products or structures—one for the best design in steel, with emphasis on aesthetic appearance; the other for the best engineering use of steel. In addition, for the first time this year, an award will be given for the most imaginative use of steel in art. The nine categories are: consumer products—industrial products—commercial equipment—transportation—residential construction—low rise construction—high rise construction—public works construction—art in steel.

For Complete Information—
Write to:
Coordinator, Design In Steel Award Program
National Design Center
415 East 53rd Street
New York, New York 10022

Steel

For more data, circle 22 on inquiry card

Why Gas absorption cooling makes sense even in TVA country.

In TVA country electric rates are among the lowest in the nation. But Gas absorption cooling proves less expensive to operate than an electric system.

The same Gas boiler that delivers heat and hot water supplies energy for the refrigeration unit as well.

There are other reasons why Gas cooling makes sense.

Gas cooling is quiet. There are no major moving parts. Low pressure steam from a Gas-fired boiler quietly energizes a liquid chiller.

And without any major moving parts, Gas systems have a long service life. They operate for years without a major repair.

How a Carrier system saves the Windsor Towers more than $2,400 a year.

The total annual operating cost for an all Gas cooling and heating system comes to $9,171 for these Nashville, Tennessee apartments.

In contrast, a combination electric cooling and Gas heating system would have cost $11,587 a year to operate.

A 311-ton Carrier absorption unit cools the 12-story building.

Chilled or hot water from the absorption cooler and boiler is sent to air handling units in each apartment. This allows tenants to regulate the temperature in their own apartments.

For more details on how you can use Gas cooling and heating to reduce your operating costs, contact your local Gas Company Sales Engineer. Or write: Carrier Air Conditioning Co., Syracuse, New York 13201.

ARCHITECT:
SWENSSON & KOTT, ARCHITECTS INC., NASHVILLE, TENNESSEE
CONSULTING ENGINEER:
I. C. THOMASSON & ASSOCIATES, NASHVILLE, TENNESSEE
GENERAL CONTRACTOR:
NATIONAL BUILDING CORP., NASHVILLE, TENNESSEE
MECHANICAL CONTRACTOR:
REYNOLDS BROS. PLUMBING & HEATING, NASHVILLE, TENNESSEE

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

For more data, circle 23 on inquiry card

A.I.A. interracial task force meets at Octagon

An interracial task force of the American Institute of Architects met at The Octagon in Washington, D.C., on July 25, acting on A.I.A. President George E. Kassabaum's pledge at the national convention to "implement the challenging suggestions" of Whitney M. Young, Jr. (August, pages 35-36, 40-41). Mr. Kassabaum told the group that "our professional role in the civil rights movement has been superficial" and called for the group to "develop specific positive programs for chapters and individual members."

The task force outlined suggestions for action, with implementation to be the subject of their next meeting in the fall. Among the suggestions were: examination of chapter membership policies; encouragement of minority groups to become active in chapter affairs; establishment of scholarships; encouragement to hire and train young men from disadvantaged neighborhoods and to use minority group building contractors; inclusion of equal employment clauses in all contracts; enlargement of the experience of architects-in-training; referral of projects to minority group architects; advising of young architects on how to start their own practices; individual and chapter support for community design centers; increasing the scope of "environmental awareness" programs in elementary and secondary schools; and review of individual office practice to eliminate any disparity of salaries between white and Negro employes.

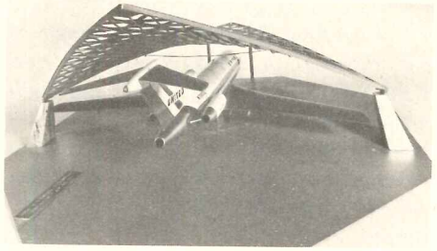
The members of the task force are architects Leon Bridges, Seattle; Jeh V. Johnson, Wappinger Falls, New York; Robert J. Nash, Washington, D.C.; Dewey A. Somdal, Shreveport, Louisiana; and Allan Y. Taniguchi, Austin, Texas. Also present were Rex Whitaker Allen, A.I.A. first vice president and president-elect, Vice President David N. Yerkes, Executive Director William H. Scheick and Israel Stein, associate director of Urban Programs for the A.I.A.

Huge project will implement Lower Manhattan Plan

A $190-million redevelopment of the 25-block Washington Street Urban Renewal Area will be the first implementation of the Lower Manhattan Plan proposed for New York City in 1966 (July 1966, page 35). Plans for the project were revised to conform to the Plan, rather than being an isolated development.

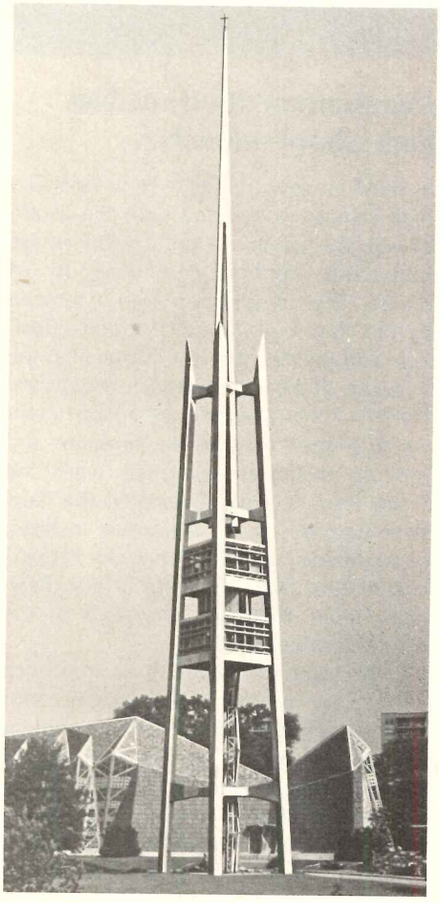
The complex will include three office towers, a shopping center, 1200 units of middle-income housing, 900 units of luxury housing, a college campus for 5000 students, and 1,000,000 square feet of industrial space for the printing industry. The major building blocks will be constructed above a base containing and incorporating parking, service facilities, cross streets, shopping facilities and pedestrian mall; and a new public plaza linking the middle of the island to the waterfront will be created.

Coordinating architects for the project are Gruzen & Partners, and that firm will also design the three office towers, the luxury housing and the industrial center. The Lefrak Organization, Inc., is sponsor for these segments. The middle-income housing will be designed by architects Oppenheimer, Brady and Associates, and sponsored by the International Brotherhood of Pulp, Sulphite and Paper Mill Workers Union, AFL-CIO. The campus for Manhattan Community College is sponsored by The City University of New York and the architects are Caudill Rowlett Scott.



Hyperbolic paraboloid for an airplane hangar

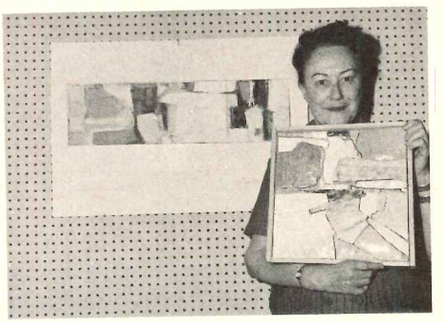
A steel frame hangar in the shape of a hyperbolic paraboloid is under construction for United Air Lines at Wold-Chamberlain Field in Minneapolis. The overnight maintenance hangar for Boeing 727 and Douglas DC-8 jets conforms to the shape of the plane while enclosing only one-third the space of a conventional hangar. The concept was developed by Professor Charles R. Hutton of Purdue University. The hangar was designed by architects Miller-Dunwiddie, Inc., with Quinton Engineers, Ltd.



Carillon Tower is added to famous "fish church"

The Maguire Memorial Carillon Tower, a 260-foot-high structure, has been completed and dedicated on the site of the First Presbyterian Church in Stamford, Connecticut. The sanctuary and fellowship hall, dedicated in 1958, as well as the new tower, were designed by architect Wallace K. Harrison of the firm of Harrison & Abramovitz (April 1958, page 10, and November 1957, pages 221-222).

The new carillon tower contains 56 bells, 36 of them being donated to the church over 20 years ago by Nestle Alimentana, S.A., of Vevey, Switzerland. The bells are played from a clavier located between two bell platforms about 75 feet above ground. A winding stairway inside the tower leads to the clavier room and belfries. Heavy teak was used for beams and louvers of the belfries and stairway enclosure to add resonance to the pealing of the bells. Remote controls enable the lower two octaves to be played from the sanctuary electronic organ console.



Mural competition involves high school students

A mural competition in 74 New York City high schools concluded with the award of U.S. Savings Bonds to 12 winners and honorable mention certificates to 24 others. The competition was organized by the New York Board of Trade's Business and the Arts Advisory Council at the initiative of the National Society of Mural Painters. Other cooperating organizations which helped to fund the program and provide technical assistance were the Trade Bank & Trust Company, the New York Chapter of the American Institute of Architects, and the American Federation of Arts. Pictured above is jury chairman Helen Treadwell with two of the winning submissions.

Students were given three months to create and execute their designs, with each student selecting a spatial problem from one of three types developed by the muralists and architects—areas in an industrial building, a community building, or a high school. Participating architects supplied blueprints of the spatial situations to be resolved through mural design. Mural painters visited the schools to offer technical advice and assistance.

A total of 150 entries survived preliminary judging by high school art departments. Helen Treadwell, mural painter and past president of the National Society of Mural Painters, headed an awards committee which included architects A. Corwin Frost and Ralph Pomerance and mural painters Xavier Gonzalez, Adolph Gottlieb and Max Spivak.

The Savings Bond awards were presented in June at a reception at the Trade Bank & Trust Company. At the same time, eight of the honorable mention winners were singled out by the National Society of Mural Painters and awarded Savings Bonds from the Society's Ernest Peixoto Memorial fund.

New York zoning change would create "transportation districts"

A proposed zoning change in New York City would create three special "transportation districts" in which the City Planning Commission would be empowered to regulate allowable floor area ratios of new developments for purposes of controlling their impact on existing transportation systems in the area. Under the proposed change, the Commission could require a reduction below standard allowable floor area ratios of up to 20 per cent or allow increases up to 44 per cent.

Specifically, the proposal would create special districts in the areas of Grand Central, Pennsylvania Station, and the Jamaica section of Queens. It would affect developments, reconstructions or enlargements of buildings in an area "dominated by a major transportation facility with interconnecting rapid transit facilities." The purpose would be to protect and promote the use of the area, to improve circulation patterns, and to encourage growth which would enhance the usefulness of the area without overloading at peak hours.

The proposal, drafted by the City Planning Commission, had been under study for some time, but the Commission scheduled public hearings this summer because of the public issues involved in the proposed 55-story office building over Grand Central Terminal (July, page 36, and August, pages 9 and 10.)

The transportation districts would be the second "special-purpose districts" proposed as part of the Planning Commission's policy of making zoning incentives and controls more precise in complex situations. An amendment to the City's zoning ordinance creating a special theater district to give developers incentives to include theaters in new buildings in the area was enacted last spring (May, page 43).

Planning Commission hearings on the transportation district proposal were held July 31 and August 14, and there was the possibility of another before the new amendment was put in final form. After approval by the City Planning Commission, the amendment must be submitted to the City's Board of Estimate for enactment.

Academic appointments

John Paul Eberhard, architect and former director of the Institute for Applied Technology at the National Bureau of Standards, United States Department of Commerce, has been named dean of the newly-established School of Architecture and Environmental Design at the State University of New York at Buffalo. Mr. Eberhard will spend the next academic year exploring the direction and program of the new school. The interdisciplinary school will be based in three of the University's academic faculties—Arts and Letters, Engineering and Applied Sciences, and Social Sciences and Administration—with Mr. Eberhard receiving joint appointments as professor in each of these departments. "It won't be a conventional school of architecture which trains the architect simply as an artist," says Mr. Eberhard. "Environmental design is more than an artistic license; it should be the infusion of our technological processes with a sense of man's individual and social needs, so that the resultant products (from buildings to cities) reflect their users' life styles and aspirations."

Harlyn Thompson has been appointed chairman of the Department of Architecture at North Dakota State University. The 35-year-old educator received his undergraduate degree in architecture from North Dakota State in 1956 and a master's degree in 1960 from the University of Illinois. For the past two years he has been a lecturer in architectural theory and design at the Queen's University of Belfast, Northern Ireland.

Dr. Walter H. Walters has been named acting dean of the College of Arts and Architecture at The Pennsylvania State University. Dr. Walters joined the Penn State faculty in 1950 and became head of the Department of Theater Arts in 1956. Since 1966, Dr. Walters has been associate dean of the College.

Obituaries

Dr. Erwin A. Gutkind, internationally-known architect, city planner and author, died August 7 in Chestnut Hill, Pennsylvania, at the age of 72. At his death, Dr. Gutkind was a senior fellow of the Institute of Environmental Studies at the University of Pennsylvania. Dr. Gutkind came to this country in 1956 from England, having fled his native Germany in 1933. Under his direction, a 10-volume "International History of City Development" has been in the process of publication.

Rexford Newcomb, professor of architecture and dean emeritus of the College of Fine and Applied Arts at the University of Illinois, died on March 16 at the age of 81. Mr. Newcombe began a 36-year teaching career at the University in 1918, organizing the College of Fine and Applied Arts in 1931 and in 1932 becoming its first dean, a post he held until his retirement. He was advanced to Fellowship in the American Institute of Architects in 1940. A well-known architectural historian and author, Professor Newcomb wrote 18 books and more than 250 articles, and edited "The Western Architect" for 10 years.

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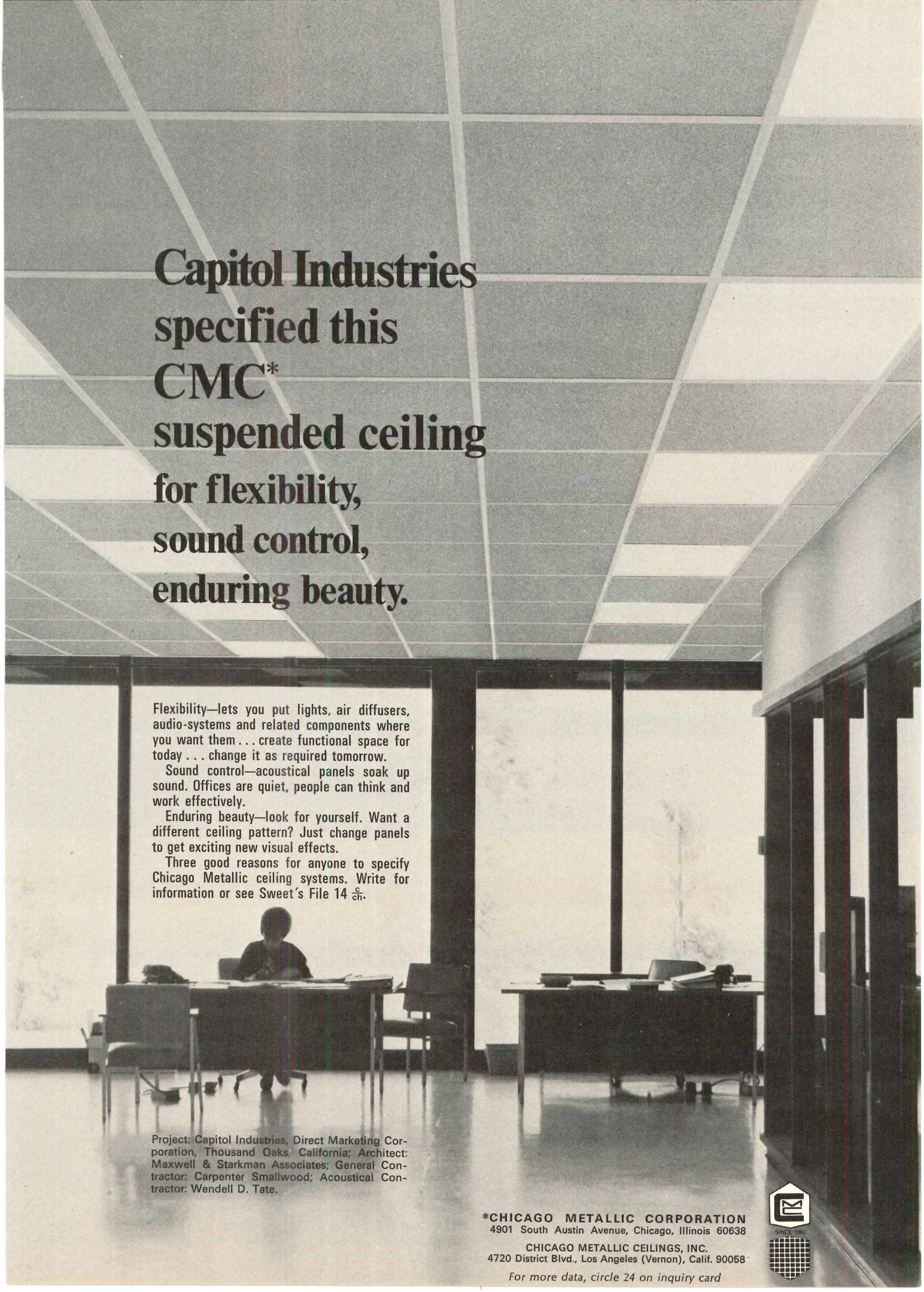

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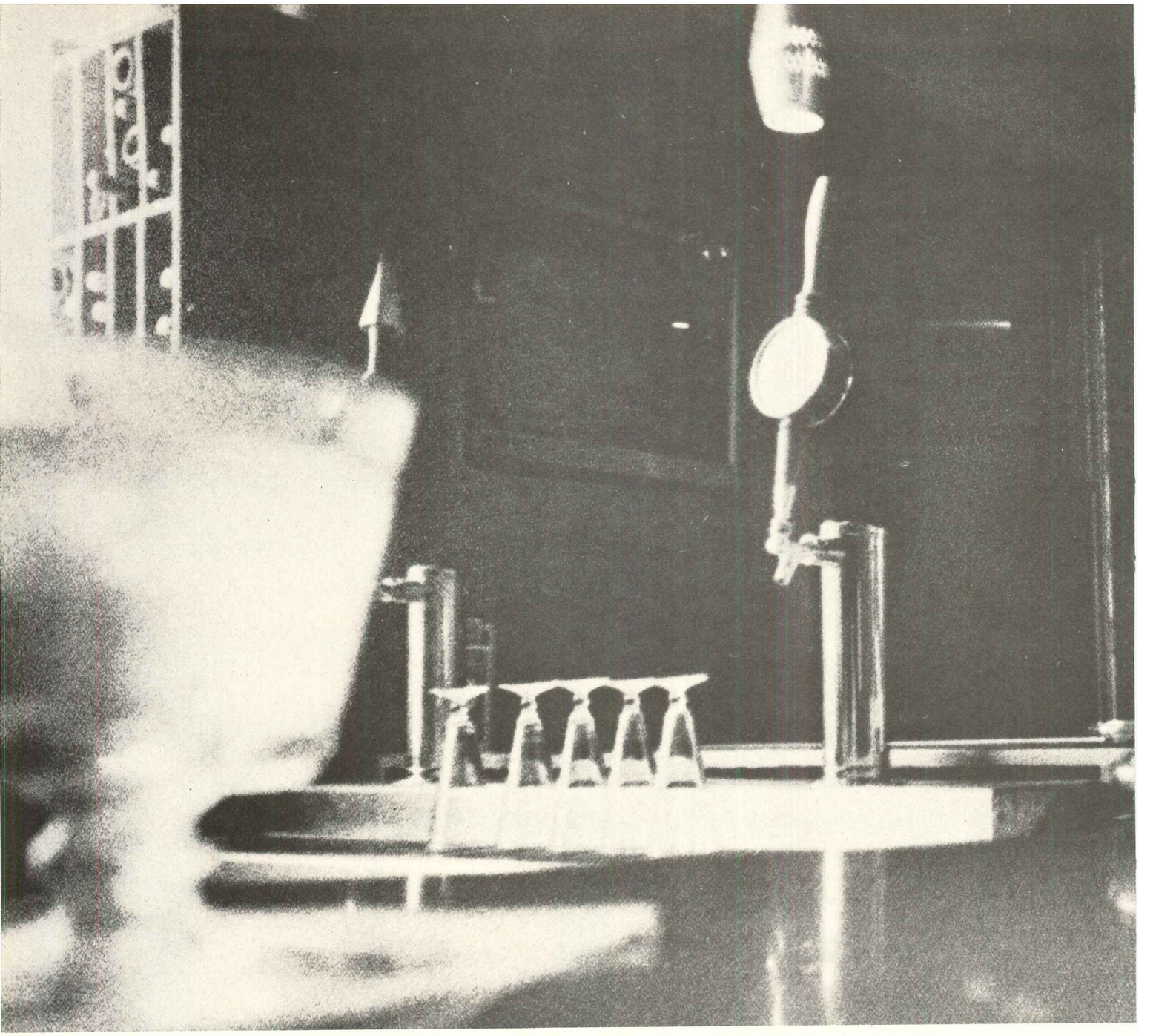

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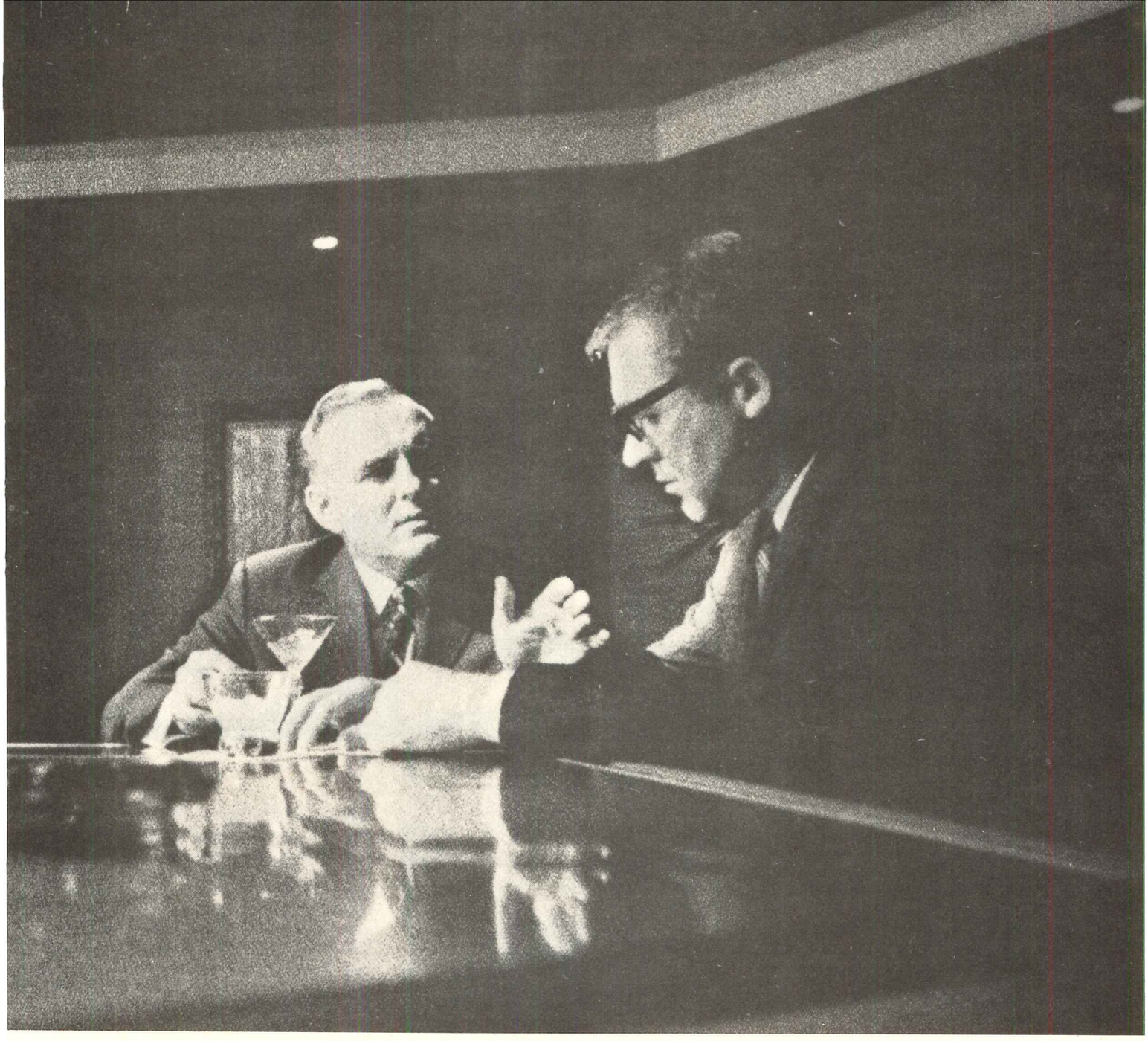

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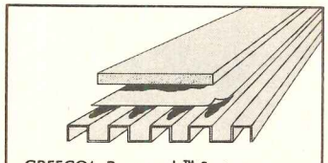

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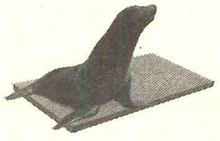

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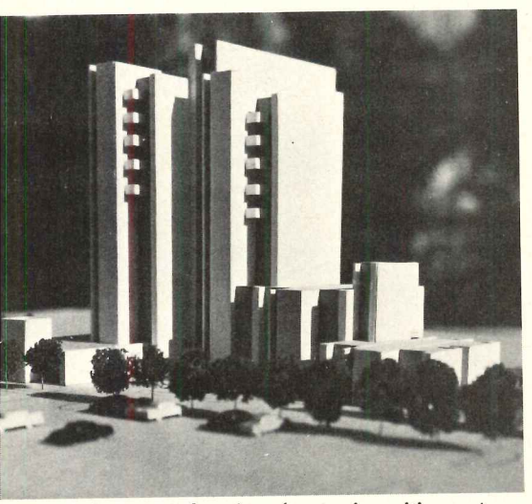
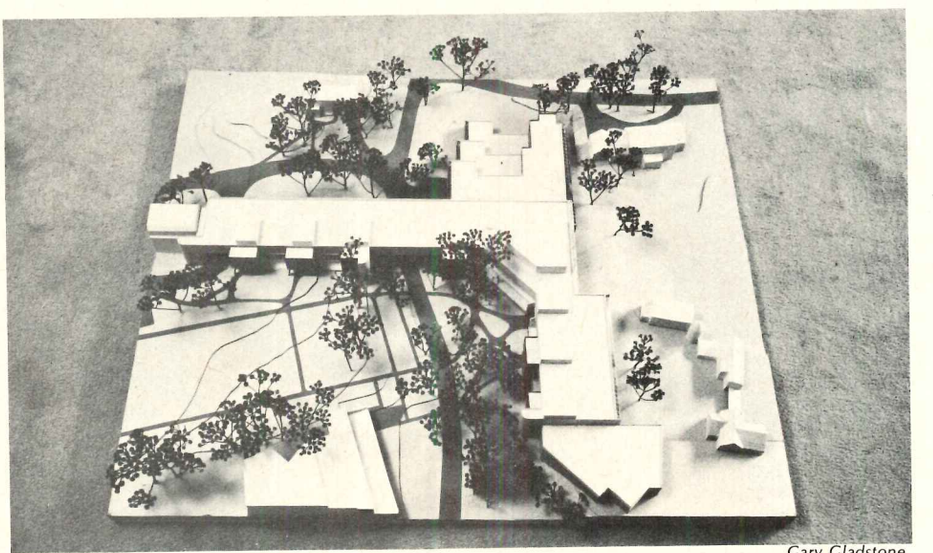
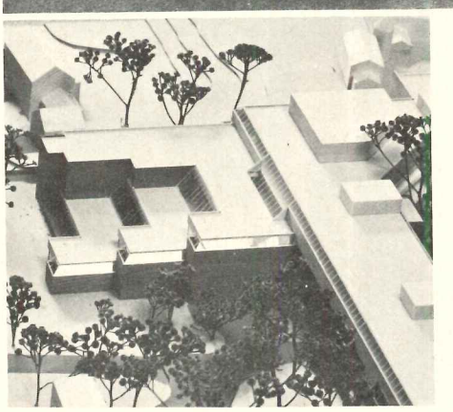
BUILDINGS IN THE NEWS



Low-rent housing for senior citizens is a project for the Housing Authority of the Township of Brick, New Jersey. It is sponsored by the Department of Housing and Urban Development and is designed by Paul Fortune Losi and William E. Lehman, associated architects. The 120-unit project has a 13-story bearing wall structural system, which, Mr. Losi says, "allowed us to take design liberties not normally possible under the statutory limitations imposed by HUD. It permitted us to develop a highly articulated floor plan and bearing wall expression, generating a form quite unlike the stereotype low-rent housing project."



Gary Gladstone

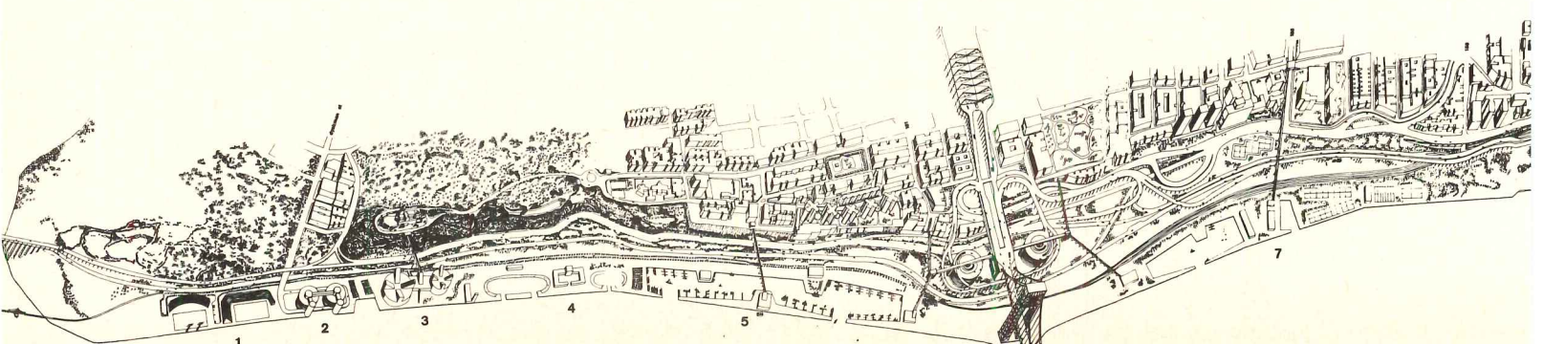


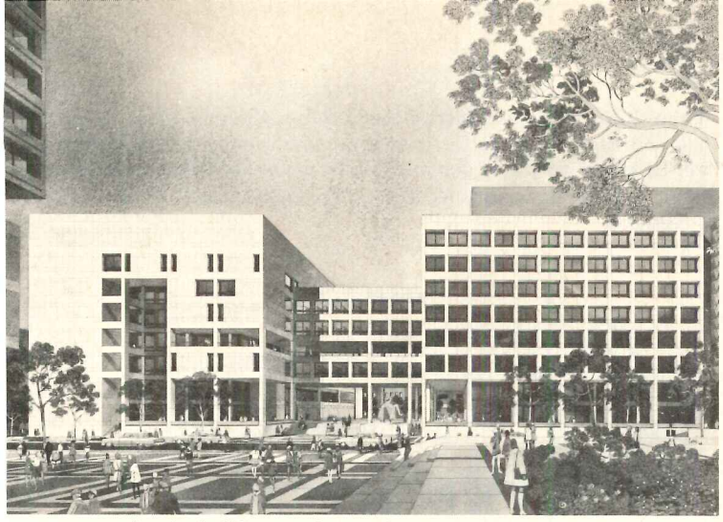
A $6-million building complex for Sarah Lawrence College, Bronxville, New York, has been designed by Canadian architect John Andrews. The structure will house the main library, art studios, science laboratories, and faculty offices. The photo above shows the auditorium at the lower right, leading to graphic art and sculpture studios with sculpture court. The central portion is the library with two levels of reading terraces adjacent. Continuing left are art studios and the science laboratories.

A master plan proposal for the entire Hudson Riverfront of Manhattan has been prepared by the Hudson Riverfront Committee and 50 young architects, planners, professors and students under the sponsorship of President of the Borough of Manhattan Percy E. Sutton. Architect Richard Dattner, with planner Glenn Ralston and architect Abe Rothenberg, coordinated the work of the professional participants, who initiated the project and contributed their time as well as necessary drafting materials and services.

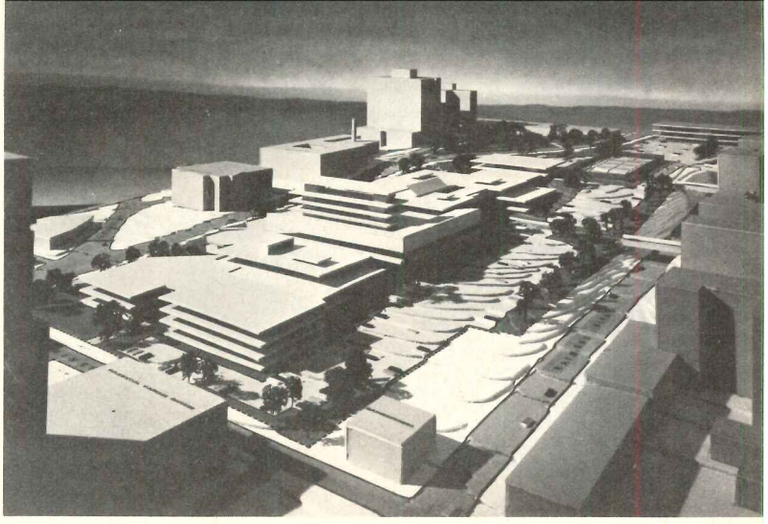
The project was undertaken in "the belief that the entire riverfront should be planned comprehensively, rather than in a piecemeal fashion" and to encourage "attention on our most valuable physical asset" by "the preparation of a document that will form a basis for future public discussion on the uses and design of the riverfront."

The 60-foot-long design proposal for the 12-mile-long area was developed during a 48-hour "Design In" March 16 and 17 after a series of preparatory meetings. It was made



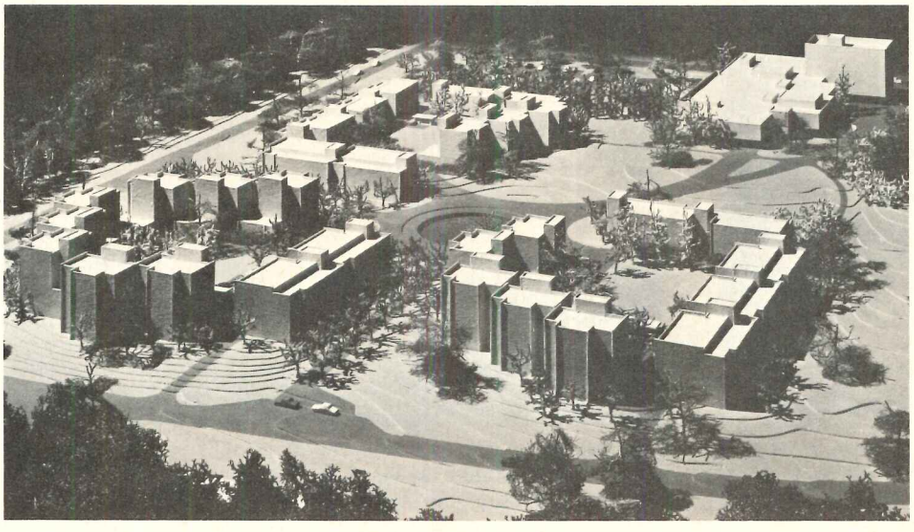


An academic building and a student center for the Fashion Institute of Technology, New York City, is part of a continuing expansion program (February, page 43). Architects are de Young & Moscowitz with Philip de Young, partner-in-charge, and Youssef S. Bahri, project designer. The steel structure will have limestone facing and brick paved plazas and campus. The student center (left) will include two levels of dining, a faculty floor, and the Physical Education Department with two gyms, plus a dance studio around the sunken court under both buildings. Entrance to both buildings is through a connecting bridge which contains a lounge and lockers.



The master plan for the $22-million Essex County College, Newark, New Jersey, calls for 685,000 square feet of construction on the 23-acre urban site. First-phase construction is expected to be completed by 1971 and to contain 460,000 square feet. An open forum will tie together the three-block-long multi-level structure designed by Frank Grad & Sons. Within the total structure will be five separate "houses," each with its own learning center, classrooms, lounge, snack bar, library, media materials rooms, group and small-unit discussion and study areas. Common to all are lecture rooms, auditorium, learning resources center, main library and cafeteria.

Louis Checkman

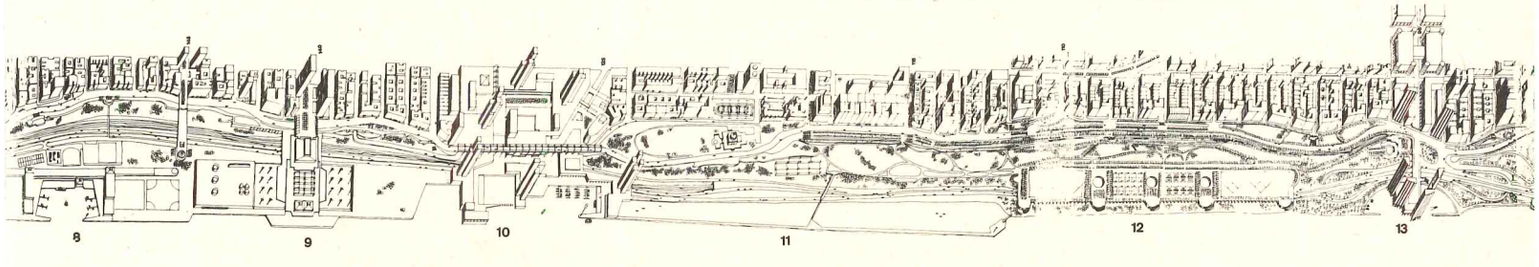


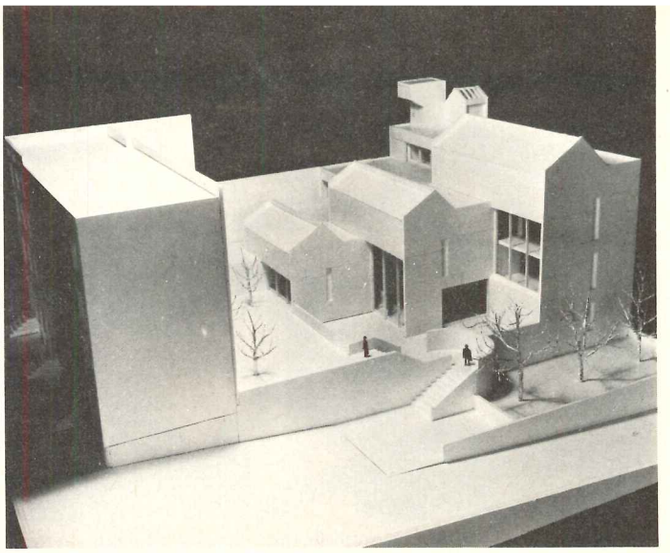
A five-building complex for Rutgers University's Livingston College, New Brunswick, New Jersey, designed by associated architects Frank Grad & Sons and Anderson, Beckwith & Haible will have three clusters of student residences to house some 1500 students. Housing will be of two basic types, split-level and cruciform. An academic building (top right in photo) will enclose 102,000 square feet of floor space with the major portion two levels high, containing classrooms and lecture halls, a dining facility and a student center. The six-story faculty and administration unit will have nearly 100 offices. A chemistry building (not shown) will include a 400-seat hall. The buildings, budgeted at $18,582,000, will be precast concrete and brick.

public in June at a press conference called by Mr. Sutton, who strongly commended the effort and pledged the action of his office in encouraging the Borough's community planning boards to give serious consideration to the possibilities it suggests. He hoped for "a merging of thought within the community."

KEY TO DRAWING

1 Sports complex including stadia and playing fields
2 Parking garages
3 Aquarium, restaurant, outdoor cafe
4 Bathing beach and bath-house
5 Marine and boat rental
6 Parking garages
7 Funicular to tennis courts, park, restaurant and marina
8 Marina and City College playing fields
9 Promenade and athletic facilities on roof of sewage treatment plant
10 Harlem Towers—residential complex with shopping and marina
11 Pedestrian quay and boating pond
12 Athletic fields and courts above West Side Highway and gymnasium complex below grade
13 Apartments and marina; new shopping area along West 96th Street

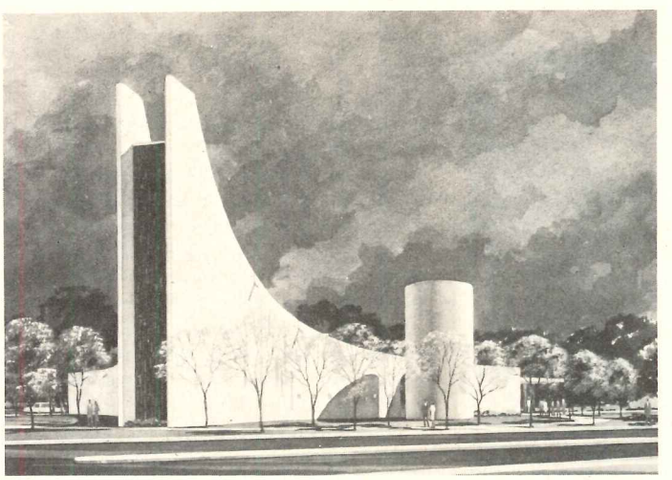




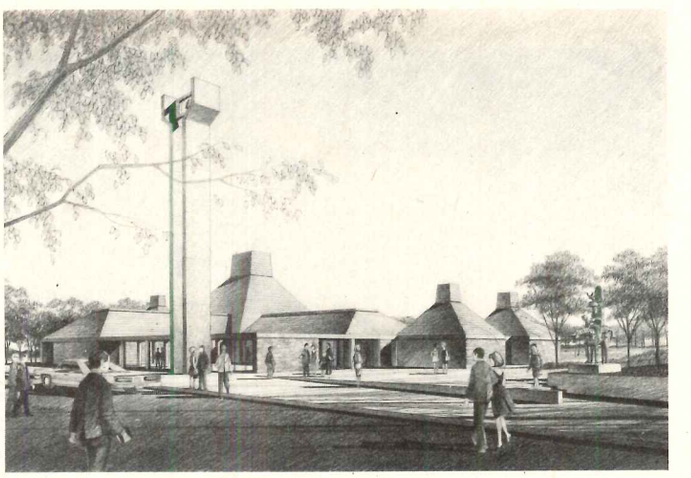
The New York State Bar Association Headquarters, Albany, New York, is designed to integrate parts of four historic houses with a new building behind them. Architect James Stewart Polshek uses the facades and a 30-foot depth of the 19th-century houses for the president's office, a conference room and reception space. A multi-level plaza joins the old buildings with the new.

BUILDINGS IN THE NEWS

A West Coast shop for Gucci, Beverly Hills, California, has a travertine and bronze colonnade framing a central entry garden, which will be paved with tiles designed by the architects, Bodrell Joer'dan Smith & Associates. Estimated cost of the 2000-square-foot building is $250,000.

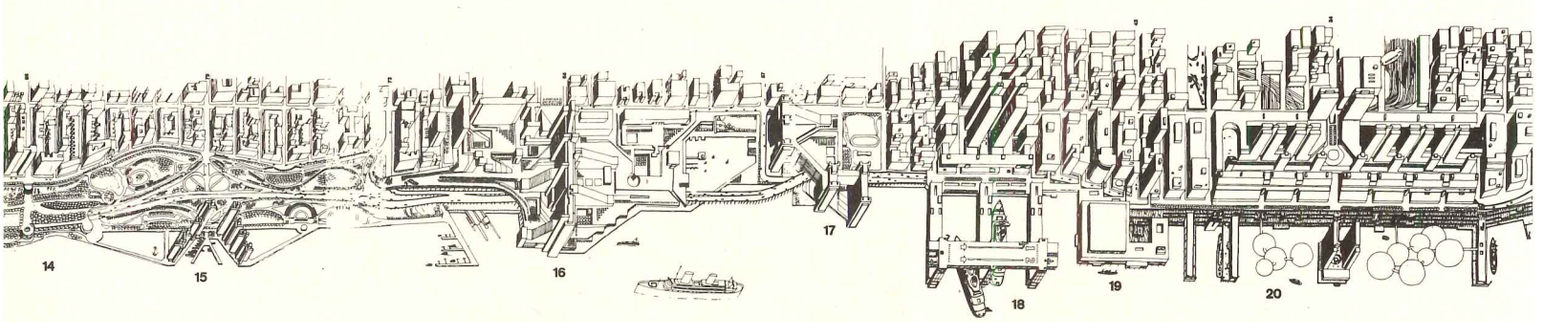


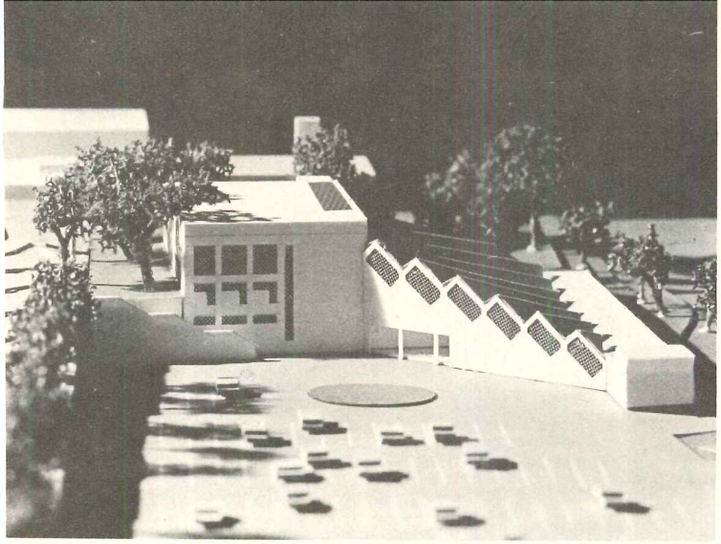
Church of the Risen Christ, Denver, designed by James A. Sudler, has entrances on each arm of the structure, while the back, rising 76 feet, contains the main window. At the rear of the nave, a second-floor conference room above sacristies, confessionals and offices can open to the church to serve as balcony. Acrylic plastic arch connects the cylindrical baptistry to the church.

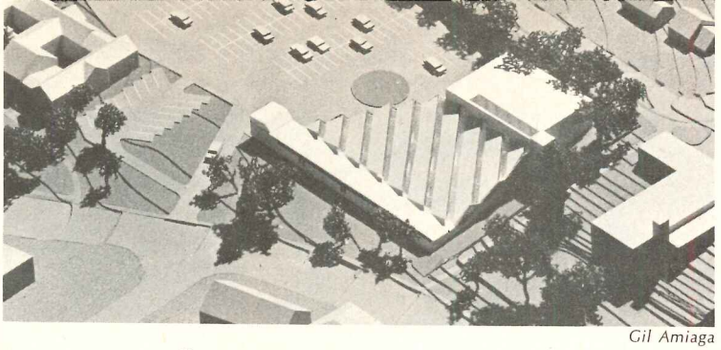


Saint Martin of Tours Catholic Church in Millinockett, Maine, will have the inverted-funnel-shaped roofs above focal points within—sanctuary, baptistry, penitential areas and reservation chapel. Walls are masonry and windowless, but skylights will admit natural light from above. The church, for a suburban congregation of 800 people, was designed by Solomita and Palermo.

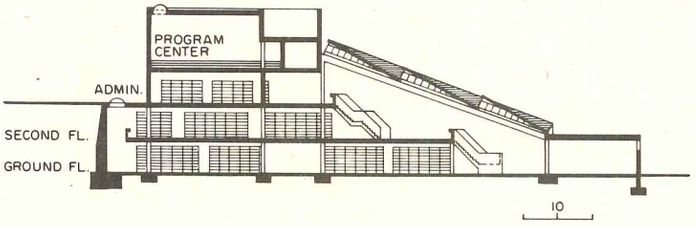
14 Playing fields over highway
15 Apartments and marina
16 Residential community; housing, shops, schools, restaurants
17 Marina, cinemas
18 Super-liner piers with STOL-PORT above
19 Convention Center with hotel complex inland
20 Residental community over parking reservoir and railroad yard; entertainment midway and amusement park along river
21 Maritime Museum with historic ships





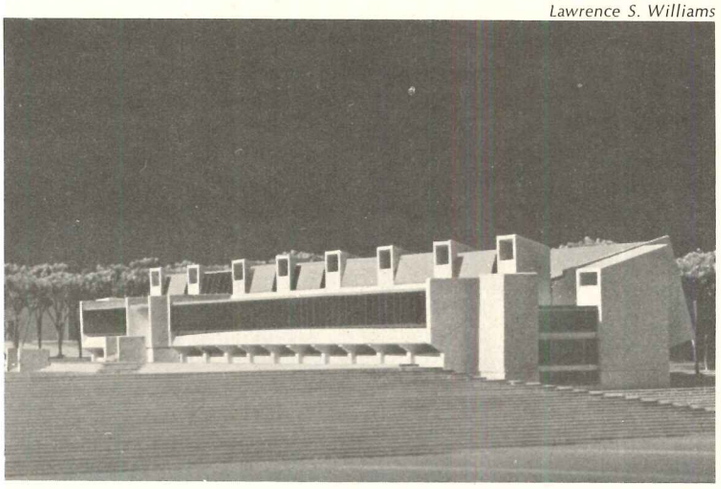


Gil Amiaga

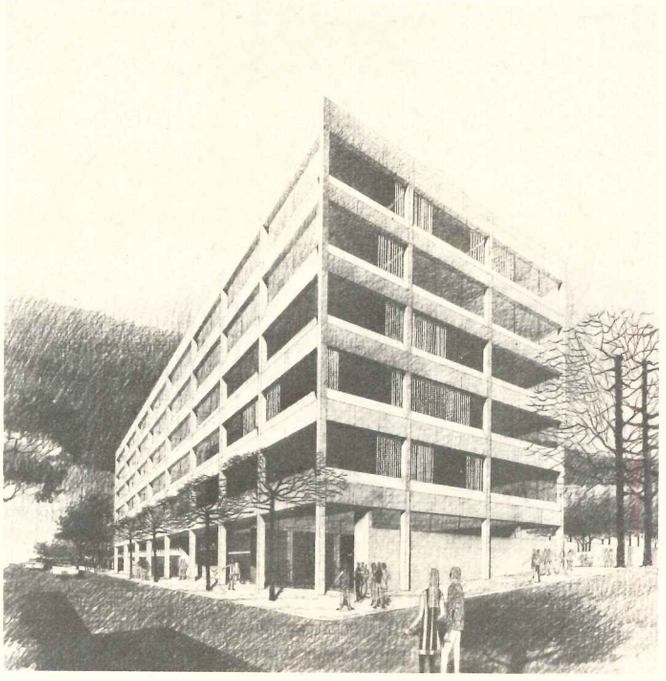


The Teaneck Public Library, Teaneck, New Jersey, will be on a steeply sloping site requiring excavation and will place much of the stack area underground. The 41,000-square-foot building has been designed by Prentice & Chan with a preliminary budget estimate of $1,400,000. Because a minimum of glass was desired, light will be brought in through the long span trusses over the main reading spaces. Skylights will be oriented diagonally on an east-west axis for north light.

Lawrence S. Williams

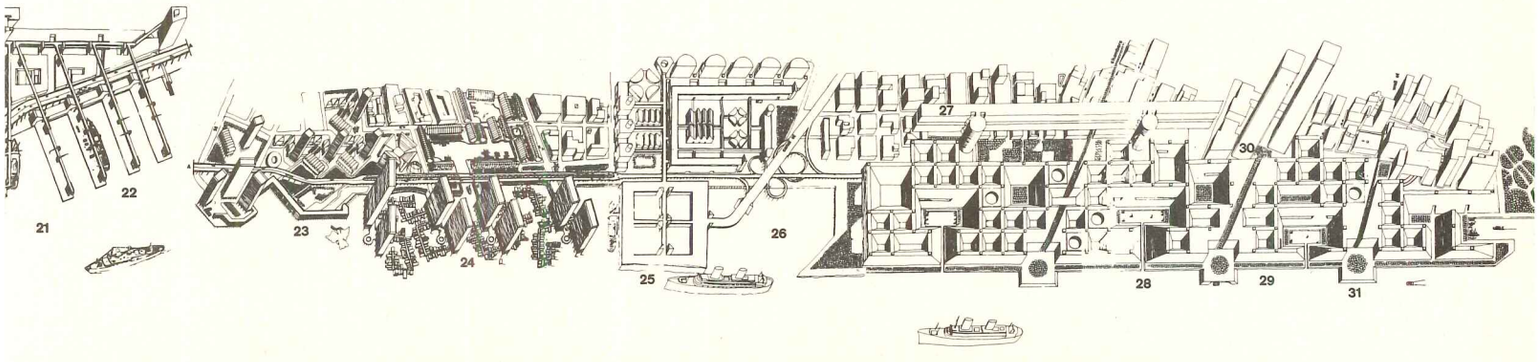


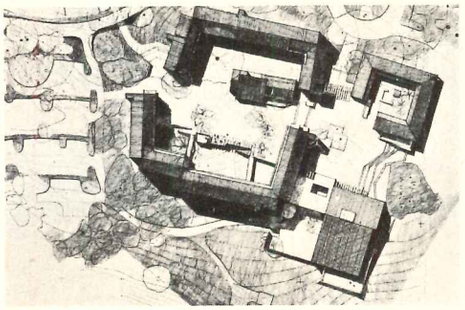
A Product Styling and Design Center for Armstrong Cork Company's Technical Center, Lancaster, Pennsylvania, puts a large, slanted, glazed bearing wall on the north side for glare-free light, and on the south side, for a view of the entire site, a "sunbreak" wall of windows—two layers of glass (the outer one solar glass) three feet apart. The building is designed by Vincent G. Kling and Associates.

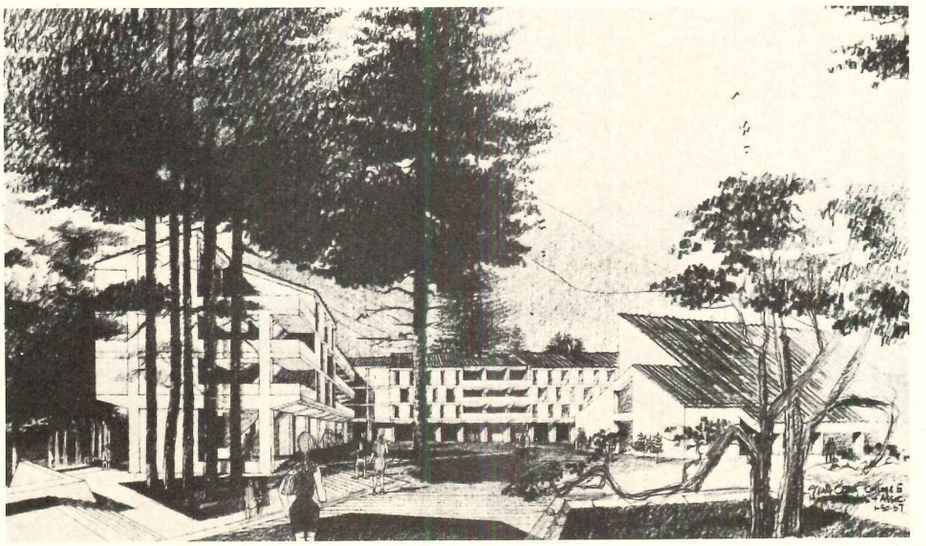


The 1033 Massachusetts Avenue Office Building, Cambridge, Massachusetts, is a $2-million building designed by Hugh Stubbins and Associates as a professional building for architects and engineers. It will be two-thirds occupied by the Stubbins firm and two engineering firms, LeMessurier Associates and Francis Associates. The building will have large open floor areas and two levels of parking.

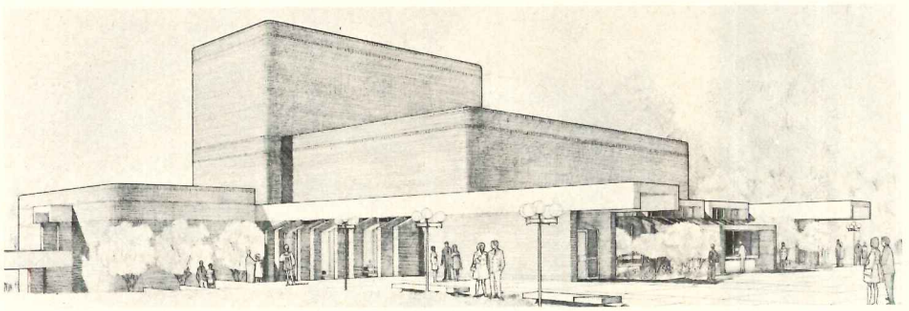
22 Chelsea Piers, with new automated warehousing
23 Off-off-off Broadway theater district
24 Housing over river, house-boat piers below; art bazaar under highway, artist's studio housing around lagoons
25 Existing pier with light industry facilities and automated conveyor systems
26 Lower Manhattan Expressway Interchange
27 University City
28 Water inlet into typical building unit
29 Housing and light manufacturing
30 World Trade Center
31 Promenade and pedestrian amenities; restaurants, cafes





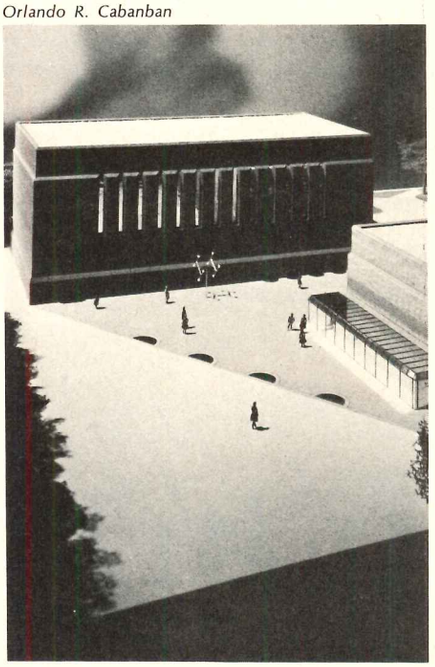


A College of the Performing Arts at the new campus of the University of California at Santa Cruz is one of some 15 separate colleges to be built there over the next 20 years. The new college will be a compact cluster of buildings, conforming to a plan which will leave areas of undisturbed landscape between the new colleges. Architects for the project are Hugh Stubbins and Associates, and the project manager is Merle T. Westlake, Jr. The project will accommodate 800 students, 550 residing on campus and 250 commuting, with a faculty of about 50. The college will be organized around two courtyards. The larger, two-level court contains the library and will be enclosed by four-story and five-story "houses," including living-study units for students, faculty apartments, and ground-floor classrooms. The smaller, "public" court is defined by a two-story building for administration, faculty studies and tutorial rooms as well as the dining hall and commons. The college theater is not part of the quadrangle, but is located within walking distance.



The Clarence Brown Theater for the Performing Arts at the University of Tennessee, Knoxville, will seat approximately 600 and will have facilities for conventional and thrust stage productions. Support facilities in the $1.3 million project include dressing rooms and shops which will also serve an adjacent arena-type theater, a 100-seat laboratory theater and faculty offices. The theater will have masonry bearing walls with cast-in-place precast concrete and brick exterior. Architect for the project is Bruce McCarty & Associates.

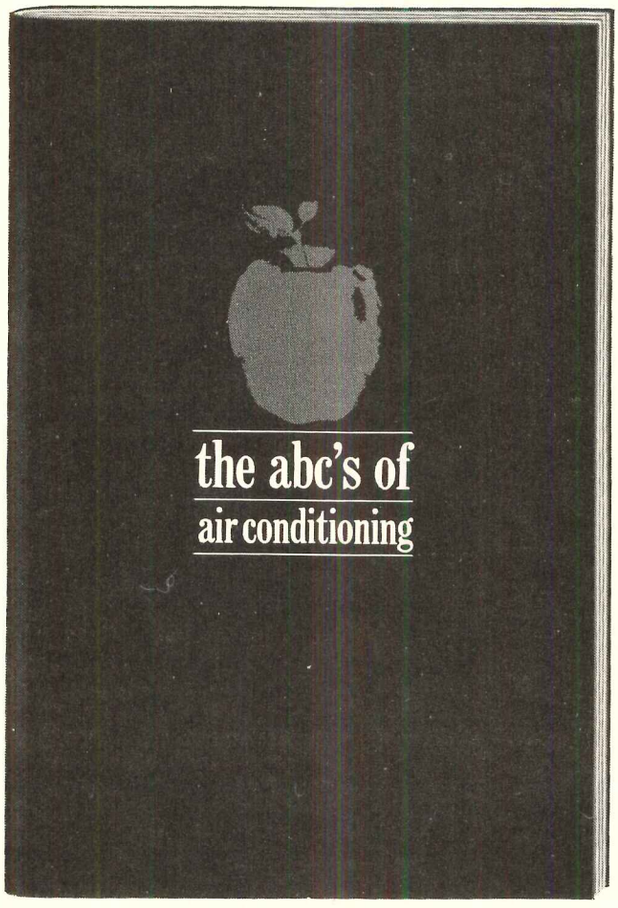
Orlando R. Cabanban



Thomas M. Laronge

A Music and Drama Center for Carleton College, Northfield, Minnesota, (left), designed by Harry Weese & Associates, will contain a rectangular recital hall seating 450 and a highly flexible theater with movable audience carts seating 450. Located under a paved entry terrace will be a common gallery intermission area and support facilities. Exterior materials of the $2-million building will be red granite brick and silver mirror glass. Construction is expected to begin this fall.

A Religion-Fine Arts Center for Roanoke College, Salem, Virginia, is a complex of buildings grouped around a courtyard. Included in the complex will be a 175-seat chapel, a 425-seat theater with proscenium stage, departments for fine arts, music and drama, and administrative and research facilities. A two-story skylit gallery off the courtyard will serve as a common connector to all departments. The complex is related in scale and choice of material to existing campus structures. The complex will have brick bearing walls and roofs of exposed timber and slate. Project architects are Vincent G. Kling and Associates.



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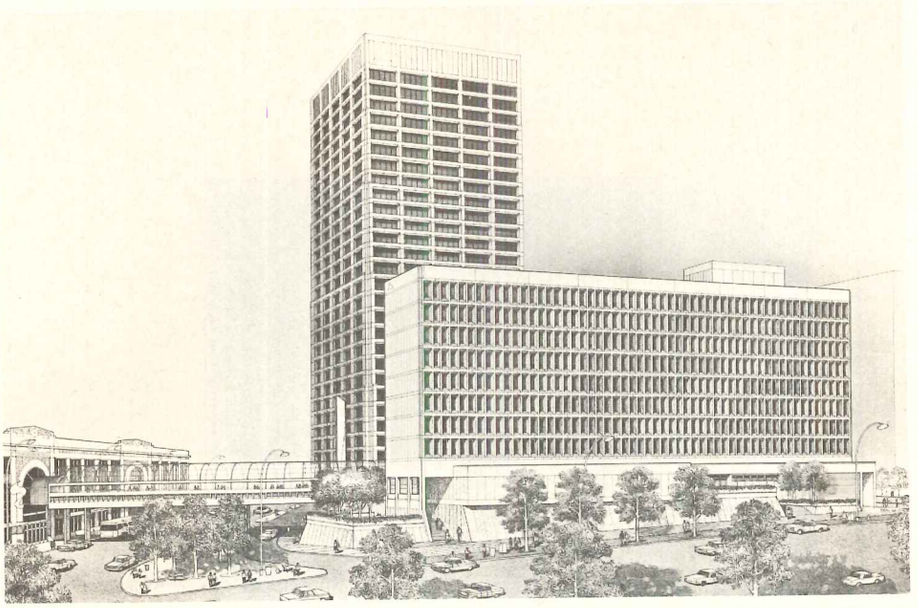
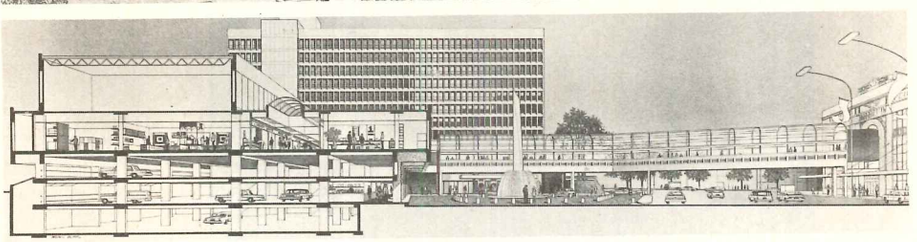
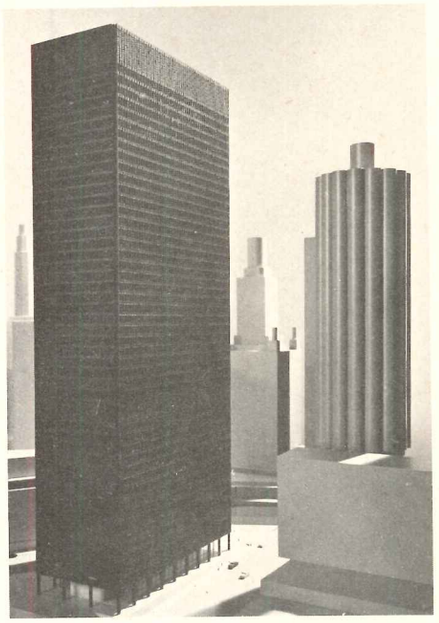
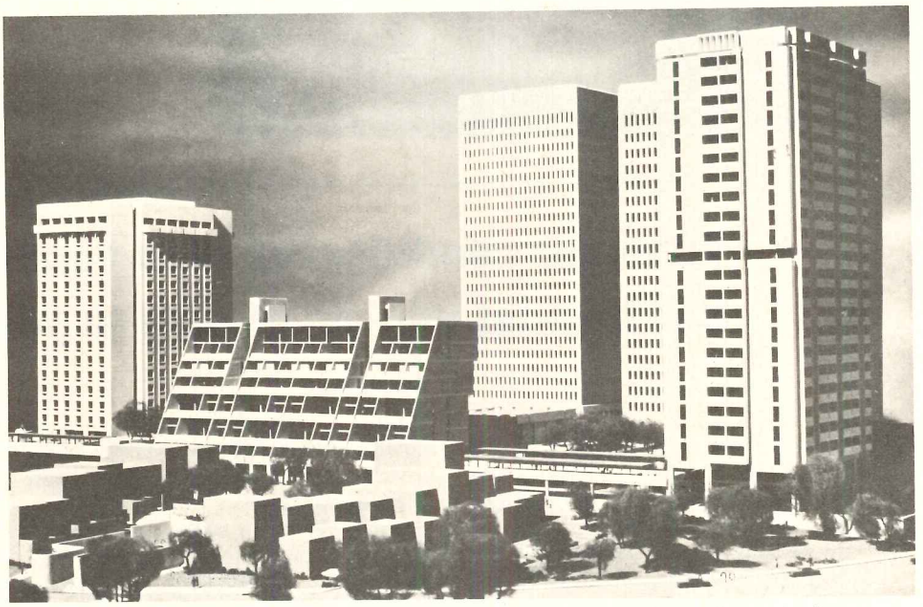
A $24-million urban renewal project in Newark, New Jersey, will consist of a 30-story office building and a 10-story, 260-room hotel connected by a pedestrian plaza. The plaza will link the track level of the adjacent Penn-Central Railroad Station to the lobby level of both buildings as well as connecting the buildings to a shopping plaza, with parking below. The office building, of reinforced concrete construction, will contain 500,000 square feet of space. Architect is Victor Gruen Associates. General contractor will be a joint venture of Frank Briscoe Company, Inc. and Gene A. Genola Company, Inc.; developer is Gateway Urban Renewal Corporation.

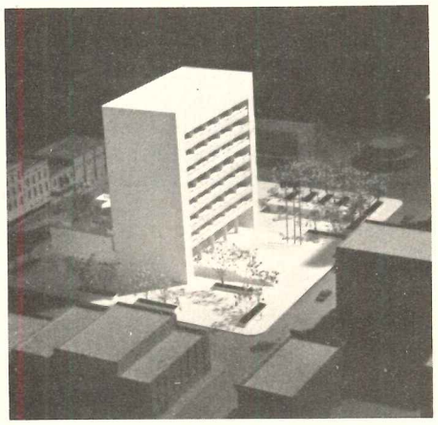






A 52-story office building for IBM in downtown Chicago, designed by architects Ludwig Mies van der Rohe and C. F. Murphy Associates, will be a metal-clad, bronze-tinted glass tower providing 1,358,260 square feet of net rentable space above plaza level. It will rise on free-standing columns, creating a glass-enclosed lobby. The standard office bay size is 30 by 40 feet to provide large column-free areas, with interior spaces on a five-foot module for maximum flexibility.





A 10-story bank-office building for the First Hutchings-Sealy National Bank, Galveston, Texas, will use balconies to provide sun control. Each floor will have approximately 7500 square feet of usable space, and some of the space, served by separate elevators, will be leased. Also included are six drive-in stations and a one-story element for executive offices. Main building materials are sand-blasted poured-in-place concrete, exposed aggregate concrete paving, and glass. Caudill Rowlett Scott are architects, planners and engineers, with Thomas M. Price, associated architect.

Colony Square, a $40-million mixed-use complex in Atlanta, designed by architects Henri V. Jova, Stanley L. Daniels and John A. Busby of the firm Jova/Daniels/Busby, will have a 100,000-square-foot shopping concourse connecting lobbies of major buildings, topped by a landscaped plaza. Major buildings will include, from left: a 500-room hotel; an apartment building with sloping facade to provide balconies; two office buildings (the first one, having 25 stories, is under construction); and an apartment tower. Also included will be 20 town houses, a restaurant building, and underground parking for 2000 cars. Landscape architect is M. Paul Friedberg & Associates; contractor is Holder Construction Company.

ARCHITECT: S. THOMAS STATHES, A.I.A., KENSINGTON, MD.

"MONUMENTAL"— LARGE SCALE BORDEN DECOR PANEL

The aluminum facade shown on the eye-arresting Washington, D.C. building which houses Hennage Creative Printers is a special custom design, using Deca-Grid style Borden Decor Panel in one of Borden's bold new large-scale patterns known as "Monumental".

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The facade illustrated is the result of close cooperation between Mr. Joseph Hennage, head of the printing firm, and Borden's architectural department. This new design uses structural tees at 12" o.c. and large 7" reversing tabs which give approximately 80% closure to the screen. The resultant strong shading effect nearly eliminates vision of the building behind the screen.

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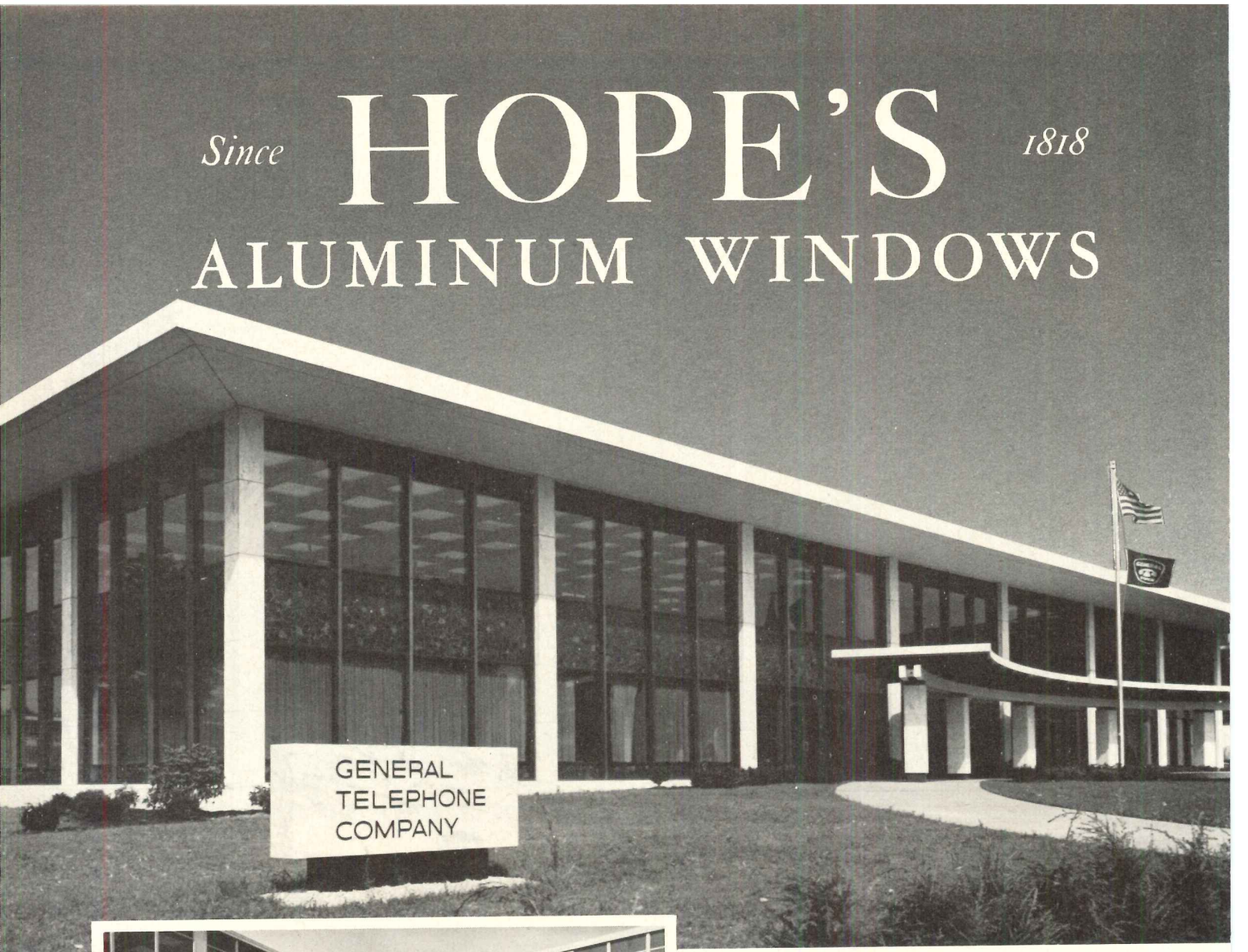

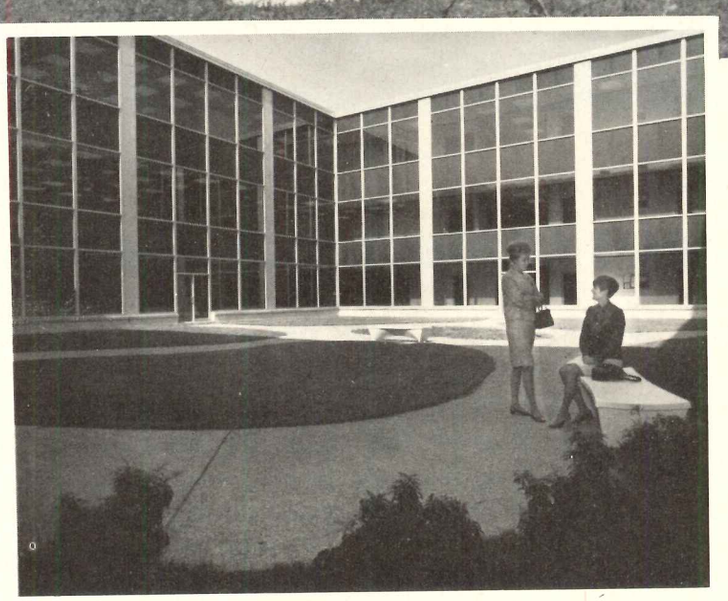

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Architects: Hallgren, Restifo and Loop
Builders: E. E. Austin & Son, Inc.

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Architects: Schooley Cornelius & Schooley, Columbus, Ohio and Hollie W. Shupe, Columbus, Ohio
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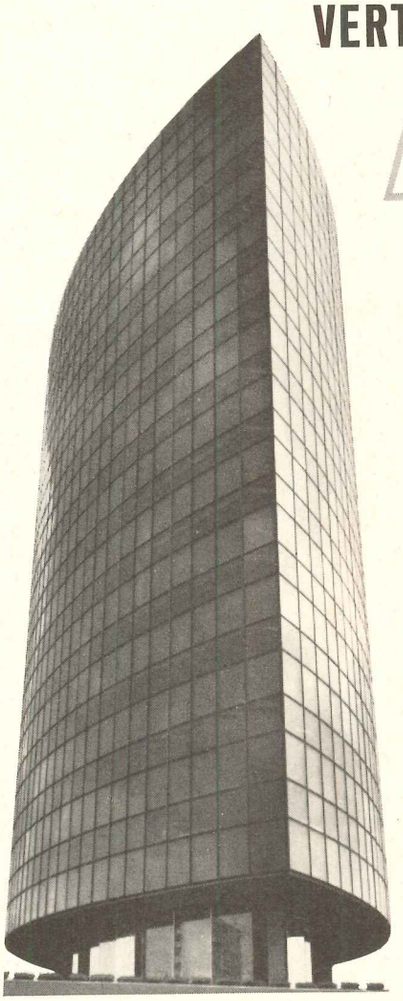
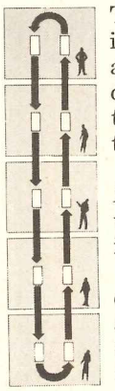


Phoenix Mutual Life Insurance Co., Hartford, Conn. *Architect:* Harrison & Abramovitz. *Contractor:* George A. Fuller Co.



The ultra-modern office buildings seen here differ greatly in architectural style—yet they do have one thing in common to give them remarkable functional efficiency.

It's a STANDARD CONVEYOR *Recordlift* Vertical Mail Conveyor System, schematically illustrated at the left.

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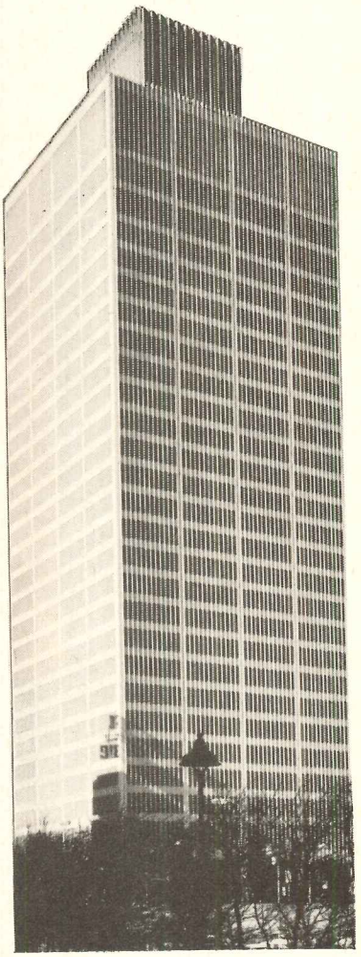
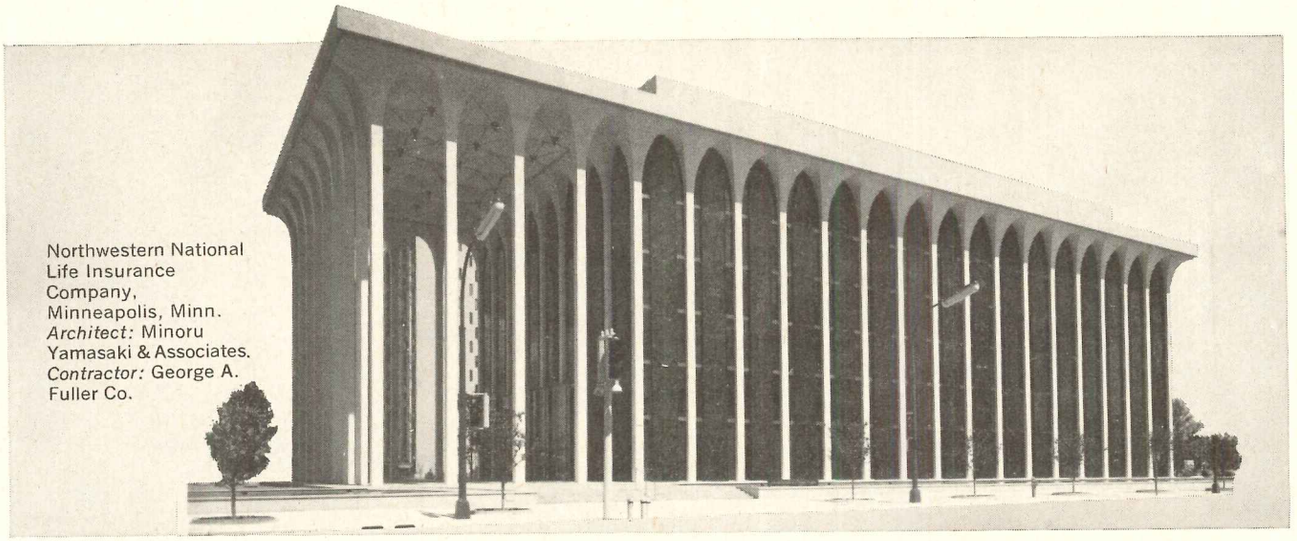


Michigan Consolidated Gas, Detroit, Mich. *Architect:* Minoru Yamasaki — Smith, Hinchman & Grylls. *Contractor:* Bryant & Detwiler Co.



Northwestern National Life Insurance Company, Minneapolis, Minn. *Architect:* Minoru Yamasaki & Associates. *Contractor:* George A. Fuller Co.

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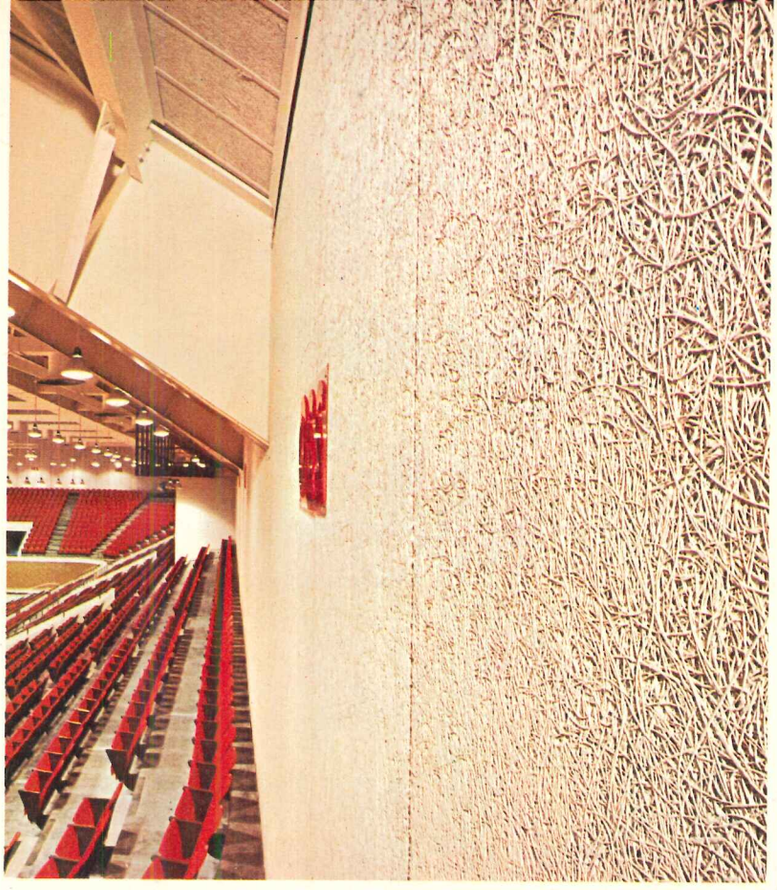

Municipal Auditorium and Civic Center, Monroe, La.

Architect:
Johns & Neel,
Monroe, La.

Tectum Contractor:
Cooper & Weir Inc.,
New Orleans

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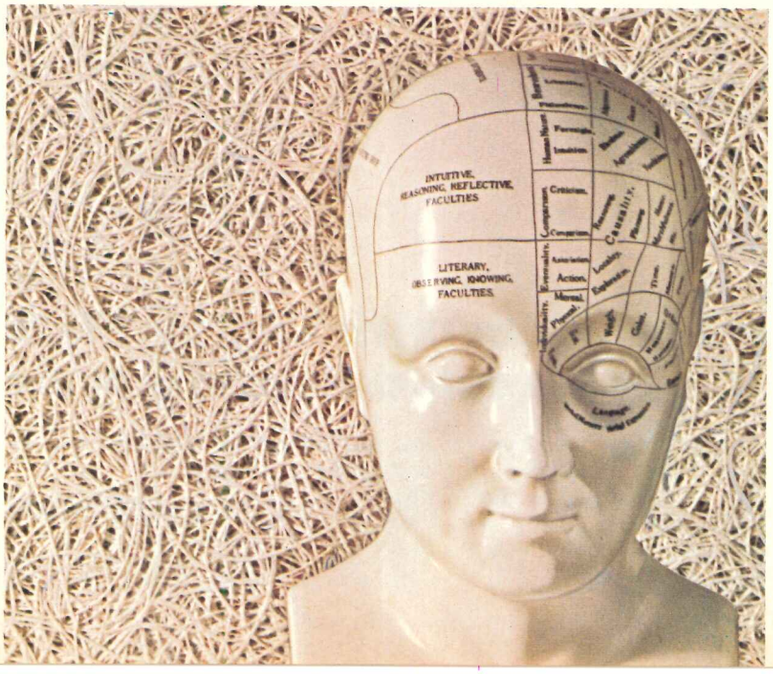

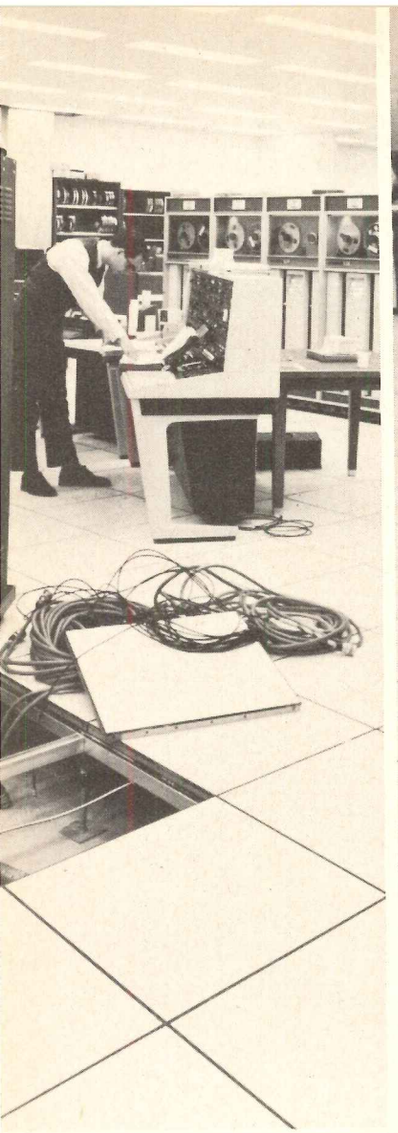

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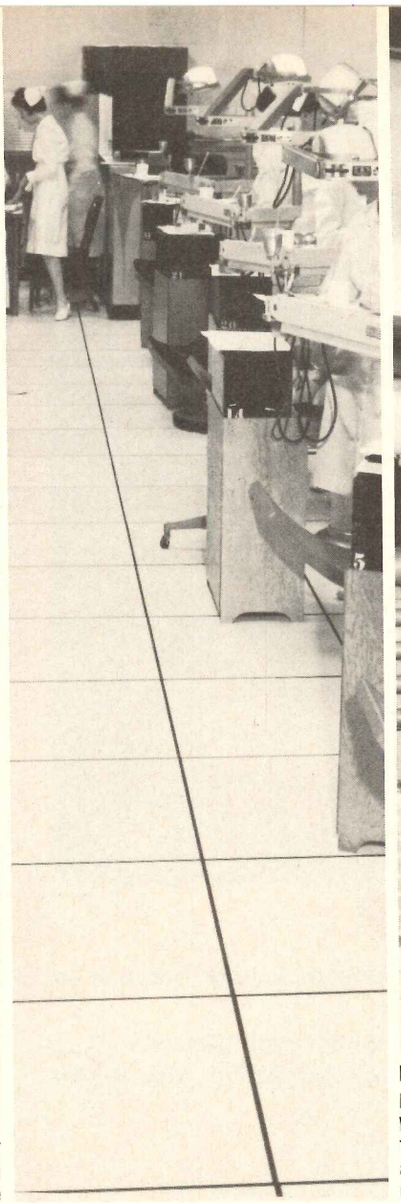
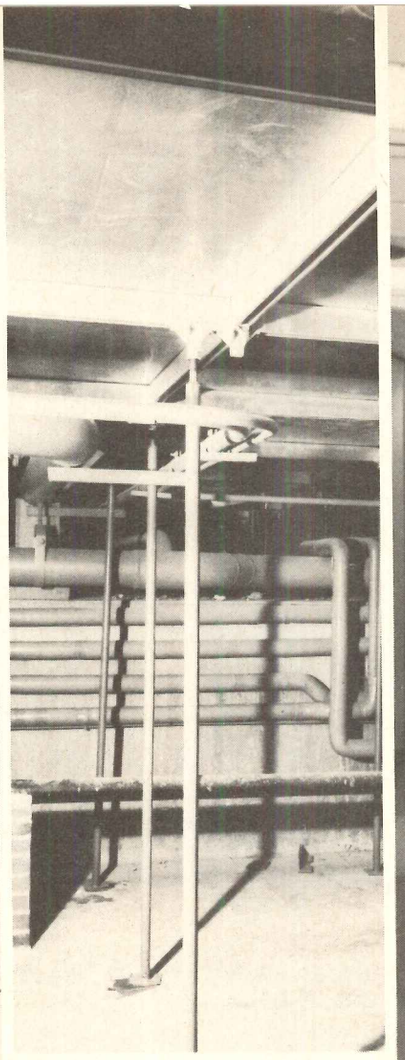


Now, see what it's done for a laboratory area. Electrical, water, gas, air, and drainage lines are completely concealed, yet completely accessible for repair or alterations. Lines can be brought up anywhere, even the middle of the room for full design freedom.



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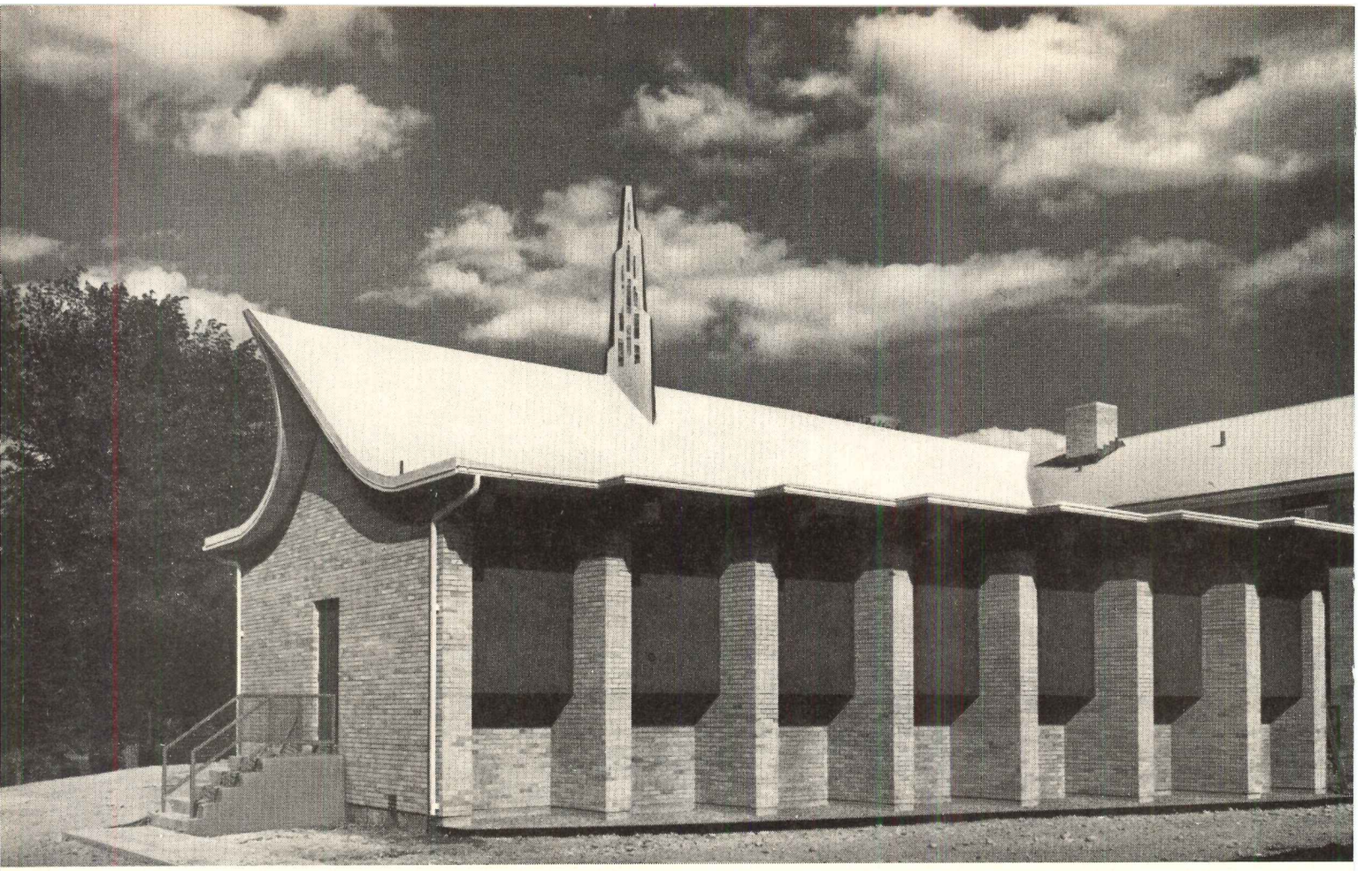

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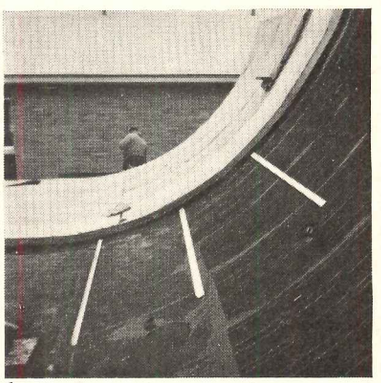
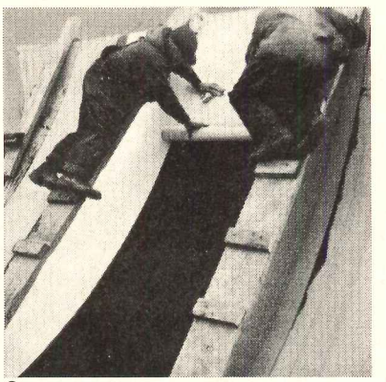
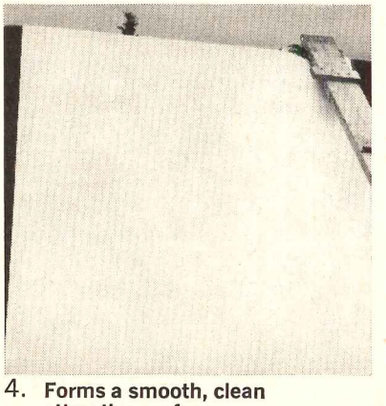


1. On any contour, any slope.



2. Easy, quick to apply.

3. Cements directly to underlayment.



4. Forms a smooth, clean attractive surface.

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

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

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

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

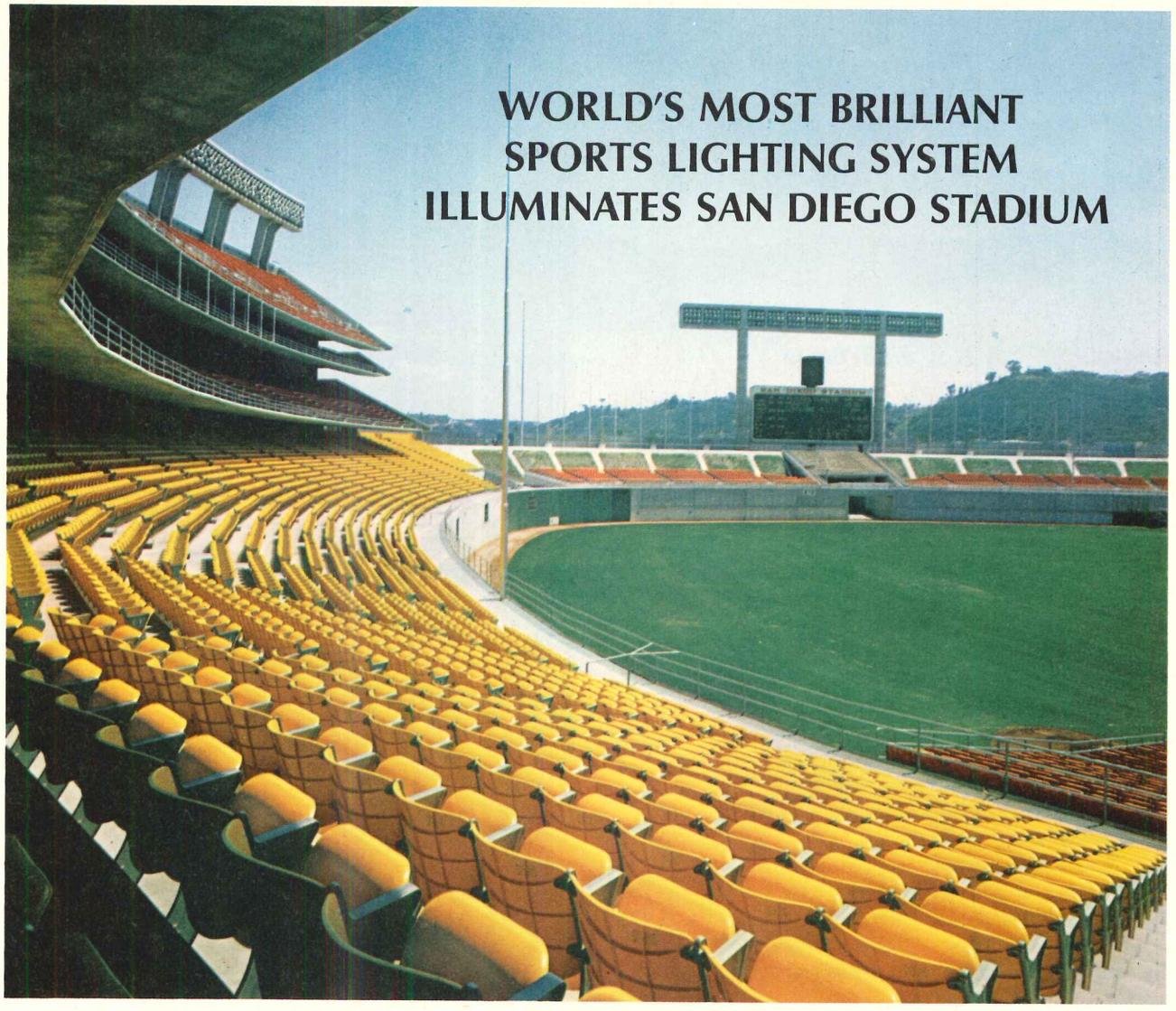
Write today for full information on this unusual roofing material. Also available in pastel grey or green.

* DuPont's registered trademark

gaf Ruberoid Building Products

GENERAL ANILINE & FILM CORP.
TECHNICAL SALES & FIELD ENGINEERING DEPT.
733 Third Avenue, New York, N. Y. 10017

For more data, circle 35 on inquiry card

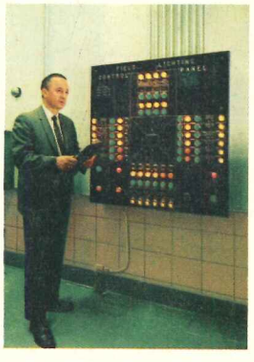


Square D equipment delivers the power

The new 50,000-seat San Diego Stadium's unique light ring, the world's most powerful light source for a multi-sports stadium, obsoletes conventional lighting towers.

A choice of lighting levels is immediately obtainable, and selection is made depending on whether the attraction is football or baseball, and whether the event will be televised in color or in black and white.

All electricity is distributed from the main switchgear supplied by Square D Company. Within the lighting ring itself, power is distributed by a 1,300 foot run of Square D I-Line Busway. Other Square D products on duty include twelve unit substations, motor control centers, I-Line power panelboards in the scoreboard, and more than 100 lighting panels. The stadium's power plant produces enough electricity to supply 5,000 homes. Electrical contractors for this installation were American Contracting, Inc. of San Francisco.



Ed Riccio, San Diego City Engineer, checks the graphic display panel which controls all lights.

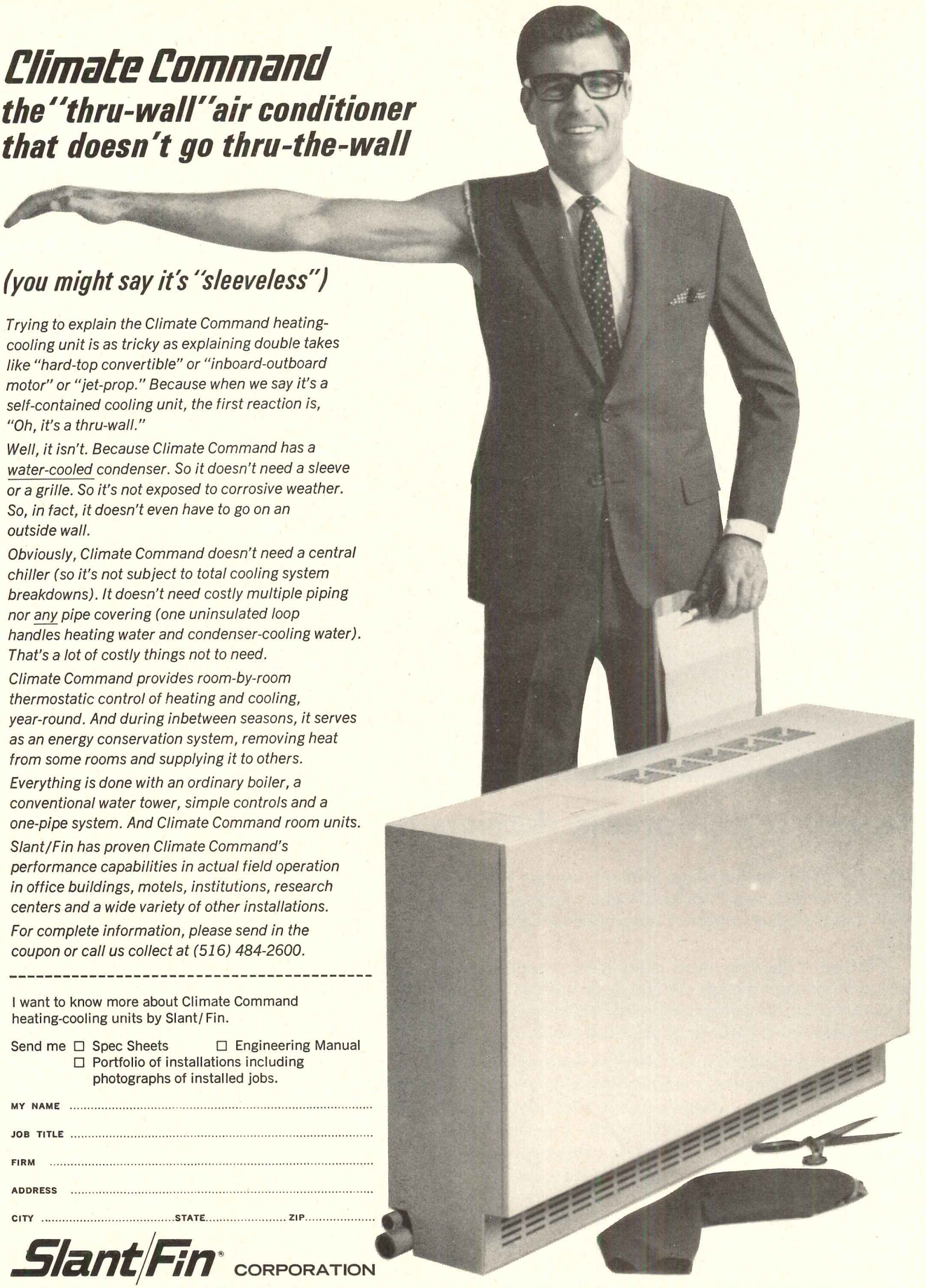
Al Eriqat of Frank L. Hope and Associates, Architects and Engineers, and Ed Butts of Square D examine the main switchgear.

SQUARE D COMPANY

Executive Offices • Park Ridge, Illinois

For more data, circle 36 on inquiry card

Climate Command
the "thru-wall" air conditioner that doesn't go thru-the-wall



(you might say it's "sleeveless")

Trying to explain the Climate Command heating-cooling unit is as tricky as explaining double takes like "hard-top convertible" or "inboard-outboard motor" or "jet-prop." Because when we say it's a self-contained cooling unit, the first reaction is, "Oh, it's a thru-wall."

Well, it isn't. Because Climate Command has a water-cooled condenser. So it doesn't need a sleeve or a grille. So it's not exposed to corrosive weather. So, in fact, it doesn't even have to go on an outside wall.

Obviously, Climate Command doesn't need a central chiller (so it's not subject to total cooling system breakdowns). It doesn't need costly multiple piping nor any pipe covering (one uninsulated loop handles heating water and condenser-cooling water). That's a lot of costly things not to need.

Climate Command provides room-by-room thermostatic control of heating and cooling, year-round. And during inbetween seasons, it serves as an energy conservation system, removing heat from some rooms and supplying it to others.

Everything is done with an ordinary boiler, a conventional water tower, simple controls and a one-pipe system. And Climate Command room units.

Slant/Fin has proven Climate Command's performance capabilities in actual field operation in office buildings, motels, institutions, research centers and a wide variety of other installations.

For complete information, please send in the coupon or call us collect at (516) 484-2600.

I want to know more about Climate Command heating-cooling units by Slant/Fin.

Send me ☐ Spec Sheets ☐ Engineering Manual
☐ Portfolio of installations including photographs of installed jobs.

MY NAME .....

JOB TITLE .....

FIRM .....

ADDRESS .....

CITY ..... STATE ..... ZIP .....

Slant/Fin® CORPORATION

AIR CONDITIONING DIVISION • 100 FOREST DRIVE • GREENVALE, NEW YORK 11548

For more data, circle 37 on inquiry card

Now, Ozite Carpet Tiles!
Soft, warm, quiet...no waxing, no polishing!

Save on maintenance. Ozite Carpet Tiles are more than attractive. They're downright practical. End costly waxing, buffing, wax-stripping. (One car dealer reports showroom maintenance savings paid for his carpet in 8 months!) Tiles are 12″ squares with built-in rubber back. Made of stain-resistant, colorfast Vectra fiber. Dense, firm surface resists soiling. Not affected by mildew. Easy to vacuum clean.

Easy to install. Ozite adhesives do the job in a jiffy. Tiles are easy to cut with a knife or scissors. Can be installed in sections. Damaged tiles can be easily replaced by maintenance people. Ozite Carpet Tiles are ideal for hotels, motels, schools, stores, hospitals—all residential and commercial installations. They provide softness, warmth and acoustical value hard-surface tile can't give.

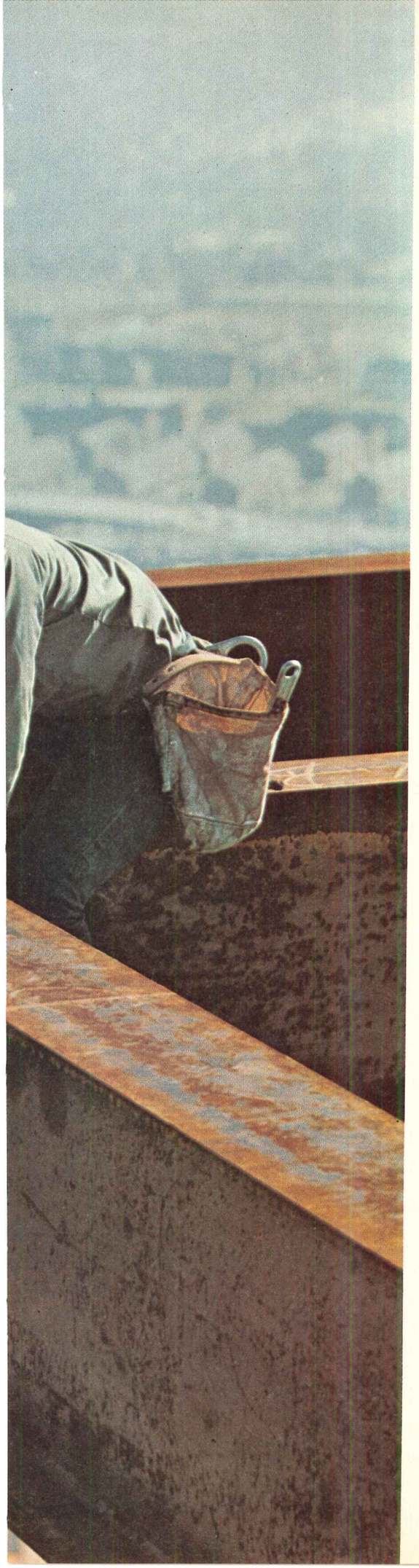
Use your imagination. Tiles come in a full range of colors. All colors also come in broadloom widths. Create check patterns or wild designs. Run tiles from the floor up the wall. Combine with broadloom widths. Possibilities are unlimited. Get the benefits of a soft floor covering, as well as the design and installation advantages of tile. See your Ozite Dealer for Ozite Carpet Tiles made with Vectra fiber!

If Product or Performance Defective ★ Good Housekeeping Guarantees Replacement or Refund to Consumer

Ozite® CARPET TILES *made with* **Vectra®** OLEFIN FIBER

Ozite® is the registered trademark of the Ozite Corporation, Merchandise Mart, Chicago, Illinois.
Vectra® olefin fiber is manufactured by Enjay Fibers and Laminates Company, Odenton, Maryland, a division of Enjay Chemical Company. Enjay makes fiber, not carpets.

For more data, circle 38 on inquiry card



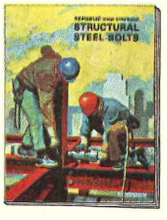
Republic high strength bolts bring long life assurance to Atlanta skyscraper.

The need for high quality in high places is met in strength in the new Equitable Life Assurance Society skyscraper now being completed on Atlanta's famous Peachtree Street.

Here, Republic high strength structural bolts bring their own kind of long life assurance. Assurance proven in high tensile steel...in faultlessly engineered design. Early assurance by rigorous testing. Long-time assurance by time itself. And, dollars-and-sense assurance that bolting—with Republic's high strength bolts—requires less labor than other structural building techniques.

That's the short, short story of Republic high strength bolts on Peachtree Street. The gist of it is: Republic Steel Corporation is the word to remember when you bolt your next building together. This one used Type A-325 in ¾" to 1¼" sizes. Standards: ASTM. Structural Engineers: Weiskopf & Pickworth, New York City.

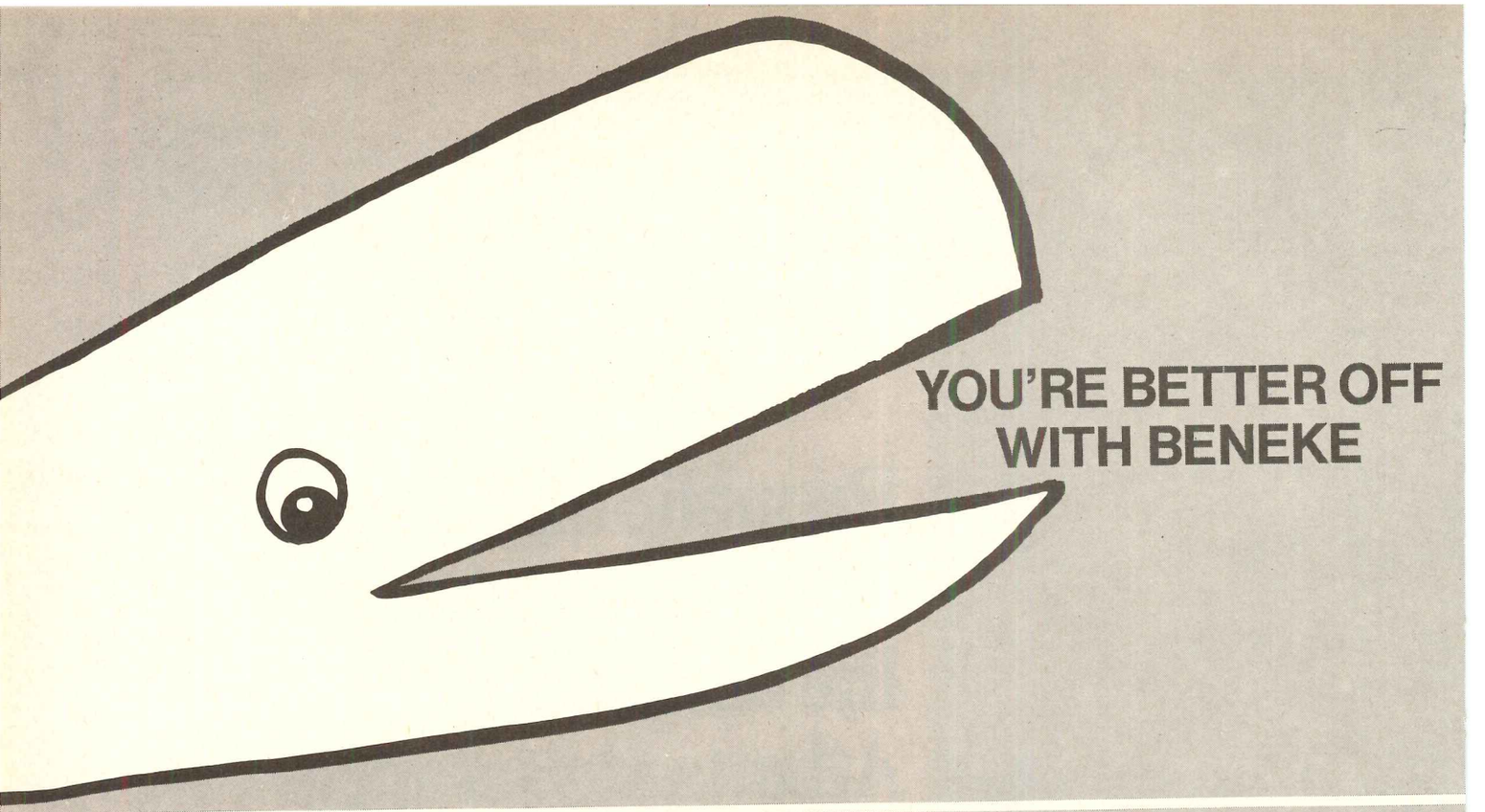
Send for free folder on Republic high strength structural bolts (Adv. 1690); includes complete specification for A-325 and A-490 bolts. Write Republic Steel Corporation, Dept. 7443, 1441 Republic Building, P.O. Box 6778, Cleveland, Ohio 44101.



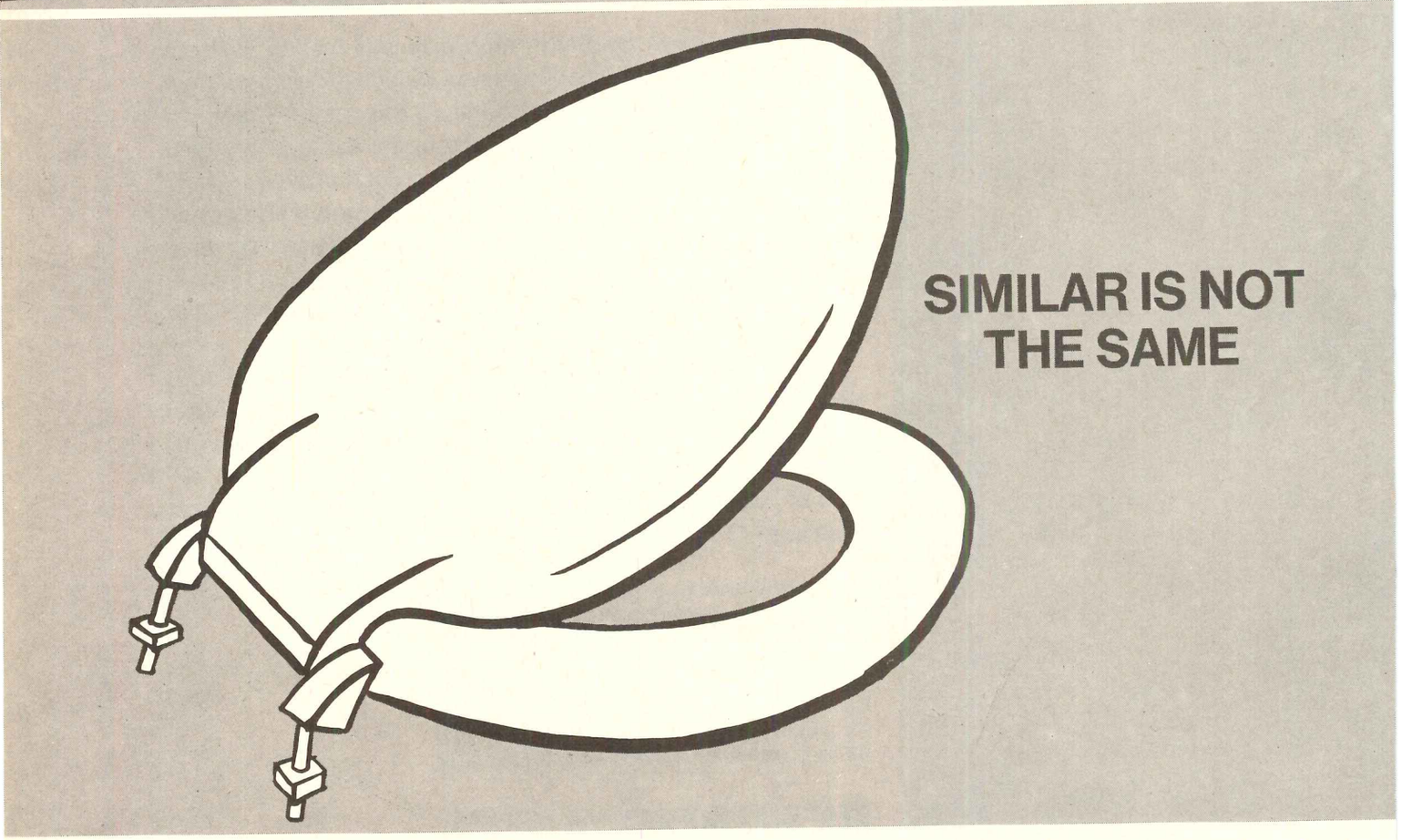
REPUBLIC STEEL
CORPORATION
BOLT AND NUT DIVISION
1441 Republic Building • Cleveland, Ohio 44101

Skidmore, Owings and Merrill, Architects; Weiskopf & Pickworth, Structural Engineers; George A. Fuller Company, General Contractors; and Ingalls Iron Works, Fabricators and Steel Erectors.

For more data, circle 39 on inquiry card



YOU'RE BETTER OFF WITH BENEKE



SIMILAR IS NOT THE SAME

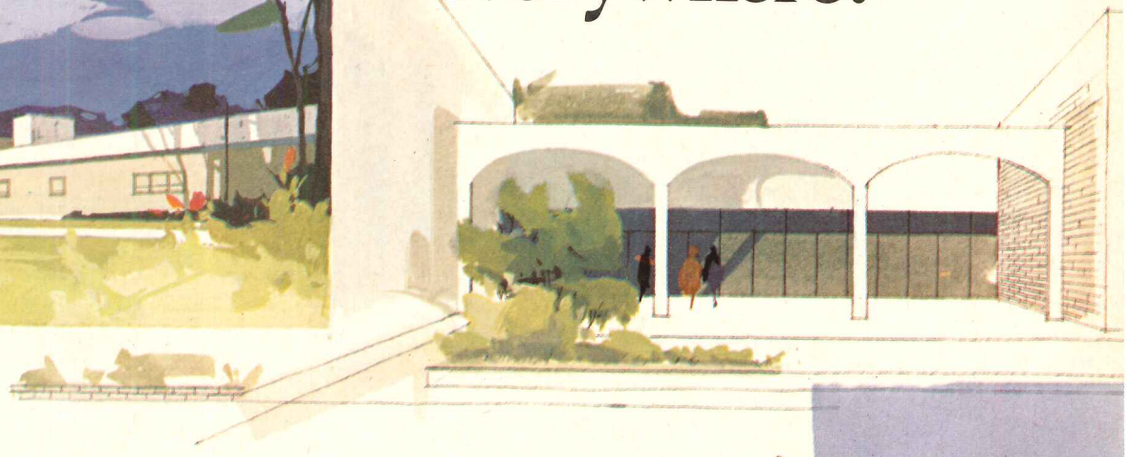
A whale is no walrus. A fish is never fowl. The building you want can't be built on facsimiles. All toilet seats are similar. They have bottoms. They have tops. But that's where the similarity stops. Beneke (and only Beneke) sculpts every toilet seat as though it were an original. An original work of art for apartment or airplane, hotel or motel, hospital or home. When you want to get exactly what you want, never say similar. Specify Beneke. There's no comparison.

BENEKE CORPORATION

CHICAGO NEW YORK LOS ANGELES SAN FRANCISCO NEW ORLEANS PARIS CANADA

For more data, circle 40 on inquiry card

The "micro-climates" are here...there... everywhere!



LENNOX
AIR CONDITIONING · HEATING

MODULAR CENTRAL SYSTEMS

solving the people problems in all types of buildings

For more data, circle 41 on inquiry card

The unique flexibility of Lennox systems weds economy, freedom of design and people comfort. For example, we create comfort to match the different problems of different people. All types of people. In all manner of activity. In the same building. At the same time. Whatever the weather. (And for any type of building – school, office, motel, apartment, plant, clinic, shopping center.)

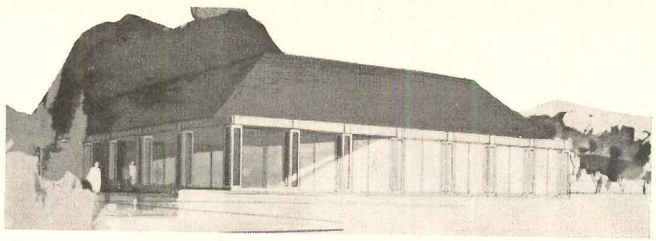
The toughest problems soften up when you specify Lennox modular central systems. Here is the sophistication of control and the flexibility to provide an almost infinite variety of "micro-climates"–individual comfort zones. And there's a system–or systems combination–to match any demand.

The single-zone Lennox combination system, for example, heats with gas, electricity or oil; cools electrically; rooftop or grade mounted. Or take the Lennox Direct Multizone Systems (DMS), for single or multistory installation, serving up to a dozen comfort zones per unit; or DMS with dual ducts and mixing dampers. Or unitary systems with a broad range of coil-blower units.

For details, see Sweet's–or write Lennox Industries Inc., 332 S. 12th Avenue, Marshalltown, Iowa 50158.

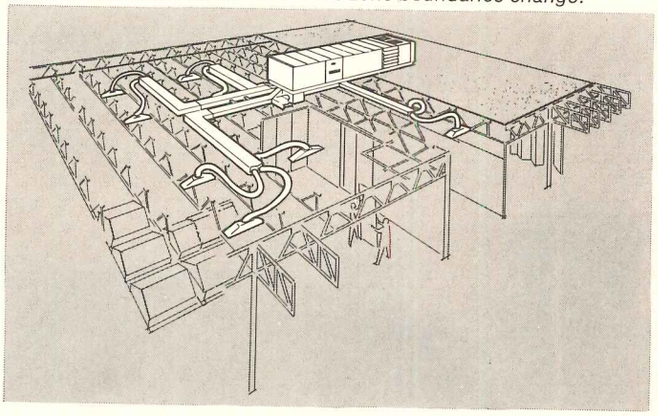
For more data, circle 41 on inquiry card

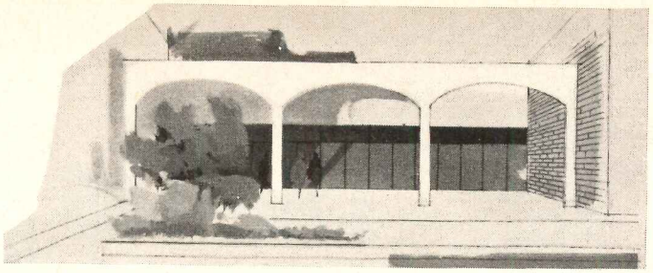
Lennox systems' flexibility combines people comfort, economy & designability.



Spacious, beautiful country club provides members' indoor comfort with "micro-climates" from concealed rooftop installations of Lennox unitary central systems. Four individually-controlled comfort zones come from one DMS1 unit of 22 tons cooling capacity and 500,000 Btuh gas heating. A Lennox GCS3 furnishes heating, cooling and ventilating for the large single-zone area (capacity: 8 tons cooling, 250,000 Btuh gas heating). Kitchen and locker rooms are heated and ventilated by another unitary system.

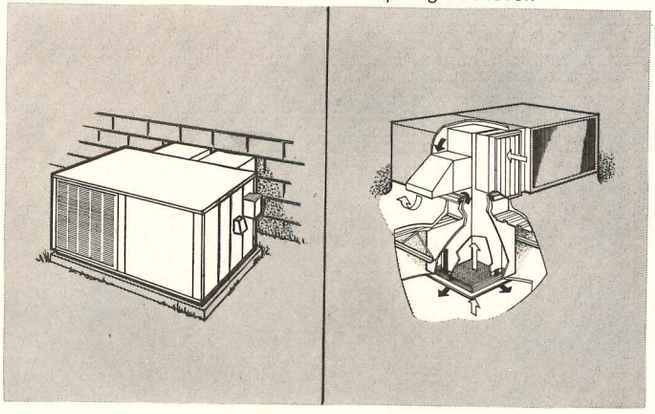
Direct Multizone units on roof serve many comfort zones through flexible duct which can be moved as zone boundaries change.

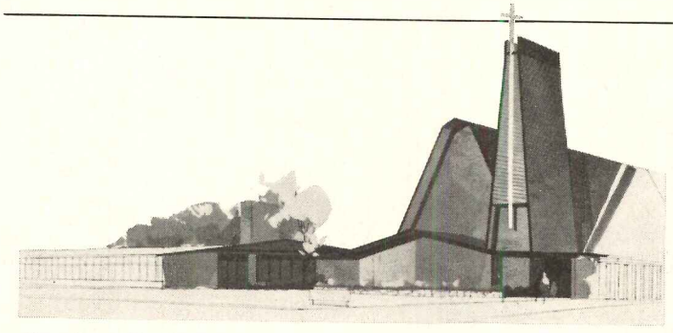




Patrons and employees of the 80 stores and theatre in this colorful, exciting shopping center will find the comfort right! Some 800 tons of cooling will come from a variety of Lennox equipment atop the center's 18-plus acres of buildings. Among the Lennox equipment supplying this large volume are: GCS single-zone combination gas heating/electric cooling units for large, undivided spaces; DMS units for the many individually-controlled comfort zones; condensing units coupled with coil/fan units; and other modular central systems.

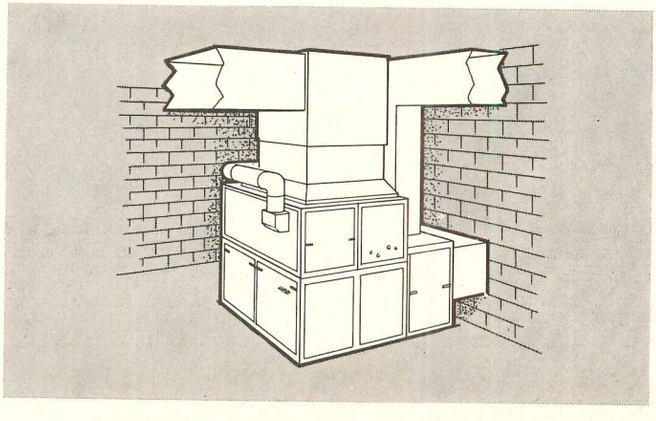
Lennox GCS3 all-weather combination gas heating/electric cooling unit serves single-zone areas from rooftop or grade level.

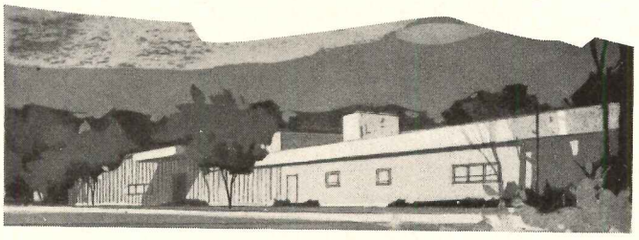




Comfort flexibility keynotes the gas heating/ventilating system of this striking new church building. To supply both upper and lower floors economically and efficiently, two new DMS2 units are installed in the equipment room. One unit serves multiple zones of the lower floor (Sunday School classrooms, etc.), the other serves the upper floor entrance hall, sanctuary and choir room. Provision is made for easy add-on cooling in future.

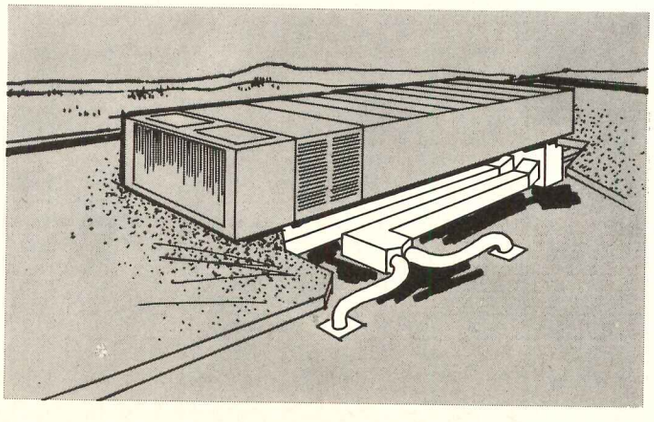
A new Direct Multizone System now adds flexibility in multiple zone applications for single and multistory buildings.





These new quarters of a leading—and growing—surgical instrument manufacturer have "room-to-grow" air conditioning and heating, in a "room-to-grow" building. Six Lennox DMS units provide the comfort for a 30,000-plus sq. ft. production area divided into six zones. Two other units take care of the 15,000 sq. ft. office area, in 12 separate comfort zones. Rooftop mounting conserves inside space; and, with flexible ducts, helps make possible easy expansion for growth.

Clean, low-silhouette DMS1 units sit unobtrusively on rooftop, help maintain design freedom.



The 345 self-closing slide moves 150 lbs. out of the way, before it gets in the way.

A slight push and drawers mounted on Grant's new self-closing 345 Slide quietly, gently glide shut. *Even if they're loaded with up to 150 lbs.!* And, this slide boasts the guided travel feature, which insures precision action without the need for precision installation methods. Requiring only ¾″ side space, the 345 is the perfect heavy duty store fixture slide, built to do the weightiest jobs and then get out of the way fast! Complete information is available on request.

GRANT®
PULLEY & HARDWARE CORPORATION

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EASTERN DIVISION: 49 HIGH STREET, WEST NYACK, NEW YORK 10994
WESTERN DIVISION: 944 LONG BEACH AVE., LOS ANGELES, CALIF. 90021

Make lighting a design tool with GE SPACE-LITE* luminaires

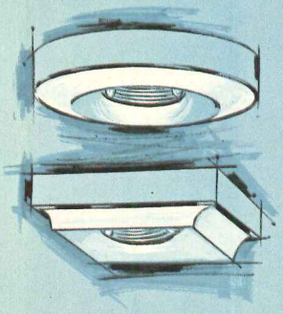
The flexibility of today's daring architecture has been captured with the dramatic styling of General Electric SPACE-LITE luminaires. Circles and squares become your tools to make every lighting installation unique.

SPACE-LITE luminaires combine flexible modular mounting arrangements and bold geometric shapes to give you exciting design possibilities. Six decorator colors, a variety of mounting hubs and arms, and today's most efficient light sources are available to further increase application flexibility and efficiency.

High-quality GE features make SPACE-LIGHT luminaires your best lighting buy. New application flexibility makes them your best design choice.

For additional information and a "Build an Installation Designers Kit" see your General Electric Sales Engineer or write to: Section 460-27, General Electric Co., Schenectady, N. Y. 12305.

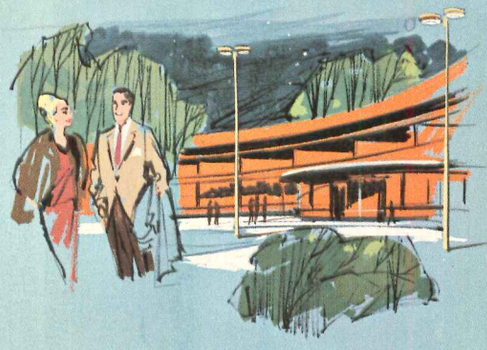
*Trademark of General Electric Co.



Outdoor Lighting Dept., Hendersonville, N. C.

GENERAL ELECTRIC

For more data, circle 51 on inquiry card



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Take out a life insurance policy for beautiful masonry walls

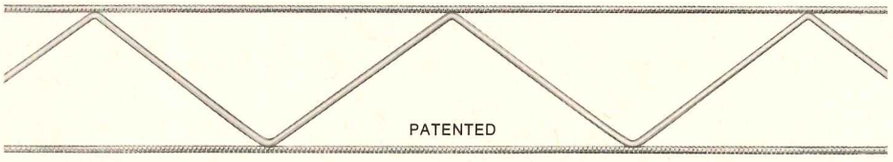
Specify Dur-O-waL® Truss masonry wall reinforcement

Masonry walls are more beautiful, more versatile than ever. And more numerous. Close to 700 million dollars' worth this year. That's a lot of masonry walls. And you can protect nearly every one of them with a Dur-O-waL "life insurance" policy.

All kinds of walls, too—single wythe, cavity or composite. Dur-O-waL Truss not only controls cracking, but also ties wythes in cavity and composite walls. All this from one product.

Dur-O-waL stands back of the policy with material approvals from many national and local code organizations.

Specify the original. Specify the best. Take out a Dur-O-waL life insurance policy on masonry walls. Need evidence? Write Dur-O-waL, P.O. Box 368, Cedar Rapids, Iowa 52406.

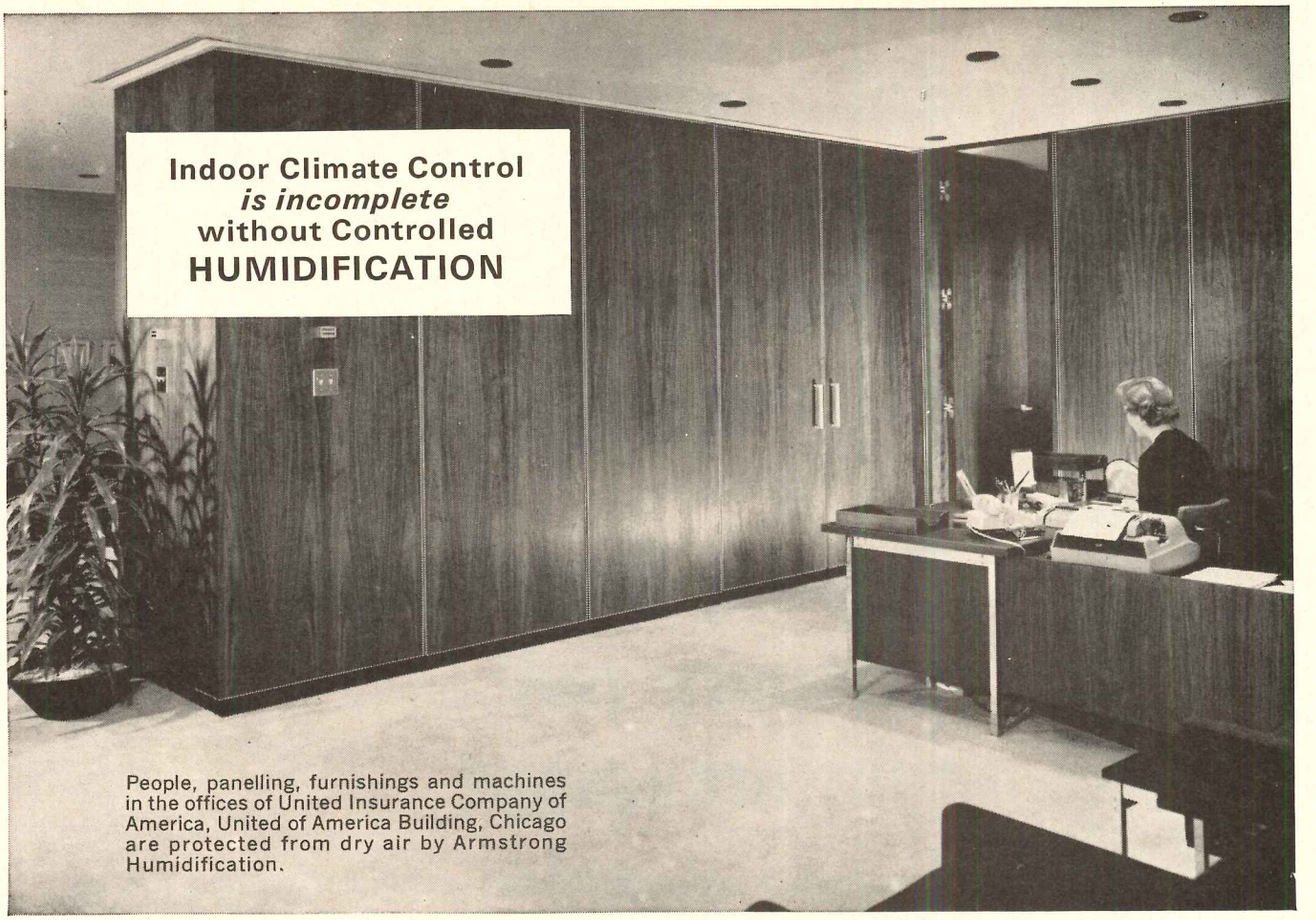


DUR-O-WAL®

THE ORIGINAL MASONRY WALL REINFORCEMENT WITH THE TRUSS DESIGN

DUR-O-WAL MANUFACTURING PLANTS • Cedar Rapids, Iowa, P.O. Box 368 • Syracuse, N. Y., P.O. Box 628 • Baltimore, Md., 4500 E. Lombard St. • Birmingham, Ala., P.O. Box 5446 • Aurora, Ill., 625 Crane St. • Pueblo, Colo., 29th and Court St. • Toledo, Ohio, 1678 Norwood Ave. • Mesa, Ariz., 213 So. Alma School Rd. • Seattle, Wash., 3310 Wallingford Ave. • Minneapolis, Minn., 2653 37th Ave. So. • Also manufactured in Canada.

For more data, circle 43 on inquiry card



People, panelling, furnishings and machines in the offices of United Insurance Company of America, United of America Building, Chicago are protected from dry air by Armstrong Humidification.

Specify Armstrong "Dry Steam" Humidifiers for effective, economical, trouble-free humidification

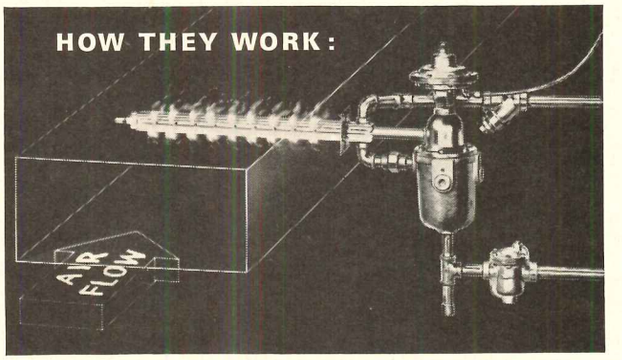
. . . to maintain the most desirable standards of winter-time comfort

. . . to reduce static electricity annoyance for people and machines

. . . to help protect wood panelling and furniture and other furnishings from the effects of dry air

A heating system provides only half of true winter air conditioning if it doesn't provide humidification. When cold outside air is brought in and heated it gets dry, very dry . . . much too dry for human comfort . . . much too dry for efficient operation of business machines . . . much too dry for long life of wood, carpeting and fabrics.

The answer is simple—and effective—with Armstrong "Dry Steam" humidification as proved by thousands of successful installations. Your Armstrong Representative will be pleased to give you full information.



Steam supply is metered in the humidifier body and liquid moisture removed. The steam jacketed distribution manifold assures that steam will be discharged into the air without drip and further assures that the steam will be uniformly distributed in the air flow.

ARMSTRONG HUMIDIFICATION

ARMSTRONG MACHINE WORKS

8574 Maple Street, Three Rivers, Michigan 49093

Manufacturers of Armstrong Steam Traps

WRITE FOR THESE BULLETINS

The Armstrong Humidification Book presents 28 pages on operation, selection and installation of Armstrong Humidifiers.

Office Building Humidification reprint tells how one of the nations' most modern buildings uses Armstrong Humidification.

For more data, circle 44 on inquiry card

You don't have to specify JAMISON

but if you value VALUE, you will

The finest materials, superior design, expert workmanship—these are all part of the value of a Jamison cold storage door. You take them for granted in a door made by the oldest and most experienced firm in the business.

But Jamison also gives you value of another kind. For instance, you may have an assignment to remodel a restaurant or cafeteria. In that case our remodelling layout sheets for food service installations can be of great value in saving you time and trouble. We have provided cooler and freezer doors for thousands of remodelling jobs, and our experience is reflected in these layout sheets.

They are yours free without obligation. Also without obligation, our book "How to Select and Specify Doors for Cold Storage Warehouses and Food Processing Plants." Send for both values.

When you receive them, you still don't have to specify JAMISON. But if you value VALUE, you will.

COLD STORAGE DOORS BY

JAMISON

JAMISON DOOR COMPANY • HAGERSTOWN, MD.

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The "Concord": Pembroke Greens, Naperville, Ill.; as built by Harris Home Builders (land developers and home builders in Chicago area); Mr. William F. Harris, Pres.

NICHOLS ALUMINUM BUILDING PRODUCTS

Long-Lasting • MAINTENANCE-FREE • ATTRACTIVE

Whether you are architect, contractor or home-developer, always specify or use top-quality Nichols Aluminum Building Products on your construction projects. Nichols offers a complete line of care-free Building Products that add beauty to any home or commercial building . . . with the added feature of virtually no maintenance costs.

Rustproof aluminum will not stain, warp, rot or otherwise deteriorate. Many Nichols' Building Products are pre-painted with baked-on enamel. Others never require painting because of the beauty of natural aluminum. Precision-engineered for quality, dependable installation.

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Begin with the basics—Hy-Tensil Aluminum Alloy Nails, with greater strength, prevent rust-spotting or staining on siding . . . and eliminate the need for repainting due to rusty nails.

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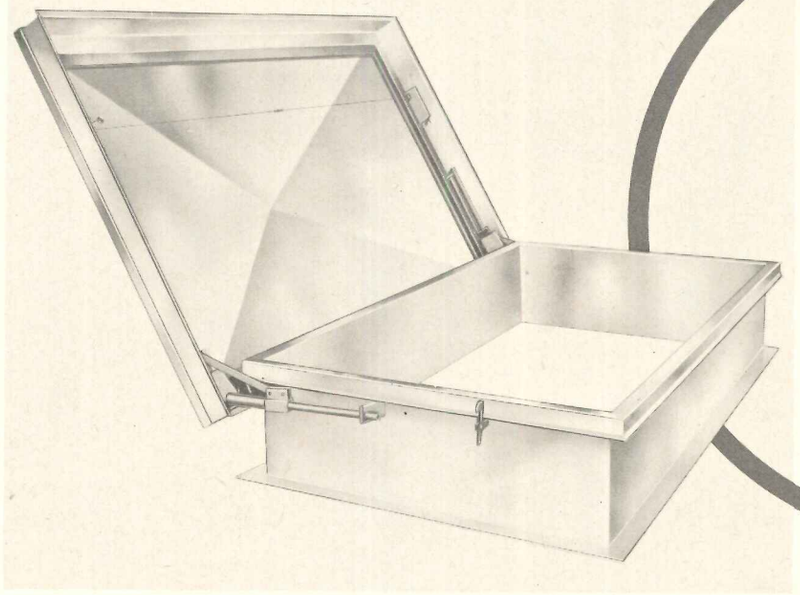
the *first* hatch-type fire-venting unit approved by Underwriters' Laboratories



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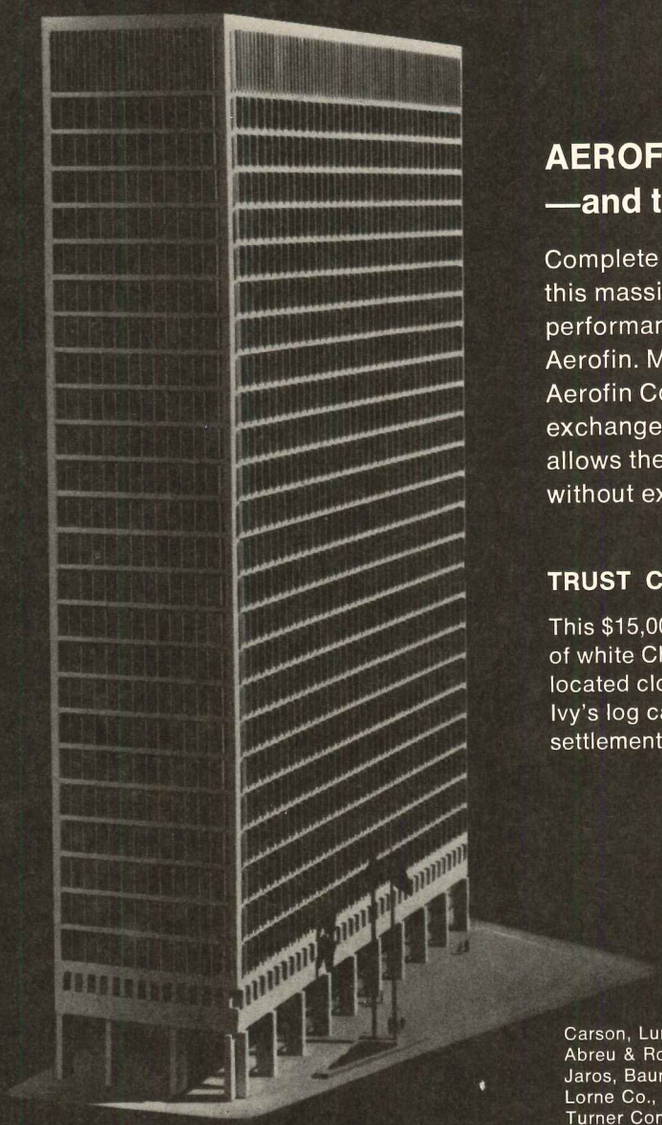

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This $15,000,000 banking center is constructed of white Cherokee marble and glass. It's located close to the historical site of Hardy Ivy's log cabin, built in 1833, the first permanent settlement in downtown Atlanta.

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Springs Mills, Inc., Customer Service Center, Lancaster, S. C.
Architect: A. G. O'Dell, Jr. & Associates

©American Saint Gobain 1968

ASG Bronze outside, Starlux® heavy plate inside

ASG plate glasses fill two design functions in new customer service center

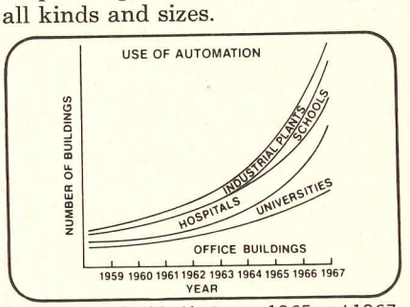
Designed to house the electronic ordering system of Springs Mills, Inc., this building had to be functional and efficient. To serve the 400 employees who service the system round-the-clock, it had to be attractive and comfortable. • Two kinds of ASG plate glass helped achieve these objectives. • The building's exterior, for instance is glazed with ASG Bronze plate glass. Its rich amber tint reduces sun heat and glare while, seen from outside, its polished surfaces mirror the evergreen and azalea plantings of the site. • The most dramatic use of glass, however, is in a 12-foot high wall of ASG's clear Starlux heavy plate that separates the lobby from a large computer room. Erected without mullions, the distortion-free glass imposes virtually no visual barrier between visitors and machines. Yet because it is ¾-inch thick, the glass wall shuts out the whirr and chatter of the computers. • Find out more about the hard-working, good looking line of ASG plate, sheet and patterned glasses. Write: Dept. D-9, American Saint Gobain Corporation, P.O. Box 929, Kingsport, Tennessee 37662.

Polished plate glass by... ASG
CREATIVE IDEAS IN GLASS

Report on trends in the temperature control industry

A Honeywell summary of recent developments in building automation

Building automation—the automatic collection and use of data to operate mechanical systems with least attention and highest efficiency—is governed by trends in building construction itself. In recent years, two major trends have emerged. These are, the increasing number of *large* buildings constructed each year, and the steadily growing cost of *operating* commercial buildings of all kinds and sizes.



Installations doubled between 1965 and 1967.

Both these trends give rise to a need for the application of more and more automation, designed to achieve greater efficiency at lower cost. In terms of automation hardware, we consider that the significant trends are:

- the standardization of systems, with modular construction.
- the increased use of monitoring systems for automatically spotting trouble.
- greater use of logging systems, to aid in efficient operation and costing.
- a trend to larger capacity, high-speed systems, able to accommodate major building additions.
- the use of new technologies.

Standardization and Modularity

Standardized automation systems bring a number of advantages. They have lower initial cost—a result of mass production. They are well-defined, with readily available technical information on their performance. They incorporate tested designs. Start-up is virtually trouble-free and servicing is simplified.

Modular construction means flexibility. A system can be easily adapted to fit the needs of a particular building. Add-on modules mean a system can grow with building additions.

Standardized, modular systems cost less, making automation practical for more buildings. For the consulting engineer, standardized systems are easy to specify—information is readily available.

Monitors catch trouble early. There is an increasing use of monitoring systems to spot equipment trouble. Monitoring means malfunctions are located before they become significant—damage to expensive equipment is avoided and tenant complaints averted. The manpower required for inspection is substantially reduced, and automatic inspections are made even during unoccupied hours.

Correctly applied automation systems mean lower operating costs. But experience shows it is possible to over-automate. A careful survey of needs should be made before writing the specification. For example, don't over-achieve by installing a 3,000 point system in a 1000 point application. Careful planning is necessary to assure maximum return on your automation investment.

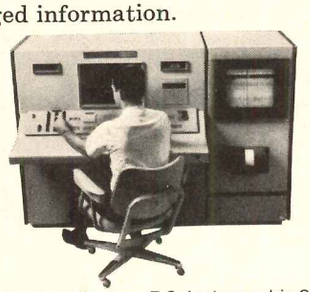
New technologies

For the efficient operation of very large buildings and building complexes, more sophisticated technologies are needed. Because of its activities in the computer field, Honeywell is particularly well equipped to do this, and from computer technology we have borrowed "core memory." From space technology we have taken micro-electronic techniques, and combined the two in a new family of standardized systems called Special Purpose Digital Data Processors.

The number of logging systems installed in the past two years is more than equal to all those previously installed. Further, a wider variety of data is being logged. For example:

- logs of values when trouble occurs.
- logs of flow and BTU's for determining costs.
- logs of energy input vs. output to indicate efficiency of operation.

On a typical Honeywell console, a series of selection switches allows an operator to demand a variety of logged information.


Standardized System 7 Selectographic Supervisory Data Center, with system analyzer and alarm printer module.

Another major trend is toward systems designed to facilitate future expansion. To provide this flexibility, systems incorporate core memories. With this device, a system can be completely reprogrammed without changes in electrical wiring. The memory also allows an operator to add a new input or inputs in minutes.

Now, the computer. Finally, there is a trend towards doing more building automation functions automatically: the next generation of systems will be based on computers, working in closed loops with the mechanical systems.

A computer's speed allows for simultaneous scanning, alarm printing, plus status and trend logging. Computer programs, aimed at more efficient operation can be written.

For the full story on building automation, ask the Commercial Division at your local Honeywell office.

Honeywell
AUTOMATION

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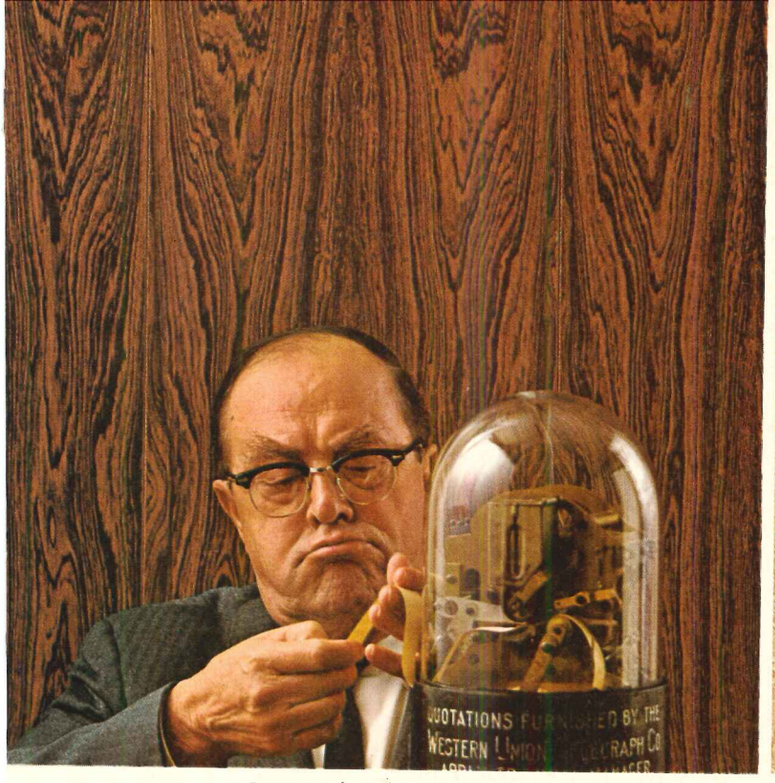
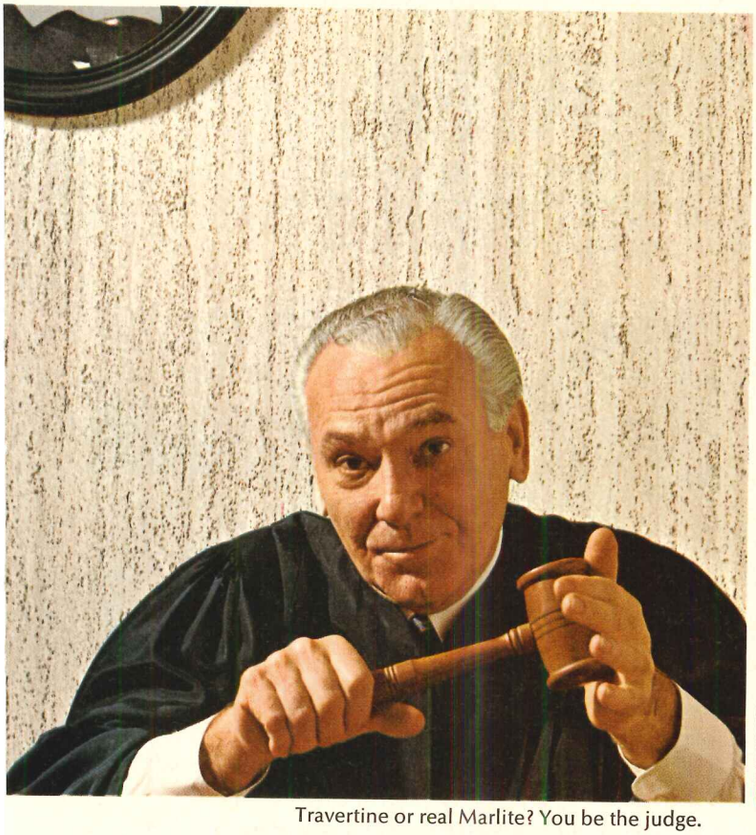


Rosewood Marlite gives walls a hand-rubbed look.

Textured Tapestry Marlite—beauty you can feel.



Travertine or real Marlite? You be the judge.

Textured Oak Marlite has everything but acorns.

6824

Most people don't know real Marlite paneling when they see it.

Don't jump to conclusions when you see a beautiful wall. It may look like hand-rubbed rosewood, imported tapestry, Italian travertine or natural oak planks.

But it could be the real thing: Marlite prefinished hardboard paneling.

Marlite is the one paneling that doesn't limit your imagination. It gives you more than 70 different ways to create exciting interiors. Deep-embossed textures, authentic woodgrains, rich or pastel colors, original patterns and designs.

And Marlite protects your reputation. Its soilproof, baked-on finish seals out heat, moisture, stains and dents—stays like new for years with practically no maintenance.

You can see the complete Marlite line at your building materials dealer's or in Sweet's File. But beware of imitations. Marlite Division of Masonite Corporation, Dept. 905, Dover, Ohio 44622.

MASONITE CORPORATION **Marlite®** plastic-finished paneling

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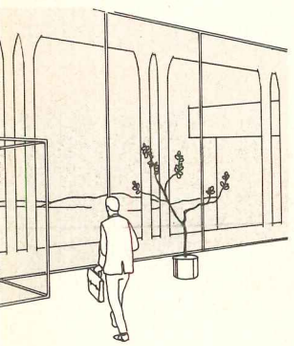

It's a big, wide, wonderful entrance, glazed with insulating glass by Thermoproof.

From outside-in, or inside-out, Therm-O-Proof insulating glass allows a beautiful, uninterrupted view. An almost ethereal effect greets the person entering or leaving this State Headquarters building of the General Telephone Company of Michigan, designed by Vander Meiden, Koteles & Associates.

To enhance the beauty of the entrance, and control heat loss and air conditioning load, Thermoproof fabricated insulating glass units up to 52" x 106" with an outboard lite of 1/4" bronze plate to meet specifications.

Custom units like these to coordinate with special aesthetic requirements are another way Therm-O-Proof insulating glass is made more ways to fit more ideas.

See full color Sweet's insert 4a/Th
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Thermoproof Glass Compa
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Detroit, Michigan 48210

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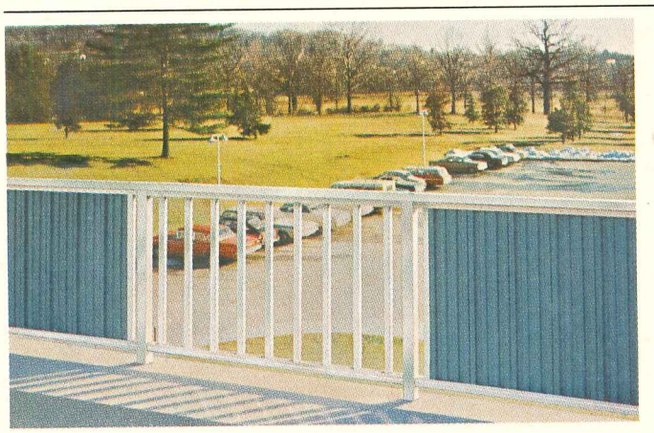

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Anchor Privacy for_____ Thank you.

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LBJ signs $5.3-billion omnibus housing legislation

President Johnson on August 1 signed the $5.3-billion omnibus housing legislation inaugurating broad new programs to provide housing for low and moderate income families (see RECORD for April, page 81).

Mr. Johnson called the legislation "the most far-sighted, most comprehensive, most massive housing program in all of American history."

The legislation's key features set up an interest-rate subsidy program to provide homes and rental units. Two new sections are added to the National Housing Act—Sec. 235 for home ownership and Sec. 236 for rental units. Both authorize the government to pay all but one per cent to lenders on market-rate mortgages in reduction of interest on FHA-insured mortgages to assist both home ownership and rental projects.

HUD has begun work on the regulations which will govern the programs.

The new law also contains these provisions:

Vacation homes: Sec. 203(m) provides for FHA insurance up to $15,000 for seasonal or vacation homes. Principal obligation cannot exceed 75 per cent of appraised value. Property must be an acceptable risk, giving consideration to the economic potential of the region.

Land development: FHA-insured land development loans may be made for up to 10 years; the limitation had been seven years.

New communities: The Secretary of HUD is authorized to guarantee bonds, debentures, notes, and other obligations issued by private community developers to help finance development of new community projects.

Rent supplements: Authorized $140 million additional to provide 155,000 more new or rehabilitated units.

Fannie Mae: Title VIII would divide the existing Federal National Mortgage Association into two corporations. One (Fannie Mae) would continue to carry on existing secondary market operations. The other (Ginnie Mae or Government National Mortgage Association) would handle existing special-assistance functions. The new Fannie Mae would go through a transitional period of from one to three years, leading to eventual private ownership.

Public housing: New contract authority of $400 million was authorized. This would mean about 387,500 more units, through regular or Turnkey construction and leasing. Major share of the funds is expected to go into Turnkey.

Write-downs: Permits land write-downs for the new Sec. 236 (rental) projects and for some sales housing under Sec. 235, as well as Sec. 221(h)(1) rehabilitation projects. Broadens eligibility for sponsors to include private developers. (Provides that the "Secretary shall assure that the benefit . . . will go to the occupant of the property rather than to such purchaser or lessee.")

Non-interest loans for architects' fees: Non-profit organizations may obtain direct loans from the Secretary of HUD for up to 80 per cent of "the necessary expenses, prior to construction, in planning and obtaining financing for, the rehabilitation or construction of housing for low or moderate income families under any Federally assisted program." Preliminary site engineering and architectural fees are specifically mentioned among purposes for which such loans may be obtained.

Homeownership foundation: The bill creates a nonprofit corporation called the National Homeownership Foundation which will assist private and public organizations to promote home ownership. Its function will be largely advisory, but it can provide grants and loans to other organizations promoting housing opportunity programs on a nonprofit basis.

New housing technologies: A new program will review plans submitted for housing using "new and advanced technologies" to be constructed on Federal land made available by the Secretary or on other land where local conditions permit variances of codes for experimental purposes.

New law shoots down architectural barriers

Last month Congress passed and the President signed a bill authorizing the General Service Administrator, in consultation with the Secretary of Health, Education and Welfare, to set up criteria for design and construction of nonresidential buildings built with Federal funds to ensure they are "accessible to and usable by persons who are physically handicapped."

ARCHITECTURAL BUSINESS THIS MONTH

Building activity 83
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Law sponsored by commission headed by architect Chatelain

The bill's passage capped the two-year effort by the disbanding National Commission on Architectural Barriers to Rehabilitation of the Handicapped. At a

valedictory press conference with HEW Secretary Wilbur J. Cohen, chairman Leon Chatelain Jr., Washington architect, summed up achievements of the 12-member commission (which included two other architects: Lorenzo Williams of Minneapolis and Robert Dietz of Seattle) as follows:

1) Staff work was started on a proposed White House executive order applying accessibility standards to new construction and directing all Federal agencies to plan and budget for feasible changes in their existing buildings.

2) Model state legislation was sent to the states, including strong enforcement provisions to require that state and local buildings constructed with public funds meet accessibility standards consistent with U.S. criteria.

3) An analysis of building codes with respect to architectural barriers was made at the commission's instigation by the Social and Rehabilitation Service.

4) SRS was assigned responsibility to follow through on the commission's report and to assist state and local governments in dealing with accessibility problems.

Commission report lists barriers, suggests some remedies

A 54-page commission report, "Design for *All* Americans," lists the common causes of inaccessibility as: steps and curbs; inaccessible elevators; steep and narrow walks; grating in sidewalks; narrow doors; revolving doors; lack of parking spaces reserved and designed for the handicapped; lack of accommodations for wheelchairs in theaters, stadiums, and other public gathering places; too-narrow aisles in cafeterias, restaurants, libraries and auditoriums; too-small public toilet stalls and telephone booths; and too-high telephones, drinking fountains, vending machines, light switches, and fire alarms.

The report (for sale at 50 cents by the Superintendent of Documents) recommends adding such accessibility features as: hand rails; a ground-level main entrance or ramp; steps that are rounded instead of squared at the edges; doors that open automatically; raised letters and numbers on doors and in elevators so that the blind can read them; danger signals equipped with light as well as sound so that the deaf will be warned; an open booth with a low-placed telephone; one or more wide toilet stalls with grab rails; and nonslip flooring.

Secretary Cohen, quoting President Johnson's June 3 message transmitting the commission's report to Congress, said that more than 20 million Americans—one in every ten—cannot use most of our buildings without help or great effort. "The simple fact is," Cohen said, "that the number of disabled and handicapped persons is growing, as medical science has extended the life span, as more and more victims of disabling accidents and illnesses are saved from death by modern health care."

States and agencies support action against barriers

Since the 1961 issuance of an American Standards Association (now USASI) publication on modes of eliminating architectural barriers, some 44 states have taken some kind of formal or legal action requiring that public buildings (and in a few cases private ones as well) be made accessible to the public. The New York State University Construction Fund, for example, issued its performance criteria in 1966 (October 1966, pages 231-232). Action to eliminate architectural barriers is also reported by 95 cities with populations over 50,000.

Key Federal agencies, such as the General Services Administration, Post Office Department, Veterans Administration, Department of Defense, and the Department of Health, Education, and Welfare, have voluntarily adopted many provisions of the standard and are asking agencies that receive grants from them to do so.

Briefs

Metric measure won't be universal here tomorrow morning. The House last month passed a long-stalled bill (H.R. 3136) to authorize the Secretary of Commerce to make a 3-year study to determine the advantages and disadvantages of increased use of the metric system in the United States. The measure has been under consideration in Congress since 1959. Rep. George Miller (D-Calif.), chairman of the House Committee on Science and Astronautics, led the successful fight for the bill, pointing out that the metric system is now used by nations comprising 90 per cent of the world's peoples.

An airport bill offering multi-million-dollar grants has been approved by the Senate Commerce Committee and is expected to get Senate approval this year. The bill would continue the grant-in-aid program at double the present rate, rejecting the administration proposal that the grant program be limited to landing area projects. Of interest to architects is provision for a loan program for airport owners to build and improve terminal area facilities. The Federal government would underwrite the loans, up to a $1-billion limit.

Profit Planning in Architectural Practice, a handbook by Dr. Charles J. Marsh and Alf E. Werolin of Case and Co., Inc., has been issued by the A.I.A. The book lists eight methods of computing fees and suggests a simple charting method of control. Copies of the 83-page manual are available from the Documents Division, The American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006. Price is $2.00 for members; $5.00 for non-members.

A "Catalog of Federal Assistance Programs" is available upon request from the Office of Economic Opportunity. The 701-page book explains the nature and purpose of domestic programs; specifies major eligibility requirements; tells where to apply; and lists printed materials that are available. Copies may be obtained by addressing the O.E.O. Information Center, 1200 19th Street, Washington, D.C.

A simplified Urban Renewal Handbook outlining legal and administrative procedures for urban renewal projects is available from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, at $14 per copy. It replaces the three-volume Urban Renewal Manual which was last revised in the year 1960.

A building valuation manual compiled by the Boeckh Division of the American Appraisal Company has been released as a three-volume set divided by building type to sell for $90 a set. Volume 1, first to be released, covers residential buildings and is designed, with color photos and charts, to permit three levels of precision in cost estimates. The publishers emphasize that this computer-compiled edition is not an updated or revised edition of the existing Boeckh manual.

Architectural technician's training is the subject of a recently published A.I.A. report of the findings and recommendations of an educational task force after a two-year study. Specific subjects covered in the 19-page report are the profession of architecture, the program of the A.I.A., the role of the technician, functions and performance in the architectural office, the curricula, the student, the faculty, and the facilities. Appendices on education for architecture, continuing education for the architectural technician, and a bibliography are also included.

CURRENT TRENDS IN CONSTRUCTION

Robert M. Young
Senior Economist
McGraw-Hill Information Systems Company

Regional trends: catching up with the leaders

1968 appears to be shaping up as a year of catching up with the leaders, as far as regional construction trends are concerned. With only one or two exceptions, those parts of the country that showed up relatively poorly in 1967's building picture are forging well ahead of the national average so far in 1968. At the same time, last year's leaders are doing little better than matching their year-ago volume.

1968 is also a year for big-city building. The 48 metropolitan areas that accounted for half the value of national construction contracts in the first six months of 1968 were responsible for almost four-fifths of the *gain* in building over the same period last year. This is not too surprising, since over half the increase in building construction has been in apartment houses and offices.

This year's stellar performance has been turned in by New England—an area that has trailed the nation for several years. The region accounted for five of the seven states in the nation that recorded building valuation increases of over one-third in the first half of 1968. The Boston area has jumped from seventh to fourth place among the nation's major construction centers on the strength of several major office building projects and an upsurge in apartment construction. New office construction, which has tripled in valuation for the region, has also sparked building gains in Bridgeport, Providence, Hartford and New Haven.

Unlike most other regions, the gains made in New England cities have been exceeded by those in the non-metropolitan areas. Non-residential contracting, which jumped a healthy 36 per cent in the region as a whole during the first half of 1968, rose twice that rate outside the major cities.

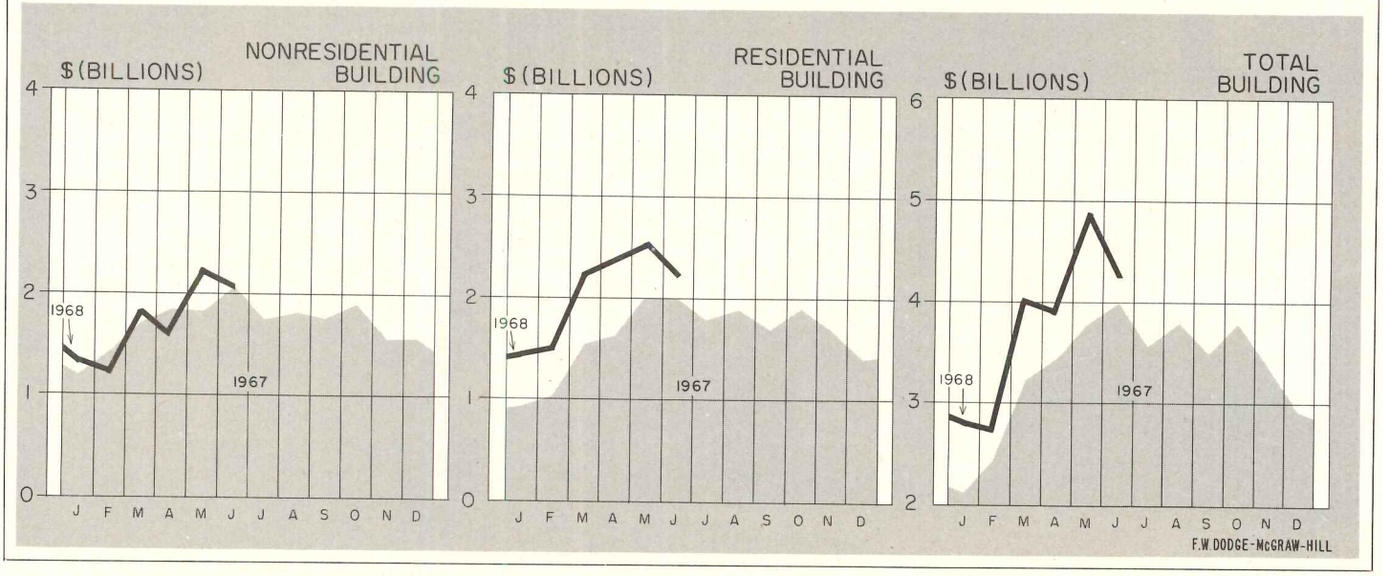
Part of New England's success so far this year is no doubt due to greater availability of money to finance building projects. A more important factor, however, has been the recent economic resurgence of the region. Long in the doldrums as traditional industries moved to greener pastures, New England has been enjoying new success as a center for light manufacturing—especially electronics—and tourism.

The West Coast and South Atlantic regions, which trailed the national growth rate in 1967, have both surged ahead in the early months of 1968 on the strength of a doubling in apartment building. Residential contracting in the three major southern California markets —Los Angeles, San Diego and Anaheim-Santa Ana-Garden Grove—has jumped 80 per cent above the first half of 1967, reflecting both easier financing in the early months of 1968 and a return to the high rates of in-migration that characterized the early 1960's.

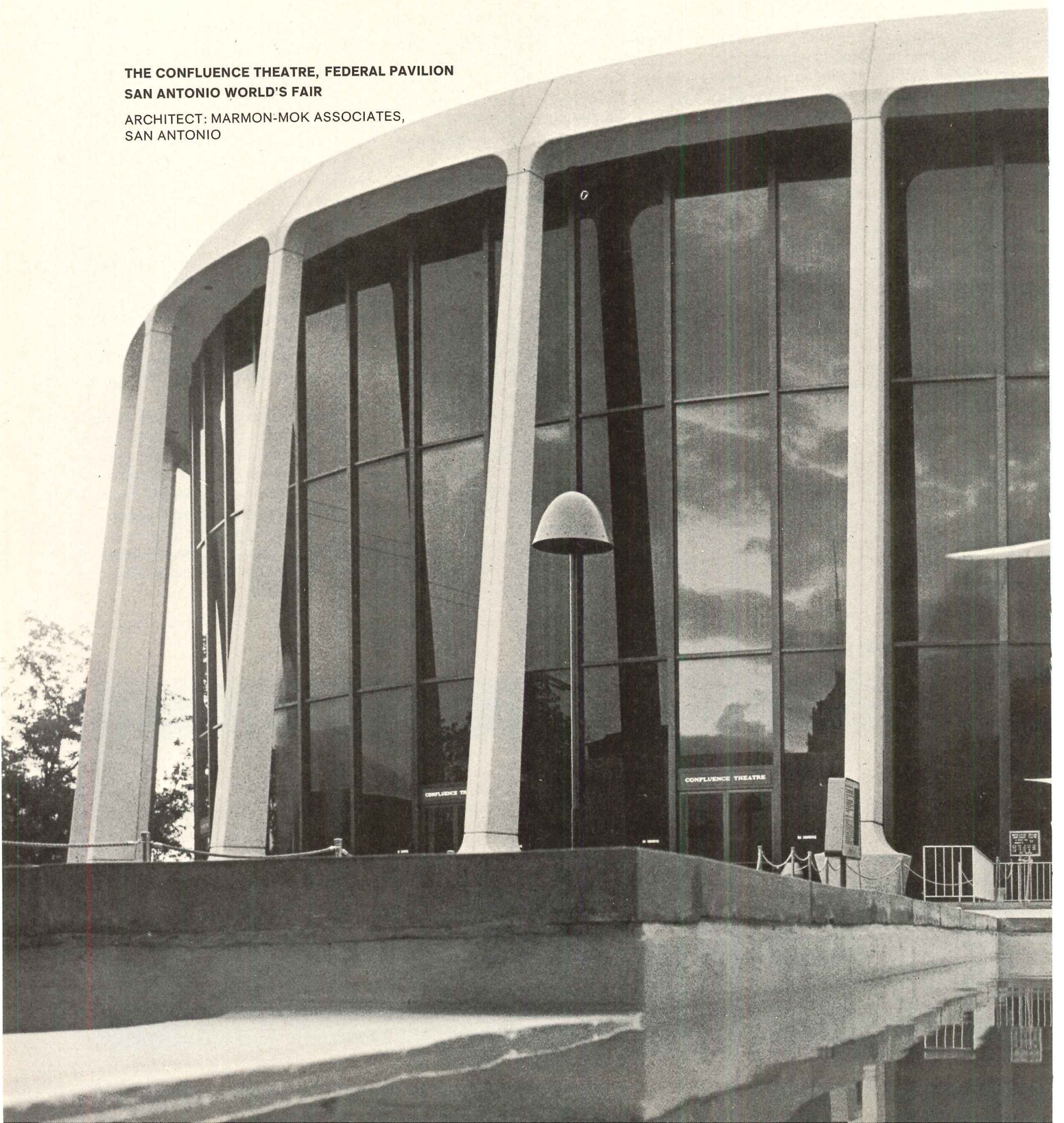
The lower east coast of Florida is also experiencing a boom, for much the same reasons as in southern California. Total building valuation in the Fort Lauderdale area more than doubled in the first six months of 1968—the largest gain in the nation—and Miami and West Palm Beach were among the growth leaders.

The Northeast metropolitan corridor continues to lag national growth trends, while the Midwest is finding it difficult to match the strong gains recorded last year. Weakness in residential building has plagued the Northeast region for some time, while the Midwest is experiencing a drop from the high levels of office and industrial building of the past couple of years.

Building activity: monthly contract tabulations



Keene focuses



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

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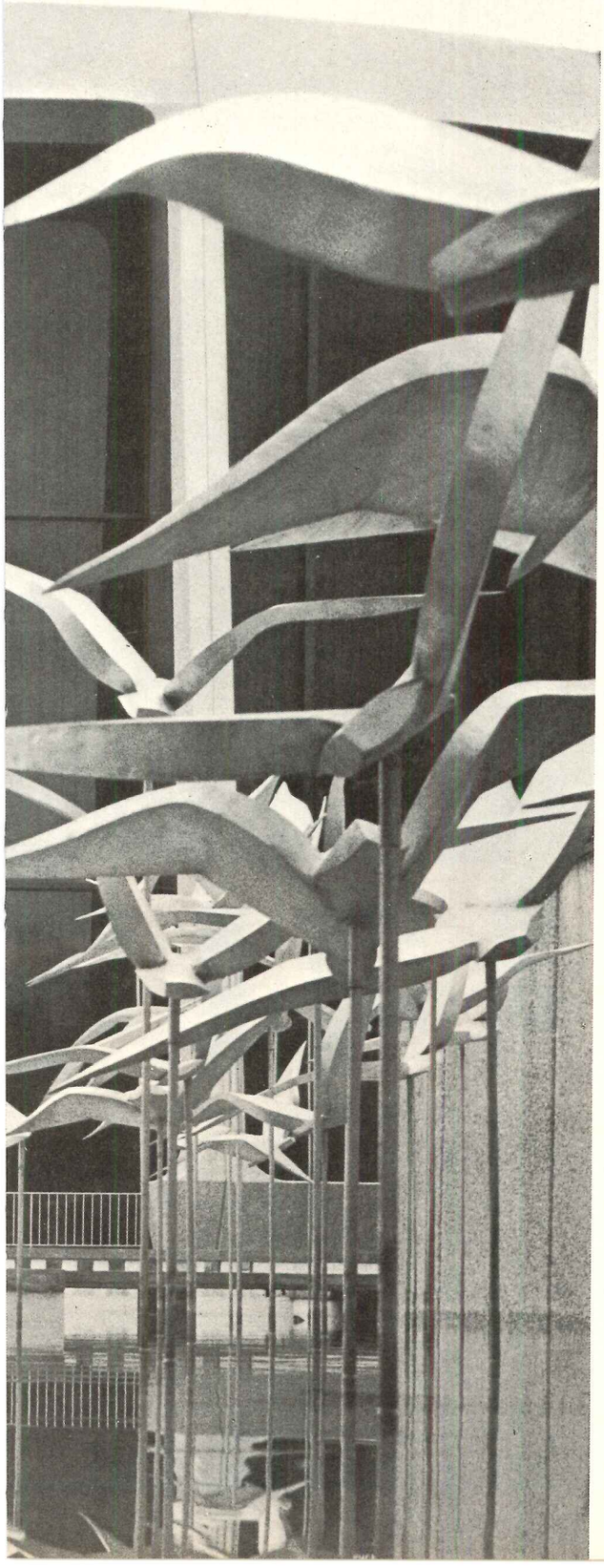
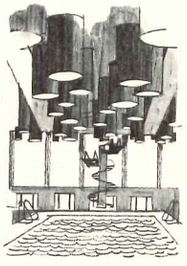


When architectural ingenuity joins with Keene's ingenuity in a race against time, the results are strikingly beautiful. The San Antonio World's Fair is a case in point. With opening day fast approaching, the benefits of Speed-Steel structural framing were confirmed as deadlines were met. Nineteen of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

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

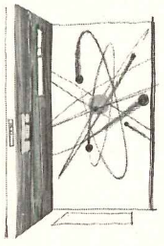
Merchandise Mart, Charlotte, N.C. Keene movable partitions selected for flexibility and design variety.

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



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

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



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

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

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

You'll be hearing more about Keene ingenuity on the job. In the meantime, send for our catalog on Speed-Steel and other Keene building products. Write to: Dept. AR-9, Keene Penn Metal, Parkersburg, W. Va. 26101.

KEENE
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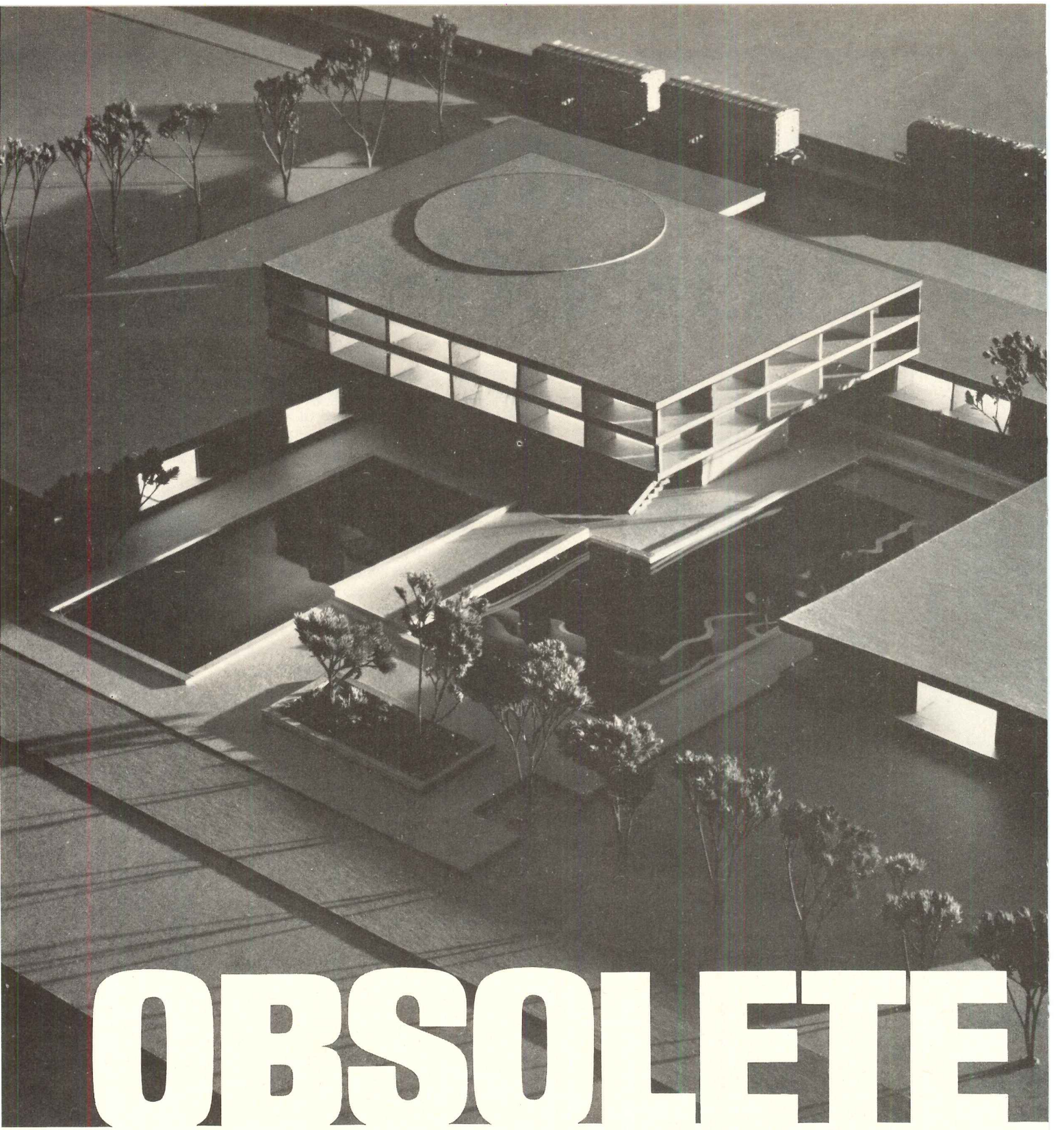
We've just begun to grow.

For more data, circle 56 on inquiry card



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TRENDS AND ANALYSIS

Lawrence C. Jaquith and Raymond F. Young
McKee-Berger-Mansueto, Inc.
Construction Consultants

On unit-price contracts—you almost surely lose

Negotiating costs with a contractor in the middle of a project is a responsibility that the architect does not especially relish—yet it is a task he often must face. Whether the discussions focus on the cost of a change in scope or on the cost of a minor work item, he is dealing in an area in which the contractor is the expert. And, in addition to expertise, the contractor has another distinct advantage: He knows that the architect is reluctant to contest an issue which might provoke a project delay. For these reasons, the architect will prefer to find a way to avoid cost negotiations whenever possible, especially if it can preclude haggling over minor work items involving relatively few dollars.

Contracted unit cost schedules have great appeal, but . . .

One common solution is to include a schedule of unit prices in the contract documents. This has an obvious appeal. By establishing the cost of key work items at the outset, the architect can mitigate some of the headaches of negotiation. But this approach can create even greater problems which are sufficient to suggest that the bargaining table may provide the best solution to any changes in costs resulting from change in scope.

A unit cost schedule can easily prove to be an expensive and inadequate substitute for negotiation for two reasons:

1. The unit price schedule rarely covers all the items that are affected by changes in scope. Many potential areas of change can be anticipated. But many cannot, because most changes take place on interior work where the items involved are numerous. It might appear that a comprehensive schedule of unit prices could overcome this deficiency. But, in fact, it is virtually impossible to accomplish this for a given project without leaving out many items. And even if this were possible, the schedule would be huge, a task to prepare, and an even greater task to fill out. It would be most confusing for the general contractor and his subs.

2. A unit price for a particular item is often unrelated to a specific situation. Every item will usually appear under different sets of circumstances, each of which can significantly affect cost. Thus a unit price schedule will force the contractor to guess at what his cost may be in a situation over which he may have no control. And more importantly, the architect and the owner are locked into paying a price for an item which may have no relevance to how and where the item was used.

Where the pricing habit is strong, detailed attention is needed

Despite the deficiencies in unit price scheduling—its inability to cover many work items and its inadequacy in accounting for varying work conditions—it is a widely used approach for handling future changes. Yet often, too little effort goes into the preparation of these schedules. The items usually appear to be selected because they were included on previous schedules rather than because they are applicable to the particular project at hand.

There are all kinds of unit prices

The unit price obtained for a given item will vary with the type of schedule selected by the architect. Among the formats used are:

1. A unit price for added work and a unit price for deducted work, for like items.

2. One unit price for an item whether added or deducted.

3. One unit price for an item whether added or deducted, but not including overhead and profit, which is negotiated separately or designated by a percentage.

4. A unit price for added work; the deduct price for the same item is a certain percentage less. (The converse can apply, i.e. a percentage increase over the deduct price for the add price.)

5. A "change order unit price schedule"; under this system, a contractor submits a unit price schedule with his bid. The schedule is then subject to negotiation *before* the contract is signed. After negotiation, the contract is signed and the schedule is included as change order No. 1.

You pay retail for extras, but sell cuts at wholesale

Of the formats listed the first is the most common, although it is probably the most uneconomical. This is because the contract cost of added work is invariably much higher than the average in-place cost for the item, and the cost for deducted work is much lower than that average. The result of this price spread almost insures that the very top price will be paid for additional work and that very little will be given back if the scope is reduced.

The uneconomical extremes of this situation can be illustrated by a change that took place on a recent project. A loading dock was to be reduced in length from 25 feet to 17 feet. The following unit prices applied:

Description	Unit of Measure	Prices Add	Deduct
1. Machine excavation.	cu yd	$15.50	$ 1.75
2. Hand excavation....	cu yd	21.00	7.50
3. Fill	cu yd	6.50	1.75
4. 3000-pound concrete	cu yd	42.00	16.00
5. Forms in place.....	sq ft	2.40	.75
6. Forms stripping.....	sq ft	.15	.15
7. Re-bars	sq ft	.40	.15

The cost of the 25-foot dock was originally estimated to be $4000. The cost of this dock was given back using applicable deduct unit prices and as a change-order allowance was worth only $3000. The cost of the 17-foot dock was then calculated using add unit prices. It came to $4200, or more than the 25-foot dock.

You get less for more if the contract says so

One might think that the contractor could not get away with charging a higher price for less work, but in this case he did, to the dismay of the architect and the owner. If the unit price schedule had not been part of the contract, it is most unlikely that the contractor would have submitted such an ab-

surd estimate for this change. And even if he had, negotiation would have certainly reduced the price below $4000.

The spread between add and deduct unit costs on the schedule above is not unusual. The contractor cannot really be faulted for creating such a large differential; he must cover himself for the most extreme conditions in which the unit price might apply, especially in the add column. For example, 3000-pound concrete might cost $24 per cubic yard under most conditions, but it also could cost $42 per cubic yard if it had to be poured in some inaccessible spot, e.g., a shaft or basement area. For the same item, the deduct unit price of $16 per cubic yard indicates that the contractor would retain his profit and overhead on any work reduction involving concrete. Because these extremes in unit costs must be applied to normal conditions, it is evident that the architect and the owner will fare better economically if a different type of unit price schedule is used, or if each change is negotiated. Otherwise, they are almost certain to pay top dollar for any change.

The second, third and fourth types of unit price schedules described above are preferable to this approach if only because the add and deduct prices are linked in some way; i.e., in format (2), they are identical; in (3) and (4) they are related by a percentage. At best, however, these approaches are a compromise. In filling out a unit price schedule, a contractor will usually put in a higher than average price to cover himself on add changes, and take his chances on deducts. To varying degrees, in equitable systems the price will be related to the cost of the work.

Pre-set prices for changes can waste negotiating time

If a unit price schedule is desired, the architect and owner often fare best using the "change order unit price schedule"—especially on private work. But this only means that time will be spent negotiating unit prices before the project is underway, instead of afterward, when the exact conditions are known and the appropriate unit costs can be applied.

Better negotiate each change as it occurs

Since the architect apparently can obtain the best price on a change through negotiation rather than via a unit price schedule, a practical solution is to prepare an estimate of the change prior to the physical installation or when the change indicates an obvious reduction. At that time job conditions can be readily assessed; prevailing wage rates can be determined; and current material costs can be applied. If the result is not acceptable to all parties, differences can be resolved through negotiation or even by having a third or disinterested party prepare a comparable estimate. The contract should include an arbitration clause and a provision that work will not be stopped because of a change dispute. The architect may be at a disadvantage in negotiations with a contractor. But in terms of price, he has a better chance to save money.

Productivity wage agreements: new British export?

A relatively new and sophisticated process of collective bargaining has achieved a measure of success in Great Britain recently. Known as a "productivity agreement," this method of negotiating wage settlements has potential application to construction industry bargaining in this country.

A "productivity agreement" is not, as might be supposed, simply a wage increase based on assumed increases in productivity resulting from technological advances. Rather, the agreement trades a wage increase for the elimination of an inefficient work practice. In doing this, it offers economic benefits to all parties concerned: To management, a more efficient use of the work force in terms of manpower planning; to labor, immediate pay hikes, plus increased job security stemming from improvements in the competitive position of the industry; to the consumer, price stability.

Higher productivity means more work for everyone

Greater efficiency doesn't necessarily mean a reduction of manpower. In fact, a study of some of the productivity agreements achieved in Great Britain indicates that, in most instances, overtime is the central issue.

This is not too surprising. British industry is similar to the U.S. construction industry in that both suffer great losses in efficiency because of institutionalized overtime. By this is meant either agreements that stipulate a specific number of overtime hours or circumstances where a certain amount of overtime is virtually guaranteed.

Featherbedding is out by mutual consent

Other inefficient work practices that have been the object of productivity bargaining in England include restrictions on management supervision; rigidity in areas of work jurisdiction by skilled trades; restrictions on shift work; work crews overmanned by, for example, too many craftsmen's helpers; and restrictions on individual output. The relevance of each of these conditions varies, of course, from industry to industry in England, as it would from trade to trade in the construction industry here.

British experience demonstrates that two preconditions are necessary for the achievement of a genuine productivity agreement. First, labor and management must be prepared to work harder and be more flexible than they have on past agreements. Labor should re-examine traditional work practices, and management should prepare data that accurately show the potential benefits of higher productivity.

Second, guidelines for negotiation must be established to define 1) specific and quantifiable contributions by labor, 2) effective controls that will insure the projected increase in productivity, and 3) clear benefits to the consumer through a contribution to stable prices.

U.S. labor practices search for stability

At the present time wage settlements in the U.S. construction industry are producing sharp cost increases. Late last spring, the newly formed President's Committee on Price Stability warned that these settlements "threaten to harm the economy seriously." More recently they urged the exercise of "utmost restraint" in wage and price decisions. It was hoped that these calls for responsibility would have some short-run effect, but they have been virtually ignored by the building trades.

In the long run, the committee hopes to introduce greater stability into construction wage agreements by stabilizing the industry, mainly via programs to reduce seasonality. This is a necessary and valuable step: construction seasonality has accounted for 10 per cent of all unemployment since World War II.

INDEXES AND INDICATORS

William H. Edgerton
Manager, Dodge Building Cost Services
McGraw-Hill Information Systems Company

AUGUST 1968 BUILDING COST INDEXES

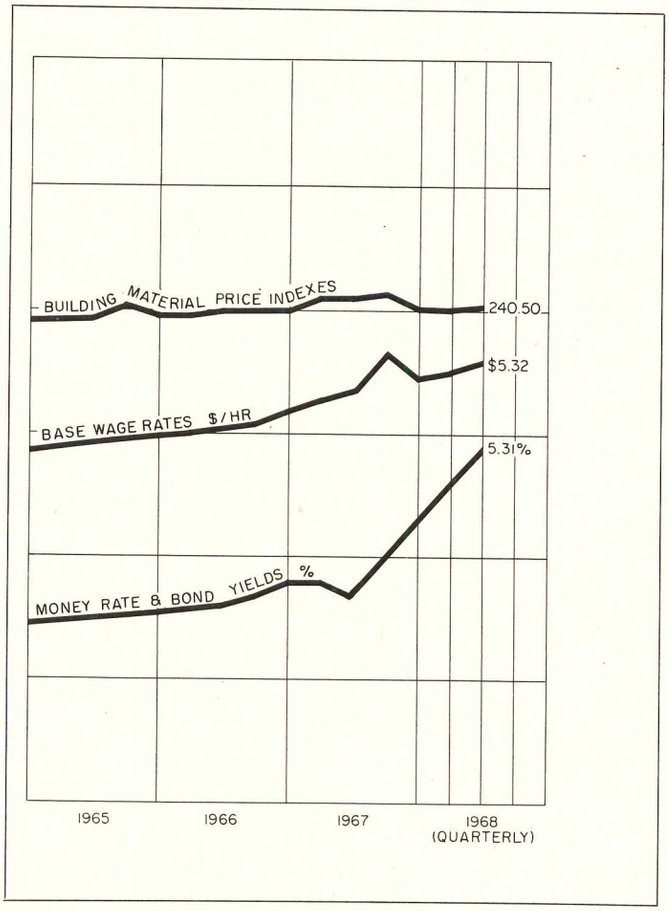
1941 averages for each city = 100.0

Metropolitan area	Cost differential	Current Dow Index residential	Current Dow Index non-res.	% change year ago res. & non-res.
U.S. Average	8.6	293.7	312.9	+4.05
Atlanta	7.3	335.3	355.7	+5.06
Baltimore	7.9	293.5	312.2	+4.11
Birmingham	7.3	266.5	286.5	+3.36
Boston	8.5	263.6	279.0	+4.01
Chicago	9.0	325.6	342.5	+3.15
Cincinnati	9.0	286.7	304.7	+4.74
Cleveland	9.8	314.6	334.3	+9.04
Dallas	7.7	273.8	282.8	+4.01
Denver	8.2	295.5	314.1	+2.21
Detroit	9.2	303.0	318.1	+4.84
Kansas City	8.3	264.3	279.8	+4.86
Los Angeles	8.4	297.3	325.3	+3.01
Miami	8.5	292.6	307.1	+6.42
Minneapolis	8.8	292.9	311.4	+2.94
New Orleans	7.8	261.3	276.8	+2.51
New York	10.0	304.1	327.1	+2.31
Philadelphia	8.6	289.0	303.4	+2.49
Pittsburgh	9.2	278.1	295.6	+6.68
St. Louis	9.1	289.5	306.7	+3.59
San Francisco	8.6	374.5	409.7	+2.85
Seattle	8.5	267.1	298.4	+2.94

Differences in costs between two cities may be compared by dividing the cost differential figure of one city by that of a second; if the cost differential of one city (10.0) divided by that of a second (8.0) equals 125%, then costs in the first city are 25% higher than costs in the second. Also, costs in the second city are 80% of those in the first (8.0÷10.00=80%) or they are 20% lower in the second city.

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

ECONOMIC INDICATORS



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

1941 average for each city = 100.00

Metropolitan area	1960	1961	1962	1963	1964	1965	1966	1967 (Quarterly) 1st	2nd	3rd	4th	1968 (Quarterly) 1st	2nd	3rd	4th
U.S. Average	213.5	264.6	266.8	273.4	279.3	284.9	286.6	292.7	293.7	295.5	297.5	301.5	302.6	303.0	308.1
Atlanta	223.5	294.7	298.2	305.7	313.7	321.5	329.8	332.4	333.4	334.6	335.7	345.6	346.7	347.1	351.1
Baltimore	213.3	269.9	271.8	275.5	280.6	285.7	290.9	290.4	291.5	294.9	295.8	302.9	304.1	304.5	306.7
Birmingham	208.1	249.9	250.0	256.3	260.9	265.6	270.7	272.9	274.0	273.8	274.7	278.5	279.5	279.8	282.6
Boston	199.0	237.5	239.8	244.1	252.1	257.8	262.0	262.9	263.9	264.8	265.7	269.3	270.3	270.7	275.2
Chicago	231.2	289.9	292.0	301.0	306.6	311.7	320.4	320.4	321.3	327.3	328.4	329.4	330.0	330.7	337.4
Cincinnati	207.7	257.6	258.8	263.9	269.5	274.0	278.3	278.7	279.6	287.3	288.2	291.4	292.5	292.8	300.5
Cleveland	220.7	265.7	268.5	275.8	283.0	292.3	300.7	300.0	301.3	302.6	303.7	316.5	318.3	318.7	329.4
Dallas	221.9	244.7	246.9	253.0	256.4	260.8	266.9	267.6	268.5	269.5	270.4	272.3	273.4	273.7	280.0
Denver	211.8	270.9	274.9	282.5	287.3	294.0	297.5	297.6	298.5	304.0	305.1	304.9	306.0	306.3	310.4
Detroit	197.8	264.7	265.9	272.2	277.7	284.7	296.9	298.0	299.1	300.1	301.2	309.2	310.4	310.8	314.3
Kansas City	213.3	237.1	240.1	247.8	250.5	256.4	261.0	260.8	261.9	263.4	264.3	267.5	268.5	268.9	275.9
Los Angeles	210.3	274.3	276.3	282.5	288.2	297.1	302.7	303.6	304.7	309.0	310.1	312.0	313.1	313.5	318.0
Miami	199.4	259.1	260.3	269.3	274.4	277.5	284.0	283.4	284.2	285.2	286.1	293.1	294.3	294.6	303.2
Minneapolis	213.5	267.9	269.0	275.3	282.4	285.0	289.4	292.0	293.1	299.2	300.2	300.0	301.0	301.3	307.7
New Orleans	207.1	244.7	245.1	248.3	249.9	256.3	259.8	262.3	263.4	266.7	267.6	270.6	271.6	271.9	273.0
New York	207.4	270.8	276.0	282.3	289.4	297.1	304.0	309.4	310.6	312.5	313.6	315.9	317.0	317.4	319.4
Philadelphia	228.3	265.4	265.2	271.2	275.2	280.8	286.6	287.1	288.1	292.8	293.7	293.3	294.2	294.5	299.8
Pittsburgh	204.0	250.9	251.8	258.2	263.8	267.0	271.7	272.2	273.1	274.1	275.0	283.0	284.2	284.5	292.1
St. Louis	213.1	256.9	255.4	263.4	272.1	280.9	288.3	290.3	291.3	292.3	293.2	293.7	294.7	295.0	302.5
San Francisco	266.4	337.4	343.3	352.4	365.4	368.6	386.0	388.1	389.2	389.6	390.8	396.4	398.0	398.5	400.5
Seattle	191.8	247.0	252.5	260.6	266.6	268.9	275.0	276.5	277.5	282.6	283.5	286.2	287.2	287.5	290.6

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

Meet cure-membrane specs and save 40%

PLIOLITE resin-based concrete cures meet even California Rule 66. Give 2/3 more coverage than chlorinated rubber.

These styrene-based resins give you the edge on three vital criteria for choosing concrete curing membranes.

1. They meet specs, including ASTM 309-58 and TT-P-00800. PLIOLITE® resin-based membranes promote maximum compression and modulus of elasticity in concrete. And they can be used with solvents that meet California Rule 66 and other anti-pollutant regulations.

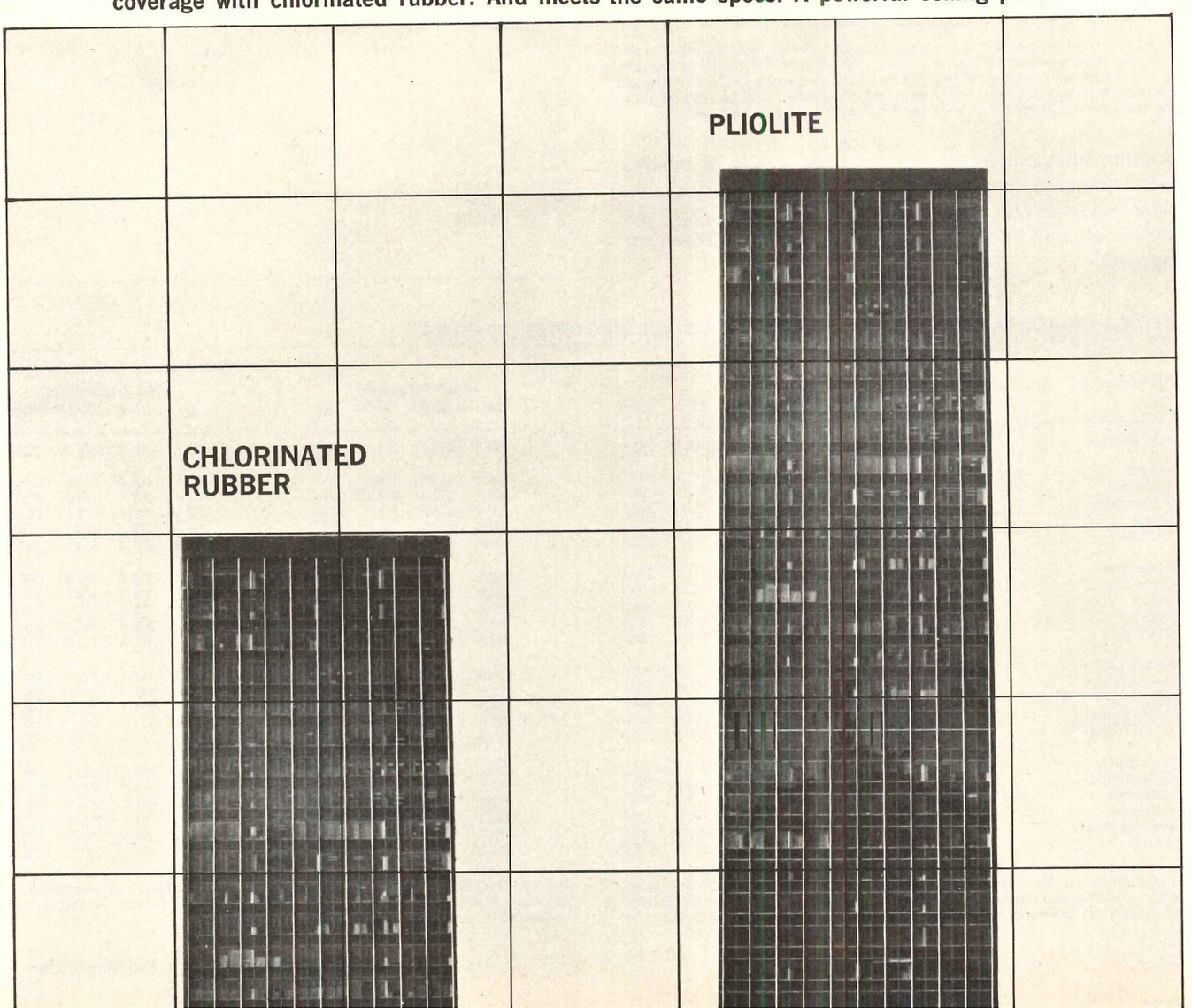
2. They prevent problems with floor coverings, give superior adhesion to tile—as tile manufacturers proved for themselves in a test of 12 curing membranes. 16 of the 17 manufacturers judged the PLIOLITE formulation best for adhesion. Paint adhesion is good, too. And PLIOLITE resins don't support bacteria or fungi that attack carpeting.

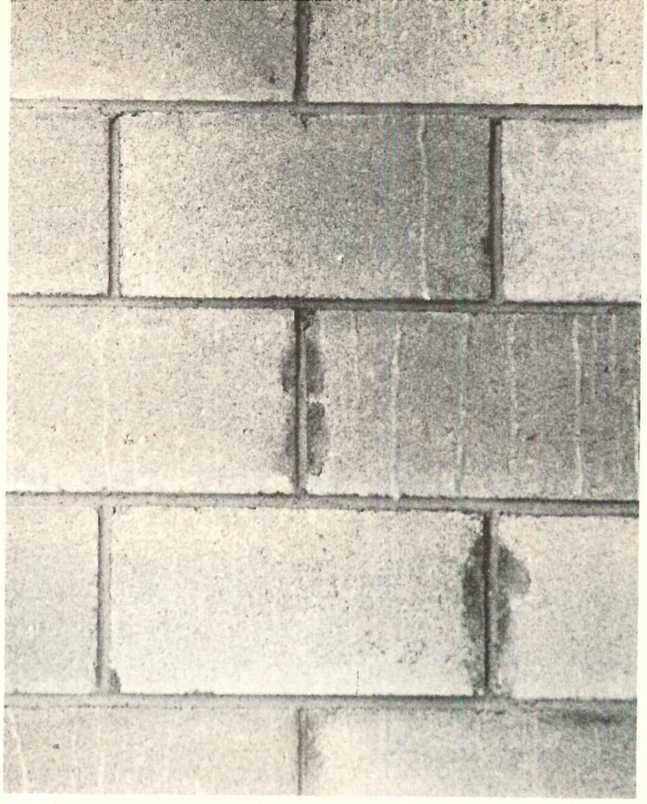
3. They give you a cost savings. You can formulate curing membranes that meet ASTM 309-58 for about 40% less than the same coverage in chlorinated rubber. A huge advantage on high-volume bids, as illustrated in the picture below.

You can offer some other advantages, too. Easy spray-on application. Superior resistance to UV light, chemical attack and spalling. A choice of a styrene/butadiene binder (PLIOLITE S-5), and a styrene/acrylate copolymer one (PLIOLITE AC).

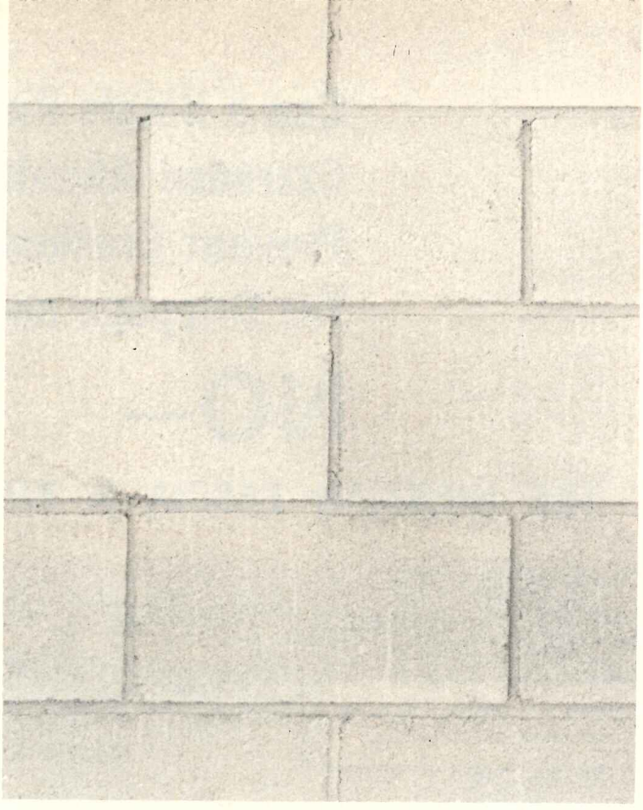
We think that's the only real choice in curing membrane binders today. And we'll be glad to send you data and samples to prove it.

A PLIOLITE resin-based curing membrane covers a 25-story building for the cost of 15 floors' coverage with chlorinated rubber. And meets the same specs. A powerful selling point.





UNCOATED CINDER BLOCK



WITH PLIOLITE FILL COAT

Stop an 8-hr "hurricane"

Both masonry surfaces above have faced spray driven at the equivalent of 98 mph for 8 hours. See the protection with PLIOLITE resin-based fill coats.
These are the only fill coats that meet this test in Federal Specification TT-F-001098. They offer you a unique opportunity in a growing market.

Fill coats with PLIOLITE form a waterproof shield on concrete, cinder block and stucco. Save money because they make paint go farther.

The nonporous coated surfaces can't blot up paint. They give the paint a better grip, save repaintings. Resist abrasion, heat, cold, sun, UV light.

PLIOLITE resin-based fill coats are easy to apply by spray, brush or roller, and even easier to formulate. The high styrene/butadiene copolymer resin dissolves readily in many low-cost industrial solvents.

And getting details is easier yet. Just send the coupon for samples and information.

Simplify basement sealing

Sealers made with PLIOLITE VTL-resin come ready to use.
They spray, roll or brush—onto dry or damp surfaces. And give results you can stand behind. Our vinyl-toluene/butadiene resin provides strong adhesion to masonry, high resistance to water and alkalis.

PLIOLITE VTL-resin may save you some fuss, too. It comes as free-flowing white granules, dissolves easily in mineral spirits of KB 36 or higher. A big improvement in basement sealers. Get in on the ground floor.

Goodyear Chemical Data Center, Dept. U-84, Box 9115, Akron, Ohio 44305.
Please send me samples and data on PLIOLITE® resins for the following applications:

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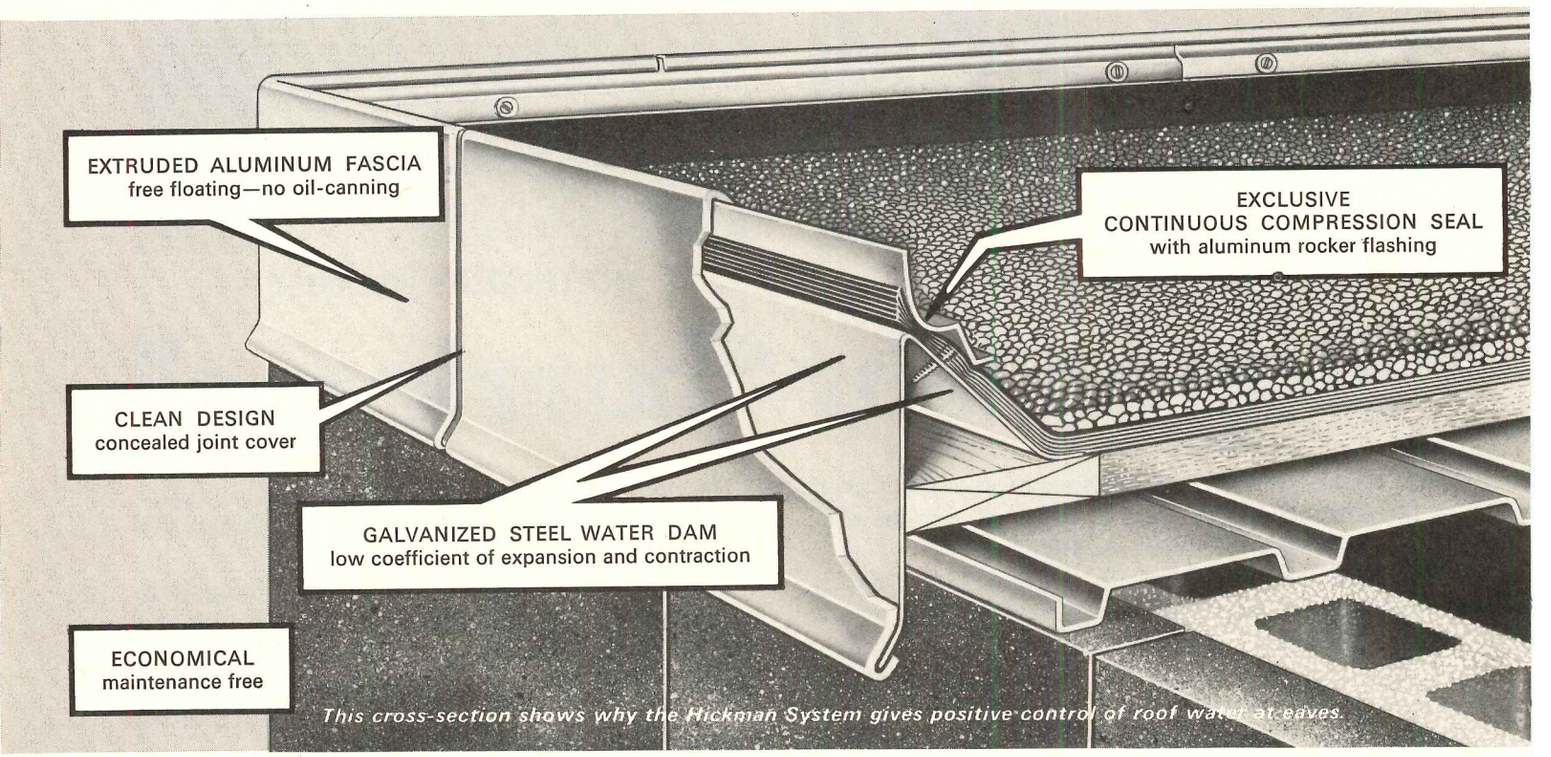
Can a Single Piece, Extruded Aluminum Gravel Stop Prevent Cracked Felts, Roof Leaks, Tar Drippage and Water Stains?

NO—

BUT THE HICKMAN FASCIA & WATER DAM SYSTEM CAN AND DOES.



This cross-section shows why the Hickman System gives positive control of roof water at eaves.

Most architects are all too aware of common roof problems—especially cracked felts, leaks, tar drippage and water stains. These are both costly and unsightly, and of course, they affect overall job quality and reputation.

The Hickman *Safeguard* fascia & water dam and expansion joint systems do eliminate these problems.

And, surprisingly perhaps, the installed cost of Hickman System is about the same or less than extruded gravel stop systems. Call your local Hickman Distributor for comparative cost data.

The key to the Hickman fascia and water dam system is the unique, continuous compression seal, along with the time-proven thermal compatibility of roofing felts with the galvanized steel (not copper or aluminum) water dam.

There is no evidence of failure of any Hickman System after thousands of installations in over ten years throughout the country.

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PROFESSIONAL SERVICES

Edward J. Agostini
Director, Becker and Becker Associates, Inc.
Programing Consultants

Programing: demanding specialty in a complex world

Advancing technology in both science and business has greatly increased the range of design options available to the architect, and at the same time has broadened, varied and made economically critical the functional requirements of the client's program. Today, the demands on the architect are increased by a triple pressure: 1) he must devote more time to design; 2) he can depend less on past experience and intuition to interpret the client's needs; 3) economic factors are increasingly stringent and dictate greater attention to programing.

Increasing costs of construction, the high cost of money, demand for capital, and the shortage of land combine to increase the premium on maximum efficiency of space use and to make premature obsolescence of new buildings intolerable. Yet, there still are instances of important and costly new buildings which, in a short time, fail in one way or another to meet the dynamic needs of the user.

Last year, the American Institute of Architects undertook a study of programing under the direction of Benjamin H. Evans, then director of education and research programs. Mr. Evans, now executive vice president of B.R.I. and continuing his interest in publication of the study, believes that "the development of thorough programing techniques holds promise of being the most significant development in architecture in current times."

A good program is a matter of fact—not design

A good program is oriented to three basic needs of the client: for human amenities, for operational efficiency and for orderly growth. It objectively defines present and future functional requirements by a systematic analysis of all factors relating to personnel, growth and individual work space standards. It considers special equipment and services, communication, adjacencies, and work and traffic flow. A thorough program also includes a determination of shared facilities for parking, food service, and meeting and training requirements, as well as special activities such as laboratory and electronic data processing installations.

The end product of the program is information—not design. It is a coherent, meaningful compilation of the facts needed to create facilities which will most effectively support the client's operations and organizational goals. A good, objective program should neither limit nor dictate design. It should permit wide design latitude and provide necessary criteria against which the architect can assess the validity and viability of his design solution.

The role of professional programing in the design of the new Boston City Hall is a case in point. In 1959 Becker and Becker, as part of an over-all programing assignment for the Government Center in Boston, developed data on space requirements which were made part of the architectural competition documents for the new City Hall. The competition was conducted by the A.I.A. and the winning entry was by Kallmann, McKinnell & Knowles, Campbell & Aldrich, and William J. Le Messurier & Associates, operating as a joint venture called City Hall Architects and Engineers.

The building was so unusual in massing and appearance that it met with some community resistance; whereupon the Government Center Commission asked the programing consultants to confirm that the space allocations met the functional requirements set forth in the program. The consultants' testimony as to the functional validity of the building, coupled with the prestige of the A.I.A. jury and the design group, made it possible for this outstanding structure to proceed exactly as the architects had conceived it. It is important to note that the design of this building evolved entirely on the basis of a written program. The architects, in fact, were specifically enjoined against direct contact or dialogue with the client during competition phases of design. The design thus grew uninhibitedly from the program and was supported by it.

A complete program saves time and money for architects

At an early stage in any project, the architect must develop or have prepared for him an approved comprehensive document expressing the client's needs and how they relate to the new facilities. A good program available at the outset leaves maximum time available to concentrate on meaningful design. The architect avoids wasted time on irrelevant solutions which often consume profit and may even result in a compromise design dictated by time pressures. Moreover, since the design phase usually occupies most time of the principals of an architectural firm, savings of this high-cost time can be significant.

According to D'Orsey Hurst & Company, management consultants with broad experience in architecture and engineering, preliminary design is the phase of a project which presents the architect with the most difficult problems of time and cost control. Although only 20 per cent of the total fee is ordinarily allocated to preliminary design, all too frequently twice that amount is devoted to design explorations, and the profitability of the entire project is dissipated. A sound program equips the management of the architectural firm with an effective tool for internal control during this critical phase of the work.

A good program eliminates the possibility of omissions which pose increasing dangers to budgets and schedules as

the job proceeds. In addition, a comprehensive program at the outset gives the architect a realistic basis on which to evaluate the types and caliber of outside technical consultant services he will need for the project—and he can set his fee accordingly. This, too, can have a significant impact on the profitability of a large commission.

The over-all relationship of program quality to profitability is established in the A.I.A. study, "Economics of Architectural Practice," prepared in 1967 by Case and Company, management consultants. In analyzing 1022 projects in which the client provided the program, pre-tax income averaged 11.8 per cent when the architect rated the program as "good." On those projects where the client-prepared program was rated "poor," profit dropped to 7.9 per cent, representing a reduction in profit of 33 per cent.

The extent of program detail may call for a separate commission

The amount of systematic research, analysis, and evaluation of the client's operation required for a good building program is such that many architects have set up separate fee structures for this work, or have welcomed the formal, third-party documents prepared by independent experts. The programing process demands involvement of the client's entire management group. It must force a careful and professional assessment of the organization's real needs and goals, divested so far as possible from errors introduced by the over-developed wishes of certain department heads and the limited sophistication of others in projecting their needs.

The professional programer (architect or consultant) makes use of highly developed fact-finding techniques in personal interviews throughout the client's organization. During the data collection process, results are periodically reviewed and approved at several management levels. The use of controlled techniques insures uniformity in the collection and processing of data. Broad management involvement assures a high degree of reliability. As a highly skilled researcher, the programer must be imaginative in searching out the client's true needs and establishing the special facilities uniquely suited to his activities.

The computer can be useful in complex program analysis

Complex programing can be advanced by the application of computer analysis and electronic processing of occupancy data. The computer is particularly useful in projecting the impact of growth and change on long-range space requirements for large-scale projects. Electronic data processing is also applied to statistical analysis of work and traffic flow, adjacency, and meeting requirements.

A computer-assisted program developed by our firm was recently used in a study of requirements for the new Xerox Corporation headquarters building in Rochester. According to Paul Van Wert, Xerox facilities planning manager, who is an architect, "The application of these advanced programing techniques contributed significantly to the efficient space utilization of the building and helped us effectively plan for our dynamic growth."

The program document itself should be a comprehensive report that presents in text and in tabular form the detailed quantitative and qualitative requirements of the entire client organization. The recommendations should include functional space standards, department-by-department space analysis and suggested organizational groupings which respond to adjacency, work and traffic flow requirements. Guidelines for accommodating future growth in an orderly manner while preserving these interrelationships should also be included. In its format and terminology, the program document should permit all concerned to understand, abide by, and implement its conclusions.

Preparation of an effective program for a corporate hierarchy requires full participation, consensus and clearance typical of today's multi-client. A recent programing commission for a new 400,000-square-foot facility, for example, involved 87 separate interviews in which 40-man-days were needed simply to assemble raw data.

How objective programing benefits the client

Programing as a separate commission, either by the architect's staff or by an objective outsider, presents the owner with a positive opportunity to play his proper role in describing functional requirements to his architect. Although the standard agreement between owner and architect places responsibility for the program in the hands of the client, in practice he rarely either accepts or assumes this responsibility fully. This is confirmed by the A.I.A. study on "Cost of Architectural Services", which revealed that institutional and corporate clients provided the program in only half the projects studied, and that only 60 per cent of the programs were acceptable. This means that clients provided usable programs in only 30 per cent of the cases.

It is understandable that pressures of time and money will frequently lead the architect to include the program as part of his work. The architect must recognize, however, that in so doing he not only increases his costs, but he assumes a responsibility which rightfully belongs to the client.

The development of a program induces the client to make a thorough reexamination of his provisions for maximum utilization of human resources. An objective evaluation gives him a rare chance to make a clean break from the familiar—but not necessarily effective—ways of the past.

Practice conditions today support the case for the program consultant

The professional programer of adequate skills and experience draws from the client an explicit definition of all his operating conditions that affect the building. The programer is then able to communicate this information in understandable form to the architectural designer. As an objective third party, the programer can help the client with the complex process of determining and fully understanding his own requirements. Ambiguities in the project are eliminated when a complete and thoroughly documented program is prepared, approved and delivered to the architect. At this point, the distinction between the client's responsibility and the architect's is clearly established. This distinction is virtually impossible for the architect to achieve if he accepts a program from the client which later turns out to be deficient.

Experience demonstrates that a coordinated programing group that includes architect, client, and consultant sparks the creative interaction requisite to formulation of a meaningful program. The traditional relationship between the architect and his client remains inviolate. As a practical matter, the architect should be actively involved during the programing phase. He should attend review sessions with client management groups, keep abreast of all significant program findings as they emerge, and participate in management meetings at which programing is aired.

In connection with the expanding scope of architecture today, George E. Kassabaum, principal of Hellmuth, Obata & Kassabaum, Inc. and president of the A.I.A., asserts: "Regardless of the size of the firm, an architect in 1968 does not always have the personnel, the time or the temperament to do all of the things that must be done to give a full service to his clients. He must supplement his own talents and abilities with the knowledge and experience of others. It is this concept of a team effort that holds out hope for the architectural profession's remaining an influential force in developing tomorrow's physical environment."

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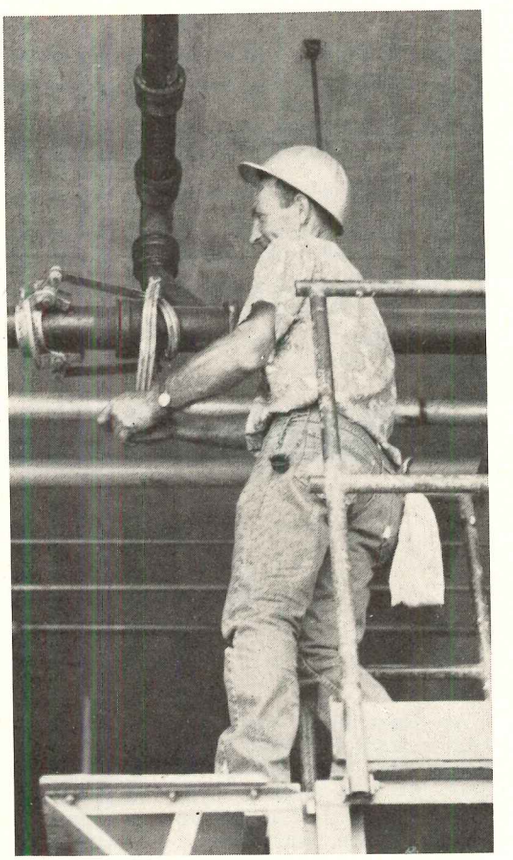

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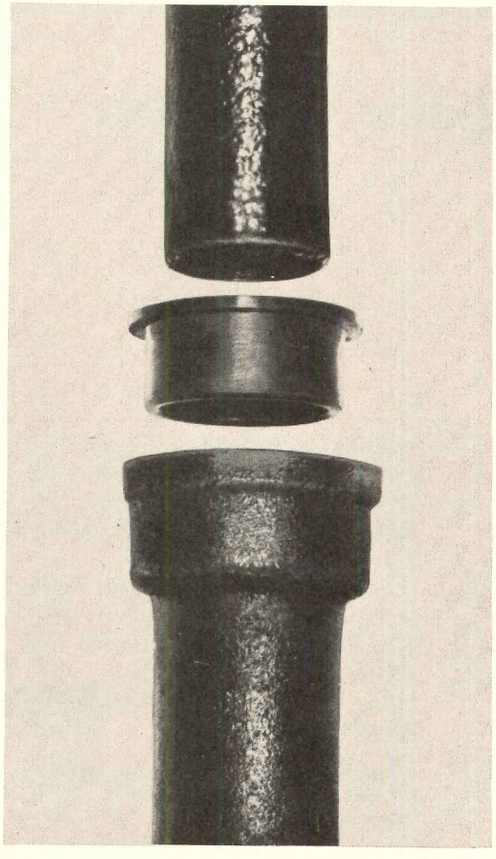

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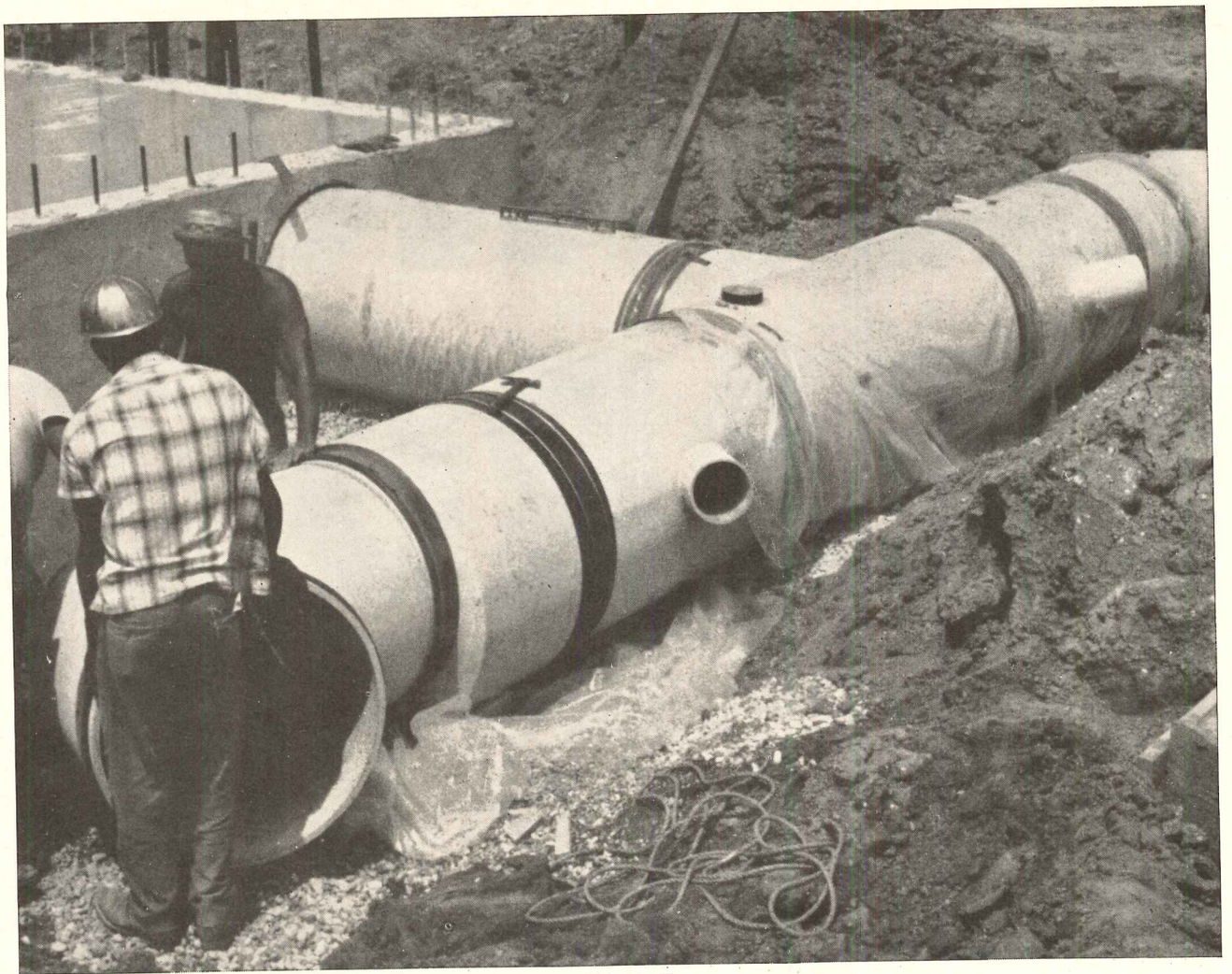

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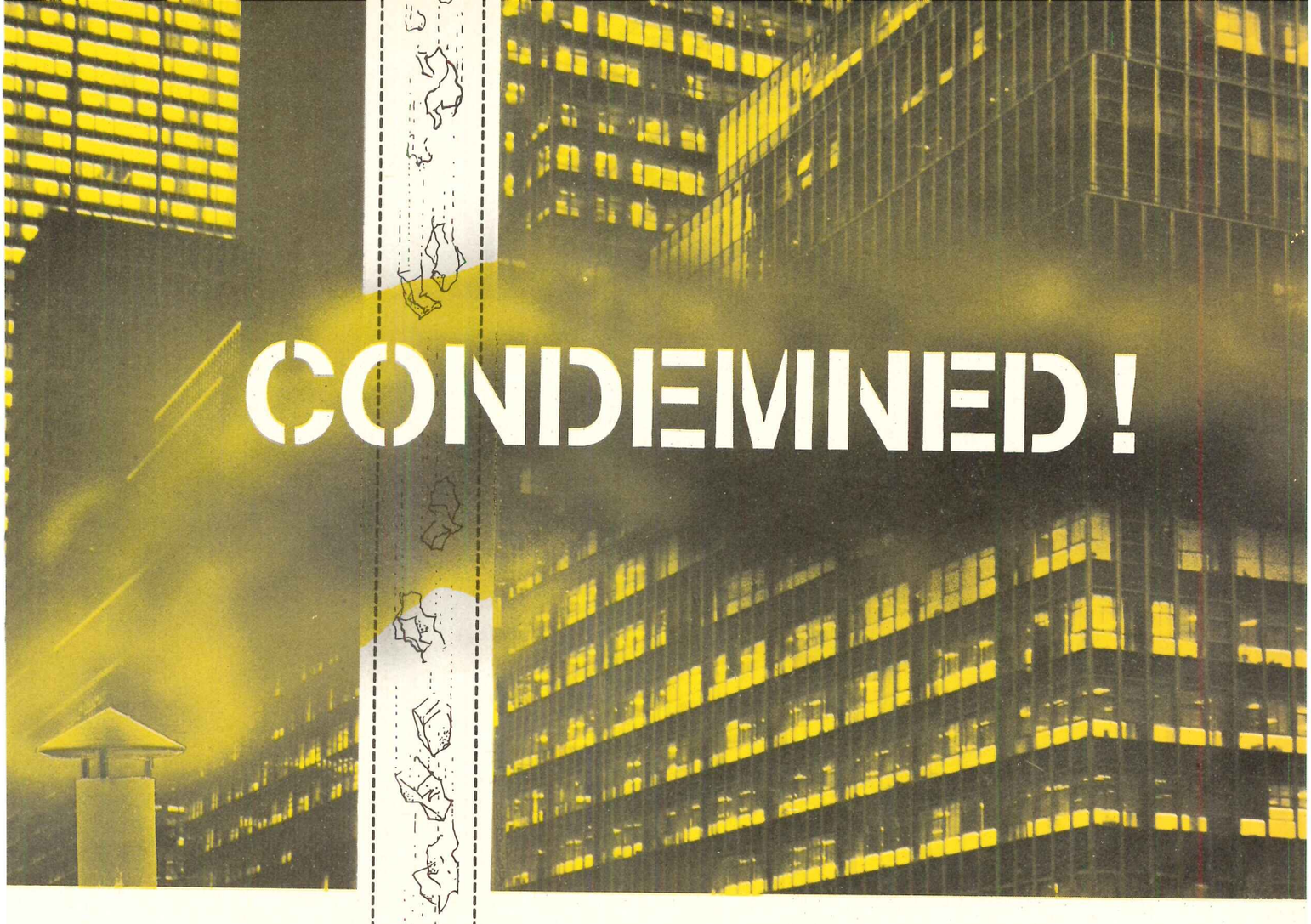

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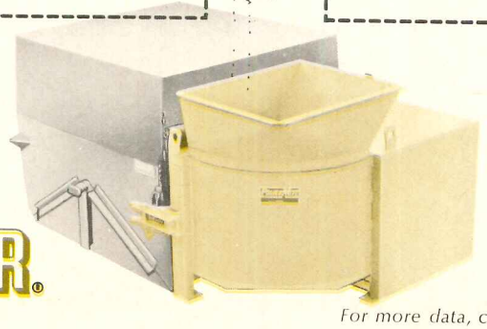

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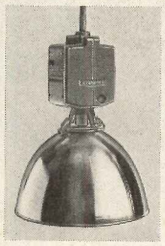
If you want to know how bright the light is, don't look up. Look around.



If you look up, you won't see much.

We designed our Vanguard fixture to brighten work areas below, and that's just what it does.

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Other accessories include a wire guard and externally accessible fuses.

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OFFICE NOTES

OFFICES OPENED

Building Program Associates has opened Seattle offices at 120 Sixth Avenue North. The firm's main office remains at 5 Third Street, San Francisco.

Ellerbe Architects, with offices in St. Paul, Minneapolis and Rochester, Minn., has established a Washington, D.C. office at 1730 Rhode Island Ave., N.W.

Robert Melik Finkle, A.I.A. announces the opening of an office at the Battell Block, Middlebury, Vermont.

Hall-McGuff Architects has opened a new office for the continued practice of architecture at 711 Houston Bank & Trust Tower, Houston.

Fenton Hollander, Architect announces the establishment of his practice at 16 Eliot Street, Cambridge, Mass.

NEW FIRMS, FIRM CHANGES

A partnership for the practice of architecture, **Bahr & Hanna,** was recently formed by **Deon F. Bahr** and **Robert L. Hanna.** The new firm is located at 555 Stuart Building, Lincoln, Nebraska.

Sidney R. Barrett, Architect, A.I.A., has appointed **L. Henry Lowrance** and **James P. Chapman** as associates. The name of the Atlanta, Georgia firm is now **Sidney R. Barrett, Architect, A.I.A. and Associates.**

Donald R. Roark and Associates, Architects, A.I.A. of Denver, has appointed **Jack N. Bell, A.I.A.** as an associate member of the firm.

Biggers & Neal, Architects, announces that **Philip N. Spann** and **Gaines B. Hall** have joined the firm as partners. The firm, located in Dothan, Alabama, is now known as **Biggers, Neal, Spann & Hall, Architects.**

William A. Bowersox has been named an associate member of the St. Louis architectural firm of **William B. Ittner, Inc.**

Arthur H. Bush & Associates, Architects, formerly **Moore & Bush, Architects,** recently announced the opening of new offices at 2243 West 32nd Avenue, Denver. The firm's new name follows the departure of **T. J. Moore, Jr., A.I.A.** to accept a position with **Hugh Stubbins and Associates,** Cambridge, Massachusetts.

Francis L. Brown, P.E., has joined with **Paul B. Slusarev, A.I.A.** to form the new New York City firm of **Brown & Slusarev, Architects and Engineers.**

The offices of **Henrik Bull, John Louis Field, Sherwood Stockwell** and **Daniel G. Volkmann, Jr.** have formed a new partnership for the practice of architecture and

continued on page 108

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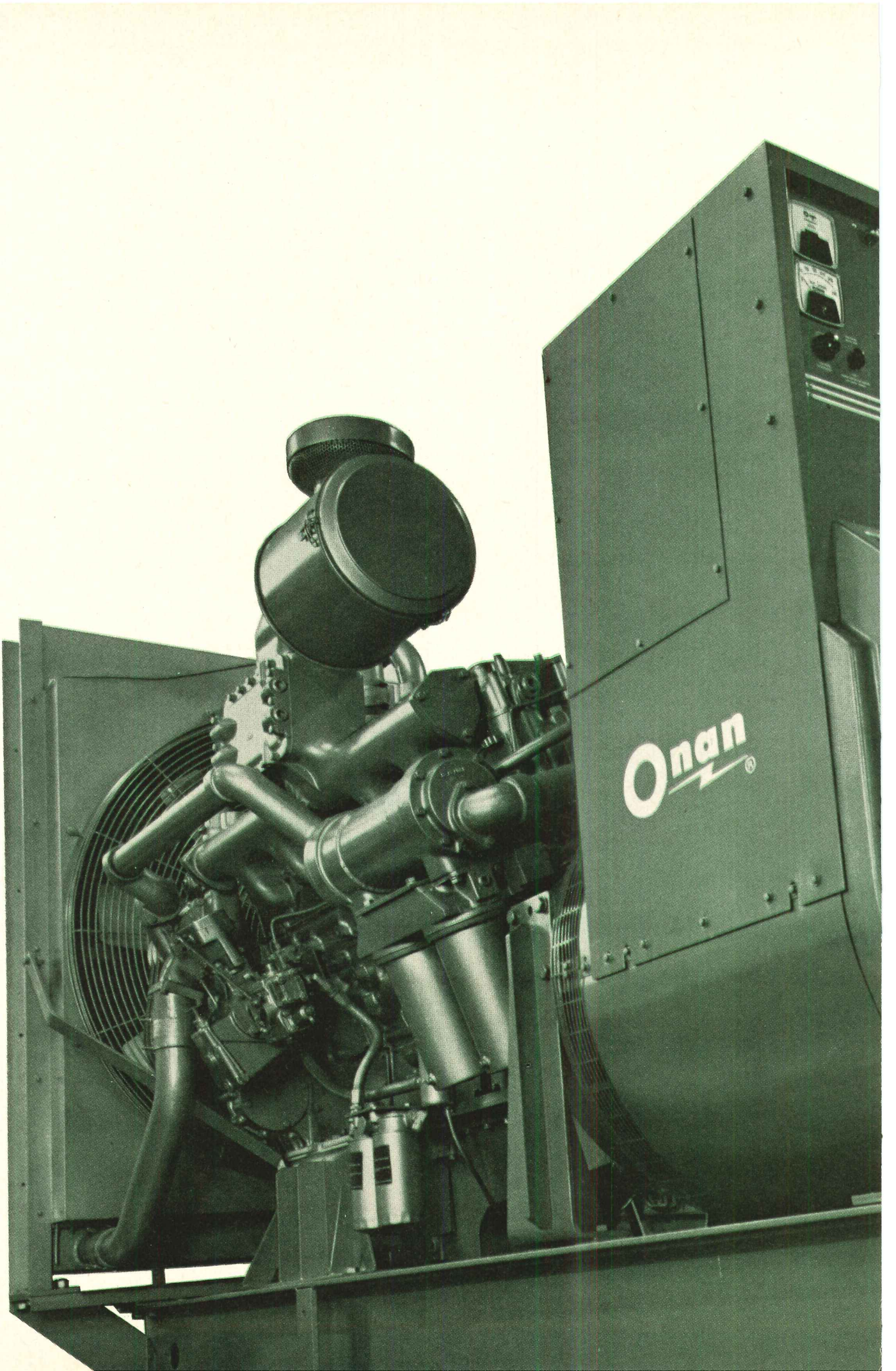
PHOTOS: Left to right. International Airport, Spokane, Washington; Warren Cummings Heylman and William H. Trogdon, Associated Architects. King County Medical Service Corporation, Seattle, Washington; Grant, Copeland & Chervenak, AIA and Associates, Architects. Willkie Quadrangle, Indiana University, Bloomington; James Associates, Architects. 968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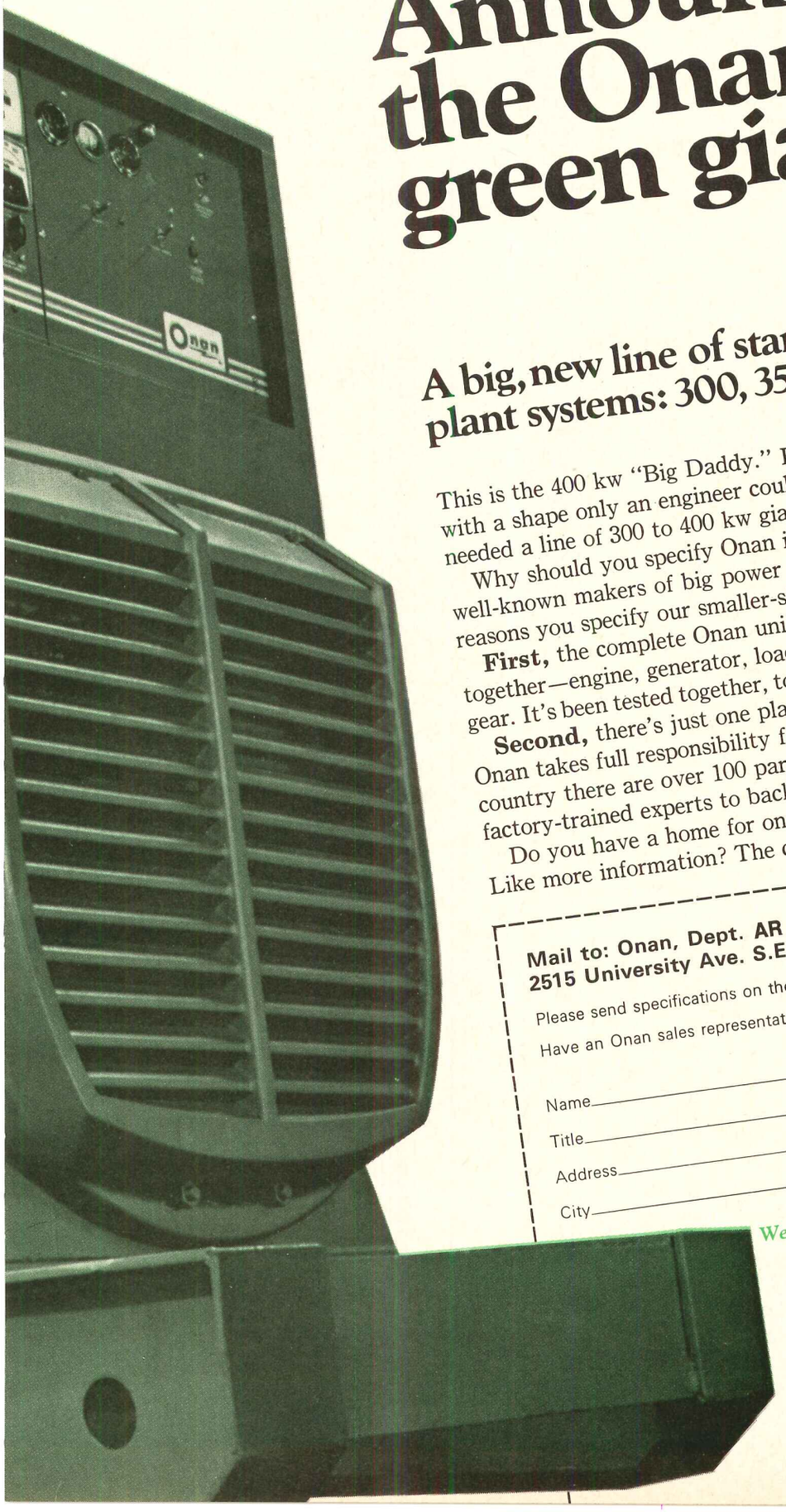

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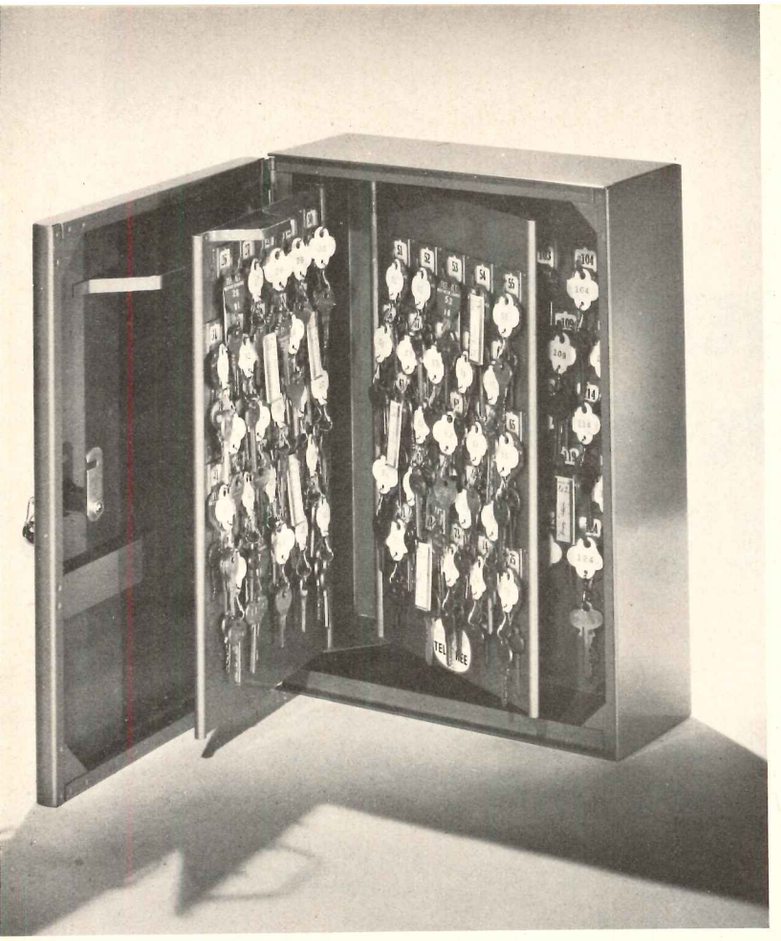

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*Thank you so much, Merton, Paisley & Brokaus, A.I.A.**

How did you know that a lot of us girls use tampons instead of sanitary napkins? Those of us who do, sure appreciate those nice built-in vending machines that hold *both.*
You can be sure if we ever hear of anyone who needs a good architect, we'll recommend you.

Sincerely,
Mary Sharp

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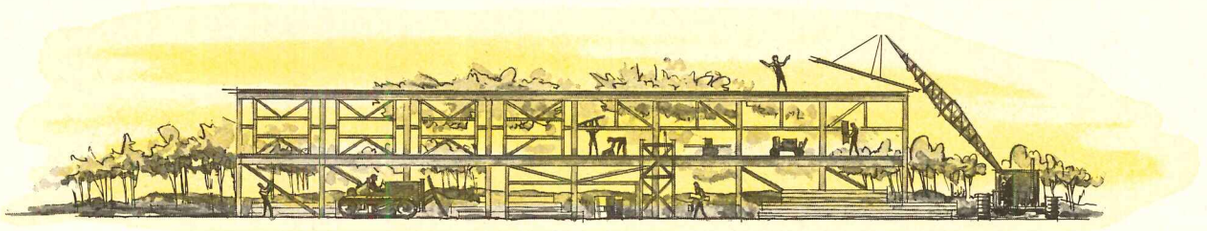

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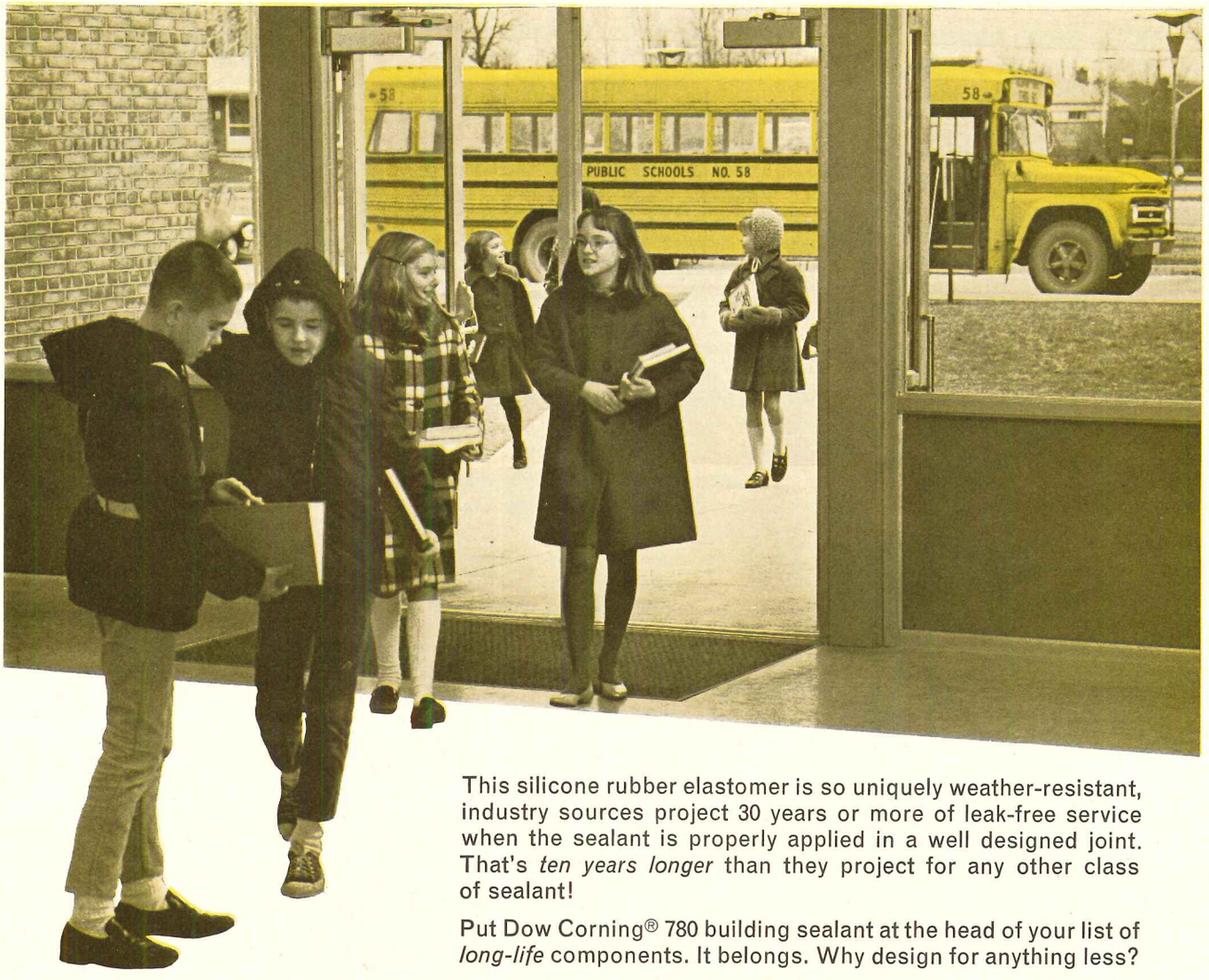

This silicone rubber elastomer is so uniquely weather-resistant, industry sources project 30 years or more of leak-free service when the sealant is properly applied in a well designed joint. That's *ten years longer* than they project for any other class of sealant!

Put Dow Corning® 780 building sealant at the head of your list of *long-life* components. It belongs. Why design for anything less?

See Sweets for Dow Corning 780 building sealant and Terraseal 100® polyurethane sealant for horizontal traffic joints. They're both extra long life. Or drop us a line for FREE DEMONSTRATION SAMPLE and full particulars. Address Dow Corning Corporation, Dept. A 8410, Midland, Michigan 48640. Offer good only in U.S.A.

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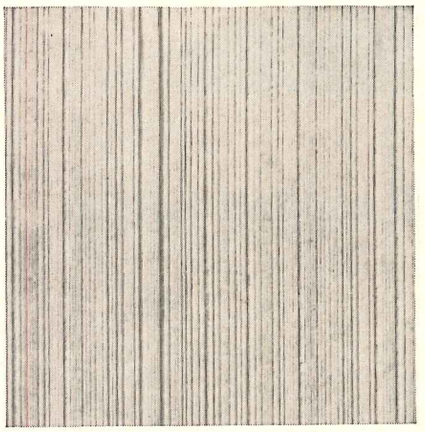
NEW!

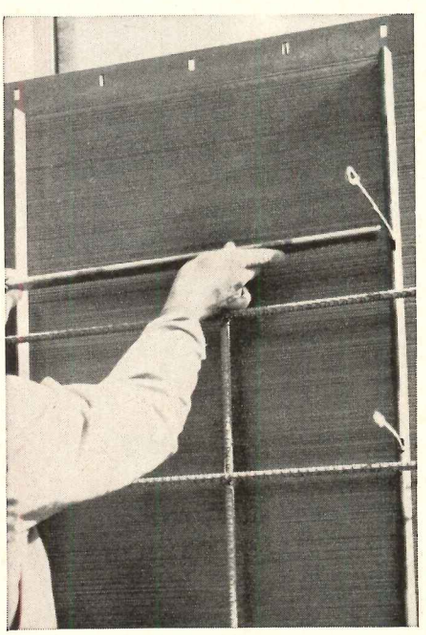


SYMONS DEEP GROOVE STRIATED FORM LINER

Symons Deep Groove Striated Form Liner leaves a soft, handsome effect to exposed concrete surfaces. Of prime benefit to the architect is the manner and ease of finishing the deep groove striations, reducing the exposure of any imperfections that may be present due to rock pockets, honeycombs and bug holes.

Normal size of the liner is 4′ x 8′, but can be ordered in any size up to 4′ x 16′. It is made entirely of a wood composite, which can be easily attached to the forming surface.

Striated form liner may be used in conjunction with Symons Rustication Strip, illustrated below. Ties are inserted through the Rustication Strip, leaving the tie hole in the impression, and not in the face of the concrete. Complete details about the striated form liner and rustication strip are available upon request.



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MORE SAVINGS WITH SYMONS

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continued from page 102

planning under the name of **Bull, Field, Volkmann, Stockwell Architects, A.I.A.** The new firm's main offices are at 400 Pacific Avenue, San Francisco.

David C. Baer A.I.A. and Waller S. Poage A.I.A., Architects–Engineers–Planners has appointed **Allen R. Carney, A.I.A.** as associate architect to direct the firm's regional offices at Wytheville, Va.

Arthur R. Cogswell, A.I.A. and **Werner Hausler, A.I.A.** recently announced the formation of a partnership for the practice of architecture under the name **Cogswell/Hausler Associates.** The new firm's address is University Square, Chapel Hill, North Carolina.

John R. Diehl and **Frank E. Miller** have announced that **Alfred Busselle** has joined them in partnership. The Princeton, New Jersey firm continues in the general practice of architecture under the name of **Diehl Miller Busselle.**

Weston H. Blake, A.I.A. and **William R. Manning, A.I.A.** have retired as partners of the Wilmington, Delaware firm, **Dollar, Bonner, Blake and Manning.** The partnership continues under a new name, **Dollar, Bonner and Funk—Architects.**

The Montreal firm of **Donaldson, Drummond, Sankey, Architects** recently changed its firm name to **Donaldson/Sankey Architects. Derek Drummond,** now at McGill University, remains associated with the firm as a consultant.

Hugh Hardy, Malcolm Holzman and **Norman Pfeiffer,** formerly **Hugh Hardy & Associates,** have announced the formation of their partnership, **Hardy Holzman Pfeiffer Associates,** offering architectural planning and programing services and located in New York City.

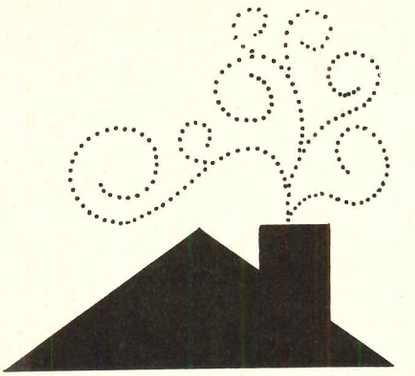
Leroy K. Lehner has joined the staff of **Richard Haag Associates, Inc., Landscape Architects/Urban Planners** of Seattle, as an associate landscape architect.

Lackey, Sokoloff, Hamilton, Blewett, A.I.A., Architects and Planners, recently announced the formation of their new firm. Principals of the firm, located at 244 Kearny Street, San Francisco, are: **Lawrence Lackey, A.I.A., H. David Sokoloff, A.I.A., Irving G. Hamilton, A.I.A.** and **Harold Blewett, A.I.A.**

Ronald J. Woody, Jr., Donald T. McQuillan and **Edward R. Carlin** are now associates of **Lorenzi, Dodds & Gunnill.** The engineering and architectural firm has offices in Pittsburgh and Washington, D.C.

Duane Lyman and Associates announced the formation of a new firm, **Lyman, Baldwin and Castle Architects.** The Buffalo, New York firm includes **Guy H. Baldwin, A.I.A.** and **Peter G. Castle, A.I.A.** as principals.

continued on page 122



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Red Jacket's new pump reference file should be at the side of anyone involved with a domestic, commercial or industrial installation that must get its water supply from a well. Included is a section entitled "Practical Engineering Information", covering everything from average water requirements for home and farm, procedures for determining distance to water level, practical suction lifts . . . to water friction tables and how to estimate operating costs.

As a handy reference it will help you be sure you're specifying and installing the right size and type of pump and tank for present and future requirements for any water system. It's yours for the asking. Just clip the coupon!

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no architect specifies *TRUS JOIST* only once *

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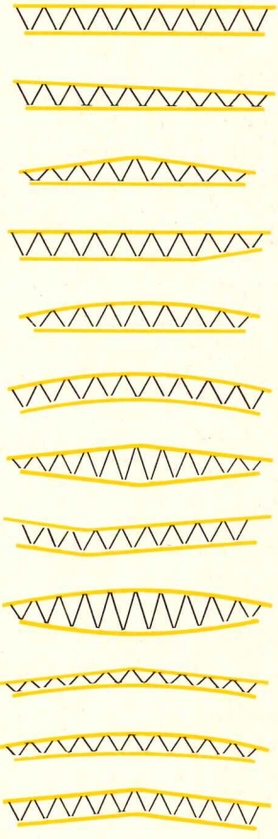
...or design your own. Shown below are twelve TJ profiles but almost any design, including curves, crescents and even "S" shapes, is possible and economical.



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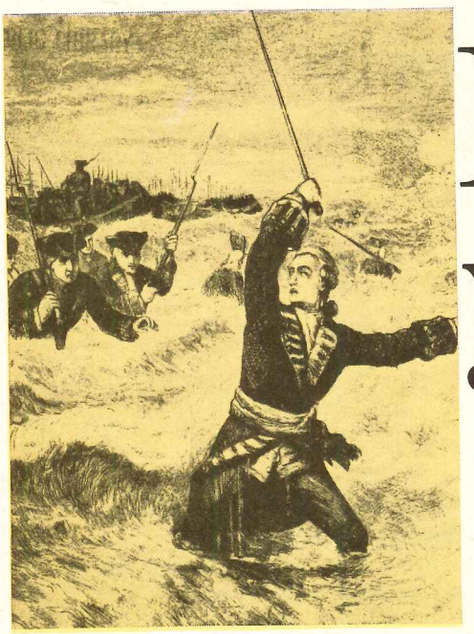

If it's not, you're sunk!

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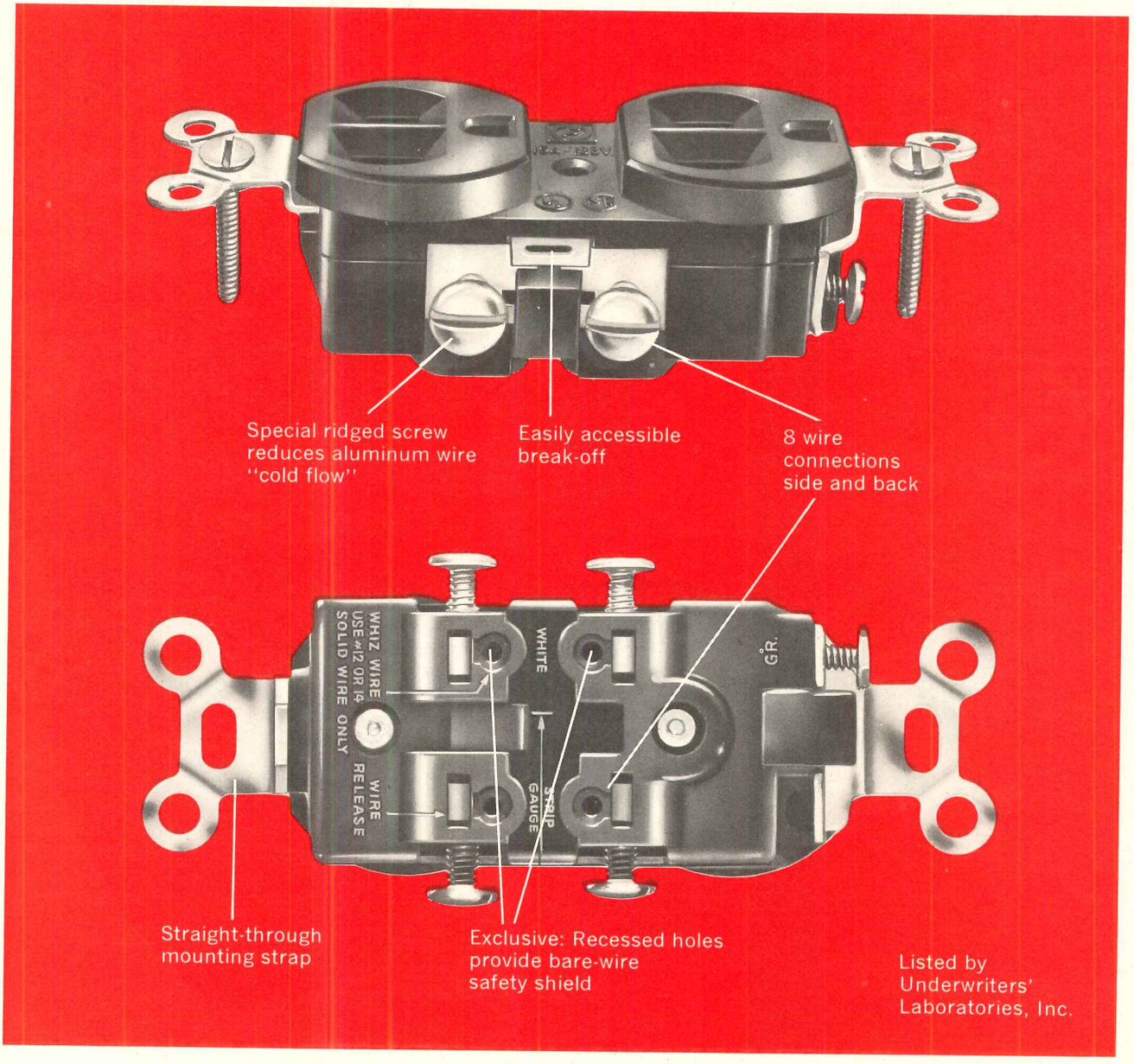

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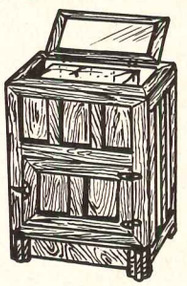
WHY

are air chambers like "Ice boxes"?



...because they are obsolete, inefficient and need constant attention...

MEETS A.S.S.E. STANDARD 1010 AND P.D.I. STANDARD WH-201

the MODERN WAY to eliminate water hammer is to install

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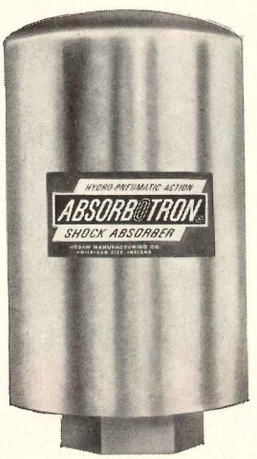
ABSORBOTRON®

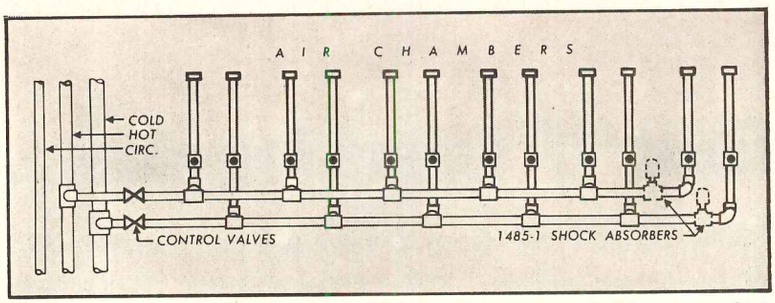
shock absorbers



Prove it yourself . . . using an established test*. You will find that a huge air chamber 57" high will fail to perform when it approaches 5,000 cycles, while a small 8" high Absorbotron Shock Absorber continues to perform indefinitely. The shock absorbers, moreover, may even cost less! The installation below indicates a typical placement of air chambers for hot and cold water branch lines serving 6 lavatories. The twelve air chambers, from 12" to 24" high, take up excessive space. Yet, two small shock absorbers can provide the same service.

Moreover, the air in an air chamber is absorbed by the water . . . and the air chamber becomes ineffective unless constantly recharged. Why use obsolete products requiring costly maintenance when you can use Absorbotron Shock Absorbers and end the problem for all time?

* Test: 50' of 1" pipe, water at 60 p.s.i., flow pressure at a velocity of 10' per second.



2 shock absorbers	$30	12 air chambers @ $2	$24
Installation @ $2	4	Installation @ $2	24
	$34		$48

(Costs are approximate, depending on area)

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SEE SCALE/4 SCALE/8 SCALE/12 SONICWAL STC 38 IN SWEET'S 17j Pa AND 13d Pa

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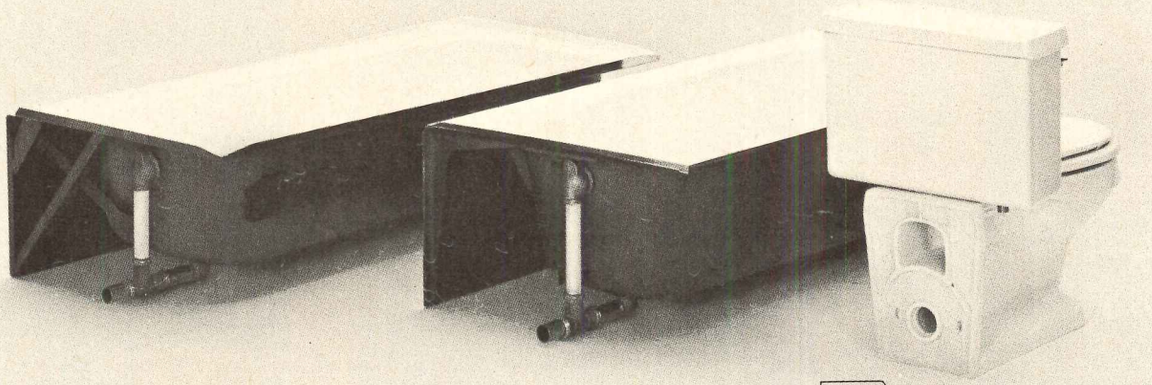
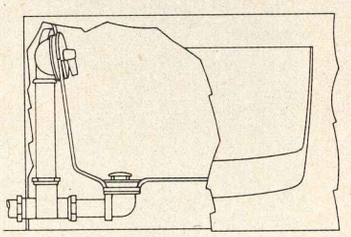
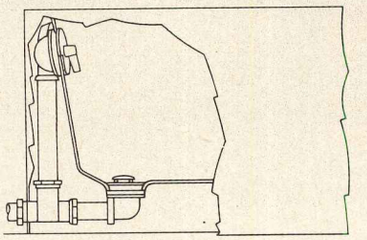
Rough-in through the wall.

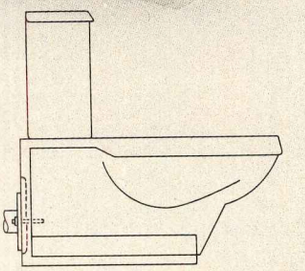




The Sarasota tub, formed steel with acid-resisting enamel, features a raised outlet that permits waste line to be installed through the wall.



The new Nile tub, cast iron with acid-resisting enamel, has a raised outlet that permits installation of a horizontal waste drain from bath to wall.



The Orlando floor-mounted, back-outlet closet fits flush with floor and wall.

Eljer shows the way.

With the addition of the new Nile tub, Eljer now offers you the most complete line of fixtures that rough-in through the wall. Only Eljer has these bathtubs of both cast iron and formed steel.

And there's more. More freedom of design for you and more savings for your client when you specify these Eljer fixtures for slab or reinforced concrete construction. Since all of the plumbing goes into the wall, there's no wasted area between floors.

For more about these compatible-with-slab-construction fixtures, call your Eljer representative. Or write Eljer, Dept. AR8, P.O. Box 836, Pittsburgh, Pa. 15230.

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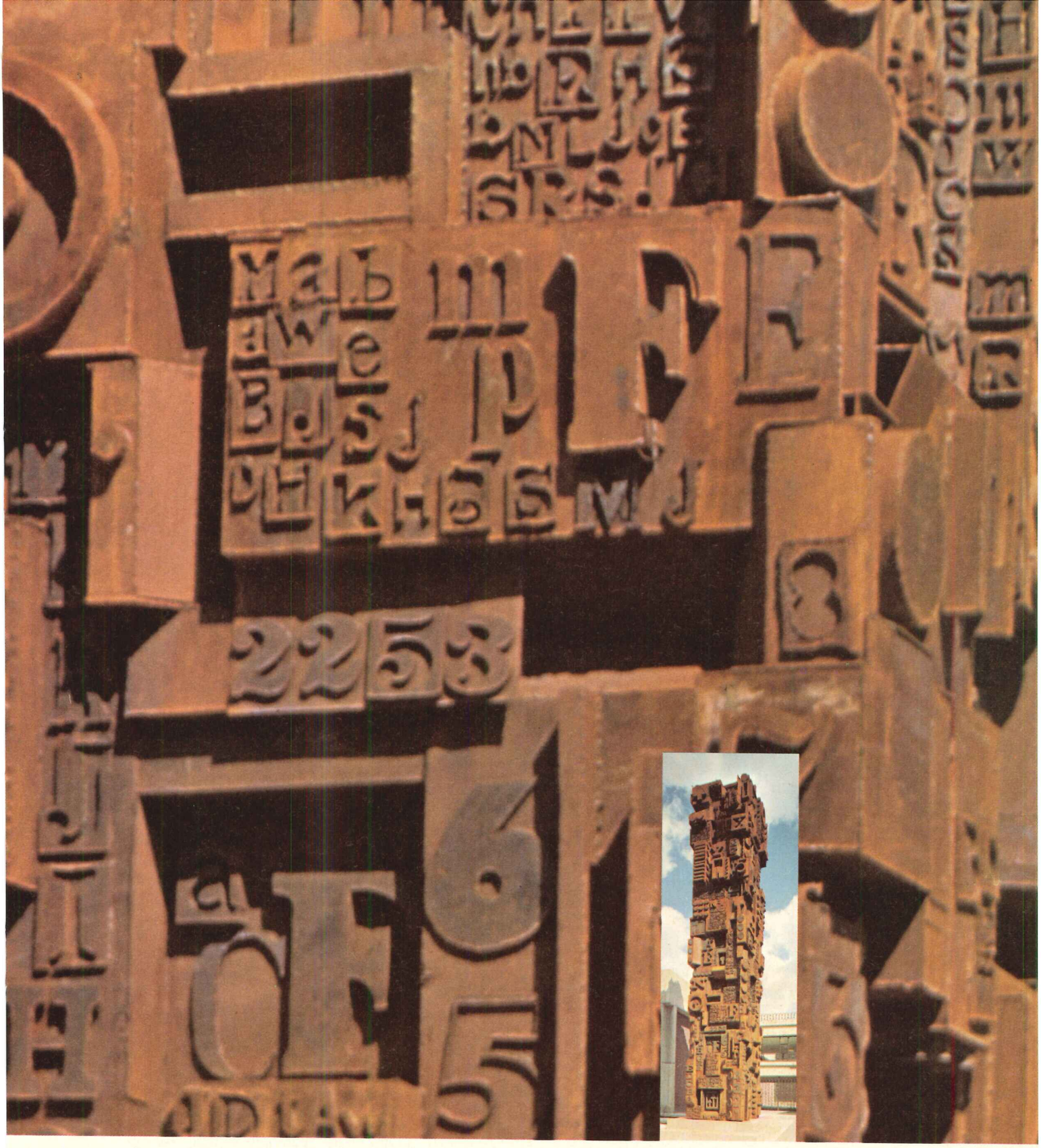

A new architectural vocabulary
In bare steel, architects and artists have discovered a new freedom of expression. Strength, lightness, permanence, function, order, nobility, simplicity—all are being communicated today in the fresh and frank language of bare steel.

The steel is USS COR-TEN High-Strength Low-Alloy Steel. As an architectural material, it is as basic and natural as a, b, c—or 1, 2, 3.

USS COR-TEN Steel is strong. It protects itself from the weather. It is self-maintaining. It develops its own color. And it grows more beautiful with age.

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This delightful yet rugged work is appropriately located at P. S. 36, New York City. The school was designed by Frederick G. Frost, Jr. & Associates, Architects. SCULPTURE by William Tarr.

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High-Strength Low-Alloy Steel

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That's why Certain-teed Dual 80, for built-up roofing, is called "the half finished roof."

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Dual 80's factory applied coattings reduce the chance of damage being caused by machine application or foot traffic . . . insuring the highest quality roofing protection for your investment. It carries a 20 year bond.

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

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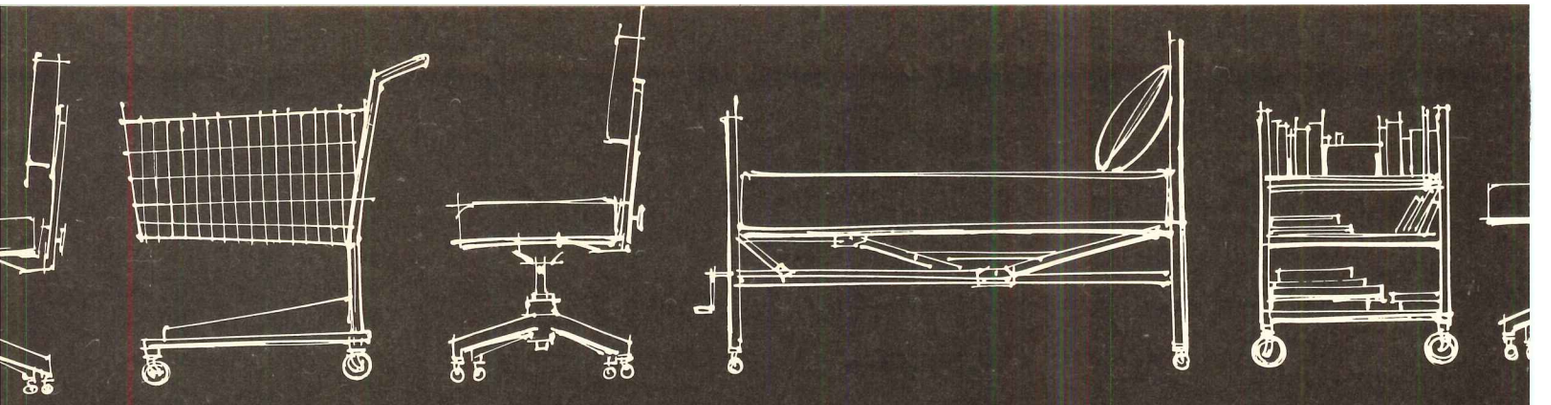

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Nothing could be simpler. Double Jute-backed carpet cemented directly to the floor . . . new or old concrete or wood. Or over previously installed resilient flooring. No cushion back on the carpet. No padding under it.

Works perfectly, as Ford Motor Co. proved in a two-year test in Dearborn. Ford is now practically standardized on this technique in new office building construction and for replacements in existing structures.

Benefits

The acoustical qualities, esthetics, luxury and thermal advantages of carpet . . . *plus* easy wheel and caster movement. Conventional wheels and casters can be used. Pads are unnecessary under chair casters if carpet pile is of good commercial grade.

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Jute's function

Jute secondary backing is vital because it provides maximum floor bond. This quality also guards against delamination of the secondary backing from the basic carpet. Jute's greater stability prevents carpets from shifting, which can misalign floor outlets with cut-outs in carpets.

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Use in any location where free movement of conventional wheels and casters is desired. General offices, hospitals, libraries, supermarkets, computer areas, restaurants, etc.

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Left, from Installation Specialist
Below, from Floor Covering Weekly

Installation specialist

The National Magazine for Floor Covering Installers

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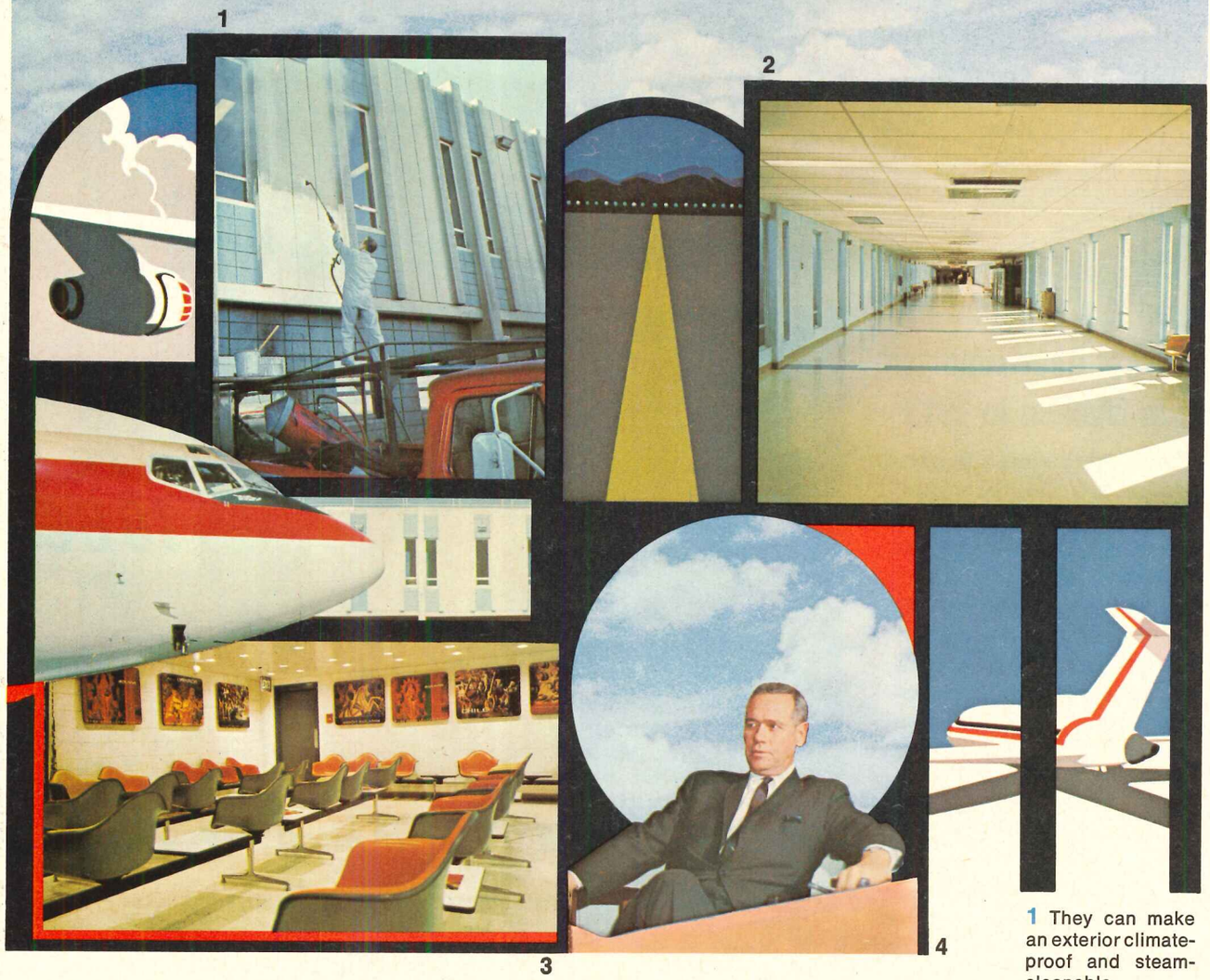
Desco coatings do everything in an airport but fly



1 They can make an exterior climate-proof and steam-cleanable.

2 They can make a corridor dirt-proof and seamlessly sleek.

3 They can make a waiting room brilliantly colorful and fire-resistant.

4 Ask Paul Reddy, architect of Denver's Stapleton Airport.

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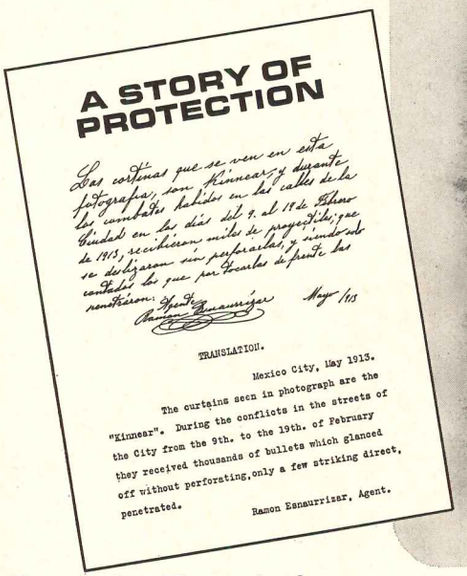
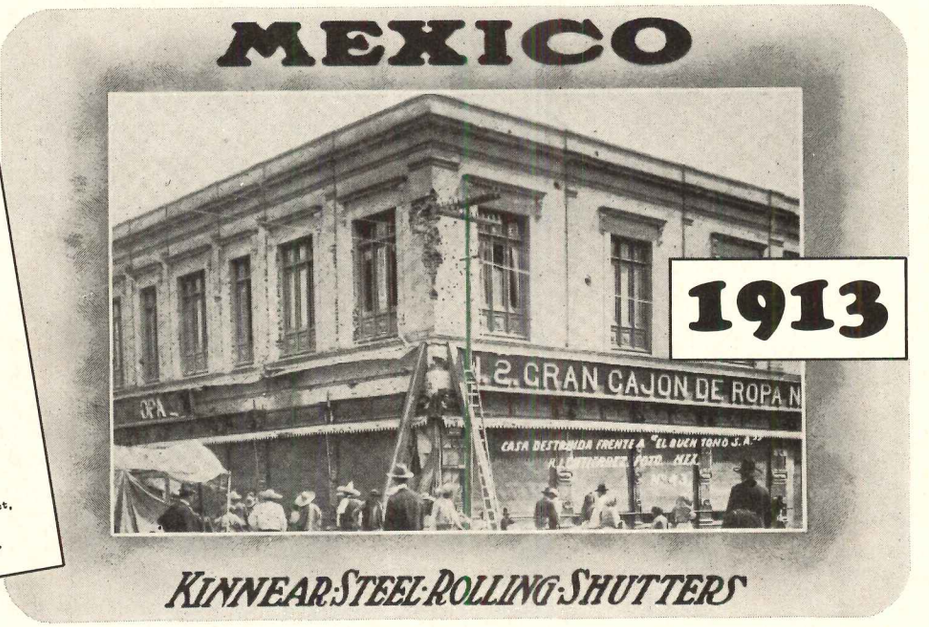
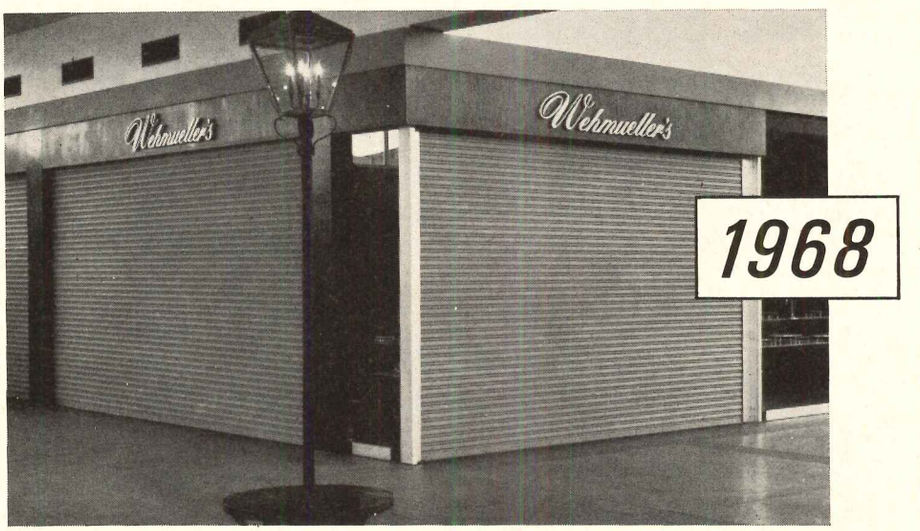




Read the Translation of what user reported from Mexico in 1913

The curtains seen in photograph are the "Kinnear." During the conflicts in the streets of the City from the 9th to the 19th of February, they received thousands of bullets which glanced off without perforating, only a few striking direct, penetrated.

Ramon Esnaurrizer, Agent



. . . and in the next century they'll still be ***providing dependable protection***

This is true because the fundamental design of the Kinnear Rolling Door is so strong and rugged—practically impenetrable to all the hazards of all the outside forces a door might encounter. In addition to the basic strength of steel, the deflection or resilience of the interlocking slat curtain effectively resists "breaking and entering" tools. A persuasive barricade to trespassers! To resist corrosion and the ravages of the elements, Kinnear Doors are given a triple protective coating—Kinnear paint bond, hot zinc coated (1.25 oz. per ASTM Standards) and field primed. They're also fire resistant. Add to these longer-life protective features the method of steel channel installation and the space-saving, rapid-acting coiling operation, **plus** "registered" life extension backed up by service and parts depots from coast to coast. It is readily understandable why Kinnear Rolling Doors have been the preferred closure for safeguarding commercial and industrial doorways, windows and corridors for more than 70 years.

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

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Centralia, Wash. 98531 • Ont., Canada

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

For more data, circle 82 on inquiry card

Worried about building automation costs?

We've helped relieve those worries for over 4,000 other architects.

The experience Honeywell has acquired by installing one-man control systems in more than 4,000 buildings may save a small fortune when you automate your client's building.

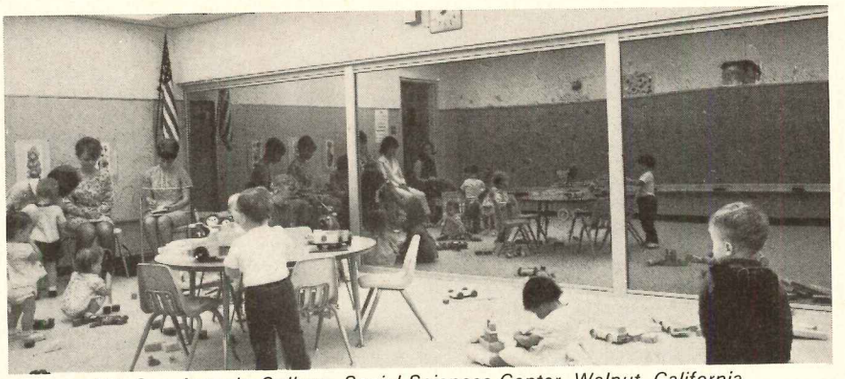
It's taught us just how much automation is necessary for the lowest first cost and greatest operating efficiency in all types of buildings.

If you'd like us to help relieve your worries—if you'd like to use our experience to cut the cost of automating your latest building design, write us.

You might also like our free Planning Guide on Automation. The address is Honeywell, Commercial Division, G6118, Minneapolis, Minnesota 55408.

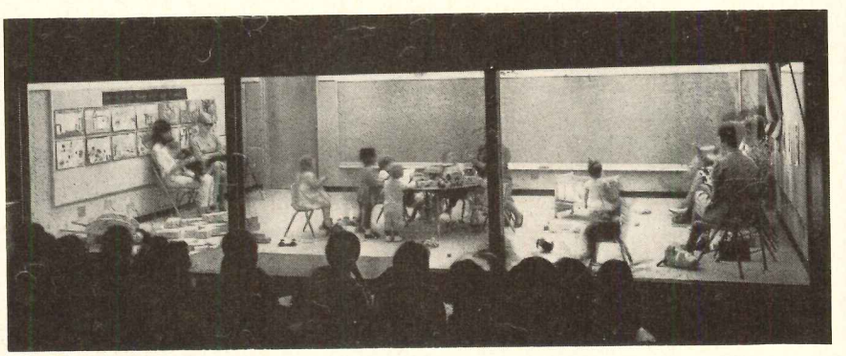
Honeywell
AUTOMATION

For more data, circle 83 on inquiry card



Mt. San Antonio College, Social Sciences Center, Walnut, California. Architects and Engineers: Austin, Field & Fry, A.I.A. of Los Angeles.

This room-length mirror is actually a soundproof, impact-resistant, "see-thru" wall.



No matter how you look at it, this installation is unusual.

Two panes of glass are glazed into acoustical aluminum frames. With ⅜" *Mirropane*® in the classroom side and ⅜" plate glass in the observation room side. A 3¾" air space between the panes greatly reduces sound transmission. A large class of child care students can freely discuss what they are observing without being overheard.

Three 7' x 5' *Mirropane* units permit maximum viewing of the entire classroom from all seats in the observation room.

Since the glass is installed at floor level, the *Mirropane* is made of *Tuf-flex*® tempered plate glass. This minimizes chance of breakage and injury should children or objects strike the glass.

Ask your L-O-F Distributor for booklet TM-2 for *Mirropane* design data. He's listed under "Glass" in the Yellow Pages. Or write Liberty Mirror Division, Brackenridge, Pa. 15014.

LIBERTY MIRROR

A DIVISION OF LIBBEY-OWENS-FORD COMPANY

For more data, circle 84 on inquiry card

continued from page 108

Gordon B. McAdam has been appointed partner of the Palo Alto, California architectural firm, **Albert A. Hoover and Associates.**

Michael S. McCormac and **Paul Nickolaus** were recently made associates of the firm, **Horatio Allison Associates.** The firm, now known as **Horatio Allison —Robert L. Meyer, Structural Engineers,** is located in Rockville, Maryland.

Donald J. McKinley, A.I.A., is now partner in the architectural firm of **Moritz Kundig Associates,** Spokane, Wash.

Robert E. Melvin, A.I.A., has become head of the architectural division of the Manila office of **Frank L. Hope and Associates.** The firm's main offices are in San Diego, California.

Royal A. McClure Co., Seattle architectural firm, has appointed **Robert J. Nixon, A.I.A.** as Member in Charge.

Neptune & Thomas Associates, Architects and Engineers of Pasadena, California, have expanded to include the following principals: **James F. Currie, F. Kirk Helm, Cecil F. Klassen, Joseph A. Leick, Anthony O'Keefe, Grover L. Starr,** architects; **C. Allan Spencer,** engineer.

Benson A. Nielson, A.I.A., is now an associate in the Spokane, Washington firm of **Trogdon-Smith, Architects.**

Arthur DeSalvo, Jr., A.I.A., has been made a partner of the architectural firm, **Eliot Noyes & Associates.** The following architects have been made associates of the firm: **Robert Anderson, Warren Kaffka, Charles Baffo, Alan Goldberg** and **H. B. VerBryck.**

Robert O'Connor, F.A.I.A., has retired as a partner of **O'Connor and Kilham, Architects.** Mr. O'Connor continues as consultant to the New York firm.

Law, Law, Potter & Nystrom, Architects of Madison, Wisconsin, have announced a change of their firm name to **Potter Lawson Findlay & Pawlowsky, Inc., Architects.**

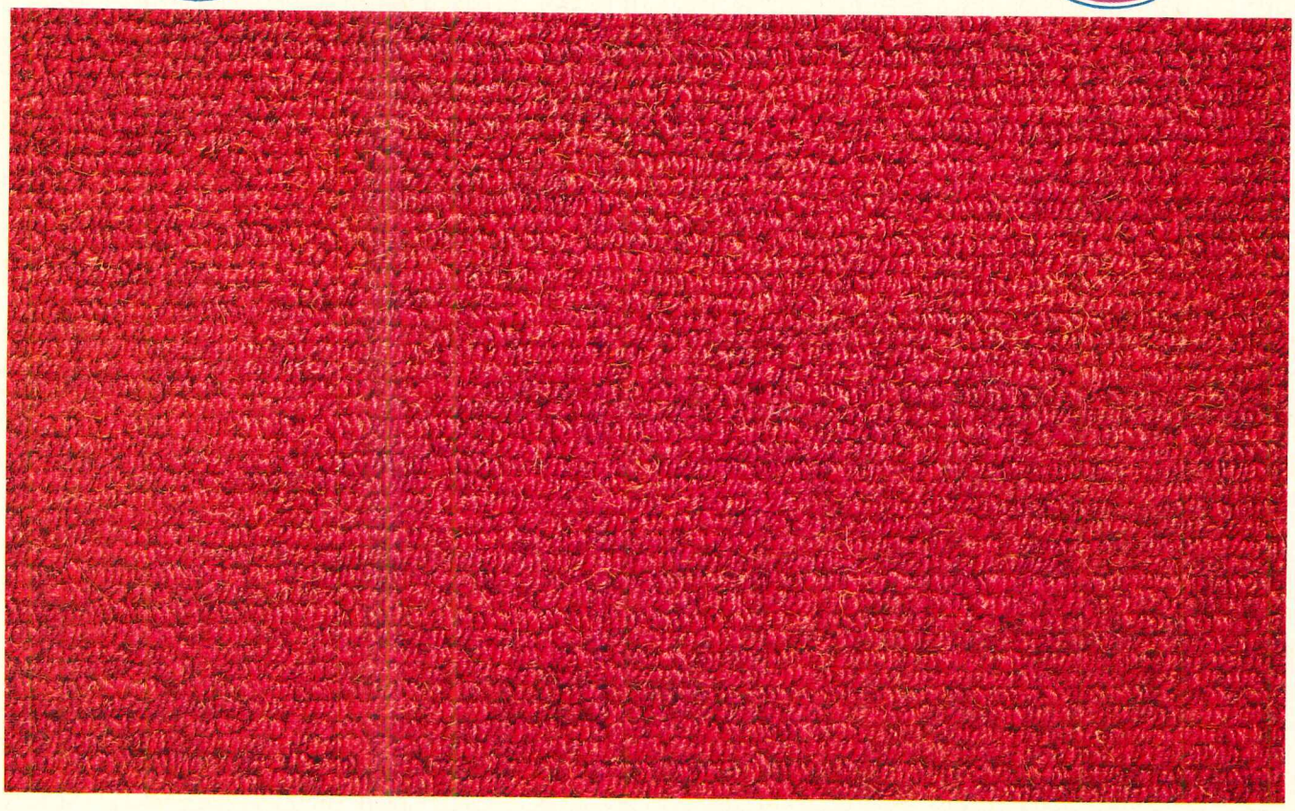
Lewis A. Redgate, A.I.A., has been appointed a vice president of the Los Angeles-based firm, **Quinton Engineers, Ltd.**

Otto R. Ritter, A.I.A., is now a partner of **Wolff-Zimmer-Gunsul-Frasca-Ritter,** architects and planners of Portland.

Carroll C. Rudd, A.I.A., has been named an associate and director of design in the firm of **Neuhaus & Taylor,** architects and planning consultants of Houston and New York.

Peter S. Sabin, A.I.A. and **James M. O'Neal, A.I.A.** announce the formation of a new firm for the practice of architecture. The firm's new name is **Sabin and O'Neal, Architects,** and it is located at 230 California Street, Palo Alto.

Where will this rich, new, natural-looking Wellco Decathlon carpet made with Vectra fiber find happiness?



In some traffic-heavy, stain-prone, fade-inducing place where most other carpets would find grief.

Happiness is finding a carpet with maximum stain, fade and abrasion-resistance, minimum maintenance...and discovering that it's also rich in natural beauty. □ Such a carpet is new Wellco Decathlon, made with Vectra® fiber. □ Here at last is a fine gauge tufted carpet that passes every rugged test in the book. Made with spun yarns of 100% Vectra olefin fiber, Decathlon also has such natural-looking tufted beauty, you may suspect us of pulling the wool over your eyes. Until you see Decathlon's remarkably modest cost. Available with all weather backing...and jute or high density rubber for interior use. □ Of course Decathlon made with Vectra fiber is outdoor-indoor carpet in the truest sense. But once you see how lush and natural it looks indoors...you may not have the heart to put it outside.

SPECIFICATIONS:

Pile of 100% solution dyed Vectra® olefin fiber
1/10 Gauge (270 Pitch)
Pile Wt.—33 oz. per yd.
Pile Ht.—⅛" or .125
Stitches per inch—9
Tufts per sq. inch—90
Yarn Count—3.00 cc (3 Ply)
Primary Backing—100% polypropylene
Secondary Backing: (weight per sq. yard)
A. 9 oz. jute
B. 32 oz.—high density rubber
C. 20 oz. special all-weather back (all bonded with 26 oz. of latex)

For additional information and samples on Decathlon write to: Wellco Carpet Corporation, Department V, P.O. Box 281, Calhoun, Ga. 30701

Name_____

Company_____

Address_____

City_____

State_____ Zip_____

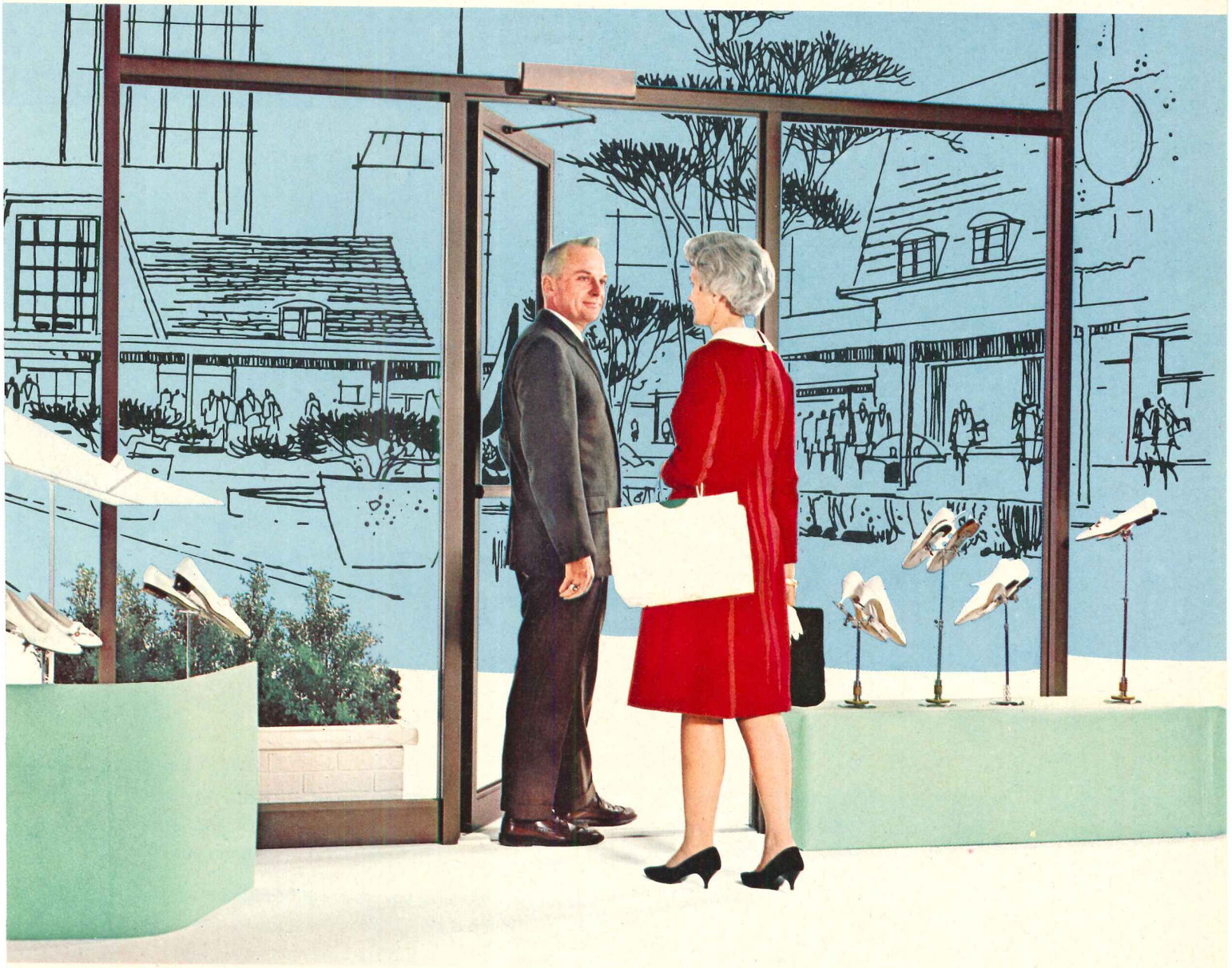
ENJAY Vectra OLEFIN FIBER

Vectra® olefin fiber is manufactured by Enjay Fibers and Laminates Company, Odenton, Maryland, a division of Enjay Chemical Company. Odenton: (301) LO 9-9000. New York: 350 Fifth Avenue (212) LO 3-0720. Charlotte: One Charlottetown Center, (704) 333-0761. Enjay makes fiber, not carpet.

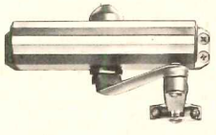
For more data, circle 85 on inquiry card

For more data, circle 86 on inquiry card

NORTON CLOSERS CONTROL DOORS • NOT DESIGN

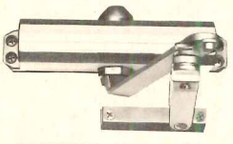


Note the clean, crisp entrance design possible with Norton® top-jamb mounted door closers. The rugged construction inherent in these smartly styled surface closers provides the utmost in dependable control. Installations on the top jamb or header bar keeps the closer off the door and out of the opening for an uncluttered appearance.



SERIES J1600

Top-jamb mounted closers featuring narrow styling to blend with the slim styling of modern aluminum door frames.

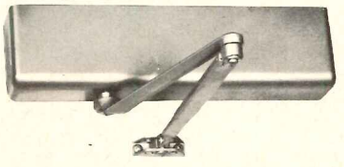


SERIES J6120

Top-jamb mounted Unitrol® controls. A combined door closer and door holder with shock absorber to protect door, frame, and closer.

SERIES J7030

Top-jamb narrow-projection closers with covers in anodized or painted finishes to match hardware or door finish.



CONTACT YOUR NORTON REPRESENTATIVE FOR COMPLETE DETAILS.

EATON YALE & TOWNE INC.

NORTON DOOR CLOSER DIVISION

372 Meyer Road, Bensenville, Illinois, 60106

1161

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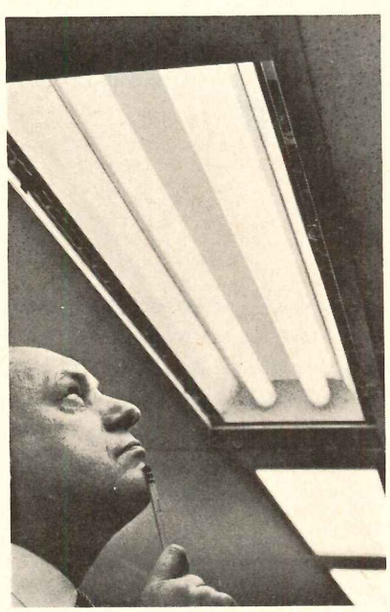
The facts of light

No. 3 in a series on plastic lighting panels.

Lighting can't be any better than the lighting panels you specify.



The prismatic panels control the results. That's why it's so important for you to write strong specifications for lighting panels . . . with brand names spelled out.

Where you write a general spec without brand names . . . you leave the job wide open for someone to ring in an inferior panel to win a price cutting competition.

A brand name panel like K-Lite guarantees you Specification Quality . . . professional results. K-Lite is the KSH brand. And KSH is the largest manufacturer of plastic lighting panels.

This is a case where the biggest is the best. So when you write specifications, remember . . . in lighting panels the name of quality is K-Lite.

Check with your fixture manufacturer. You'll find that K-Lite quality is a bargain.

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All the brass on this blueprint is value-rated TOP BRASS *Beautifully by* SPEAKMAN

Specify *value-rated* brass—top brass. Specify Speakman. It costs less really than you think. If you doubt it, get an estimate from us on your next project.

For value, after all, is not just cost, but performance in relation to cost. And dollar for dollar, Speakman brass consistently outperforms other lines of admittedly good brass. This is what we mean by *value-rated*. It's a planned superiority built into every item in Speakman's wide spectrum of home, plant and institutional products.

An excellent *value-rated* example is our new single control COLORTEMP line, for shower, bath, lavatory and kitchen, that uses color for water temperature selection. Unquestioned dependability has caused COLORTEMP to be the first in acceptance among those who have been cautious in specifying single control valves for their projects.

The achievement comes primarily from Speakman's patented cartridge that provides trouble-free performance far beyond that of ordinary single control valves. Maintenance costs are extremely low. The cartridge houses the *only* working and wearable parts found in COLORTEMP valves. Interchangeable in all models, the cartridge can be replaced in minutes. Specify top brass—beautifully by SPEAKMAN.

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Pyro-Kure® Vapor Barriers Protect Insulation And Are Permanently Non-Combustible

Pyro-Kure facing and jacketing are the safest possible vapor barrier materials to use with insulation for walls, ceilings and floors, on low temperature pipe and service lines, and on air conditioning ducts.

They differ in three important ways from any other vapor barrier:

1. A patented flame-extinguishing adhesive between the plies of paper, foil or vinyl makes Pyro-Kure *permanently* non-combustible. This means its U/L Flame Spread Rating of "25 or less" will never be reduced by age, moisture or humidity, as can happen with chemically treated barriers. **2.** Pyro-Kure meets the standards for non-combustibility of the National Building Code and has been approved by the Board of Standards and Appeals of New York City. **3.** Pyro-Kure has a minimum MVT rate for maximum protection against condensation damage to insulation.

All leading insulation manufacturers offer Pyro-Kure-faced insulation under their own brand names. Also available in roll form for local facing. Write for samples and data on various grades. Contact Sisalkraft, 56 Starkey Avenue, Attleboro, Massachusetts.

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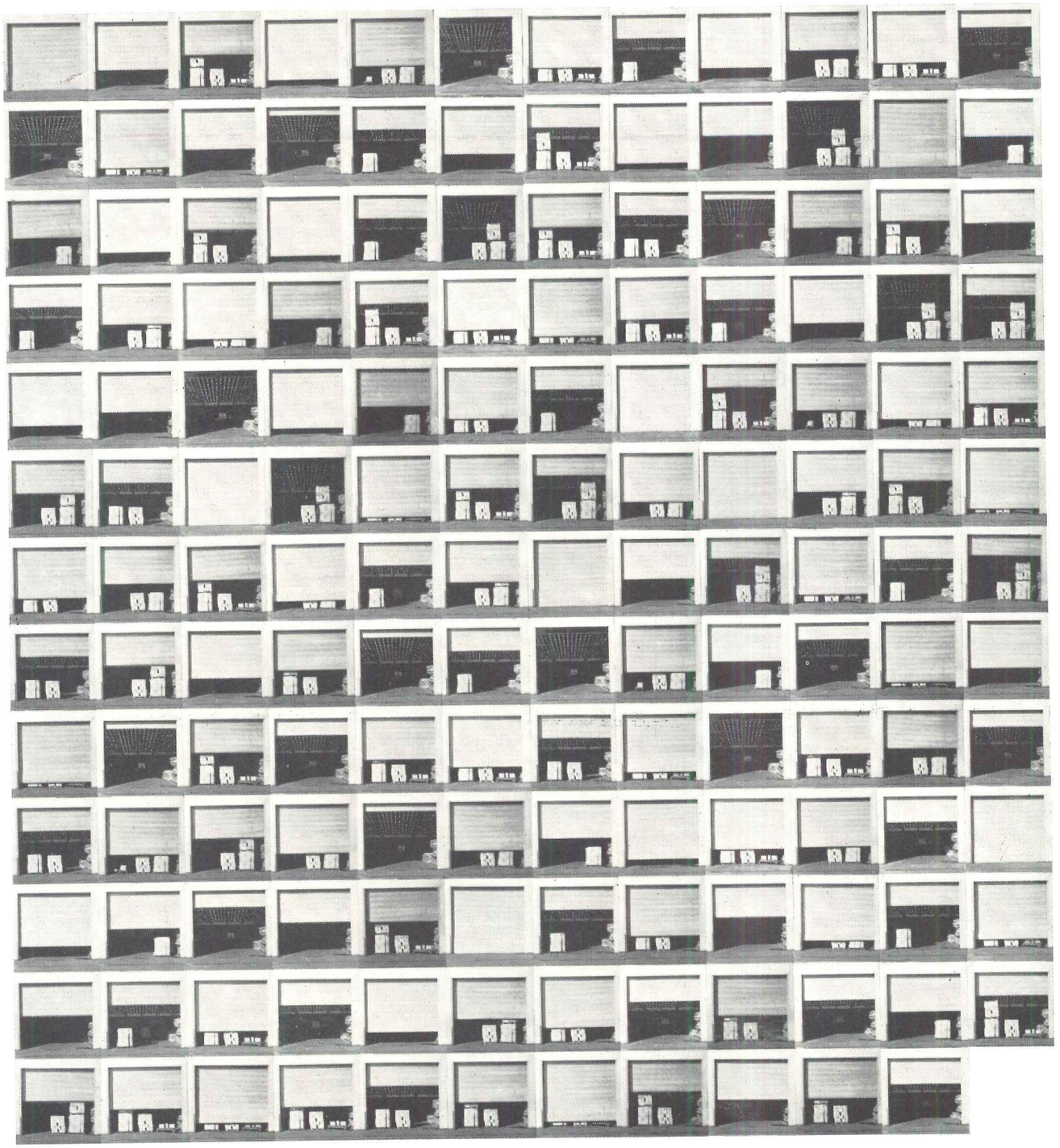

155 NEW WAYS IN AND OUT OF SAN FRANCISCO

And every one secured by a Cookson steel rolling door

When the Port of San Francisco opens its new Army Street Terminal for business every morning, Cookson opens the doors. And closes them again at night.

155 Cookson power-operated steel rolling doors provide easy access to, and complete security for, the $25 million installation's 820,000 square feet of enclosed cargo handling and storage facilities.

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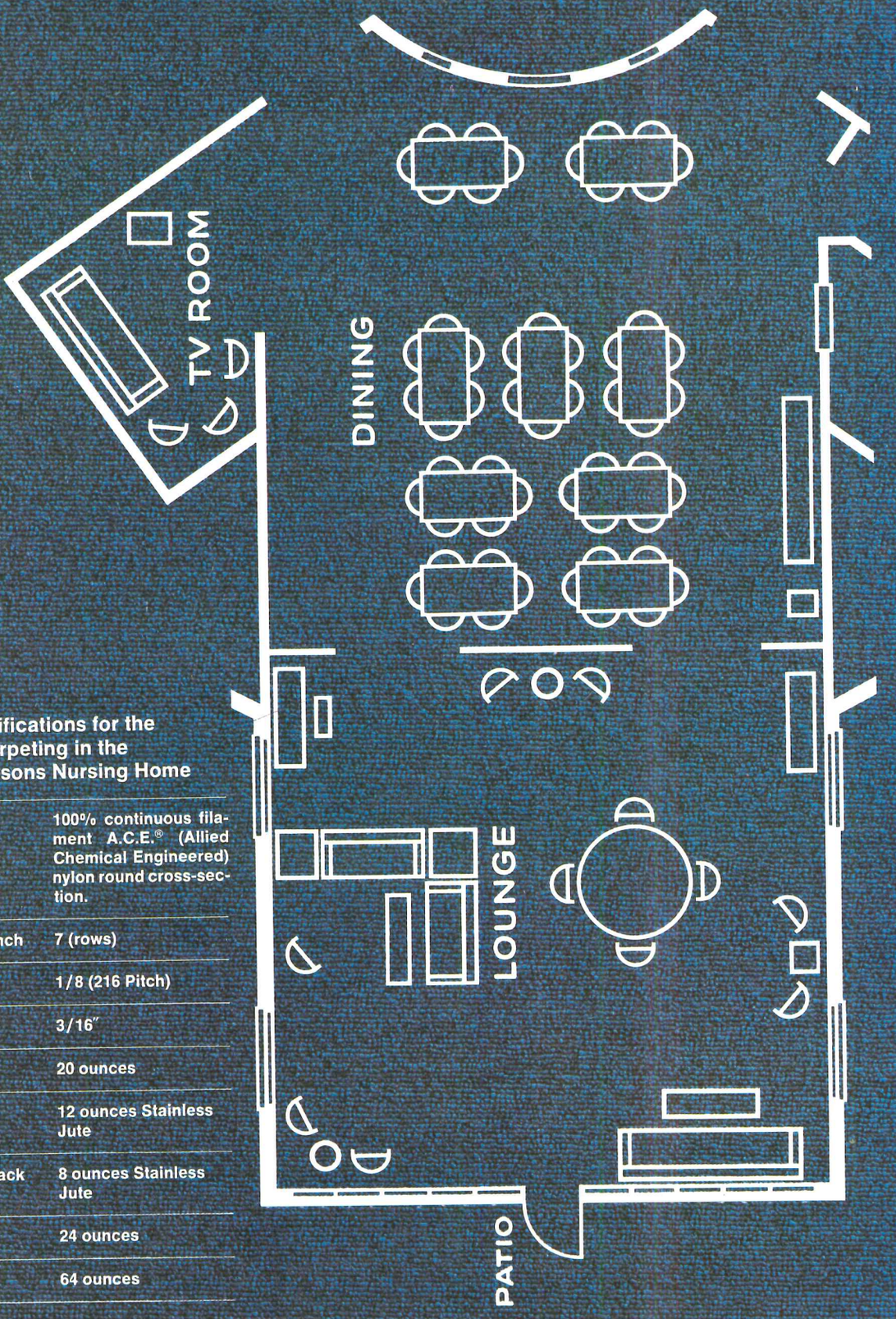
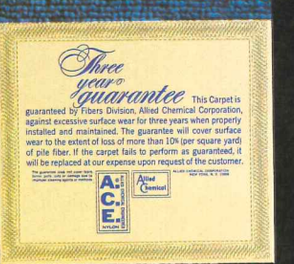
This is a Commander.

Mr. Jack Clark, President of the Four Seasons Nursing Centers of America. He commanded carpeting of A.C.E.® (Allied Chemical Engineered) nylon fiber from Sequoyah Carpet Mills for the Four Seasons Nursing Home in Oklahoma City, Oklahoma, to meet the special needs of his nursing home: elegance, ease of maintenance, and comfort. The carpeting of A.C.E. nylon he chose (a deep blue John Quincy Adams pattern) is high in durability and low in maintenance. And it has a quiet elegance ideal to its surroundings. Mr. Clark is a Commander of Allied Chemical nylon.



Specifications for the carpeting in the Four Seasons Nursing Home

Yarn	100% continuous filament A.C.E.® (Allied Chemical Engineered) nylon round cross-section.
Stitches per inch	7 (rows)
Gauge	1/8 (216 Pitch)
Pile Height	3/16″
Yarn Weight	20 ounces
Prime Back	12 ounces Stainless Jute
Secondary Back	8 ounces Stainless Jute
Latex	24 ounces
Total Weight	64 ounces



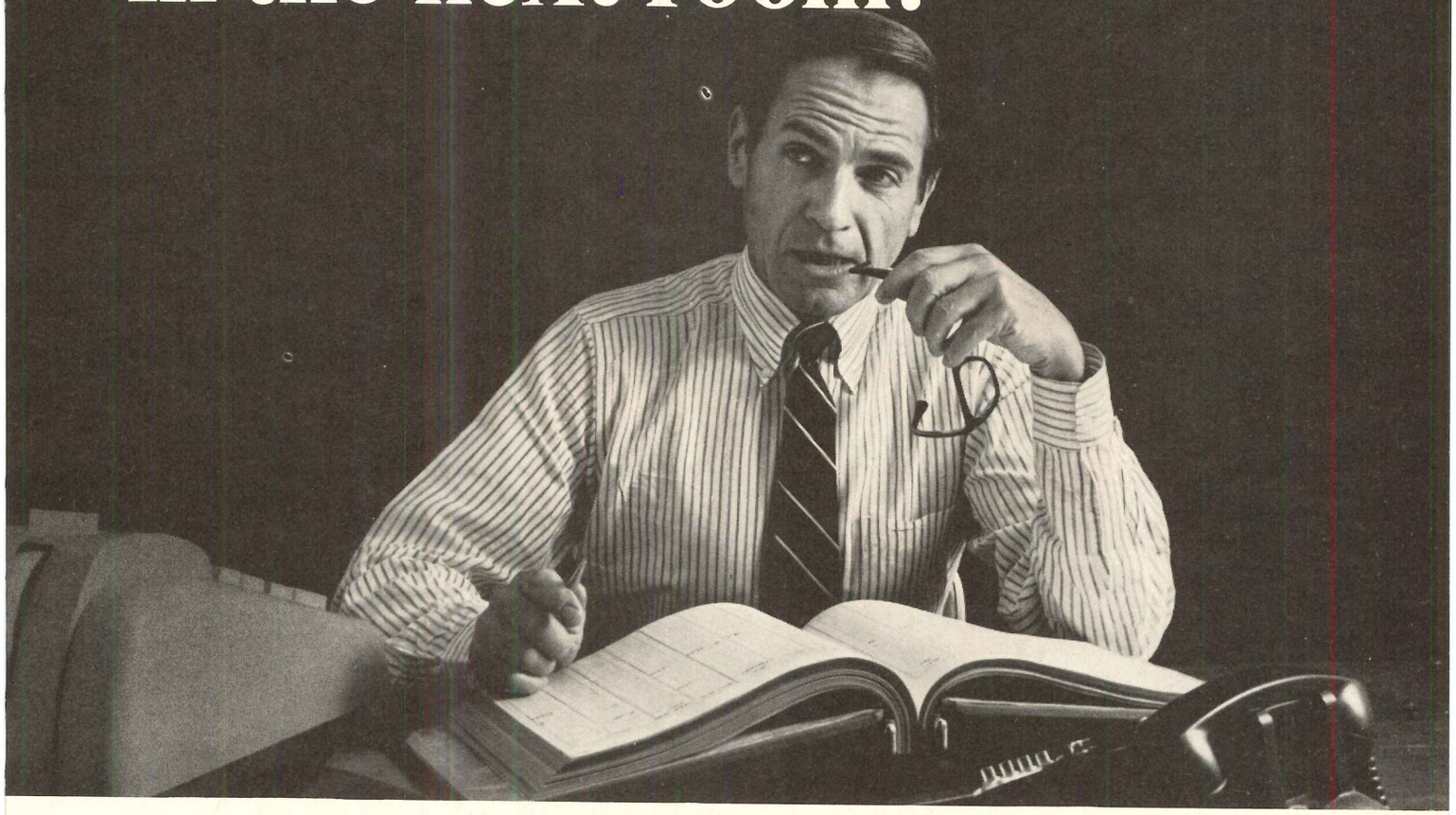
Become a Commander. Specify carpeting of A.C.E. nylon on your next contract. Allied Chemical is the only fiber producer to back carpeting carrying its A.C.E. label, with an unprecedented 3-year Guarantee.

Become a Commander. For more information, write to The Commanders, Allied Chemical Corporation, Fibers Division, No. 1 Times Square, New York, New York 10036, or telephone (212) HA 2-7300, Ext. A.C.E.

Allied Chemical

In top command of commercial carpeting.

$1183 was spent to soundproof this office and you can hear a cough in the next room!



They forgot an Acoustilead plenum barrier.

Soundproof wall materials, plus expensive acoustical ceiling tiles, were specified to make this a noise-free office. These materials do the job . . . up to a point. That point is the plenum, the space between a partition top and the floor slab above it.

Sound waves flood over the partition virtually unimpeded if there is no acoustical plenum barrier. Ordinary sound barriers in a plenum are usually so full of leaks around ducts and pipes that noise still passes freely.

Gain Maximum Noise Reduction at Minimum Cost. The solution to this annoying problem is Asarco Acoustilead—sheet lead that's only 1/64-inch thick. Drape a curtain of Acoustilead from the floor slab above to the top of the partition and you stop penetration of all normal noise. There are no sound leaks because Acoustilead fits tightly around ducts and wires. It can be cut with scissors, easily bent by hand, and is installed in less time than other acoustical materials.

Acoustilead is the first material available for sound barriers in normal plenum areas, with an installed cost generally below $1.00 per square foot.

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ASARCO

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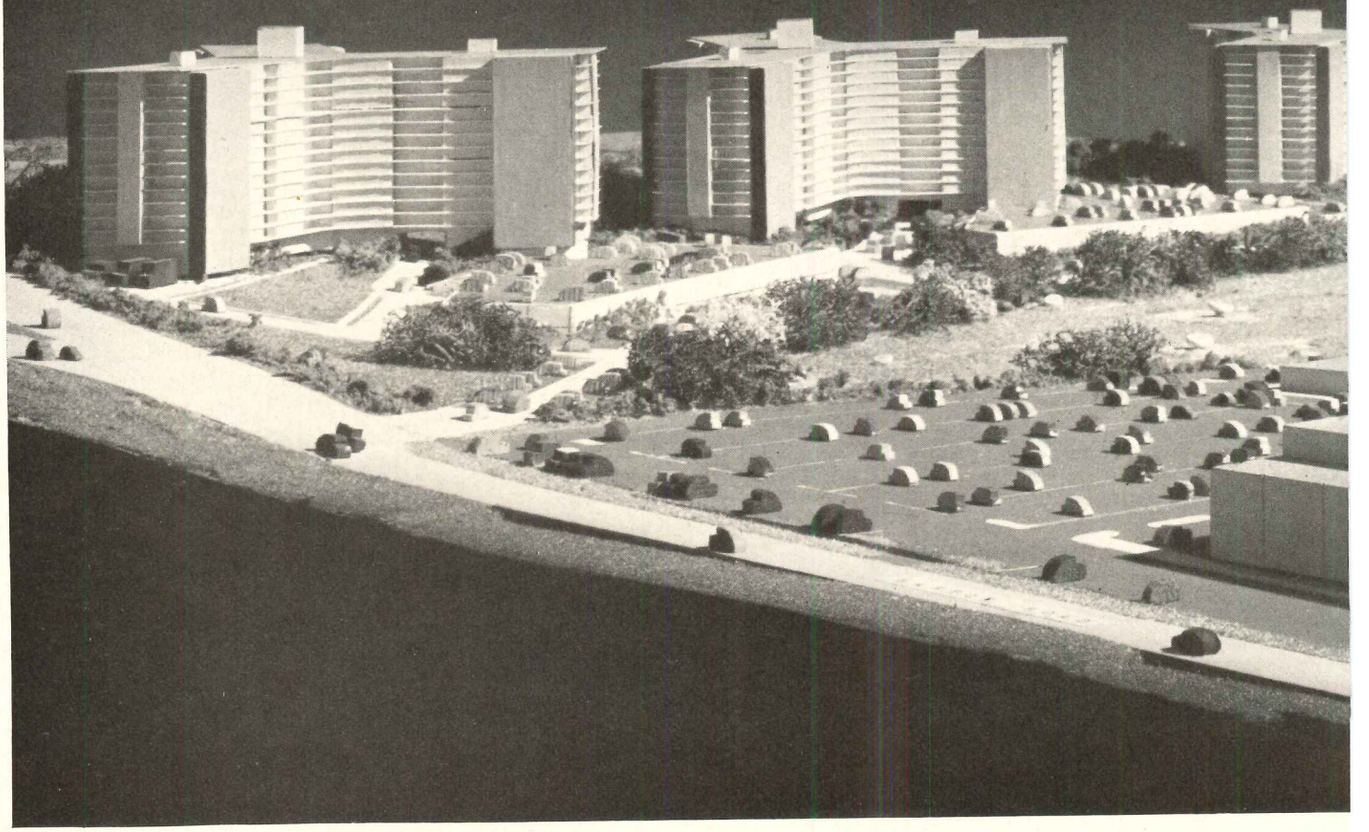
For more data, circle 93 on inquiry card

Complex phase construction simplified by All-Electric design.



Cedarbrook Hill

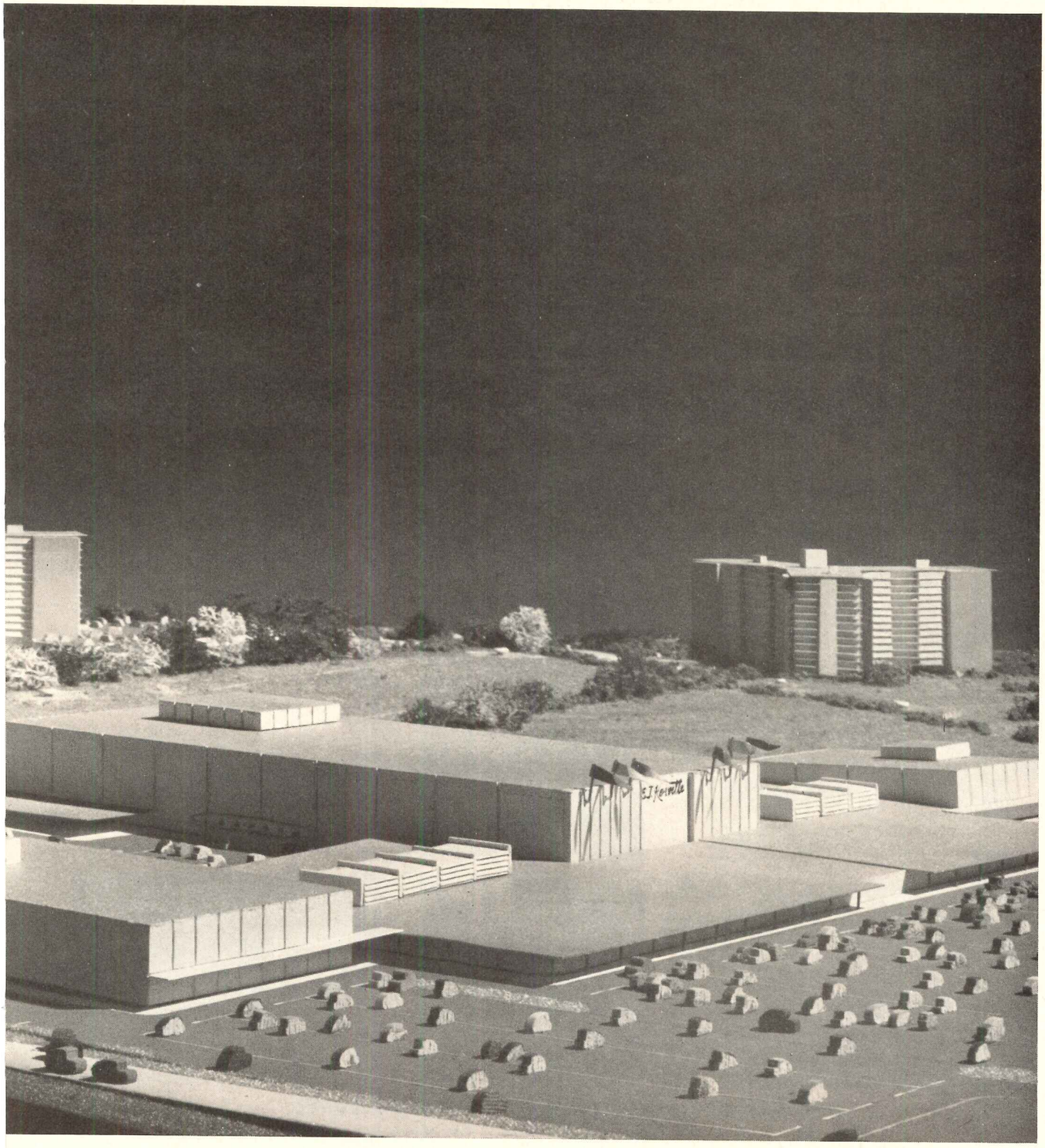
OWNER:
Cedarbrook Joint Venture

ARCHITECTS:
Lathrop Douglass, G. Daub,
Milton Schwartz & Associates

CONSULTING ENGINEERS:
Robert J. Sigel, Inc.
S. W. Barbanel

GENERAL CONTRACTOR:
Leonard Shaffer Assoc., Inc.

Spread over 148 acres in suburban Philadelphia, the 150 million dollar Cedarbrook Hill project was designed to be built in phases. A 524,000 square foot enclosed shopping mall and two apartment buildings are already occupied. Three more apartment buildings are planned, along with a motel, offices and research units. With phase construction planned from the beginning, a flexible climate control system was a necessity. The design chosen: All-Electric.



At Cedarbrook there's no need for boiler rooms. Or over-capacity units to accommodate future needs. Or fuel storage tanks. Or expensive smoke stacks. Without a boiler room, fewer attendants are required, reducing maintenance costs. Another advantage of an All-Electric system: tenants can control their own heating and cooling. In each room. Of each apartment.

Design freedom. Unmatched flexibility. Competitive cost. Good reasons why All-Electric design has proven the practical choice in hundreds of thousands of buildings across the country. Good reason to get in touch with your electric light and power company.

Live Better Electrically

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

ALL-ELECTRIC BUILDING AWARD ®

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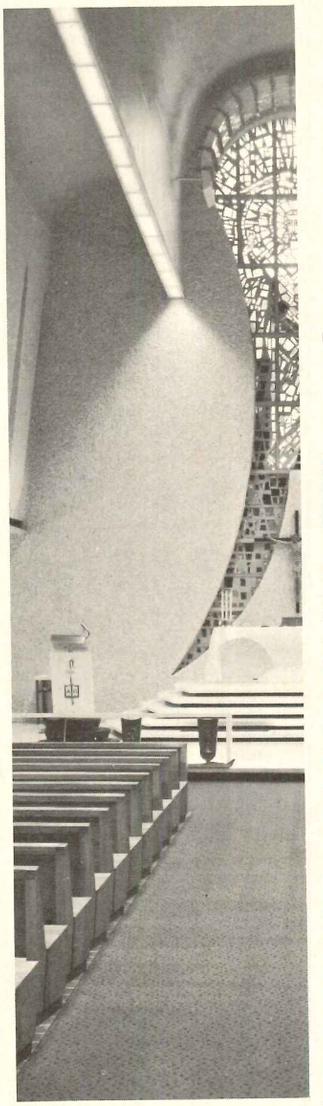
ideas



to stir your imagination

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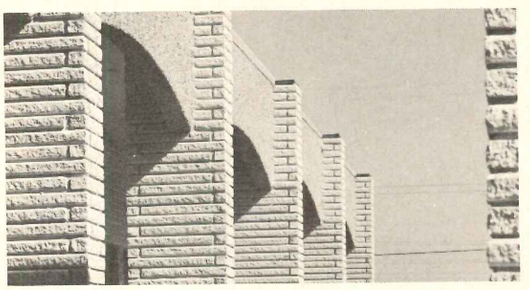
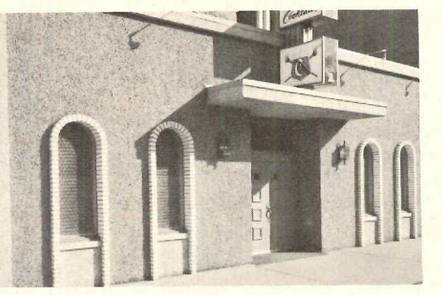
Maybe you can adapt one of these ideas to your own needs!

Our only business is adhesives—researching and developing adhesives to meet constantly changing and expanding industrial needs . . . improving our products and product line . . . providing the architectural industry (and hundreds of other industries too) with the *very best adhesive to do any particular job.* And we've been at it for over 80 years.





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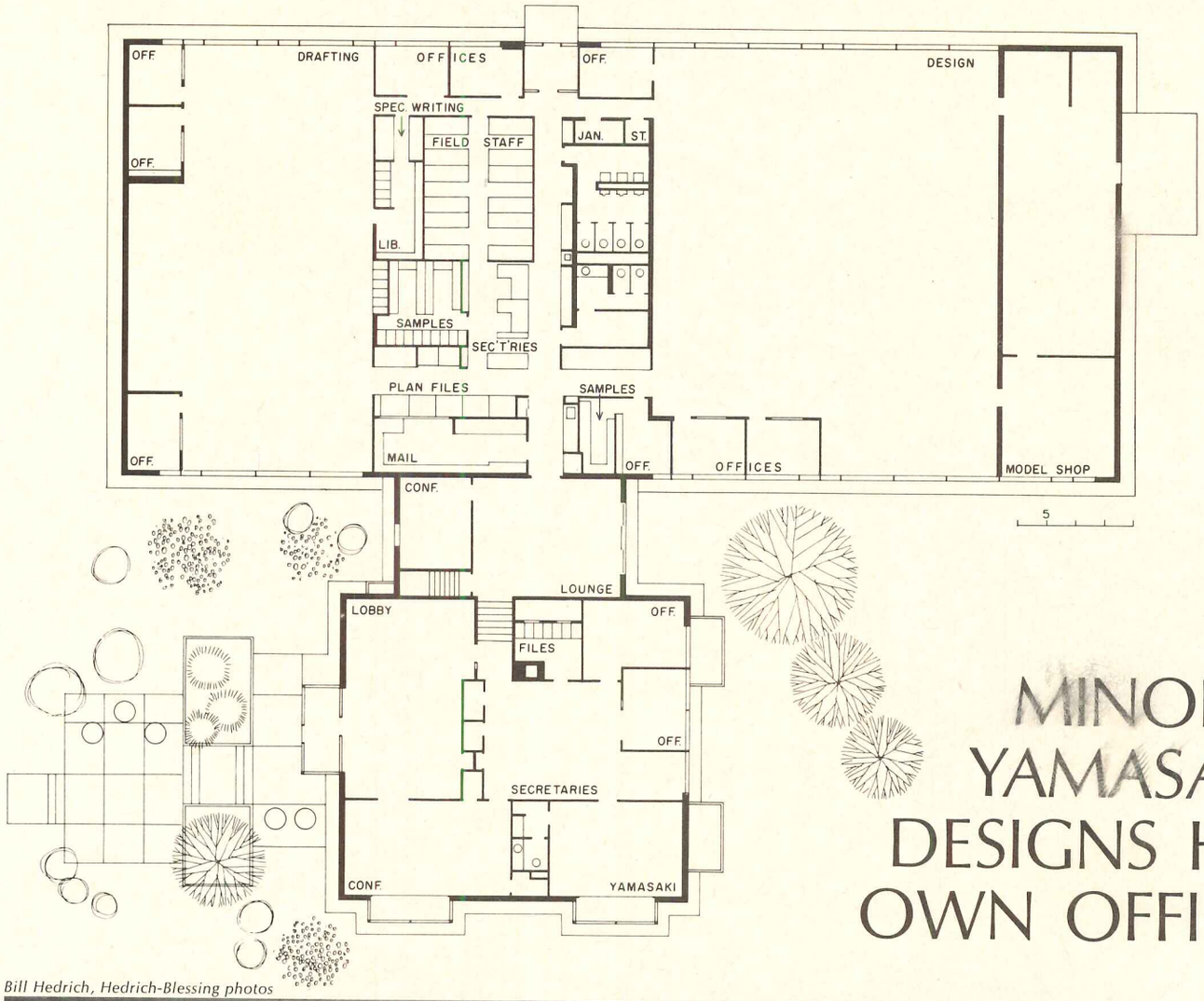
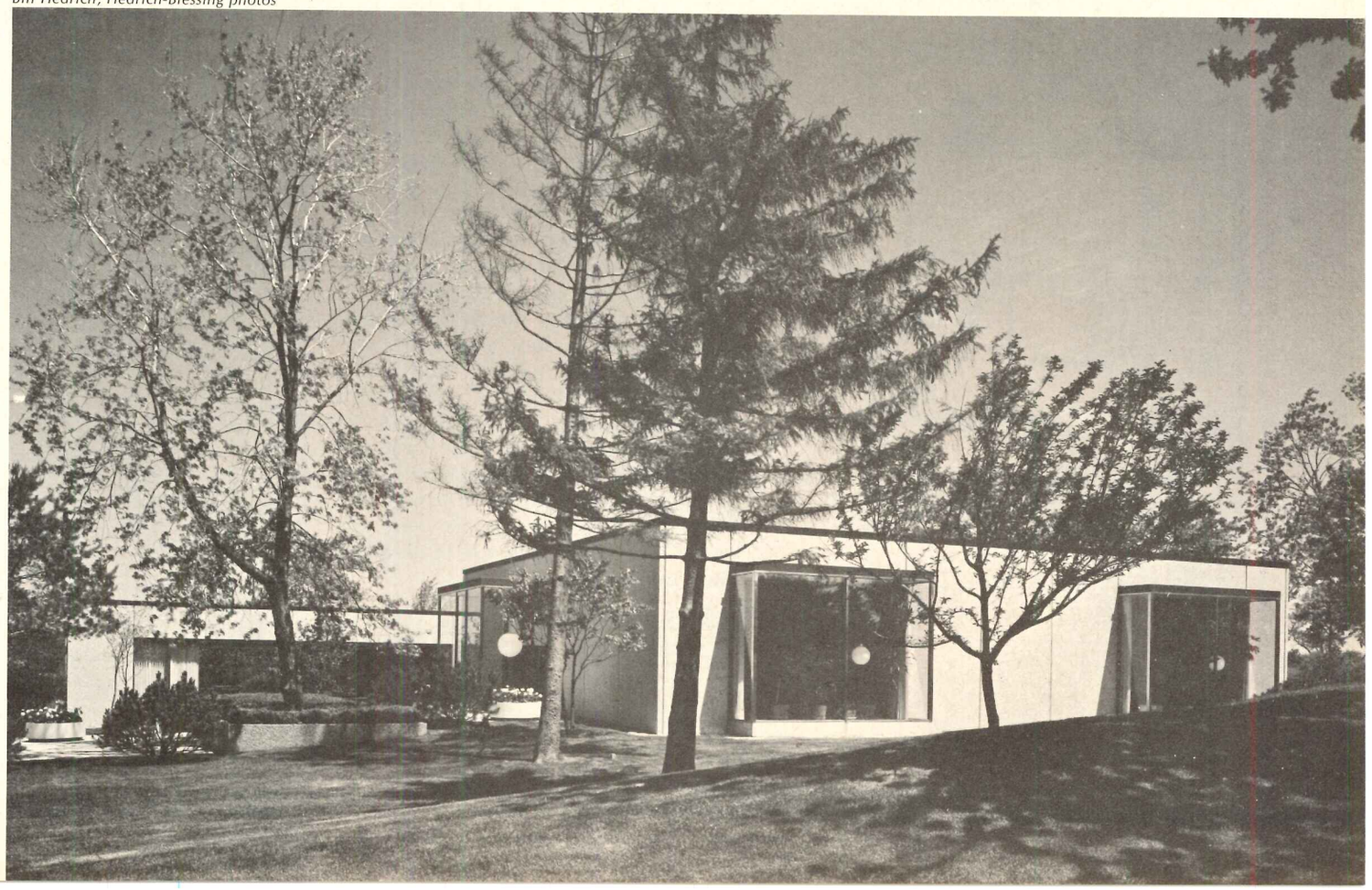
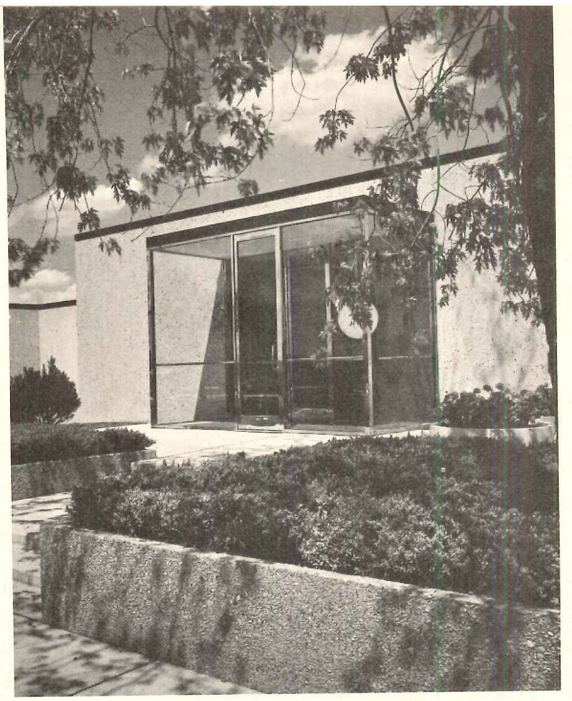


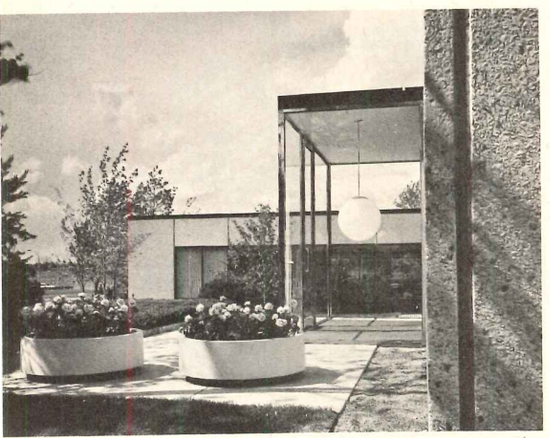
MINORU YAMASAKI DESIGNS HIS OWN OFFICE

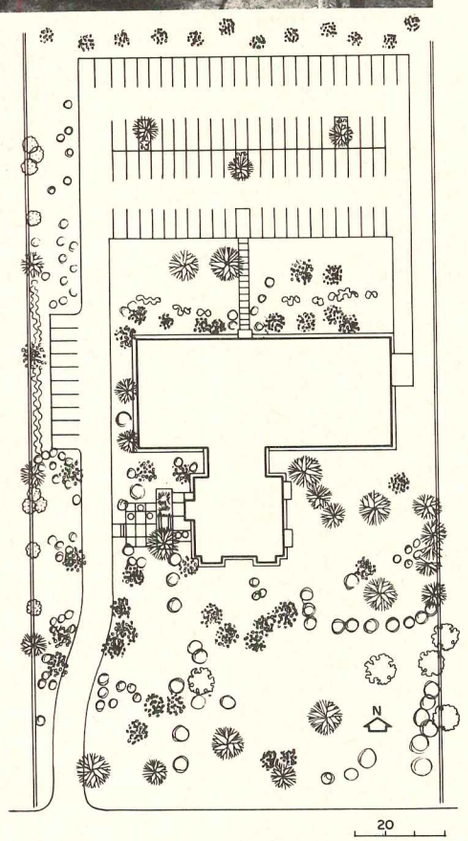
Bill Hedrich, Hedrich-Blessing photos



YAMASAKI's OWN OFFICE



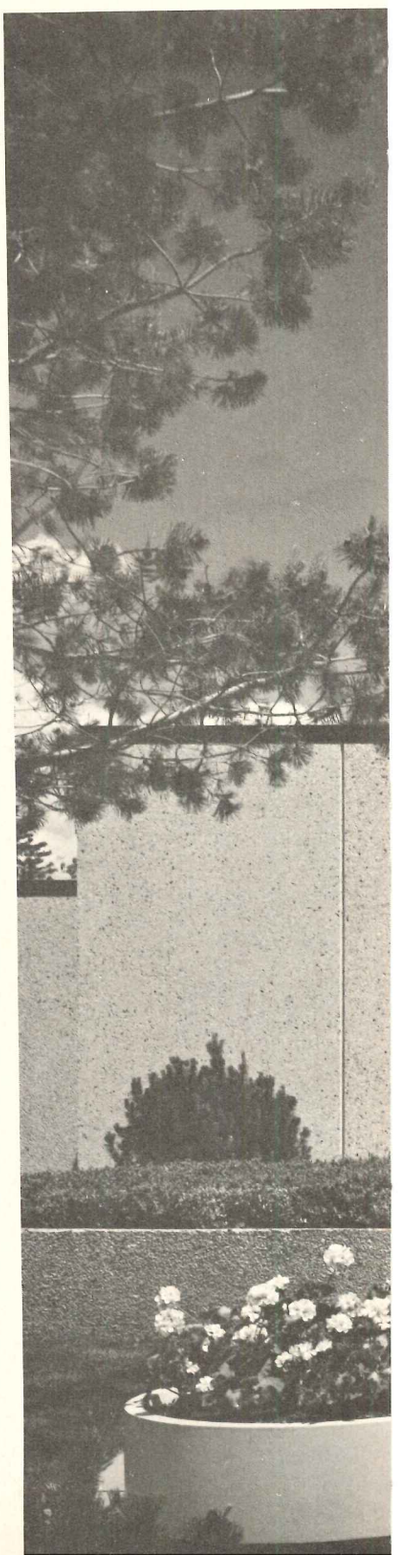




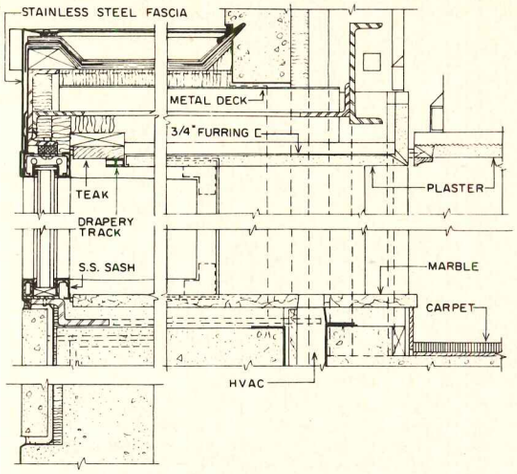
Yamasaki's own office building is quite unlike anything else he has done. Although it has the quality of expensive elegance which is typical of his best work, it is surprisingly simple. One looks in vain for traces of his luxuriant style—evocative plant forms in precast concrete with marble infill, or noble porticos with slender tapering columns ending in delicately pointed arches. In shaping his working quarters, the architect has chosen to abandon a more highly elaborated design vocabulary to display an unexpected mastery of the Miesian esthetic. Yama the client has convinced Yama the architect that this time "less is more".

"We wanted to be modest", said Yama. "We wished to avoid falling into the trap of building an office building as an advertisement. . . . We decided instead to carefully tailor a single-purpose building to our own special way of doing things. It is really for ourselves." And for themselves—seventy-five, plus or minus ten, including forty architects, twelve engineers and twelve model makers—Yama has created an exquisitely detailed and proportioned building, set within a five-acre site with beautiful trees, which he has landscaped with great care. "Our group," said Yama, "consists of highly trained and sensitive professional men who should have the kind of physical environment which can give dignity to their working lives. We felt that if we could build a quiet and tasteful building in a garden oasis, we could be happy and proud of the place in which we work."

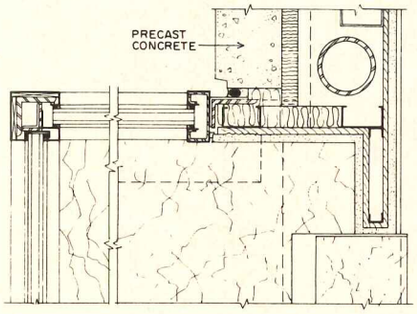
OFFICE BUILDING FOR MINORU YAMASAKI AND ASSOCIATES, Troy, Michigan. Architects: *Minoru Yamasaki and Associates;* landscape architect: *Masao Kinoshita of Sasaki, Dawson, DeMay Associates;* general contractor: *George W. Auch Company.*



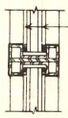
The conference room (above), and Yama's office (below) are enhanced by deep bay windows shown in the exterior photo (opposite page). The entrance vestibule shown in the lobby photo and on the preceding pages is similar to the bay windows in detail. Sash and trim are stainless steel. Exterior walls are precast concrete.



SECTION



PLAN AT SILL



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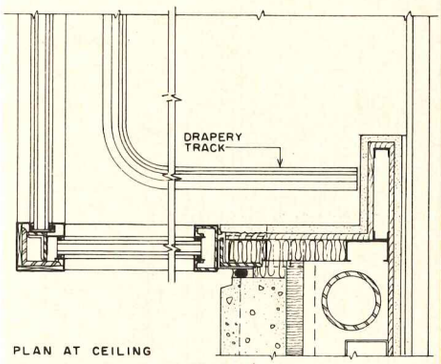
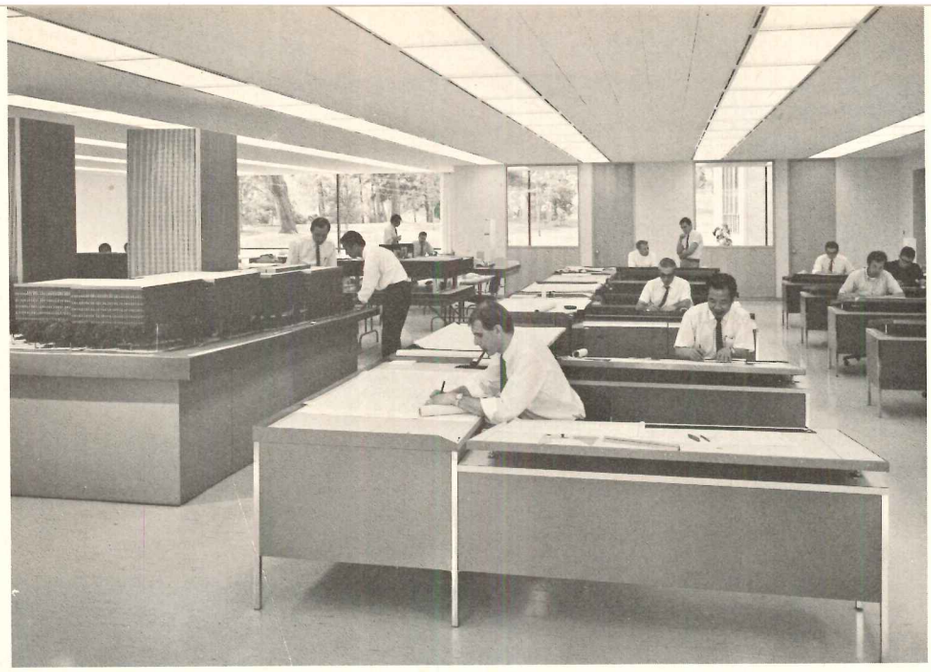
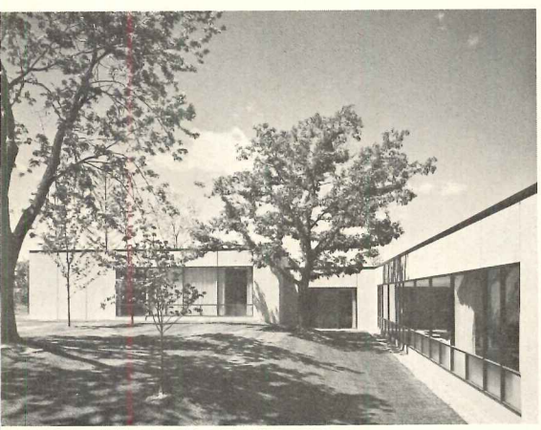
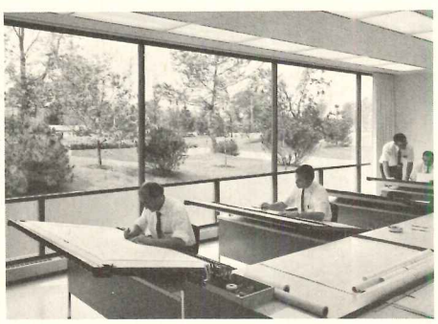


PLAN AT CEILING

YAMASAKI's OWN OFFICE



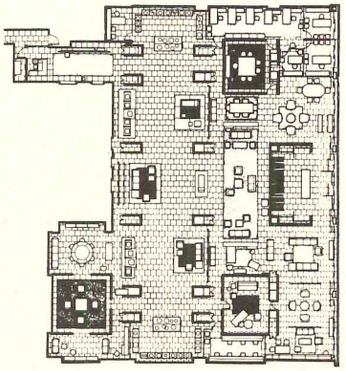




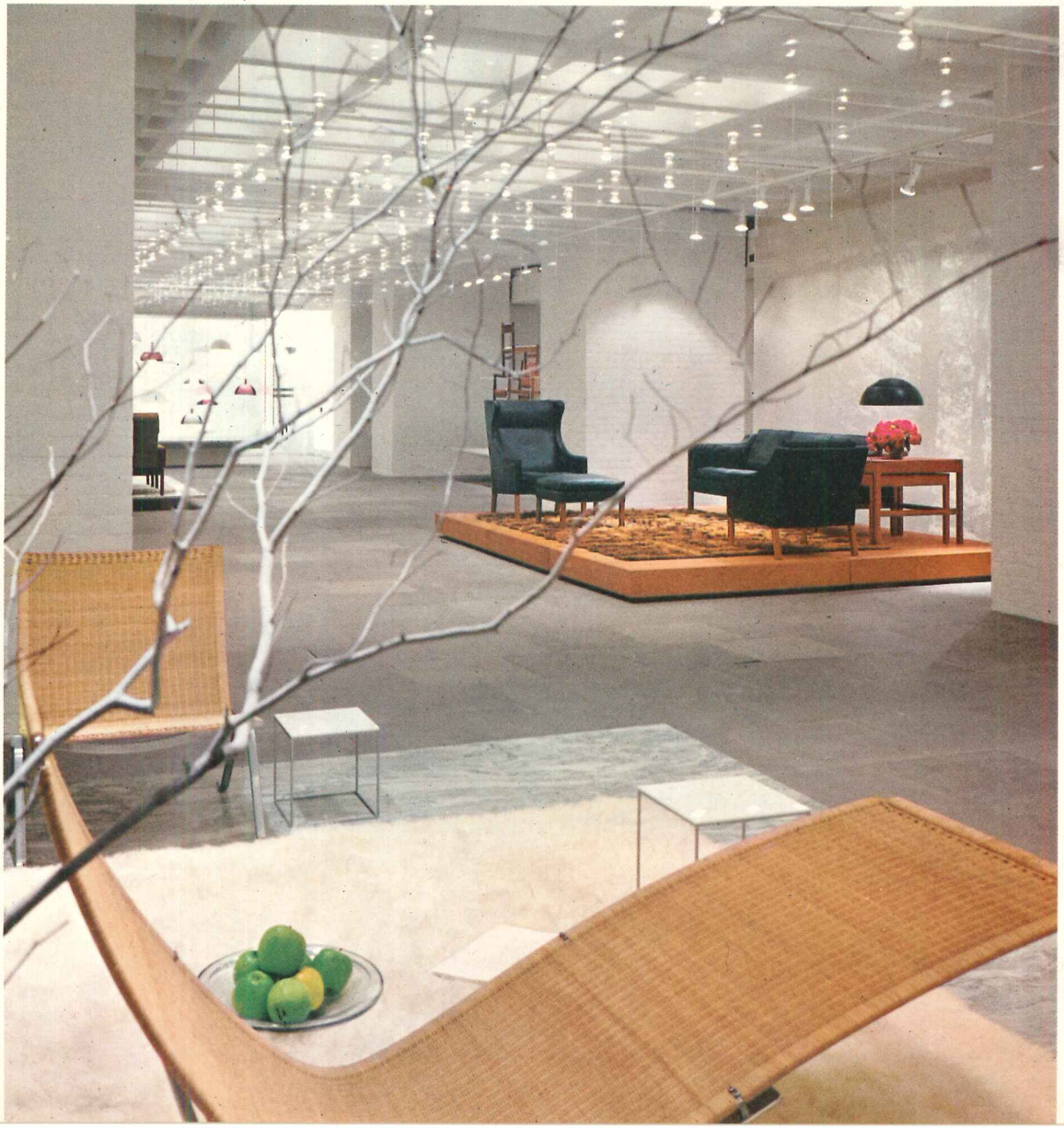
The administrative area is connected to the design and drafting wing by a linking element as can be seen in the photo (above left). The ground has been carefully sculptured to conceal the parking lot shown below. Drafting and design areas are spacious, allowing plenty of room for large scale models.

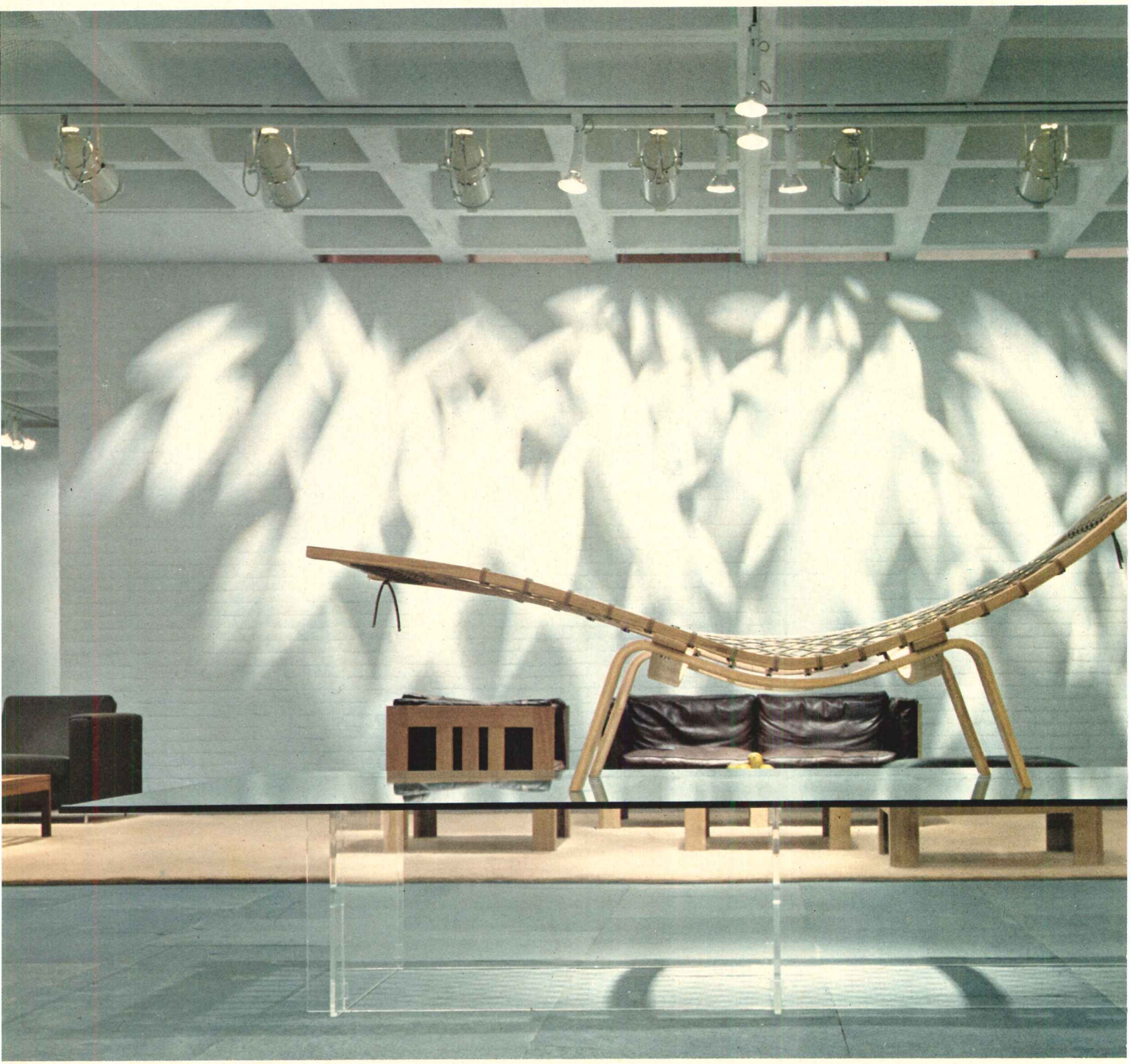
ARCHITECTURE IS REALLY SPACE

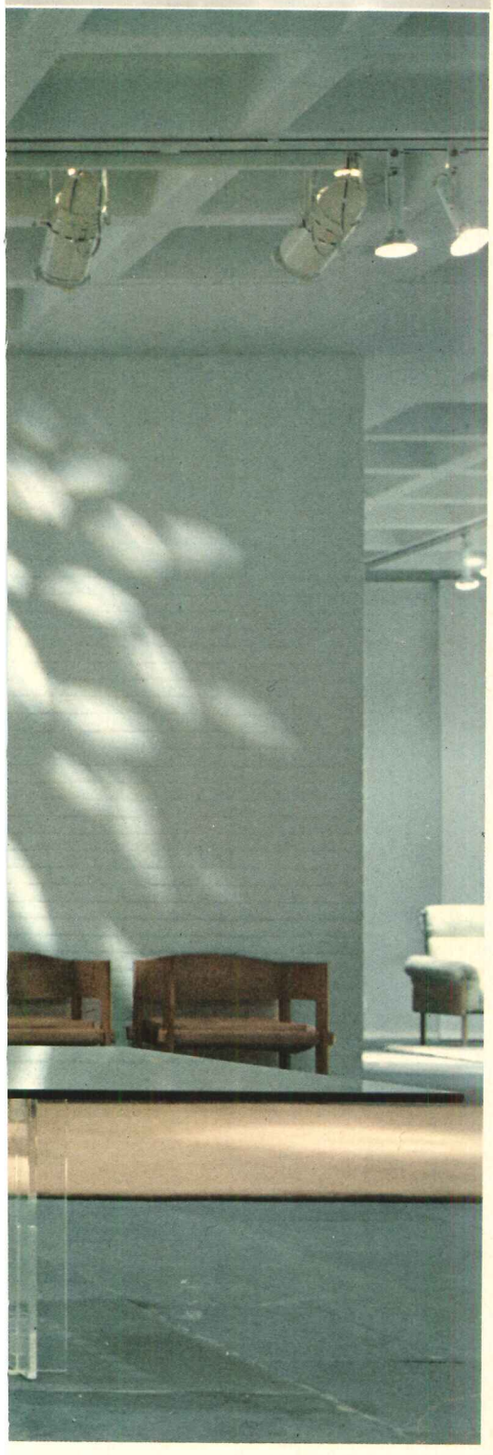
in Warren Platner's approach to design—and he proves the validity of that concept with aplomb in his scintillating design for this new showroom for Georg Jensen, Inc. From a big, amorphous area in a fairly standard commercial building, he has created eventful and highly articulated spaces to display beautifully crafted furniture and lighting fixtures by such architects and designers as Hans Wegner, Borge Mogensen, Poul Henningsen and Arne Jacobsen. To cast displays into high relief, the showroom is very restrained—never insistent. Yet, with a simple palette of materials, colors and light, quiet spaces have been transmuted into truly architectural interiors.

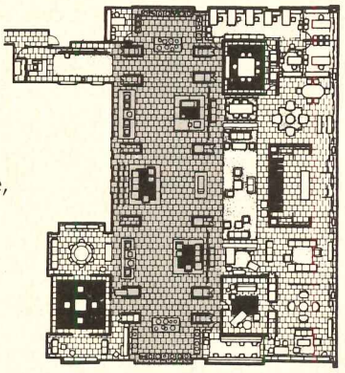


© Ezra Stoller Associates, Inc., photos



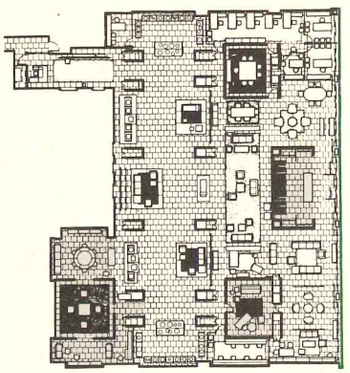


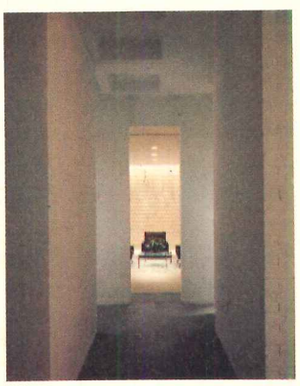


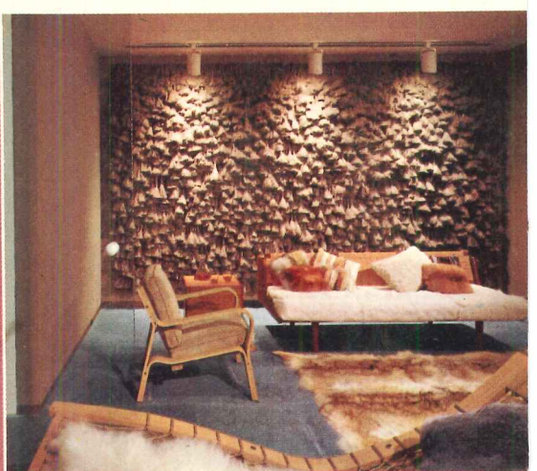


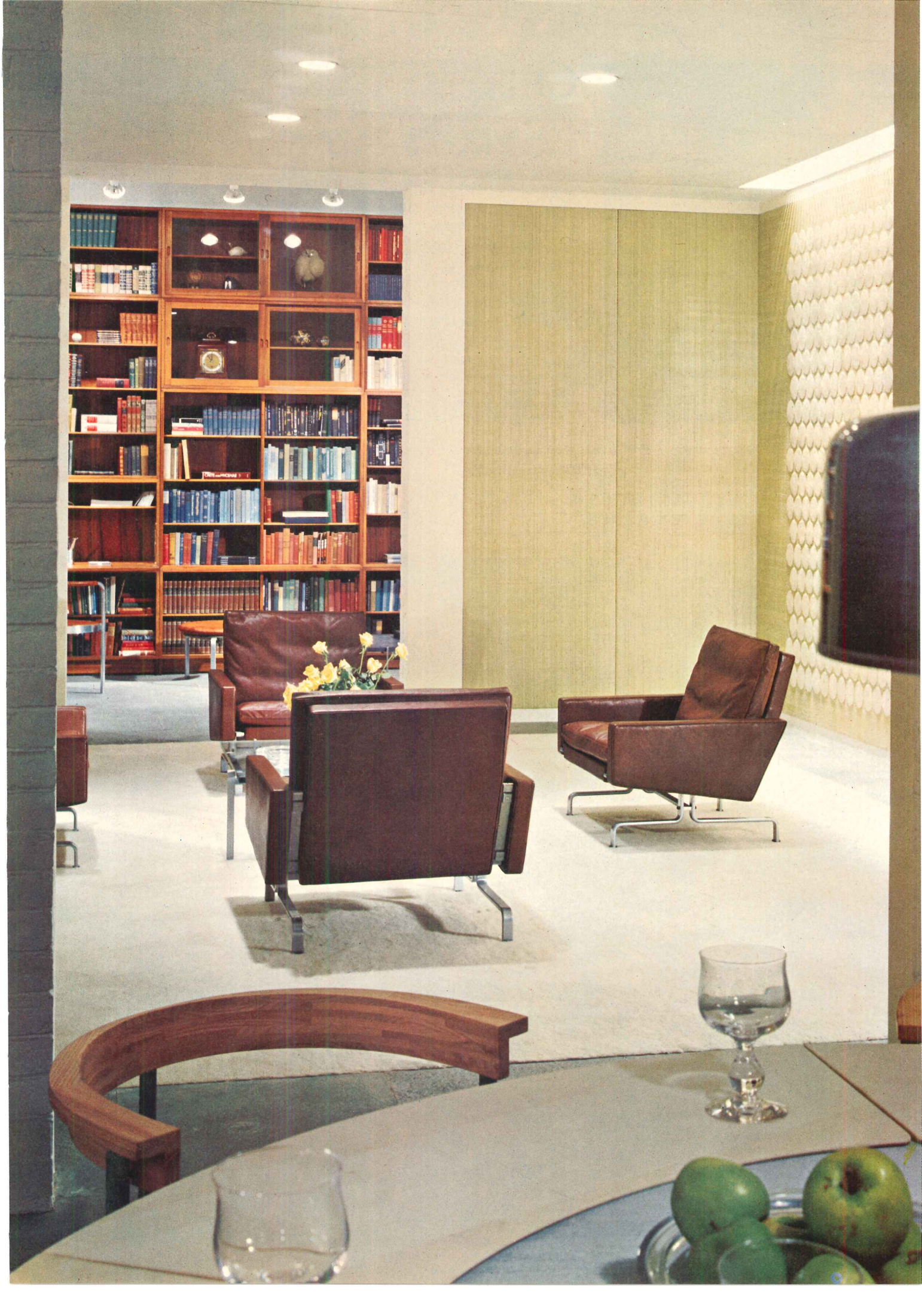
The effect of a shopping street or galleria has been created by Platner as the main focal area for the Jensen showroom. Instead of the usual "sea of objects on display", related groupings are set apart on raised podiums, and divided by sizeable, white-painted brick piers. The latter not only mask structural columns, but also provide handy yet out-of-sight spaces for storage, kitchenette and the like. The other major surfacing materials are equally simple and substantial: floors are gray Norwegian slate, and ceilings are the exposed, coffered concrete slabs which came with the building. Display platforms, however, are rich and shimmery, and made of marble, granite, beautiful woods, plastic or glass. Their eye-catching appeal is augmented by low-key but innovative lighting, including an abstract mural created entirely of light, and a totally non-imitative but sky-like "ceiling of light" made of a myriad of small bare bulbs separated and reflected by long strips of transparent plastic. Although all lighting and displays have been painstakingly and knowingly planned by Platner, he has also incorporated great flexibility into their design for inevitable future changes.

A series of small-scale, enclosed spaces was devised by Platner to contrast with, and heighten the effect of the cool, sparkling "galleria". Vistas through them were planned to create a chiaroscuro of light and shade, and they are richly lined with fabric panels and textile murals. Though most of these spaces are carried out in soft, warm colors, the area set apart for the actual display of Jensen's line of fabrics utilizes the inherent riot of texture and color to create a highly effective change of pace. To heighten concentration on the displays, most of these spaces are windowless—and white vertical blinds are installed to mask the existing wall of windows in the building. Ceiling heights in the smaller areas are reduced by suspended panels covered with the same silk or linen as the walls.
As the main point of the program for the entire showroom was, obviously, to show off the merchandise, one must comment that seldom has one seen objects—even such elegant ones as these—displayed to such an imaginative advantage and adding up to such a total impact of good architectural space.

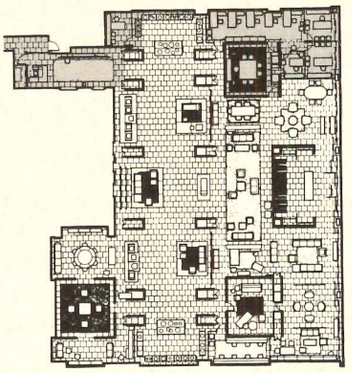








Offices and reception areas of the Jensen showroom are executed with the same imagination and eye for effective display as the other areas. Four private offices, set apart by all-glass partitions and doors, and a general office space are ranged around an enclosed office-conference room. All are furnished with desks, tables and storage cabinets designed by Hans Wegner; the conference room is treated similarly to the other "snug" areas, with wall and ceiling panels of mohair designed by Warren Platner and Sheila Hicks. The lobby lighting level is very low to focus on a wall of slide images of natural design elements.



GEORG JENSEN CENTER FOR ADVANCED DESIGN, New York City
Architect: *Warren Platner—Robert Brauer, associate;*
consulting engineer: *John L. Altieri;* projection devices: *George C. Izenour Associates;* graphic materials: *Don Wise & Co.;*
textile wall designs: *Warren Platner and Sheila Hicks;*
contractor: *Sprain Construction Company, Inc.*

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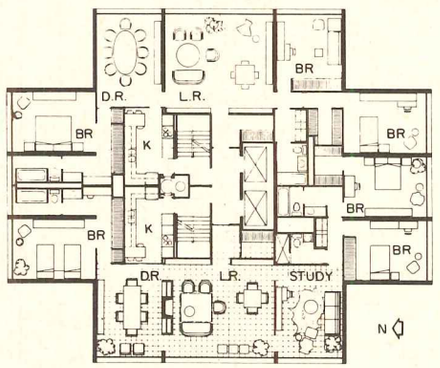
GARDEN LIVING UNITS AT APARTMENT TOWER BASE GIVE SCALE AND VARIETY

Skidmore, Owings & Merrill's tower and garden combination has pleasant scale, an unusual air of seclusion, and exceptional openness for all units.

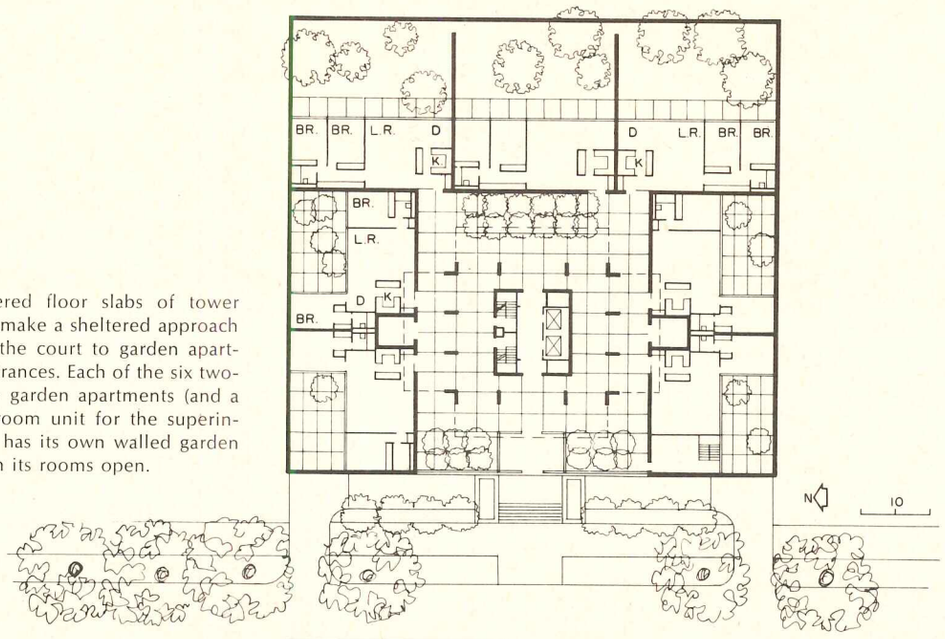
Tower and garden apartments are combined in this group with remarkable skill to achieve an unusual degree of seclusion and, at the same time, openness. The tower rises to a height of 15 stories from the reinforced concrete bearing piers which surround the elevator lobby at entrance level. The one-story garden apartments are ranged along the sides of the almost-square site, and are entered from the court in which the tower stands. The entrance level of the site—151 feet by 150 feet—is used to capacity, yet the tower remains free, with light and air on all sides. The concrete shear walls of the tower cantilever from the building core, and act as partitions between and within apartments and as enclosing exterior walls. Face brick is used on the walls around the garden units; textured architectural concrete for the piers and shear walls. Spandrels are of black aluminum. A full level under the entire site provides for a parking garage and for all services. Located just north of the University of Chicago Midway Plaisance, the building was designed to house personnel from the university.

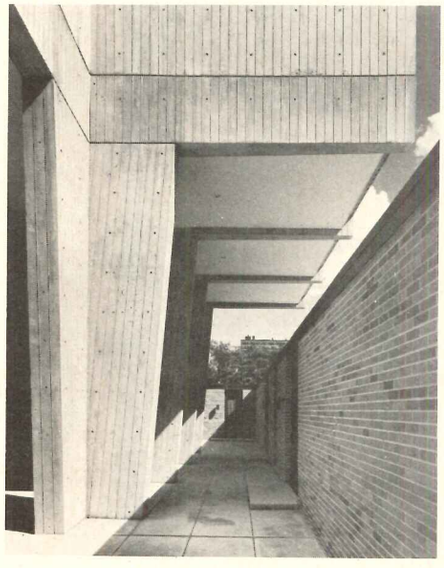
5825 DORCHESTER, Chicago. Owner: *Draper and Kramer, Inc.;* Architects and engineers: *Skidmore, Owings & Merrill—William E. Hartmann, partner-in-charge; Bruce J. Graham, partner in charge of design; Richard E. Lenke, associate partner and project manager; Robert Diamant, associate partner and senior designer; S. H. Iyengar, project structural engineer; Albert I. Cho, project mechanical engineer;* landscape architect: *Stephanie Kramer;* general contractor: *Turner Construction Company.*

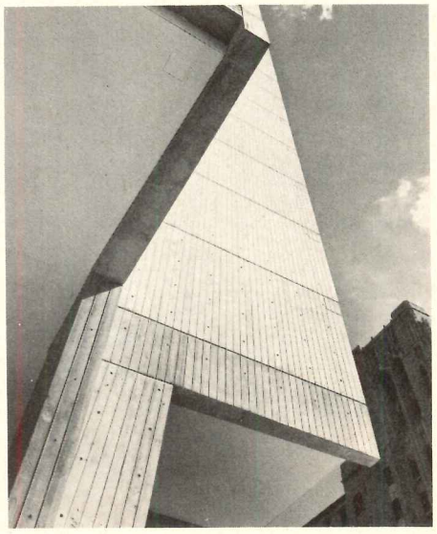


FIFTEENTH FLOOR

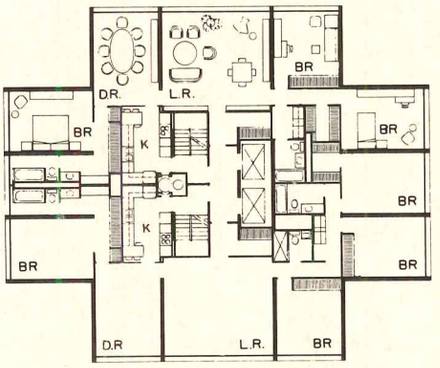
Cantilevered floor slabs of tower building make a sheltered approach through the court to garden apartment entrances. Each of the six two-bedroom garden apartments (and a one-bedroom unit for the superintendent) has its own walled garden off which its rooms open.







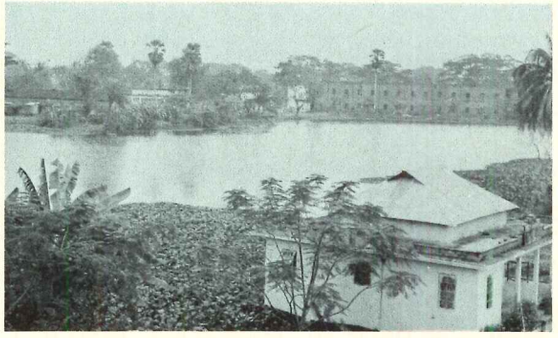
The broad band of windows floods all tower rooms with daylight. Living room (above) is 13 by 20 feet in size; dining room, which opens off it, is 12 by 13 feet. Typical floor plan shows use of shear walls for partitions and enclosing walls. The tower contains 28 three- and four-bedroom apartments.



TYPICAL FLOOR

By Raymond Lifchez

MASTER PLAN STUDY GIVES EAST PAKISTAN NEW APPROACHES FOR TROPICAL ARCHITECTURE



A unique master plan has recently been completed for the expansion of five technical institutes in East Pakistan. When built, the new facilities for existing institutions in the cities of Pabna, Rangpur, Sylhet, Barisal and Bogra will represent more than additional accommodations. They will demonstrate architecture as rational building, for they were conceived of as congruous forms, based upon a sympathetic understanding of the country's environment and the way of life enjoyed by its people.

Formulation of the master plan has taken two and one-half years to complete. Design and working drawings, related to work on the various sites, are now in process, and construction will begin this year. The study which backs up the master plan represents an achievement of architectural significance not only to Muzharul Islam and Stanley Tigerman, the project's architects. They believe that when available in book form, the study will be of considerable use to architects and builders of East Pakistan, whether or not they are specifically interested in designing polytechnic schools. Their research, meticulously organized, is the first of its kind compiled for that country. It should become an especially valuable tool for native builders in a country that suffers, like many others, a kind of architectural schizophrenia: the result of rational native practices in conflict with European styles imported during generations of foreign domination. In having produced such a study, the architects now believe they will leave something behind them other than buildings: a work that could be part of a continuing process.

The study from which the specific building programs were written is comprised of several parts. These deal with the formulation of design criteria based upon the exploration of the unique problems of this geographical locale and its people. When they first undertook the project, the architects quickly discovered that there was neither documentation of existing standards nor of performance or quality of work, and they set out to collect such information.

Having completed their basic research, the architects then proceeded toward a synthesis of their findings as built forms. The result was a compendium of construction details, spatial arrangements and siting configurations that could be tested against the country's unique problems and environment. It was only after these initial steps were accomplished—qualifying architectural forms in terms of all determinants—that the specific requirements for polytechnical training were introduced. Throughout the study, existing practices were often challenged by the architects in an effort to sort out current educational intentions from a morass of old practices and prejudices. Ultimately, a set of building forms was arrived at that is well-related to accommodating teaching, administrative, recreational, social and housing needs: a *kit of parts* which will contribute to the future development of all of East Pakistan's polytechnic institutes, and perhaps to the betterment of architecture in all places with similar problems.

BASIC RESEARCH EVOLVES SEVEN GENERATORS OF ARCHITECTURAL FORM

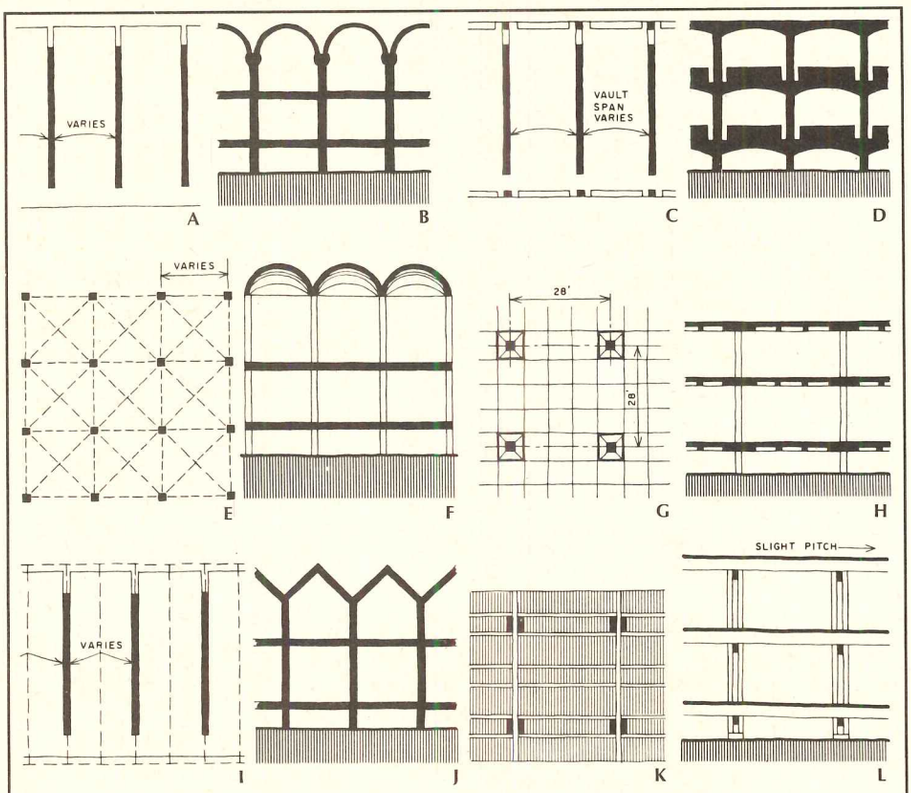
The architects' first concern was the evaluation of what they have come to call *generators of architectural form*. This includes research of cultural and sociological patterns, economics, environment, esthetics, function, flexibility, structures, materials, and construction methods related to the existing architecture of East Pakistan.

"Normally", Tigerman points out, "a master plan of this scope is based on natural and sociological criteria already documented. Since, in a large measure, this body of data was unavailable, we gathered, compiled and prepared such data as would be useful as background for our expansion program. The result of this data gathering process now equips us, as the architects, to do our job more adequately.

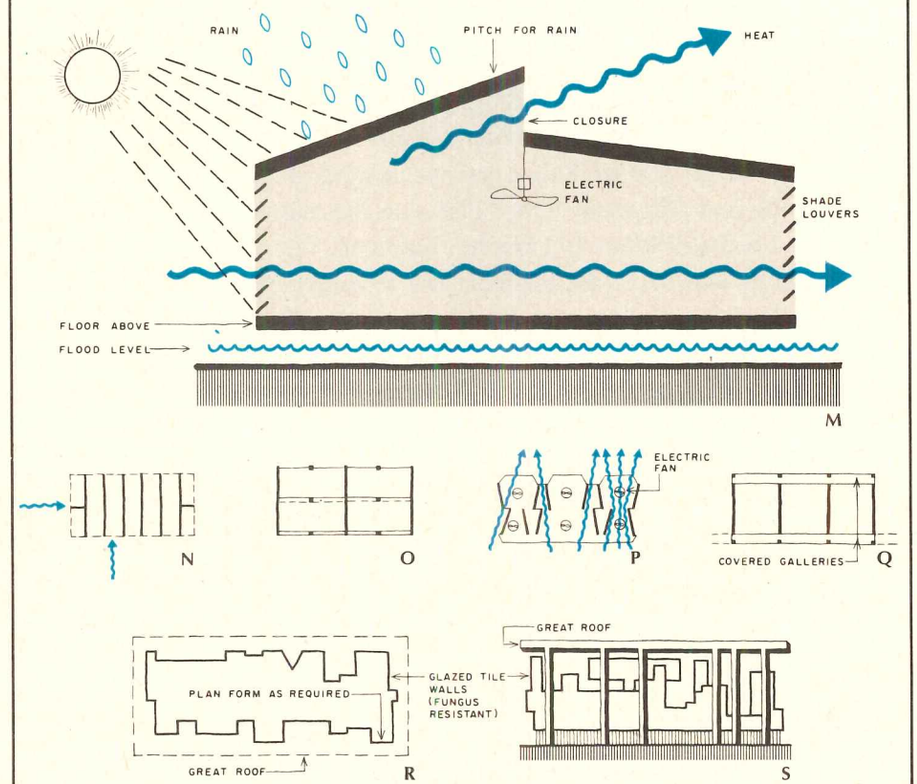
"There are three parts to the study. The first part is general and could be useful to anyone building in Pakistan. This part has nothing particular to do with the teaching of polytechnics, but discusses in broad terms natural and sociological criteria as design determinates. The second part of the study is concerned with existing and future programs of the Director of Technical Education. This part has much general information as well as being specifically related to this particular project. The first and second parts are being used in designing our project, of course, but are not determined by it. The third part is the specific project. As you see, the study may be used in three ways: by all architects, by those working on future polytechnics, and by the people on our project."

East Pakistan is a small portion of Pakistan: 55,000 square miles. It is principally agricultural; the country's industry is located in the other sector, west of India. Natural resources are largely untapped. The climate is tropical. Building techniques are either native, or patterned after European methods, which are not entirely suited to the environment. The people are Moslems and their buildings must be thoughtful interpretations of traditional life styles that are not easily challenged.

In the first phase of the study the architects found that natural phenomena of geography and climate could be more readily interpreted as built-forms than could cultural concepts. The correct interpretation of the latter, however, would ultimately prove the success of the undertaking.



GENERATORS OF ARCHITECTURAL FORM are explored in the Master Plan in seven sections: *form through structure; materials; environment; cultural and sociological patterns; function, fixity and flexibility; form;* and *economics and construction methods:* The sections are illustrated and are related to detailed analyses of related problems.



BUILDINGS IN EAST PAKISTAN MUST BE PROTECTED from the deleterious effects of moisture and fungus, which erode such commonly used building materials as plaster and concrete. To this end, the architects are experimenting with native glazed tile, which for centuries has proved a perfect surface material, and with "umbrella roofs", which keep building surfaces free of stain moisture which is conducive to mold.

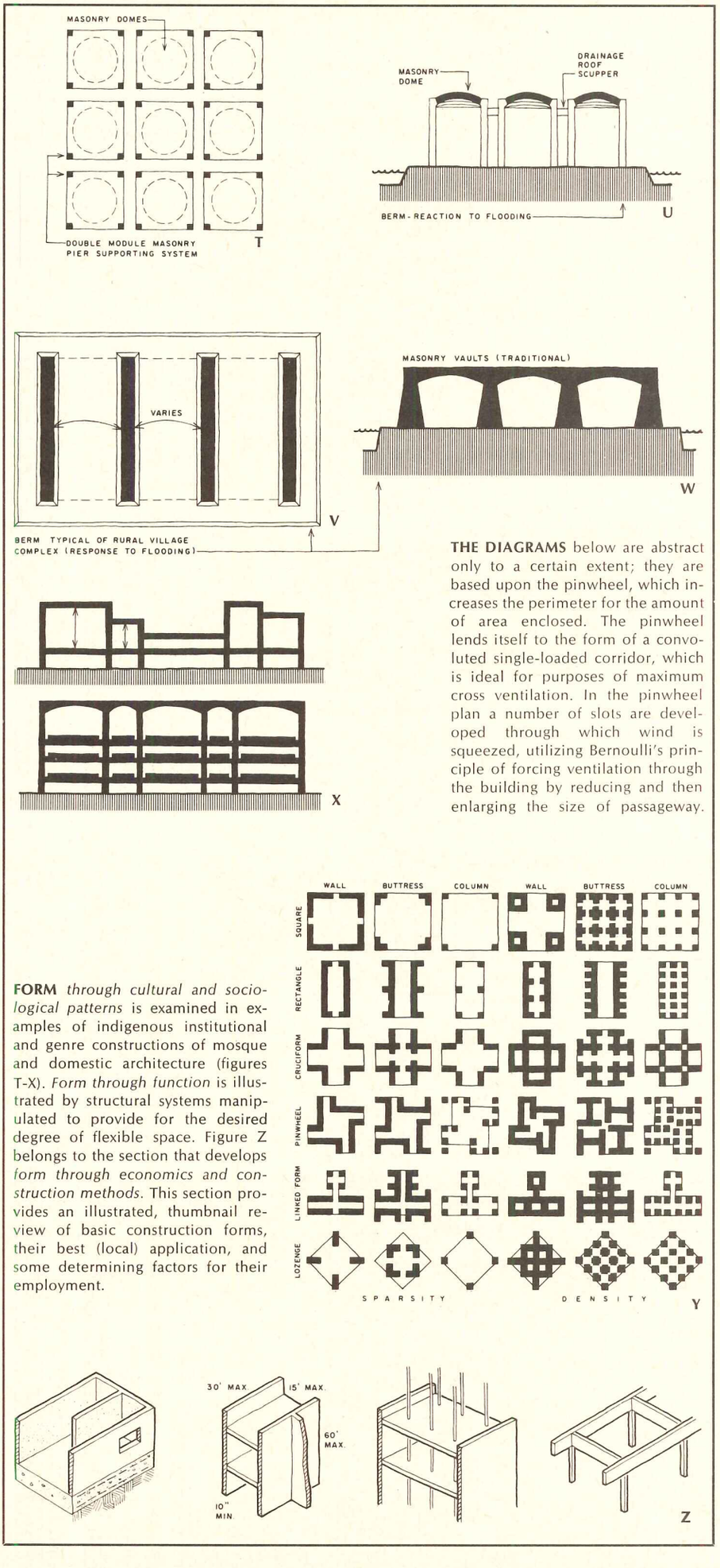
Social habits and customs, physiology, education, family structure and recognized idiosyncrasies of the East Pakistani were recorded wherever they appeared relevant to making suitable accommodations. The Pakistani's concept of "public" and "private" had to be understood both in terms of accepted cultural patterns, determined largely by economic exigencies, and the future of these patterns in light of sociological change as a result of education, urbanization, and prosperity .

Statistics on labor, materials and construction costs were compiled. These figures were given a specific architectural context in relation to economical building forms and mechanical systems in general use in the country. Good practices born of native ingenuity were brought into focus, especially when exploring the problems of construction and materials in the monsoon season. Figures A-L are some of the 22 diagrams explaining *form through structure and form through materials*. These illustrate various combinations of columnar and wall and/or composite systems, employed to achieve either flexible or fixed spatial systems. Vaults, domes and arches, and folded plates are illustrated because of their relevance to building techniques in East Pakistan.

Form through environment is illustrated by diagrams (M-S) that show hypothetical building sections under different weather conditions: sun, wind, rain, air movement, flooding, etcetera. In the tropics, a building's relation to climate is extremely important. Mechanical air-conditioning systems are seldom used because of their high initial expense and operating cost. During the winter, the lightly-clothed East Pakistani may experience some discomfort at night when the temperature is 45-50° F. minimum. He compensates for the problem by closing the openings of his home to keep out the night air. During the hot, humid monsoon season, natural ventilation is the basic means of maintaining comfort, facilitated by large building openings. But when this fails, electric fans are sometimes used.

In the study Tigerman offers a section called *form through form* (figure Y). Unlike other sections in the book, this one, he insists, is not to be translated "literally." He explains, however, that formal configurations, extended from the abstract, may form a basis of architectural esthetics and esthetics are important in East Pakistan, where, as in most places, self-respect is heightened by beautiful architecture.

For those who may be doubtful, the usefulness of this kind of "formal analysis" (as illustrated in the diagrams at right) will be found in the buildings.



THE DIAGRAMS below are abstract only to a certain extent; they are based upon the pinwheel, which increases the perimeter for the amount of area enclosed. The pinwheel lends itself to the form of a convoluted single-loaded corridor, which is ideal for purposes of maximum cross ventilation. In the pinwheel plan a number of slots are developed through which wind is squeezed, utilizing Bernoulli's principle of forcing ventilation through the building by reducing and then enlarging the size of passageway.

FORM *through cultural and sociological patterns* is examined in examples of indigenous institutional and genre constructions of mosque and domestic architecture (figures T-X). *Form through function* is illustrated by structural systems manipulated to provide for the desired degree of flexible space. Figure Z belongs to the section that develops *form through economics and construction methods*. This section provides an illustrated, thumbnail review of basic construction forms, their best (local) application, and some determining factors for their employment.

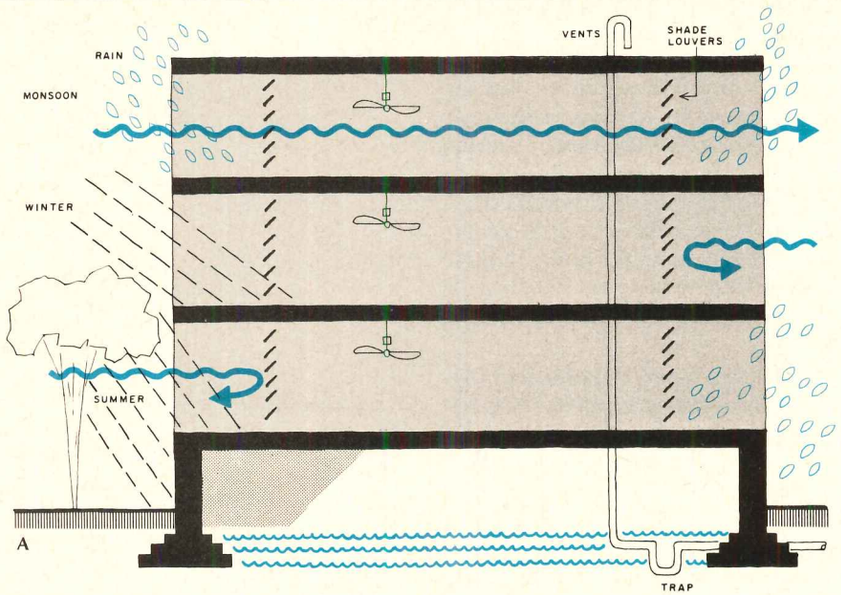
BUILDING CONCEPTS SYNTHESIZED FOR A TROPICAL ENVIRONMENT

The primary synthesis of built form and environmental determinates is illustrated by a schematized typical building section shaped in response to the varying seasons of the country: monsoon, winter, and summer. The same diagram is then used to illustrate a secondary synthesis: that of a building's response to materials, vegetation, and pests.

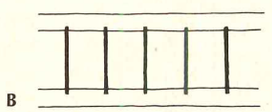
Natural forces affecting climatological human comfort—temperature, humidity, air velocity, and light—are commonly acknowledged as design determinates. The master plan study points out, however, that factors of age, sex, skin pigmentation, clothing, general health, and acclimatization are also critical factors.

The climate of East Pakistan is of the tropical monsoon type. Winter (November through mid-March) has temperatures ranging from 45° to 90° F., clear skies, little rain, wind velocities from one-half to two and one-half mph, and low humidity. Summer (mid-March through mid-May) has the highest temperatures (100° F.), 15 per cent of the total annual rainfall (100-220 inches), and frequent violent thunderstorms with wind velocities up to 120 mph. During the monsoon (mid-May through October) over 80 per cent of the annual rainfall occurs. Frequent storms are characterized by steady, moderate rain lasting from several hours to several weeks. Wind velocities are slightly lower than during the summer; maximum temperature is above 90° F., humidity is at its annual peak, and skies are generally overcast. During monsoon, most of the tropical cyclones occur bringing storm winds in excess of 75 mph and very heavy rainfall.

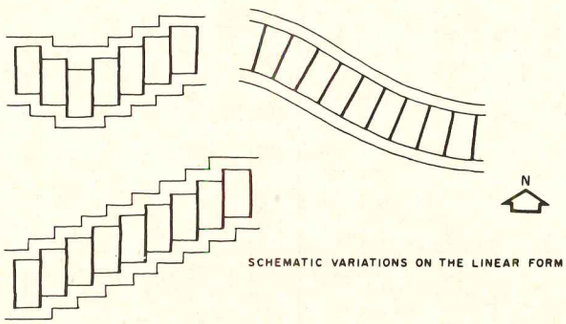
Appropriate architectural form, its critical dimensions and proper orientation, is to be derived in response to the specific demands of the country's climate. Also, certain building practices must be observed: topsoil must be stripped and replaced by sterile silt to control growth of vegetation; ground cover must be planted to reduce reflected solar gain; house traps must be water-sealed to exclude rats and cockroaches; windows, doors and vents should be screened to exclude vermin. The living platform of all structures must be elevated above monsoon flood level. Large overhangs and louvered openings are to be oriented to allow for control of wind, light, and rain in the different seasons. Massive roofs are useful in winter as a solar heat reservoir for night time reradiation.



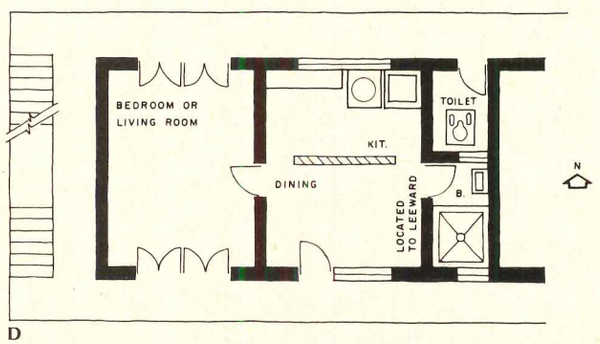
SCHEMATIZED TYPICAL BUILDING PLANS are shaped in response to climatological forces of East Pakistan. Certain rules-of-thumb are established for good building practice. All wall openings should be maximum size for maximum ventilation; closures should be of materials affording minimum interference with ventilation, such as screens and nets. A north-south orientation of walls takes advantage of prevailing winds. Exterior galleries facilitate dry, ventilated interiors and also promote air circulation. Many variations of the ideal linear form are possible. The continuous gallery can be interpreted both for public service and as a private veranda (fig. D), depending upon the disposition of interior spaces. Masonry walls should, at least at one point, make one right angle turn for seismic stability. Windows and doors should be louvred. Eaves are extra-heavily anchored and weather joints are designed for high wind-driven rain. All sanitary and cooking facilities should be placed to the leeward side of the building.



SCHEMATIC PLAN - TYPICAL BUILDING
(MONSOON SEASONAL RESPONSE GOVERNING FORM)



SCHEMATIC VARIATIONS ON THE LINEAR FORM



A KIT OF PARTS FORMS THE PROTOTYPICAL POLYTECHNIC INSTITUTE

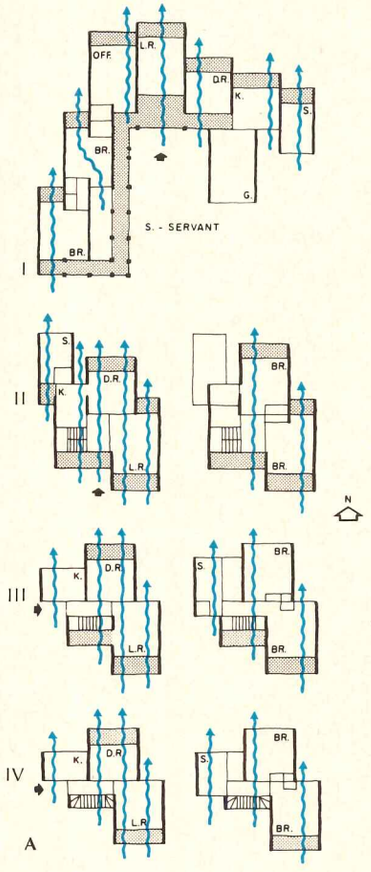
Undertaking the existing and future programs of the Director of Technical Education, the architects developed component parts for a prototypical polytechnic complex. Spaces were developed for administration, classes, twelve kinds of laboratories, seven kinds of shops, ten kinds of staff housing, student housing, recreation, medical and religious facilities.

What evolved was a "kit of parts". The elements are rationally formulated configurations in themselves, but they remain to be interpreted as architecture in response to the specifics of a given site and program. For example, traditionally 10 different housing units were considered necessary to accommodate the various ranks of teaching staff (figure A). Upon evaluation, the architects decided this distribution to be excessive and unjust. They were able to modify their designs to only four types, providing approximately the same accommodations for all, varying them only in space.

The individual modules of space for each program type were developed in such a way as to allow for interpretation in response to environment or esthetic preferences (figure B). Tigerman considers this the "exciting part of systematic thinking, of working in systems analysis and permuting multiples. To achieve diversity is a desired goal. Normally diversity is achieved only by the intuitive mind. But if the problem, let us say, is housing for the poor of East Pakistan—I mean dealing in something where cost is an issue—then you have to somehow find a system, a really taut plan, a taut module, so that that module may be repeated to form many varieties which would not look 'project-like'; forms which will not necessarily reveal the individual modules that made them up. Thereby the analytic mind can be at work on something to achieve the end of diversity, which is one of those things sought by human beings: something different that is theirs, their piece of *terra firma*, their house, their thing. And there is no way to do this out of the intuitive mind alone through form or esthetics while still trying to be operative in the taut planning context of solutions dealing with the poor."

A large reservoir or tank is incorporated into the plan of each prototypical site. The tank serves to collect some of the annual rainfall of 100 to 220 inches. Such tanks are to be found in every village. At the school, as in the towns, they will be used for recreation and bathing.

CHARACTERISTIC SPACE ALLOCATION RELATED TO ACADEMIC STATUS



I One story dwelling
Net Area—1500 sq ft
Gross Area—2400 sq ft

II Two story row house
Net area—1125 sq ft
Gross Area—1600 sq ft

III Four story stacked maisonette
Net Area—1025 sq ft
Gross Area—1300 sq ft

IV Four story stacked maisonette
Net Area—1025 sq ft
Gross Area—1300 sq ft

V Three story flat
Net Area—840 sq ft
Gross Area—1000 sq ft

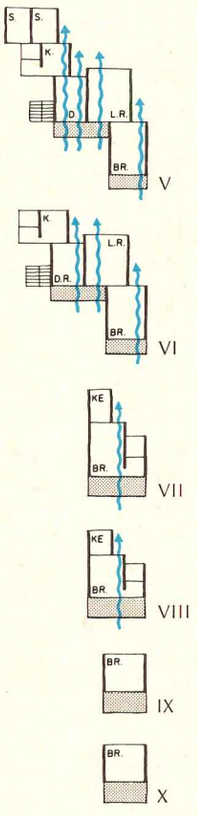
VI Three story flat
Net Area—510 sq ft
Gross Area—700 sq ft

VII Two story flat
Net Area—190 sq ft
Gross Area—286 sq ft

VIII Two story flat
Net Area—150 sq ft
Gross Area—225 sq ft

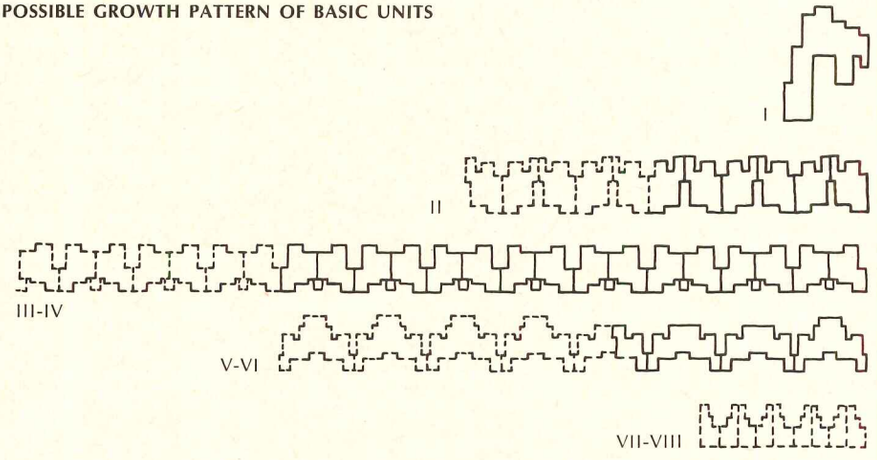
IX Two story flat
Net Area—90 sq ft
Gross Area—150 sq ft

X Two story flat
Net Area—90 sq ft
Gross Area—150 sq ft



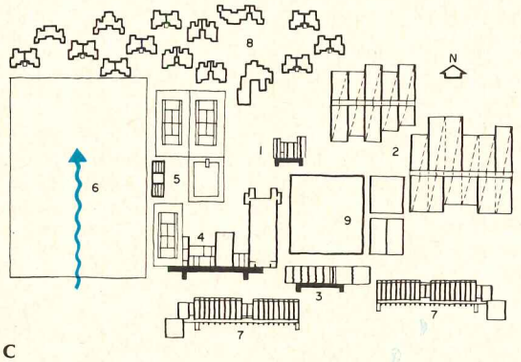
A

POSSIBLE GROWTH PATTERN OF BASIC UNITS



B

1. Administration
2. Teaching facilities
3. Social facilities
4. Recreation
5. Water tank
6. Playing fields
7. Student housing
8. Staff housing
9. Reservoir



C

THREE PROTOTYPICAL POLYTECHNIC SITES were developed. These are considered site diagrams based upon function, environmental determinates and expansion possibilities. Each one is developed in terms of land-use flexibility: phasing building programs, indeterminate growth patterns, obsolescence. They are not based upon any relationship with outside facilities, such as a town or other educational institutions. Actual site relationships—physical, social and cultural—will shape each institution into a unique environment. Typical plan shown, left.

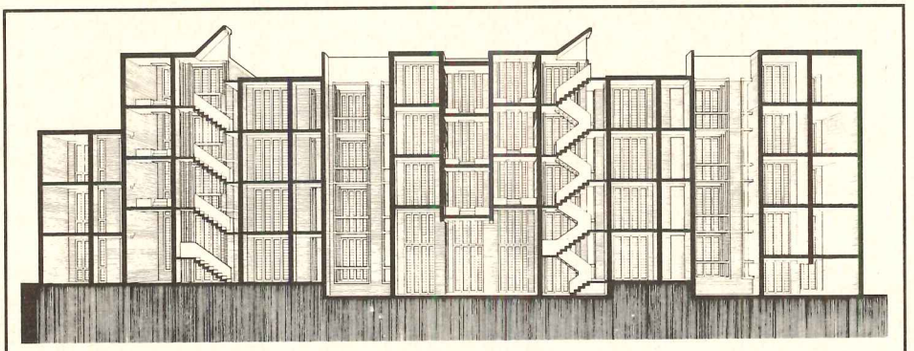
PROTOTYPICAL DESIGNS CONSOLIDATED INTO BASIC BUILDING TYPES

Out of the numerous programs to be spatially accommodated, four building types were established: housing for students, faculty and administration; laboratories, offices and classrooms; shops; and recreation facilities of all types.

To refine the requirements for living accommodations, questionnaires were sent to all students and faculty at existing institutions. The architects were especially interested to know current attitudes toward Western conveniences. To many Pakistani Western models are equated with modernization. In Pakistan cooking facilities and sanitary conveniences are radically different than those in the West, and it was decided, on a purely pragmatic level—because many of the residents will spend much of their professional life abroad—that they be introduced to the differences. This meant that both traditional hearth stoves and Western appliances, flush valve and squat toilets would be provided.

The boys' hostel includes common facilties for dining, a dispensary, prayer hall, and various public rooms. The basic living unit is a split-level room which sleeps four. In two of these rooms eight boys have their own veranda. Four rooms receive a toilet and stair. Each floor, with its cluster of rooms, is meant to represent a tiny neighborhood. Separated from their homes and having little social intercourse with either townspeople or families of the faculty, the boys rely upon congenial groupings for companionship. Socializing with one's peers in a meaningful way is particularly important in Pakistan, where the boys, when at home, had led a very cloistered family life.

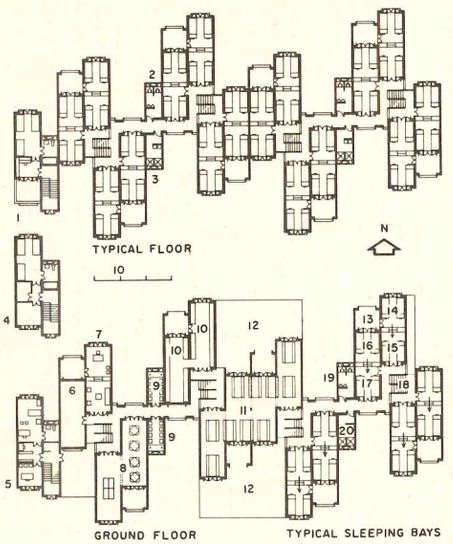
The architects consider it an accomplishment to have been allowed to group apartments for different categories of teaching staff into one building form. Normally, since the various ranks carry certain social distinction, the groups are separated. The architects hope that proto-



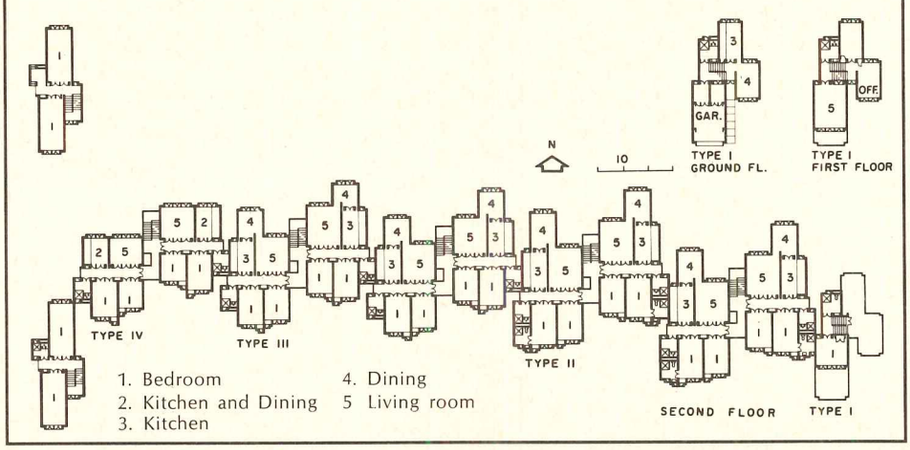
THE HOUSING UNITS are an adaption of the single-loaded corridor plan, and are oriented to take advantage of the prevailing south wind. All rooms can be opened to allow for cross-ventilation through the building.

The student's rooms are split-level. The levels are stepped in ascending form from north to south. Each level provides a place for two boys to sleep. The beds for each pair of boys are slightly elevated, exposed to the wind, and thus afforded maximum ventilation. Stairwells serve as a kind of ventilation chimney. These open on to roof decks, which are popular in summer for communal sleeping.

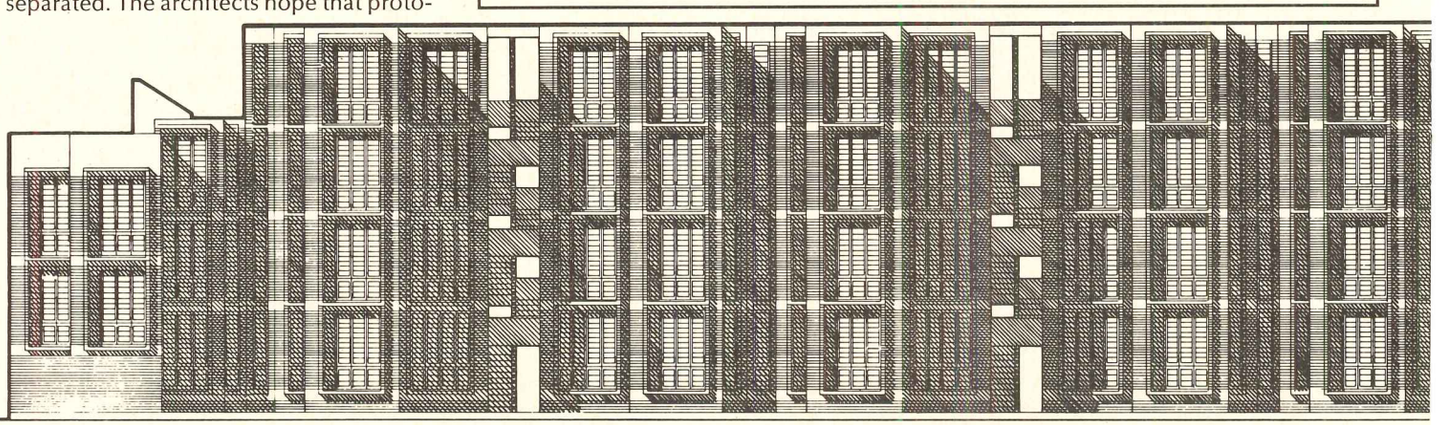
Economically, no glass sections could be used in openings. The most appropriate section for a closure is a louvred panel with operable slats. Tests show that entire walls made of such panels are best for optimum ventilation.



1. Dispensary
2. Toilet
3. Shower
4. Dispensary (upper level)
5. Dispensary
6. Prayer hall
7. Lounge
8. Recreation
9. Lavatory
10. Kitchen
11. Dining
12. Dining terrace
13. Veranda
14. Bedroom
15. Bedroom
16. Bedroom
17. Bedroom
18. Access way
19. Toilet
20. Shower



1. Bedroom
2. Kitchen and Dining
3. Kitchen
4. Dining
5 Living room



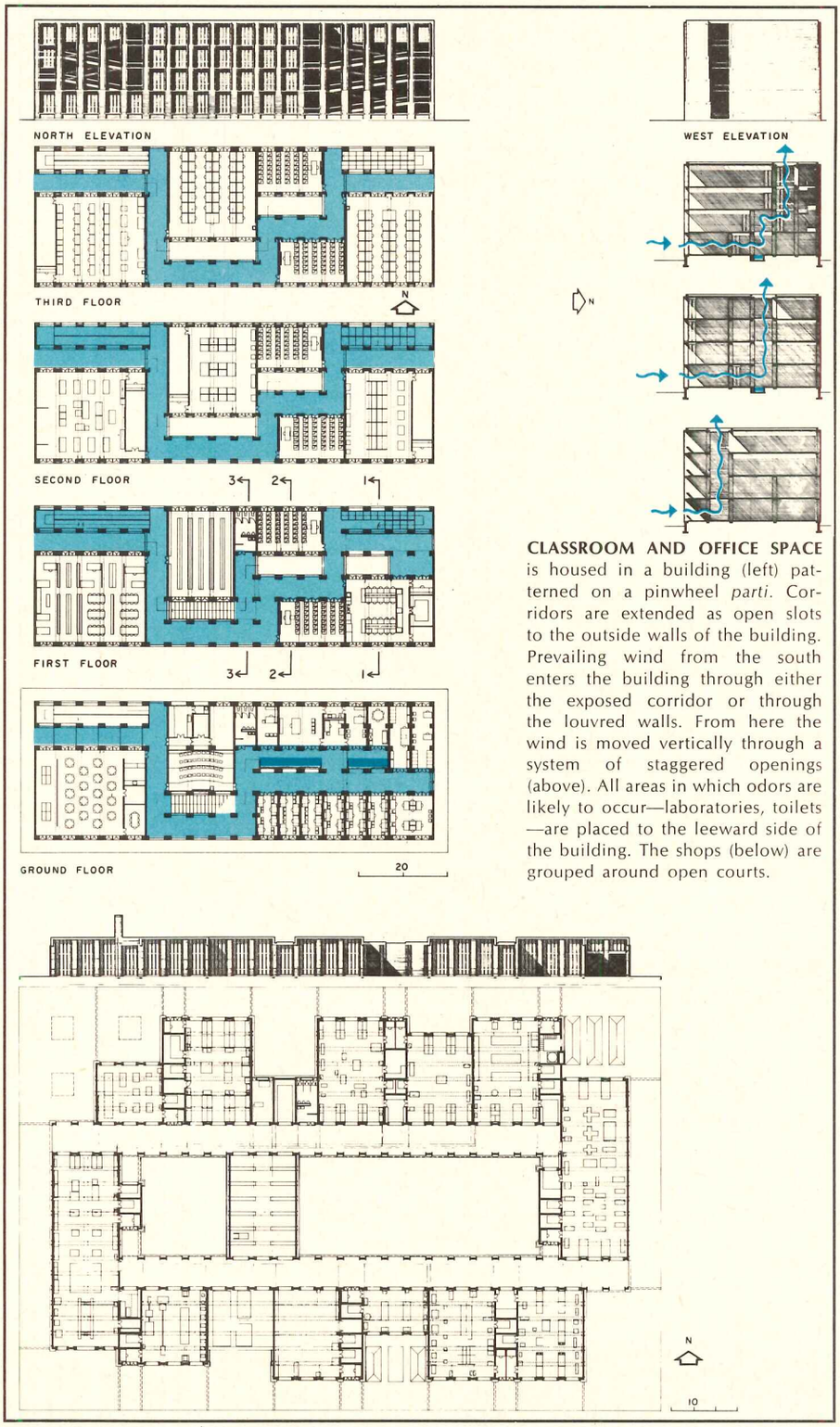
col may eventually give way as residents chance upon one another.

No common facilities are provided for faculty and staff (opposite). Entertainment for the residents takes place at home, to which relatives and friends are frequently invited. Typically, women and children occupy certain rooms and the men others when there are guests.

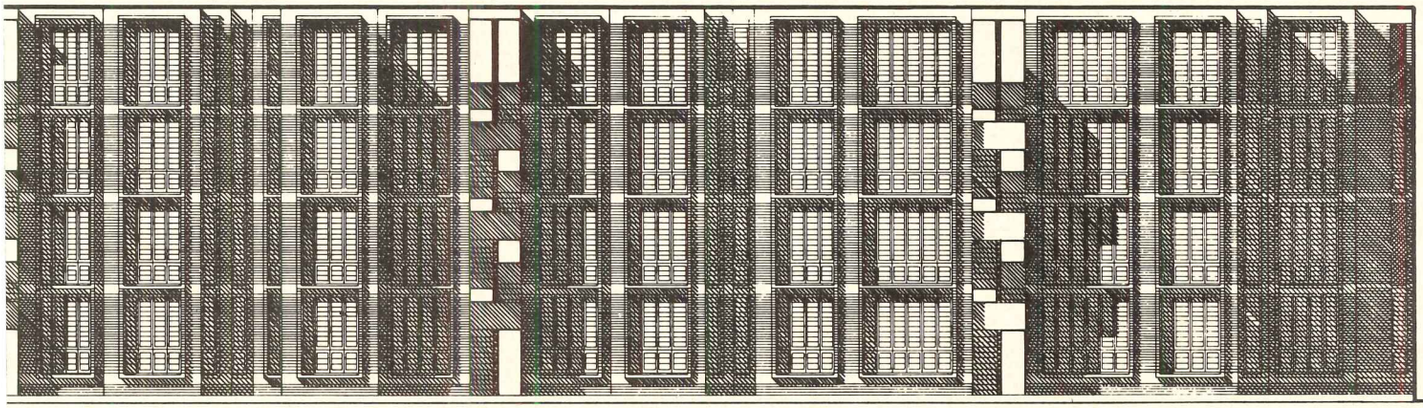
Tigerman points out that purdah as a system is not so pronounced as it once was, but many of the traditions remain. "So we had to accommodate in the housing, as you see in the various plans, a way that women can move around in the kitchen and dining area, where they spend most of their day, and a place for men to retire after meals, especially when there are invited guests. No matter what social position a family may hold in Pakistan, individuals would expect this kind of accommodation. Custom necessitates a variety of separate spaces within a home which serve the entire family on many levels of sociability. Friends and relatives drop in at all hours, and as there are generally no telephones, a family must be ready to receive them. Traditionally, impromptu visiting is in bad taste during meal time, so it is important, to prevent embarrassment, that all dining may be done privately, separate from the other public areas of the house. However, since the Pakistani family is always blessed with the presence of some relative, every corner of the house, no matter how assigned, is likely to be someone's bedroom."

When the 10 prototype living units were reduced to four, the architects were able to appreciably improve upon the overall design concept for staff housing.

Each unit now has the same number of rooms, with the exception of the principal's, which has an office and servant's room. Now, they believe, there is a certain equality for the four staff grades in the housing. By Pakistan standards, the quarters are considered quite adequate. However, distinctions of rank are quite rigid, and it would not be possible—in the foreseeable future—that a person of lower rank, but with a large family, might enjoy the increased spaciousness of a higher-ranking apartment.



CLASSROOM AND OFFICE SPACE is housed in a building (left) patterned on a pinwheel *parti*. Corridors are extended as open slots to the outside walls of the building. Prevailing wind from the south enters the building through either the exposed corridor or through the louvred walls. From here the wind is moved vertically through a system of staggered openings (above). All areas in which odors are likely to occur—laboratories, toilets—are placed to the leeward side of the building. The shops (below) are grouped around open courts.



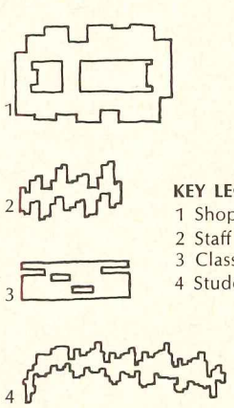
The sites for the expansion of the technical institutes are in existing towns. Resident families and students rely upon the town for a certain amount of socializing and entertainment. Family marketing is done by the servants and male householders at the bazaar. Restaurants are the principal meeting places for male companions. Everyone attends the movies.

Even though at this time the five sites are little more than small towns, the architects have now turned their thoughts to multi-storied forms to meet the needs of future urbanization. The Master Plan study allows for such an open-ended interpretation in making the final decisions about design. When Tigerman was in Dacca at the end of June, he and Islam designed the first multi-purpose form to come out of the Master Plan: they amalgamated the classrooms, shops, and administrative offices into one three-story building. This form will provide for a huge open space on the middle several floors. At the outset, the building may seem unfinished; only a certain amount of floor space will actually be filled in.

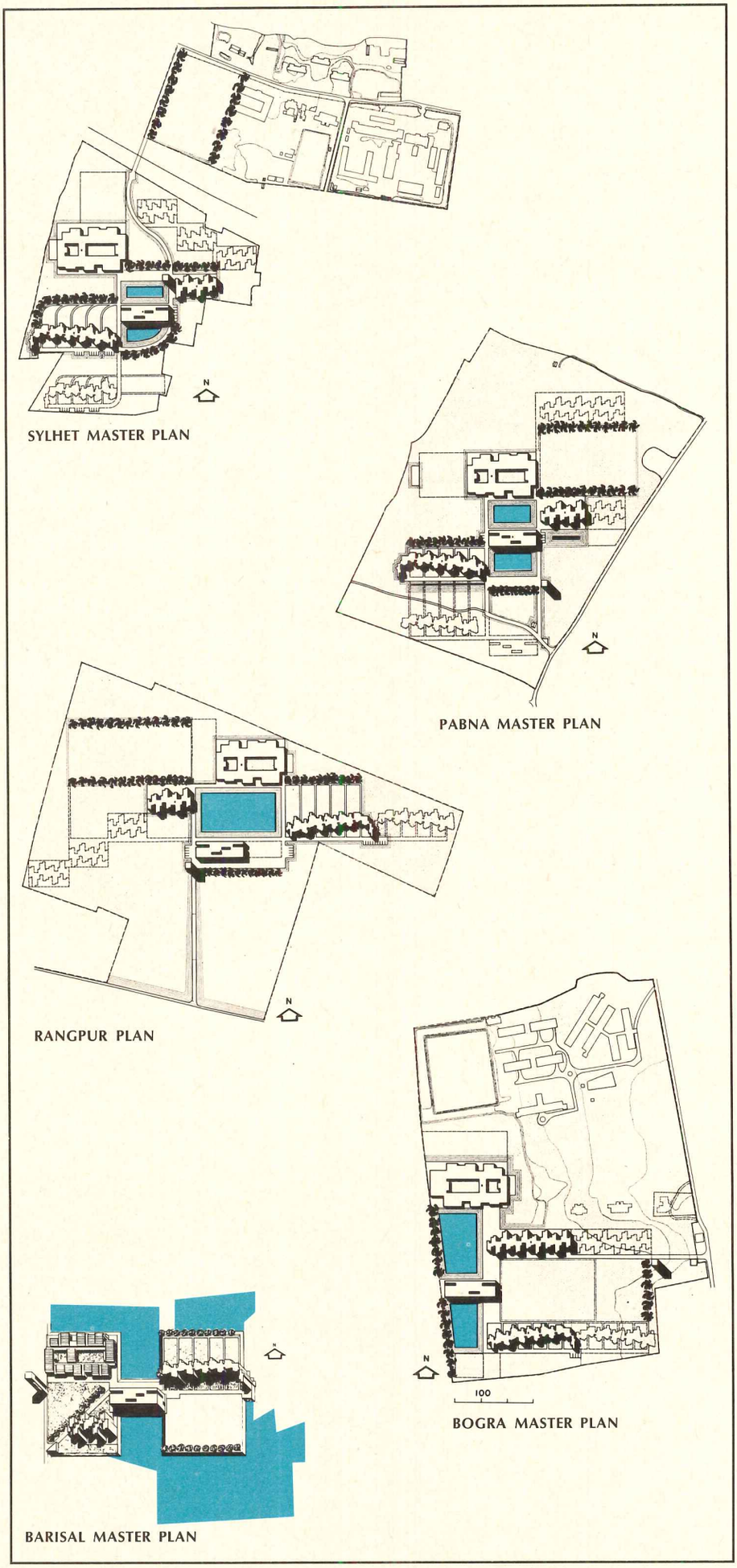
The unbuilt space will allow for expansion, but meanwhile, it will serve as a large veranda. Perhaps the next step is to place the housing above teaching space, shops, etcetera, which would certainly make sense in smaller sites than the ones selected. The multi-storied building will cost less, maintenance will be less, and the students will, in terms of climate, have a better environment.

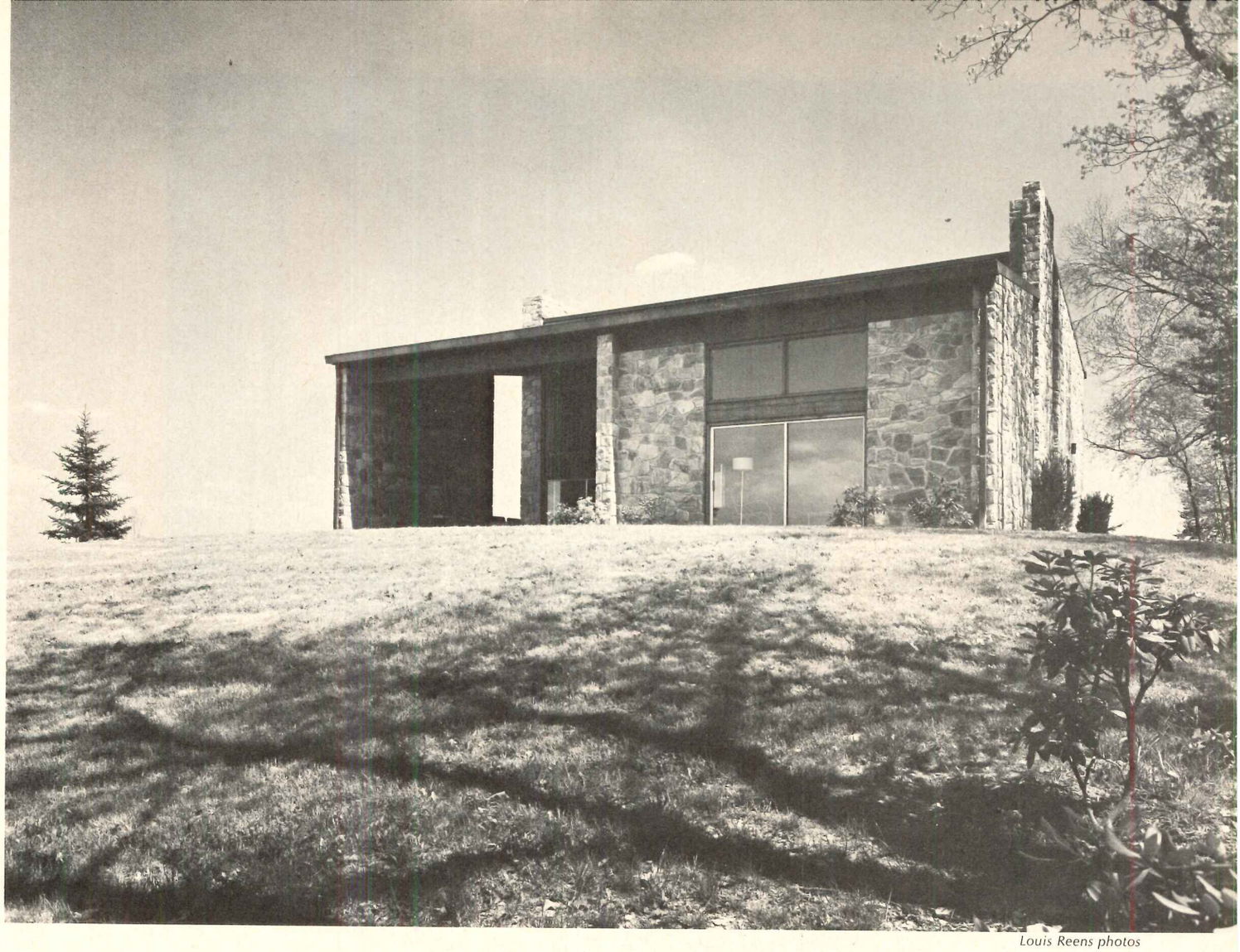
This kind of planning and changing has occurred time and again, and has been allowed for in the way information in the Master Plan has been assembled. Tigerman has confidence in the quality of these changes. "We all keep growing and I keep learning more and more about the particular problems of East Pakistan. The designs, as they change, begin to solve the problems, in our judgment, in a better way."

FIVE POLYTECHNIC INSTITUTES AT BARISAL, BOGRA, PABNA, RANGPUR AND SYLHET, EAST PAKISTAN. Client: *Directorate of Technical Education, Government of East Pakistan.* Architects: *Stanley Tigerman and Muzharul Islam.*



KEY LEGEND
1 Shops
2 Staff housing
3 Classrooms/Administration
4 Student housing





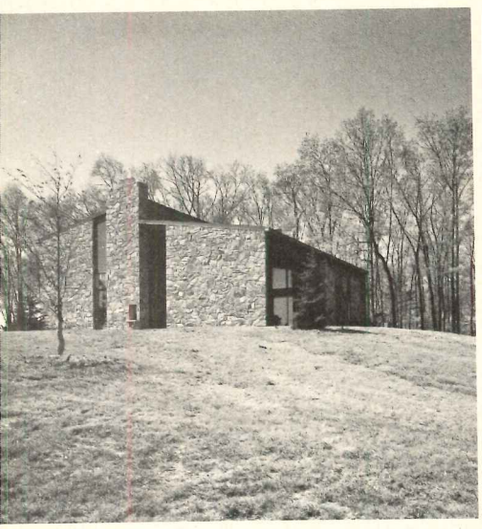
Louis Reens photos

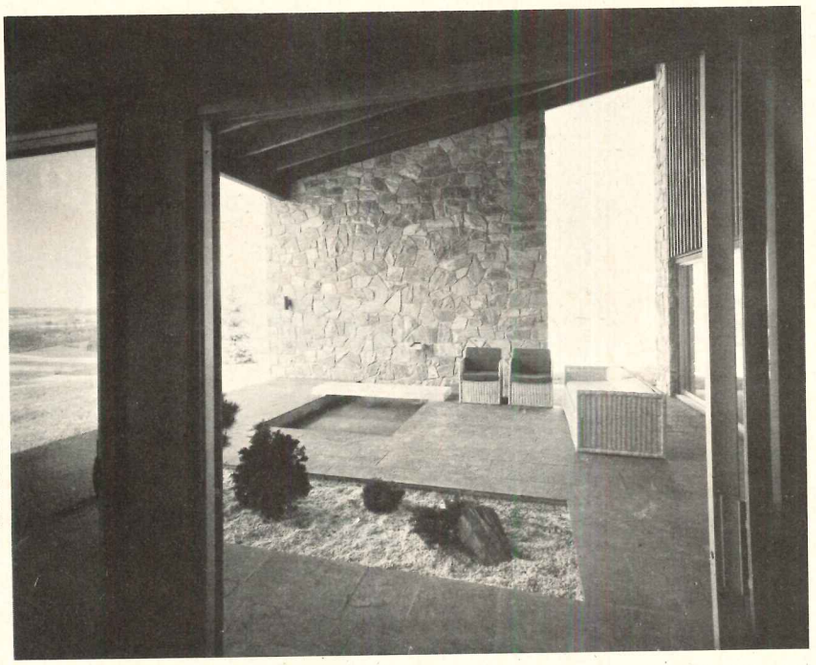
Massive roofs and fieldstone shelter a hilltop country house

Stone and wood were the owners' requirements for their rural home perched atop a hill in the rolling farmlands of Pennsylvania Dutch country. Both materials are aptly suited to the casual living and practical wear-and-tear of an active family of six. And the rugged local fieldstone, typical of traditional Pennsylvania Dutch country buildings, is teamed with massive contemporary shed-roof forms in a merger of material and shape that reflects the stalwart character of the rustic hilltop site. Thick masonry walls and volumes give defense from a windy exposure. But the house is designed with glass and openness, as well as stone and shelter, in mind. Large expanses of floor-to-ceiling glass are open to rolling farmland, while nearby snatches of woodland view are caught by tall, slit windows. Interior sliding doors, lining living areas, open onto the sheltered two-story terrace seen in the photo above, which, with its quiet pool and slate floor, forms a transition from inside to outdoor scale. This room, measuring 23 by 23 feet, is a hub for summer family living, and, in bad weather, its blank wall forms a windbreak for the glass expanses within and frames the landscape view. The house is large, with 3500 square feet of living space, and cost about $65,000.

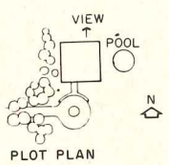
RESIDENCE FOR MR. AND MRS. PETER PALMER, Dallastown, Pennsylvania. Architect: *Alfred E. De Vido;* contractor: *Robert Dunbar.*

Despite its exposed site, the Palmer house is equipped for comfort and convenience. Spaces are amply heated by two oil furnaces, one for radiant panels recessed in living room floor, and the other for convectors throughout. Foam-glass and built-up roofing provide insulation. The structure, wood frame with 14-inch-thick stone bearing walls, has a concrete block foundation. Both stone and redwood beams are exposed inside. White plaster for wood stud partitions is carried directly to beams, recalling interiors of typical Pennsylvania Dutch farmhouses.

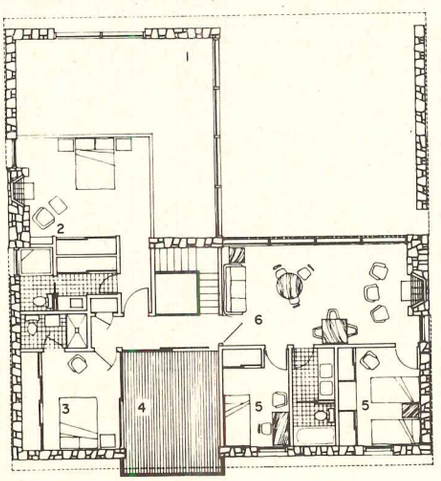




A practical four-square plan divides child and adult activities into opposite two-story quarters. The living areas of each give on to the outdoor family room, whose interior is shown at right. A master bedroom loft projects into the living room to share its light and view, and creates a quiet, darker living space beneath that contrasts with the adjacent two-story spaces (photo below). Extra light is gained upstairs by a recessed terrace and clerestories over bath and playroom. A corner kitchen is strategically placed near the entry, recreation room and maid's quarters. Five baths and ample storage space are included. The recessed entry links with a central stair in a quick circulation scheme that completes the compact plan.



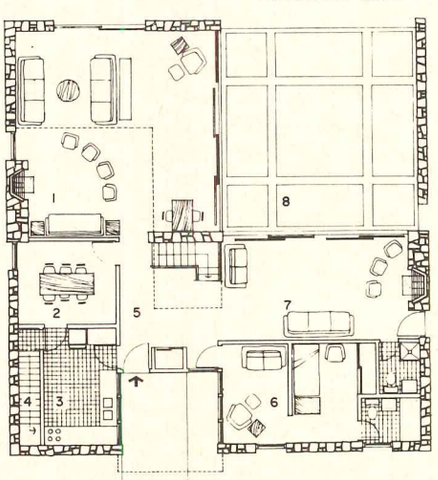
PLOT PLAN



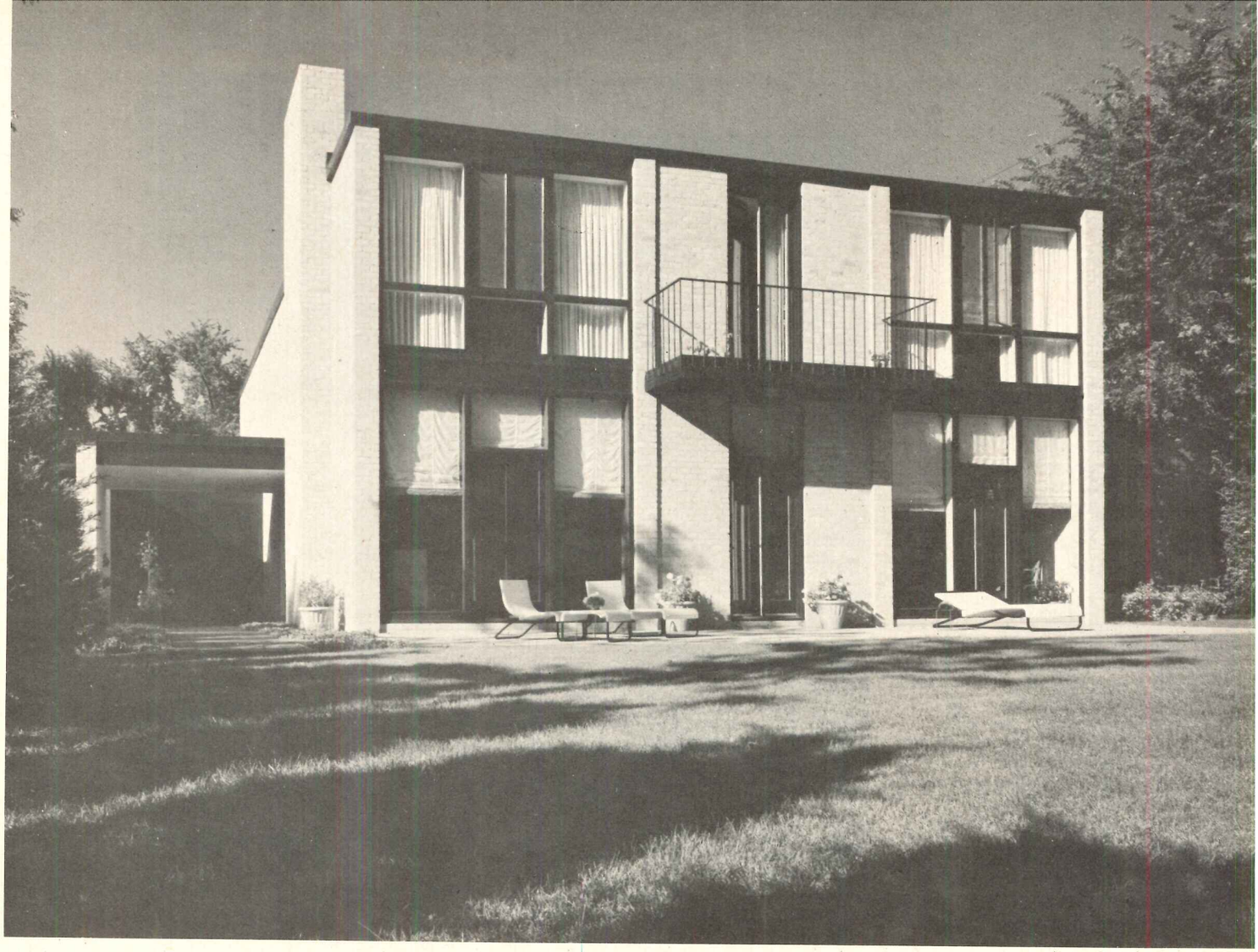
UPPER LEVEL

1 Open to living
2 Master bedroom
3 Guest bedroom
4 Terrace
5 Children's bedroom
6 Children's living room

1 Living room
2 Dining room
3 Kitchen
4 To utility—storage
5 Entry
6 Maid's quarters
7 Recreation room
8 Outdoor room



LOWER LEVEL



James O. Milmoe

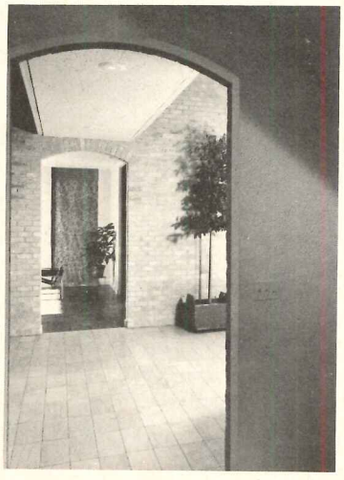
Spatial depth and ordered elegance enhance a finely detailed city home

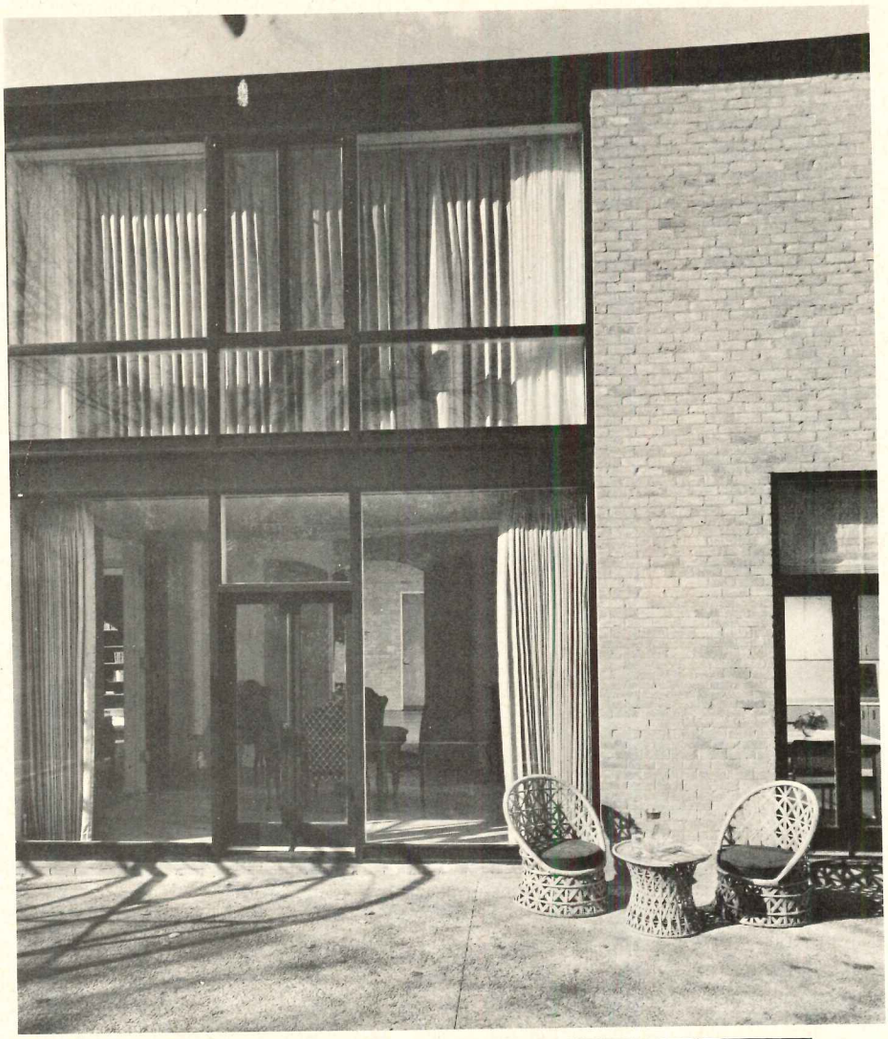
Creating space and privacy for a restricted city site is a pressing problem graciously met in this trim and elegant home for a family of five. The very personal environment is quite removed from the busy city scene, but imparts a quality of sophisticated precision that reflects urban character at its best. Since the owners already owned a ski house in the Colorado mountains, it was their wish that the Denver townhouse be, in contrast, suited to a formal city style, and at the same time adapted to the varied entertainment requirements of an active social and civic life. The small, flat city lot, removed from the street, suggested the house's compact, two-story scheme. Community and privacy are both assured by basic zoning of the plan—adult activities to the front, with formal areas below and private above, and children's areas and utilities to the rear. All are connected along an organizing central axis, and pivot on a central skylighted spiral stair. Dining and living rooms, gallery and library knit into this axis and can be closed off as formal rooms or fused together for open-house use. A skylighted entrance gallery helps to articulate the upstairs plan while providing a focal point for rooms below. Special elements—including a guest suite and basement sauna—are also neatly incorporated.

RESIDENCE FOR MR. AND MRS. WILLIAM V. WARREN, JR., Denver. Architect: *Carl Groos, Jr.—Mardi B. Groos, associate;* structural engineer: *B. W. Lorance;* mechanical engineer: *John Blank.*

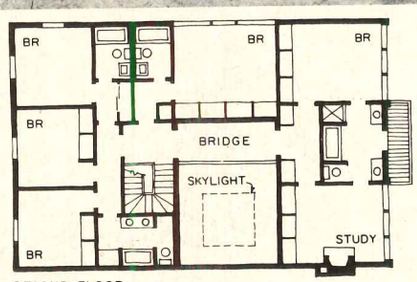
Axial views with their framed vistas are used as a design motif throughout and provide a sense of depth to the compact volume of the house. This spatial design, a classical device illustrated in the photos of gallery, dining and living rooms below, reveals the rich contrasts that make walking—as well as looking—through the house a pleasurable experience, and at the same time reflects the orderly and practical arrangement of its functions.

Marc Neuhof photos

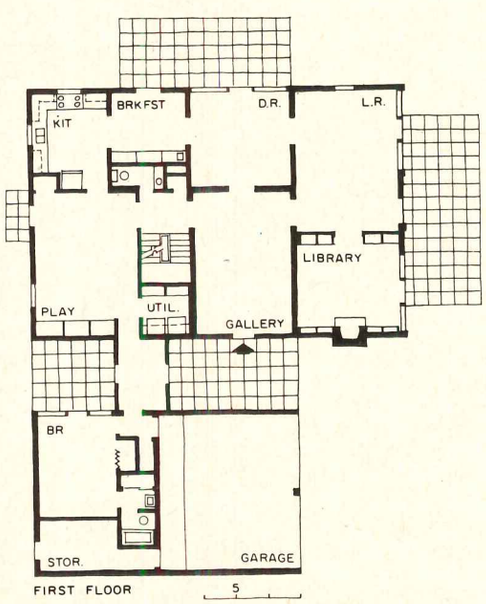




Facades of the Warren house reflect the owners' request for open, but restrained formality. Glazed areas on three sides are ample, but never aggressive, and are subordinated to the symmetrical scheme. Warm beige brick, imported from Mexico, contrasts with the crisp lines of dark wood sash. The same carefully integrated precision of parts and good materials is carried throughout the interior. Brick and highly polished granite are used in the cool, formal gallery (photo below), and contrast with the rich wood parquet floors of the living areas beyond. Polished beige flagstone over concrete is used for kitchen and baths. The owners collect fine antiques, and both these more ornate pieces and the simpler contemporary furniture are complemented by the timeless quality of both materials and design. The entrance gallery shown below, with its bridge linking upstairs master suite and children's quarters, combines spatial formality and inventiveness in a counterpoint that keynotes the house's design.



SECOND FLOOR



FIRST FLOOR

5

BUILDING TYPES STUDY 388
®

COLLEGE BUILDINGS

Campus architecture in the United States is undergoing a remarkable renaissance. The vast ten-year increase in the volume of college and university building construction to accommodate the exploding student population has produced a great upsurge of design quality. Although the sheer quantity of building is only part of the reason for the current preeminence of college and university buildings as architecture, construction figures are worth noting. In 1957, 9.4 million square feet of college and university classrooms were constructed and 20.8 million square feet of dormitory space. The 1967 figures are 32.9 million square feet and 42.4 million square feet respectively—an increase in the former category of 249 percent, and in the latter of 104 percent. In 1957 the dollar volume of college and university classroom contracts was $161.6 million and the dollar volume of dormitory contracts was $315.2 million. The 1967 figures are $924.7 million and $858.6 million, respectively, an increase of 410 percent and 172 percent.

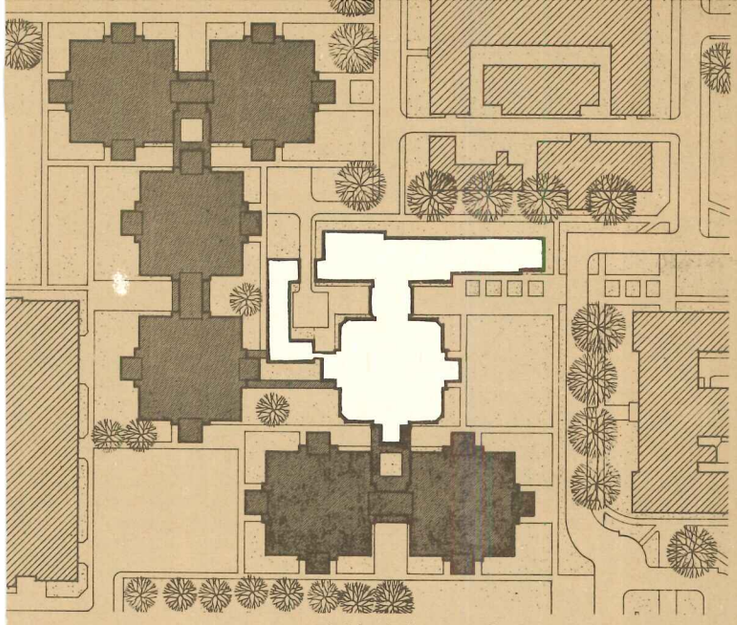
A construction boom of this magnitude could be expected to create a better climate for good architecture and it has. College administrators are gradually gaining a broader conception of what design and planning are and what an architect can do. College presidents now regard the quality of the campus environment as part of their major responsibility. State governments, following New York's lead, are looking for ways to match the statewide planning and building achievement of Governor Nelson Rockefeller's State University Construction Fund, an agency which commissions architects and planners to achieve successful results at all scales of architecture—for the individual building, for State University campuses as catalysts of regional development, and for intermediate scales between.

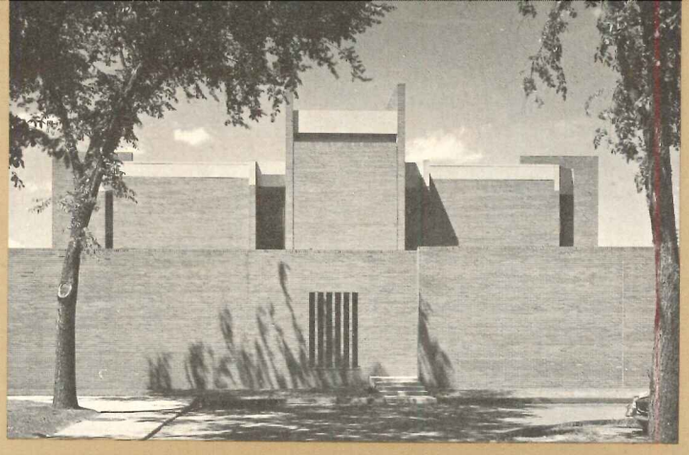
A typical campus plan used to be constructed over a great number of years on a piecemeal building-by-building basis. In the past decade there has developed a new time scale and a new size scale. Because huge facilities are now master planned and built all at once, or in large increments for rapidly changing requirements, architects are being challenged by new problems—how to design flexible prototypes for specialized buildings, for example, or expansible systems for an entire campus. And the new scale of architecture still brings the old problems—how to design well-scaled open space, respect an existing architectural tradition, find the appropriate expressive qualities for a universal space. The campus work on the pages which follow suggests solutions to all these problems and more. Included are a science facility prototype, a new library for an eclectic campus, a seminary designed without a recognizable religious reference and a new community college, built rapidly in a semi-rural environment.

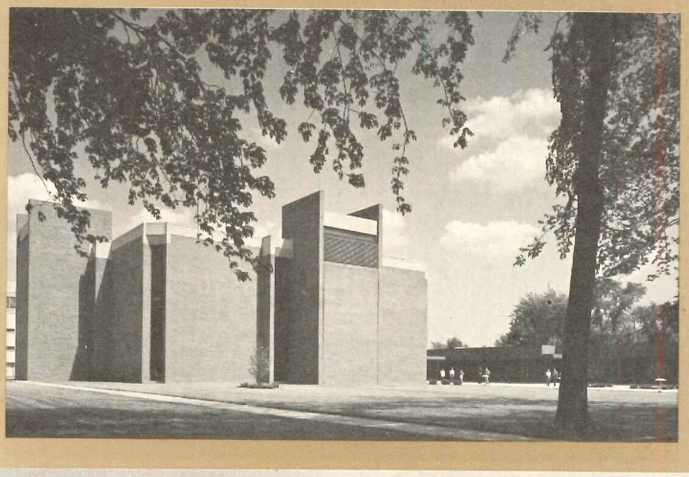
—Mildred F. Schmertz

Bill Hedrich—Hedrich-Blessing photos

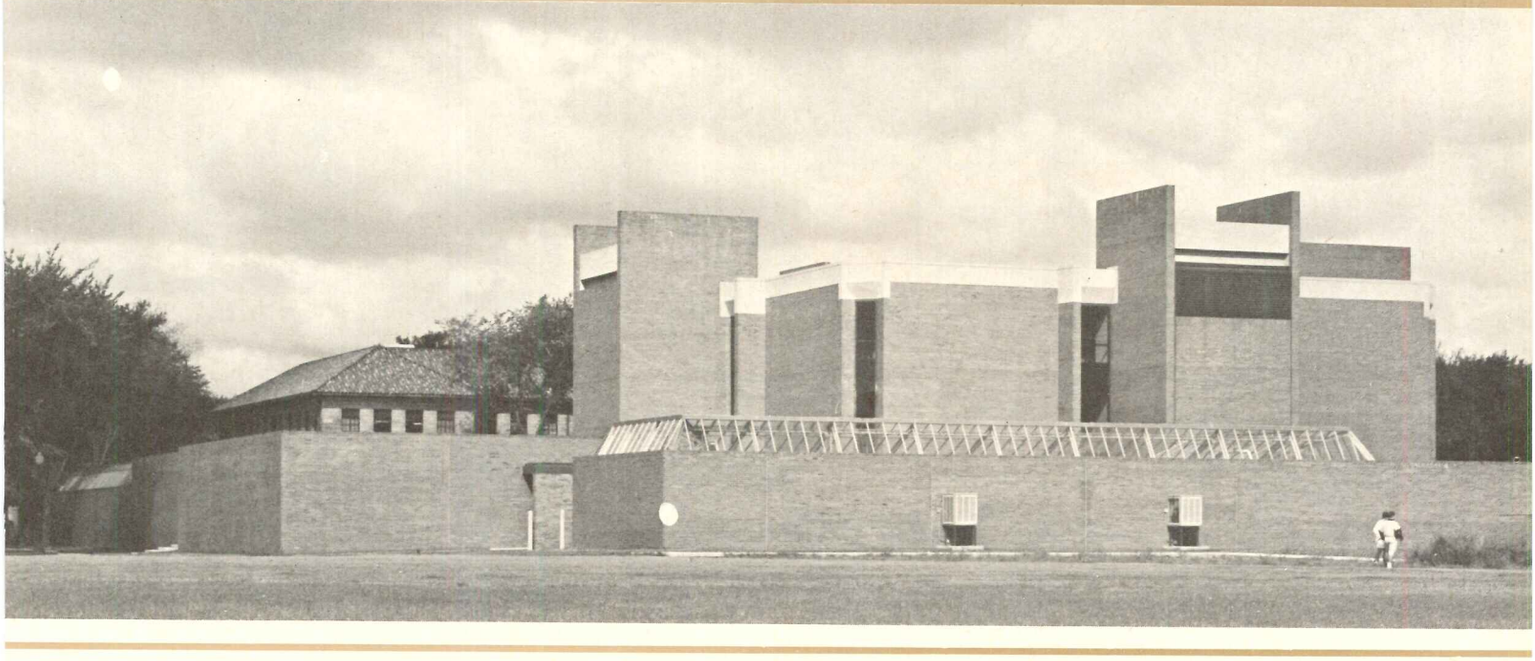
A single laboratory prototype for all sciences







Finished elements shown in white on the plot plan (above) are the laboratory unit and two one-story wings. The smaller wing is a greenhouse (shown below) and the larger contains classrooms and lecture hall... The larger wing and the laboratory unit will combine with the existing chemistry building and a second basic unit yet to be constructed to form a contained and well-scaled campus space. The main entrance link, connecting the laboratory unit and the lecture hall-classroom unit, is shown in the photo (opposite page).

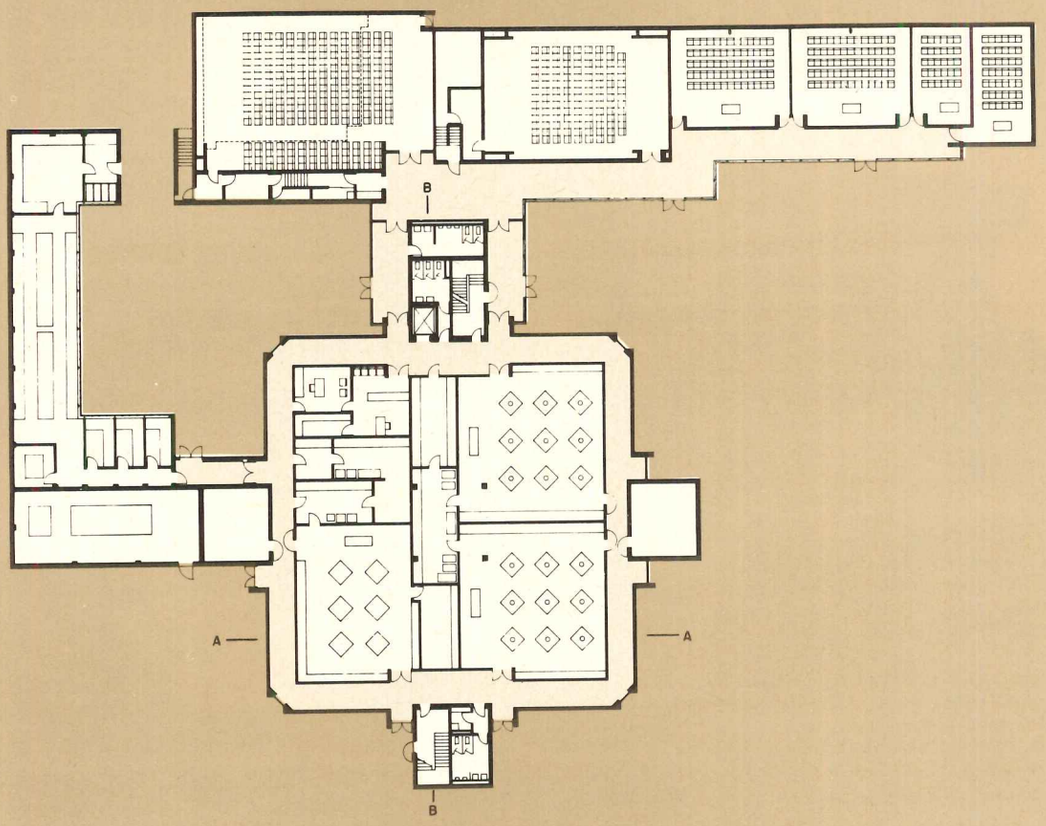


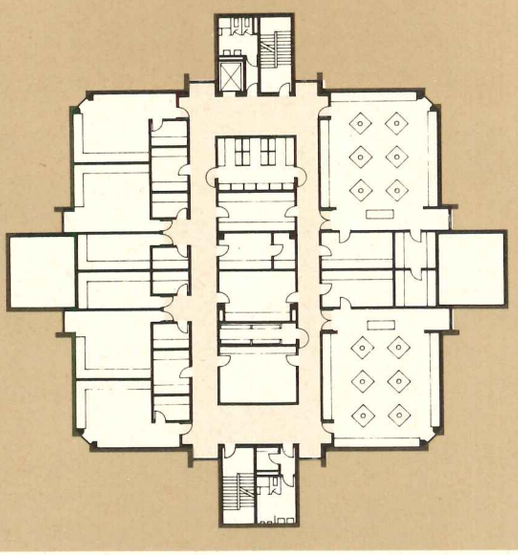
An unusual new laboratory, part of the phase one construction of the Ford Life Sciences Complex at the University of Detroit, is now complete. Eventually it will be joined by a group of similar, closely related laboratories, connected by open or enclosed corridor links, which will form the total complex. Master-planned and designed by Glen Paulsen and Associates, each unit, including the one now finished, is square in plan and adaptable to instruction or research in any of the science disciplines. The laboratory structures will vary in height to correspond to program requirements.

The prototype shown completed consists of loft space 102 feet square, with combined toilet, stair and elevator towers at opposite ends of one cross axis and mechanical shafts at opposite ends of the other. The interior of the structure is thus free of any obstacles to reorganization of space or equipment. The mechanical services are distributed through a spine or plenum connecting the mechanical towers at each floor. Branch lines serve each half of the building through regularly spaced openings in the major beams flanking the ceiling plenum. A suspended lay-in type acoustic tile ceiling provides direct access to wiring, plumbing and ductwork. The pan-formed joist floor permits service connections over a large percentage of the floor area. Fenestration has been minimized for better environmental control and arrangement of equipment.

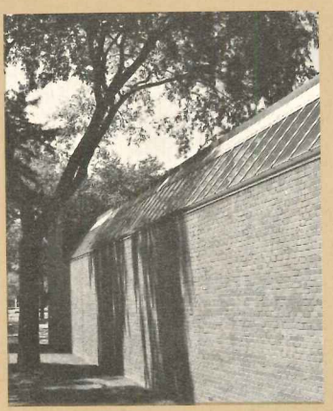
The basic laboratory units can be coupled in any direction by interlocking corridors which will extend from the paired vertical projections on either side of each main shaft. Various methods of coupling are shown on the site plan.

The structural frame of the laboratory unit is of reinforced concrete. The

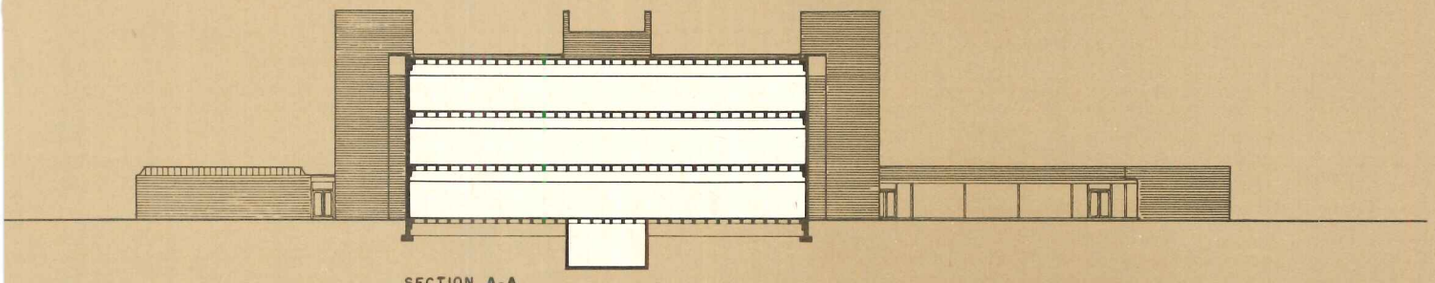




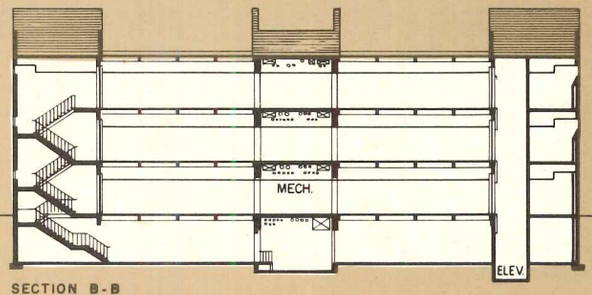
Typical floor plans of the 102-foot-square three-story laboratory unit show two of the six or more basic circulation systems and laboratory arrangements which the scheme facilitates. The new building, programed for biology, contains office space, seven teaching labs, thirteen research labs and the necessary specialized facilities. Mechanical and stair towers are 20 feet square. The mechanical spines can be seen in section B-B. Rooms in the lecture-classroom wing were sized in multiples of each other to simplify scheduling and to begin a general pattern of campus classroom standardization.



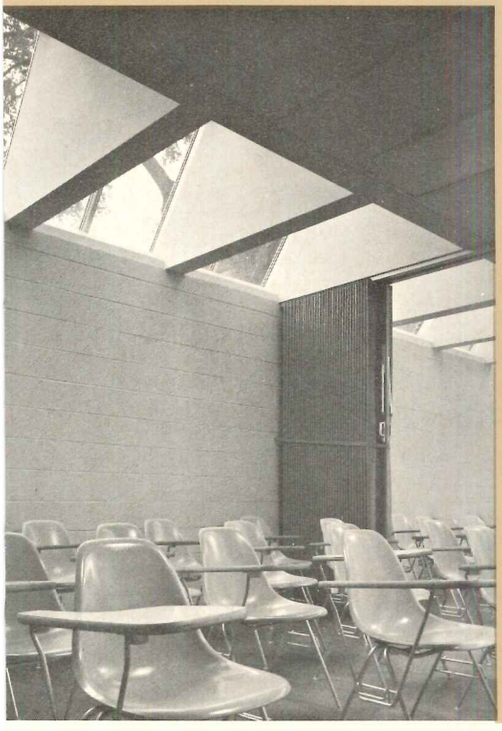
Typical classrooms are lit by skylights, shown in the photos (above and right). The four-sided laboratory benches which can be seen in the plans and in the photo (far right) were designed by the architects. Laboratory windows occur only at corners; thus interior wall space is conserved and exterior facades are simplified.

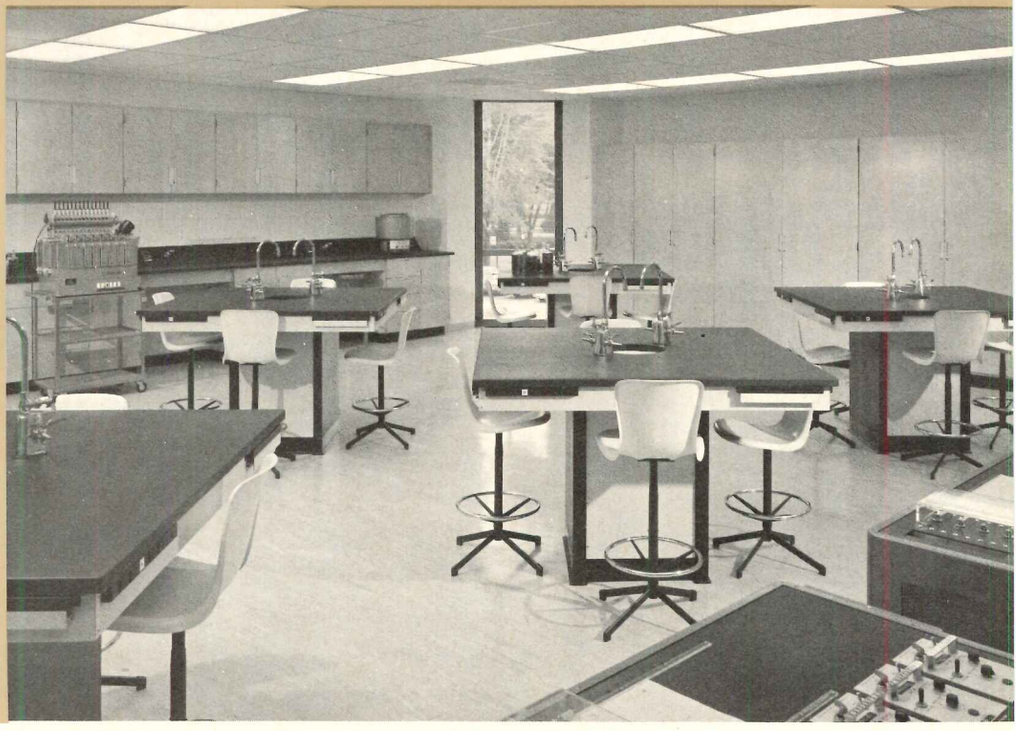


SECTION A-A



SECTION B-B





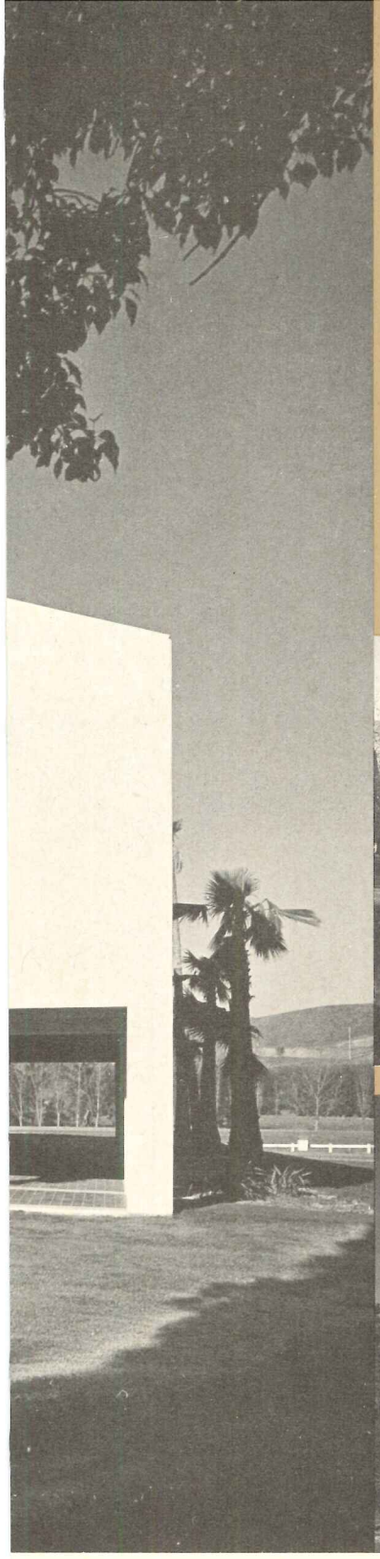
exterior materials are brown smooth-faced brick, integrally colored precast concrete parapets, dark painted steel window frames and gray, glare-reducing plate glass. Floors are vinyl asbestos. Interior walls are painted concrete block or brick. Attached to the basic laboratory unit are two one-story wings, the smaller one comprising a greenhouse and the other a lecture-hall-classroom unit. These wings combine bearing wall and steel frame construction. Their interior finishes are similar to those in the laboratory unit.

Heating is provided through a central plant. The buildings are air-conditioned throughout. The mechanical system for the laboratory unit is basically a one-temperature duct system with electric duct heaters and individual room control. Construction cost for the total gross building area of 55,000 square feet, including all built-in furniture and equipment, was $1,715,365 or $31.19 per gross square foot.

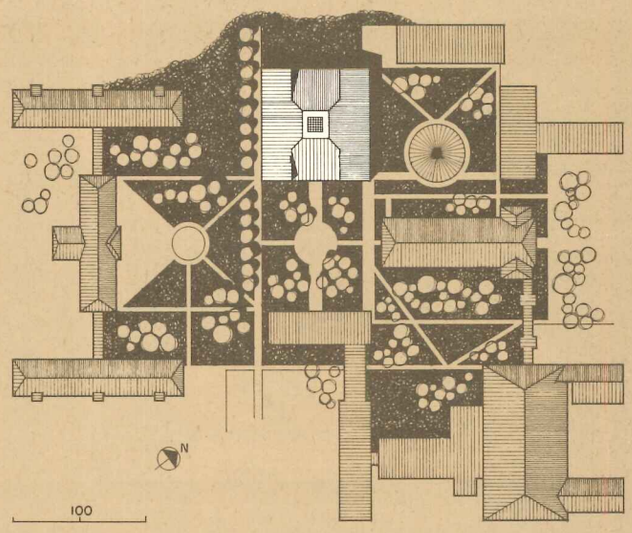
FORD LIFE SCIENCES COMPLEX, University of Detroit, Detroit, Michigan. Architects: *Glen Paulsen and Associates, Inc.;* structural engineers: *Robert Darvas and Associates;* mechanical and electrical engineers: *Hyde and Bobbio, Inc.;* general contractors: *Utley-James, Inc.*

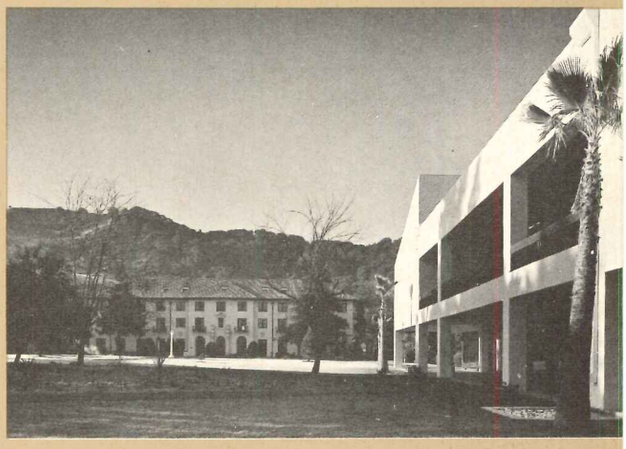
Joshua Freiwald photos

A contemporary library from the Spanish Colonial vernacular



The location and basic configuration of this library, the first new building to be constructed on a Spanish Colonial Revival campus designed by John J. Donovan in 1927, were determined by Mario Ciampi in his recent master plan. The library defines two new campus quadrangles and sets up axial relationships with its neighboring buildings, one of which appears in the photographs. As an integral part of an older campus with a consistent architectural character, the new library has been designed to repeat the basic stylistic elements—roof, loggias, color—of the campus as a whole.

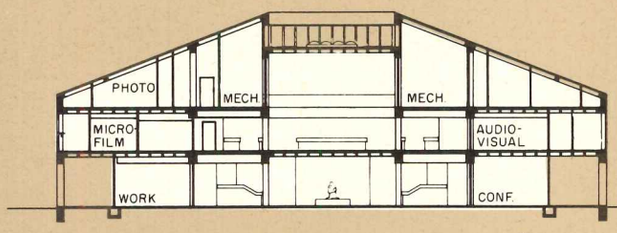




The new library at St. Mary's College, a small men's school with an enrollment of 1200, derives its sloping red clay tile roof, its quarry tile floors, its sun-reflecting white walls and deep shadowed loggias from Andalusia. Everyone knows that a revival of this California Spanish Colonial tradition became for a time the accepted regional style—due in large part to the vigorous archaeological eclecticism of the leading West Coast architects of the 1920's and 30's. What is interesting, however, is that the young, progressive Oregon-based firm of Wolff, Zimmer, Gunsul, Frasca and Ritter, in deference to St. Mary's 1927 Mission Style campus, should attempt to revive the revival. They have managed to create an excellent library building, wholly contemporary in spirit and function, while pumping new life into a renewable vernacular. Critic David Gebhard recently wrote that California's leading Spanish Colonial Revivalist architect—the late George Washington Smith—in using the buildings of Spain for his base of inspiration was able to develop designs which were romantic in their expression of this tradition but at the same time highly intellectual in their total form. This new library would seem to belong in that highly select category.

The poured-in-place reinforced concrete structure consists of a combination of square waffle slab bays left exposed and narrow flat slab bays which are furred and used for the mechanical distribution. Mechanical rooms feed from above through the utility cores.

ST. ALBERT'S HALL, St. Mary's College, St. Mary's, California. Architects: *Wolff, Zimmer, Gunsul, Frasca, Ritter;* structural engineers: *Stanley V. Carlson & Associates;* mechanical engineers: *Thomas E. Taylor & Associates;* electrical engineers: *Grant Kelley & Associates;* general contractor: *Barrett Construction Co.*



SECTION A-A

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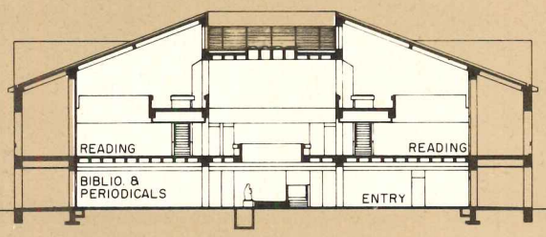
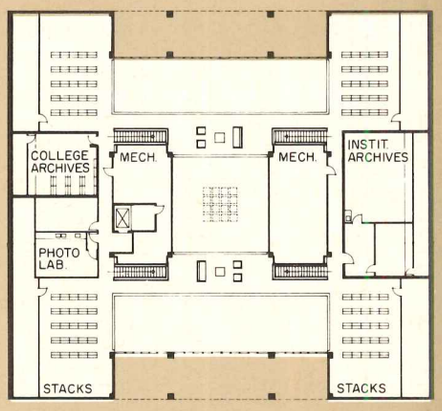
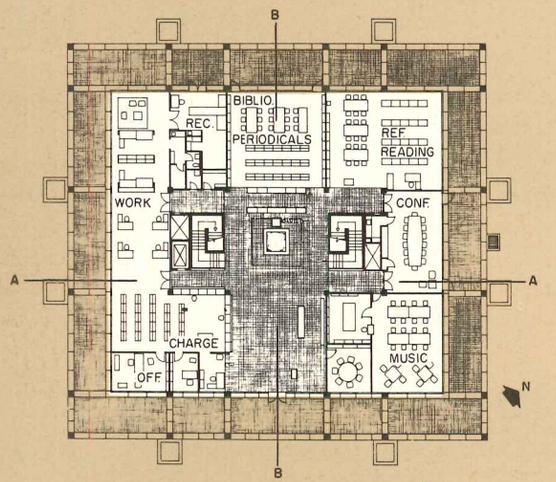


SECTION B-B

The library is organized on two levels with a mezzanine above and revolves about a central skylight which floods the surrounding area with clerestory as well as direct down light. The three central bays at the ground floor level contain the card catalogue, stairways and elevators. A deep four-sided arcade protects the interior spaces from direct sunlight. On the second floor the three central bays enclose the foyer which connects the two main reading rooms. Beyond these reading rooms are the reading loggias. On the third level are the second tiers of carrels and stacks, a reading mezzanine and mechanical equipment areas.



MEZZANINE FLOOR



FIRST FLOOR

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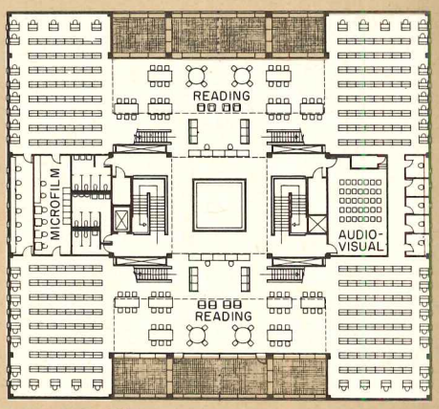
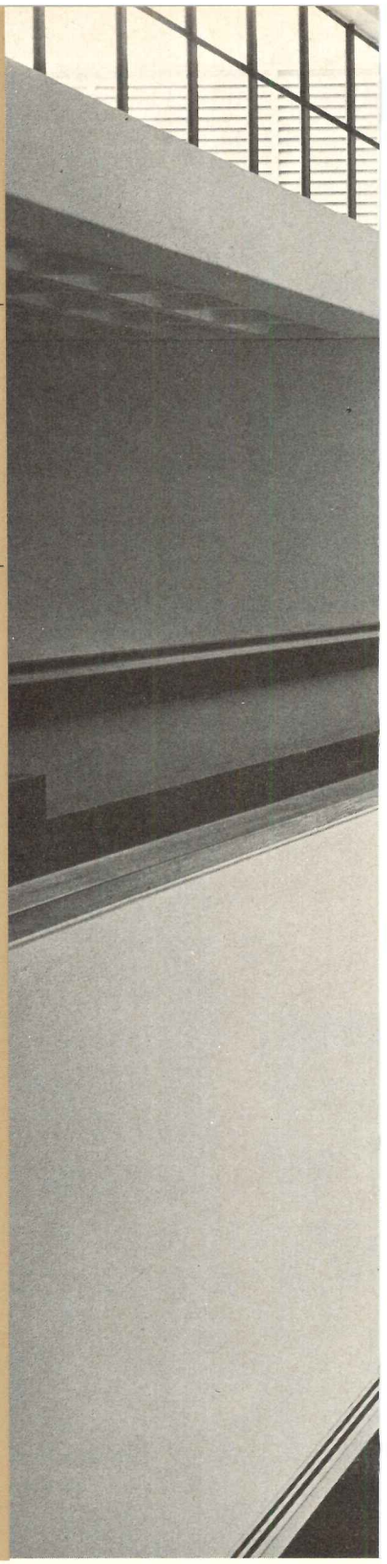
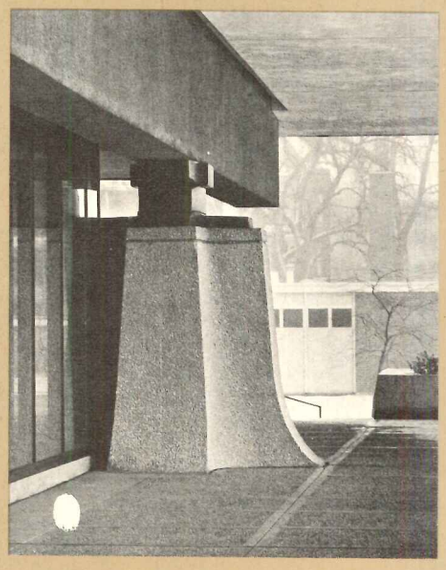


SECOND FLOOR

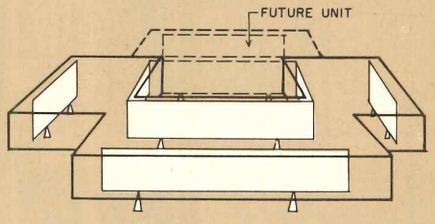


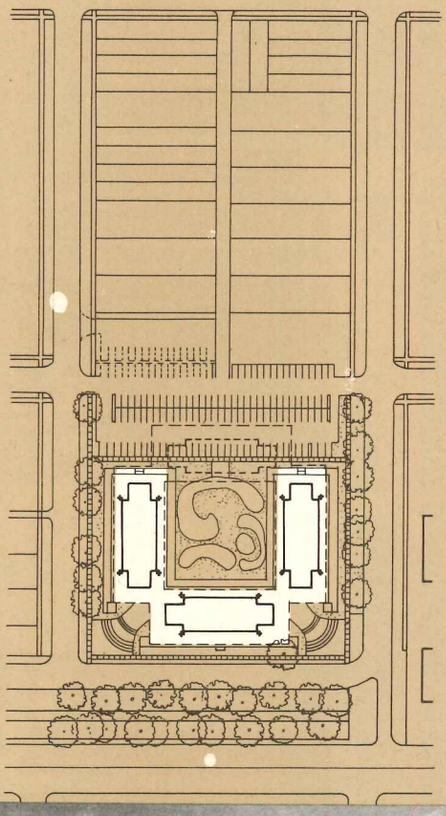
Orlando R. Cabanban photos

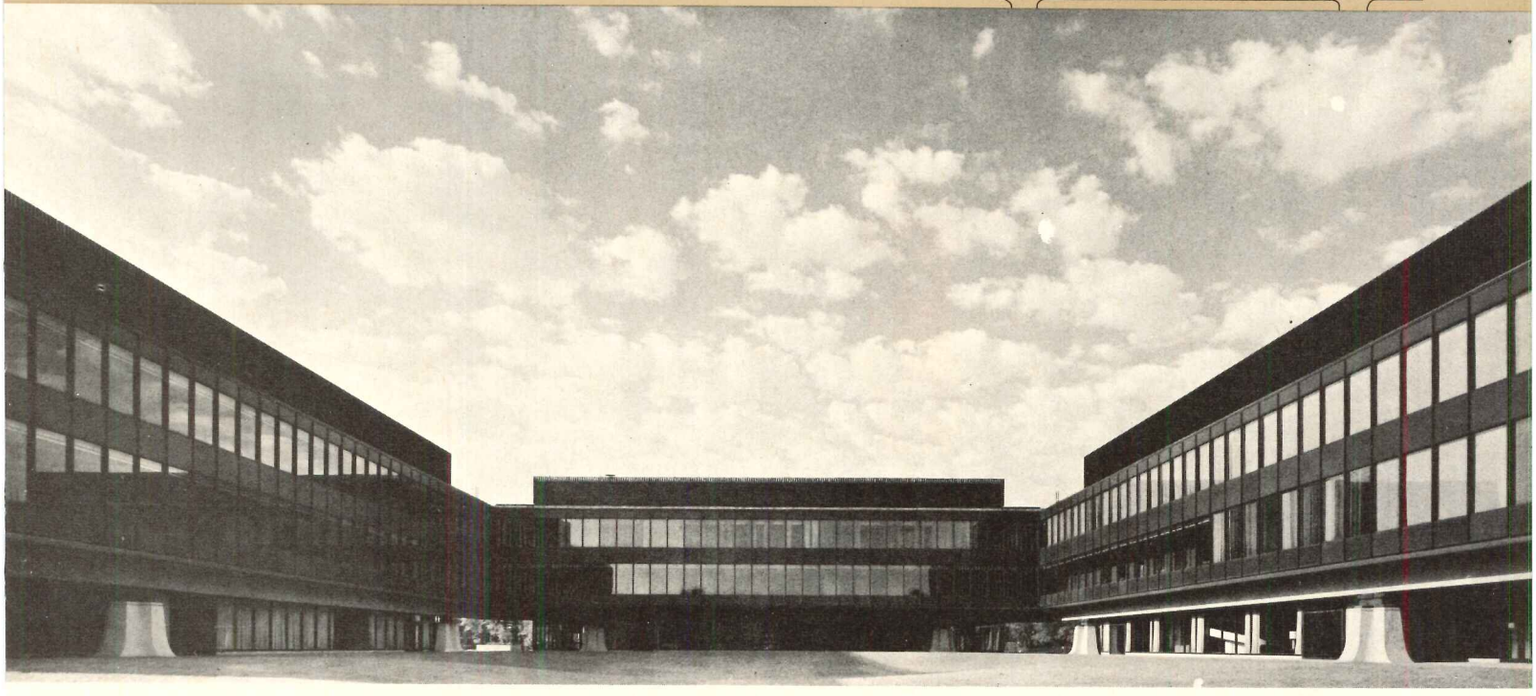
Sophisticated technology for a Lutheran seminary



Six Vierendeel trusses shown in the diagram (below) support the three completed wings of the Lutheran School of Theology at Chicago. They were poured in pairs with the floor slabs and transfer their weight to three-piece load rockers designed for a concentrated load of 2,800,000 pounds, and supported in turn by the concrete pedestals shown in the photo (left). These are carried on cruciform piers of concrete below the plaza floor; piers bear on round caissons. For reasons of economy, the curtain wall facing the court (below) is less complicated in profile and detail than the walls facing the street (opposite).



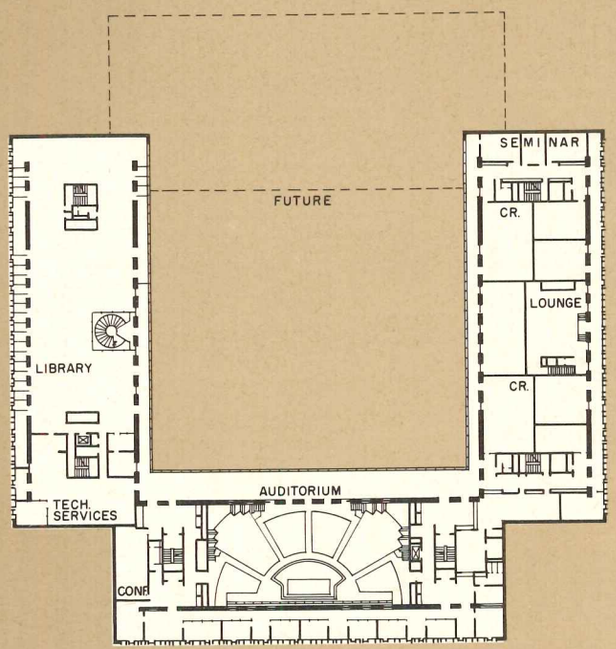




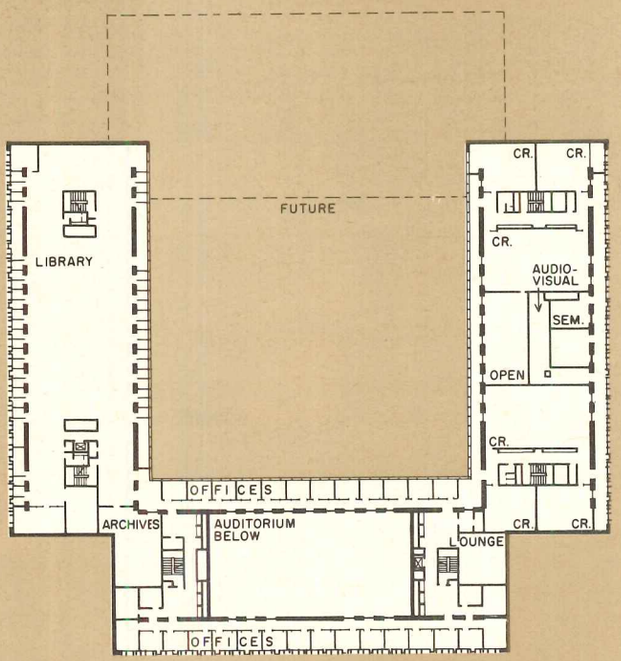
The Lutheran School of Theology recently completed by The Perkins & Will Partnership on a site adjacent to the campus of the University of Chicago is refreshingly free of any trace of obvious religious symbolism, and indeed has as much 20th century technological elan as the most advanced secular building.

How did it happen? Architect Wilmot Vickrey, partner-in-charge, likes to credit his two clients, Dr. Robert Marshall, former head of the school and now President of the Lutheran Church in America, and the current head, Dr. Stewart Herman, for their insistence upon the design of flexible, expansible universal space to meet unforeseen future needs. Says Vickrey: "Tailoring a building to the clients' needs of the moment is passe. I've been trapped too often into designing for particular programs only to have subsequent administrators come along and do everything differently. On the other hand—when you design for endless flexibility—how do you express the essential nature of the institution you are designing for?" Vickrey's design for the seminary is a good solution to the problem posed by this question, for it has expressive qualities which this institution should find appropriate to its faith. In the process of devising a long-span structual system to gain maximum amounts of adaptable space, he has created a religious building which has strength, character, and—most important—relevance.

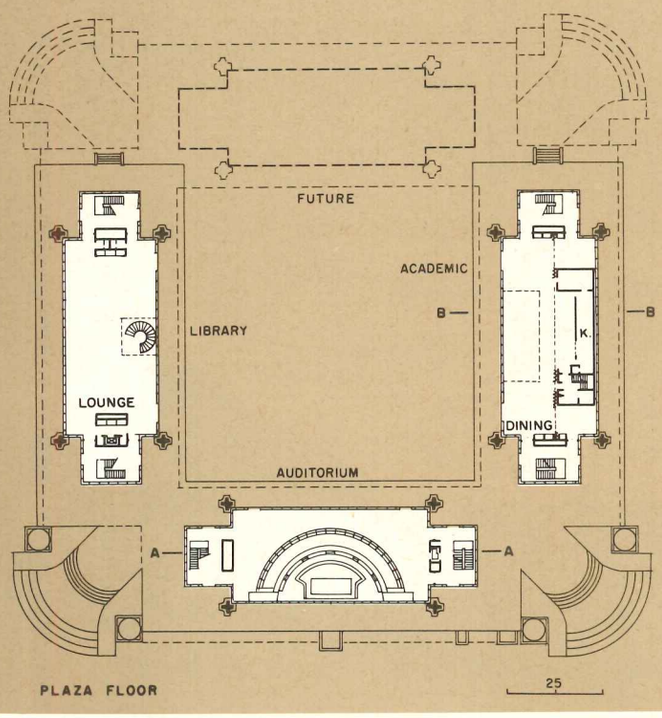
Located in pairs and 55 feet apart are six two-story-high concrete Vierendeel trusses 175 feet long, 36 feet deep and 2 feet thick. Each truss perches on two supporting concrete pedestals, spans 110 feet and cantilevers over 32 feet. In two of the three wings of the structure each pair supports two floors, a



SECOND FLOOR



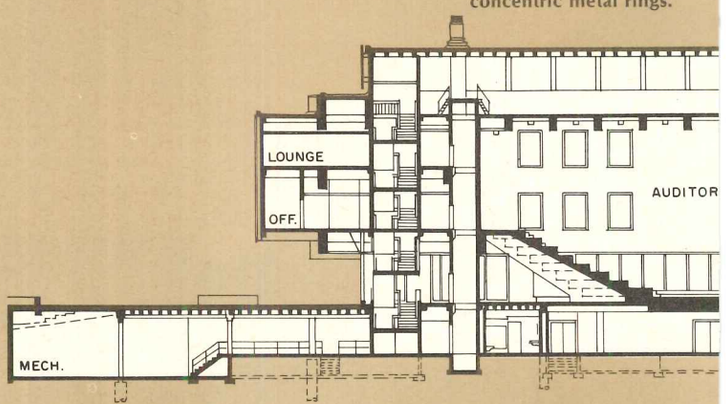
THIRD FLOOR



PLAZA FLOOR

25

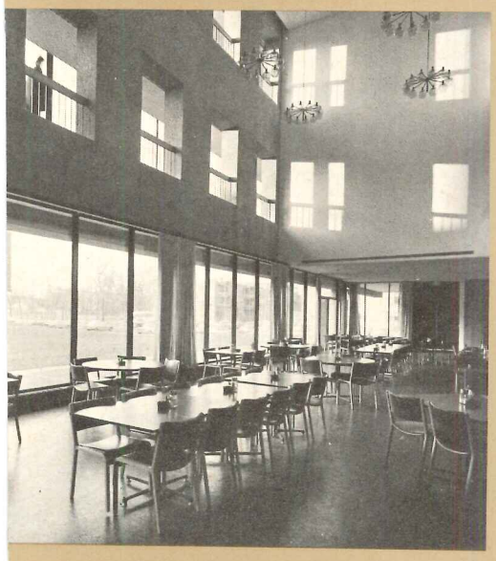
The commons dining area (above) has been designed as a three-story well. The two-story-high Vierendeel truss appears to float above the plate glass windows at floor level. Visible through rectangular openings within the truss are the second and third floor corridors which cantilever from the Vierendeel. The chapel-auditorium unit shown in the photo (right) is a three-story well 55 ft by 110 ft, defined by the dimensions of the truss spacing and span. A fan-shaped acoustic baldachino of glass set in two tiers of radial strips is suspended from two concentric metal rings.

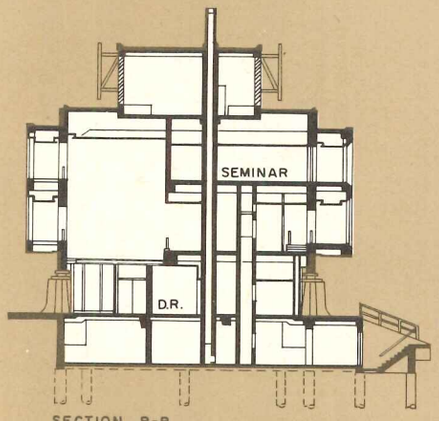


SECTION A-A

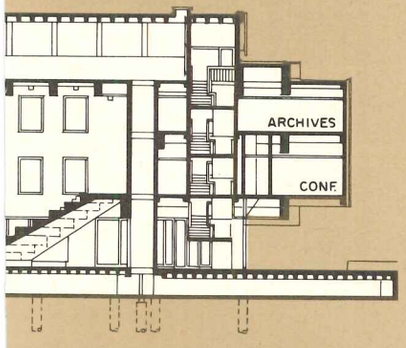
roof, and a mechanical penthouse; in the third wing, the paired trusses carry only the roof and penthouse for the three-story-high 500-seat chapel-auditorium.

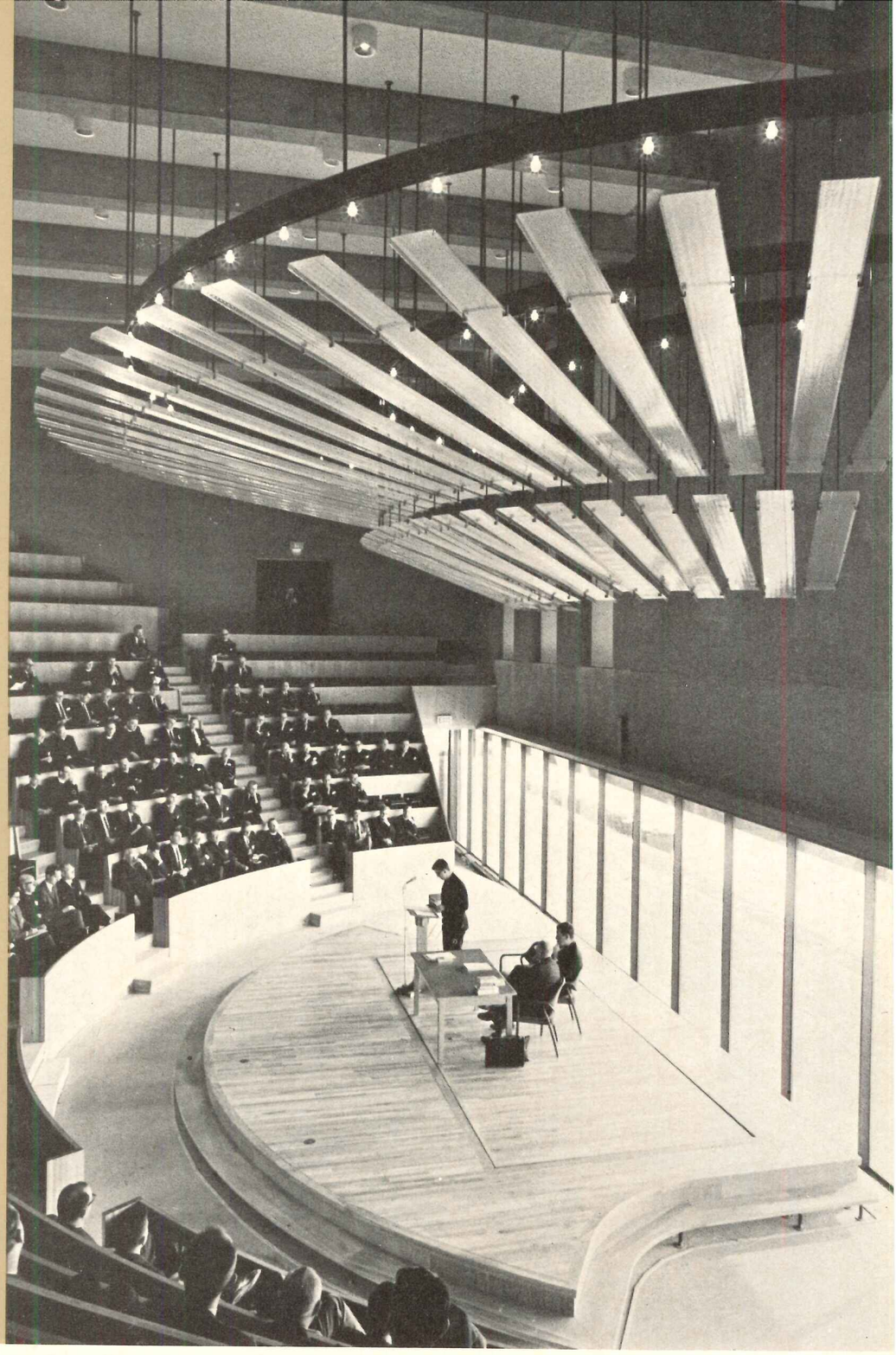
The building accommodates 500 students and, in addition to the chapel-auditorium, includes classrooms, lounges, a dining hall, a library of 120,000 volumes and administrative offices. Set in one square block in a high-density area in Chicago's South Side, it was designed to look outward toward the variety and vitality of the city life which surrounds it and inward to the quiet of its own central court. When the fourth wing is con-





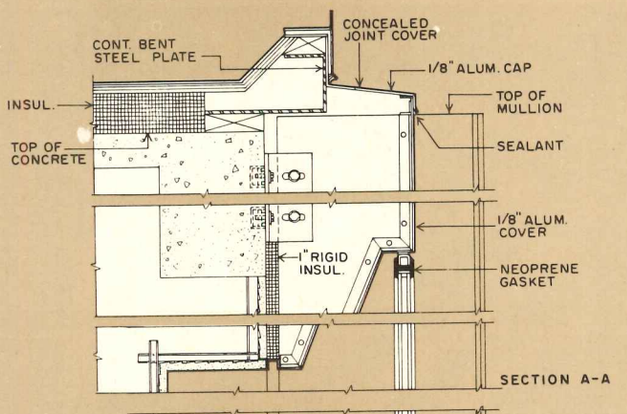
SECTION B-B



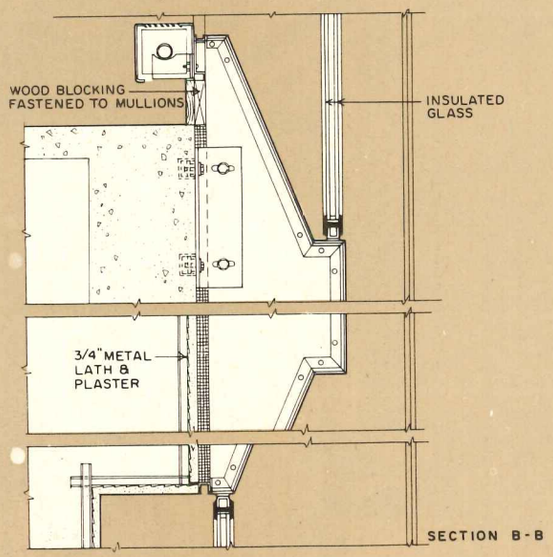


structed, the court will be enclosed. The corners of the building turn inward, to emphasize the location and importance of the entrances.

The chapel-auditorium has semi-circular, stepped seating and a thrust stage, the center portion of which may be lowered, converting it for use as a chancel. The upper two floors of the side wings, while presently divided into library and classroom units, have only stair and toilet cores as fixed elements. The rest of the area is column-free and can be easily adjusted to changes in methods of instruction and size of enrollment. The



SECTION A-A



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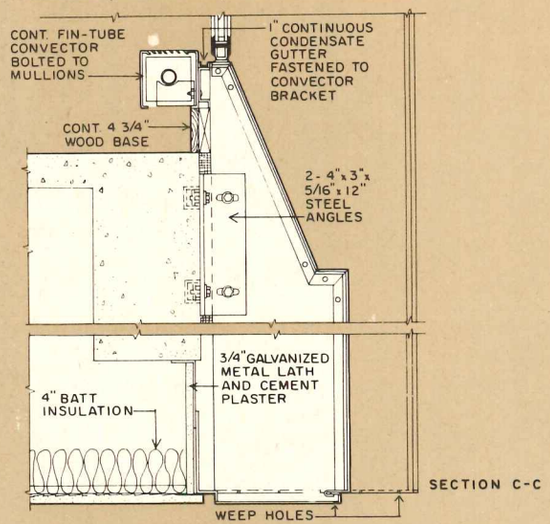

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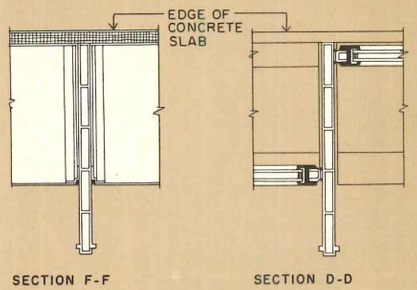
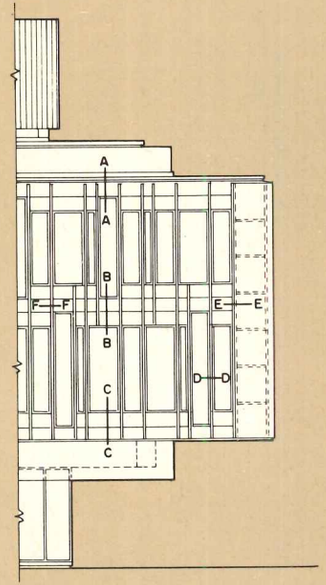
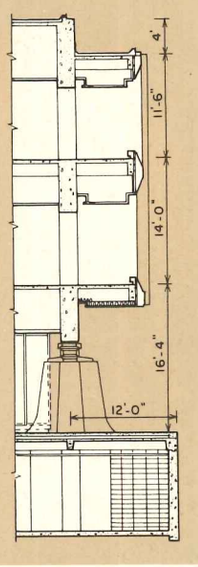


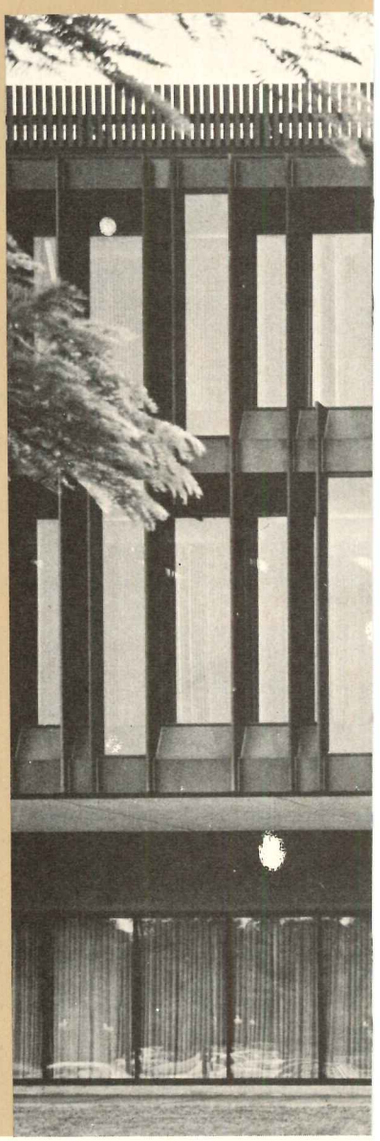
SECTION F-F

SECTION D-D

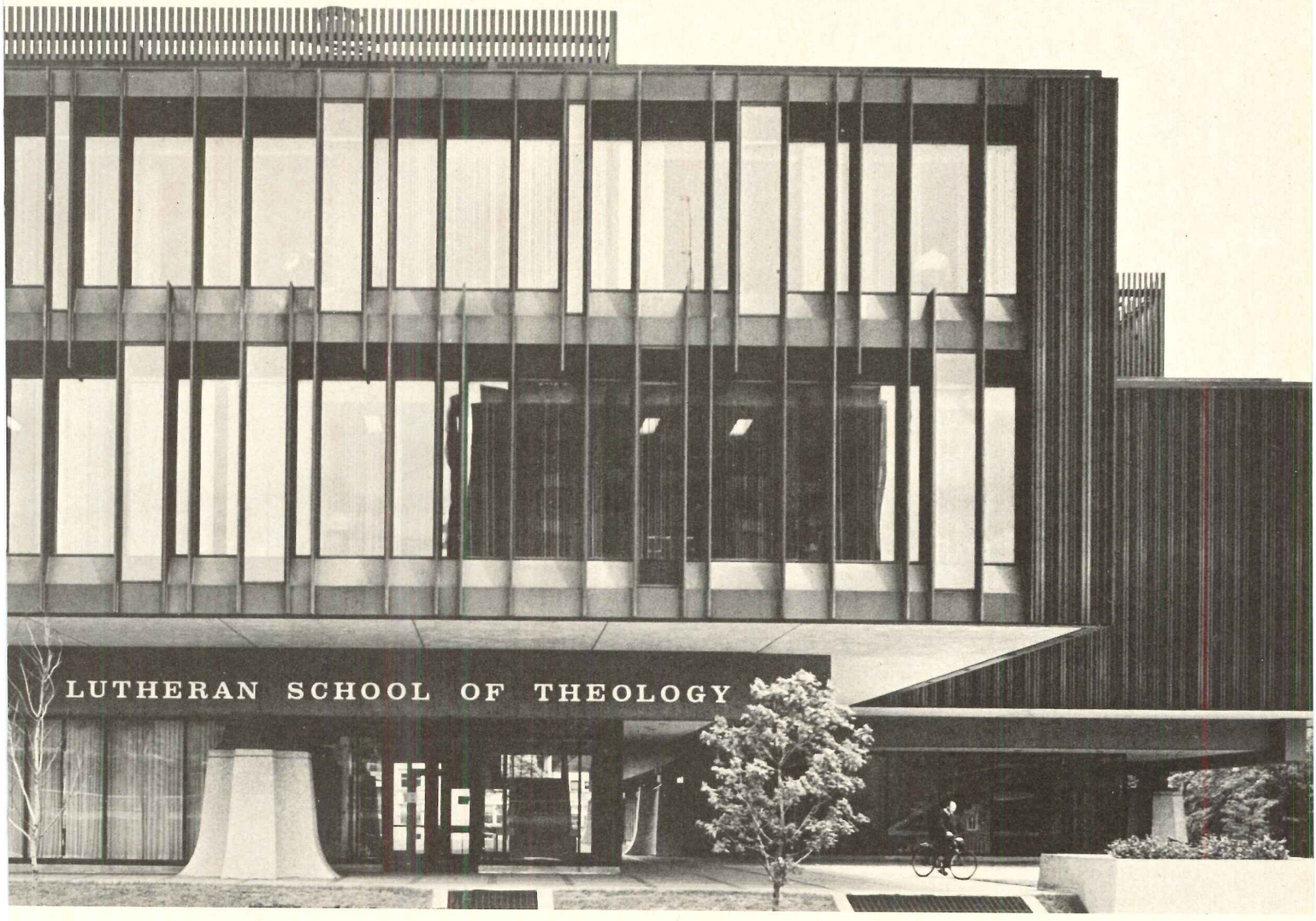
SECTION E-E







The two-story dark-brown anodized aluminum curtain walls which face each of the three streets follow an intricate pattern. The 1 in. bronze-tinted insulating glass is set on either of two planes—forward or back as shown in the photographs and details. The vertical rhythm is established by 1-in. thick fins projecting 12-in. from the inner glass line. Their spacing is patterned on 28, 16 and 44-in. centers.



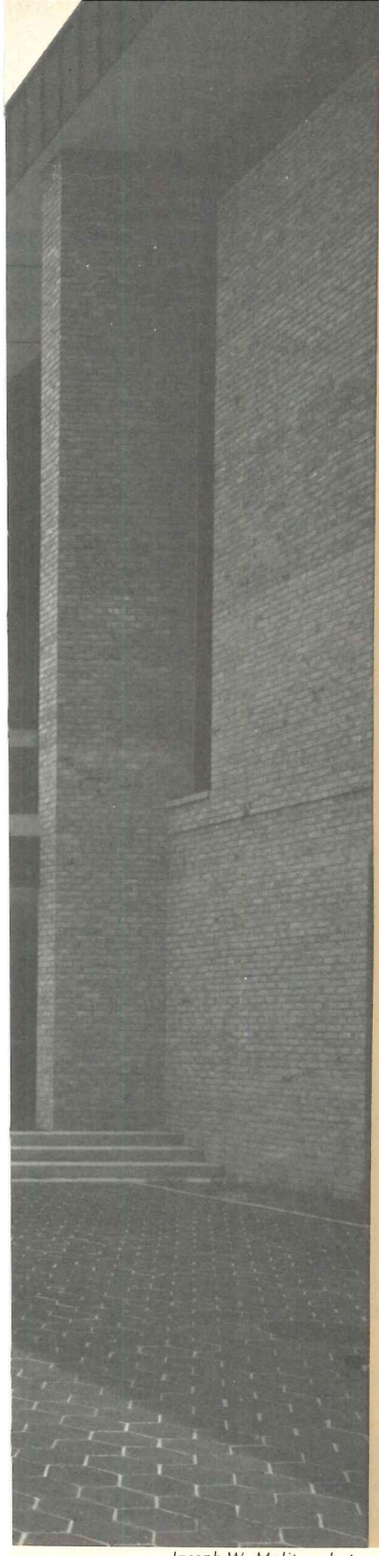
present classrooms vary in size from eight- to 12-person seminar spaces to rooms with a capacity of 30 to 125 students. All the major teaching spaces have TV wiring and a special audio-visual area permits rear screen projection.

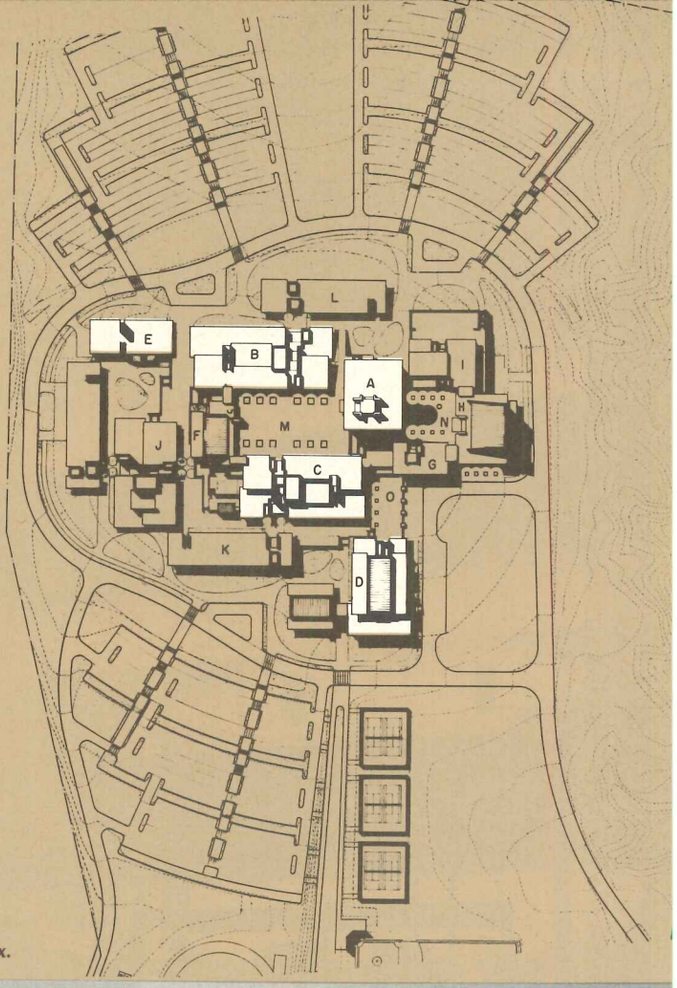
The library has a generous number of individual carrel spaces adjacent to the book stacks. Much of its space is also adaptable to future growth.

The vocabulary of materials has been kept simple—concrete pedestals and trusses, bronze-hued glass and aluminum mullions and siding. Cost of the building was $4.2 million, averaging $29 per square foot. Cost of all metal and glass walls was approximately $490,000. Total cost—including the city block site, furnishings and fees, plus the conversion of an apartment building across the street into a dormitory—was over $7 million.

LUTHERAN SCHOOL OF THEOLOGY AT CHICAGO, Chicago, Illinois. Architects: *The Perkins & Will Partnership—partner-in-charge: Wilmot Vickrey; project architect: James L. Caron; designer: Raymond C. Ovresat; job captain: James K. Maeda;* structural engineer: *Frank Klein;* mechanical and electrical engineers: *Perkins & Will Engineers, Inc.;* acoustic consultants: *Bolt Beranek & Newman.*

Design controls for flexible growth shape community college





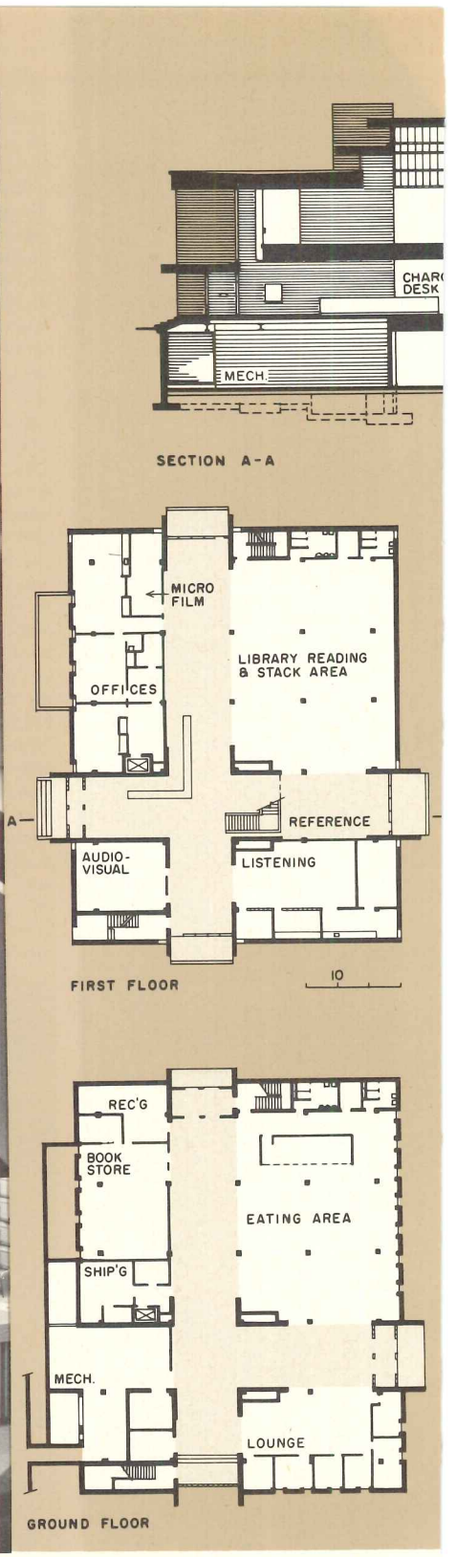
Completed buildings (shown in white) are the library (A), the humanities building (B), the science-math building (C), the gymnasium (D), and the utilities and maintenance plant (E). The probable second phase of construction will include the theater (F), administration (G), auditorium (H), and student union (I) buildings. Further expansion will include the technical and business administration building (J), the science-math addition (K) and the art-music building (L). The key to the cohesive development of this community college is the spatial pattern which will evolve as buildings are added to the complex. As the campus grows, new buildings will form a series of new courts which will grow out and down the hill from the campus spine formed by the academic court (M), the library and the social court (N). This spine, the main east-west avenue of space, is terminated at its ends by the theater and the auditorium. The sloping roofs of these forms will face and emphasize the library and the formal campus entry (O) shown in the photo (left). The library, shown in relation to the science-math building (left) and to the humanities building (below), is designed as the focal point of the campus.
As the site plan indicates, pedestrian and vehicular movement are clearly separated. Automobile traffic is relegated to the ring road. Within its circumference are footpaths and service access roads. Since this college is expected to continue to be for commuters only, no dormitories have been provided—only parking for 1500 cars. The parking lots are handled as three large-scale land forms surrounding and focusing upon the building complex.

Joseph W. Molitor photos

Anne Arundel Community College occupied its new campus last fall with more than 1400 students and a faculty of 81. The program and master plan for this two-year college built from scratch was prepared by a design team, the Anne Arundel County Associated Architects, led by Francis T. Taliaferro of Rogers, Taliaferro, Kostritsky & Lamb—one of the participating firms.

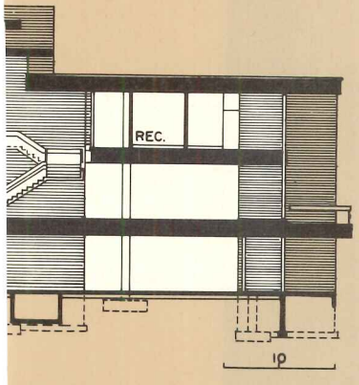
The architects have successfully established a system of campus growth which is flexible enough to meet the changing and undetermined needs of the students, the faculty and curriculum as they evolve; but which at the same time, as the architects have put it, "outlines a framework of control to insure the growth of a single campus fabric, having a sense of order, unity and cohesion at any point in time." Thus their master plan not only determined site zoning, circulation and growth and space patterns, but defined the massing, size and relationship of buildings to each other, as well as the vocabulary of construction methods and materials. The forms which resulted are typical of all five campus buildings now constructed, and establish a continuing building tradition for the college.

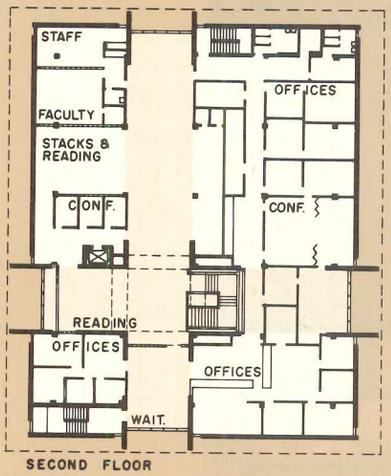
Determining how the buildings would negotiate the sloping site was a basic concern. After studying the academic building requirements, the architects decided that two one-story double-loaded corridor units, placed together and stepping down, would negotiate the slope well. This resulted in a series of stepped-up horizontal roofs which reinforce the desired image of continuity. The buildings are entered at grade and interior "streets" connect the upper and lower levels. These interior streets (photo and section, overleaf) have a separate structure and a roof form made up of



a series of horizontal planes. The clerestory windows between the planes flood the street with light and provide a view of the countryside. These streets form circulation connectors to the outer ring of buildings which are of the single unit, double-loaded corridor variety.

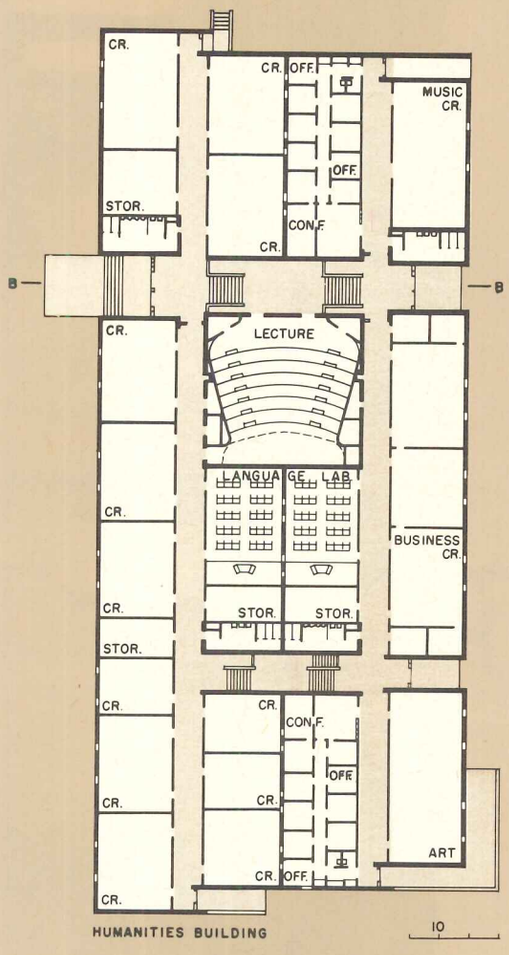
All the buildings either rise directly from the site or from terraces—none are raised above the ground on exposed columns or arranged over platforms. Thus grading is easier and more natural and the campus appears to be a series of masses, organically related to the slope as they ascend the hill.





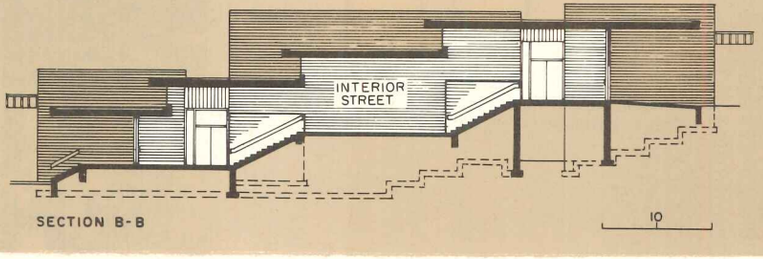
SECOND FLOOR

THE ANDREW G. TRUXAL LIBRARY
serves as the central pivotal building in the architectural composition—a functional and symbolic expression of its role in the educational process. The main corridors, cruciform in plan, are an integral part of the circulation system established for the entire campus. The bay at which they intersect is treated as a three-story vertical element shown in the photo (left) and the section (above). This handsome space is the true campus center because each of the four corridors which extend from it end at a vantage point which commands one of the four quadrants of the campus. On the upper floors these corridors appropriately terminate in large windows, deep balconies and seating areas.



HUMANITIES BUILDING

THE HUMANITIES BUILDING
like the science-math building shown in plan and section (overleaf) is typical of the classroom academic spaces to be provided throughout the campus. Two levels, each consisting of double-loaded corridors, are staggered down the hillside. The central portions of the building accommodate spaces which need double height such as lecture halls or which serve central functions which can be located at a halfway level such as faculty offices. Service facilities are located at the lower level and under the uphill classroom sections. This two-level hillside plan permitted the development of an "interior street" shown in the photo (above) as the connector of the two levels, linking the top and bottom entrances and serving as a foyer to the building's central lecture hall, and as a place for exhibits.



SECTION B-B

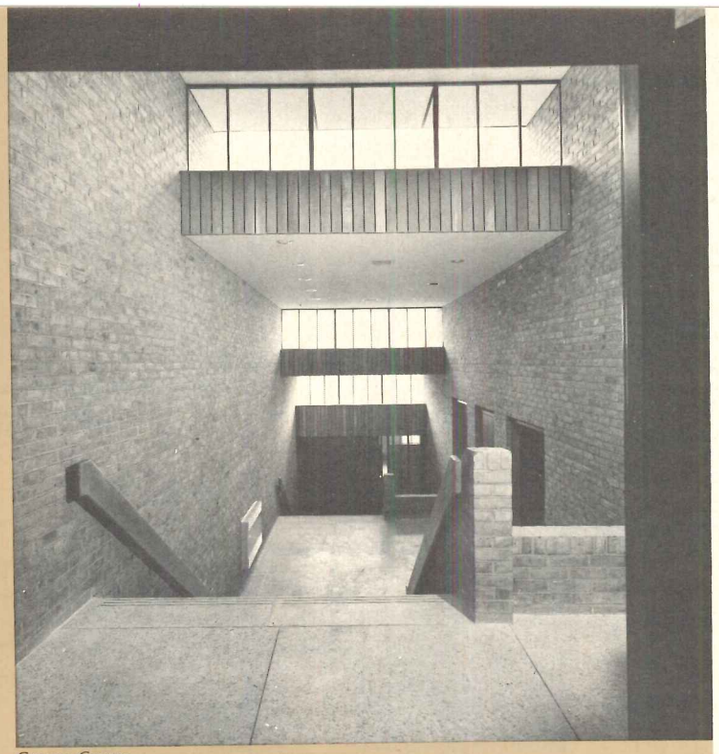
The structural corollary to these site decisions was that the vertical structure should not be expressed on the exterior facades. The steel columns rise directly behind the exterior non-load-bearing masonry walls. This approach allows the floor lines not to be expressed on the facades either—a welcome design simplification on a rolling site with many varying grades.

A deep clerestory window band separates the roofs from the exterior walls and the broad overhangs control the heat gain. Narrow floor-to-ceiling windows provide a view to the outside without forming a distraction or using valuable wall space. All interiors are air-conditioned throughout.

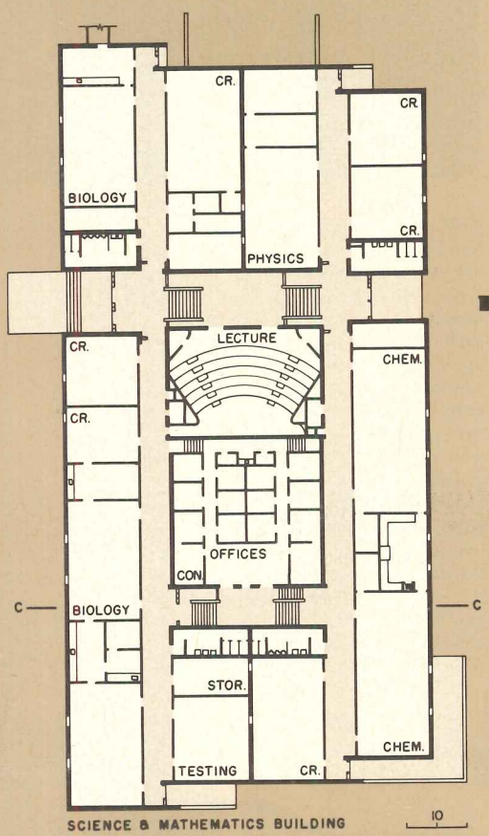
Special space such as the lecture rooms, interior streets and service and toilet areas project up through the main roof slabs and are expressed on the exterior. Some house rooftop mechanical equipment.

The vocabulary of materials which the architects have selected for this community college is particularly successful. The tan brick combines well with the standing seam oiled copper roof fascias, which are dark brown in color.

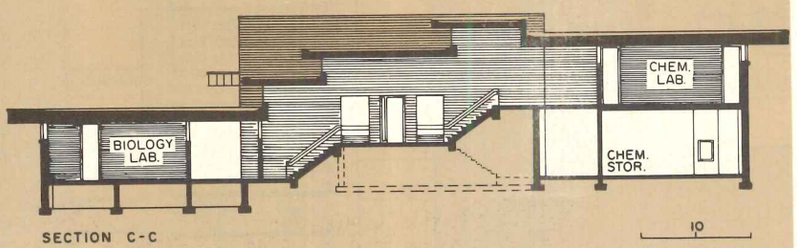
THE SCIENCE-MATHEMATICS BUILDING will eventually be an all-laboratory facility when its classroom space becomes part of the science-math addition. The corridor shown (right) serves as a secondary mode of circulation which links the uphill and downhill corridors but is not a through street. The major interior street in this building is similar to the one shown (overleaf) and gives access to the upper row of seats in the two-story lecture hall shown in the photo (below).



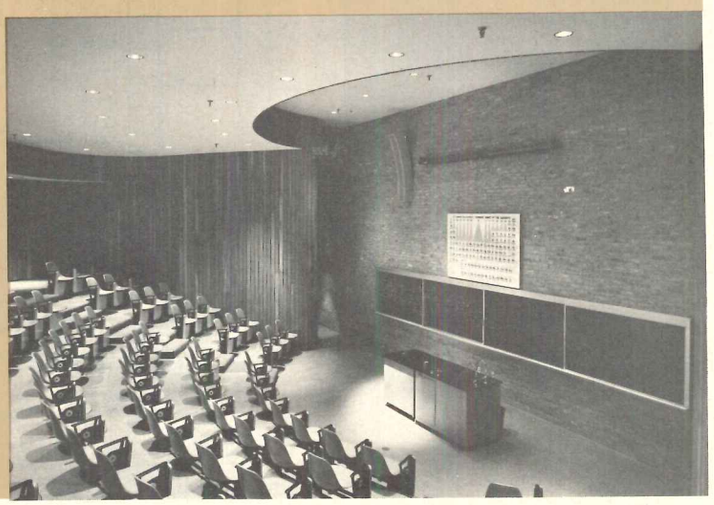
George Cserna



SCIENCE & MATHEMATICS BUILDING 10



SECTION C-C 10



ANNE ARUNDEL COMMUNITY COLLEGE, Arnold, Maryland. Architects: *Anne Arundel County Associated Architects—partners-in-charge: Francis T. Taliaferro (Rogers, Taliaferro, Kostritsky & Lamb), Earle S. Harder (Earle S. Harder & Associates), Howard Wheeler (Wheeler, Bonn, Shockey & Associates), William H. Harder; project manager: Fred D. Fishback (RTKL); project architect: Edward P. Haladay (RTKL); job captain: Eugene Ratych (ESH); furnishings: Reni T. Shulman (RTKL);* structural engineer: *Van Rensselaer P. Saxe;* mechanical engineers: *James Posey & Associates;* landscape architects: *Sasaki, Walker & Associates, Inc.;* site engineers: *Rummel, Klepper & Kahl;* general contractor: *Ames-Ennis, Inc.*

SPECIAL REPORT NO. 8

Some particular problems of noise control

In a sequel to the previous broad-scoped study on noise control last year, this special report focuses entirely on three subjects of particular importance in which there are areas of controversy, misunderstanding and uncertainty: 1) impact noise testing of floors, 2) field versus laboratory values for rating the sound transmission of partitions, and 3) a generalized discussion of vibration problems caused by mechanical equipment located in upper floors and on rooftops of buildings.—Robert E. Fischer

For a number of reasons we have become a much more noise-conscious people. The problem seems to have become sufficiently pervasive for some to refer to it by the term "noise pollution." The parallel with air pollution is only partly apt. While it is true that the sources of noise have proliferated, it generally is not the intensity of noise *per se* that bothers people, but rather the "informational content" of the noise, because of the intrusion on one's privacy.

The range of noise levels experienced by an office worker in his daily routine illustrates the point that content of noise rather than level of noise is the disturbing element. At home in the suburbs, this office worker, in the absence of the din of children and labor-saving kitchen devices, might have a background noise level of only 15-20 decibels. Driving to work in his car, he would be immersed in a noise level of 55 db. Then at the office the background noise might be at a level of 30-35 db. It is believed that man's auditory system developed as a warning device to be used for the detection of any intrusion. But the office worker in the example is not often worried about physical harm. Rather, he becomes irritated when he hears footsteps from the apartment overhead; he jumps when he hears the screech of tires on the highway; and he cannot concentrate on his work when he can understand what people are saying in the adjacent offices, or if his desk shakes because of transmitted vibration from a large piece of air-conditioning equipment.

The following people were helpful in the development of this article: Architectural Acoustics and Noise Control Group of Bolt, Beranek and Newman, Inc.; Dr. Thomas Mariner of Armstrong Cork Company; and W. E. Whale of Korfund Dynamics Corporation.

Actually there is little excuse these days for noise to be a source of annoyance in buildings. The know-how, practical techniques, materials and devices are available. Still, unfortunately, potentially disturbing sources of noise many times are not designed-out in the beginning, and remedial work has to be undertaken after the fact. Frequently noise problems are fixed because of neighbors' complaints—sometimes under the threat of litigation. It is sad, but true, that some architects and clients have to be "burned" by a noise problem before they realize that proper design in the first place would have resulted in far fewer headaches and less cost than the corrective measures. Some aspects of acoustical design for privacy are quite straightforward. In fairness to all those involved in building design, however, it should be said that there are some areas that are not always clear-cut. Furthermore, proper communications do not always exist among the various consultants whose systems may have a synergistic effect upon one another in regard to noise. For example, a lightweight structure may be perfectly safe and within conventional limits for ordinary dead- and live-load deflection, but when a vibrating piece of equipment is added to it, the supporting structure may be in resonance with the machine—a vibration problem is the result. This could occur even though the mechanical engineer specified normally satisfactory vibration isolation techniques. But unwittingly, the mechanical designer may have located the machine in the center of the span rather than near a column or supporting wall, compounding the resonant situation.

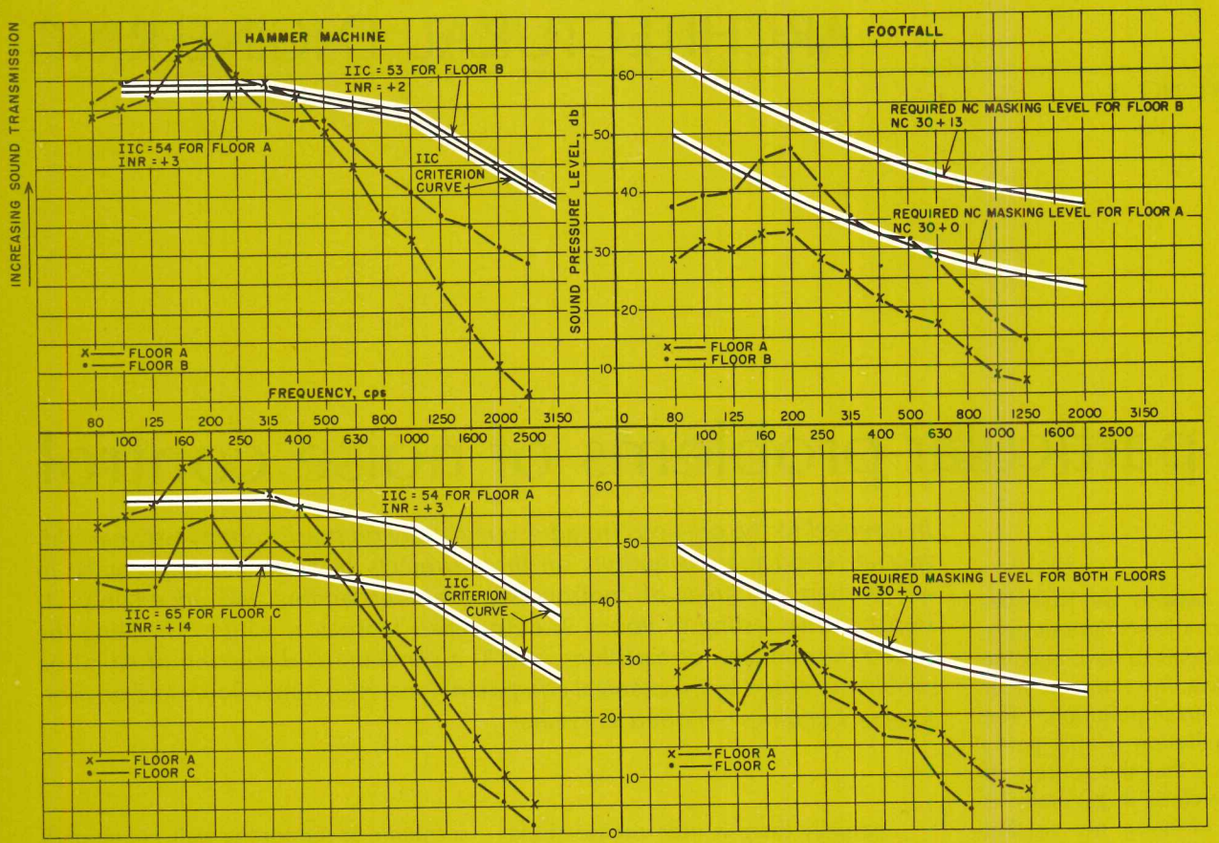
What are the criteria by which satisfaction or dissatisfaction regarding acoustical privacy can be judged? Allowing for varying degrees of fussiness among people, the guidelines generally boil down to one rule: "detectability."

With speech, for example, 80 per cent of a group of people will be satisfied with the privacy of their office space if they can make out only 5 per cent of the words spoken by occupants of neighboring offices.

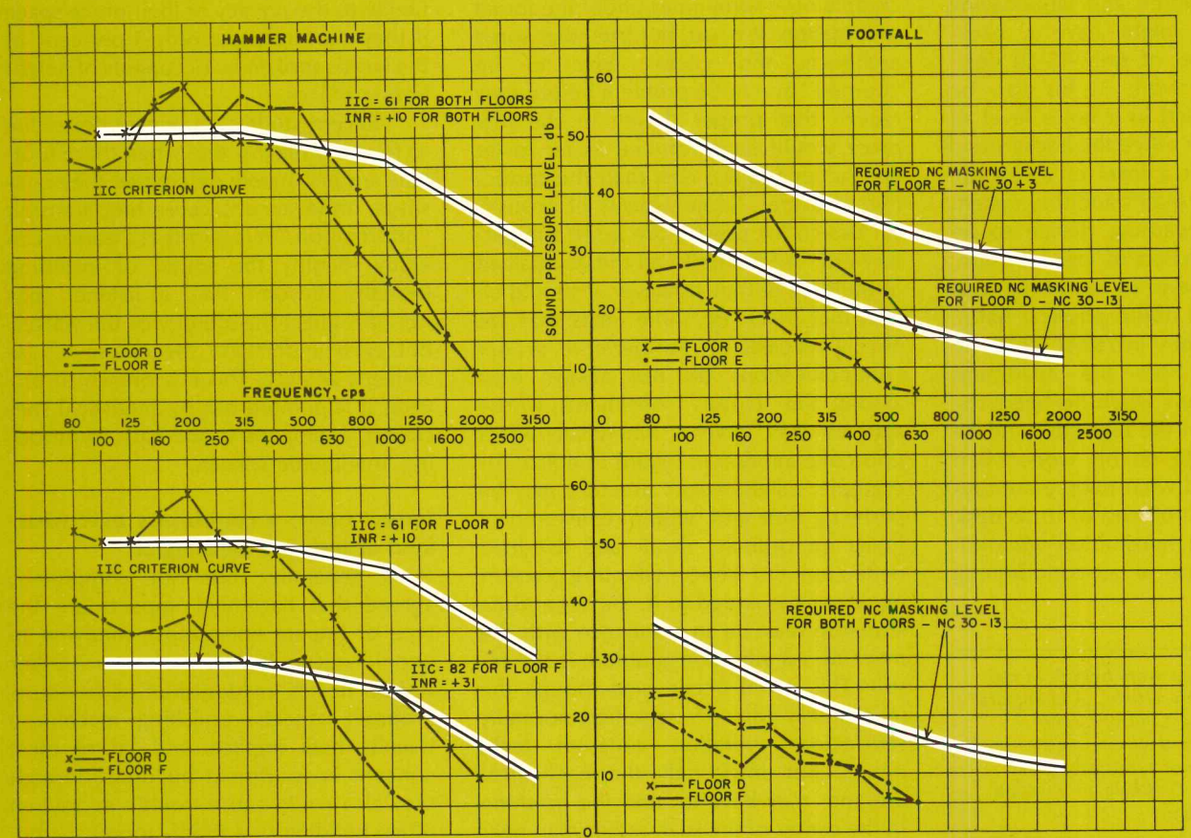
Recent studies on impact noise due to footfalls suggest that when these footfalls are just barely detectible, they constitute annoyance because they transmit "information." It is said that a person can easily identify the sound of intruding footfalls. Beyond this, a listener may not only guess the identity of the walker, but even understand the nature of the walker's activity. This is a breach of privacy, it is pointed out by acoustical specialists, analogous to the case of intruding, intelligible speech.

Impact noise: a controversy over what kind of tests are meaningful

It is generally, but not completely, agreed that hard-heel impacts are the type of impact noise most annoying to people occupying floors below. (Other impact noises include shuffled furniture, dropped objects, polishing machines.) Usually heel impacts will be of most concern in apartment buildings, though they also could cause trouble in, say, an office building or a multi-storied school.



Impact noise generated by the hammer machine gives a much different picture of the relative effectiveness of various floors than do actual footfalls. The point is to determine how much noise comes through to the occupied space below. The data in these curves are from measurements made on test floors in the acoustical laboratory of the Armstrong Cork Company. In all the tests, the structure consisted of a 4-in. concrete slab. Various types of floor treatment were employed, and, as identified in the graphs, they are: A) foam-backed sheet flooring, B) wood surface, on wood sleepers, on fiber isolation layer, C) foam-backed sheet flooring, suspended ceiling below concrete slab, E) foam-backed sheet flooring, F) carpet on underlay. The criterion for rating floors by hammer machine is the Impact Insulation Class curve, now recommended by FHA. The criterion for rating the transmitted footfall noise is the familiar NC 30 + X curve (see opposite page). These graphs illustrate that the hammer machine test may show two floors to have about the same effectiveness, whereas the footfall test shows they are far apart in quality. Contrariwise, two floors may be rated differently by the hammer machine, the same by footfall.



Recent research shows that the currently-used impact noise ratings of floors give misleading impressions of how well floors screen out the noise of footfalls.

European countries have had standards for impact noise, as well as for airborne sound transmission, in dwellings for a number of years—as far back as 1938. The first guidelines for impact noise control in the U.S. were issued by FHA in January 1963. Inasmuch as no research on footfall impact sound had been conducted in this country at that time, and because of FHA's feeling that some guidance was urgently needed, a criterion was recommended in line with the European approach—an impact sound pressure curve that fell nearer the stricter European codes.

The European curves were based on an arbitrary correlation between sound pressure measurements made in the laboratory using a hammer machine (see photo) and acceptability or rejection of actual floors as determined by interviews with occupants of multi-family dwellings. All the criterion curves are more or less on the model of the original German DIN-curve, varying somewhat in configuration depending upon the type of construction in a certain country.

More recently in a new handbook* the FHA curve has been slightly modified, and the rating numbers—originally called Impact Noise Rating (INR) and now called Impact Insulation Class (IIC)—have been raised to make them parallel in magnitude to the airborne sound ratings, Sound Transmission Class (STC).

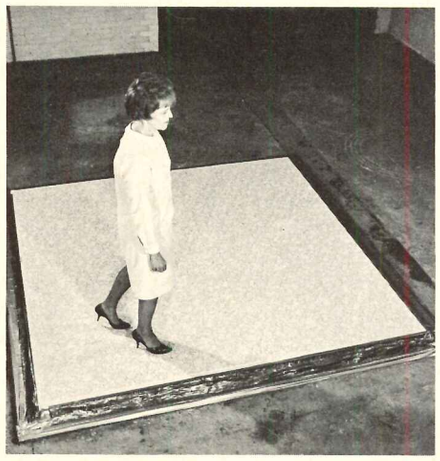
But a controversy has now arisen concerning the validity of the hammer-machine technique. The substance of the argument is this: Opponents of the hammer machine technique say that not only does the hammer machine produce impacts greatly dissimilar from actual footfalls, but, more seriously, it can give highly erroneous impressions of the relative efficacies of different types of floors.

One of the main adversaries of the hammer machine technique, Dr. Thomas Mariner of Armstrong Cork Company, points out that, based on over 200 types of floors he has tested using women as test walkers, floors that produce the same loudness of noise in the test room below can vary as much as 14 in Impact Noise Rating (approximately the same magnitude for Impact Insulation Class). More significantly, taking a number of floors having the same INR, the masking noise required to prevent detectability of footfalls in the room below can vary as much as 22 db. (Masking noise is a continuum of noise that covers up sounds of a lower intensity. It can be usefully employed to "mask" unwanted noises.) What this means is that with two floors differing by 22 db in masking noise required, the better floor might be masked even in a quiet environment (NC-20 curve), whereas the poorer floor would be satisfactory only in a moderately noisy environment (NC-40 curve).

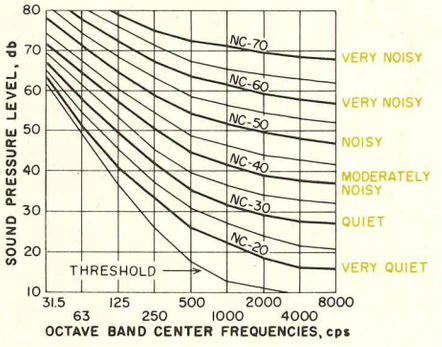
Even some of the Europeans are dissatisfied with results that the hammer machine gives. They, too, find that the hammer machine fails to reflect the true merits of floors for suppressing impact noises. But the inclination of the Europeans is to make adjustments to the criterion curves, so that results given by the hammer machine more nearly correspond with the subjective reactions to real impacts, by taking less account of the greater high frequency noise generated by hammer impact.

Much research work has been done and more is in progress at Bolt, Beranek and Newman, Inc. in determining, first, a theory that mirrors as closely as possible the real-life situation, and, second, the characteristics of a machine that will correctly simulate the footfall impact. This work, sponsored by the Armstrong Cork Company, has demonstrated that annoyance is related to the threshold of detectability, and this can be expressed in a specific formula. And when considered in relation to typical background noise criteria, it is possible to employ a single-number criterion for floor acceptibility (see graphs on page 186). To develop such a machine, however, more statistics are needed on different walkers. Also, there is the question of whether the machine should have one foot or two: this makes a difference in whether the advancing heel stretches the floor as well as causes impact (the impact noise values may be affected). There is also the question of how much weight is necessary to make wood joist floors creak.

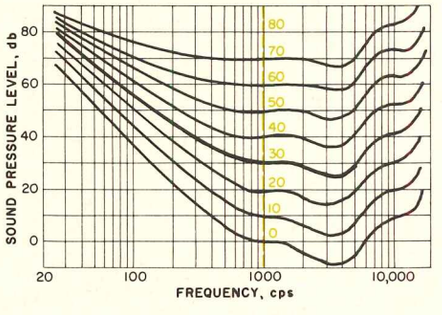
The first footfall rating system in the U.S. was developed by the Geiger and Hamme Laboratories of Ann Arbor, Michigan, under the sponsorship of the Insulation Board Institute. (Geiger and Hamme has a reputation for recognizing the reality of a problem—bringing in real elements of building spaces—residence, office—and the realities of construction



Women walkers, wearing high, hard-tipped heels were asked to walk at a normal vigorous pace in a circular pattern for the tests conducted at Armstrong Cork Company. Measurements of transmitted sound pressure levels were taken in the test chamber below, which had a certain amount of absorption to more nearly approach the condition of actual rooms.

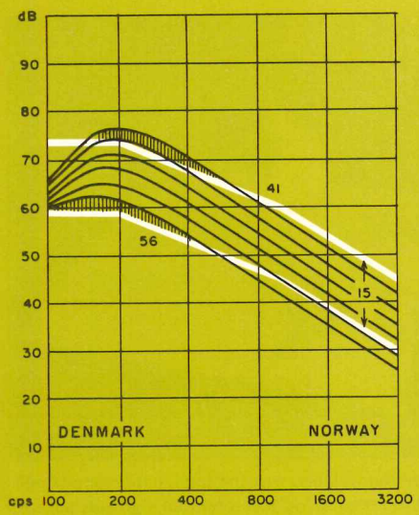


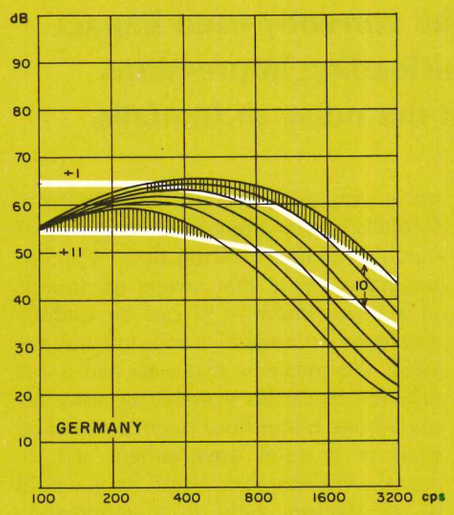
This is the family of Noise Criterion curves, originally proposed by Beranek for specifying noise levels as they affect speech in offices. An NC-30 shaped curve was taken as one possible type of background noise by Bolt, Beranek and Newman in their research study proposing detectability as the measure of a floor meeting impact noise reduction requirements.



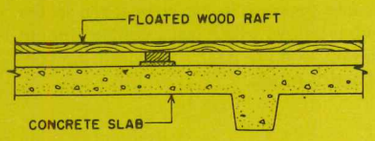
Note the similarity between the shape of the NC curves and these equal loudness contour lines. These lines indicate that the ear is more sensitive to higher frequencies than lower frequencies. The NC curves were constructed on the basis of both the loudness of the background noise and the speech interference level.

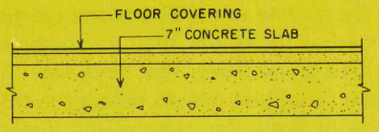
* A Guide to Airborne, Impact and Structure Borne Noise-Control in Multifamily Dwellings, September 1967, by R. D. Berendt, G. E. Winzer and C. B. Burroughs, National Bureau of Standards, U.S. Government Printing Office, Washington, D.C. 20402. $2.50.

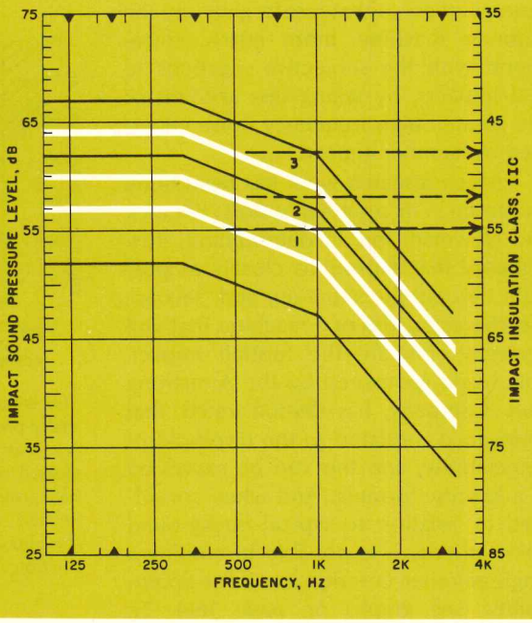


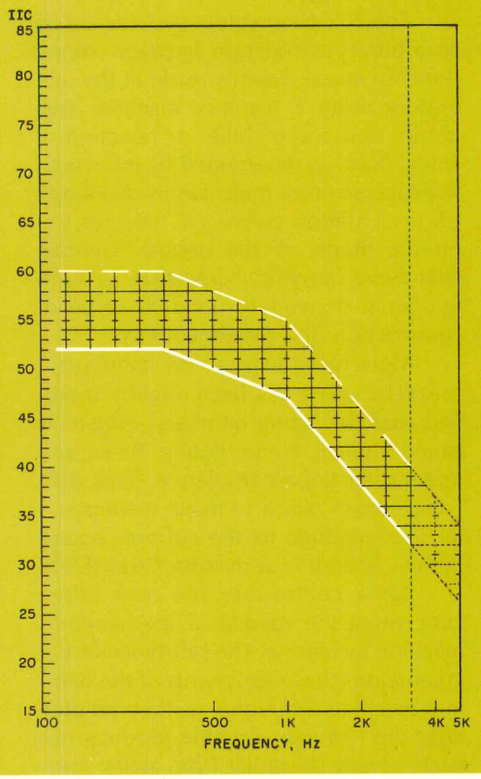


Impact noise criterion curves based on use of the hammer machine originated in Europe and vary in shape from country to country, illustrated at left. The reason is that the normally used floors in apartment buildings vary with the country, and the regulatory agencies in various countries have used different surveys of occupants and made their own judgments as to what constitutes a good floor. A new FHA guide on noise prepared by the National Bureau of Standards uses a criterion curve quite similar to the German curve. Below is an overlay for determining the Impact Insulation Class according to the FHA method. The dashed line indicates the maximum any one point on a test curve may exceed the criterion curve. The FHA guide proposes three classifications of rated floors, indicated by the lines so labeled in the graph below, left.









practices.) The Geiger and Hamme approach, called the IBI-I-1 technique, considers a floor to pass if 90 per cent of the footfalls are undetectable. It also uses monaural sound, rather than binaural sound as used by BBN. The one-number ratings of BBN's TSD analysis (theory of sound detection) require, on the average, 3 db higher noise levels than the IBI analysis. Still to be demonstrated —but almost a certainty—is the validity of the TSD theory below 100 cycles per second, which is very important for wood-joist floors.

How much is known right now about the comparative qualities of various floor systems? Most is known, with assurance, about different treatments of concrete floor slabs. Both carpeting and foam-backed sheet flooring demonstrate good results. A wood floor on sleepers set on fiber isolation pads is shown to require a fairly high background noise to prevent impact noise from coming through, although the impact machine gives it a good rating.

Despite the proven discrepancies of the hammer machine testing method, there are a number of acoustical engineers in high places here who favor its adoption as a standard test procedure. In their view: 1) the hammer machine has been used "satisfactorily" in Europe for a number of years; 2) footfalls may be overrated as a noise source; and 3) modifications can be made to the hammer machine classification reference curve to give more consistent results. Their objections, however, would seem to be rooted more in a "let's don't rock the boat" argument, or in a defense such as, "you have to use some standard, and this one is approved by the International Standards Organization." Thus they prefer to make "adjustments" to compensate for demonstrated philosophical and technical deficiencies.

To sum up, opponents of the hammer machine feel that in some instances decisions based on the test will require more expensive constructions than necessary; in other cases, the constructions will be grossly inadequate, and corrective measures may be very costly. Further, a lot of money is likely to be spent on meaningless laboratory and field tests.

The effectiveness of partitions as barriers to airborne noise is less than laboratory tests indicate unless leaks are sealed. Caulking is a practicable solution.

Architects are probably more aware of the rating of partitions for acoustical privacy than almost any other aspect. The main reason, no doubt, is that a good many partition constructions are either proprietary assemblies or comprise a number of products, such as fiber blankets, sound deadening boards, etc., that only recently have been incorporated in partitions to improve their sound attenuating capabilities.

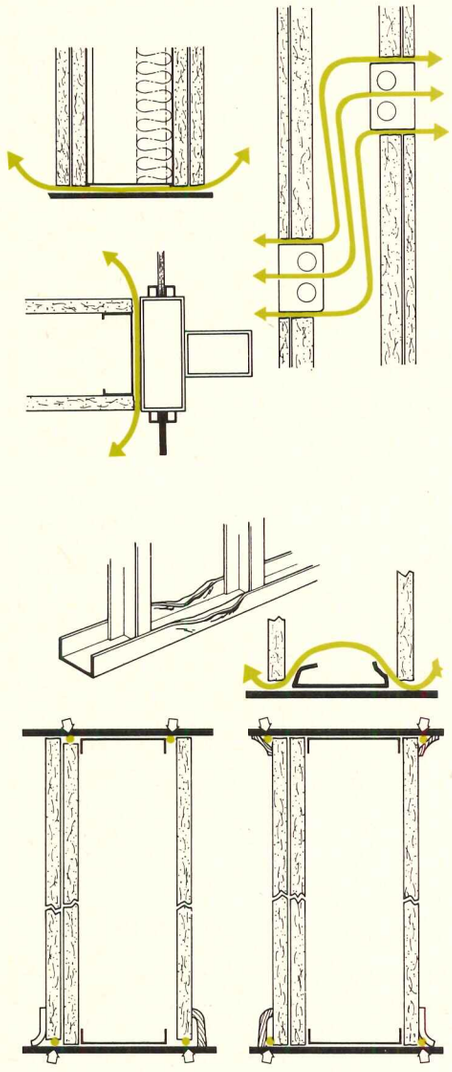
The result is considerably more promotion and technical literature in this area. Thus the term STC (Sound Transmission Class) for rating the airborne sound transmission qualities of partitions has been publicized rather well. But architects are not always aware of the discrepancies between STC's determined by laboratory test and STC's measured in the field. The differences are caused by sound leaks through cracks around the perimeter and through penetrations such as electrical outlet boxes. Laboratory values will be the highest attainable for partitions, because in mounting the partitions for tests, all cracks are sealed. Beyond this, size of test panel can affect test results—small panels give unduly high readings. ASTM standard E90-66T recommends that the smallest dimension of the panel preferably be not less than 8 ft, and never less than 6 ft. Some time back it was fairly customary for laboratories to test smaller panels. The result was that these partitions showed much better performance than they should have. For example, it is possible to find published data that is sufficiently off to give a difference in STC rating of 15—an enormous difference when you consider the fact that STC values for all types of partitions generally range from 30 to a little over 50.

STC efficacies for partitions in the field can come close to laboratory values if all the cracks are sealed. With operable partitions, for example, resilient gaskets, kept under pressure, are used to prevent sound leaks. With fixed partitions, resilient gaskets will only be effective if they are under pressure. Otherwise unevenness of floors and out-of-plumb walls will permit cracks. Manufacturers of gypsum board recommend that caulking be used to seal gypsum board partitions top and bottom and at electrical boxes. Conventional gypsum board taping systems seal cracks at first, but building movement can split the seams and make cracks. Even small cracks cause bad sound leaks. At the request of U.S. Gypsum, Tremco Manufacturing Company developed a non-drying, non-hardening gunable acoustical sealant for use with gypsum board partitions.

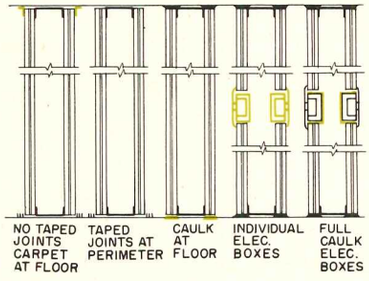
In selecting partition designs on the basis of STC ratings, the architect should keep in mind some of the realities of the overall design. For instance, it does not pay to choose a highly-effective partition if its performance will be deteriorated by an ungasketed door. The NAHB Research Institute in its manual on Residential Sound Conditioning points out that the maximum practical airborne sound reduction achievable between two rooms connected to each other through two doors and a short-section hallway is about STC 40. Thus, NAHB says, there is no point in using walls with a sound reduction performance higher than STC 43 when these walls are permanently "flanked" by sound transmission through doors or untreated ducts. On the other hand, the manual states, it may be justifiable to use STC wall ratings higher than 43 for the common wall between two rooms when they are connected only by a very long hallway or through open spaces. This might occur when a bathroom wall abuts a living room wall and the two rooms are connected by a bedroom hallway and an entrance hall.

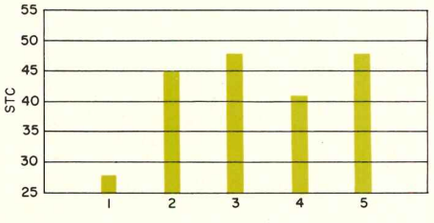
The grade classification of airborne sound transmission qualities of walls and floors originated in Europe and Great Britain, as did the impact noise rating classification. The basis for these classification systems grew out of surveys of occupants of row dwellings and apartment buildings. British and Dutch surveys showed that noise from the floor above created the greatest disturbance. Nonetheless, both British and Swedish surveys showed that complaints were less for floors with increased airborne-sound insulation. The German standard has rating curves similar to those of Britain and Scandanavia, but requires slightly greater transmission loss in the middle frequencies, and slightly less at the lower frequencies. These were the curves used as the basis for the ASTM sound transmission class contours, issued first as "tentative recommended practice" in 1961.

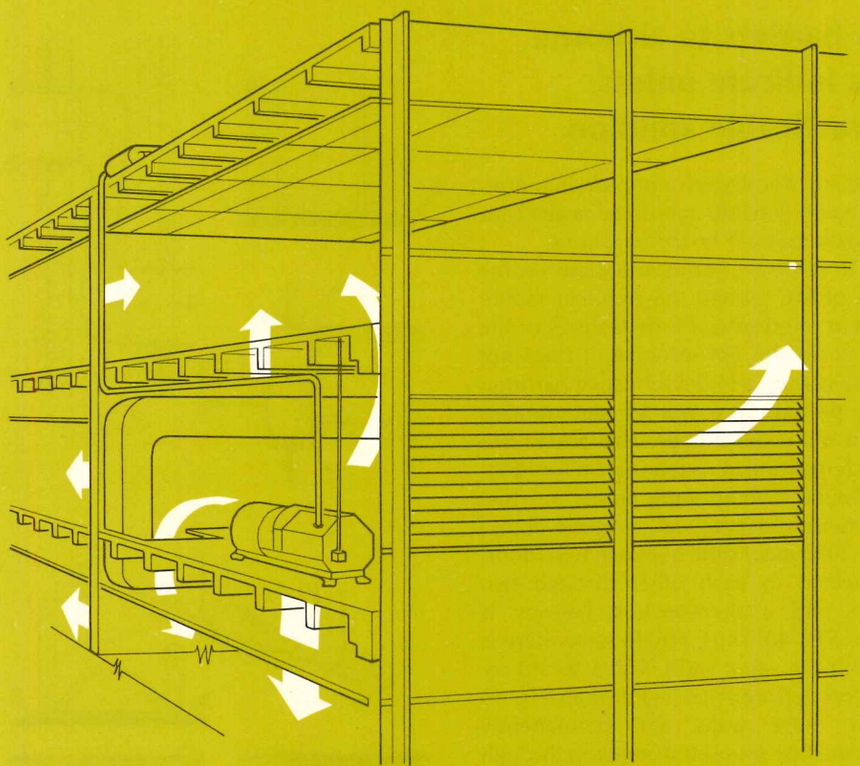
Before this time, transmission losses were reported in accordance with ASTM standard E90-55 which used the arithmetic average of the transmission losses measured at nine frequencies. Objections to this method were that: 1) it gave equal weight to all frequencies, regardless of their relative importance in sound insulation; 2) it could permit serious deficiencies at critical frequencies.



Sound leaks are responsible for the deterioration of the effectiveness of a partition against airborne sound from the laboratory rating. These leaks can occur where partitions abut room surfaces and jambs, at electrical outlet boxes, and where metal tracks have been damaged. A method of preventing these leaks is to plug crack with a non-hardening sealant. Details suggested by Tremco Manufacturing Company are given. How badly openings can affect the integrity of a partition is shown below in tests conducted by U.S. Gypsum Company.

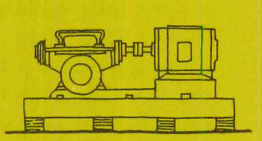


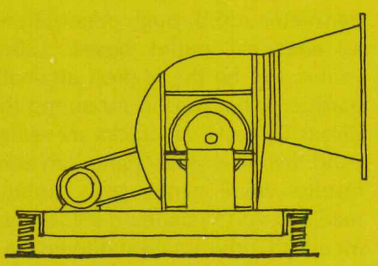


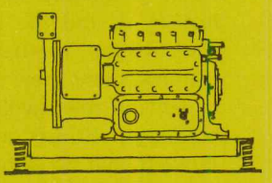


Large capacity reciprocating refrigeration compressors put out considerable vibrational forces as well as airborne noise. These compressors should, preferably, be mounted on concrete inertia blocks and isolated from the floor by large-deflection steel springs. This drawing illustrates various possible paths for transmission of airborne noise and vibration.

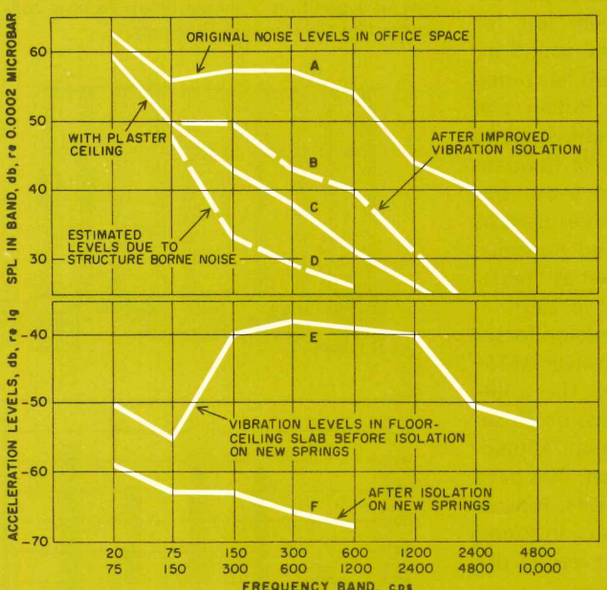
The graphs below illustrate the case history of a "trouble" installation of two 75-hp, 1800 rpm reciprocating compressors. These compressors were installed on a structure comprising 14-in. deep, one-way concrete joists on 20-in. centers, topped by 2 in. of lightweight concrete. The machine room was located directly over rental office space. The compressors were mounted on springs having a static deflection of less than 1 in. Although this comes within the limits of the theory, the initial noise level (curve A) was higher than NC-50. The initial recommendation called for the construction of concrete pedestals within which the compressors were to be suspended on springs having a 2-in. deflection. Additionally, a resiliently-suspended gypsum lath and plaster ceiling was to be hung below the joists. The concrete pedestals had to be omitted for several reasons, so the compressors were finally mounted on springs having a 4-in. deflection. Curve B shows the effect of the new spring isolators. Curve C shows the additional effect of the suspended ceiling. Curves E and F show the relative oscillation of the floor structure before and after isolation by the new springs.



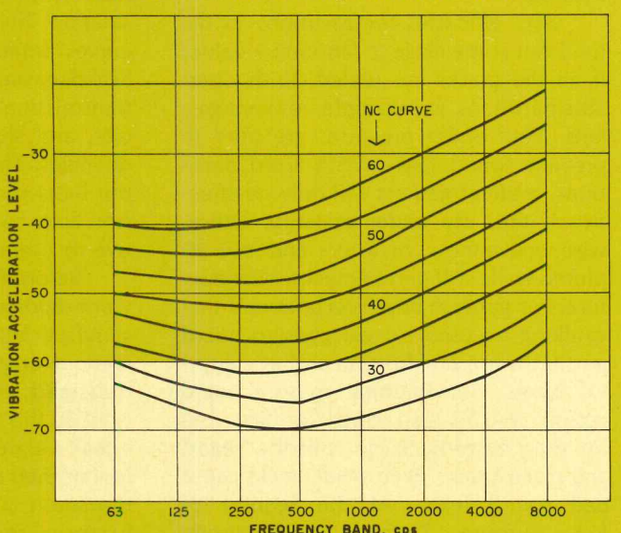




Vibration specialists recommend that large centrifugal fans and large reciprocating compressors be mounted on inertia blocks and large-deflection springs. Pumps requiring isolation may use fiberglass pads or steel springs, depending on how critical the occupancy is.



Allowable vibration can be specified by acceleration level not to be exceeded. For offices it might be set at —60 db.



Greater awareness of potential vibration problems will help avoid them. While formulas give guidance, there is no substitute for informed engineering judgment.

Of all the possible noise problems, those resulting from vibration are, perhaps, the most vexing because it is more foreign to the environment than other types of noise. Further, uncontrolled vibration can wear out equipment faster. Vibration problems have multiplied in number and seriousness as more and more machines are used in buildings, particularly on upper floors, penthouses and rooftops, and as building structures grow lighter and lighter. What causes vibration, what are its effects, and how can it be controlled?

Vibration results from some imbalance in rotating machines and from the kinetic forces of reciprocating machines. Of course the equipment should be as well balanced as possible in the first place, but this will depend to some extent on its quality and, consequently, cost.

Rigidly-mounted machines can transmit vibratory impulses to the supporting structure, and the resulting disturbances to people may come in the form of "feelable" vibrations from the floor they are on, or as airborne noise caused by a structural element (floor-ceiling construction) set in motion causing a rumbling sound, or both. Vibration problems will be most serious with such equipment as large, centrifugal fans that transmit low-frequency noise, or high force-imparting equipment such as large reciprocating compressors. But vibration can also be a problem with packaged air-conditioning equipment such as rooftop air-cooled condensing units if the roof structure is light and flexible.

Vibration transmitted to supporting structural elements can be reduced by means of vibration isolation techniques. The principle is that one of a number of resilient materials, or sometimes a combination of two, that are placed under the machine, are chosen so that the natural frequency of the loaded isolators is three to six times lower than the driving frequency of the machine. The isolators consist of such resilient materials as ribbed rubber pads, precompressed glass-fiber pads, rubber-in-shear compression mounts, steel springs and air springs. Cork is also used, but is limited to the frequencies above 1800 cpm. Vibrating machines will generally transmit a fundamental frequency and several multiples of it at lesser energy. Because springs are short-circuited at high frequencies, they may be used in series with ribbed rubber pads that work well at higher frequencies.

It is important to note why the natural frequency of the isolator has to be considerably less than the driving frequency. The formula for transmissibility, T, is:

$$T = \frac{F_t}{F_d} = \frac{1}{\left(\frac{f_d}{f_n}\right)^2 - 1}$$

where f_d = frequency of the disturbing vibration,
f_n = natural frequency of the resiliently mounted system,
F_d = unbalanced force acting on the resiliently-mounted system,
F_t = force transmitted through the resilient mountings.

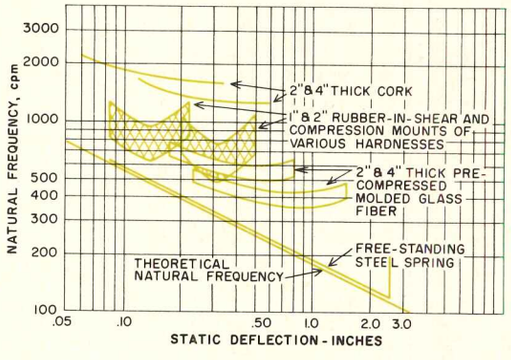
Also, $f_n = 188 \left(\frac{1}{d}\right)^{\frac{1}{2}}$

where d = static deflection of the isolator in inches.

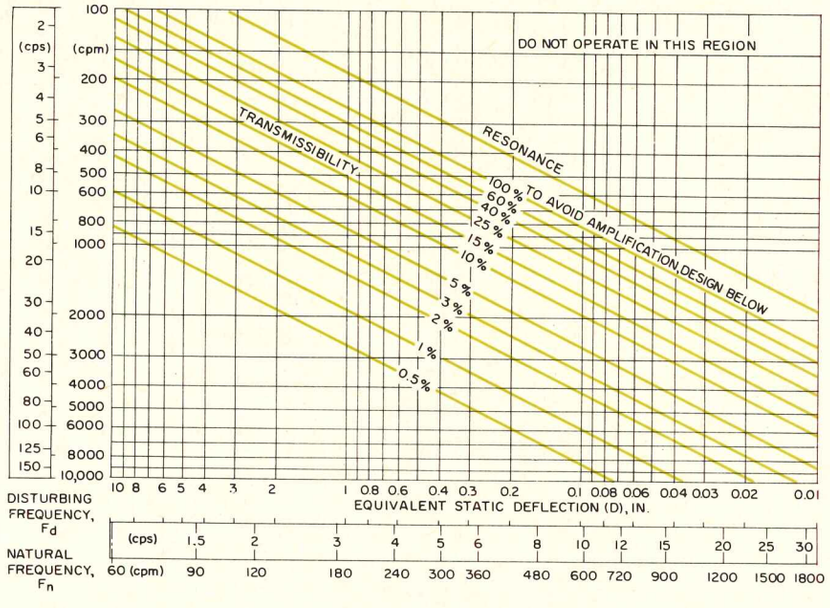
It can be seen that when the disturbing frequency is less than 1.4 times the frequency of the system, the tranmissibility actually increases above that resulting if there were no isolation at all, and the machine were bolted down solidly. In fact, resonance occurs if careless selection of the mounting results in a natural frequency equal to the driving frequency.

The most resilient isolators are springs because they have the largest deflections. Next in resiliency is rubber-in-shear isolators, followed by ribbed neoprene pads, and precompressed molded fiberglass. Air springs can be used for various frequency ranges, and may be the only solution for very low-frequency vibration. Frequency of air springs is determined by the volume of air enclosed.

Increasingly, resonant conditions occur in buildings having lightweight, flexible floor structures. For example, an engineer with the General Engineering Laboratory of General Electric Company, R. Plunkett, has described a situation in which a rash of complaints was received by the company about excessive vibration of their washing machines in one part of the country. It was found that the machines were installed in a series of housing developments in which the floors were of relatively flexible construction, and the machines were installed next to an interior wall having no support below. The flexibility of the structure was sufficient to have lowered the natural resonance of the washing machine case to the point where it was just



These curves give the actual measured natural frequencies for various types of vibration isolators, as reported by Laurence Eberhart of Consolidated Kinetics Corporation. Only springs follow theoretical natural frequency values.



This chart gives the transmissibility (its reciprocal is efficiency) of vibration isolators when the disturbing frequency is known and the equivalent static deflection is determined for a given isolator.

about at the spin speed of the machine.

Vibration control is only part engineering; the rest is art, as was demonstrated in the above example. Vibration theory is only part of the answer—experience counts considerably. Of course manufacturers of vibration isolation equipment will bring more expertise to bear on the more critical jobs where they will be compensated for the time needed to develop engineering application information and guidance. Vibration problems frequently occur with "budget" jobs because no one takes the responsibility for anticipating them. The manufacturer of package equipment may, for instance, provide reasonable vibration isolation suitable for most installations, presuming a sufficiently stiff supporting structure; but with this kind of application the mechanical engineer may not check the structure for its limberness, and the structural engineer will probably consider only the weight of the equipment and not its kinetic energy. Most manufacturers of packaged equipment will not recommend specific vibration isolation techniques for their equipment.

There are, of course, theoretical methods for checking whether a structure may be driven into resonance by a piece of mechanical equipment—at least for the simpler, but common, configurations of floor and roof structures. The structural engineer probably should be asked to check for resonance in lightweight and/or long-span structures, providing that his fee is sufficient to warrant his undertaking this work, and provided that the mechanical engineer can supply him with the right information on equipment characteristics. On lower-cost buildings, where an extensive investigation is not warranted, at least the designers should try to keep equipment away from the center of the spans, and nearer columns or bearing walls.

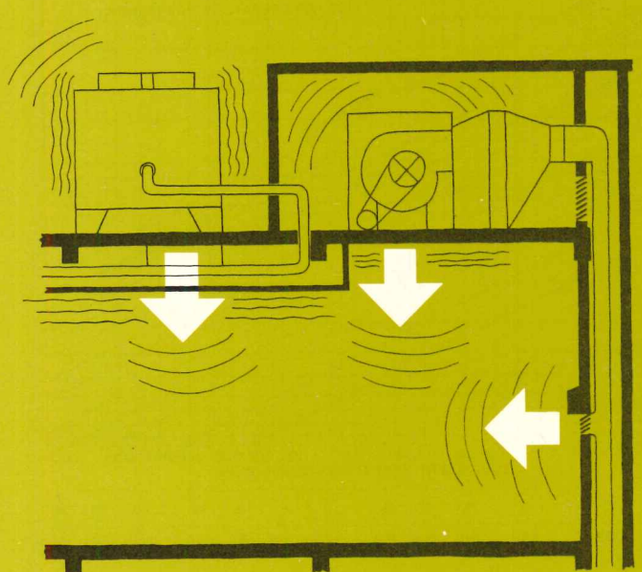
Two parameters that determine the basic vibration isolation technique are the vibration frequency and the relative power of the equipment. Design has to consider the relationship of the two. For example, one common way of specifying vibration isolation is to give the allowable transmissibility, or, conversely, the efficiency of the mounting. There are some objections to this type of specifying because it is not possible to check "efficiency" of the mountings on the job. But it illustrates the point: if the vibration isolation efficiency for fans is specified broadly for all sizes, a little 1-hp fan would require as much deflection from the isolators as a 100-hp fan. The recommended way to specify isolators in order to check them in the field is to use the required deflection corresponding to the frequency being designed for. This form of specification is most applicable to spring and neoprene-in-shear mountings where the deflection can be easily measured with a rule. Another method of specifying vibration isolation for critical installations is to prescribe the vibration levels that are not to be exceeded in any structural element surrounding an equipment room. This method gives a quantitative measure that can be related to the standard NC curves.

Vibration isolation techniques for various types of mechanical equipment are as follows:

Fans. Large centrifugal fans can be a source of considerable low-frequency vibration. These fans and their motors should be mounted on a common, rigid base to avoid misalignment which wears out fan belts and bearings. The rigid base is in turn placed on spring isolators. Sometimes the base is a concrete slab called an "inertia block." This inertia block, in addition to providing a rigid platform, evens out the load on the springs. Also its mass helps reduce somewhat the airborne transmission through the floor-ceiling construction below. Further, inertia blocks reduce the amplitude (but not the force) of the oscillation and reduce the amount of movement—this is more important for equipment such as refrigeration compressors which have piping connected to them.

Refrigeration compressors. Large, low-speed reciprocating compressors should be isolated by springs and inertia blocks. In some "trouble" installations (such as the one referred to on page 190), when springs only are used, the springs may have to have a fairly high deflection, perhaps on the order of 4 in., to perform their isolation job properly. High-speed centrifugal compressors, on the other hand, require only a minimum of isolation even when they are near occupied spaces. This can be done with several layers of ribbed neoprene; cork can be used if they are to be mounted on large concrete bases.

Cooling towers. Cooling tower vibration is of two types. If propeller-type fans are used, these will need to be isolated by high-deflection springs, sometimes as much as 4 to 6 in., to prevent transmission of their low-frequency vibration. Waterfall noise, in contrast, has higher frequency content and this can be isolated by ribbed neoprene or rubber-in-shear mounts. If the cooling tower uses a centrifugal fan, the lesser low-frequency vibration will permit low-deflection springs (1 in.) or rubber-in-shear mounts.



The increasing use of rooftop-mounted air-conditioning equipment together with the growing trend for structures to become lighter and lighter makes vibration all the tougher to control. Large blowers put out low-frequency vibrations which, if not blocked by proper isolation, may cause a resonant condition with a lightweight structure. Cooling towers produce low-frequency vibration if they use propeller fans, and the cascading water produces high-frequency vibration. Of course both of these components create airborne noise which may have to be attenuated to prevent complaints of neighbors as well as occupants of spaces directly underneath this equipment. Airborne fan noise can be attenuated by properly-designed machine room construction. Cooling towers may require silencers on the fans.

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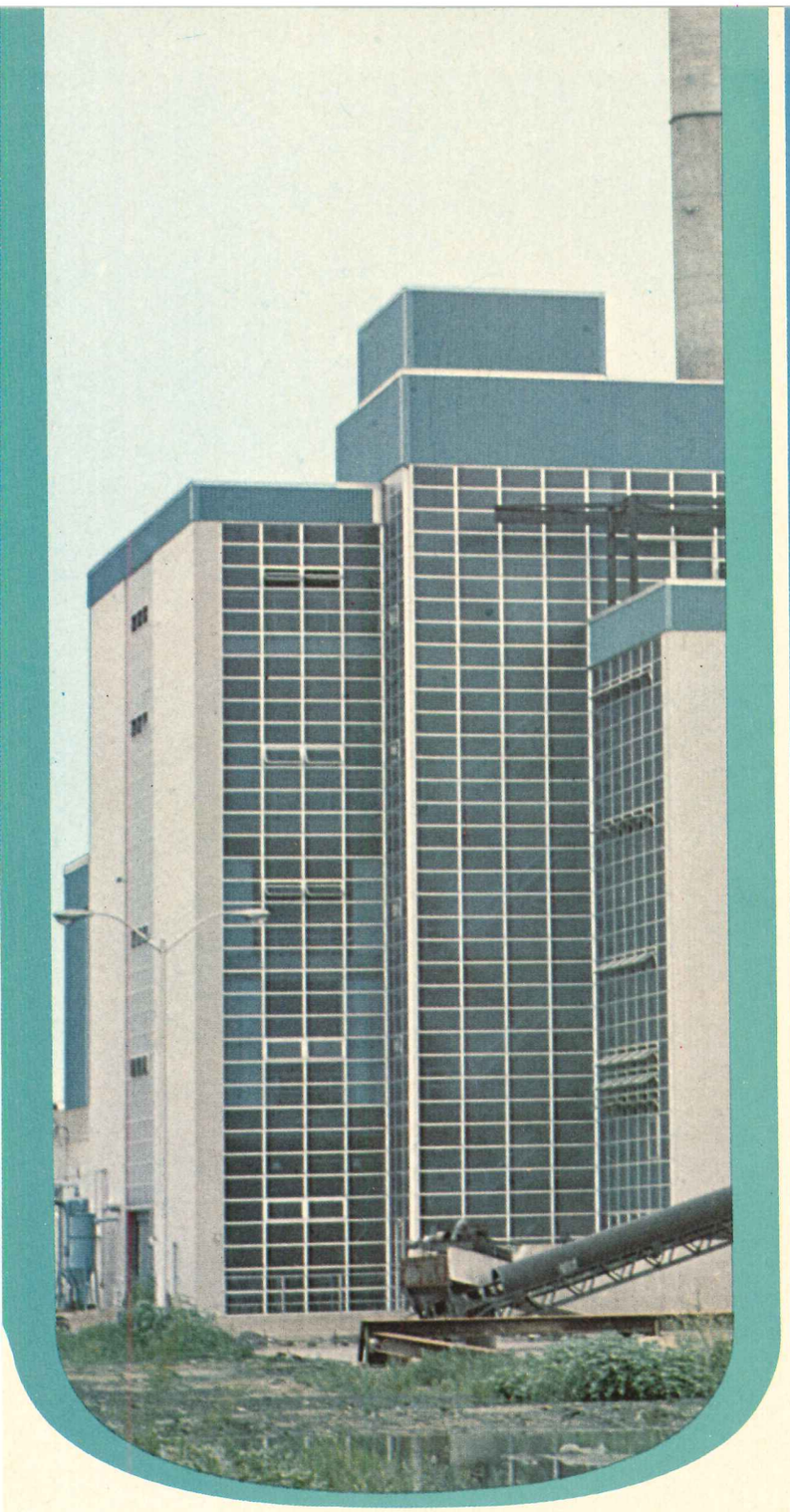

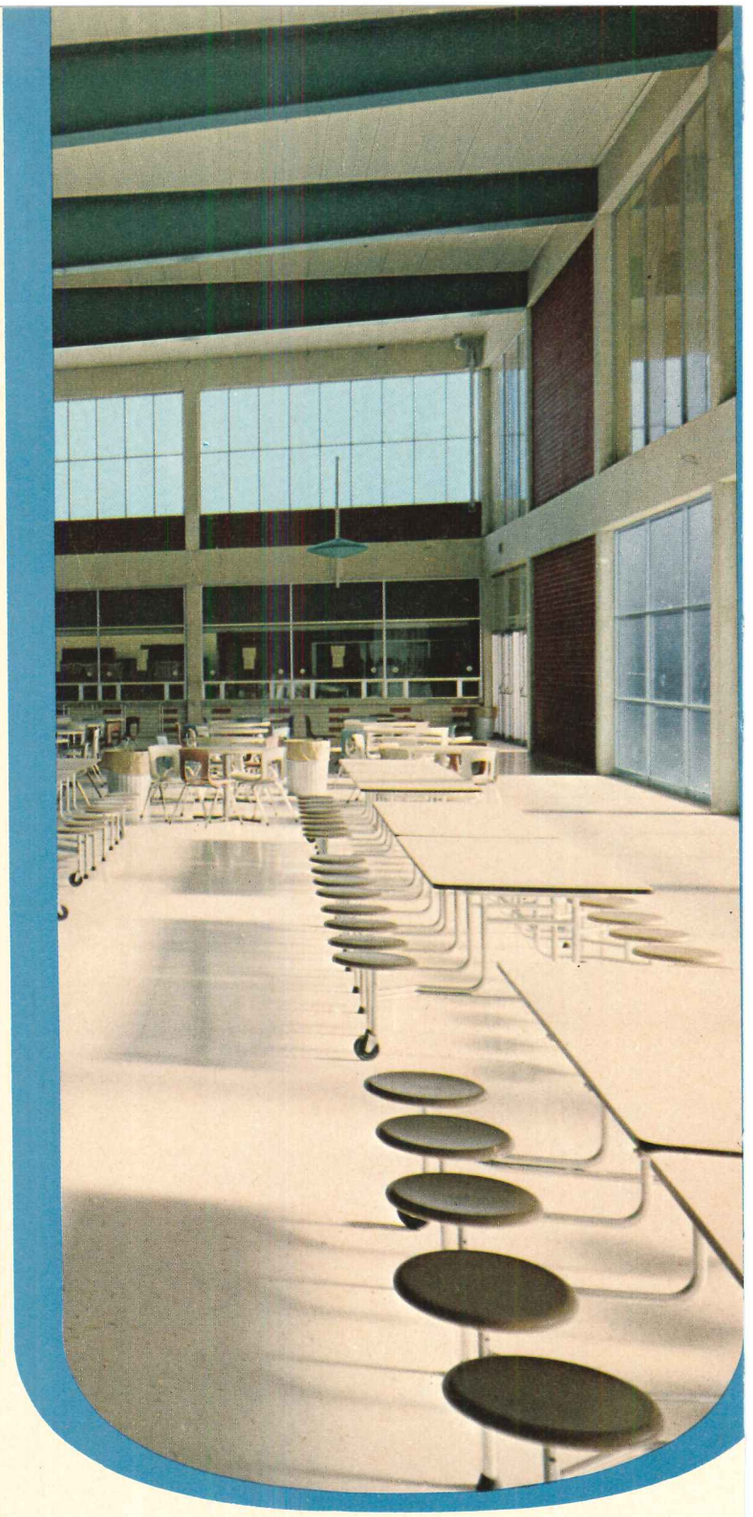

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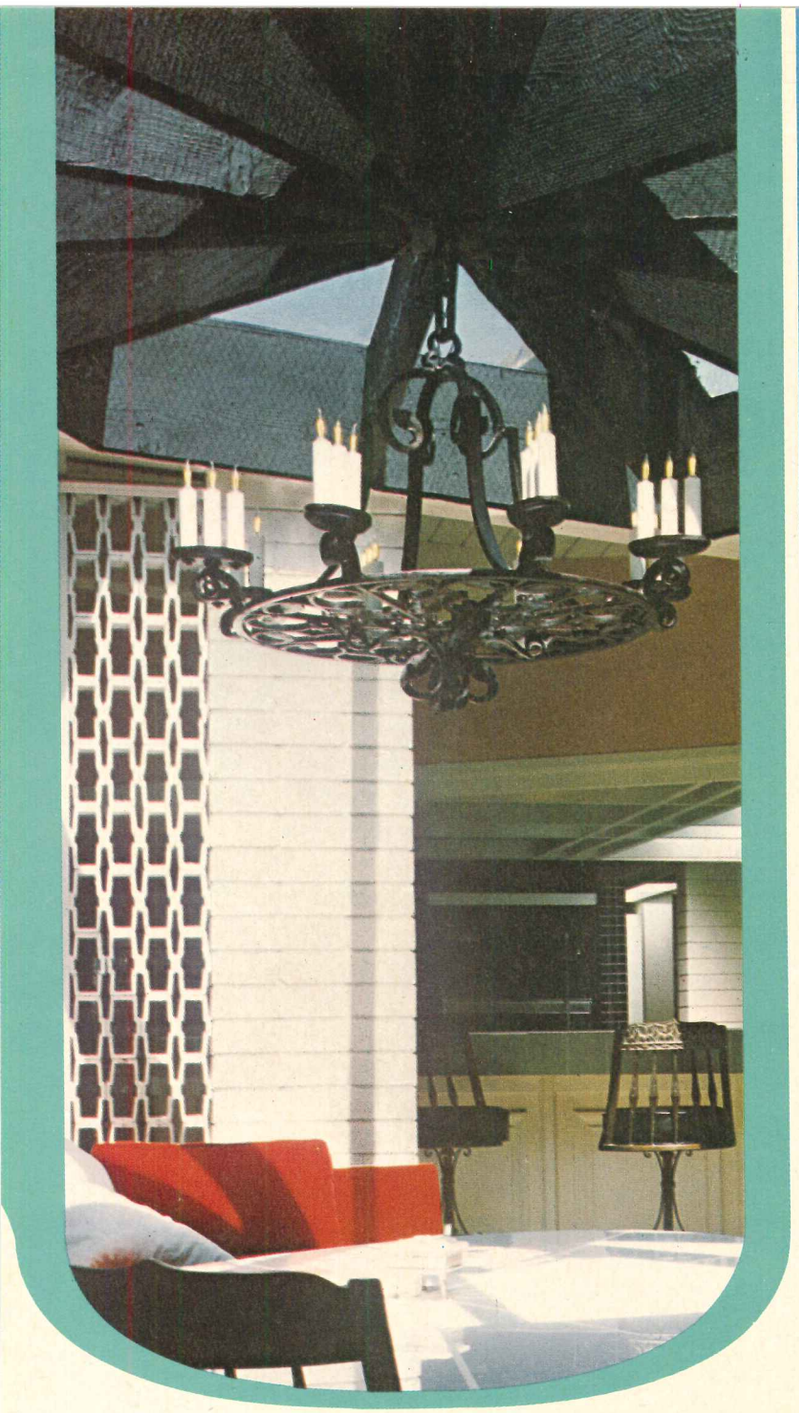
Coolite, functionally located to reduce heat gain from the sun, coordinates beautifully in churches with the art glass of altar and sanctuary areas.

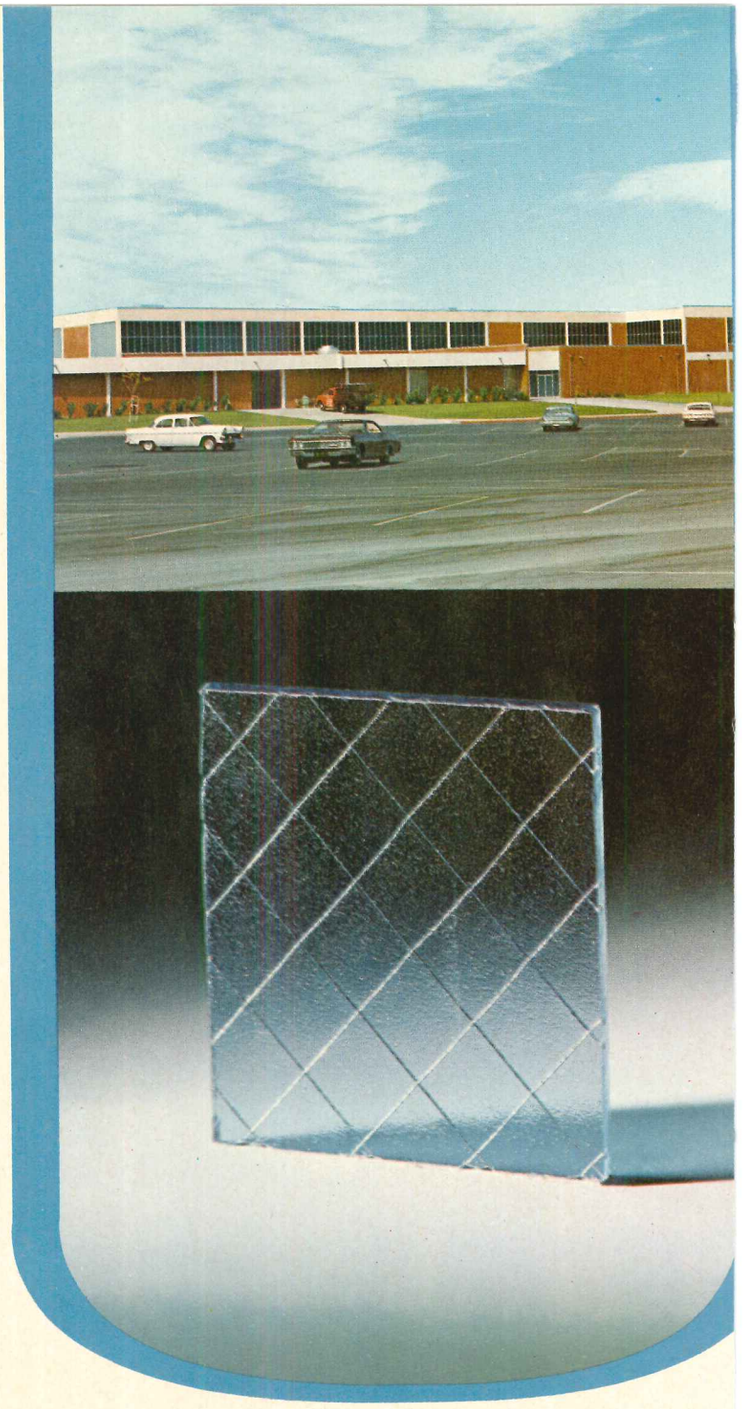
The blue-green tint of the glass blends attractively with stainless steel and anodized aluminum in today's curtain wall construction.

Coolite offers the architect opportunity to relieve vast stretches of fenestration with the pleasing touch of subdued color in glass with the built-in heat shield.

MISSISSIPPI GLASS CO.

For more data, circle 98 on inquiry card





COOLITE MISCO

Listed "Fire Retardant" by Underwriters' Laboratories, Inc.

All the heat-absorbing quality of Coolite plus the fire-retardant protection of Misco Wire Glass. Coolite Misco absorbs sun heat to make room cooling more efficient. In case of fire it seals off areas against smoke damage and reduces danger from rapid spread of flame. This two-way protection warrants consideration by architects and builders who seek practical solutions to environmental control.

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FIRE WINDOWS AND DOORS
ISSUE NO. 101
MISSISSIPPI GLASS CO.
MADE IN U.S.A.

For suggestions on thickness, glare reducing finish, and glazing procedures contact our local sales office.

While Coolite installs as readily as conventional glass, certain precautions are necessary to provide for the extra heat absorbency of Coolite. Be sure to refer to Installation Instruction on Page 7 of our Coolite Catalog. (If you do not have a copy of this latest catalog in your file, write and we will send you a copy without delay.)

See our catalog in Sweet's Ⓢ

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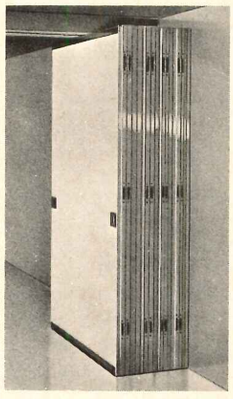
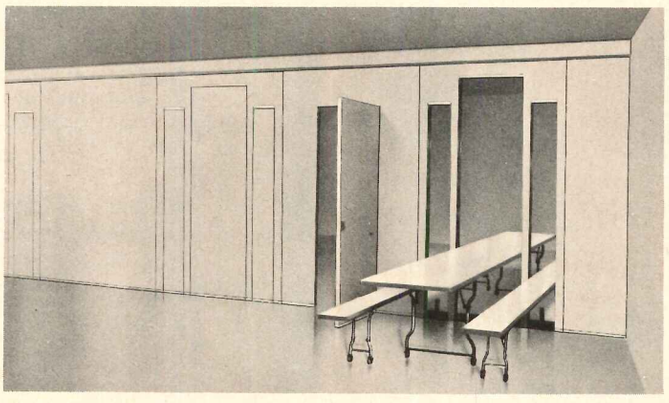
For more information circle selected item numbers on Readers Service Inquiry Card, pages 307-308

GYM SEATING / A 10-year guarantee on seatboard refinishing on vinyl-on-steel gym seating will read: "Manufacturer will agree to pay all costs of materials and labor whenever the seatboards require refinishing within 10 years from date of installation." ▪ Brunswick Corporation, Kalamazoo, Mich.

Circle 300 on inquiry card





WALL COMPONENT / Electric-hydraulic operable walls and folding tables and benches have been combined into *Duo-Wall*. One switch electrically drives the wall from stacked position to extended position, where it is perimeter-sealed. Another switch rolls out tables and benches, which extend seven feet each side of the partition and seat up to 20 children. Roll-out units are built into every second panel. ▪ Robert Haws Company, Detroit.

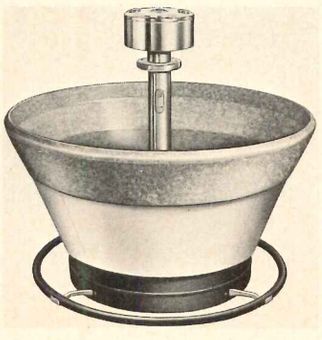
Circle 301 on inquiry card

SPACE SCIENCE SEATING / Fiberglass shell seats of the *Constellation* system tilt back 20 deg, giving a full view of the planetarium sky. When the folding tablet arm is in writing position, it will be parallel with the floor, even though the chair is tilted. Individual pedestals are floor- or riser-mounted. ▪ Clarin Manufacturing Company, Chicago.

Circle 302 on inquiry card

AUDITORIUM SEATING / A large writing surface folds to a position level with the bottom of the seat, allowing unimpeded movement when the arm is not in use. The single, heavy-duty tubular steel column of each chair adapts to installation on level and sloping floors, as well as on risers. ▪ Heywood-Wakefield Company, Gardner, Mass.

Circle 303 on inquiry card



WASHFOUNTAIN / The high-strength, lightweight bowl made of fiberglass-reinforced thermosetting resins is nonporous and is acid- and corrosion-resistant. As many as eight users may be served with a single set of plumbing connections, and units come in a variety of colors. ▪ Bradley Washfountain Co., Menomonee Falls, Wis.

Circle 304 on inquiry card

more products on page 204d

OFFICE LITERATURE

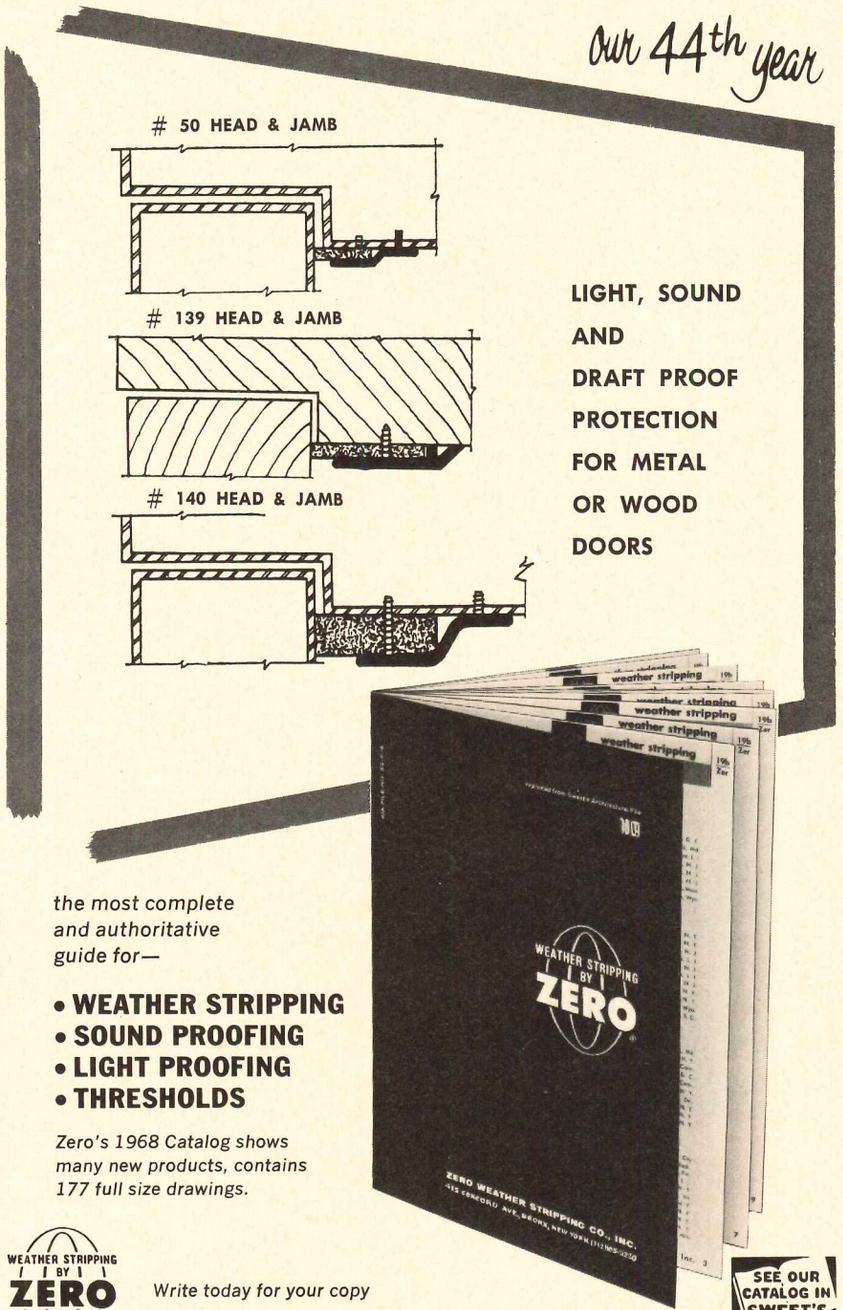
For more information circle selected item numbers on Reader Service Inquiry Card, page 307-308.

ELECTRICAL DISTRIBUTION / Up-to-date prices, catalog numbers, and selection and application information for a complete line of electrical distribution equipment are included in the 1968 *Speedfax* catalog. The 188-page illustrated book contains information on standard products for industrial plants, commercial buildings, and institutional and residential installations. ▪ I-T-E Circuit Breaker Company, Philadelphia.

Circle 400 on inquiry card

ALUMINUM SLIDING DOORS / The revised 1968 *Specifications for Aluminum Sliding Glass Doors* contains two new provisions. For the first time, specifications require the use of safety glass in sliding glass door construction. The new standard also requires that doors undergo a stiffer water resistance test and uniform load structural test. ▪ Architectural Aluminum Manufacturers Association, Chicago.*

Circle 401 on inquiry card



For more data, circle 99 on inquiry card

HOSPITAL COATINGS / The selection of functional, easy-to-maintain interior and exterior coatings for hospitals and other patient-care institutions should be simplified by a comprehensive guide. The guide specifies the precise product to meet the environmental demands of every area in these institutions. ▪ Desco International Association, Buffalo, N.Y.*

Circle 402 on inquiry card

ARCHITECTURAL LIGHTING / 1968 catalog includes three new lines: outdoor mercury-vapor luminaires; weathertight fluorescent fixtures, and versatile incandescent wall brackets. Other cast-aluminum fixtures include recessed and semi-recessed luminaires, post lights, wall brackets, landscape units, directional fixtures and step lights. ▪ mcPhilben Lighting, Melville, New York.*

Circle 403 on inquiry card

OFFICE FURNITURE / A comprehensive 100-page catalog presents desks, chairs, files and accessories for almost any office situation. ▪ Columbia Unlimited, Inc., New York City.

Circle 404 on inquiry card

AIRPORT CARPETING / A 4-page folder documents steps required in the installation of *Design III,* a woven *Antron* nylon carpet, throughout the terminal buildings at McCarran Airport, Las Vegas. ▪ Lees Carpets, Bridgeport, Pa.

Circle 405 on inquiry card

ROOFING MANUAL / The 1968 edition of the *Barrett Built-up Roofing Systems Manual,* an authoritative summary of modern roofing practices, recommends specifications for insulation, roofing, flashing, drainage, waterproofing and dampproofing. ▪ The Celotex Corporation, Tampa, Fla.*

Circle 406 on inquiry card

STRUCTURAL CONCRETE / *Torsion of Structural Concrete* is a 512-page volume dealing with four general areas: 1. analysis of structures for calculation of torsional forces on elements of the structure; 2. theory of torsional stress distribution in members; 3. experimental observation of the behavior of members subjected to torsion; and 4. design of members subjected to torsion. The volume is available for $14. ▪ Publications Department, American Concrete Institute, Box 4754, Detroit 48219.

**Additional product information in Sweet's Architectural File*

more literature on page 243

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Design with canvas and your imagination takes wing, while the cost stays happily down to earth. That's because standard hardware or welded pipe framing supplies all the structural support needed. The fabric is a sturdy weave of 100% cotton (8 to 15 ounces per yd. of 31″ width) treated for mildew and water resistance to weather any outdoor job. No wonder there's so much happening in canvas. Canvas solves so many problems. Ask your local canvas products manufacturer.

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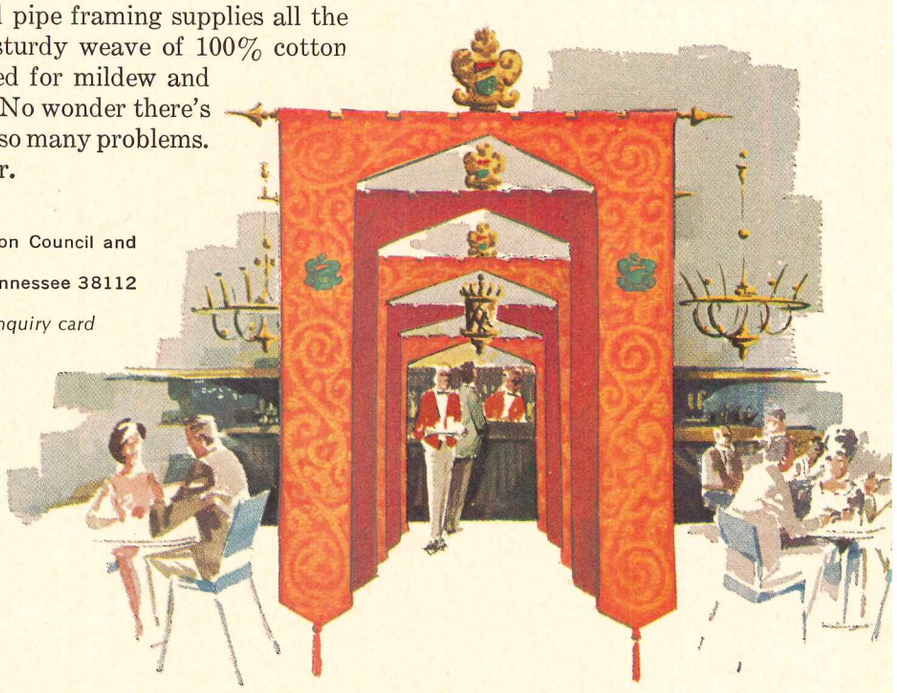
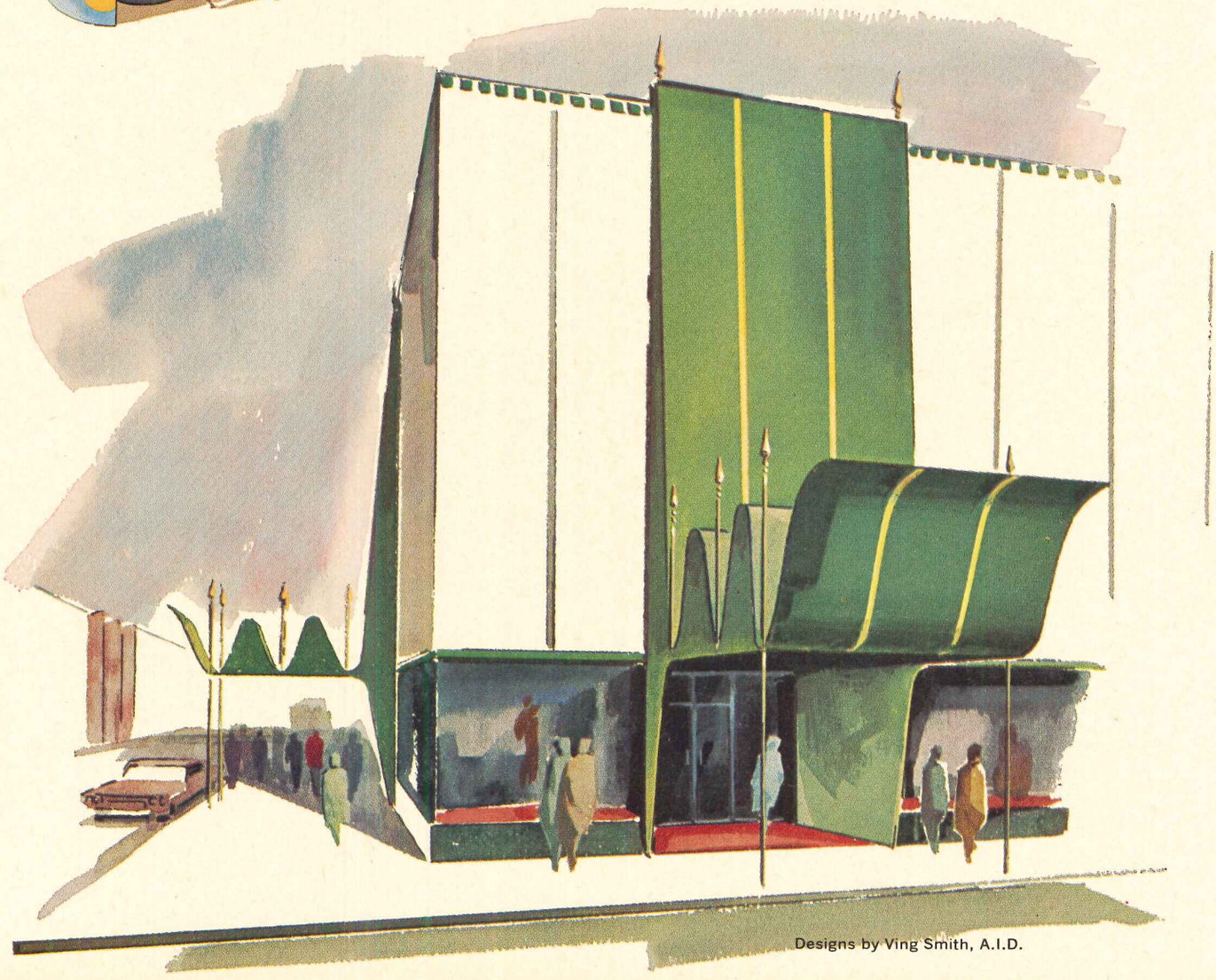
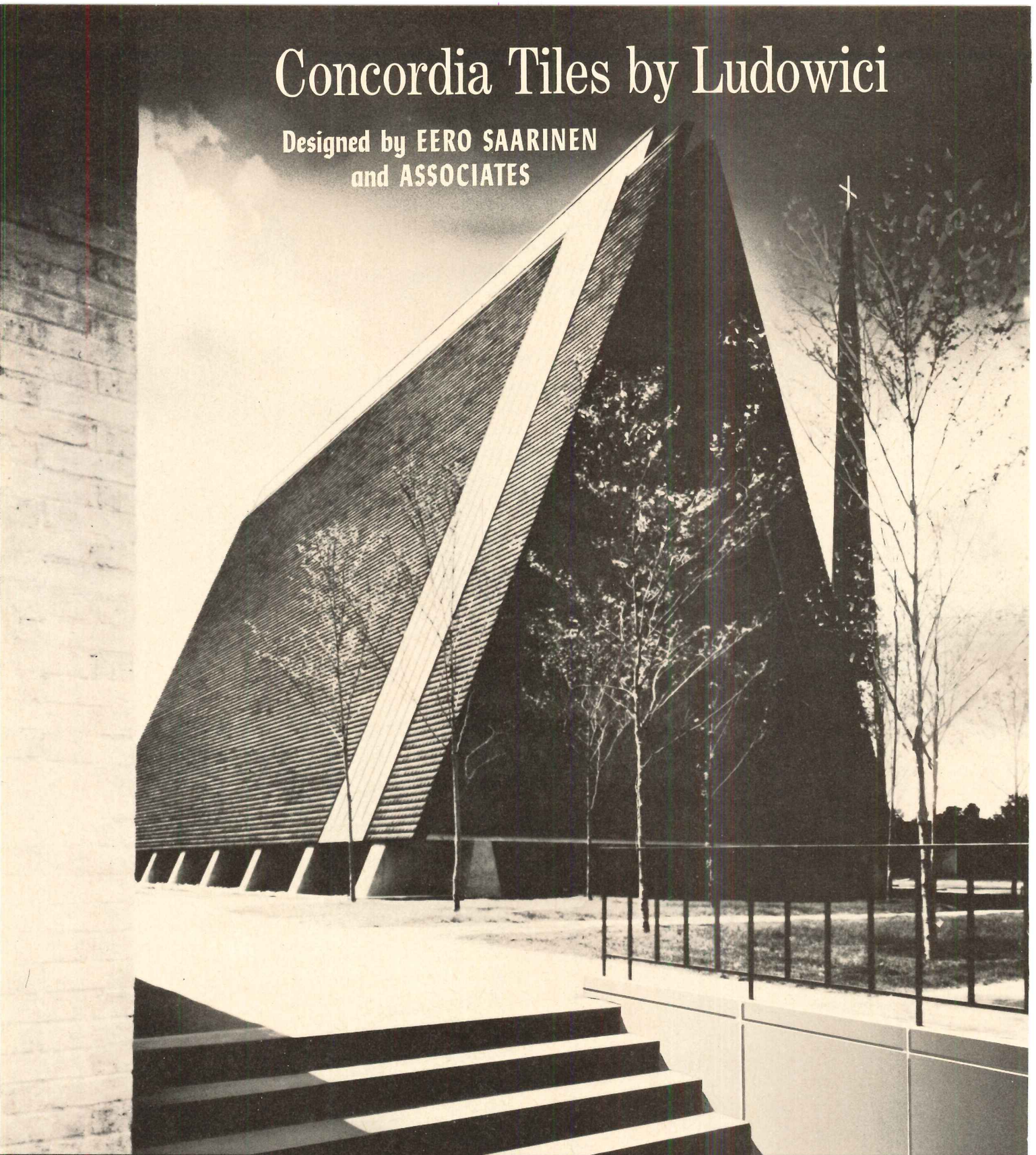




Designs by Ving Smith, A.I.D.

Concordia Tiles by Ludowici

Designed by EERO SAARINEN and ASSOCIATES



Ludowici-Celadon Company was selected to produce the ceramic roofing tiles, designed by Eero Saarinen & Associates, which were so important in the full development of the architectural character of Concordia Senior College.

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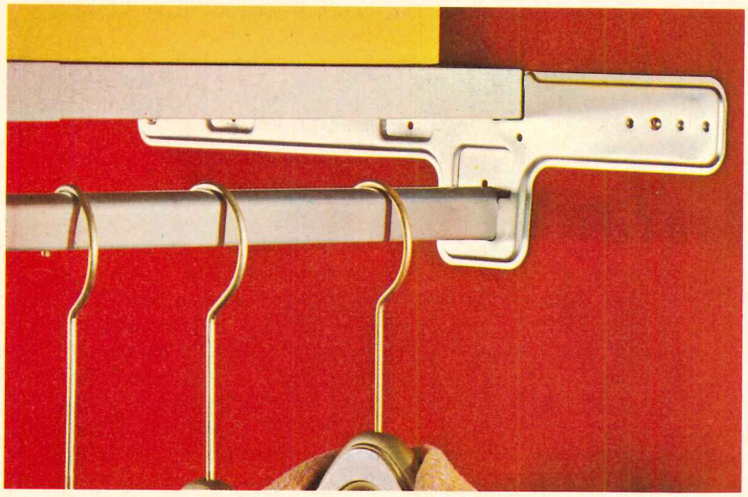

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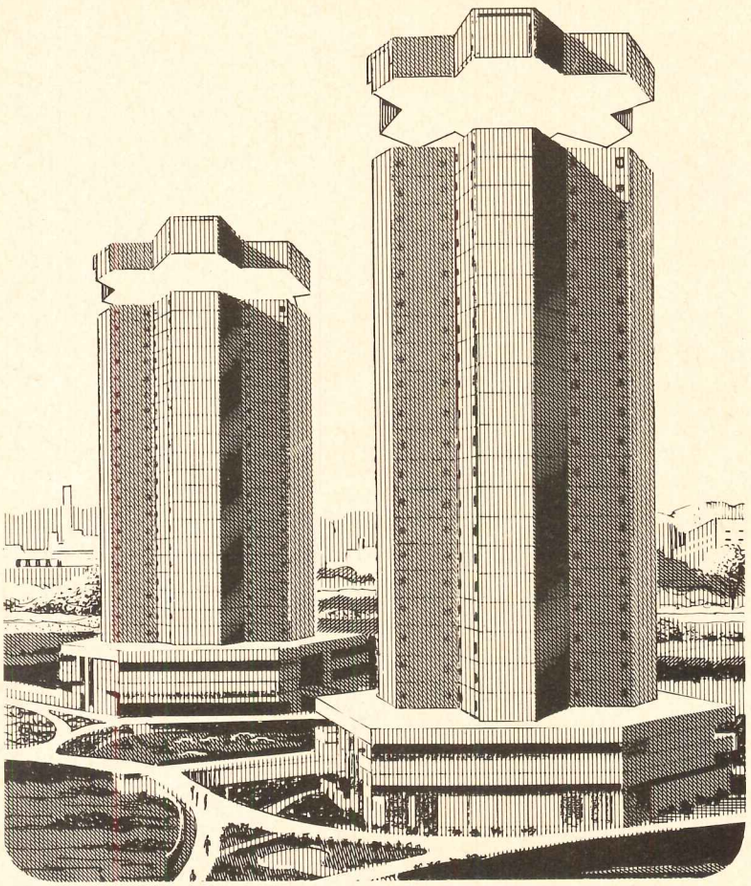
For more data, circle 102 on inquiry card



Buildings: Lincoln Tower and Morrill Tower,
Ohio State University Campus, Columbus, Ohio
Architect-Engineers: Schooley Cornelius Schooley, Columbus, Ohio
General Contractor: George Driscoll Co., New York City

It's like the 24th floor isn't there

Isolating noise and vibration in two dormitory towers at Ohio State University was a tall order. Each penthouse mechanical room contains four (4) gas driven engine-generator sets which supply the electricity, heat, air-conditioning and hot water for the 3880 student complex. The transmission of noise to the student sleeping and study rooms below posed a formidable problem ▪ Consolidated Kinetics designed and manufactured the noise and vibration isolation system. A 6″ concrete floor, floating on panels of precompressed fiber glass effectively isolates airborne and structure-borne noise from other parts of the building ▪ If you have a sound transmission problem created by people, music, or machines, Consolidated Kinetics can provide you with a solution. Complete capabilities, from mechanical equipment mountings to entire area isolation systems. Qualified field engineers are available in all major U. S. Cities.

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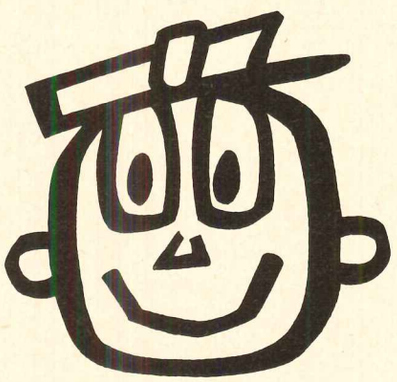

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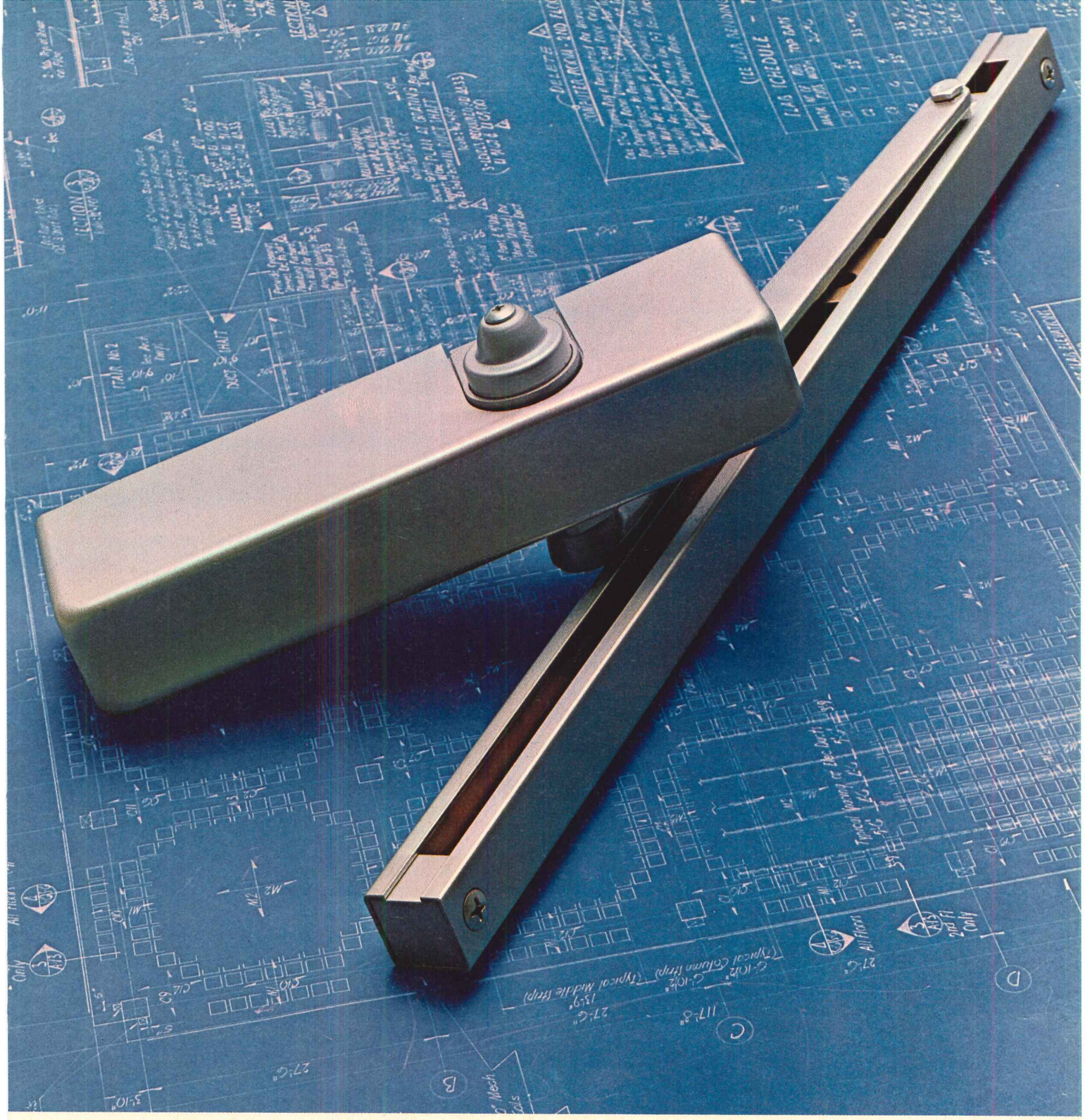

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When door control calls for truly universal closers, Russwin's newest addition, the 2800-T Series is your logical choice. Closer mechanism of the 2800-T mounts on door frame. Arm rides in track on face of door. Nothing projects. Even when hinged close to a right angle wall, door can open full 90 degrees. Precision performance. Modern styling. Tamper-proof. The smooth-acting, long-lasting closers for schools, hospitals, offices. Write for latest brochure. Russwin, Division of Emhart Corporation, New Britain, Conn. 06050. In Canada — Russwin Division of International Hardware.

RUSSWIN

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

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

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

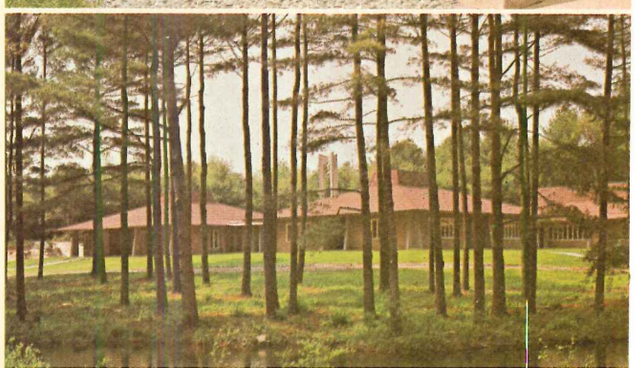
Why *stock* windows in such a unique design? With **six types and hundreds of sizes,** our architect had complete design freedom. He knew he could get them fast from **local warehouse stock** to meet his construction schedules. (He liked the **local service backup,** too.)

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

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

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

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



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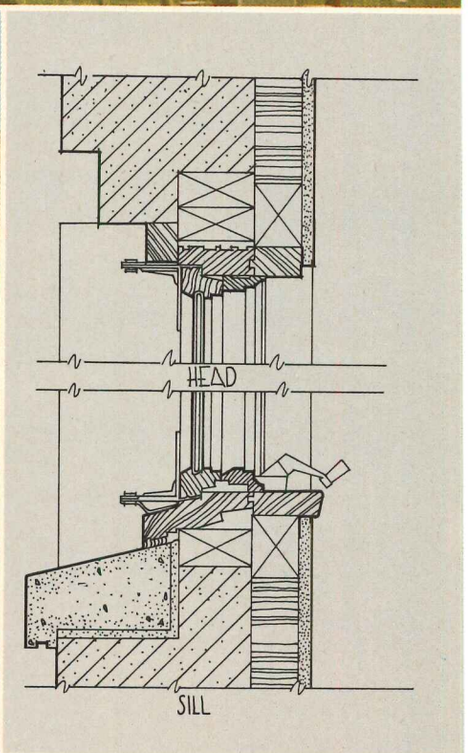
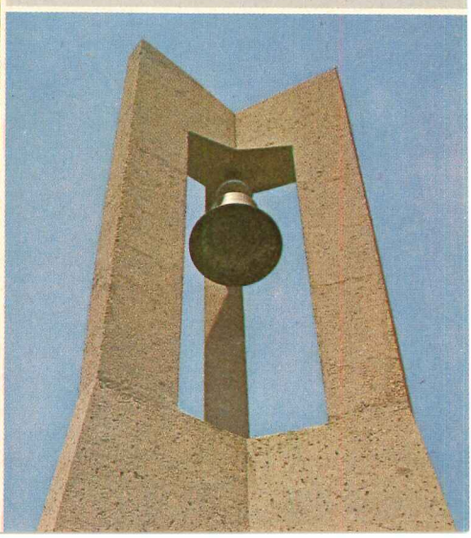
Window Beauty is Andersen


HEAD
SILL



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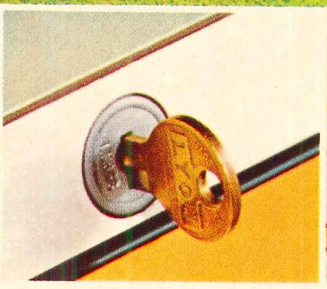

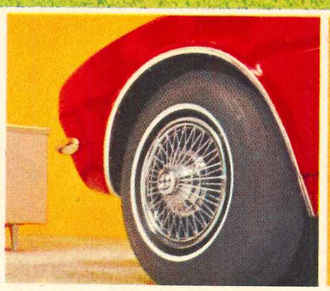

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LYON OFFICE FURNITURE

Showrooms: New York, Aurora, Los Angeles

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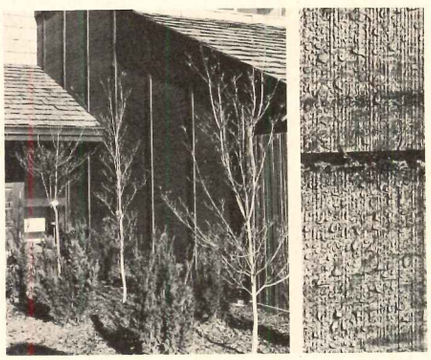
continued from page 197



REDWOOD PANEL SIDING / *Shadow Groove* is patterned plywood designed for both vertical and horizontal application. V-grooves are "burned" into premium *Ruf-Sawn* redwood plywood on 3.2-in. centers to provide a distinctive shadowline without breaking through the surface veneer. Because of this, a 3/8-in. panel may be used where a 5/8-in. panel would normally be required, and in horizontal application prevents the moisture absorption that can occur with "sawn" groove patterns. *Shadow Groove* may be applied directly to sheathing, with no caulking or battens required on shiplapped long edges. The water-repellent surface may be painted, stained or left to weather naturally. Besides siding, panels may be used for soffits, accent panels, fencing, and interior paneling. ▪ Simpson Timber Company, Seattle.

Circle 305 on inquiry card

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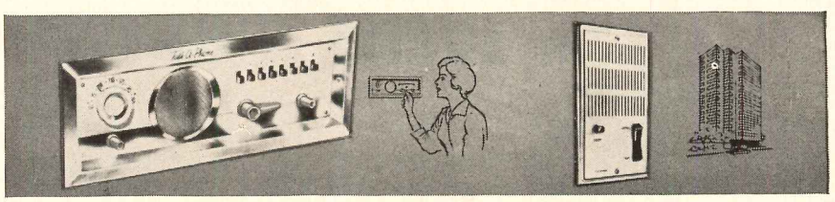

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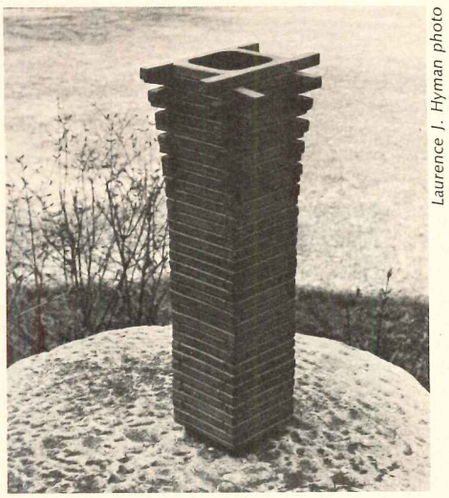


Laurence J. Hyman photo

POTTERY / A special new custom pottery workshop has been initiated "to develop a broader and bolder concept of design in pottery." Londa Weisman has constructed large sculptural outdoor planters and free standing pots for both new and old buildings. Patricia Probst has designed a number of wall mirrors and a series of surface tiles. ▪ Bennington, Vt.

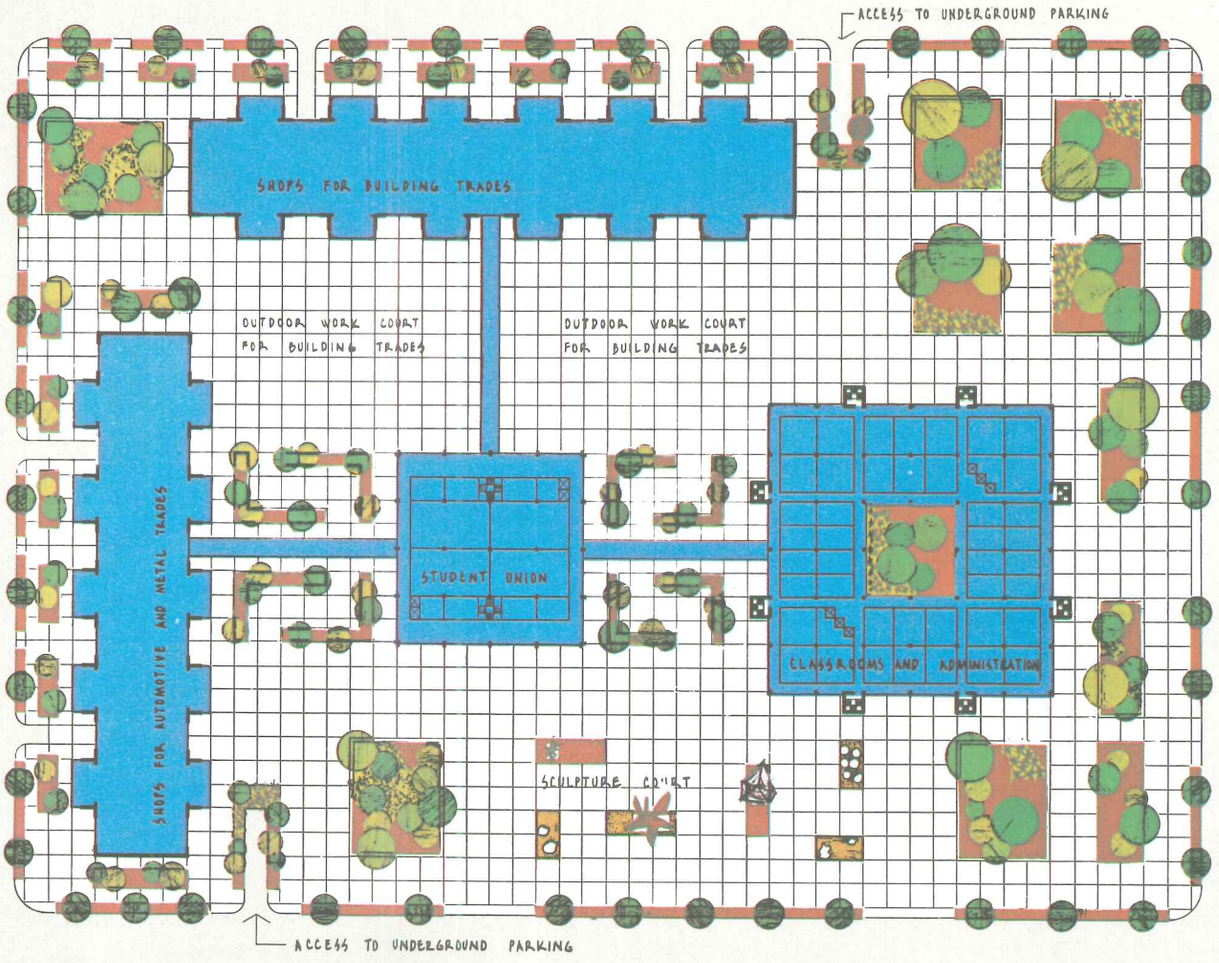
Circle 306 on inquiry card

CHEMICAL FABRIC / *Frontera* sculptured polymer is said to provide the potential to create virtually any textured surface in any dimension and to any degree of flexibility. Upholstery on this chair, table and stool is *Frontera Opus*, a suede-like material. All fabrics will have the same basic attributes: they are waterproof, can be cleaned with soap and water, are resistant to stains, crocking and abrasion, have excellent crease-recovery and good dimensional stability, and they resist fading and drying out. ▪ Tenneco Chemicals, Inc., New York City.

Circle 307 on inquiry card

more products on page 222

Harper-Drake Associates design a Junior College to help un-blight an urban area.

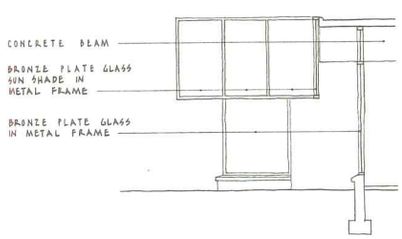


It's a higher educational facility for those who have graduated from high school, a vocational training center for those who haven't. An enlightened concept for getting an urban renewal project rolling. This six-block campus is designed to be more than a 10,000-student college. It would become the center of a community in both physical and intellectual senses.

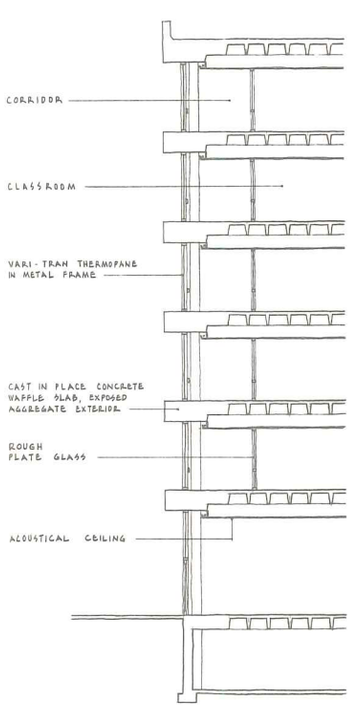
The buildings will be inviting, open, alive with activity that can be seen and experienced. This can be achieved by eliminating the traditional ivy-covered walls and substituting large areas of glass. People can walk to all of the buildings through corridors of bronze Thermopane® insulating glass. This design permits leaving coats in lockers in the Student Union. Parking is planned for underground.

If the community feels at home and accepts the physical environment, perhaps the next acceptance will be the intellectual environment.

The Student Union occupies the center of the campus. Here, programs,



SECTION AT AUTOMOTIVE AND METAL TRADES BUILDING



SECTION AT CLASSROOM AND ADMINISTRATION BUILDING

recitals and seminars are available to the public. And to make the buildings more attractive (and more comfortable inside), entrance doors are bronze-tinted Tuf-flex® glass, window walls are glazed with Parallel-O-Bronze® plate glass separated by bronze Vitrolux® spandrel glass.

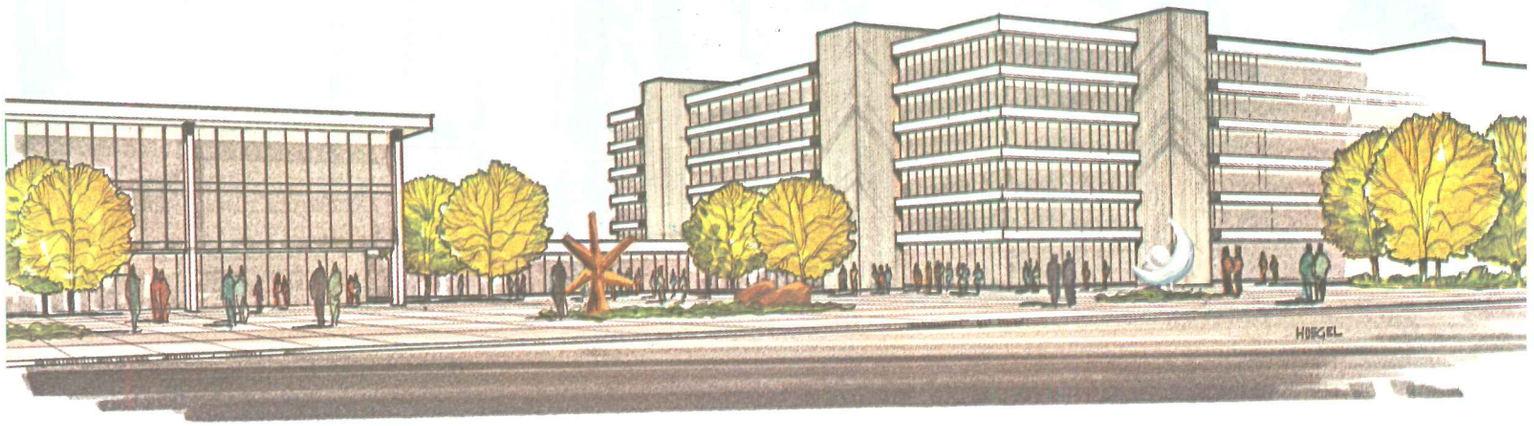
The Classroom and Administration Building is glazed with Thermopane with Vari-Tran™ coated glass as the outer pane. This special-performance glass controls transmission of light and heat. It also mirrors the environment around the building. The windows' 3-foot overhang for sun shading provides window washers a working ledge.

Corridors are next to exterior glass walls of the building. Classroom partitions facing the corridors are Rough Plate Glass to transmit outside light to interior rooms. A 100-square-foot open court provides daylight and eye-resting views through clear plate glass windows.

Shop buildings have extra-high ceilings to expedite moving of machinery. Machinery is placed a few feet from the windows so people outside can see what's going on inside—to see that people with ambition *can* be trained. Window walls are bronze plate glass. As further protection from low sun rays, a bronze sunshade extends down from the roof overhang.

Expansion? Not on this campus. As the architects, Harper-Drake Associates of Milwaukee, see it, it would be far more beneficial to the urban community to build a similar educational complex in another blighted area. It is hoped that the campuses will inspire upgrading of properties surrounding them.

SECTION AT STUDENT UNION BUILDING



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

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Parallel-O-Grey®, ⅜", ½"
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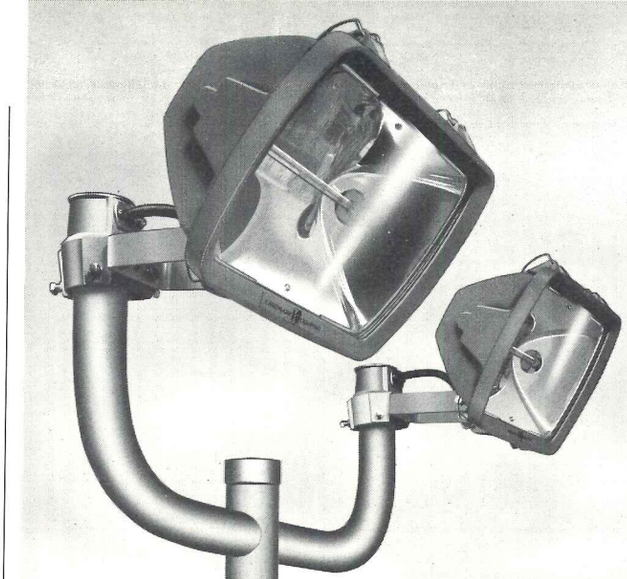

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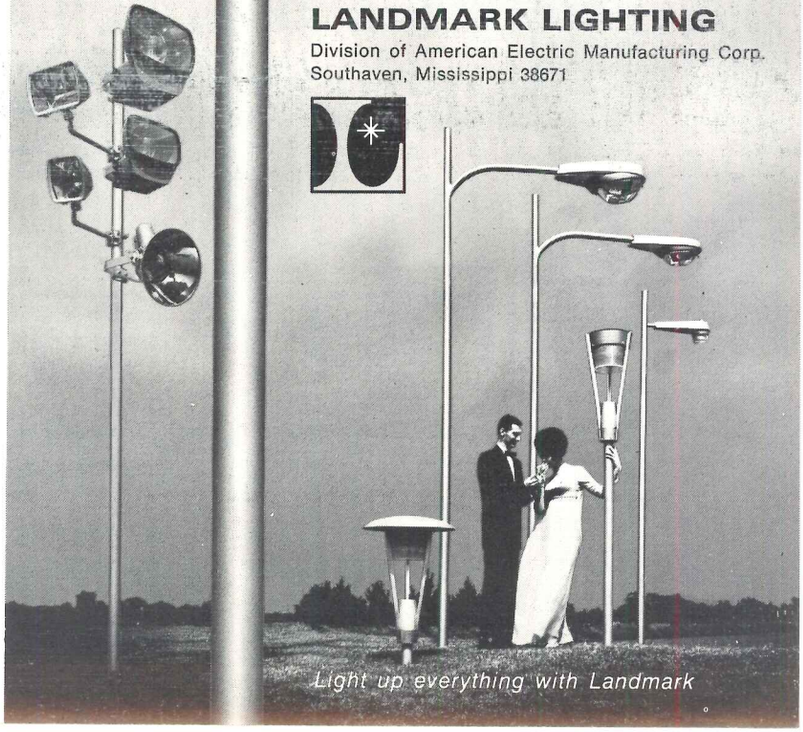

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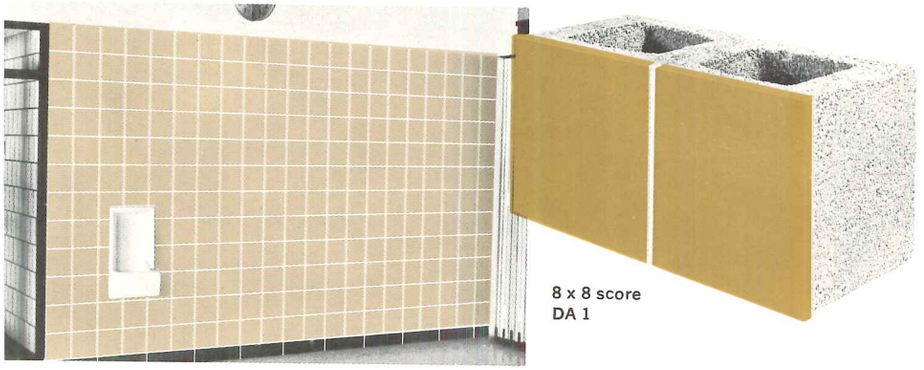
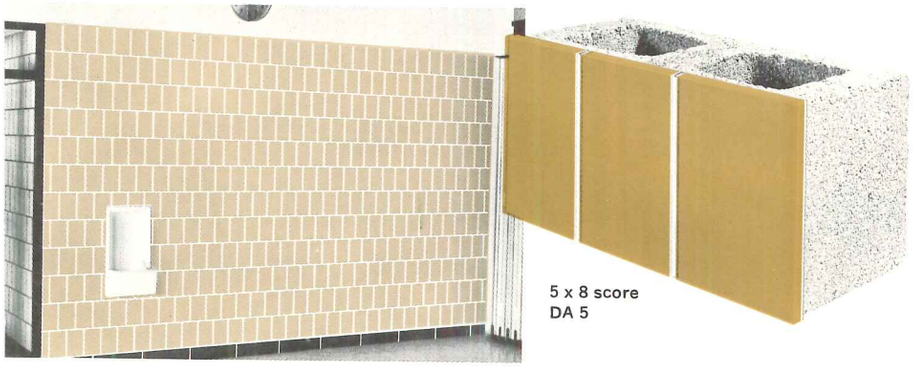
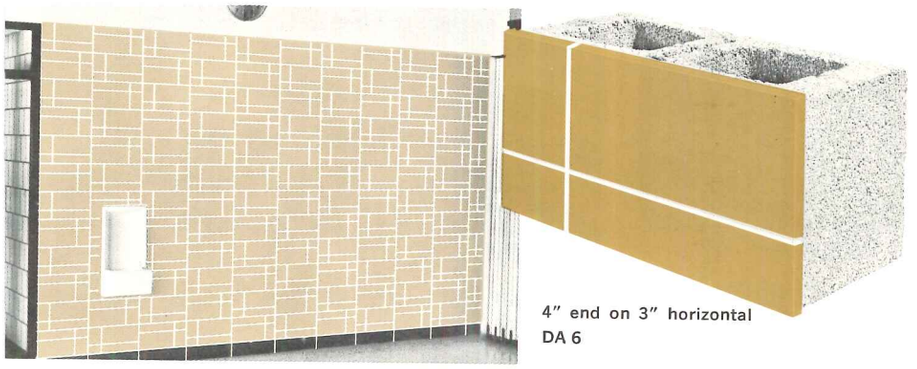
8 x 16 UNIT



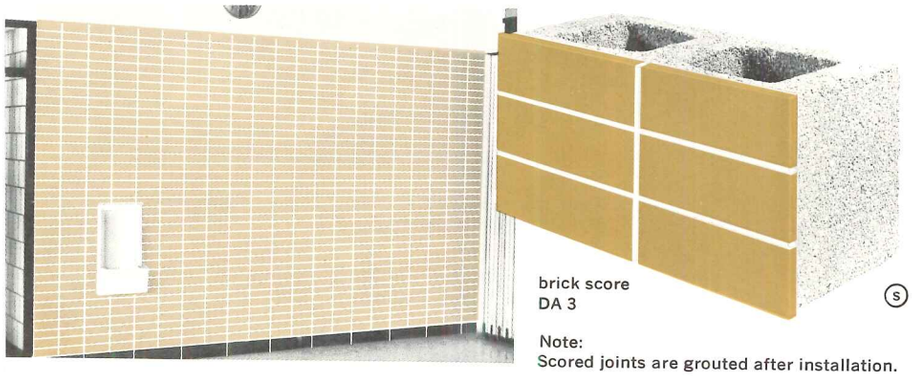
8 x 8 score
DA 1



5 x 8 score
DA 5



4" end on 3" horizontal
DA 6



brick score
DA 3

Note:
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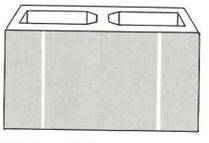
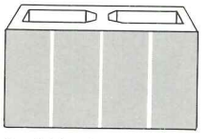
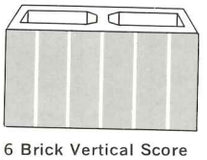


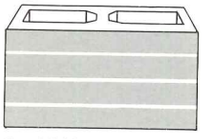
3" Offset Score



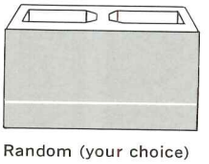
4 x 8 Vertical Score



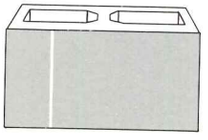
6 Brick Vertical Score



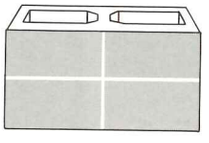
2 x 16 Horizontal Score



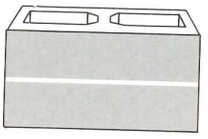
Random (your choice)



4" End Score



4 x 8 Score



4 x 16 Score

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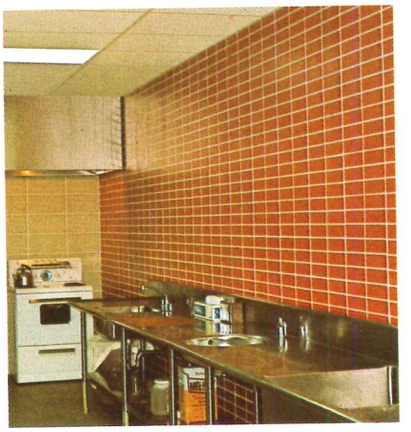

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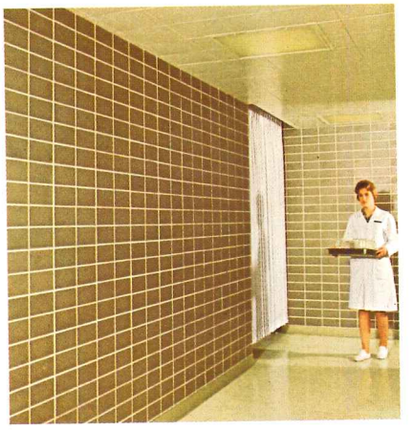

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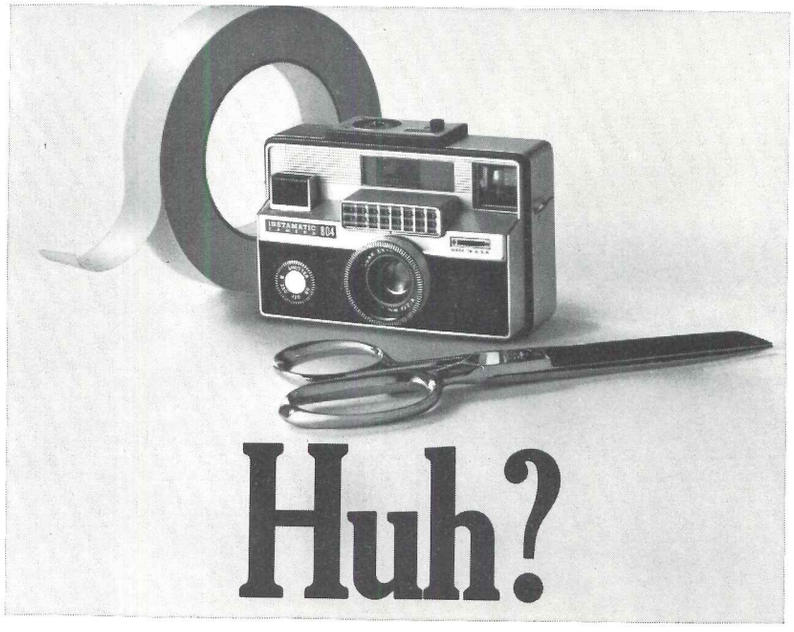

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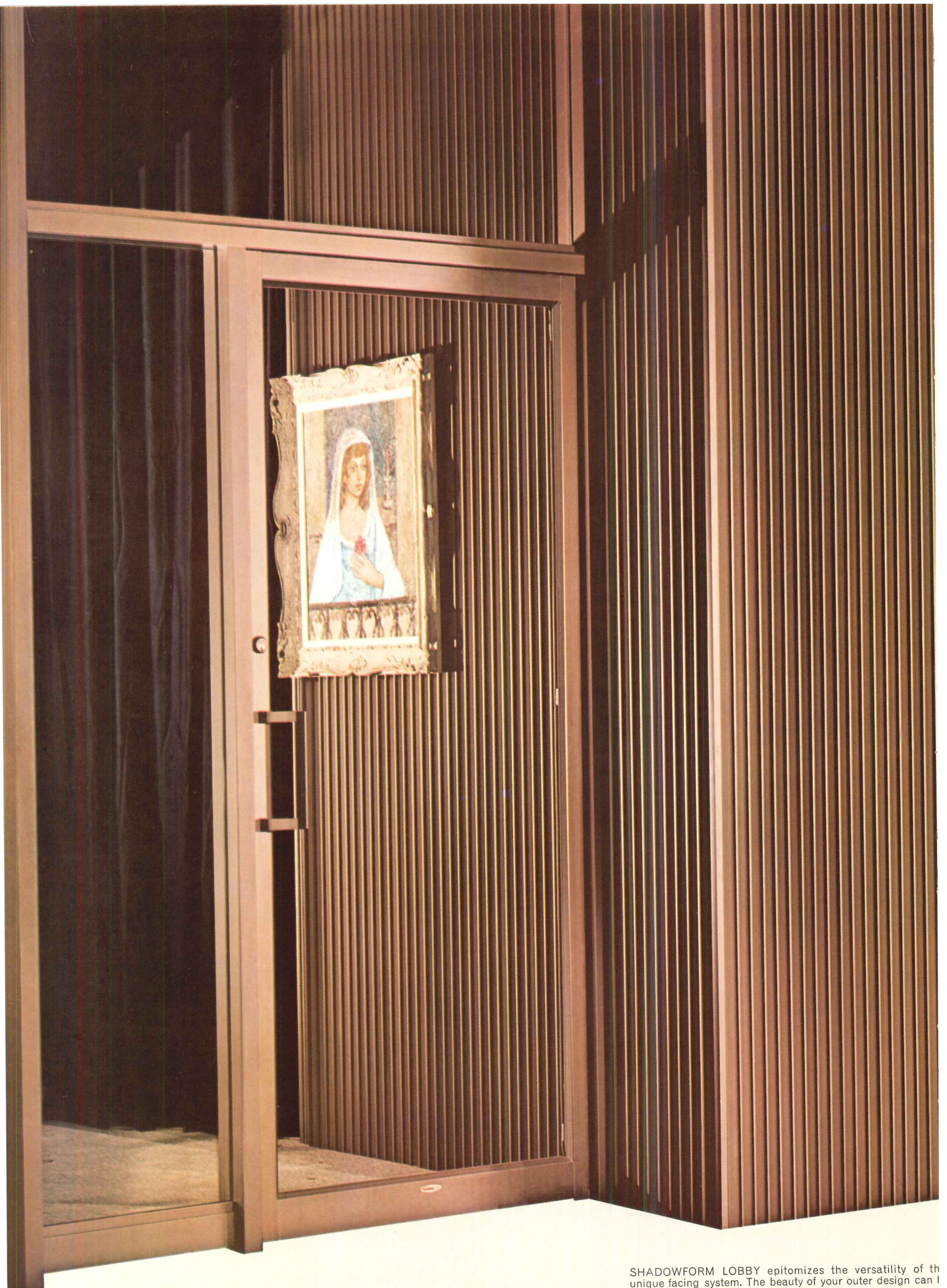

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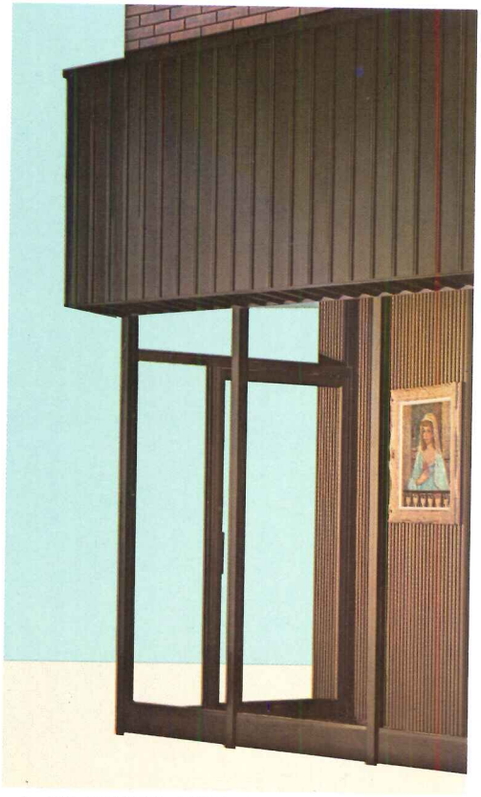

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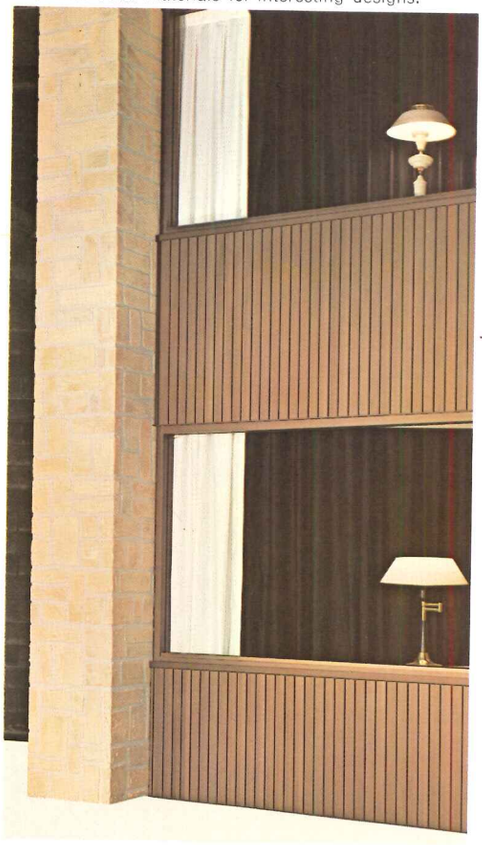

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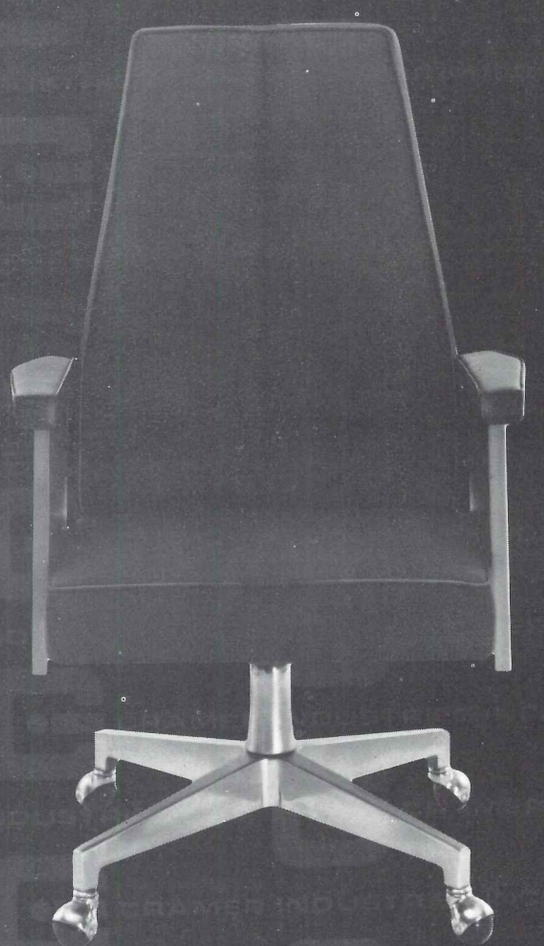

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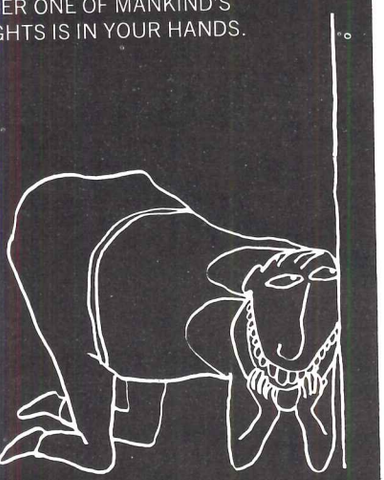

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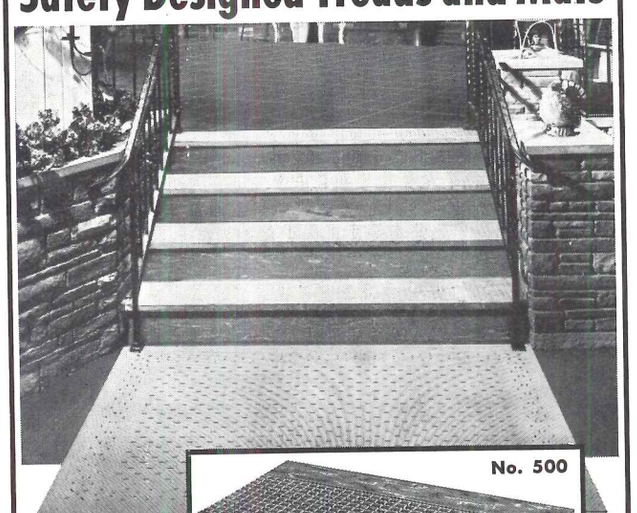

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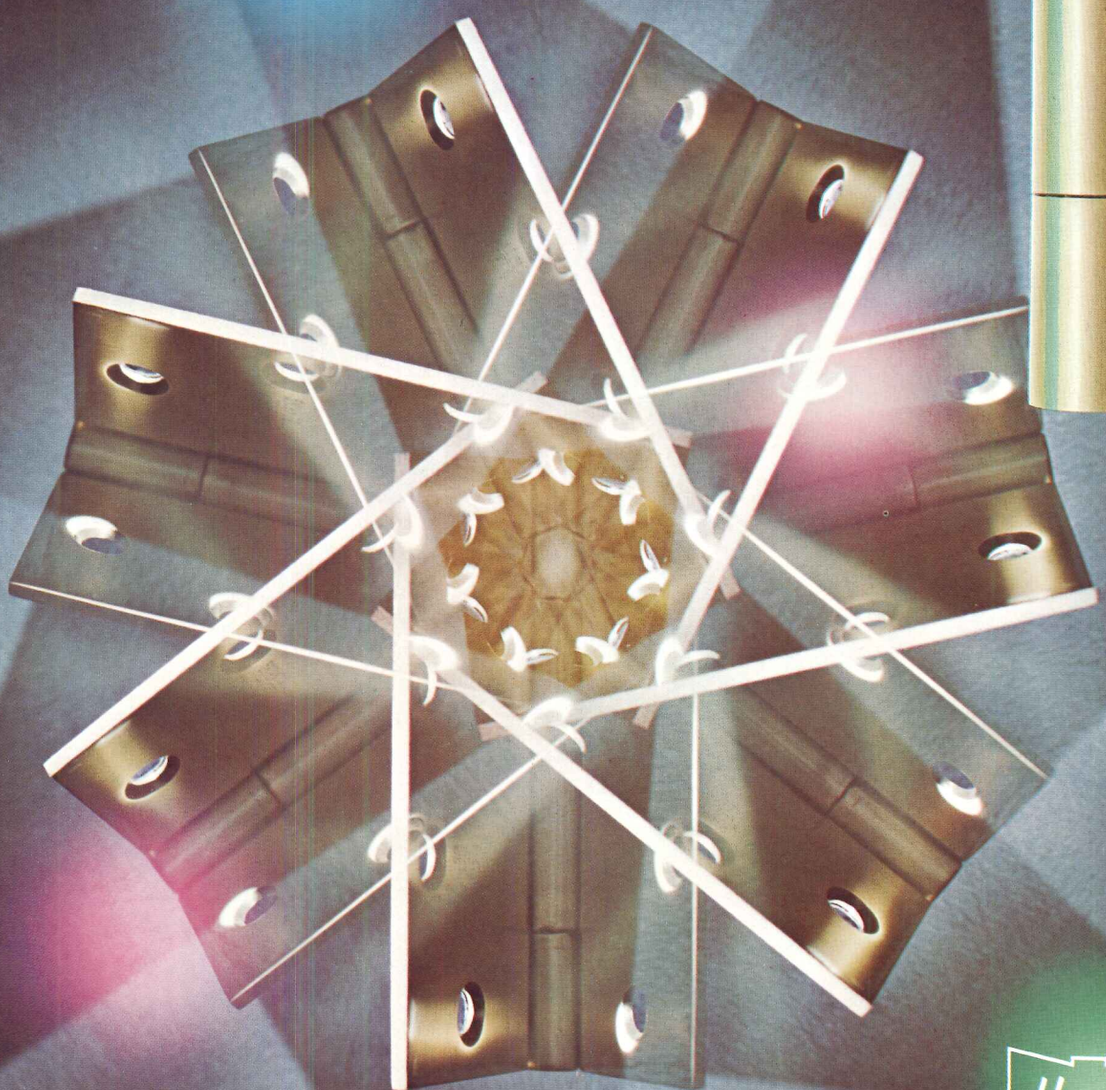

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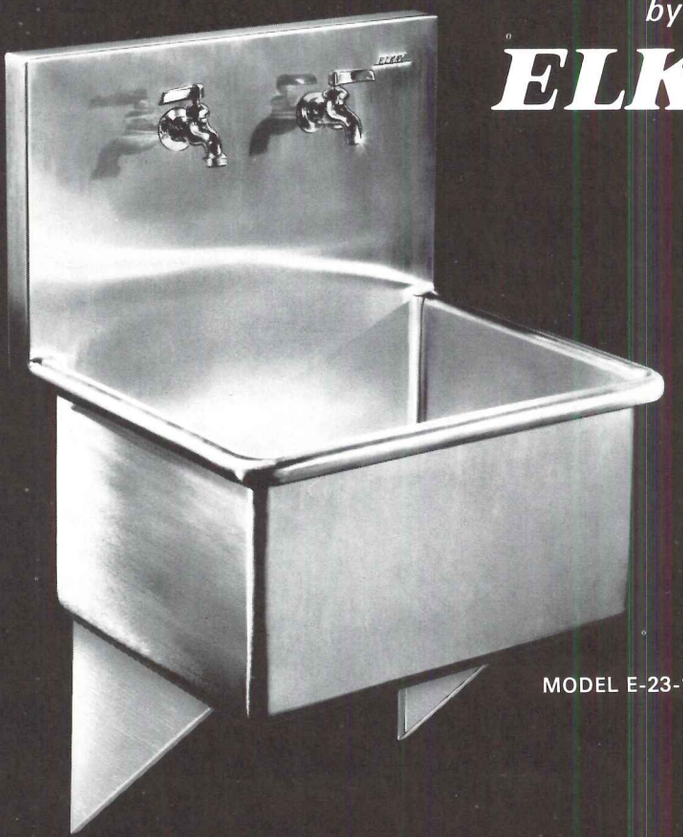

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Mops, buckets, or heavy utensils can never chip, crack, or stain Elkay's extra-rugged service sinks. They're built for a lifetime of trouble-free usage. Seamless construction leaves no corners or crevices to hide dirt. Extra-spacious compartment is crafted of 14 gauge nickel-bearing stainless steel.

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

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continued from page 222

CUSTOM WALL COVERINGS / Expanded hand printing facilities make possible large size custom orders, so that any document, corporate logo, historical material or special design may be incorporated in a hand print custom order. All backgrounds are vinyl coated. ▪ United Wallpaper Company, Chicago.

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ARCHITECTURAL METALS / *Terne-Coated Stainless Steel* (TCS) is a 304 nickel-chrome stainless steel covered on both sides with terne alloy (20 per cent tin, 80 per cent lead) that will have a broad range of applications from roofing to weathersealing. The metal is said to "outlast virtually any building on which it is specified." It will not produce discoloration, it solders without special preparation, and is easily workable. If unpainted, it will weather to a uniform dark gray. ▪ Follansbee Steel Corporation, Follansbee, W. Va.

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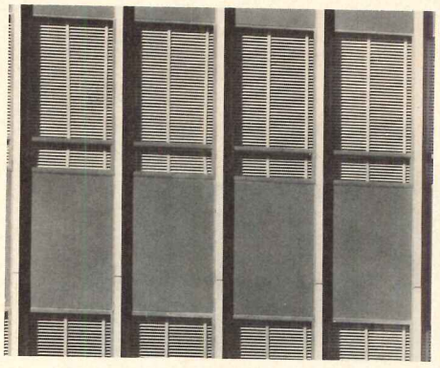

STEEL WINDOWS / An improvement of the basic *Cecoclad* steel window eliminates maintenance and corrosion problems of traditional finishes. A closed-cell foam vinyl weatherstripping permanently bonded to the windows controls water leakage and air infiltration, and windows are coated on all sides with an impervious layer of polyvinyl chloride 6 to 10 mils thick. Primary applications will be in high-rise apartment and office buildings which encounter strong winds and rains. Other applications are expected to be in structures requiring weathertightness and maximum daylighting. ▪ The Ceco Corporation, Chicago.

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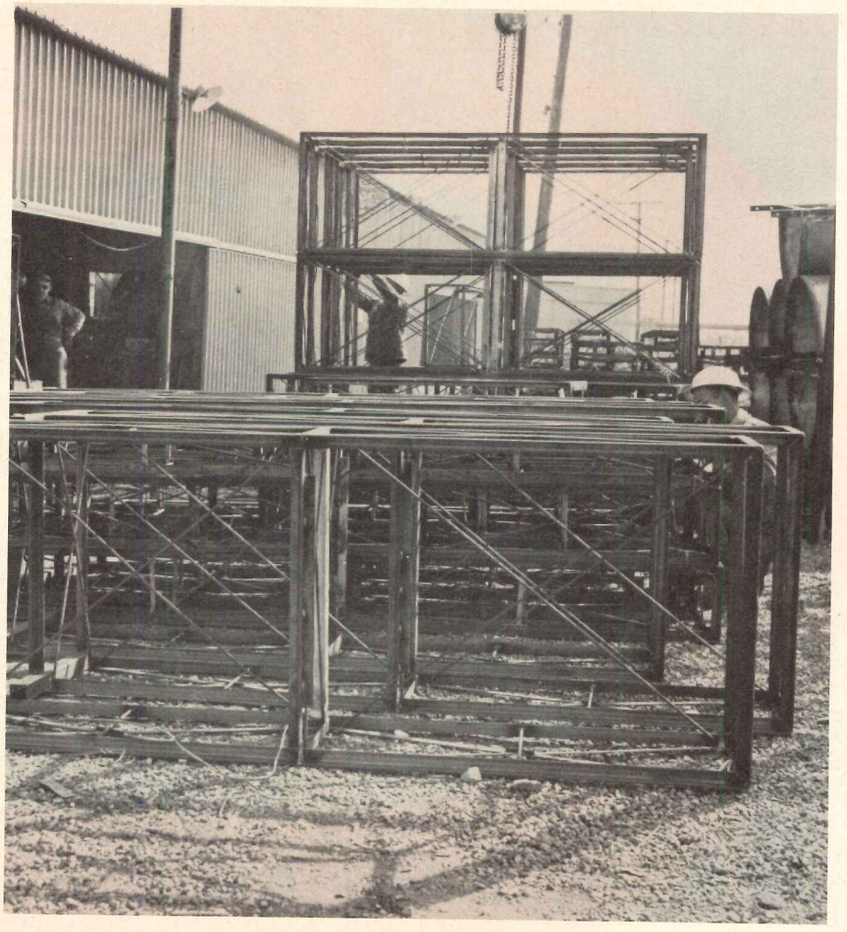
more products on page 238



this is a marina?

Yes, this is *part* of a marina—the part you don't usually see. These are the galvanized steel frames that form the backbone of a beautiful MEECO Marina.

Topside, where you see them, the galvanizing is covered with a coat of colorful, tough, non-fading epoxy enamel. And the pure white polystyrene plastic flotation will not lose its buoyancy.

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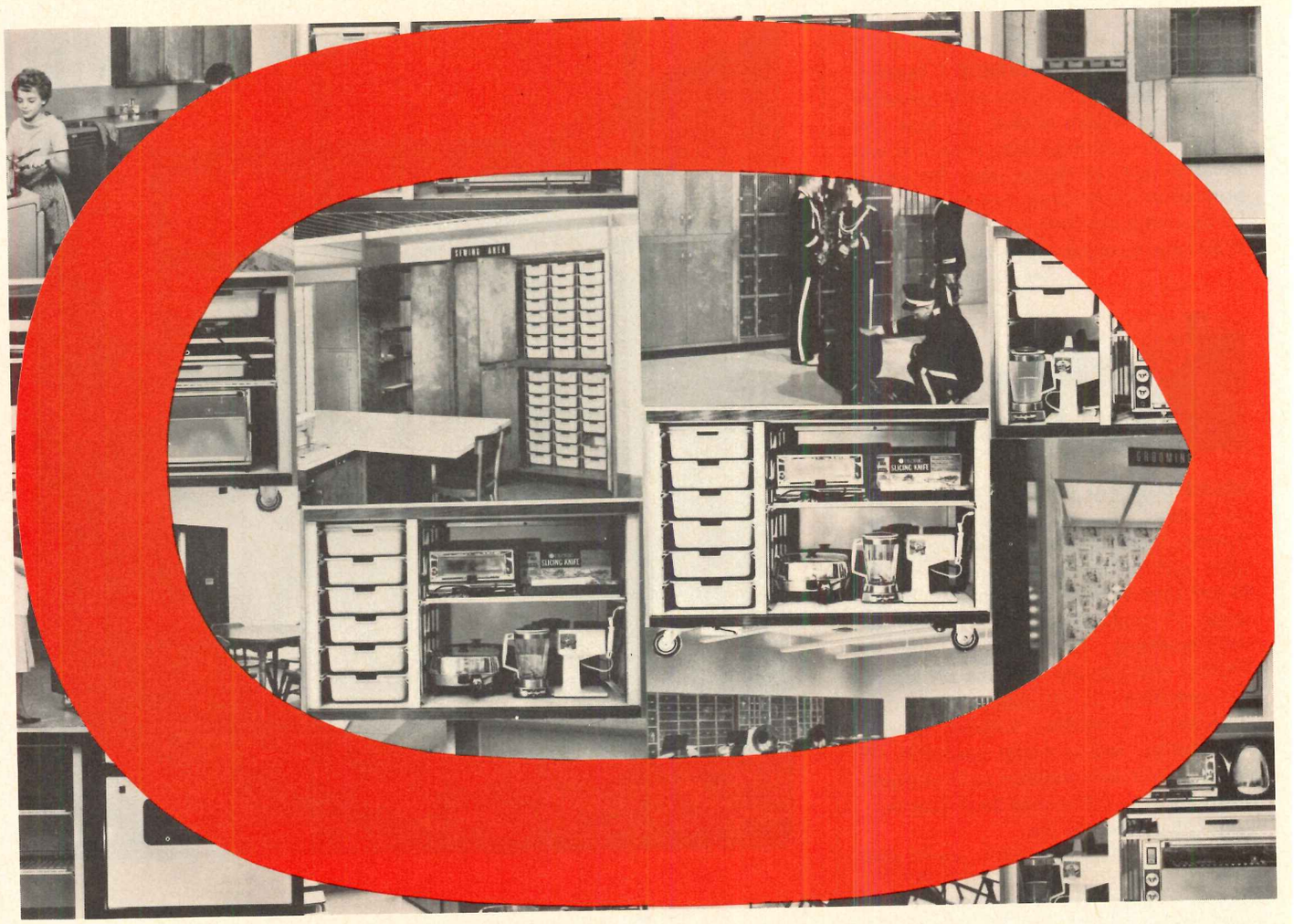
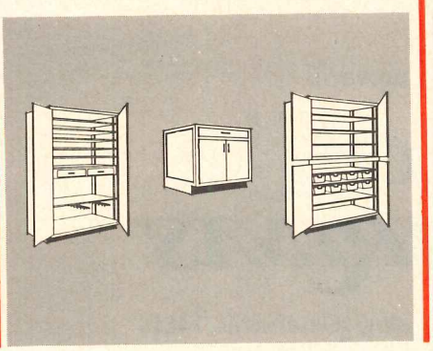
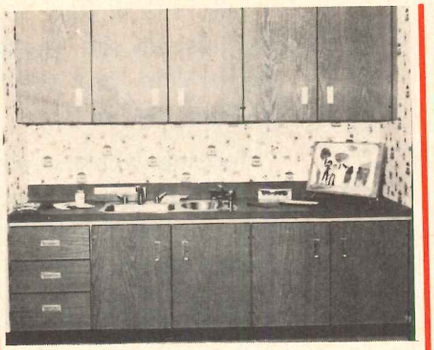
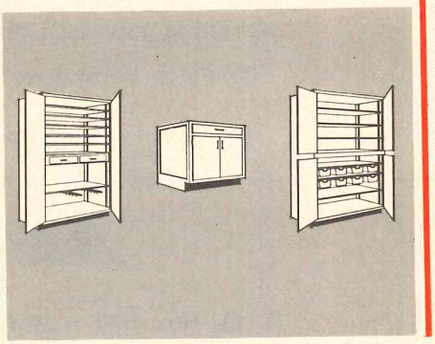


MULTIPLEX

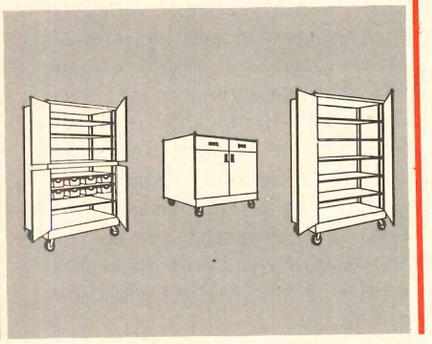


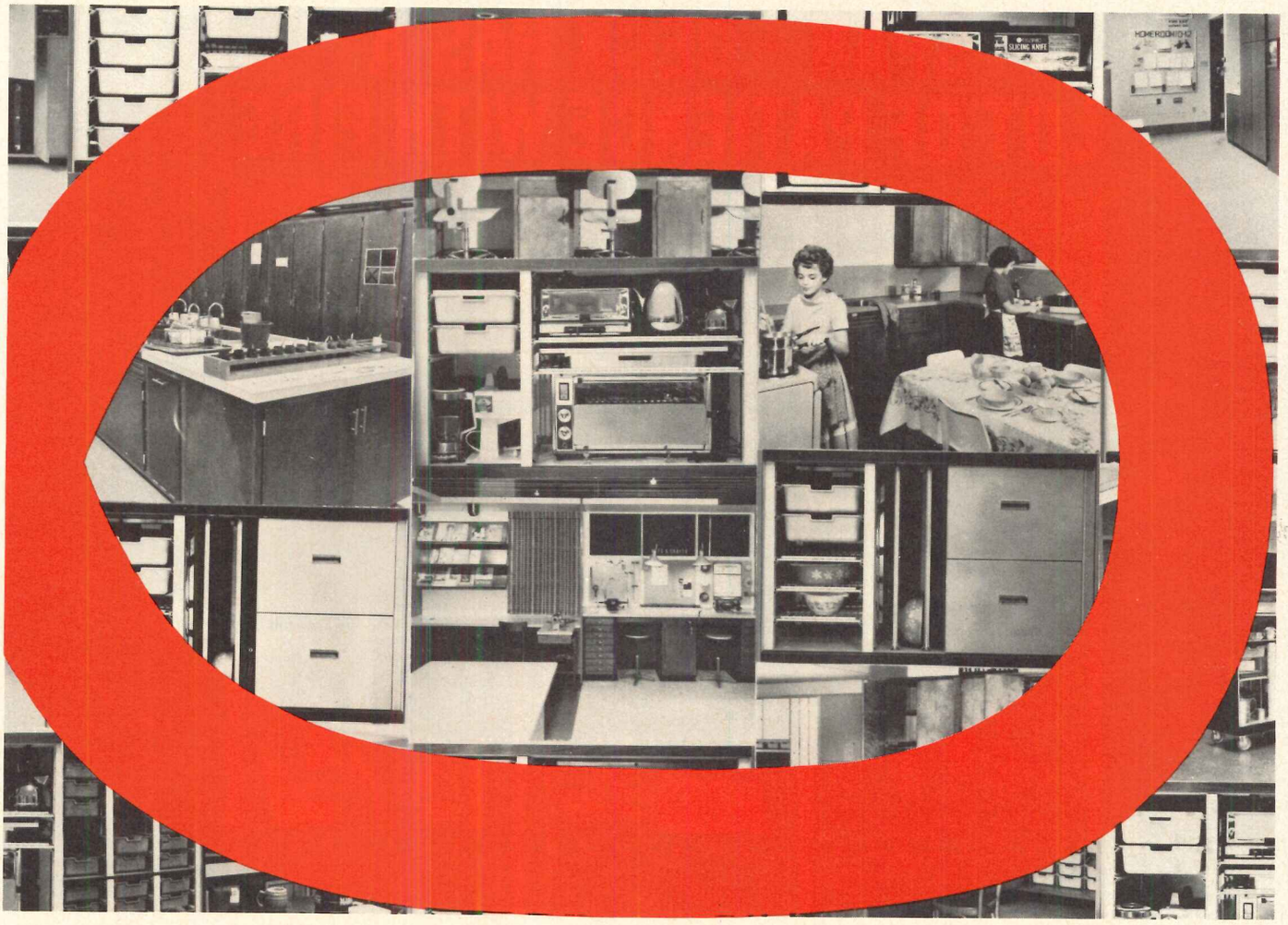


FLUSH PLASTIC



COMSTO





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Mutschler, the creative storage people, offer you an almost infinite choice in school cabinetry, designed not just for storage, but to fill specific teaching requirements. That's why Mutschler cabinetry is called *curriculum-oriented* storage . . . it becomes an integral part of the teaching process in home economics, arts and crafts and music areas. Choice of Multiplex fixed cabinetry, Flush Plastic units and Comsto movable cabinetry with revolutionary new Equaflex self-leveling suspension system. Wide selection of interchangeable interior kits. When you specify storage, specify Mutschler — the long, long line that has been school-engineered by people who have added an important new dimension to mere function.

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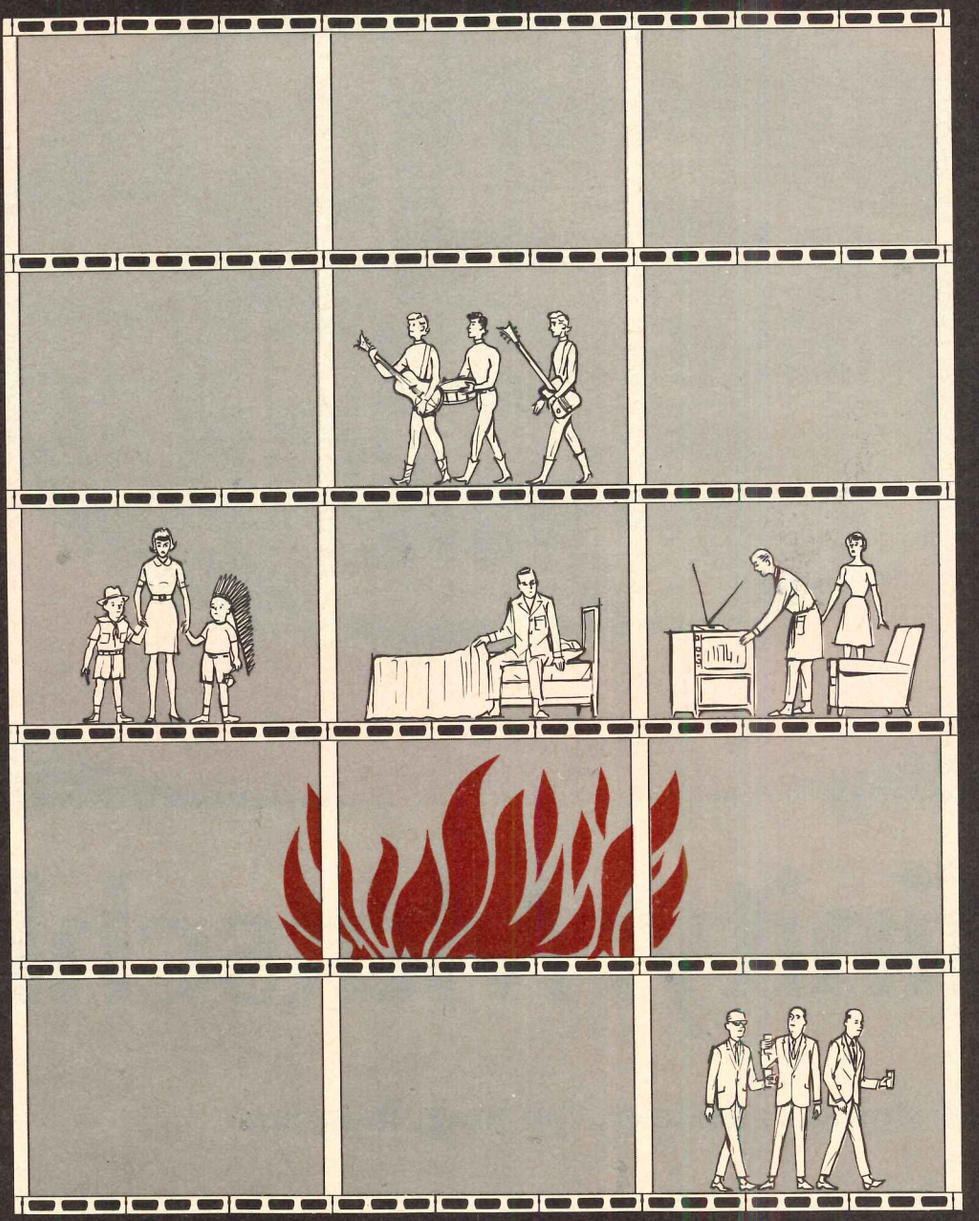

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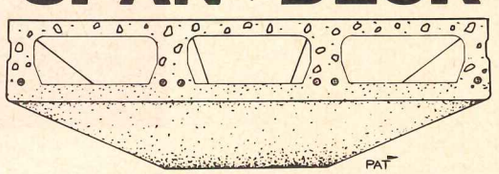

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from Bradley!

BRADLEY

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Ellerbe Architects, Inc.
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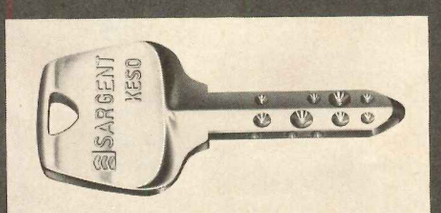
The Sargent Maximum Security System Protects Notre Dame Library



The new Memorial Library of the University of Notre Dame is the largest of its kind in the world. Its 750,000 volumes include many manuscripts, folios and volumes of priceless nature and one-of-a-kind editions.

The University decided on the Sargent Maximum Security System for the 782 locks which guard the library areas, exhibits and faculty offices.

The new lock system prevents unauthorized key duplication: the unique six-sided reversible keys with precision milled indentations cannot be duplicated on "corner-store" key cutting machines.

In addition, the Notre Dame Library is acquiring in these locks a new degree of pick-resistance. Unlike conventional cylinders, which have a single row of usually five or six key pins, the new cylinder has 12 key pins located on three different rows. The pins converge on the key from three different angles, making the cylinder impervious to the usual professional picking or "raking" techniques.

The Notre Dame Library contains a large number of faculty offices in addition to its books. Area control was greatly aided by the many levels of master-keying available in the Sargent Maximum Security System.

Among the other outstanding examples of Maximum Security installations are the new Loyola University of Chicago Medical Center; Pier 66 luxury motel-marina in Fort Lauderdale; Philco Ford, Western Development Laboratory, in Palo-Alto, California, which is typical of large manufacturing plants with proprietary security needs; the offices of the Secretary of Defense in the Pentagon; and Allstate Insurance Company's home office building outside of Chicago.

For full information on the Sargent Maximum Security System, write to Sargent & Company, 100 Sargent Drive, New Haven, Conn. 06509 • Peterborough, Ontario • Member Producers' Council

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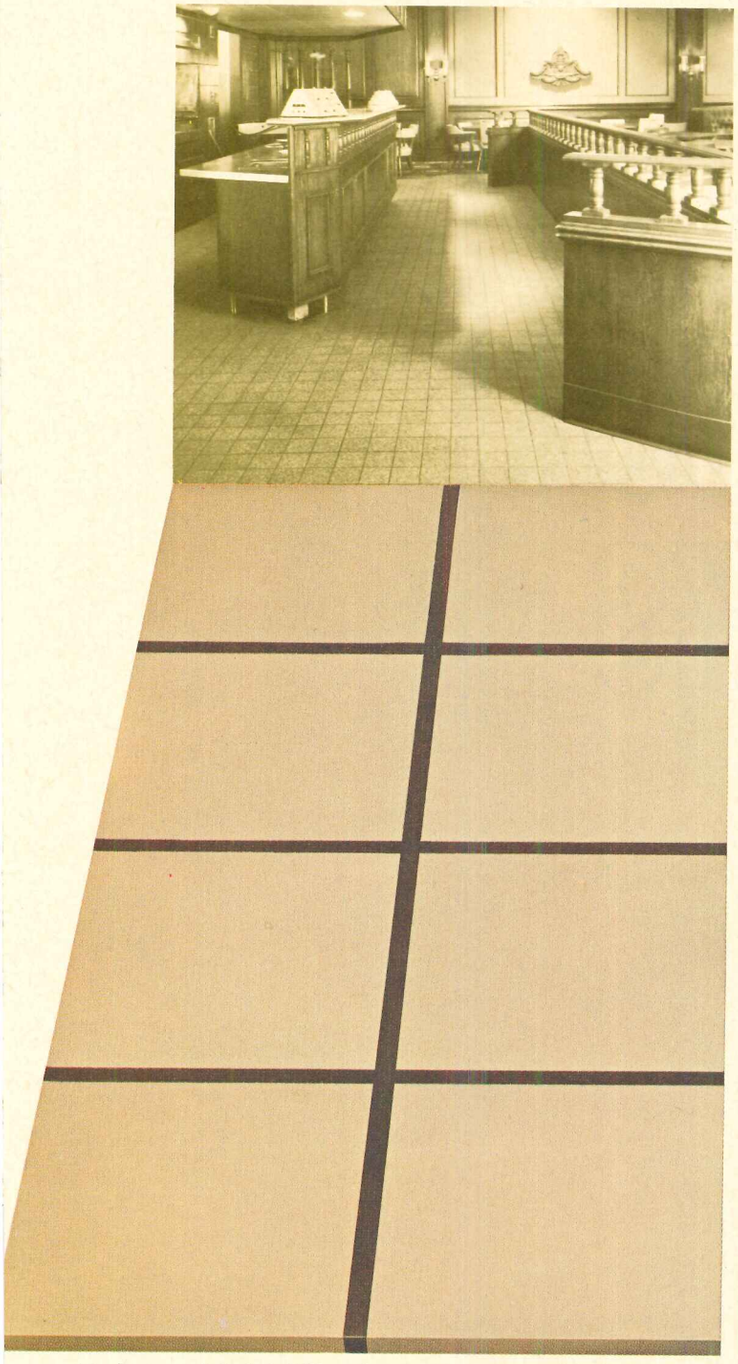
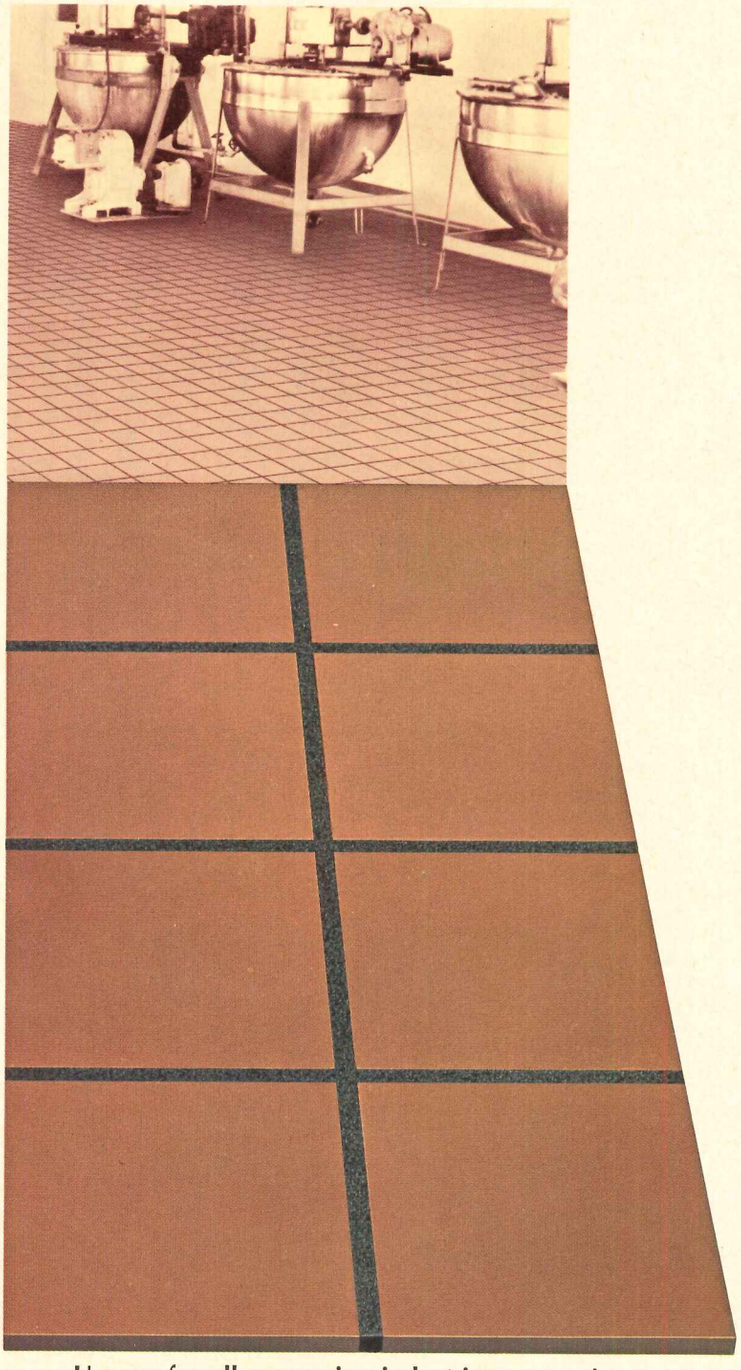


Hydroment Joint Filler for: restaurants, kitchens, schools, hospitals, lobbies, etc.



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When you specify a quarry tile or brick paver floor, it's more economical to rely on a "trouble-free" grout instead of taking chances. **Hydroment Joint Filler** has over 25 years of proved performance, comes pre-packaged for dependable uniformity. Your clients will appreciate the dense, non-shrinking, easy-to-clean joints — comes in 10 non-fading colors.

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Architect James J. Eugenides, A. I. A., used Pittsburgh Corning Intaglio II units to ring the Department of Water Works Building in East Chicago, Indiana, in floor-to-ceiling panels.

PC Intaglio provides plenty of soft daylight for a comfortable working environment. It also screens the harsh surrounding industrial view. Practical considerations of noise reduction, elimination of surface condensation and good insulation made glass block a sound, economical choice for this handsome municipal structure.

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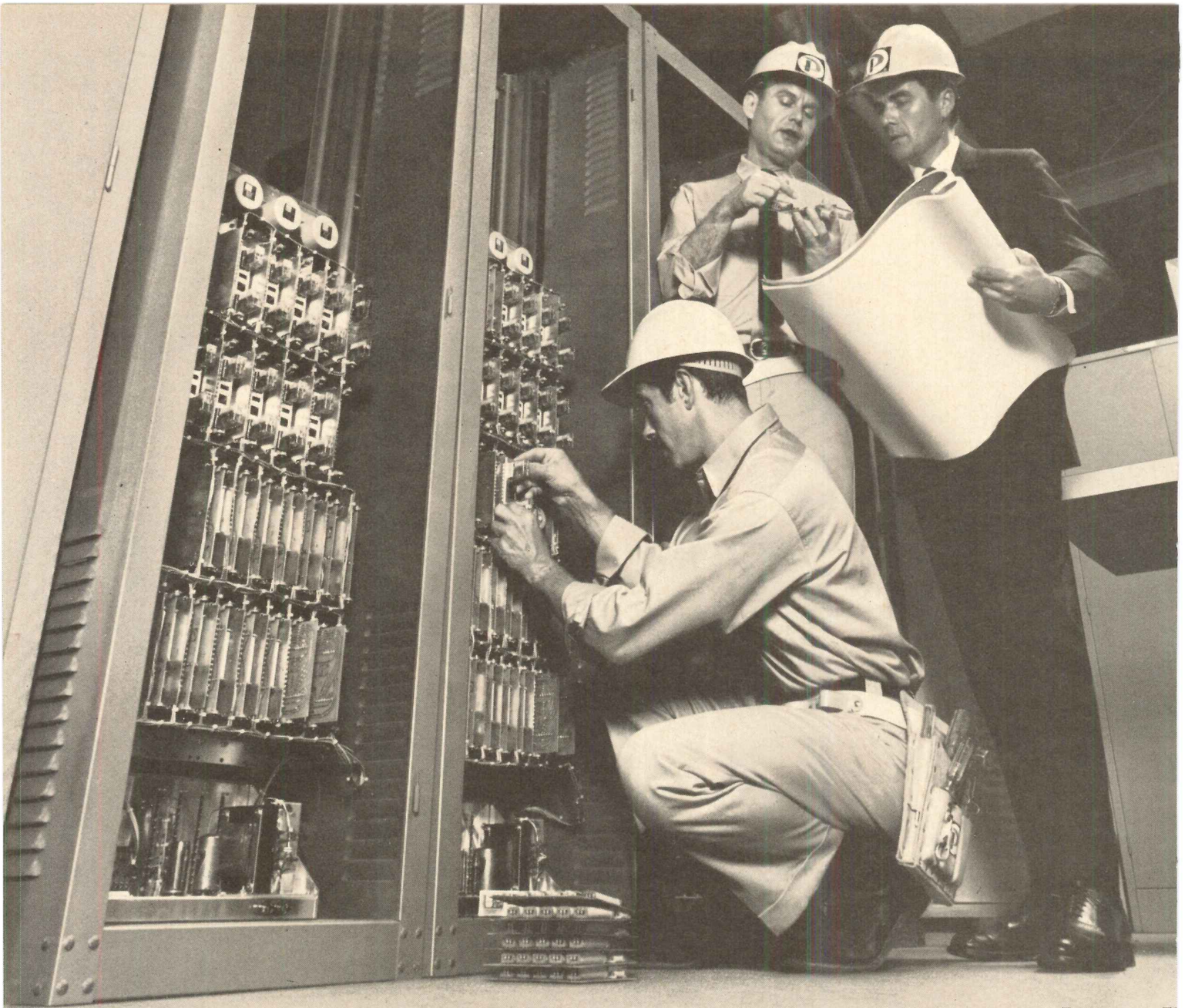

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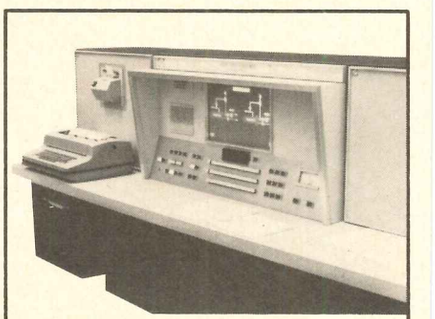

Powers Automation System 330 . . . Commands, indicates, monitors, prints and logs. Employs technique of convergence scanning. Permits exceptionally high, effective scan rates as compared to existing industry standards.

POWERS
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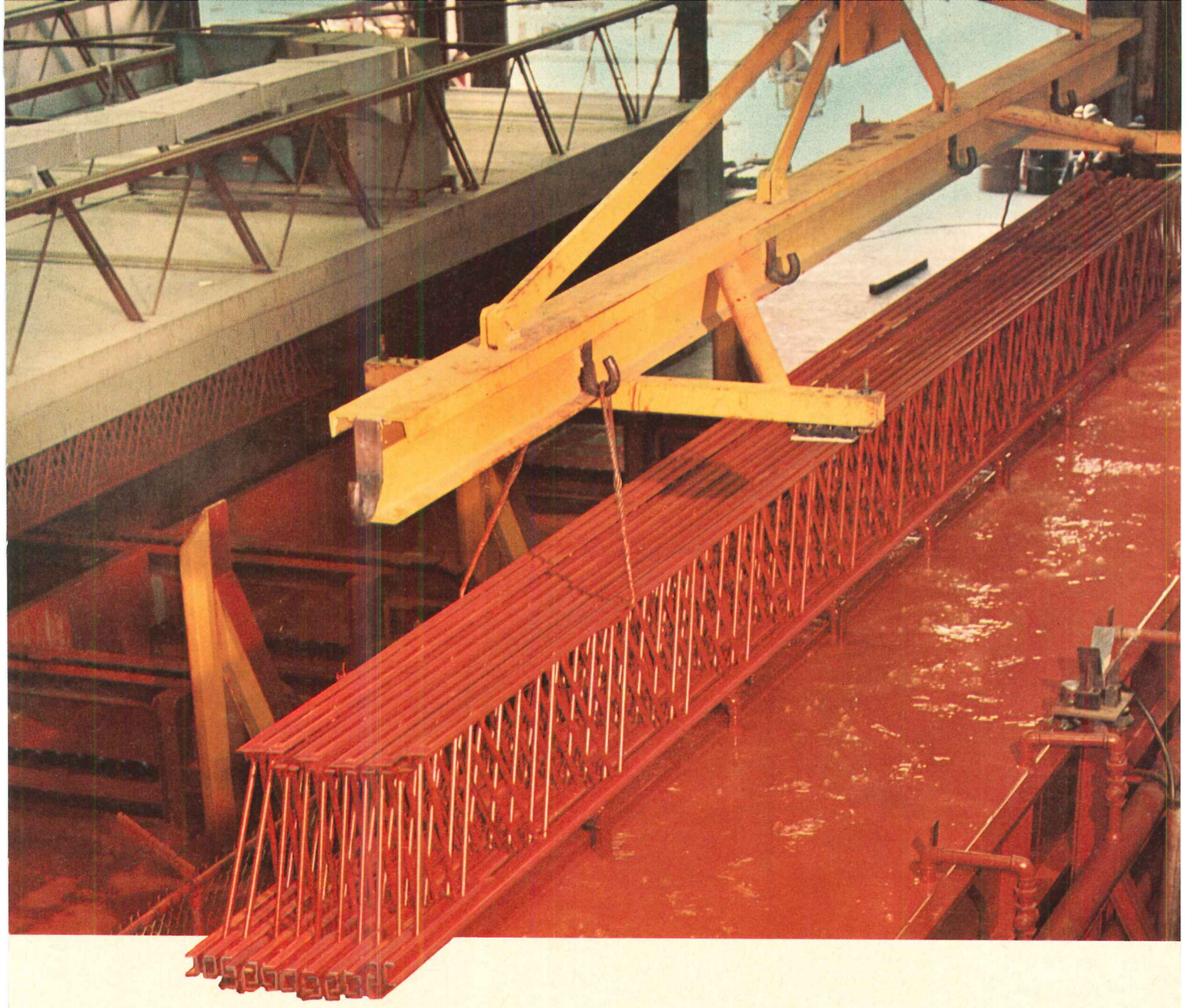

NEW ELECTROPAINTING PUTS TOUGH, UNIFORM PROTECTIVE COATING ON LACLEDE JOISTS

One of the most advanced painting methods available is now used to apply a highly durable and uniform protective coating on Laclede Open Web Steel Joists.

The new process, called electropainting, uses the same principle employed in electroplating. The positively-charged joists, immersed in a bath, attract the negatively charged paint particles, which build up on the surface of the joists in a tight, dense coating of uniform thickness. Thickness of coating is directly proportional to the applied voltage, and can be closely controlled throughout the painting process.

The coating applied by this process has many advantages:

1. Coverage is uniform and complete, including sharp edges, corners and hard-to-reach nooks and crannies
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6. The coated joist has excellent finished product appearance

The electropainting process in a red finish is now standard on all shop coated Laclede open web steel joists. Specify Laclede electropainted steel joists for your next construction job.

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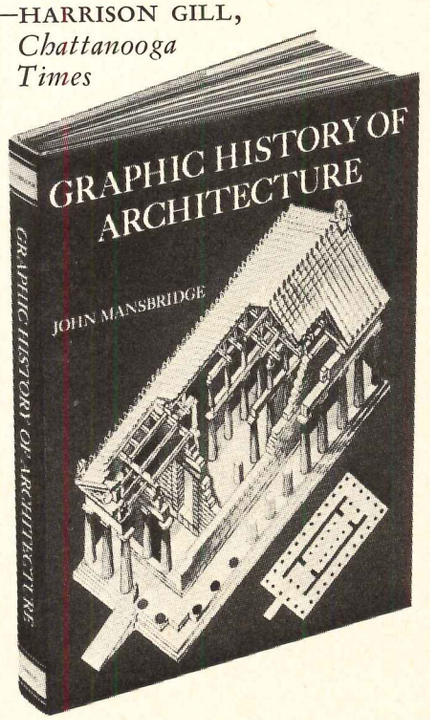
"The most complete visual history of architecture in one volume which has ever been published."

—HARRISON GILL, *Chattanooga Times*



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That a single volume should cover the whole of Western architecture, from its Greek and Roman origins to its present-day development, is remarkable enough; but what particularly distinguishes John Mansbridge's *Graphic History of Architecture* from other studies is its dramatic visual approach: The drawings themselves reveal the changing pattern of European building over the centuries. The combination of plans and elevations and the use of cutaway and isometric drawings show, in a way that neither words nor photographs could, the three-dimensional form and dynamic construction of buildings as well as their historic development.

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PRODUCT REPORTS

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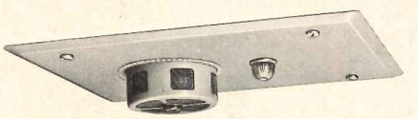

SMOKE DETECTION / *The Detector Releasing Unit (DRU)* houses a *Pyr-A-Larm* ionization or flame detector and an alarm-operated relay in a recessed ceiling fixture. A *DRU-1* located inside a tape storage vault could actuate automatic extinguishing equipment directly inside the vault. Or, a *DRU-1* located within an electrically-locked room could unlock that room and no other, when a fire is detected inside. ▪ Pyrotronics, Inc., Union, N.J.

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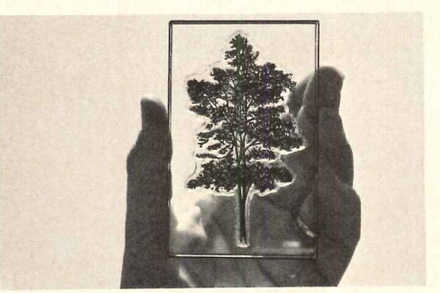

ARCHITECTURAL STAMP / *Clearstamp* is a clear vinyl printing surface bonded to a crystal-clear *Lucite* block. It provides finely detailed images for exact positioning on plans, elevations and perspectives. ▪ Clearstamp, New York City.

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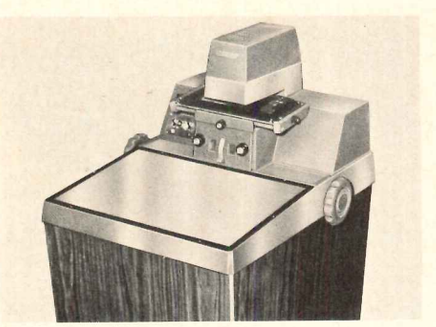

MICROFILM VIEWER / The *SCAN Executive 10/40* will project normal-size architectural drawings to half-scale, and magnify sections of those drawings through a full and dimensionally accurate range of sizes up to twice normal size. The unit projects roll microfilm, aperture cards and microfiche onto a 15- by 20-in. horizontal desk-high screen. ▪ F.W. Dodge/Photronix, Inc., St. Louis.

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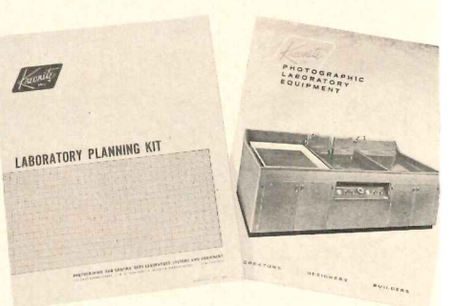

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Until now, standard lay-in ceilings have been just that. Standard.

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Armstrong
Ceiling Systems that work

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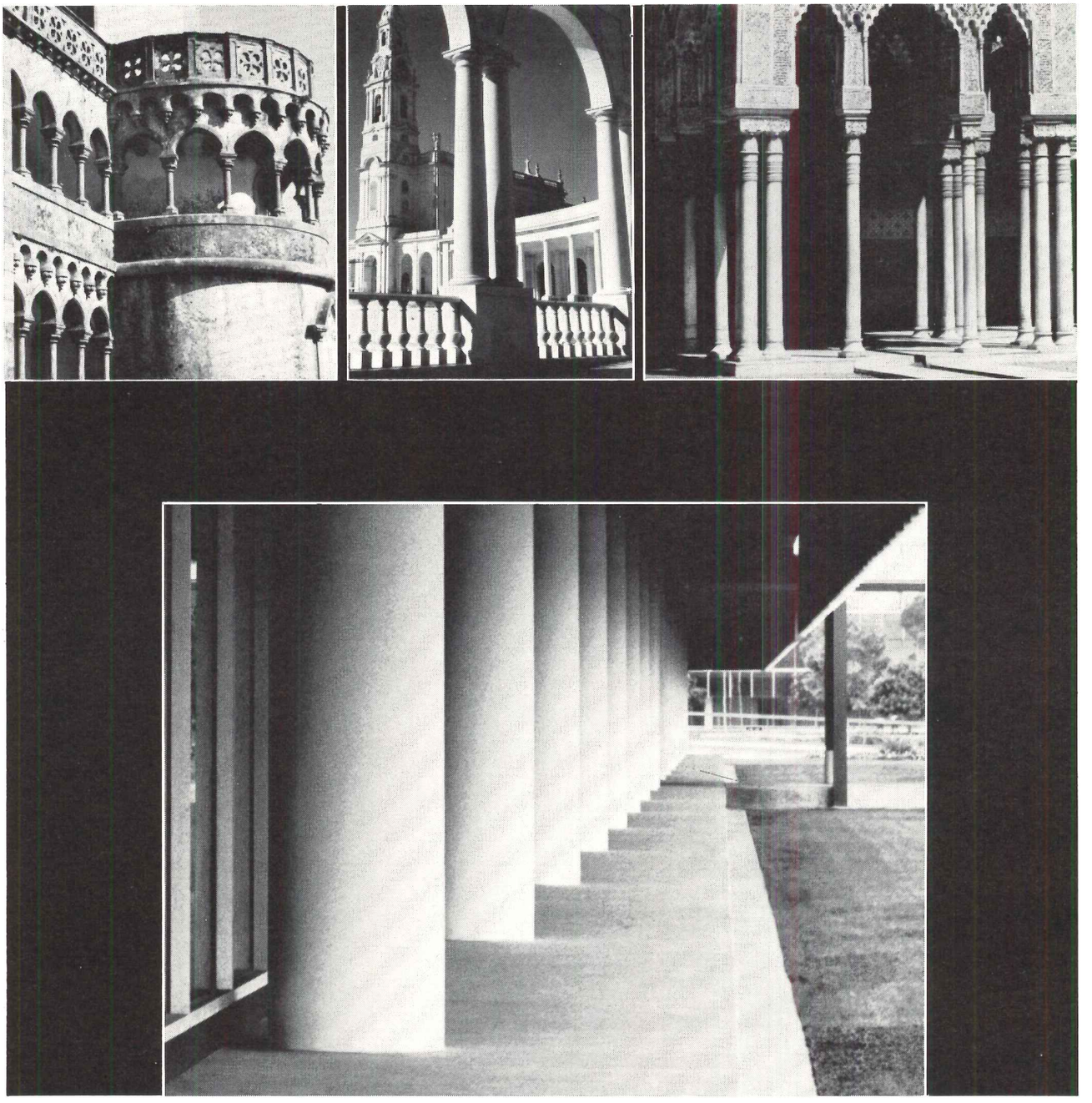

The rebirth of round columns.

Years ago, just about every column was a round column. Then, architects began coming up with new and different designs. And round took a back seat.

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Much of this beauty is shown in our new booklet: A Portfolio of Round Columns. Earlier round column design is also featured.

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continued from page 198

ELASTOMERS / "Building with Elastomers" is an 8-page booklet that discusses the necessity of sound conditioning in both old and new structures. Uses for neoprene are examined. ▪ Du Pont, Wilmington, Del.

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CERAMIC TILE / "1968 Designer's Guide to Ceramic Tile" is a 32-page product catalog describing a wide selection of tile colors, shapes and textures. ▪ American Olean Tile Company, Lansdale, Pa.*

Circle 408 on inquiry card

ROOFTOP UNIT / An 8-page catalog contains graphic illustrations, charts, engineering specifications and other data on the *Benchmark* series multizone-rooftop air processing units for schools. ▪ Schemenauer Manufacturing Company, Holland, Ohio.

Circle 409 on inquiry card

URETHANE GUIDE / 1968 *Urethane Industry Marketing Guide* features eleven segments of the urethane industry from additives to polyols. Areas covered in the 32-page guide are past and future predicted performance, prices, production, capacities, usage, demand, and trends. ▪ Urethane Industry Digest, Chicago.

Circle 410 on inquiry card

ALUMINUM EXTRUSIONS / The Aluminum Association and the Aluminum Extruders Council have issued a new basic booklet on aluminum extrusions. The 32-page guide includes technical data on common extrusion alloys. ▪ The Aluminum Association, New York City.

Circle 411 on inquiry card

EXTERIOR COATING / A color brochure describes *Fluropon,* a fluorocarbon exterior. architectural metal coating said to have a 20-year life. The 8-page brochure contains data on the highly inert coating's exterior weathering characteristics. ▪ DeSoto, Inc., Des Plaines, Ill.*

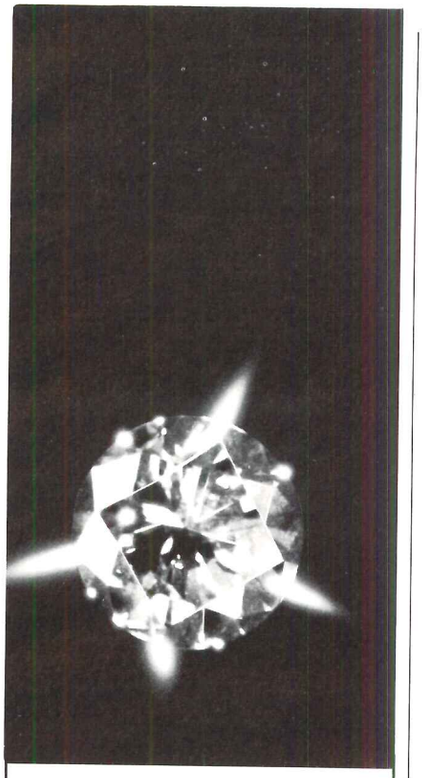
Circle 412 on inquiry card

PROFESSIONAL STORAGE / A 96-page *Professional Storage Planning Manual* presents ideas for planning storage in warehousing, manufacturing, stock room, and production areas. Besides layout suggestions, the manual shows types of equipment. ▪ Bernard Franklin Company, Philadelphia.

Circle 413 on inquiry card

**Additional product information in Sweet's Architectural File*

more literature on page 260



Flawless
thousands of tiny diamonds could do great things for your ceiling light

Arranged in flawless, crystalline symmetry, a bucketful of finely cut diamonds might give your office or classroom the perfect refractor for light dispersion. At least it would be the most talked about ceiling fixture in town. But could you find a jeweler who'd make one for you? And could you pay for it? Maybe what you need is something like Precise. Wakefield Operation, ITT Lighting Fixture Division, International Telephone and Telegraph Corporation, P.O. Box 195, Vermilion, Ohio 44089

Precise

WAKEFIELD LIGHTING ITT

For more data, circle 135 on inquiry card

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Flawless
Precise offers something more practical: thousands of tiny prisms

This exciting luminaire is an injection-molded refractor, gleaming with controlled light dispersed through precisely-spaced prisms. In fact, Precise is *all* prisms, to give you nothing but light . . . the maximum you'll need . . . distributed with ultimate performance. And these prisms are way below the market price of diamonds. Wakefield Operation, ITT Lighting Fixture Division, International Telephone and Telegraph Corporation, P.O. Box 195, Vermilion, Ohio 44089

Precise

WAKEFIELD LIGHTING ITT

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Now... USS **Ultimet** in color

USS ULTIMET in stainless steel was the first curtain wall system competitive in price with materials of less strength and durability.

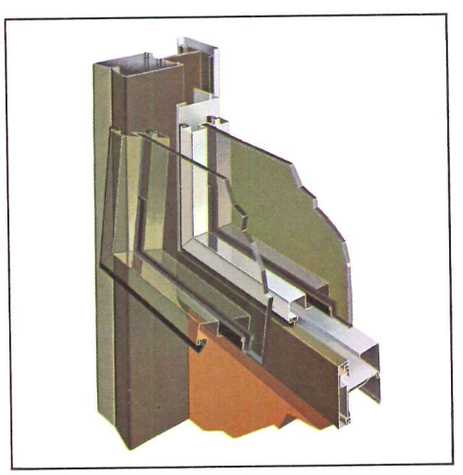
Then came USS ULTIMET Framing in COR-TEN high-strength low-alloy steel, the steel that "paints" itself with a handsome russet-colored oxide skin that virtually eliminates maintenance necessitated by corrosion.

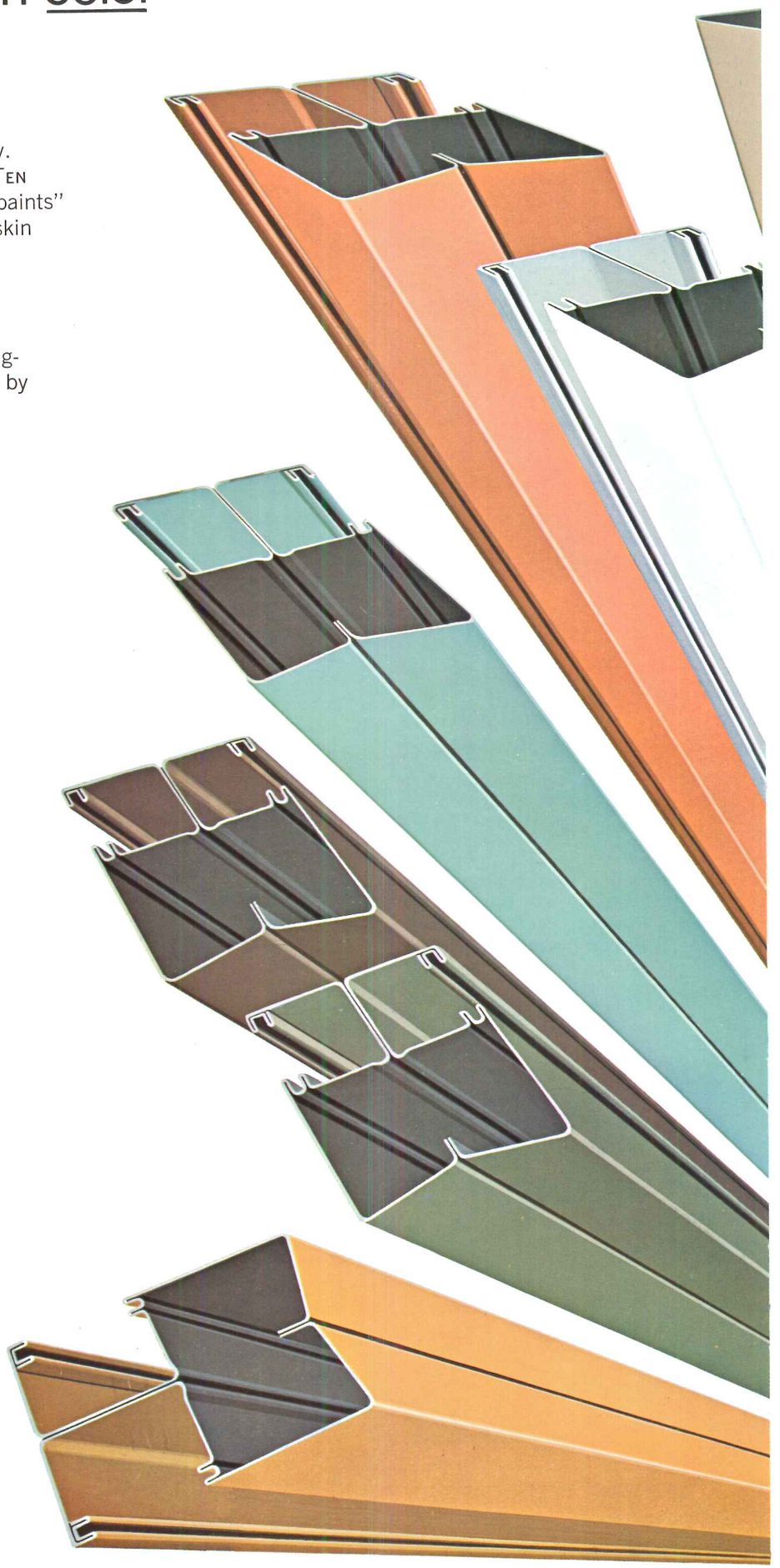
Now it's USS ULTIMET Wall Framing Components in a wide selection of *colors*. The shapes are supplied by U. S. Steel in long-lasting galvanized steel and are color-coated by qualified applicators.

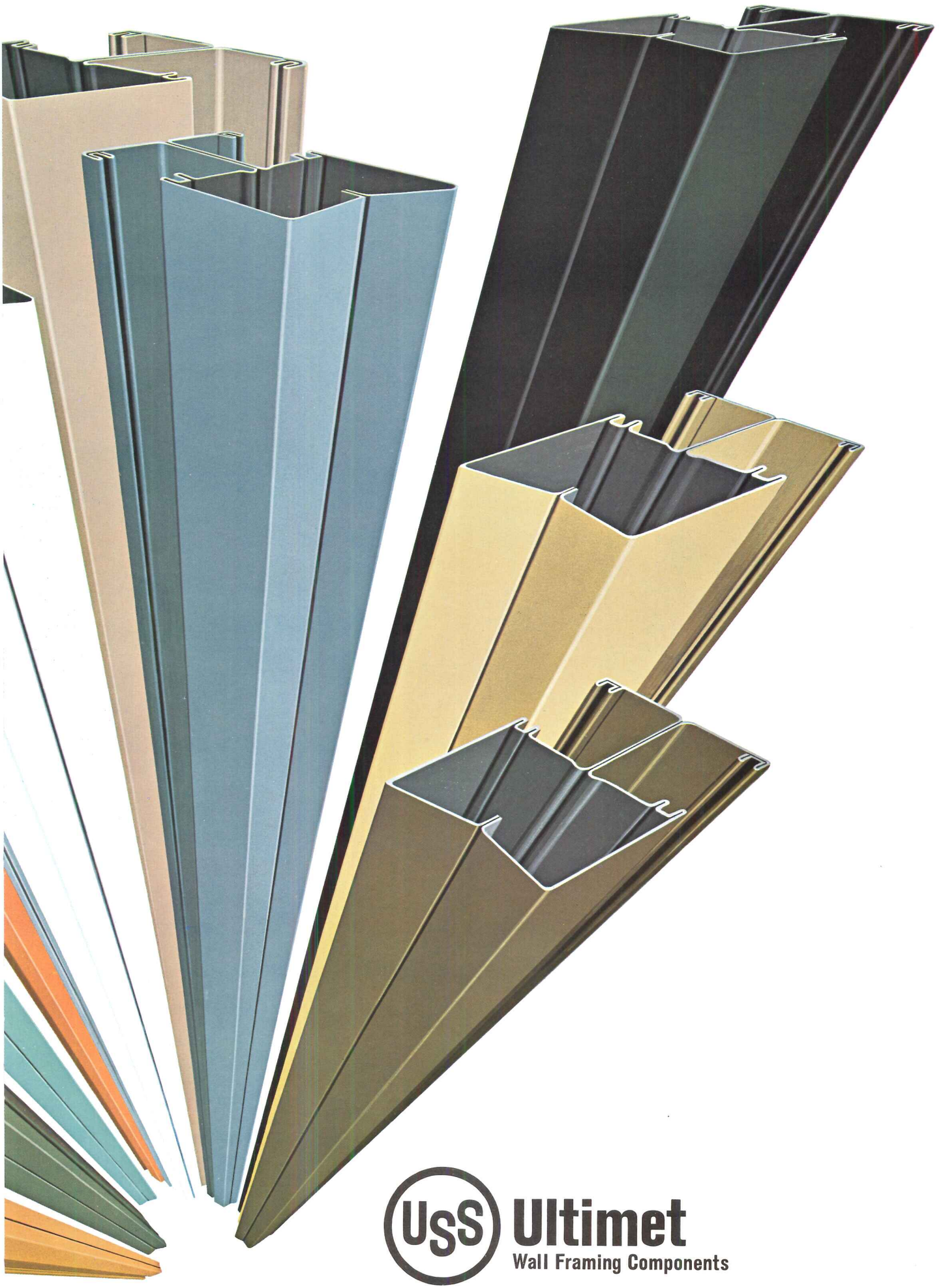
You get the same fast, easy, clutter-free construction, with no cutting or special fitting at the site. Most USS ULTIMET components snap-lock into place. Long life is assured by the combination of the heavy zinc coating, and the applied coating of a high quality pigmented fluorocarbon polymer.

But perhaps best of all is the low cost. USS ULTIMET color-coated galvanized steel framing can cost less than materials that can't give you steel's strength, beauty and durability.

Stainless, COR-TEN, or color-coated galvanized steel—it'll pay you to take a good look at cost-saving USS ULTIMET Curtain Wall Framing Components before you build or remodel. Write for a free copy of our new booklet on USS ULTIMET Wall Framing (ADUSS 88-2496) to United States Steel, P. O. Box 86 (USS 5612), Pittsburgh, Pennsylvania 15230. Or contact a USS Architectural Products Representative through the nearest USS Construction Marketing or Sales Office. USS, ULTIMET and COR-TEN are registered trademarks.





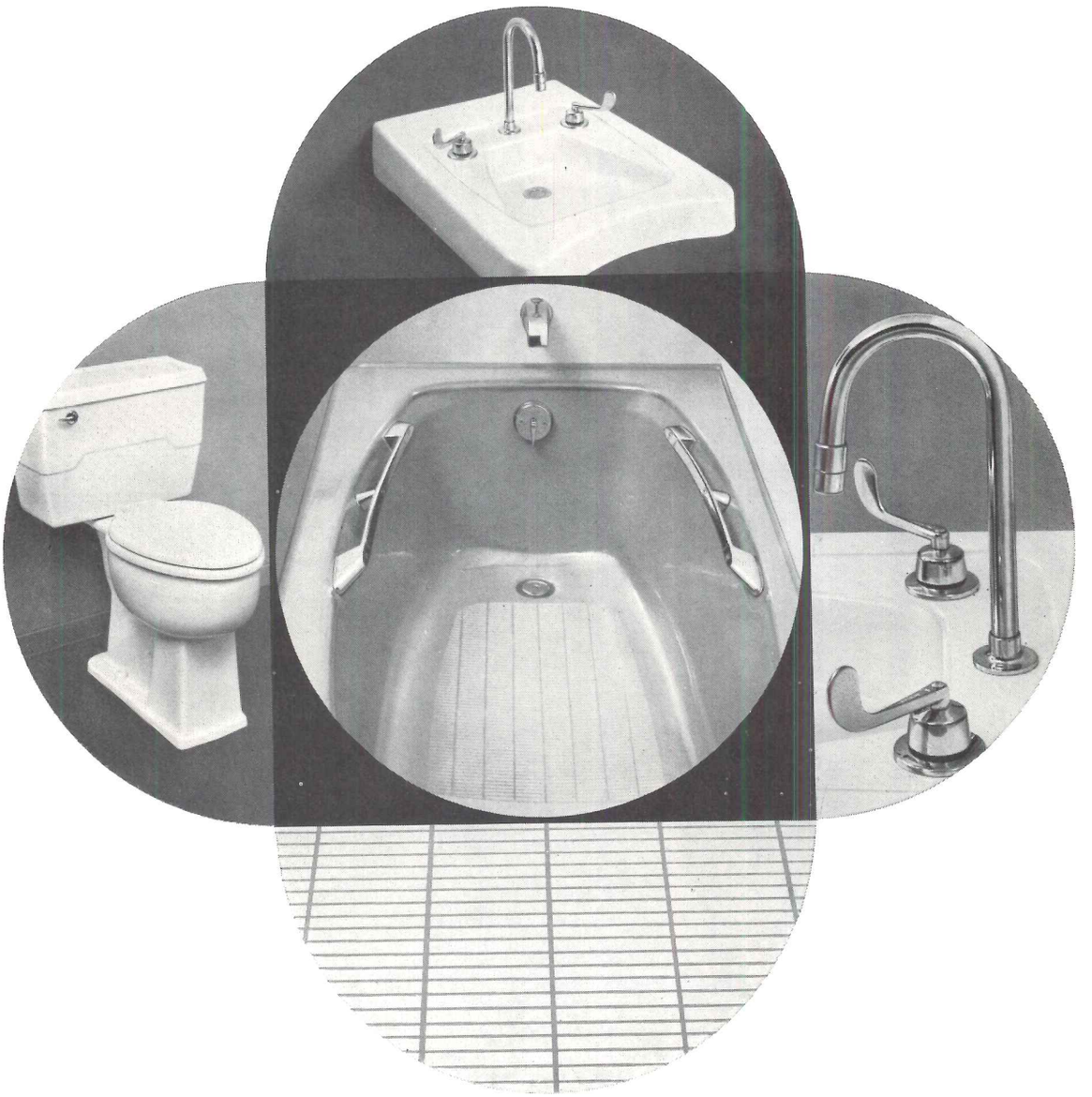


USS Ultimet

Wall Framing Components

Let Kohler make life easier.

In hospitals and nursing homes, Kohler plumbing is specially designed to make life easier—for the patients, the staff—and for you who recommend it.



NEW GUARDIAN BATHTUB provides safety, comfort, easy use. Extra large grip rails on both sides help the patient in and out...Safeguard® bottom assures firm footing. Five-foot by 32-inch dimensions afford generous bathing room. Yet the Guardian guards *costs:* no-frills design includes a straight front to speed the tiling-in of recess installations.

HIGHLINE CLOSET features a higher bowl—18 inches from floor to rim—for easier use by the elderly and infirm. By helping patients help themselves, Kohler fixtures make life easier for the nurse as well... enable her to use her time to best advantage.

NEW WHEELCHAIR LAVATORY is easy to use from a seated position: low basin, convenient wrist controls. In patient rooms, Kohler lavatories in color provide a bold, bright note of cheer, a refreshing change from "the institutional look."

TROUBLE-FREE SERVICE. The *administrator's* life is easier when you recommend Kohler quality all the way—in fittings as well as fixtures. Kohler all-brass fittings serve for years.

No matter what the plumbing need, you'll find it in the Kohler catalog. One-source selection...makes *your* life easier!

KOHLER OF KOHLER
Kohler Co., Kohler, Wisconsin

For more data, circle 136 on inquiry card

For more data, circle 137 on inquiry card

Look what you get with Pyrotect ceilings from SIMPSON

Pyrotect non-directional fissured pattern, recessed edge ceiling board

24" x 24" x 5/8" ceiling board with 3/8" recessed edge.

12" x 12" x 3/4" Self leveling tile for metal suspension systems or adhesive application.

1. **Choice of Styles,** including square recessed-edge ceiling panels and square-edge tile with self leveling tongue and groove on all sides.
2. **True Non-directional Fissuring** that effectively camouflages tile joints for a monolithic look.
3. **Top Performance** in sound attenuation and absorption, *plus* . . . noncombustibility (Flame Spread 0-25)
4. **Superior Appearance** of subtly sculptured fissures etched into glare free, soft lustre, white finish.

For complete technical data on Simpson ceiling products, see our catalog in Sweets File or write to: Simpson Timber Company; 2000 Washington Building; Seattle, Washington 98101.

Simpson®

Ceiling products designed for better living

For a better concrete cure at less cost specify Hillyard Cem-Seal®

Northpark shopping complex, Dallas, Texas. Architects: Harrel and Hamilton, Dallas; Eero Saarinen and Associates, New Haven, Connecticut.

DESCRIPTION — Composition and Materials: A modified chlorinated rubber in a volatile aromatic solvent.

Basic Use: Concrete curing agent. It forms a clear membrane surface barrier that holds the moisture in the mix for a prolonged curing period to aid in complete hydration. Produces watertight, dense, hard concrete. At the same time, it protects against the penetration of moisture, stains or other soil as other trades complete construction.

Limitations: Do not use on concrete slab that is to receive Bonded or Monolithic Terrazzo.

Advantages: Eliminates expensive operation of wet sawdust, wet sand, earth — the costs of placing these materials on a new installation, keeping them damp, and then removal. Eliminates ponding and spraying. Eliminates covering with building paper, etc. to keep the moisture in the concrete.

Color: Not pigmented. Gardner, maximum 6.

Standards: Complies with ASTM C156, water retention efficiency of liquid membrane forming compounds for curing concrete. Also conforms to ASTM C309 Type I as required by the National Terrazzo and Mosaic Association. U/L listed as "slip resistant."

TECHNICAL DATA — Pittsburgh Testing Laboratory: Water Retention at 3 days — Average of 3 controlled tests — 98.38%.

NVM: Minimum 20%.

Viscosity: Gardner A2-A5.

Drying Properties: Sets to touch in 30 minutes. Dries hard in 2 hours. Dries traffic-ready in 4 hours.

Clarity: Clear

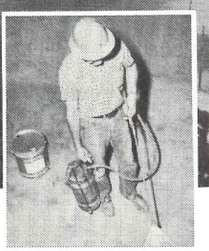
Sediment: None

Suspended Matter: None

No loss in drying or skinning in container.

INSTALLATION — One man, who need not have special training, can apply Cem-Seal with a sheepskin applicator or sprayer. Should be applied as soon as the slab can bear weight. Can be used on vertical installations. Only one coat needed.

GUARANTEE — When applied in accordance with manufacturer's directions, it is guaranteed to meet all claims made for it in the proper curing of concrete and terrazzo floors.



MAINTENANCE — This is not a wearing surface but will leave concrete smooth and easy to maintain and free from "dusting" and efflorescence. Cem-Seal will not affect the future installation of resilient flooring or application of finish, providing: (1) Flooring Manufacturers' instructions are carefully followed prior to laying floor, and (2) Hillyard preparatory steps are followed prior to finishing.

TECHNICAL SERVICES—Over 200 trained, professional, architectural consultants are located in and near principal cities. Write or call collect for our representative in your area. We will have him contact you immediately. He will recommend the proper approved treatment for the floor you are specifying and supervise application procedures at job site.

FILING SYSTEMS—Sweet's Catalog 11n/Hi

HILLYARD
FLOOR TREATMENTS
ST. JOSEPH, MISSOURI, U.S.A.
TOTOWA, NEW JERSEY
SAN JOSE, CALIFORNIA
IN CANADA: Ontario ; ALBERTA

SINCE 1907

The most widely recommended and approved treatments for every surface

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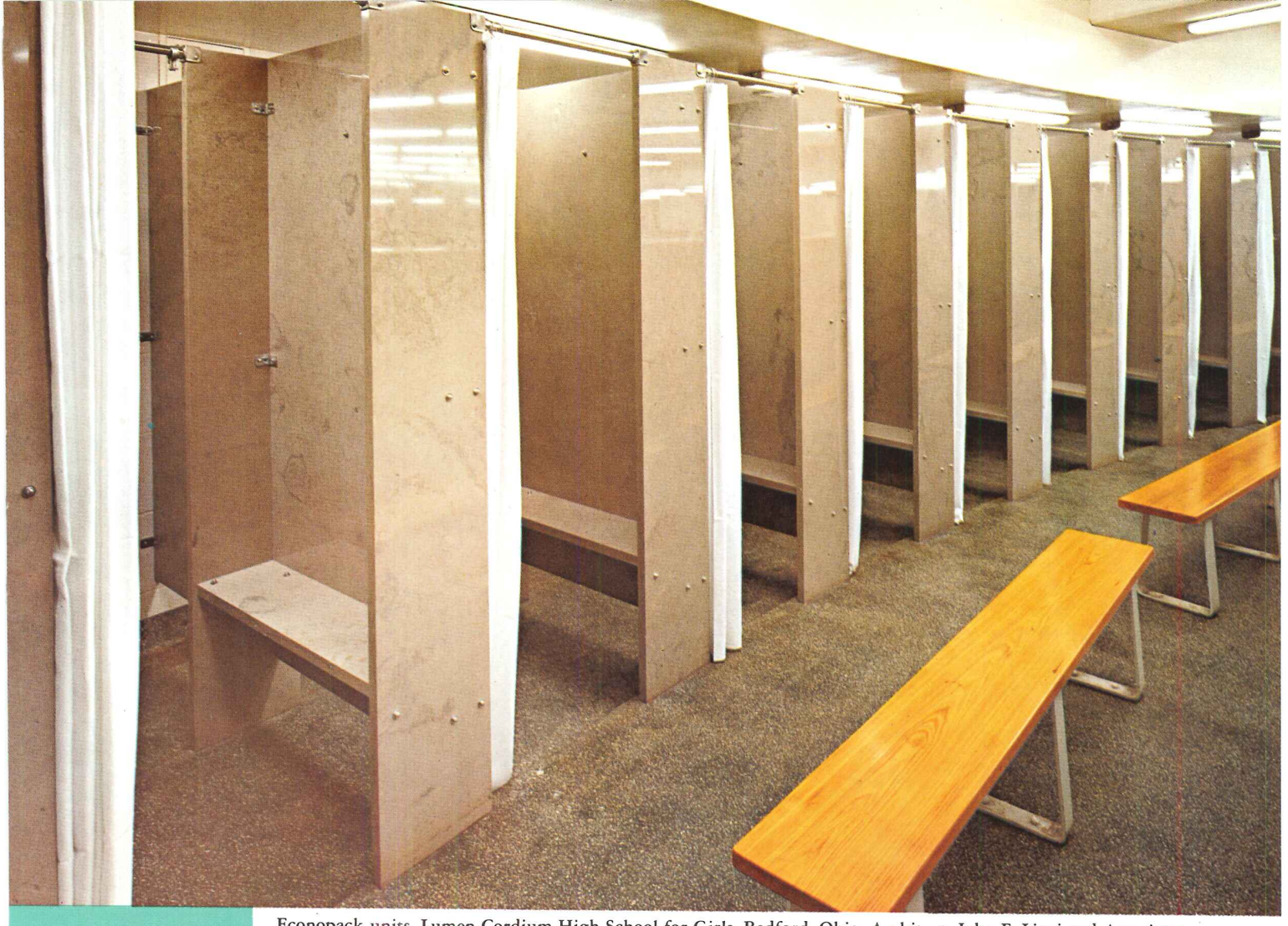
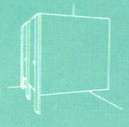
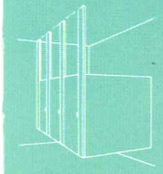


Econopack units, Lumen Cordium High School for Girls, Bedford, Ohio. Architect: John F. Lipaj and Associates.



STALLPACK, the packaged marble toilet enclosure



SPACEPACK, the ceiling-hung Stallpack

SHOWERPACK, the complete marble shower cabinet

ECONOPACK, multi-unit marble dressing room and shower

URINAL SCREENS, standard screens in Stallpack marble

Econopack solves shower problems with durable marble partitions.

PERFECT FOR INSTITUTIONS. Econopack provides long-lasting marble for multiple dressing-room-and-shower units in schools, dormitories, clubs, bathhouses, nursing homes and hospitals.

A COMPLETE PACKAGE. Econopack includes marble stiles, partitions and seats, 10-ounce white duck shower curtains and a complete set of chrome-plated brass hardware. One specification supplies the best in multi-unit showers for your building.

QUIET AND RUSTPROOF. Water splashes quietly against these solid marble partitions, and they cannot rust or deteriorate. Econopack hardware is top-quality chrome-plated brass for a completely rustproof unit.

EASY TO CLEAN. Flush construction with solid marble eliminates dirt-catching hollow places, eliminates the many hard-to-clean mortar joints of glazed tile showers. Washing with mild soap and water keeps these large marble partitions clean and sanitary. Imagine the savings in upkeep cost!

UNIVERSAL COLOR. Econopack comes in three lustrous light grey marbles—Napoleon Grey, Ozark Fleuri and Ozark Tavernelle. All three are excellent marbles for showers, blend well with any color scheme.

ENDURING VALUE. Econopack is priced to compete with other shower units, yet it offers the durability and easy upkeep that marble alone can give. Over the years that durability will mean true economy for the building owner.

See our catalog in Sweet's Architectural File, Section 13b/Ca, or send for Econopack Information File. Circle reply card or write Carthage Marble Corp., P.O. Box 718, Carthage, Mo. 64836.

CARTHAGE MARBLE CORPORATION

STALLPACK, the packaged marble toilet enclosure

SPACEPACK, the ceiling-hung Stallpack

SHOWERPACK, the complete marble shower cabinet

ECONOPACK, multi-unit marble dressing room and shower

URINAL SCREENS, standard screens in Stallpack marble

Two Stallpack units, First Baptist Church, San Angelo, Texas. Architects: Lovett and Sellars.

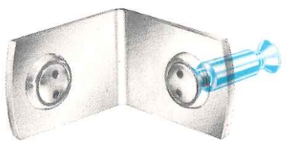
Stallpack® keeps solving partition problems with durable marble and rustproof hardware!

A COMPLETE UNIT. Stallpack gives you the unique durability of solid marble partitions precut to standard size, predrilled ready to assemble, and offered in a package unit complete with door and chrome-plated non-ferrous hardware. These units are ready to be shipped immediately.

EASILY SPECIFIED. Architects just indicate water closets 2′10″ on centers, then specify Stallpack. That one specification gives the toilet rooms of your building the lasting beauty and trouble-free durability that cannot be had with any material but marble.

EASILY CLEANED. These partitions are easy to keep clean because they are solid marble. Flush construction with solid marble leaves no inaccessible hollow places around the base of the stiles to breed germs and retain odors.

PERMANENT. Stallpack marble partitions will not rust or deteriorate. They will never need refurbishing. Washing with mild soap and water is all it takes to keep Stallpack marble partitions in perfect shining condition. Imagine the total savings in upkeep expense!



THEFT-RESISTANT spanner head machine screws now fasten the exclusive Carthage Marble clip-angle. It takes a special two-pronged screwdriver to remove the screws. This slotted clip-angle saves hours of setting time because it adjusts to out-of-line floors and walls.

UNIVERSAL COLOR. Stallpack partitions are made of fine Ozark Grey Veined marble. This lustrous light grey marble blends beautifully with any color scheme, stays beautiful as long as your building stands.

ECONOMICAL. High sales volume enables us to polish Stallpack marble partitions on an automated production line and to purchase top-quality doors and hardware in carload lots. Stallpack is priced to compete with other types of partitions, yet it offers the durability that marble alone can give. Over the years that durability will add up to real savings for the building owner.

See our catalog in Sweet's Architectural File, Section 13b/Ca or send for complete Stallpack Information File. Circle reply card or write Carthage Marble Corp., P.O. Box 718, Carthage, Mo. 64836.

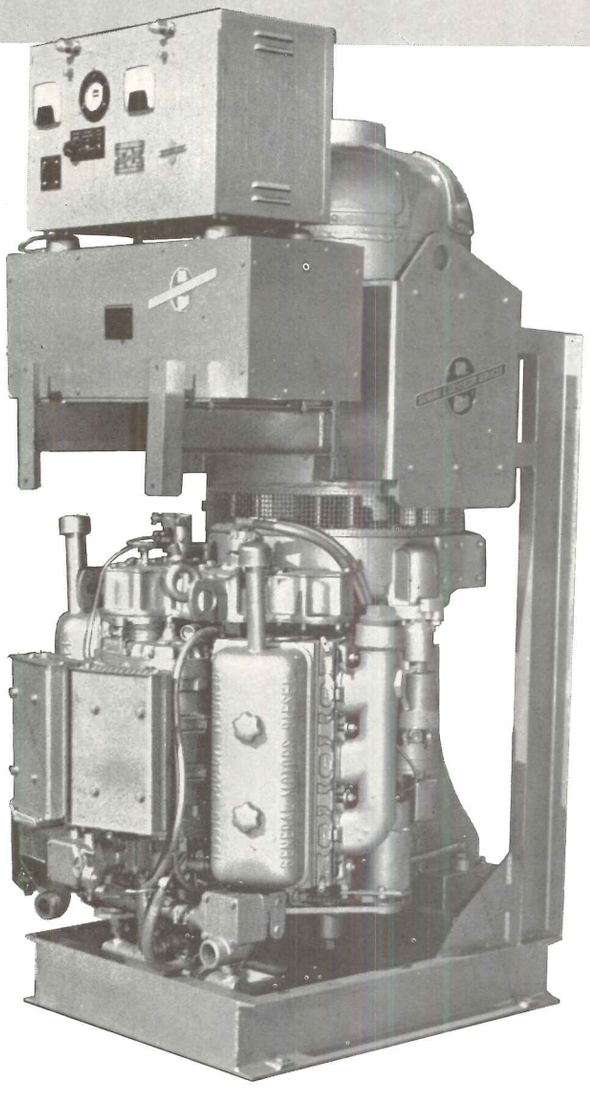
CARTHAGE MARBLE CORPORATION

STEWART & STEVENSON

FINDING A BETTER WAY

POWER + PROFIT + PROGRESS

...even if it means standing a generator and engine on its end!



Stewart & Stevenson has the answer in this revolutionary VERTICAL GENERATOR SET

If you need generated power but are limited in available space, the Stewart & Stevenson vertical generator is for you. If you are planning a new building, don't overlook the possibilities open to you with this new, revolutionary unit.

Stewart & Stevenson's vertically-mounted generator sets have been made possible and practical through many years' experience gained in making vertical engine installations for deep-well turbine pumps. The reliability of this vertical engine configuration has been thoroughly proven in hundreds of rugged applications throughout the world.

- ***. . . requires only a four foot square floor area.***
- ***. . . capacities from 20 KW to 675 KW.***
- ***. . . has a wide range of standard and optional equipment.***
- ***. . . all sizes have same equipment as conventional sets.***
- ***. . . all offered for use with choice of several fuels to insure maximum economy and reliability.***

RESEARCH · STEWART & STEVENSON · ENGINEERING

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THE WORLD'S LARGEST DISTRIBUTOR OF DIESEL ENGINES

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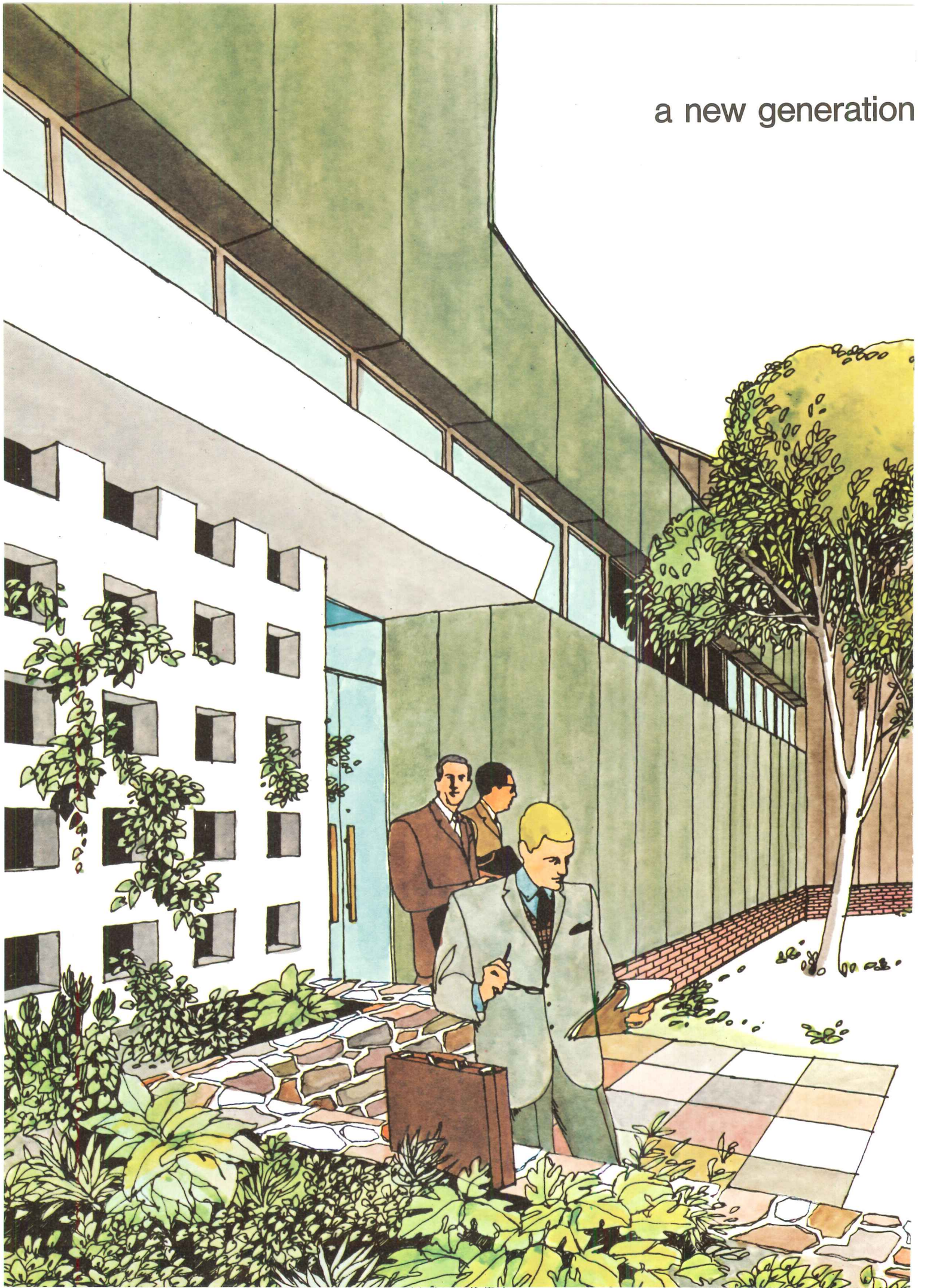
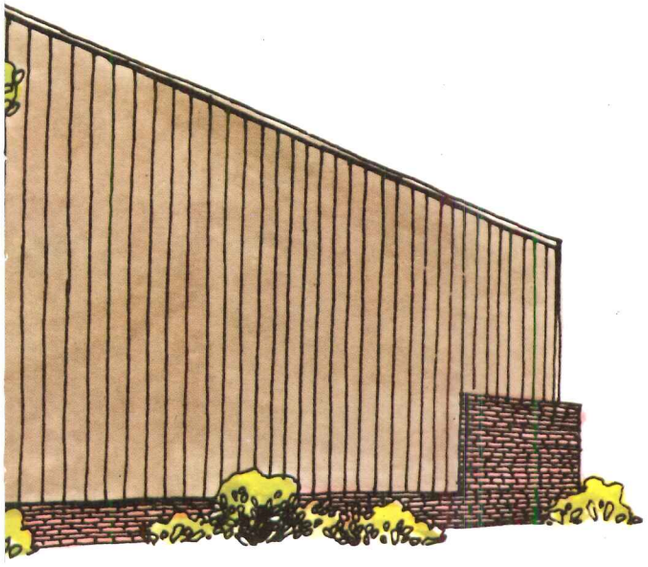
a new generation



of long-life factory-applied finishes for metal buildings

NEW PPG DURANAR™ FLUOROPOLYMER COATINGS

withstand everything under the sun longer, more colorfully than any other organic finish



Amazing new Duranar fluorocarbon coatings give you a super-tough finish for metal buildings. They offer longer finish life and low maintenance even where ultra-violet rays, salt, high humidity, and chemical fumes cause other organic finishes to deteriorate.

Exterior aluminum and steel panels and trim finished with Duranar coatings can be expected to stand out as bright, tight and colorful as ever, even twenty years or more after installation. That makes colorful metal buildings comparable in cost and performance to masonry, porcelain and anodizing.

Intensive research, formulation and testing have gone into making Duranar fluorocarbon coatings the finest, most durable organic finish ever developed. Color retention is unequalled: white stays white, colors stay bright even under a tropical sun. Its highly inert fluoropolymer base of Kynar 500* assures outstanding immunity to chemical attack by industrial acids, alkalis or salts. Toughness and flexibility of Duranar is truly superior. Fabrication of prefinished stock to a Zero T-bend is possible without surface fracture.

Before you select any other material, investigate the advantages of using architectural metals with amazing Duranar finish. Contact your supplier or PPG INDUSTRIES, Inc., Dept. 16W, One Gateway Center, Pittsburgh, Pa. 15222. Telephone 412 - 281-5100, ext. 2174.

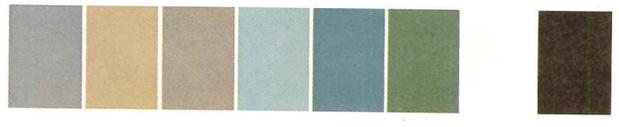
Color Coatings

PPG INDUSTRIES

*T.M. Pennsalt Chemicals Corporation

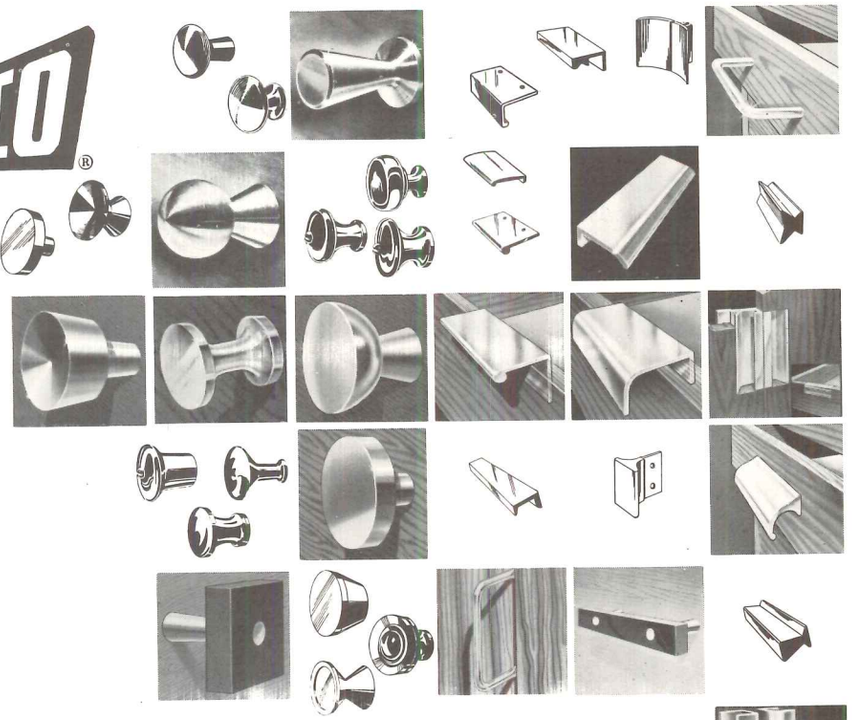
New PPG pigmentation concept makes possible maximum color retention and finish stability

Another reason for the superior performance of Duranar: an entirely new system of pigments and pigmentation techniques that was specially developed to extend color integrity to match the long life of the fluoropolymer base. Some typical Duranar coating colors are illustrated. New, exciting, high quality Duranar metallic finishes are available, too. All coatings in flat and semi-gloss.



Here are just a few of the reasons why it's easy to specify EPCO Knobs and Pulls for cabinets, doors and drawers ...

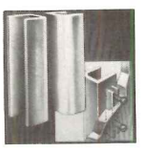
EPCO®



There are many more styles in our catalog. Each is designed for handsome appearance, ease of installation and to be maintenance free. Knobs are machined from Aluminum or Brass bar stock. Pulls are extruded aluminum. All are available in popular finishes.

FREE 42-PAGE CATALOG
The complete EPCO line of sliding door hardware, mirror frames, pulls and knobs, and magnetic catches will be sent on request.

SEE SWEET'S CATALOG
Mirror frames in Arch. file 25d-RE and Light Const. file 12d-RE. Track and hardware under Arch. file 169-En and Light Const. file 7b-En.



THE ENGINEERED PRODUCTS CO.

P.O. BOX 108 FLINT, MICH. 48501 PHONE AREA 313 976-2050

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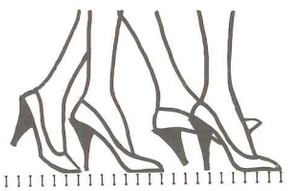
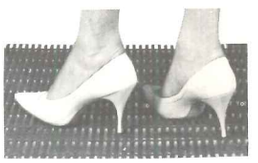
ATTRACTIVE LIGHT WEIGHT GRATINGS
LONG SPAN HEAVY DUTY GRATINGS



Reliance I-Lok Aluminum Grating is not only structurally strong but also has aesthetic appeal. The grating has a finished look and is ideally suited for use where a pleasing appearance is required.
This grating, with openings as small as ¼" x 2", is the best choice for use in locations where women will be walking, such as sidewalk vault covers, kitchen floor drains and utility trenches. Request our Catalog RSL-12AAR for more detailed information.

This bar grating is recommended for locations where material handling equipment, as well as people, must travel over the installation. Where it is necessary to temporarily remove a grating panel, fastening devices and lifting lugs are easily designed to fulfill your requirements.
For more detailed information, request our design manual RSL-11AR.



RELIANCE Steel Products Company

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see our catalog in Sweet's (S)

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The big mouth

Here's the only low-cost whiteprinter with a 47-inch mouth!

With the big-mouth 146, you make extra-wide prints, or multiples of smaller sizes, at speeds up to 9 fpm. It exposes them clearly, develops them sharply, spews them out the back for easy stacking. And copies cost only 1¢ per sq. ft!

Amazingly simple to operate, and easily portable, set up the 146 anywhere and you'll have the lowest cost, big-mouth producer of whiteprints on the market. And dependable? It's backed by Blu-Ray's exclusive 1-year warranty.

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For more data, circle 182 on inquiry card

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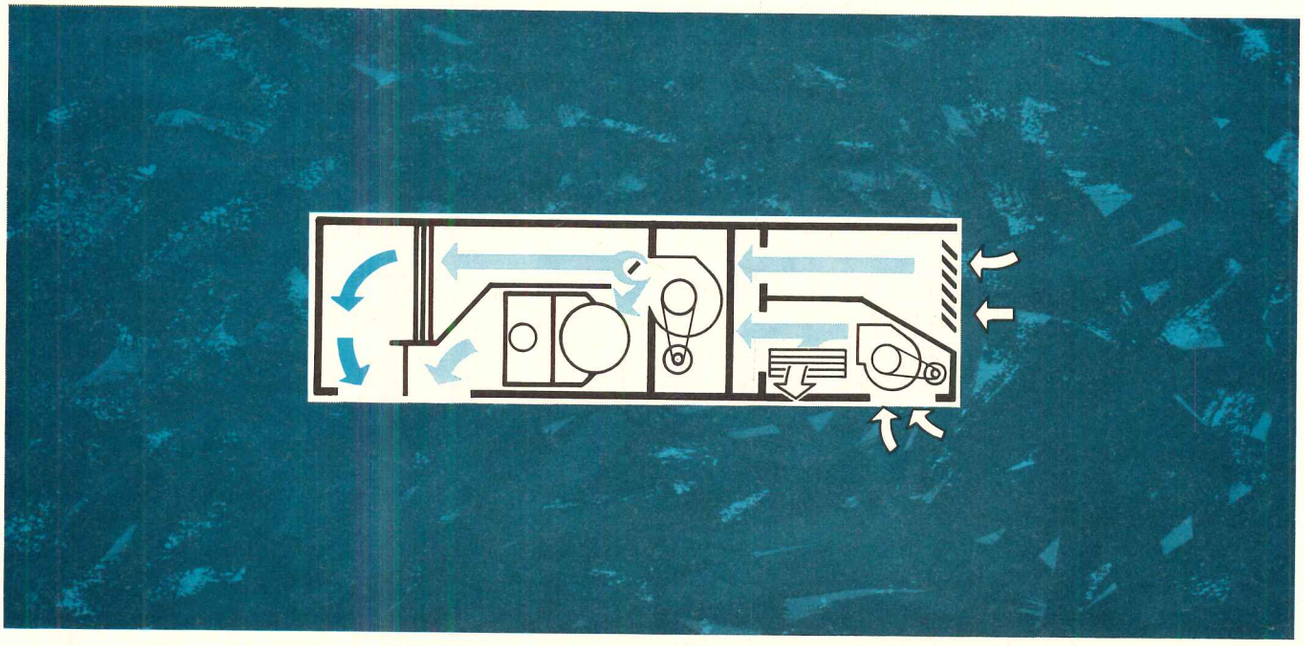


THE MAMMOTH ADAPT-AIRE MULTI-ZONE UNIT

HEATS · COOLS · VENTILATES

(UP TO 1,000,000 BTU) (UP TO 50 TONS) (UP TO 18,000 CFM)

and provides total air control in any combination or all at once . . . and with more capacity than any equipment in its class!

The truly versatile Mammoth Adapt-Aire multi-zone unit provides single-unit control of all the environmental air control functions—heating, cooling and ventilating. Mammoth calls it total flexibility by design . . . flexibility that spells maximum economy and greater ease of specification for the architect or engineer designing air conditioning systems for industrial, commercial or institutional buildings.

Heating and cooling capacity? The Mammoth Adapt-Aire gives you more of it per unit than any rooftop equipment in its class—heating from 235,000 through 1,000,000 Btu, cooling from 10 through 50 tons.

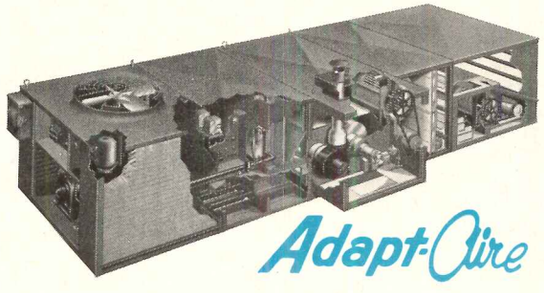
Ventilation? The Adapt-Aire handles up to 12 zones for heating, cooling and ventilating, with 100% fresh air capacity automatically available whenever the equipment is running.

Power return-exhaust? The Adapt-Aire incorporates a unique full-capacity centrifugal exhaust and return air system, allowing the designer to provide complete control of all return and exhaust air functions for his entire building.

The Adapt-Aire multi-zone is a low-silhouette unit supplied completely piped, wired, charged, programmed and factory pre-tested to eliminate problems in the field. And Adapt-Aire utilizes all popular methods of heating and cooling—gas, oil, steam, and hot and chilled water.

There are 350 Mammoth representatives in 85 offices in the United States and Canada ready to explain in detail how the Adapt-Aire can provide flexible, economical environmental air control for your building. Contact the Mammoth office nearest you, or write, wire or phone Mammoth (612-544-2711) for full information.

Adapt-Aire is fully documented in Mammoth Bulletin AMZ-67-S. Write for your copy.



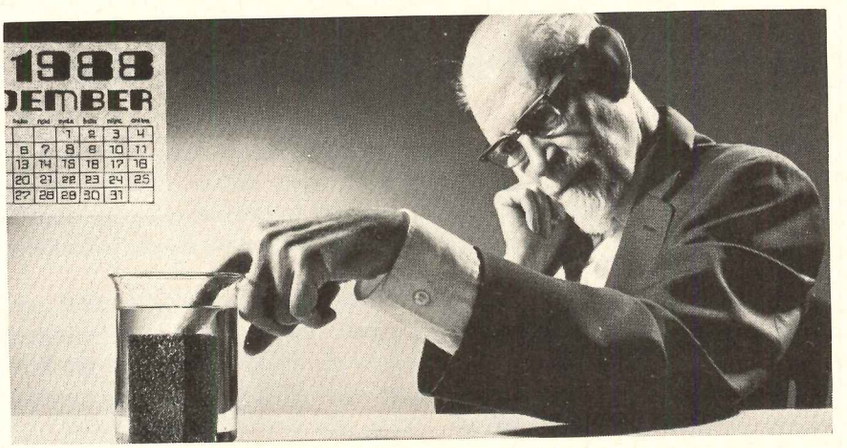
MAMMOTH
ENVIRONMENTAL AIR CONTROL FOR INDUSTRY
Industries, Inc.
13120-B County Road 6 • Minneapolis, Minn. 55427

ISi

For more data, circle 143 on inquiry card

FOAMGLAS® BOARD roof insulation keeps its insulation efficiency indefinitely.

Make this simple, 20-year test.



We guarantee that FOAMGLAS-BOARD will retain its original insulating value for at least 20 years.

Don't expect other people to make the same claim. They can't. Because only FOAMGLAS insulation, which is cellular glass, is waterproof and vaporproof. Permanently.

Equally important, it's dimensionally stable, providing an excellent base for built-up roofing. Beveled edges relieve vapor pressure, the major cause of roof blisters.

We'd like to send you a sample of FOAMGLAS-BOARD and a copy of the guarantee. Write Pittsburgh Corning Corp., Dept. AR-98a, One Gateway Center, Pittsburgh, Pa. 15222. In Western Europe, Pittsburgh Corning de Belgique, S.A., Brussels.

The Insulation People

PITTSBURGH pc® CORNING

For more data, circle 144 on inquiry card

OFFICE LITERATURE

continued from page 243

LIBRARY FURNITURE / A color brochure presents wall and island shelving, card file cabinets, and tables, chairs, desks and study carrells. ▪ Decar Plastic Corporation, Bellwood, Ill.

Circle 414 on inquiry card

LIGHTING DIFFUSERS / As a visual aid in the choice of specialized flat lay-in luminous panels for suspended ceiling systems, a five-window sample card shows acrylic and treated polystyrene lighting diffusers for panel replacement, remodeling and new construction. Samples include a fire-rated acrylic, a clear and opalized version of random gem-faced *C-1* panel, crepe-textured and scratch-resistant sparkle grain polar cloud panel, *AR87* impact prismatic (reduces glare but maintains high light transmission), opal acrylic, and the *AR35C* (a tinted, chemical-coated polystyrene prismatic). ▪ Artcrest Products Co., Inc., Chicago.*

Circle 415 on inquiry card

METAL DOORS / A 24-page brochure presents seamless metal *PyroDors*, pressed steel frames, and full flush sliding *Pyrodors*. ▪ Keene Dusing and Hunt, LeRoy, N.Y.

Circle 416 on inquiry card

FIRE INSURANCE / A 12-page booklet reviews factors bearing on fire insurance costs for buildings, with particular reference to prestressed concrete. ▪ Prestressed Concrete Institute, Chicago.*

Circle 417 on inquiry card

CHURCH LIGHTING / A 48-page catalog features traditional church lighting fixtures for both interior and exterior design. ▪ NL Corporation, Cleveland.

Circle 418 on inquiry card

WINDOWS / A 36-page catalog presents a complete line of steel, aluminum and stainless steel windows for industrial, commercial and institutional buildings. ▪ The William Bayley Company, Springfield, Ohio.

Circle 419 on inquiry card

CERAMIC WALL SURFACING / A 36-page *Work Book of Design-Technics Ceramic Wall Surfacing* presents 100 textured, sculptured, mural and pierced screen designs, along with information on color, lighting, detailing and specification. ▪ Design-Technics, New York City.*

Circle 420 on inquiry card

**Additional product information in Sweet's Architectural File*

more literature on page 261

continued from page 260

ISOLATORS / An 8-page color brochure describes and illustrates the recommended method to select and specify vibration and structure-borne noise isolators for modern building construction. A selection guide, which is included, helps select and specify isolator deflection for air-conditioning units, fans, pumps, and other mechanical equipment in all types of construction. ▪ Consolidated Kinetics Corporation, Columbus, Ohio.*

Circle 421 on inquiry card

ELEVATED FLOORING / A 12-page booklet defines technological advances in elevated flooring and explains the use of this concept in modern building construction. Also included is a section on environmental components and air conditioning equipment to be used with the raised flooring. ▪ Weber Showcase & Fixture Company, Grand Rapids, Mich.*

Circle 422 on inquiry card

PIPE AND FITTINGS / A 265-page book, *Cast Iron Soil Pipe and Fittings Handbook,* has been compiled and edited by Frank T. Koelble and William T. Hogan of the Industrial Economics Research Institute of Fordham University. The book contains tables, charts, illustrated specifications, abbreviations, definitions and recommended symbols. ▪ Cast Iron Soil Pipe Institute, Washington, D.C.

Circle 423 on inquiry card

STREET FURNITURE / The Council of Industrial Design, which publishes an illustrated catalog of street furniture every two years, is offering the latest catalog for about $2. The catalog is sent to 2500 architects and local authorities in Great Britain and is used to select most of the street furniture used in that country. ▪ Council of Industrial Design, 28 Haymarket, London, SW1.

PLANTERS / Fiberglass planters that are decorative, yet serve to divide and define areas and help channel pedestrian traffic are featured in an 8-page color brochure. ▪ Landscape Forms, Kalamazoo, Mich.

Circle 424 on inquiry card

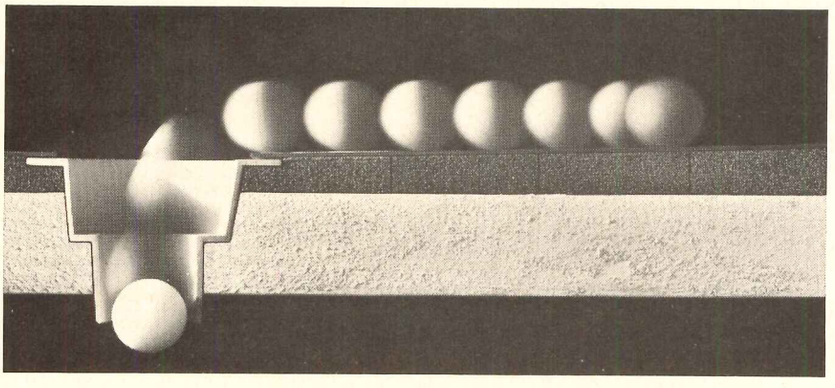
PRODUCTS CATALOG / A comprehensive book presents color illustrations and data on major products of the forest and gypsum industries. ▪ Georgia-Pacific, Portland, Ore.*

Circle 425 on inquiry card

**Additional product information in Sweet's Architectural File*

Tapered FOAMGLAS® roof insulation automatically drains flat roofs...

like water off a deck's back.



You know the flat roof deck problem. Ponding. Here's a new solution: Place tapered FOAMGLAS insulation blocks and you've got a perfect slope for positive drainage. The roofer can do it himself and roof over immediately.

FOAMGLAS is lightweight, incombustible . . . permanently waterproof and vaporproof (it's cellular glass). It will keep its original insulating value indefinitely. We guarantee it in writing for 20 years.

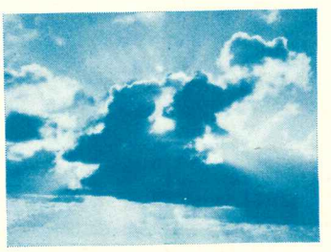
Write for information and a free sample. Pittsburgh Corning Corp., Dept. AR-98, One Gateway Center, Pittsburgh, Pa. 15222. In Western Europe, write Pittsburgh Corning de Belgique, S.A., Brussels.

The Insulation People

PITTSBURGH PC® CORNING

For more data, circle 145 on inquiry card

A Report from the Prestressed Concrete Institute:



Pioneering is a lonely business. *Only when you go it alone.*

■ When pioneers join forces, have a good idea where they're headed and have the heart to hang in there, pioneering is usually a gratifying group adventure.

So it has been for the ever-widening circle of membership in the Prestressed Concrete Institute in the decade since its inception. While lacking the almost-lost-in-obscurity beginning of ancient building materials, prestressed concrete is no patiently plodding frontiersman. Rather, like the jet, it has spread its swept-back wings and soared. Evidence of that is everywhere for all to see. In terms of what has already been accomplished, prestressed concrete has long since passed the point of no return.

PCI represents all facets of precast and prestressed concrete, whether pre-tensioned, post-tensioned, or architectural precast. Its members include producers, architects, engineers, industry suppliers, educators, students, and technicians.

■ The Institute serves principally in three areas: (1) To gather and disseminate knowledge of whatever nature will advance the industry's cause; (2) Through

continuous research and development, to increase the use of prestressed and precast concrete; (3) To establish and maintain industry-wide design and production standards.

■ The entire construction industry has benefitted significantly from many Institute-sponsored activities. Among them were original PCI specifications, the first published in the U.S. The PCI Building Code was the first national code on prestressed concrete. An Institute committee developed and recently released new guide specifications for the industry. A PCI-AASHO joint committee is continuing to prepare design standards that assure economy in bridge structures.

As a result of PCI fire tests, two, three and four-hour U.L. label service is now available on most prestressed concrete building elements.

■ Each year, an internationally prominent Awards Jury selects and suitably recognizes excellence in design originality. This competition does more than merely herald those so recognized. It spotlights design creativity to benefit the entire construction industry.

Annually, PCI convenes to offer stimulating technical forums on design, research, production, and new developments. Formal presentations, panel discussions, and shirt-sleeve sessions combine to form balanced, rewarding meeting programs. State and regional conferences throughout the year augment this annual event.

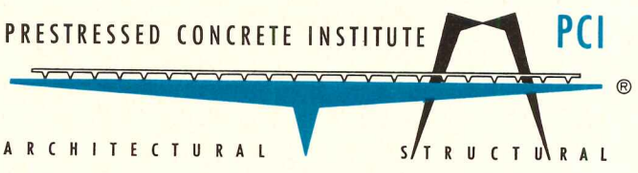
■ Numerous publications regularly keep PCI members aware of industry advances as they occur. Among the most recent are a long-span bridge study, one on fire resistance, and a 156-page book containing 341 illustrations, *Schools of Prestressed Concrete,* which covers planning, design, and construction in all areas of educational building.

Several high-priority PCI programs of promise are currently in various stages of development. They include preparation of a prestressed concrete handbook, industry-wide product standardization, intensive fire research, further implementation of quality-control techniques, safety practices, coordination of research by agencies throughout the U.S. and Canada, and cooperation with foreign countries in exchanging design concepts and manufacturing procedures. *(PCI is the sole U.S. representative to the world prestressed concrete organization, Federation Internationale de la Precontrainte.)*

■ It is perhaps no accident that design and management people of pioneering mind should have become attracted to prestressed concrete. Although modern as tomorrow, the credentials of prestressed concrete as a trustworthy construction material are beyond question, providing as it does the strengths of both concrete and steel. No mere building *ingredient,* this. No commodity. But a unique structural and design medium with inimitable, innate characteristics.

The use of prestressed concrete faces ever more far-flung horizons, as broad as the true professional's endless quest for the new, the better, the lower-cost way to improve mankind's lot. And, in the process, his own.

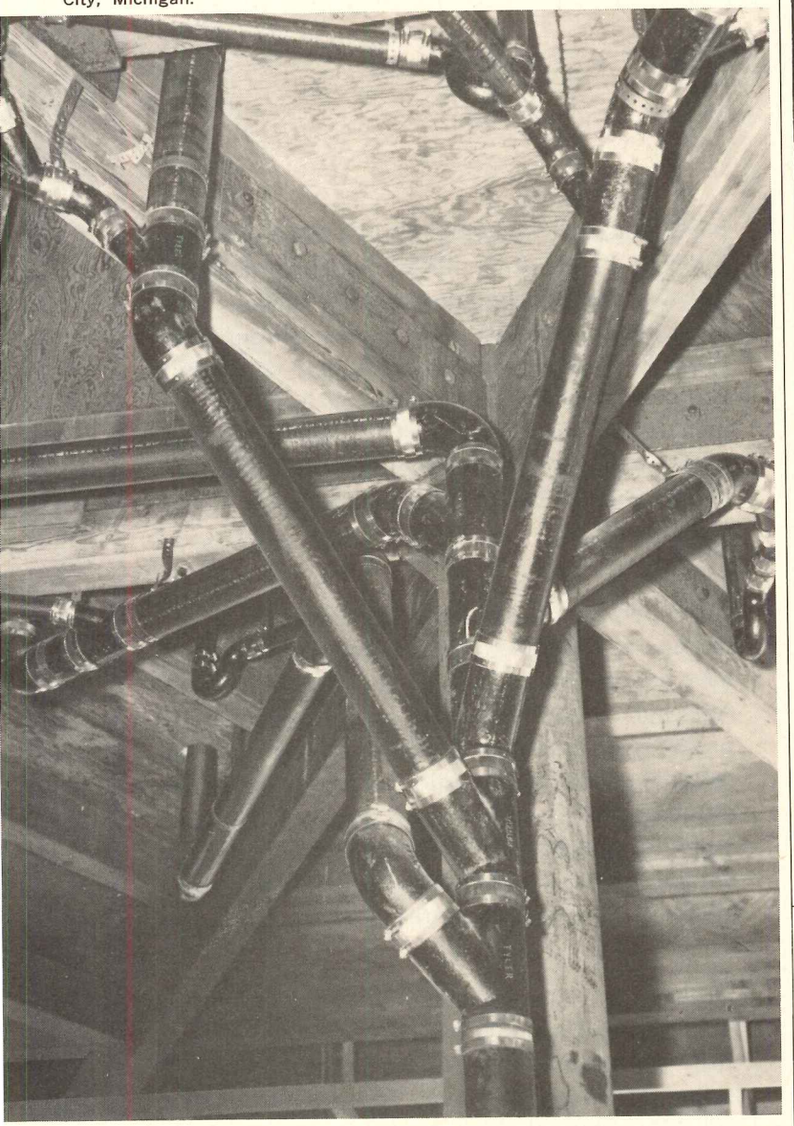
■ In the belief that those of like mind get further, faster, when banded together, we invite you to consider joining PCI. If, of course, you are not already a member. Simply call or write us.



205 W. Wacker Drive / Chicago, Illinois 60606 / Telephone: (312) 346-4071

For more data, circle 146 on inquiry card

ACTUAL JOB PHOTO showing just one of six Tyler No-Hub risers serving the Polyhedron Lodge in Grayling, Michigan, a three story, 58-room ski lodge. Mechanical Contractor: Axtel-Hardy Corp., Traverse City, Michigan.



TYLER NO-HUB...

makes close-quarter installations like this both possible AND profitable. In fact, on jobs where no other permanent method can be used, you can count on easy-to-install Tyler No-Hub! Specify it.

TYLER PIPE INDUSTRIES

SOIL PIPE DIVISION
TYLER PLANT, TYLER, TEXAS
PENN PLANT, MACUNGIE, PA.
Member cast iron soil pipe institute

TPI makes Tyler cast iron soil pipe and fittings • Wade plumbing-drainage products • Tyler water main fittings and municipal castings.

For more data, circle 147 on inquiry card

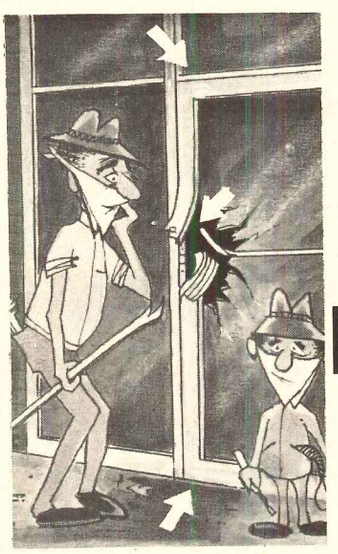
American Savings, San Jose, Calif. Architect: Robert Hagman

It's Gail Brickplate for floors and walls, the basic ceramic tile used on Europe's prestige buildings for generations and now sweeping this country. Here are just a few of the reasons top American architects are discovering more and more uses for Brickplate: ■ BRICKPLATE gives a custom solution at a standard price ■ BRICKPLATE comes in glazed and unglazed finishes ■ BRICKPLATE is frostproof ■ BRICKPLATE is only a tile thick ■ BRICKPLATE has a keyed back for secure attachment without mechanical ties ■ BRICKPLATE has outstanding abrasion and chemical resistance. Write today or give us a call for more information on this beautiful man-made product with the density of natural granite.

GAIL INTERNATIONAL CORPORATION
582 Market Street
San Francisco, California 94104

See our catalogs in SWEETS

For more data, circle 183 on inquiry card



3 WAYS to BUG the BAD GUYS

1 The W & F No. 6000 Series Deadlock offers TRIPLE point

2 Entrance Door SECURITY.

This versatile mechanism will actuate any combination of jamb bolt, header bolt, and threshold bolt to meet the Single, Double, or Triple locking point requirements of your entrance.

We invite inquiries regarding our product line and welcome the opportunity of working with you on specific requirements.

W. & F. MFG., INC.

811 AIR WAY, P.O. BOX 30, GLENDALE, CALIF. 91209 • PHONE (213) 245-7441

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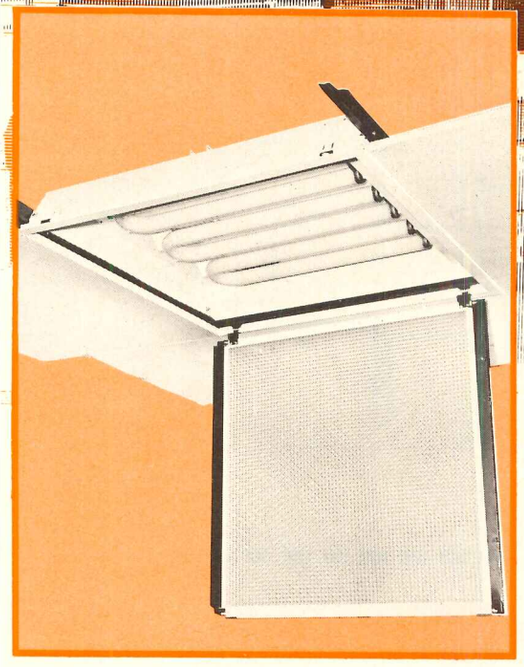


Sechrist recessed troffers for the 40 Watt U-shaped lamp feature a unique unitized electrical assembly. Ballasts and sockets are lined up to a common housing which can be hinged and removed for easy installation and maintenance. Positive supporting brackets hold the curved end of the lamp so that positive contact is made with the telescopic lampholders.

5′ Module?

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

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

SECHRIST

the Air-Lite Specialists

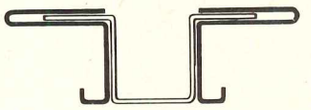
SECHRIST MANUFACTURING COMPANY

P.O. BOX 16775, DEPT. 89 / DENVER, COLORADO 80216 / (303) 534-0141

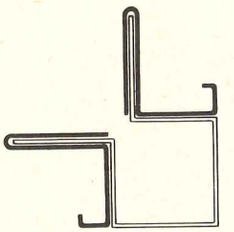
For more data, circle 148 on inquiry card

9 things our No.40 expansion joint can do besides saving you a small fortune.

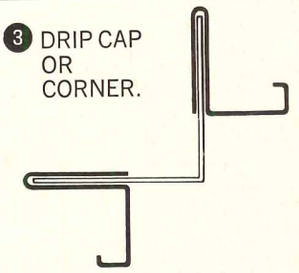
❷ DIVIDER STRIP.



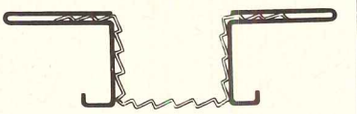
❹ OUTSIDE CORNER.



❸ DRIP CAP OR CORNER.

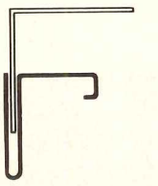


❺ AIR VENTS IN CEILINGS OR SOFFITS.

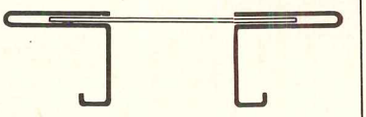


❶ OUR NO. 40 eliminates stucco cracking from structural movements and thermal stresses. Eliminates on-the-job fuss and bother.

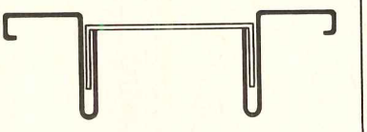
❻ UNRESTRICTED CORNER ANGLE.

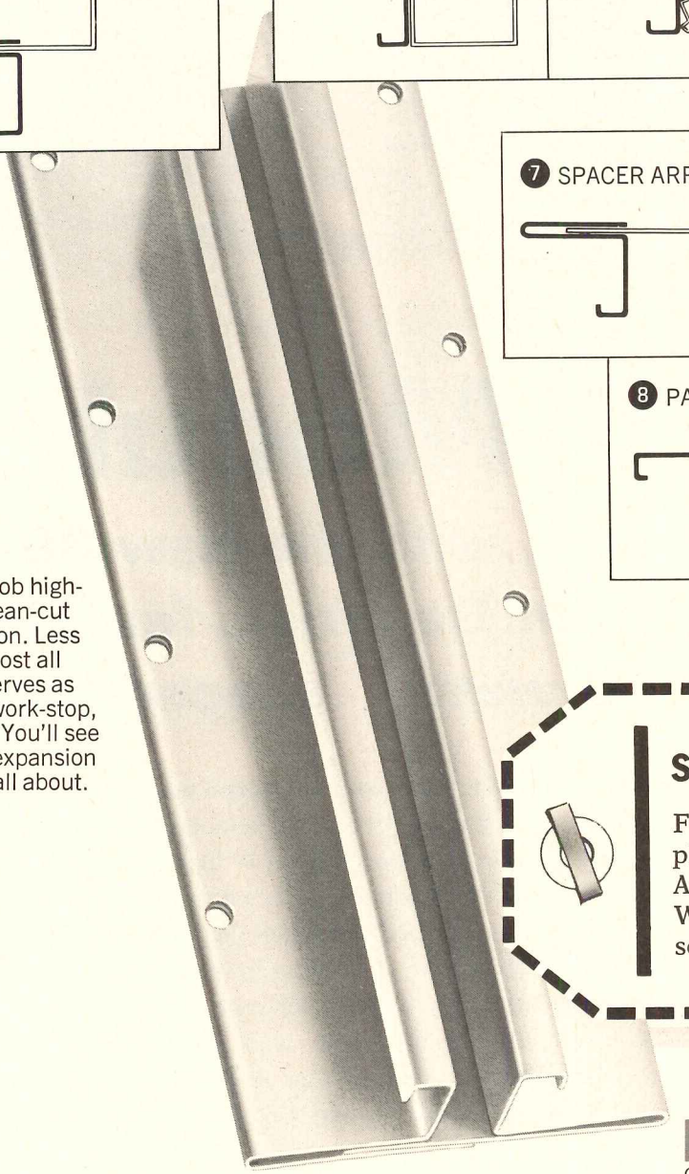


❼ SPACER ARRANGEMENT.



❽ PARTITION ABUTMENT.





❾ NO. 40 gives any job high-quality, clean-cut construction. Less time and cost all around. Serves as a perfect work-stop, too. Try it. You'll see just what expansion joints are all about.

Send for our free sample.

For all the data sheets, and a free sample of our great No. 40, just write our Al Smith on your company letterhead. We'll give you many more great reasons for using our expansion joints.

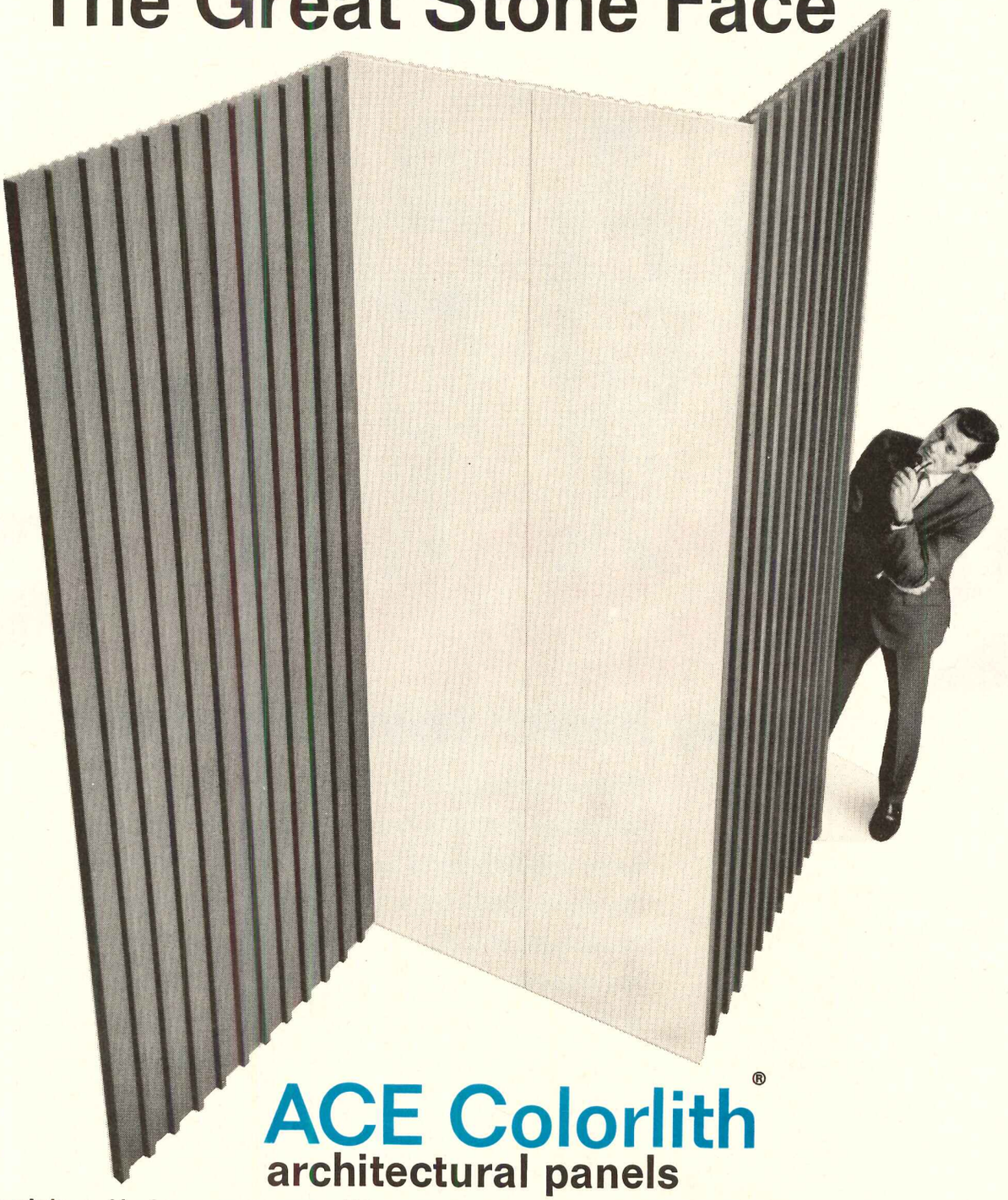
See our catalog in Sweets

KEENE CORPORATION PENN METAL DIVISION

Parkersburg, West Virginia 26101

For more data, circle 149 on inquiry card

The Great Stone Face



ACE Colorlith®
architectural panels

They're a whole new idea in masonry facing—look like stone, weigh far less, and they come with the patterns built right in.
Now you can add unique patterns and texture to your building exteriors—at a fraction of the weight and expense of other masonry materials.

Made by the new Johns-Manville ACE (asbestos-cement extrusion) process, stone-hard Colorlith panels are available *from stock* in a variety of continuous ribbed patterns. And in contrasting meerschaum white and stone gray colors with a textured sand-blasted surface. Also available is a natural color (smoke) with a sand or aggregate surface. You can extend a distinctive pattern vertically to the full height of the building, or alternate plain and ribbed panels horizontally for fresh design effects.

ACE Colorlith panels let you design new economy into your buildings, too. They weigh only a fraction as much as precast concrete panels. Two men can carry a 12-foot panel, so cranes are not needed. Because of less weight, structural framing can also be reduced. Maintenance costs are minimal with a material that's proof against fire, weather, rot and corrosion—and free from the veins of weakness in natural stone.

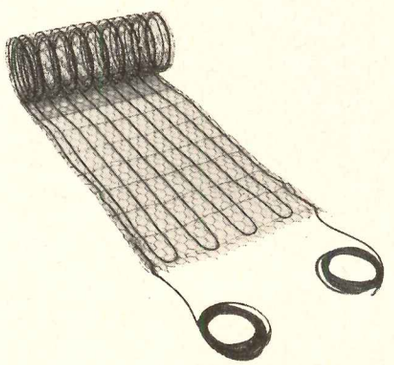
Explore with us the possibilities of ACE Colorlith panels for your next design. Write for details on stock panels, and information on how we can work with you in developing custom patterns.
Johns-Manville, Box 111,
New York, N. Y. 10016.

Johns-Manville

For more data, circle 150 on inquiry card

who benefits...

...from easy heat* snow melting mats?



Only one answer to that question . . . everyone! Yes, everyone benefits because no matter who they are . . . or what they do for a living . . . shoveling snow is no fun! It's dangerous! Ice is dangerous, too! Slips, slides, broken bones and Winter seem to go together. There's one sensible answer . . . a SAFETY ZONE . . . created by the installation of an *easy heat* snow melting system. Snow doesn't stand a chance and ice never forms because the *easy heat* electric heating mats keep sidewalk and driveway surfaces just above freezing temperature. Always specify an *easy heat* snow melting system. Made to order mats in all shapes and sizes are easily and economically installed.

Another product designed for safer living by SINGER.

For more information and technical data, write: Dept. AR-98

SINGER
ELECTRIC HEATING PRODUCTS

*A Trademark of THE SINGER COMPANY

THE SINGER COMPANY • 555 NORTH MICHIGAN STREET • LAKEVILLE, INDIANA 46536

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

Use Ceco's Steelform

experience

for your next monolithic concrete floor system

There's a practical way to design buildings that have two wanted attributes: visual variety and built-in rigidity. First, choose monolithic concrete construction, just now being rediscovered by architects for its versatility. Then design fluidly. As you sculpt and mold, call in Ceco to carry out your floor framing ideas with dependable Steelform Service.

Ceco offers cooperation by analyzing equipment requirements, furnishing cost data and coordinating form work on the project. All developed through more than fifty-six years of *specialized experience* . . . kept current for your benefit.

Ceco's trained crews and knowledgeable supervision can make your building come alive promptly. Ceco steelform service is nationwide. It is backed by vast experience, making Ceco the No. 1 supplier of steelform floor framing. Construction is fast. Forming equipment, rebars and concrete are available nearby—no long waits. Construction is economical—often $1.00/sq. ft. less than other types. The Ceco Corporation, general offices: 5601 West 26th Street, Chicago, Illinois 60650.

CECO

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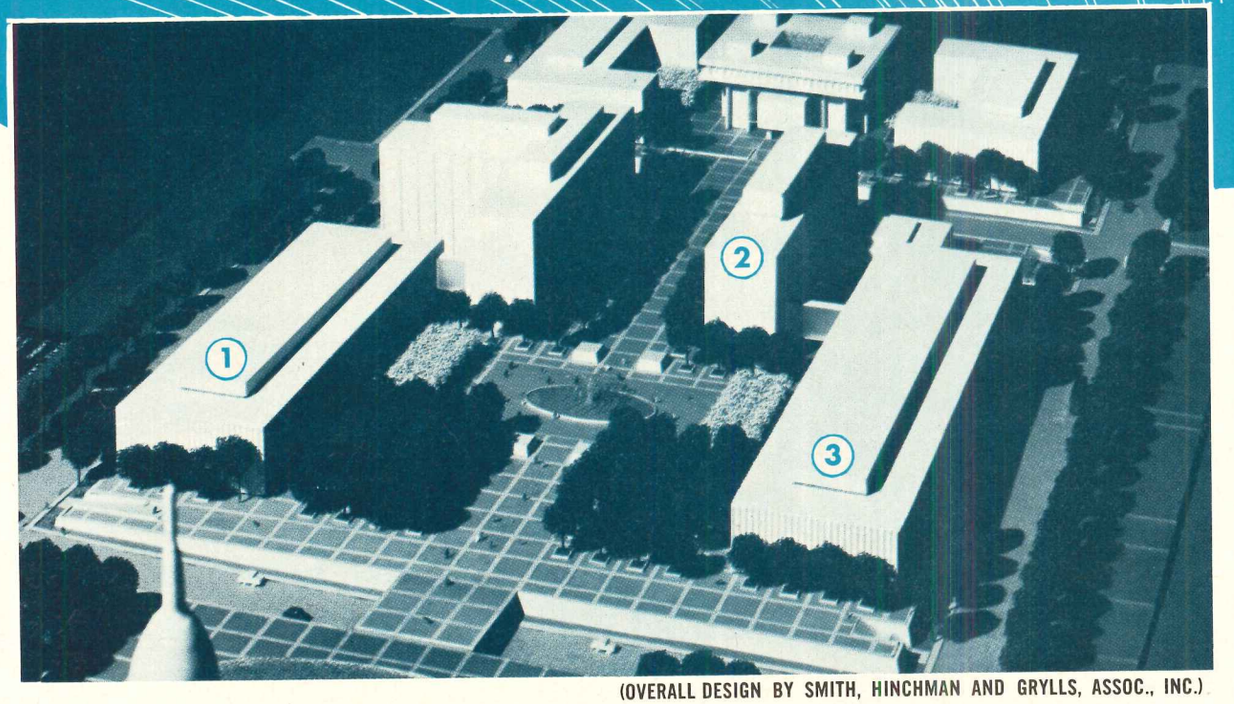
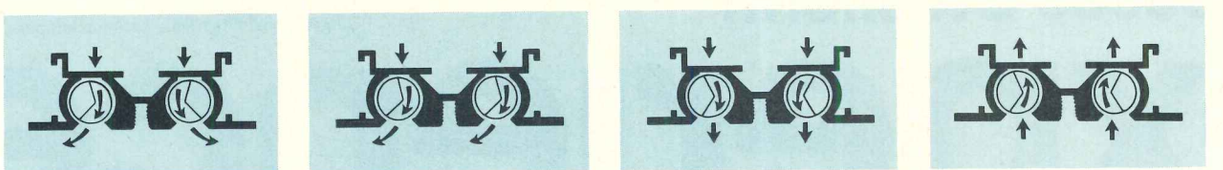
OVER 40 MILES OF KRUEGER



(OVERALL DESIGN BY SMITH, HINCHMAN AND GRYLLS, ASSOC., INC.)

in the New State Development Complex, State Office Buildings, Lansing, Michigan.

Here is a ceiling suspension system that permits modular flexibility, it is an air diffuser and also a partition receiver. Used as a grid system, the Tri-Trol Air Trak supports all standard ceilings and lighting fixtures. Tri-Trol Air Trak air distribution patterns are easily adjustable within a full 180 degrees. A knurled knob allows fingertip adjustment of pattern control valve for entire length of the diffuser. A threaded center groove allows ceiling connections for partitioning at any desired point. Partitions can be quickly and easily attached or detached. Krueger's Tri-Trol Air Trak is available in both supply and return units.



Two-way Ceiling | One-way Ceiling (either side) | Down | Return Air

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LINEAR AIR TRAK...

4-Story Office Building of the State Capitol Development Lansing, Michigan.

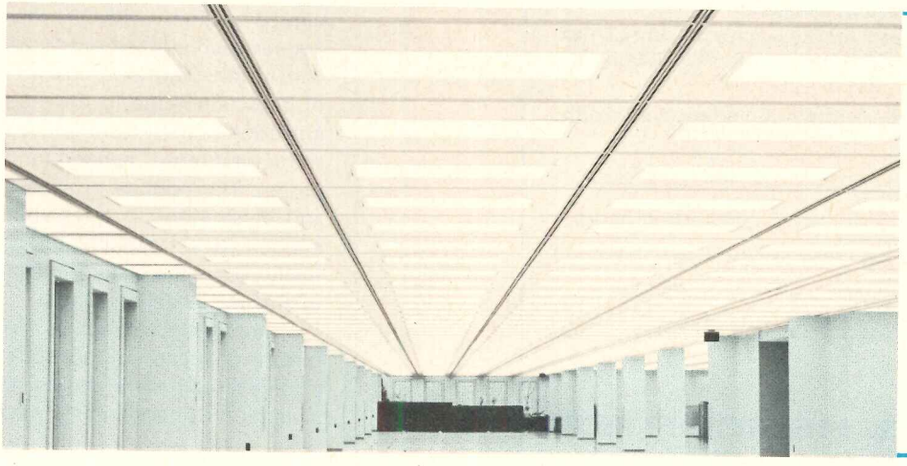
Architect Engineer, Smith, Hinchman and Grylls, Assoc., Inc., Detroit, Michigan;
General Contractor, The Christman Company, Lansing, Michigan;
Mechanical Contractor, Phoenix Sprinkler and Heating Company, Grand Rapids, Michigan;
Electrical Contractor, Hatzel and Buehler, Inc., Lansing, Michigan;
Sheet Metal Contractor, McConnel Sheet Metal Company, Lansing, Michigan;
Ceiling Systems Contractor, Fiberglas Supply and Contracting, Detroit, Michigan.

7-Story Office Building of the State Capitol Development, Lansing, Michigan.

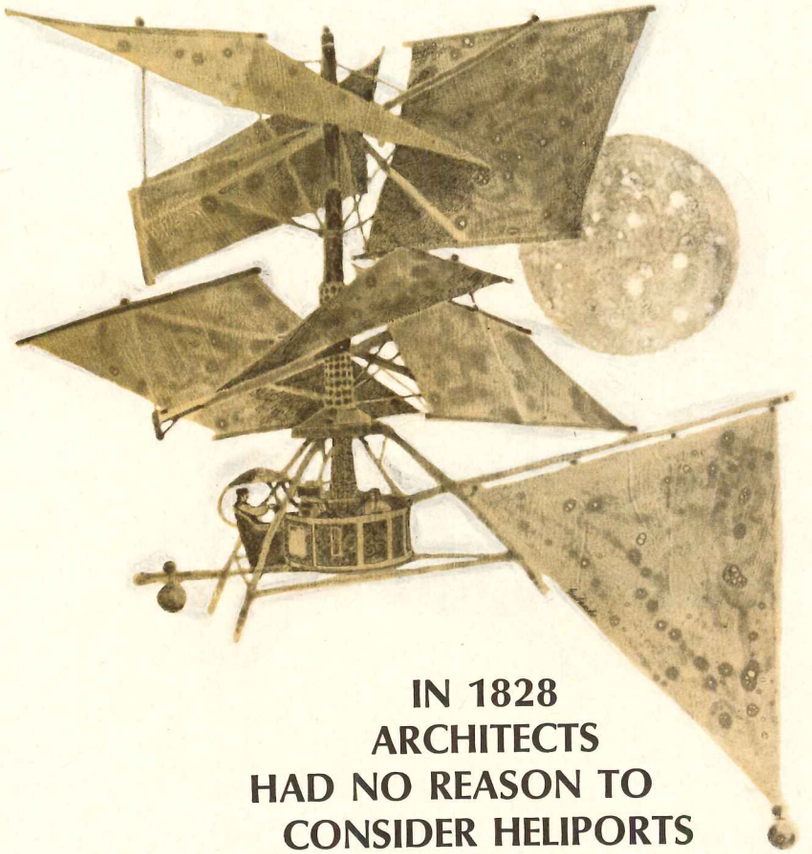
Architect Engineer, Smith, Hinchman, and Grylls, Assoc., Inc., Detroit, Michigan; **General Contractor,** The Christman Company, Lansing, Michigan; **Mechanical Contractor,** Shaw-Winkler, Inc., Detroit, Michigan; **Electrical Contractor,** Hatzel and Buehler, Inc., Lansing, Michigan; **Sheet Metal Contractor,** White Heating and Ventilating Co., Lansing, Michigan;
Ceiling Systems Contractor, Fiberglas Supply and Contracting, Detroit, Michigan.

Michigan State Highway Department New Central Office Building of the State Capitol Development, Lansing, Michigan.

Design Architects and Engineers, Smith, Hinchman, and Grylls, Assoc. Inc., Detroit, Michigan. **Architect,** Sedgewick, Sellers, and Assoc., Inc., Flint, Mich. **Consulting Engineer,** Stellwagen, Di Clemente, and Mouw, Inc., Detroit, Michigan; **General Contractor,** The Christman Company, Lansing, Michigan; **Mechanical Contractor,** Spitzley Corporation, Mason, Michigan; **Electrical Contractor,** Lansing Electric Motors, Lansing, Michigan; **Sheet Metal Contractor,** Iowa Sheet Metal Contractors, Inc., Des Moines, Iowa; **Ceiling Systems Contractor,** Fiberglas Supply and Contracting, Detroit, Michigan.



Note the clean, uninterrupted ceilings in this Krueger Tri-Trol Air Trak installation. Partitions may be quickly and inexpensively mounted at any point along the Air Trak . . . or, instantly removed when desired.



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REQUIRED READING

Structural behavior

STRUCTURAL DESIGN IN ARCHITECTURE. *By Mario Salvadori and Matthys Levy. Prentice-Hall, Inc., Englewood Cliffs, New Jersey. 457 pp., illus. $17.30.*

A review by Anthony F. Nassetta

Many authorities have written traditionally in the form of analysis of structural systems or components without regard to quantitative solutions, suggesting that understanding structural behavior is not synonymous with understanding three-dimensional space relationships. Consequently, the architectural or engineering student who does not eventually specialize in structural design never can adequately bridge the mathematical gap between intuitive design and rigorous mathematical solution.

Too often a building design concept is committed before study is given to the structural components, because the designer lacks a system approach or a means of resolving structure and architecture simultaneously. He will invariably separate the two because he was taught to visualize space forms and to calculate structure.

The authors of *Structural Design in Architecture* have attempted to bring structure and architecture together in several ways. Each section of the book is cross-referenced with those sections of *Structure in Architecture* (a companion text written by Mario Salvadori and Robert Heller) where the same subject matter is presented in a purely intuitive manner. Each chapter separately treats almost every conceivable structural system in a basic analysis and design approach with a minimum of mathematics. The structural systems presented include space frames, shells, membranes, arches, grids, rigid frames, trusses, cables, beams, columns and plates. The 18 chapters contain 93 sections, with 151 illustrative examples each worked out to a meaningful conclusion. The methods presented are of particular value to the student in engineering or architecture in developing a "structural sense" needed for preliminary design. The book is prolific in diagrams and illustrations, is clear and orderly in mathematical treatment and comprehensively covers the systems most often used to enclose or define space.

Architects sometimes define structure as a means of enabling forces to change direction and the resistance to deformation while spanning spaces. This re-

Anthony F. Nassetta is a partner in the firm of Weiskopf & Pickworth, Consulting Engineers, New York, N.Y.

continued on page 281

NEW SPACE SAVER

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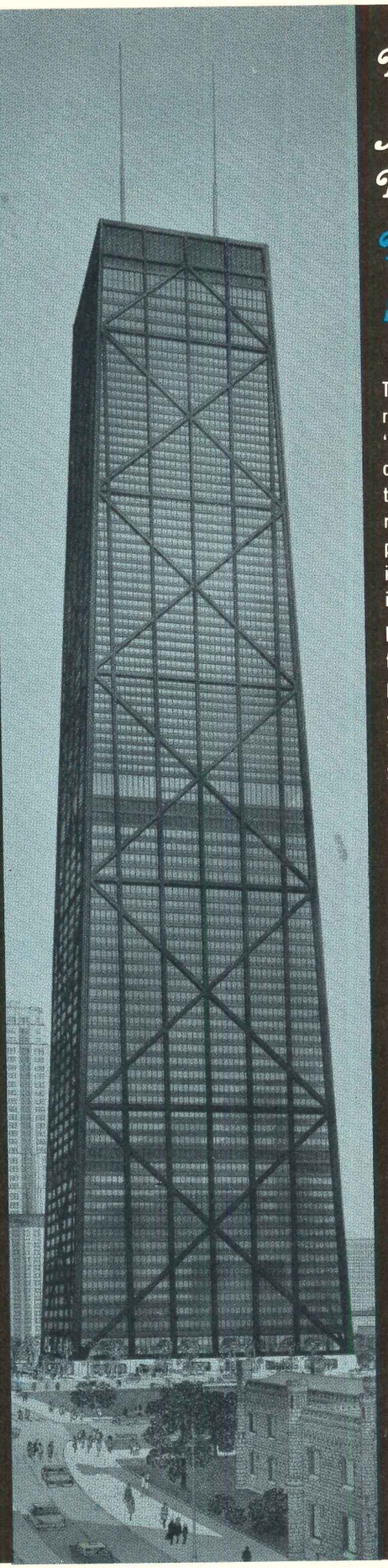

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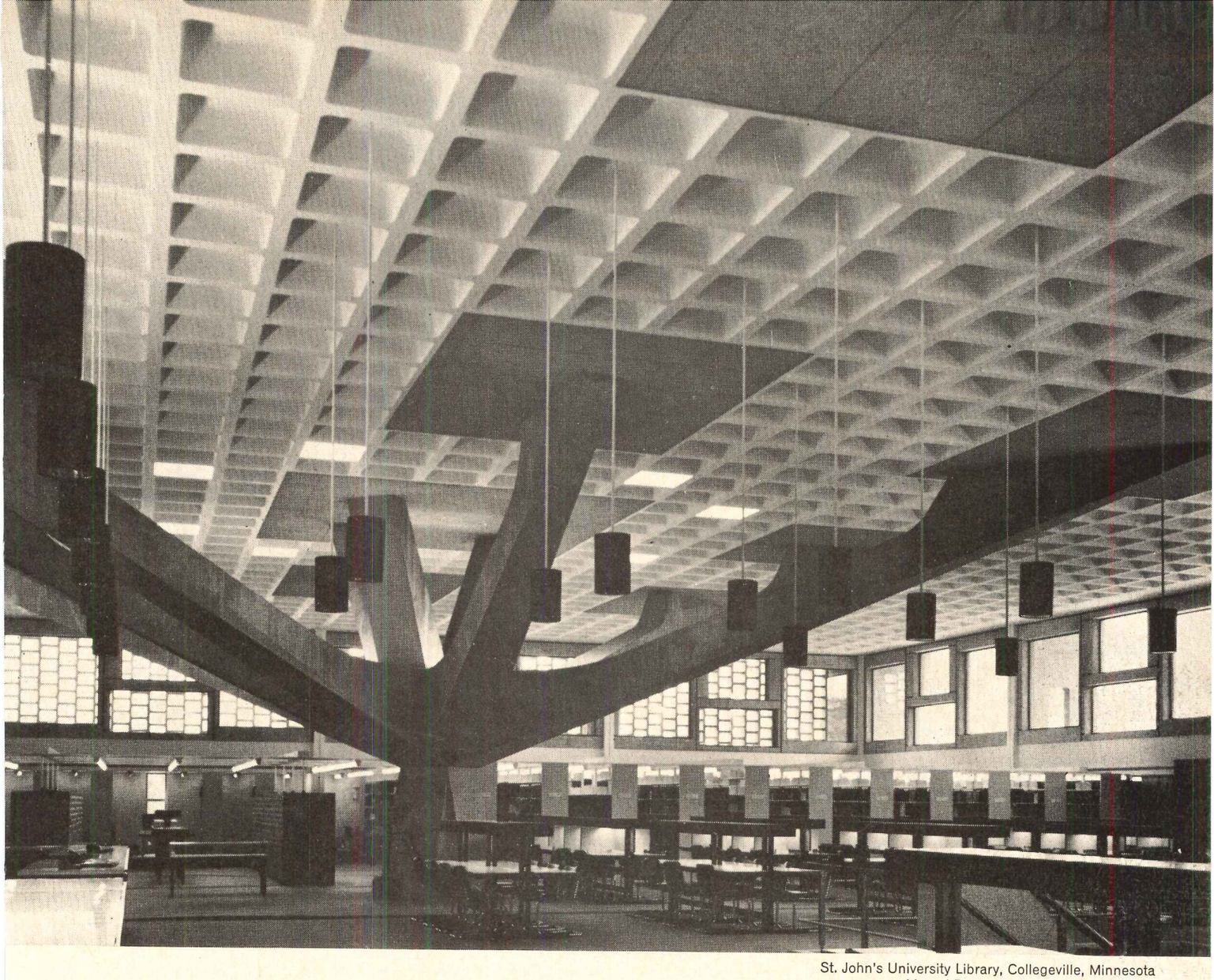

St. John's University Library, Collegeville, Minnesota
Marcel Breuer & Associates, architects
Johnston-Sahlman Company, structural engineers
Gunnar I. Johnson & Son, Inc., contractors
Ceco Steeldome Service for waffle-pattern monolithic concrete joist construction

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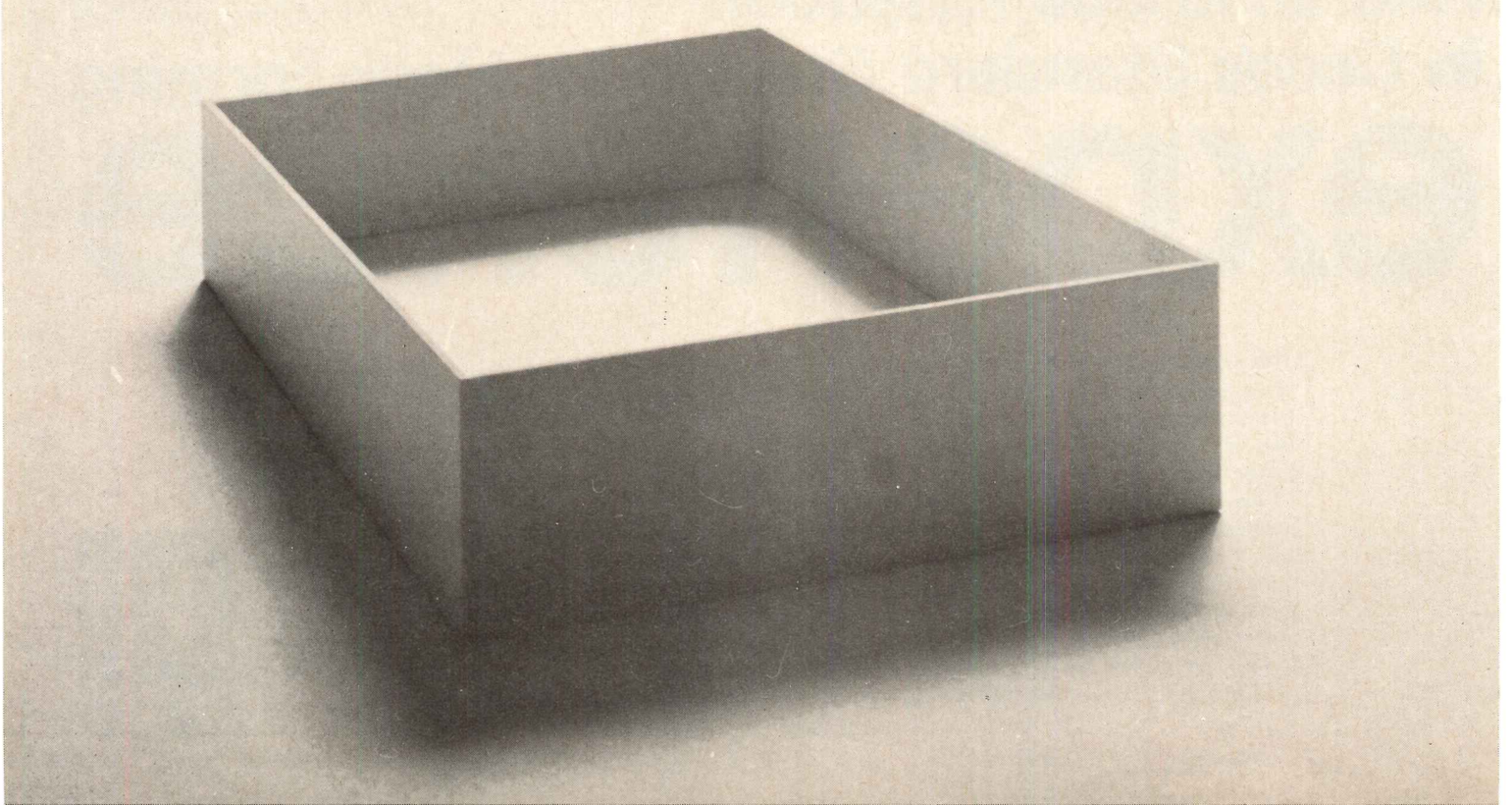

Check your local building codes for the many specific advantages you can gain for various types of structures when you design-in an "Automatic" Sprinkler system. To help, we have compiled some of the permissive clauses from the four major building codes, and put them into a booklet called, "The Code Book."
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The Uniform Building Code:
(SEC. 507) "The limits set forth in Table No. 5-D may be increased by one story if the building is provided with an automatic fire extinguishing system throughout . . ."

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The Southern Standard Building Code:
(SEC. 402.6) "The maximum allowable number of stories may be increased by one story if the building is provided with automatic sprinklers throughout."

The Basic Building Code: (SEC. 310.2) "Except in buildings where automatic sprinkler equipment is a requirement of article 4 or article 12 for special uses or occupancies, all structures of fireproof, non-combustible, and exterior masonry wall construction, designed for business, industrial, mercantile, low or moderate hazard storage uses may be erected one (1) story or twenty (20) feet higher than specified in table 6 when equipped with an approved one-source automatic sprinkler system."

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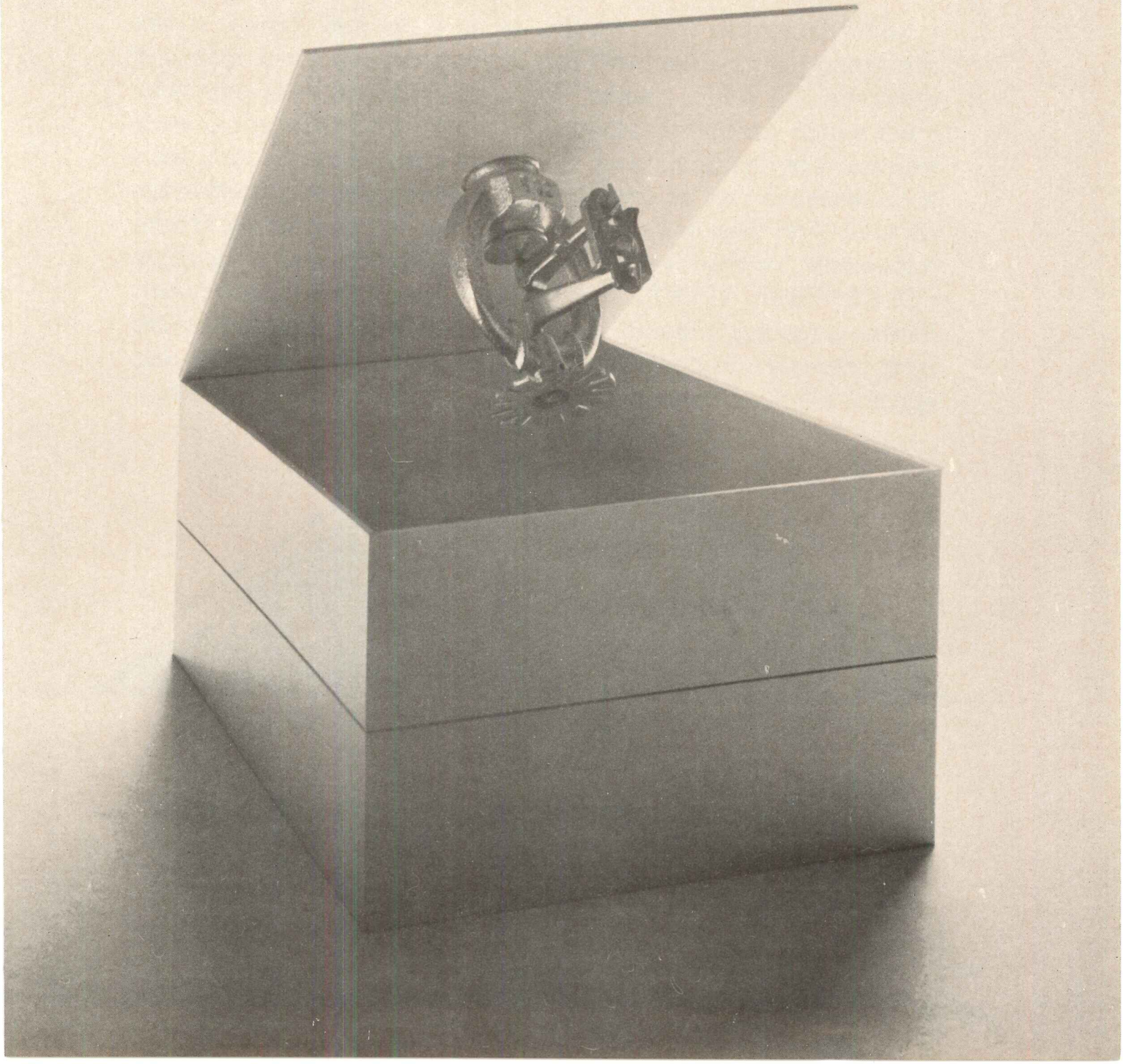

Speaking of roofs

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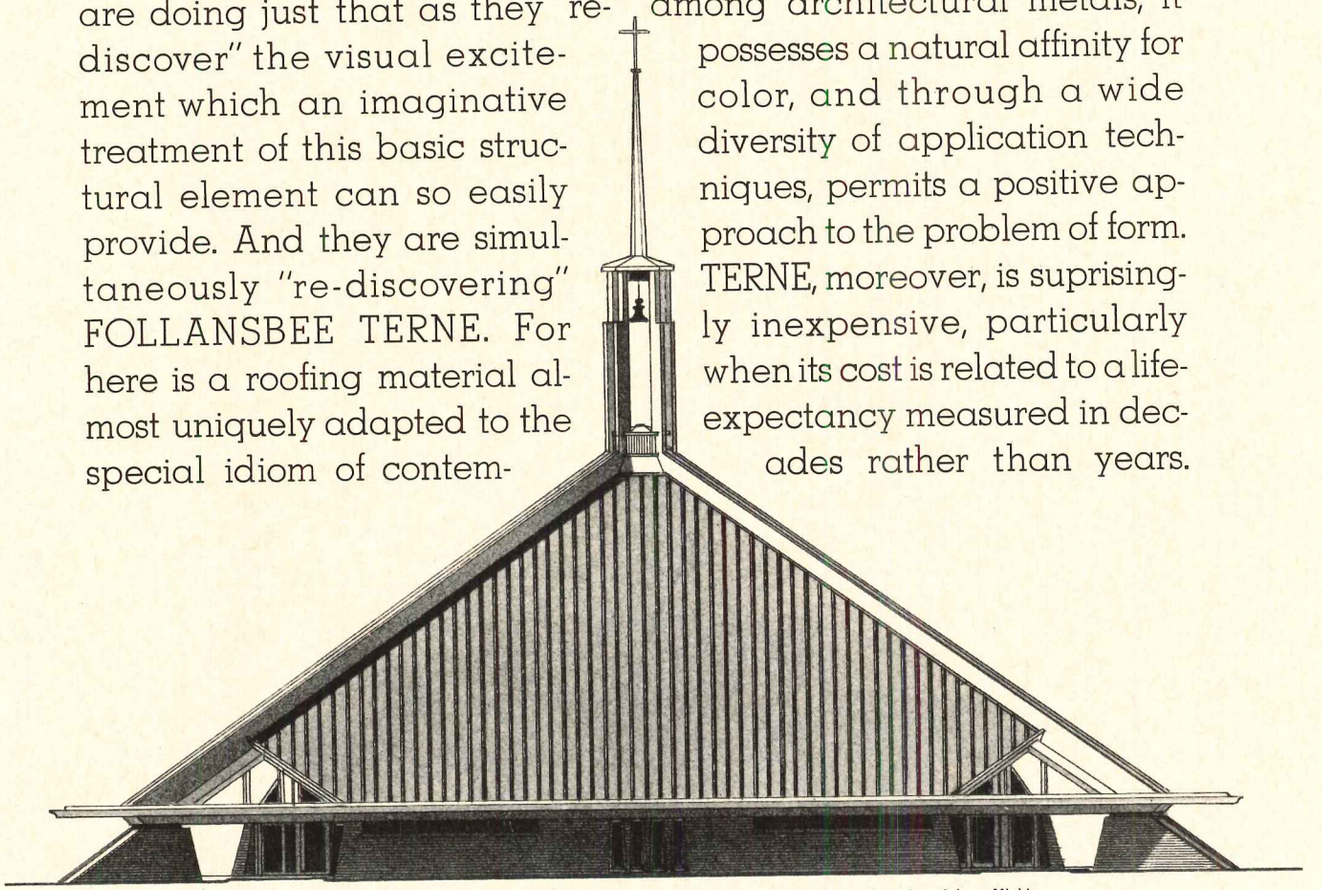

Concordia Lutheran Junior College — A College of the Lutheran Church, Missouri Synod — Ann Arbor, Michigan
Architect: Vincent G. Kling, FAIA Philadelphia, Pa. Roofing Contractor: Detroit Cornice & Slate—Detroit, Michigan

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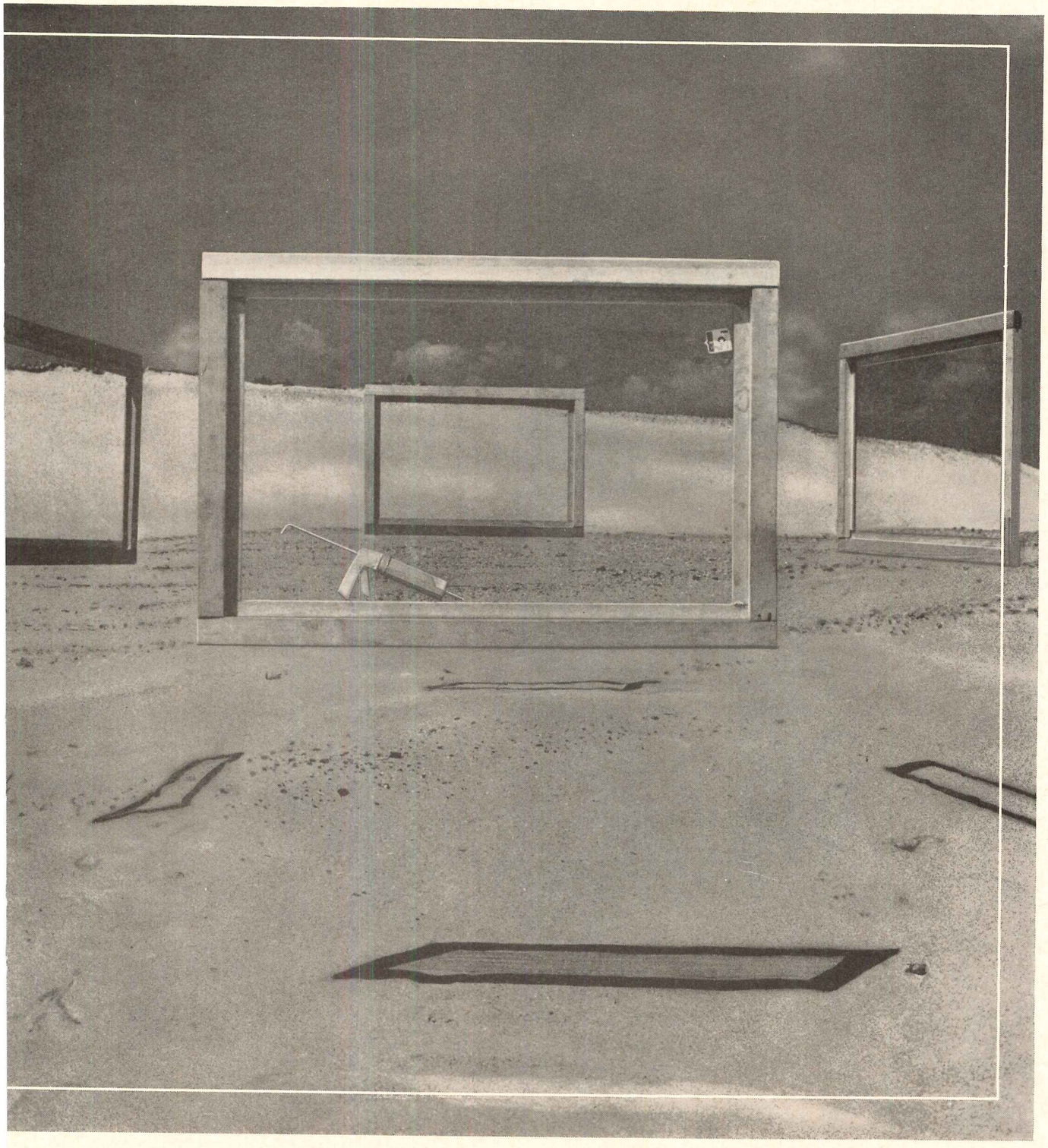

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continued from page 272

quires an added sense of structure. Additional sections and examples in the various chapters more fully describing the nature of deflections and deformations resulting from gravity loads (particularly in large flat roofs), wind loads, thermal loads, creep in concrete, prestressing, and seismic forces would give invaluable depth to a remarkably well done treatise.

A basic knowledge of structural systems, confidence in practical application, and mastery of the art is essential. The book provides the tool needed by both the student and practitioner to meet the growing demands of sophistication in modern architecture.

BOOKS RECEIVED

AN INTRODUCTION TO ENGLISH MEDIAEVAL ARCHITECTURE. *By Hugh Braun. Frederick A. Praeger, Publishers, 111 Fourth Avenue, New York, N.Y. 298 pp., illus. $17.50.*

NATIONAL AND REGIONAL PLANNING AND DEVELOPMENT IN THE NETHERLANDS: AN ANNOTATED BIBLIOGRAPHY, *Council of Planning Librarians Exchange Bibliography 47. By Dr. Gideon Golany. Mrs. Mary Vance, Editor, Post Office Box 229, Monticello, Ill. 61856. 38 pp. Paperbound, $4.00.*

PORTUGUESE PLANNING AND ARCHITECTURE ON THE SEA ROUTE TO THE ORIENT, *Council of Planning Librarians Exchange Bibliography 44. By Michael Hugo-Brunt. Mrs. Mary Vance, Editor, Post Office Box 229, Monticello, Ill. 61856. 53 pp. Paperbound, $5.00.*

HOUSING, RENEWAL AND REDEVELOPMENT BIBLIOGRAPHY, *Council of Planning Librarians Exchange Bibliography 46. By William L. C. Wheaton, William C. Baer, and David M. Vetter. Mrs. Mary Vance, Editor, Post Office Box 229, Monticello, Ill. 61856. 44 pp. Paperbound, $4.50.*

ARCHITECTURE IN TRANSITION. *By Constantinos A. Doxiadis. Oxford University Press, 200 Madison Avenue, New York, N.Y. 10016. 200 pp., illus. Paperbound, $1.75.*

CHURCH ARCHITECTURE AND LITURGICAL REFORM. *By Theodor Filthaut. Helicon Press, Inc., 1120 N. Calvert Street, Baltimore, Md. 21202. 109 pp., illus. Paperbound, $1.75.*

THE RETIREMENT RESIDENCE: AN ANALYSIS OF THE ARCHITECTURE AND MANAGEMENT OF LIFE-CARE HOUSING. *By James Frush, Jr. and Benson Eschenbach, A.I.A. Charles C. Thomas, Publisher, 301-327 East Lawrence Avenue, Springfield, Ill. 108 pp., illus. $5.75.*

LIBRARY TECHNOLOGY AND ARCHITECTURE, *Report of a conference held at the Harvard Graduate School of Education, Harvard University, Cambridge, Mass. 51 pp. Paperbound, $11.00.*

DESIGN OF THE HOUSING SITE, A CRITIQUE OF AMERICAN PRACTICE. *By Robert D. Katz. Small Homes Council-Building Research Council, University of Illinois, Urbana, Ill. 61801. 223 pp., illus.*

DRAWING AS A MEANS TO ARCHITECTURE. *By William K. Lockard, Reinhold Book Corporation, 430 Park Avenue, New York, N.Y. 10022. 96 pp., illus. $10.95.*

AIR TRANSPORTATION 1975 AND BEYOND: A SYSTEMS APPROACH, *Report of the Transportation Workshop, 1967. Edited by B. A. Schriever and William N. Seifert. The MIT Press, 50 Ames Street, Cambridge, Mass. 02142. 516 pp., illus. $20.00.*

KAUAI AND THE PARK COUNTRY OF HAWAII. *By Robert Wenkam. Sierra Club Books, The Book Warehouse, Ind., Vreeland Avenue, Borough of Totowa, Paterson, N.J. 07512. 158 pp., illus. $25.00.*

continued on page 286

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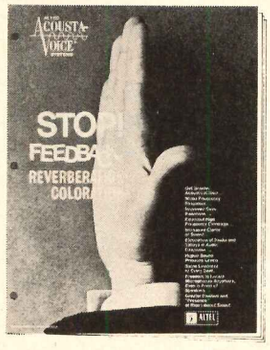

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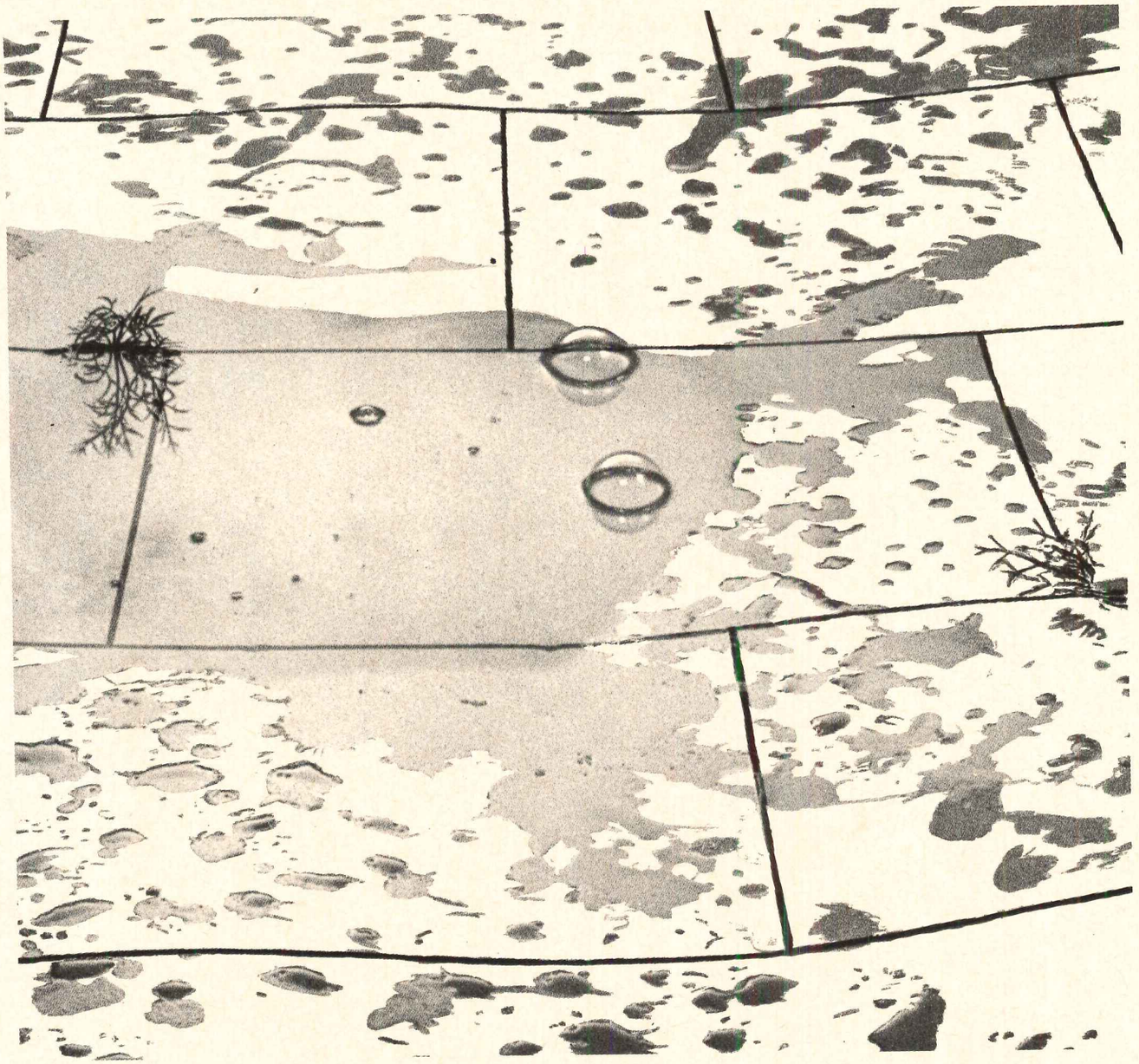
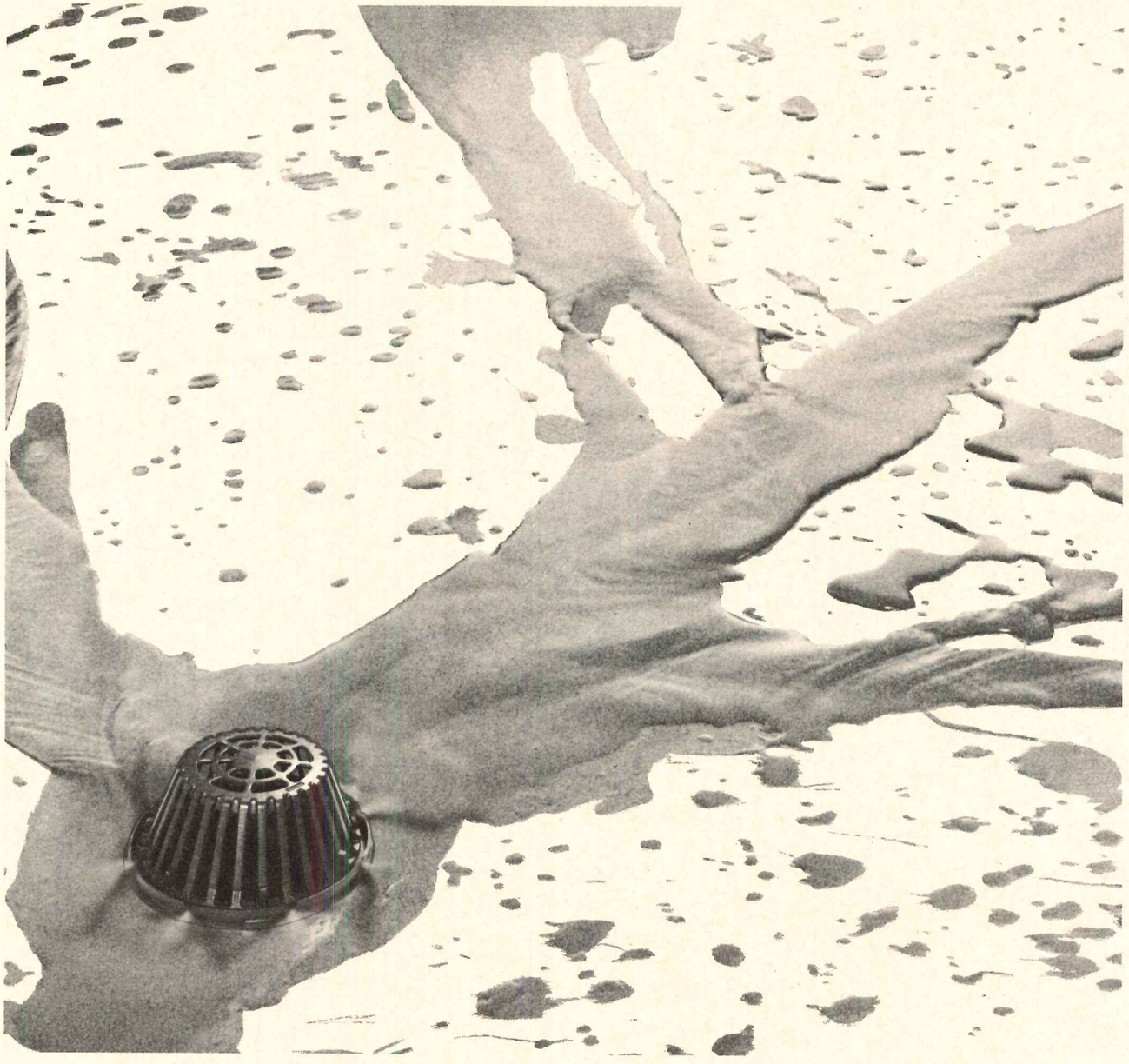


Seamy roof decks have problems



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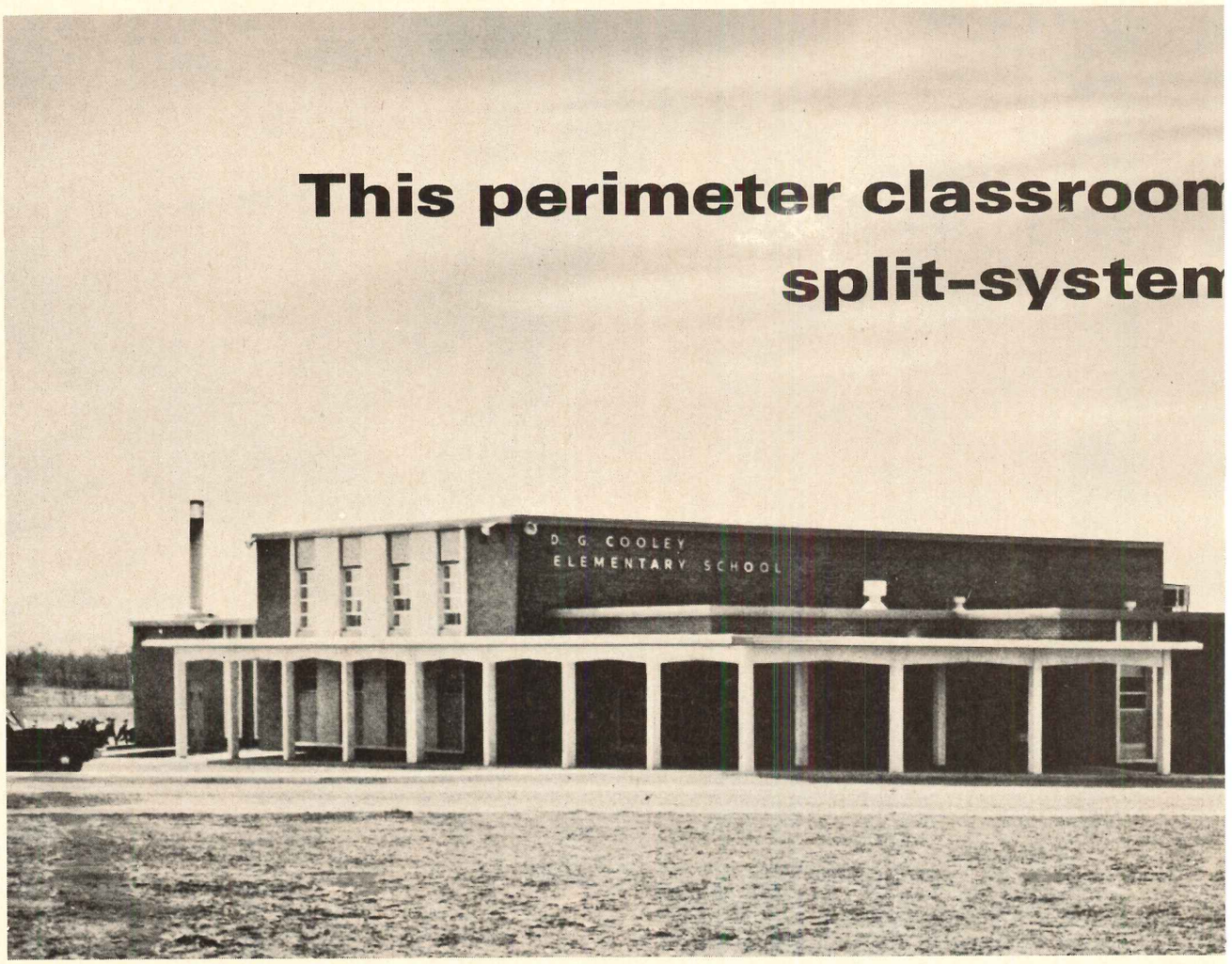
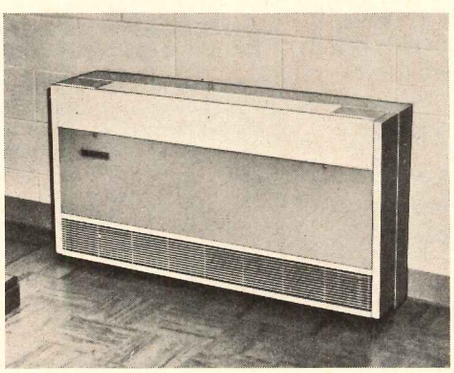
This perimeter classroom
split-system



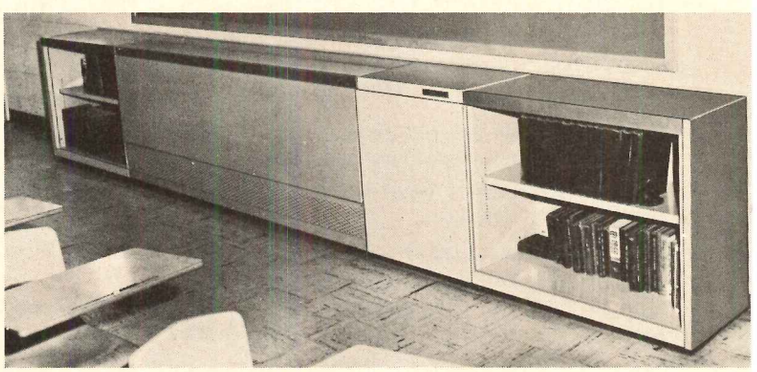
The one-story D. G. Cooley Elementary School in Berryville, Virginia, needed a variety of air systems for its 15 perimeter classrooms, two courtyard rooms, auditorium, administrative offices, and faculty lounges.

Many precise needs. *One* supplier. AAF/Herman Nelson. In the classrooms and library, SC UNIvent unit ventilators provide a year-round thermal environment: electric heating, air conditioning, and fresh air ventilating. The units require no complex, space-consuming central system. Each SC UNIvent is fully self-contained for independent operation. SC NELSON/aire cabinet heating and cooling units do similar jobs in the smaller offices.

An AAF Audivent unit ventilator meets the thermal requirements in the school's auditorium and

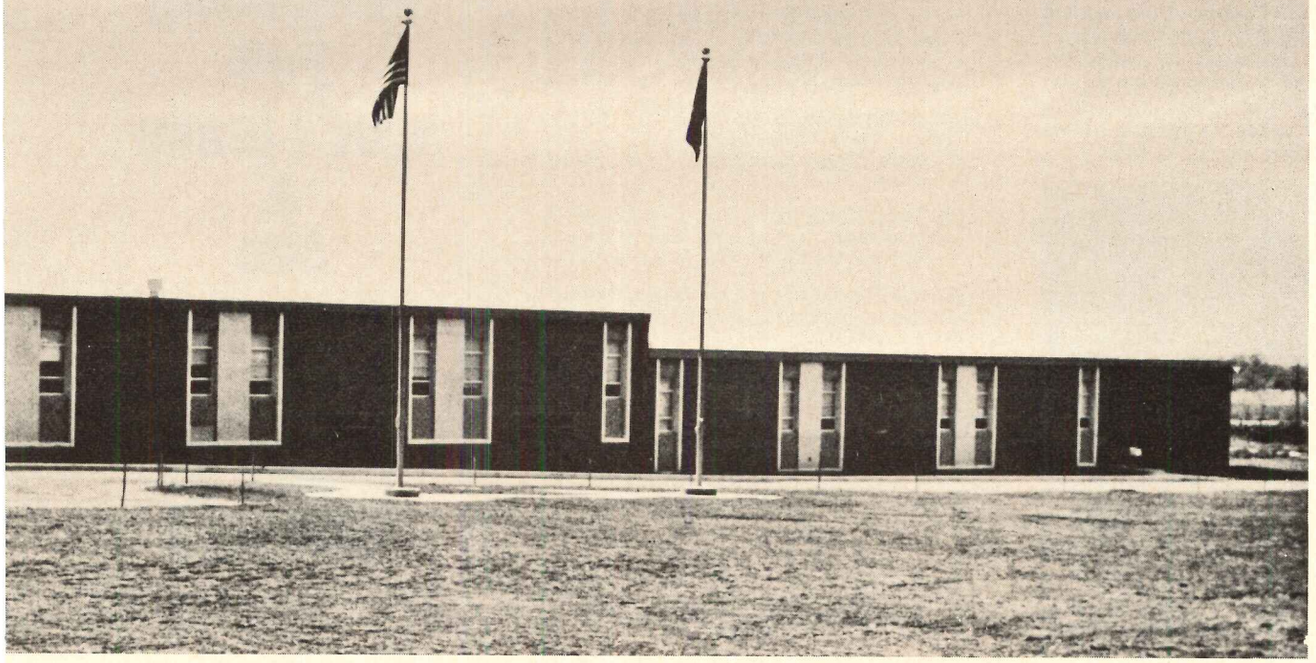


Smartly styled SC NELSON/aire cabinet units bring independent air conditioning, heating and ventilating into smaller areas such as administrative offices.



SC UNIvent classroom unit ventilators feature self-contained refrigeration, electrical hea and up to 100 per cent fresh air ventilation for perimeter classrooms. Matching acces cabinets provide convenient storage for books and teaching aids.

design calls for
heating, cooling, ventilating

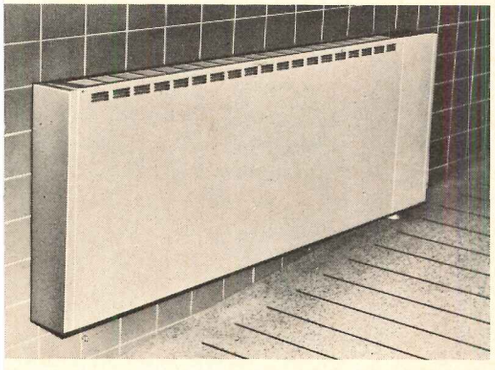


Clarke County, Virginia, Superintendent of Schools: Mr. Robert A. Wood • Architect: Dixon and Norman, Richmond, Virginia • Engineer: Wagner and Jones, Richmond, Virginia • General Contractor: Howard Shockey and Sons, Inc., Winchester, Virginia • Electrical Contractor: Baker and Anderson Electrical Co., Winchester, Virginia.

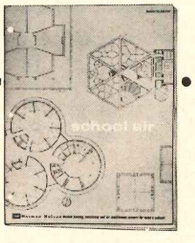
multi-purpose room; ceiling unit ventilators take care of the teachers' lounges. Each of these units has a remote condensing unit on the roof.

The first building in what will be an elementary-junior high school complex on fifty landscaped acres, the D. G. Cooley Elementary School features a well-integrated, balanced atmosphere for teaching and learning . . . at a low cost per pupil. The key to it is AAF/Herman Nelson's school air flexibility. Write for a copy of our booklet *School Air* which explains in detail how this flexibility—and a full line of school air products—can help you.

AAF Herman Nelson
SCHOOL PRODUCTS DIVISION



F space-saving electric convection-type heaters
g the walls to provide clean, dependable warmth
hallways.



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American Air Filter Company, Inc.
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☐ Please send a copy of "SCHOOL AIR" brochure.

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for the life of your building, put WASCO® in your plans

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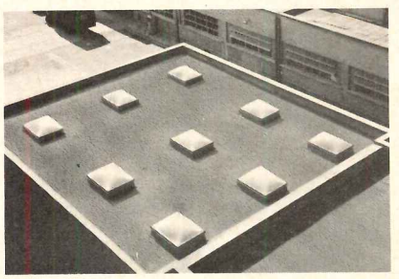

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REQUIRED READING

continued from page 281

DE VITRUVE A LE CORBUSIER TEXTES D'ARCHITECTES. *By G. Uniack. Dunod, 92, rue Bonaparte, Paris, VI 160 pp., illus. 48 F.*

CORROSION GUIDE. *By Erich Rabald. American Elsevier Publishing Company, Inc., 52 Vanderbilt Avenue, New York, N.Y. 10017. 1,009 pp., illus. $60.00.*

A HISTORY OF ARCHITECTURE IN ENGLAND. *By T. W. West. David McKay Company, Inc., 750 Third Avenue, New York, N.Y. 10017. 176 pp., illus. $4.95.*

A HISTORY OF ARCHITECTURE IN SCOTLAND. *By T. W. West. David McKay Company, Inc., 750 Third Avenue, New York, N.Y. 10017. 208 pp., illus. $6.95.*

MATRIX ANALYSIS FOR STRUCTURAL ENGINEERS. *By William M. Lucas, Jr. Prentice-Hall International Series in Theoretical and Applied Mechanics, Prentice-Hall, Inc., Englewood Cliffs, N.J. 364 pp., illus. $12.95.*

COMPUTERS IN ARCHITECTURAL DESIGN. *By David Campion. American Elsevier Publishing Company, Inc., 52 Vanderbilt Avenue, New York, N.Y. 10017. 320 pp., illus. $12.50.*

THE ARCHITECTURE OF HISTORIC RICHMOND. *By Paul S. Dulaney. The University Press of Virginia, Charlottesville, Va. 208 pp., illus. Paperbound, $2.45.*

NEW YORK NEW YORK: *A study of the quality, character and open space in urban design. By Lawrence Halprin and Associates. A study prepared for the city of New York. New York Department of Housing Development, 110 Church Street, New York, N.Y. 10007. 119 pp., illus.*

THE CONCEPT OF AN OPTIMUM SIZE CITY. *By William A. Howard. Council of Planning Librarians Exchange Bibliography 52. Mrs. Mary Vance, Editor, Post Office Box 229, Monticello, Ill. 61856. 5 pp. Paperbound, $1.50.*

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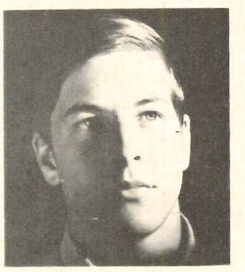
Success is something you can't leave a son



In today's complex and specialized world, success depends more and more on whether he gets a college education.

But he may not be able to get one unless the nation's colleges can answer some serious questions: How to cope with rapidly increasing student enrollments? How to keep the quality of education constantly improving with more modern laboratories, better libraries, new classrooms? How to attract able new faculty members?

Your support will help colleges answer these questions . . . help them make your son ready for his world.

Give to the college of your choice.

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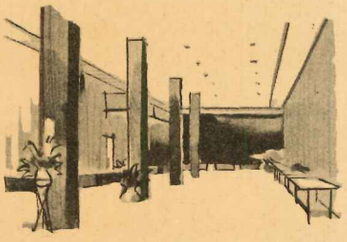
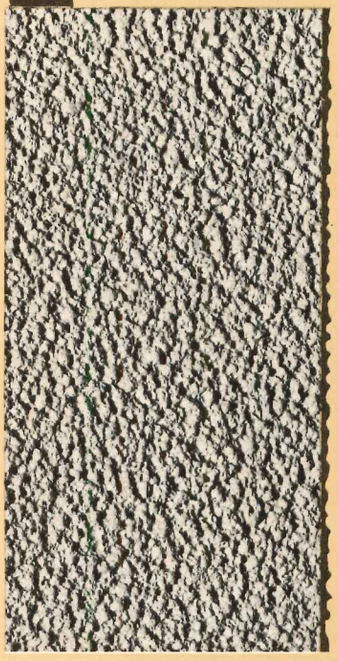
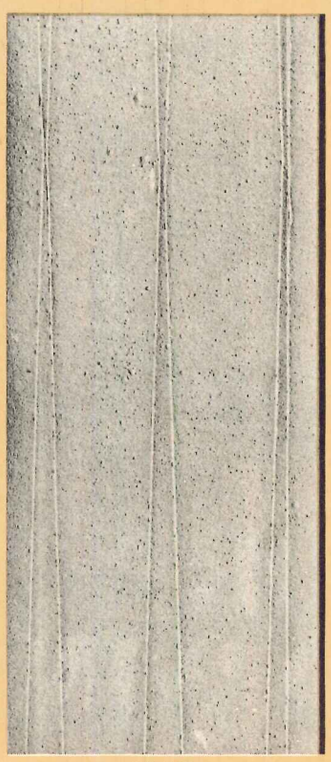
"In my designs, I stress simplicity and purity of line. Are there vinyl wallcovering patterns that will harmonize with these concepts?"

Yes, VICRTEX® ARCHITECTURAL PATTERNS

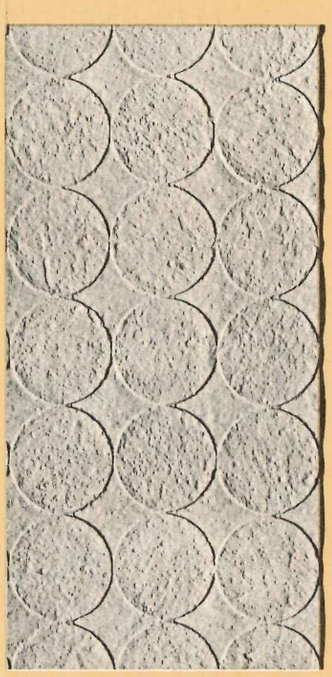




ALPHA



LINNEA



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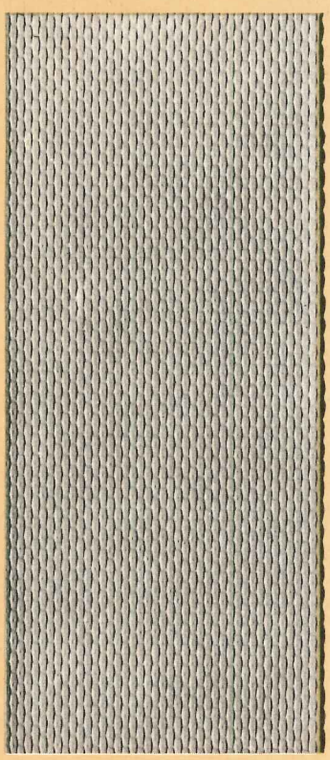
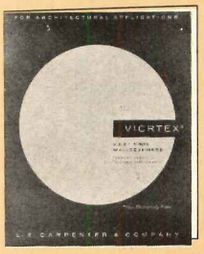


SEMITONE



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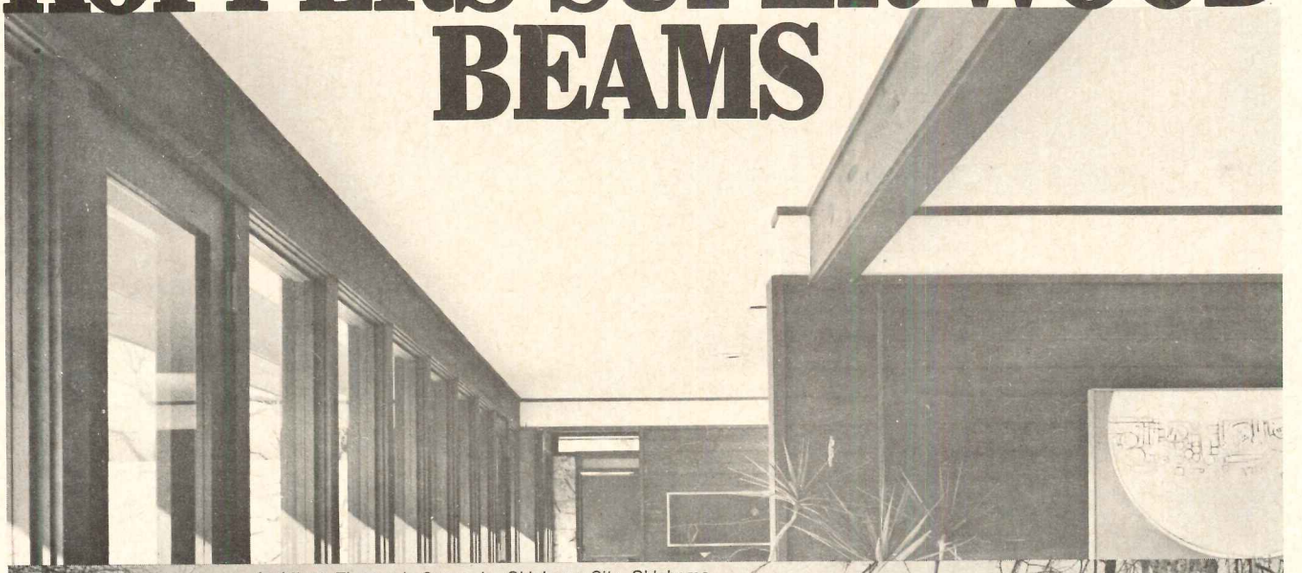
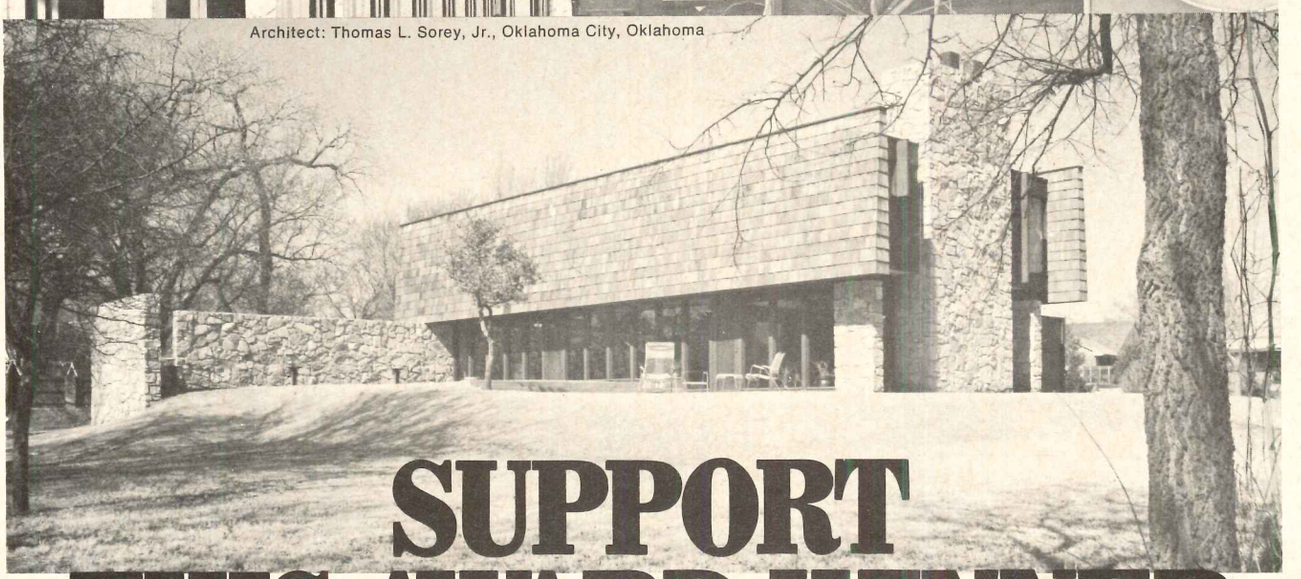
KOPPERS SUPER WOOD BEAMS



Architect: Thomas L. Sorey, Jr., Oklahoma City, Oklahoma



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KOPPERS
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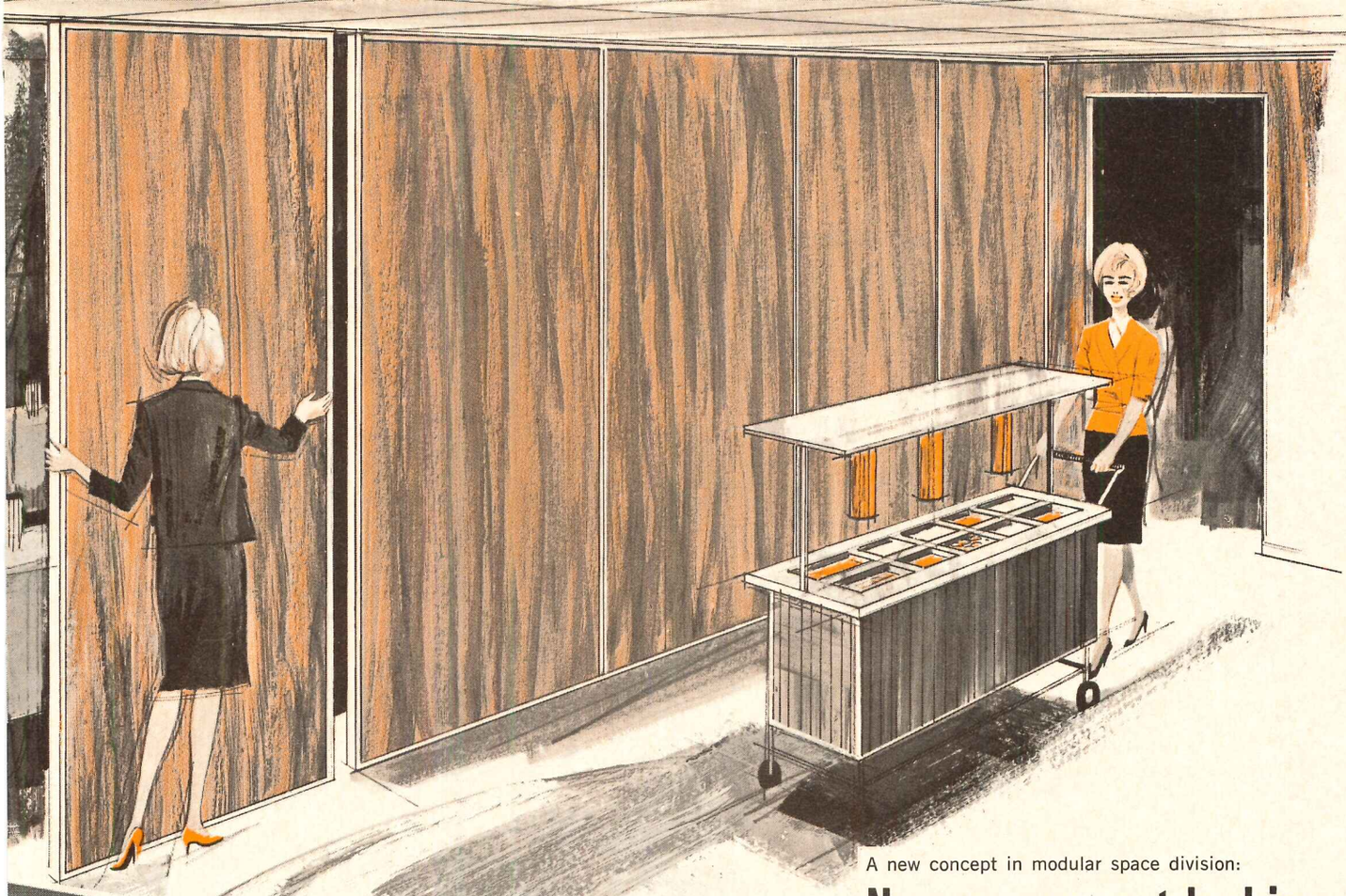

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Beautiful Kwik-Wall movable walls make it fast and easy to divide large areas into smaller profitable rooms. A choice of more than 1526 high-fashion laminates, vinyls, prefinished hardwood, print grains and unfinished ready-to-paint surfaces gives this movable wall a permanent look that will complement your decor. Both the fully portable units and the ceiling track-mounted Kwik-Wall movable walls have sound retardant qualities. Both lock solidly into position with a simple one-hand lever operation. Matching walk-thru doors are available for either style. For more information, send coupon today.

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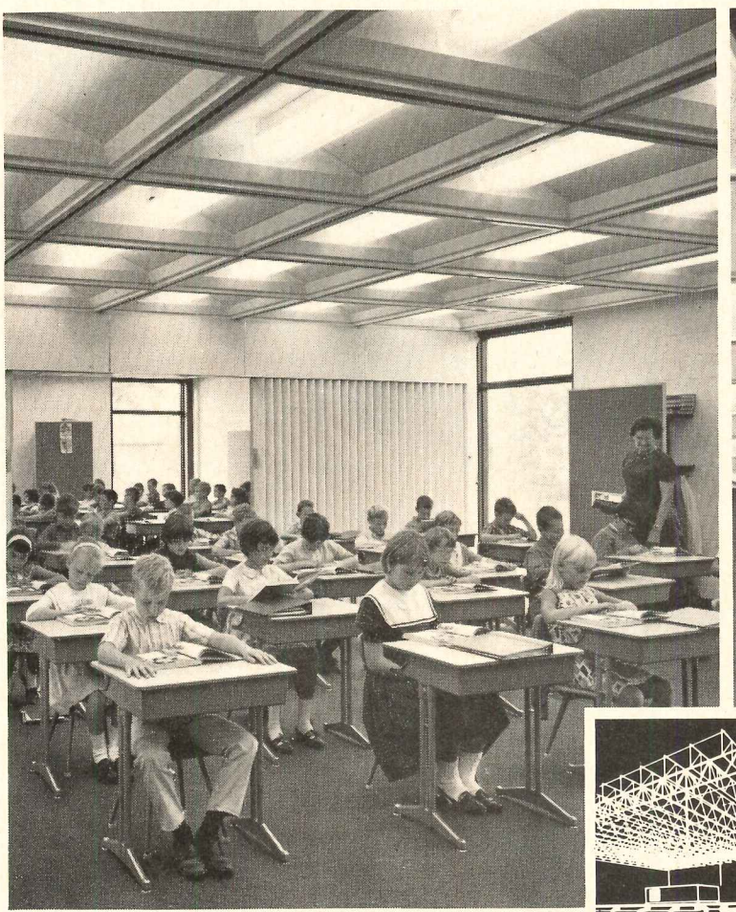
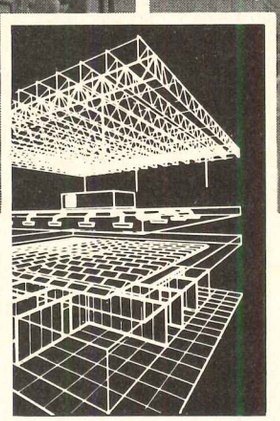
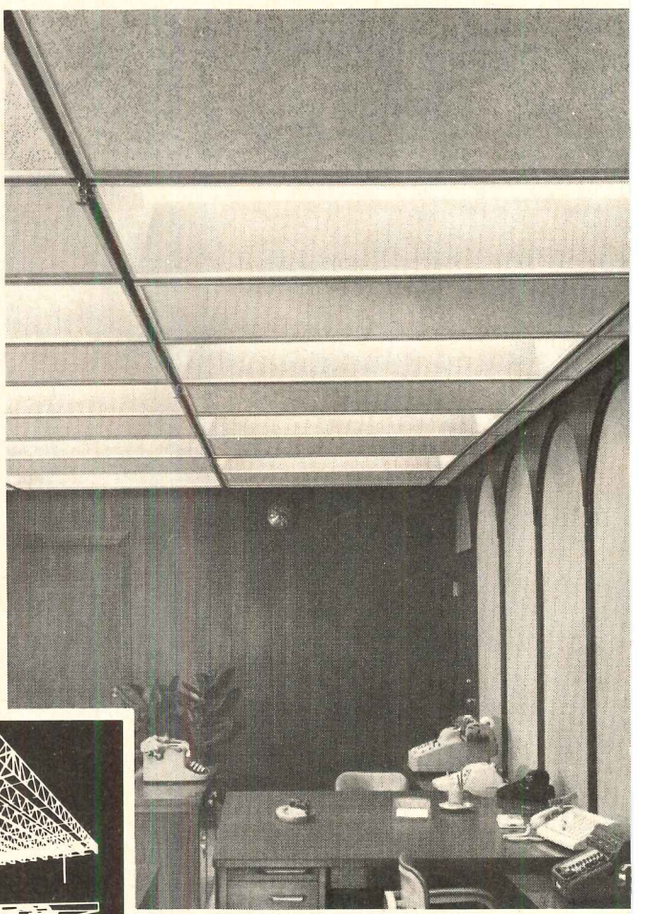
THE MACOMBER V-LOK® MODULAR COMPONENT SYSTEM:

VLMC flexibility



TEC VI BY LUMINOUS CEILINGS INC.





ARMSTRONG C-60 LUMINAIRE

No VLMC building need ever become obsolete. The V-LOK Modular Component system allows for remodeling the interior quickly and economically, at any time, to fit the changing needs of the future. All interior components — air handling equipment, lighting-ceiling systems and partitions — can be rearranged to create entirely new environments. The total building can be expanded harmoniously to accommodate growing space requirements. This lasting flexibility is one of the reasons why VLMC is America's foremost systems approach to building construction.

Macomber Incorporated supplies the heart of the system, which is V-LOK® steel framing that interlocks for quick and positive joining of members. Macomber also supplies the steel floor and roof decking. There are at least two nationally-known suppliers for each of the other components, providing a variety of design options, all compatible with the basic five-foot module. Once the steel frame has been erected, these factory-finished components are fitted into place with a minimum of on-site work.

The result is quicker occupancy in a superior building — more versatile and adaptable than the total cost would otherwise permit.

LIGHTING-CEILING SYSTEMS

Modern lighting-ceiling systems, compatible with

includes choice of versatile ceilings

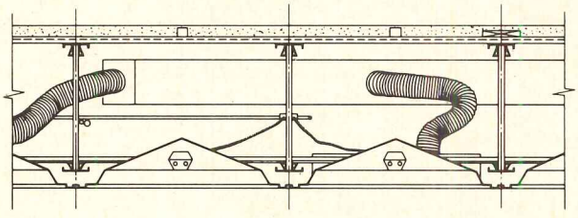
the basic module, contribute to the flexibility and economy of VLMC structures. Their economy stems partly from the fact that they combine the separate functions of enclosure, lighting, ventilating and acoustical control in one highly efficient, fully integrated package, while providing an important feature of the interior decorating scheme.

Many variations in design are possible with each system. Light control and sound attenuation can be calculated precisely in advance; supply-air and return-air distribution can be varied for individual area requirements. Customized design becomes a reality without the penalty of extra construction time or cost. Two of the most popular compatible ceiling systems are described below.

THE TEC VI BY LUMINOUS CEILINGS INC.

This sturdy system offers great flexibility within the five-foot-square module. Flat panels, interchangeable with lighting coffers, form eye-pleasing patterns while maintaining performance, flexibility, and economy.

Several fixture options are available. They offer the designer his choice of direct lighting, luminous indirect or total luminous ceilings.

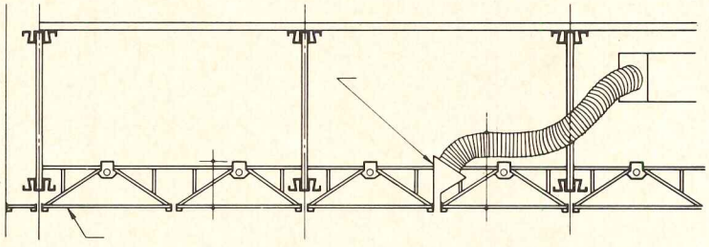


Sound absorption and attenuation are provided by mineral or fiberboard panels measuring two feet by four feet. Conditioned air enters the room through linear air diffusers mounted on the module line. Adjustable return-air dampers are located in the crown of the coffer, removing lighting heat.

The ceiling system is attached to the VLMC framing by means of exclusive adjustable leveling devices, and meets the standards established for the California School Systems.

ARMSTRONG C-60 LUMINAIRE

The C-60 Luminaire Ceiling System offers maximum flexibility. Within a five-foot area, a combination of vaulted and flat 30" x 60" modules can be arranged eight different ways. Luminaire units can be added, removed, or exchanged, even after the ceiling is installed. The system can deliver air by the ceiling-wide method (ventilating) or the point-source method (linear diffuser). It also offers several methods of air return.



C-60 Luminaire delivers about 15% more light output than a highly efficient recessed troffer system using the same number of lamps. And its mineral fiber ceiling panels provide UL-rated fire protection and excellent acoustical control.

The C-60 suspended grid attaches to the VLMC framing and provides a level plane for the attachment of the ceiling.

For more information on the Macomber V-LOK Modular Component system, contact your local Macomber Representative, or write to *Macomber Incorporated, Canton, Ohio 44701.*

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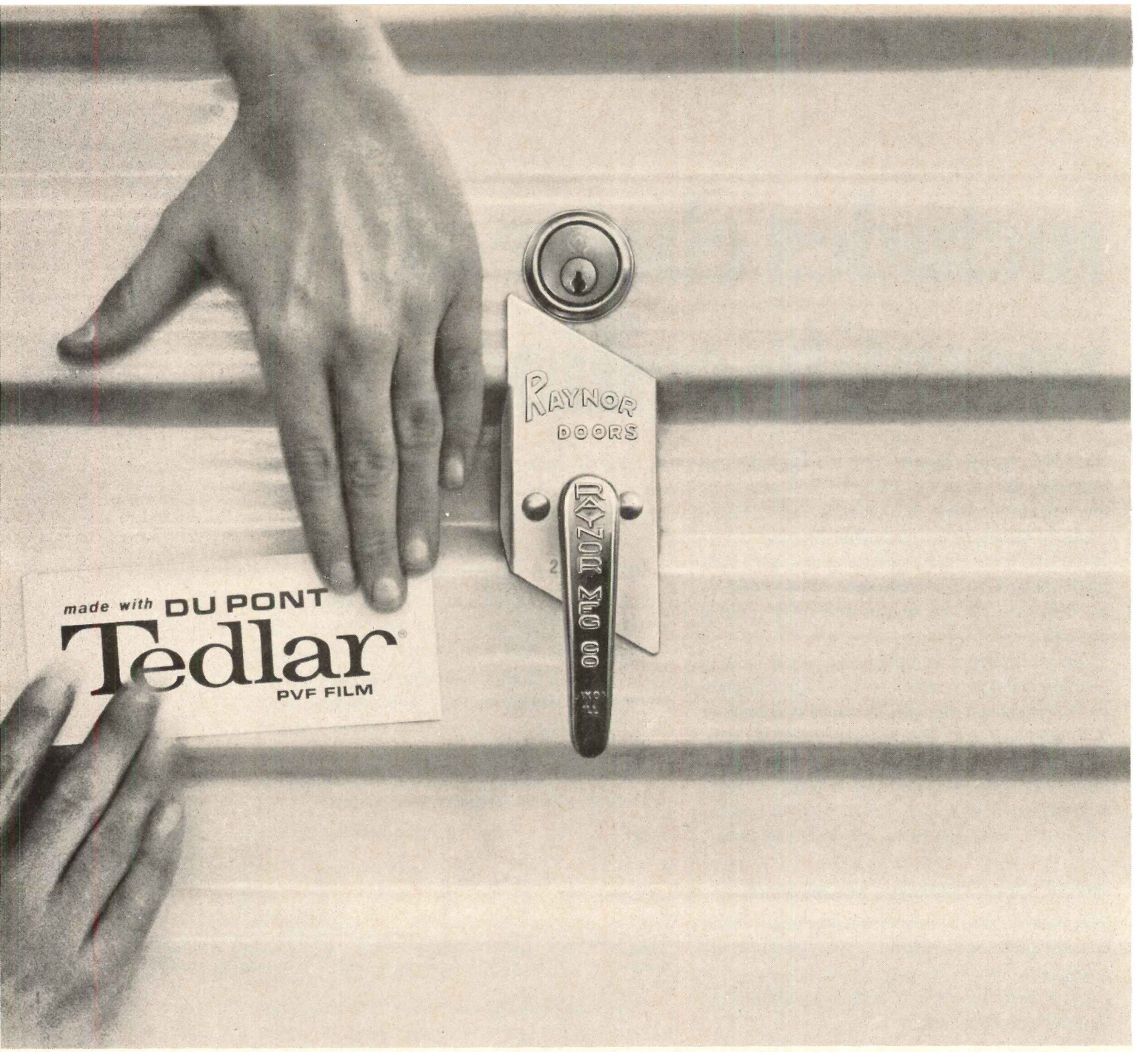

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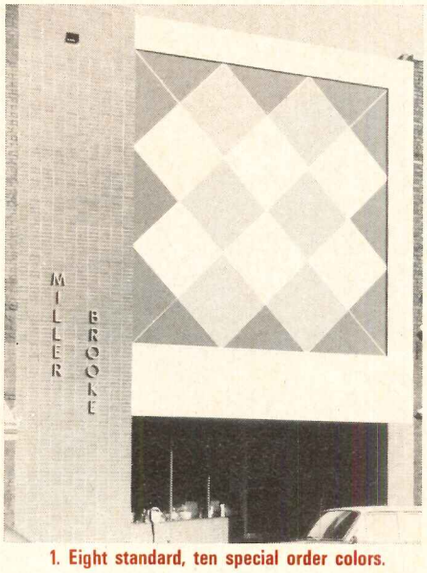
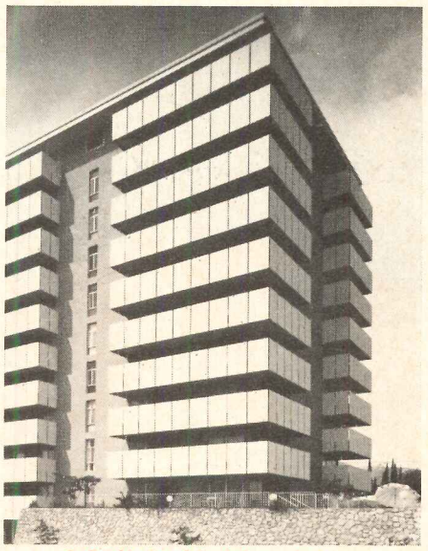
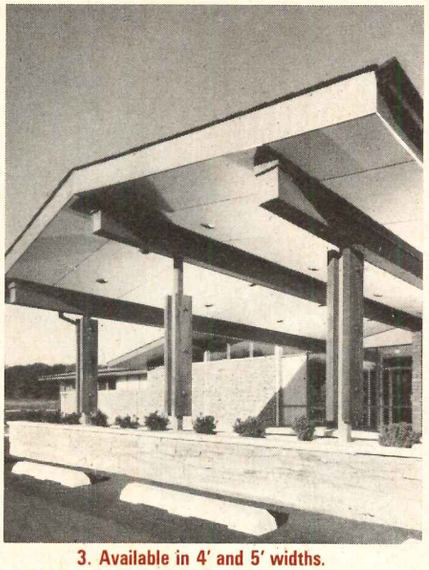


1. Eight standard, ten special order colors.



2. Double-faced for balcony designs.



3. Available in 4' and 5' widths.

4. Class I flame spread rating.

5. Outstanding dimensional stability.

6. Guaranteed not to need refinishing for 15 years.

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I'm interested in more information on Weyerhaeuser Prefinished Siding/Panel 15.

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City_____ State_____ Zip_____

Weyerhaeuser

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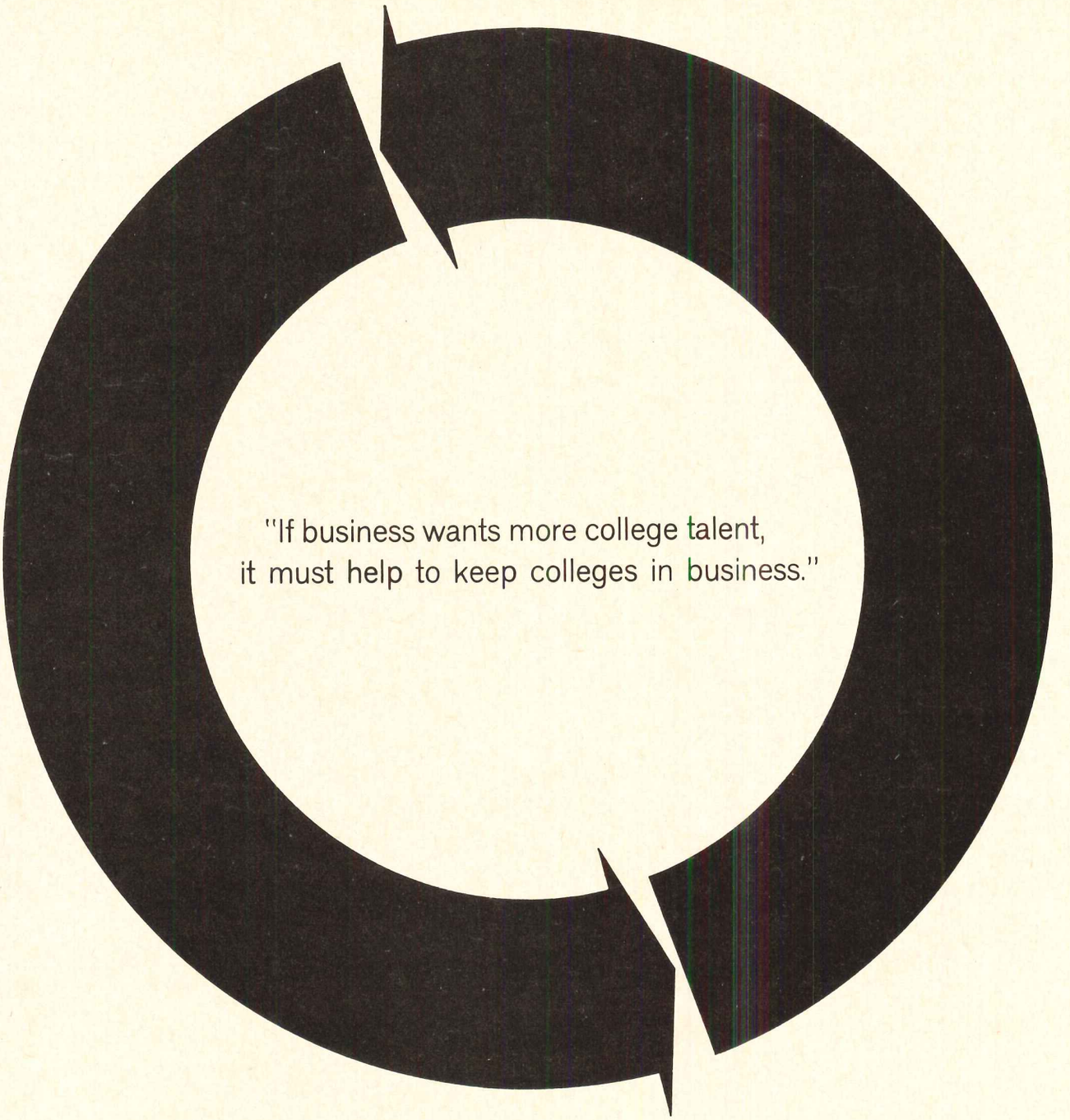

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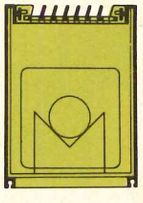
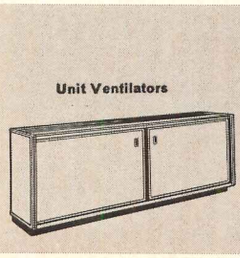
AN EXCITING NEW CONCEPT IN RADIATION ENCLOSURES

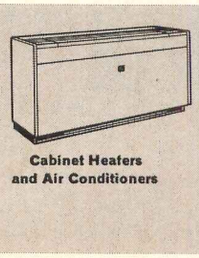
naturally it's **SCHEMENAUER**

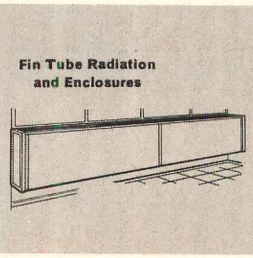


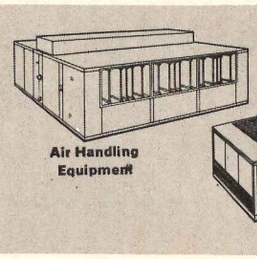
Extruded aluminum has made stamped metal radiation enclosures something architects no longer have to put up with. And Décor is the reason. Décor is Schemenauer's totally new concept in enclosures for electric, hot water or steam heating elements. Standard models are anodized aluminum while custom models, in various heights, are available in aluminum, vinyl clad steel, stainless steel and enameled steel — all with extruded aluminum grilles. Here, for the first time, is a unit that enhances any architectural motif while providing unparalleled strength. In addition to ease of installation, its unique design incorporates easy-to-open hidden dampers. Available in five separate models with a full range of sizes, air flow arrangements, dampers and inlet grilles, Décor has just made other enclosures old fashioned. Write for catalog 970 or see your local Schemenauer representative. Schemenauer Manufacturing Company, Holland, Ohio 43528

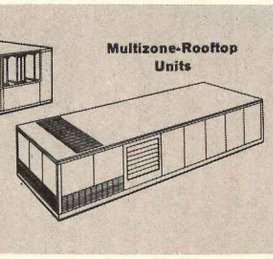
For assurance of quality in heating, air conditioning and ventilating equipment, insist on this Schemenauer benchmark.







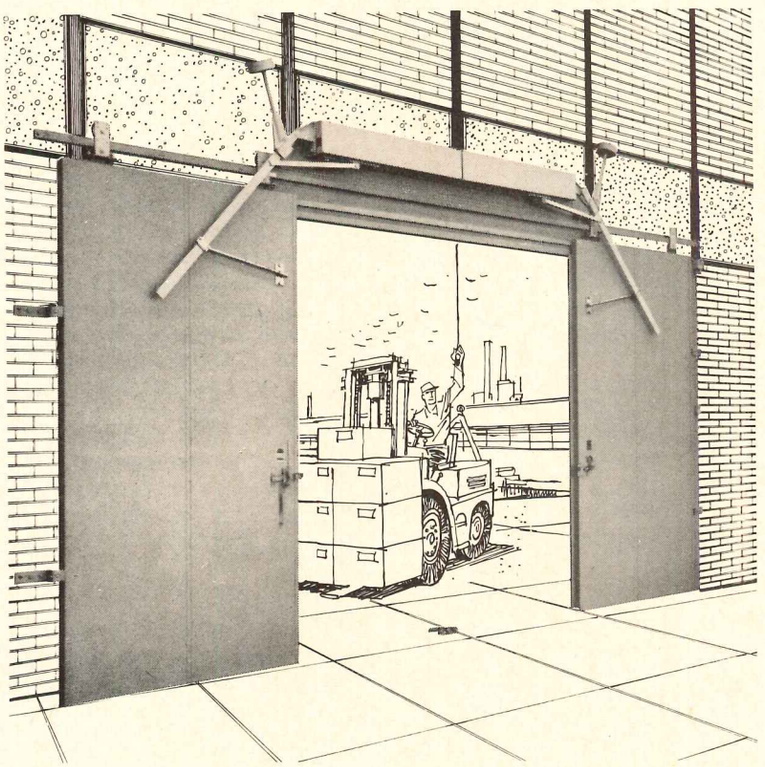




For more data, circle 175 on inquiry card

The automatic fire door

Completely functional. Functionally automatic.



That's Steelcraft's automatic J-sliding labeled fire door. Clean, flush design. Looks like it belongs, not just something to be tolerated.

The complete package . . . door, pneumatic operator and controls all listed with Underwriters' Laboratories and Factory Mutual inspection procedures:

- The door . . . flush, 18-gage steel rated for up to 3 hours of fire protection, class A rating.
- The hardware . . . designed for heavy duty, high frequency use.
- The operator . . . pneumatic and simple design means low operating costs.
- The controls . . . performance proven plus fail-safe fire protection.

Single sliding and bi-parting packages are available.

The automatic J-door is also available in non-label construction. For more information, write Steelcraft, 9017 Blue Ash Road, Cincinnati, Ohio 45242 U.S.A.

STEEL Craft **Steelcraft**®
finest name in metal doors and frames

For more data, circle 176 on inquiry card

Introducing monolithic UNITY* Ceiling Tile

From Conwed...a non-directional pattern made by the wet-felted process

Our new *Conwed*® Unity pattern gives you the beauty and design versatility of a conventional, non-directional ceiling tile . . . but none of the conventional disadvantages. You see, this 12" x 12" tongue and grooved mineral fiber tile is made by the wet-felted process. Which means it has superior dimensional stability and can be machined more accurately . . . to minimize joint lines for a neater, more monolithic appearance.

Moreover, when you specify our new *Conwed* Unity pattern as slotted ventilated tile, you'll find it offers low air porosity. Which means you also get more accurate control over air distribution.

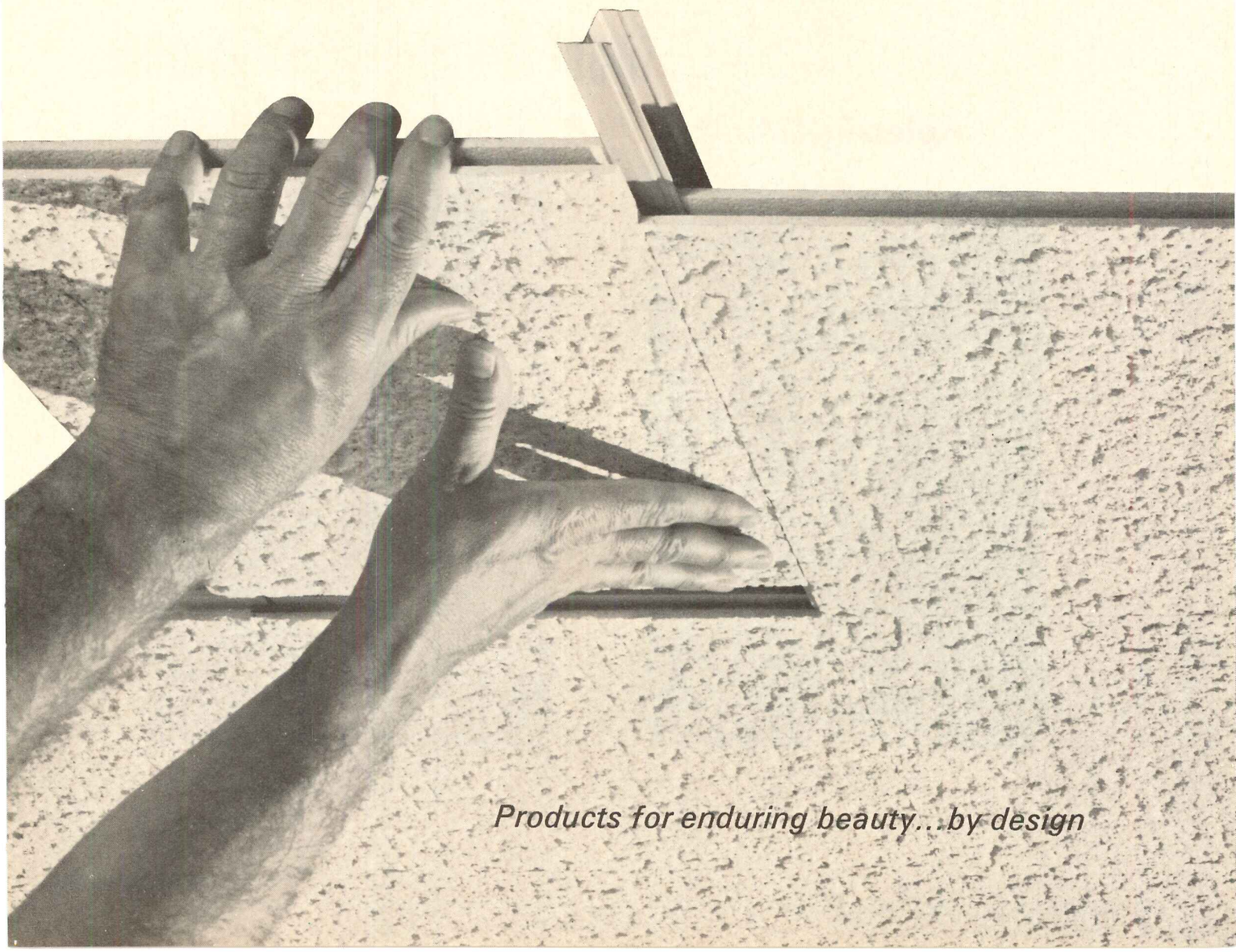
You'll also be happy to know that because new Unity pattern is non-directional, it saves installation time and can be used in areas where directional patterns would be objectionable. It can be applied either in a concealed grid system or with adhesive. And it meets AMA Class I and Class 25 (0-25) Federal Specification SS-S-118a.

Get the complete facts on *Conwed* Unity . . . the first natural-looking, non-directional ceiling tile made by the wet-felted process. Write us or talk with your nearest authorized *Conwed* representative.

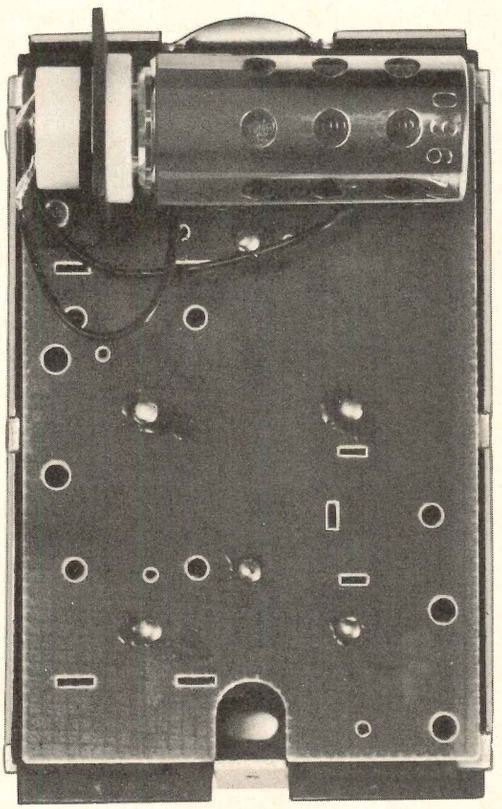
*Des. Pat. Pend.

Conwed
CORPORATION
332 Minnesota Street, St. Paul, Minnesota 55101

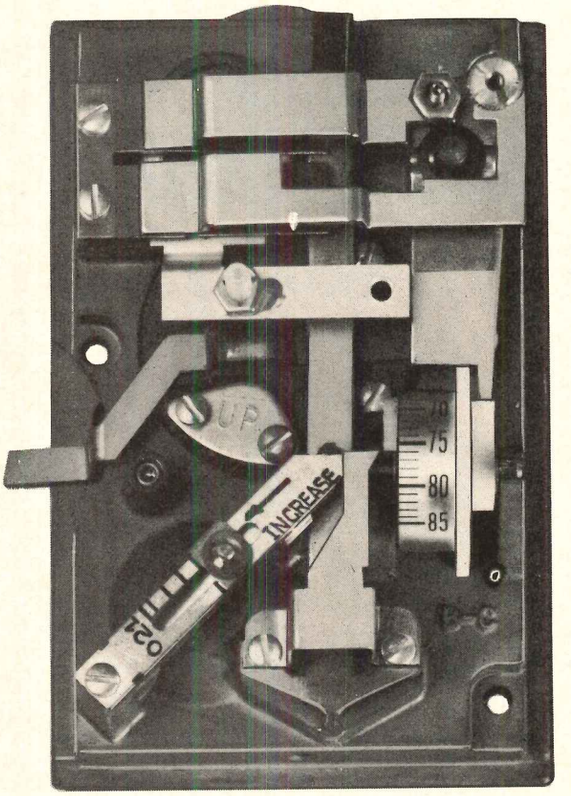
For more data, circle 177 on inquiry card



Products for enduring beauty...by design

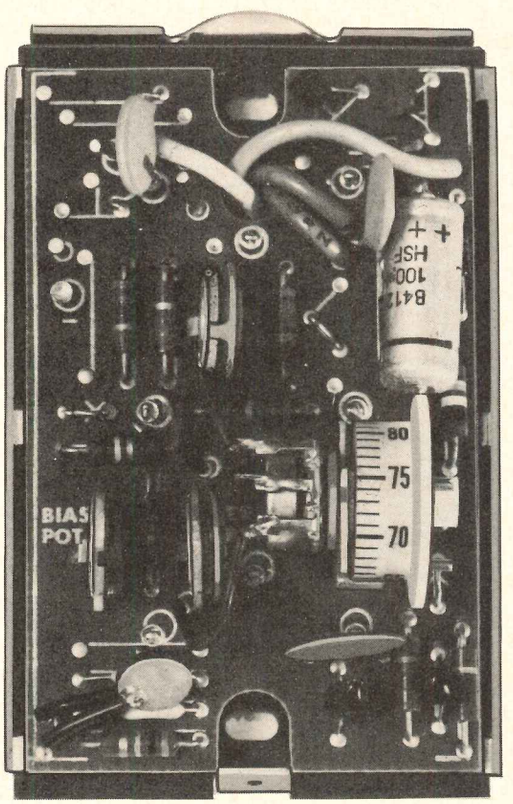


Solid-State
Humidity Controller

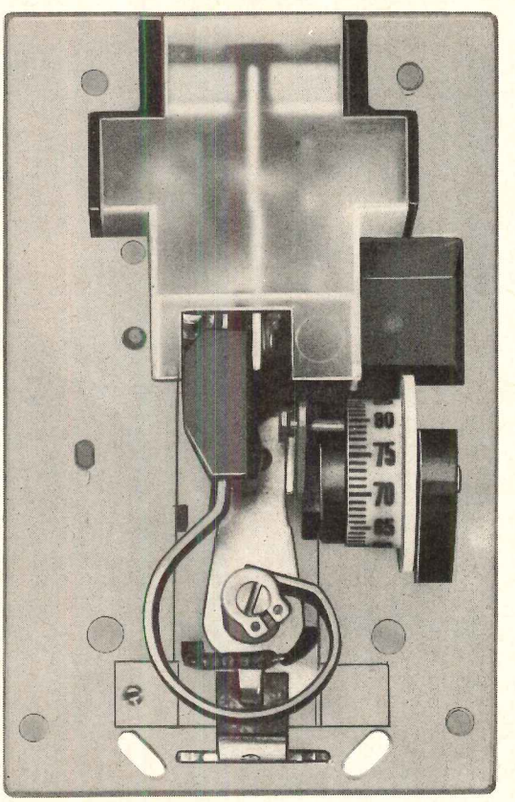


Pneumatic Day-Night Thermostat
Night-Temperature Override

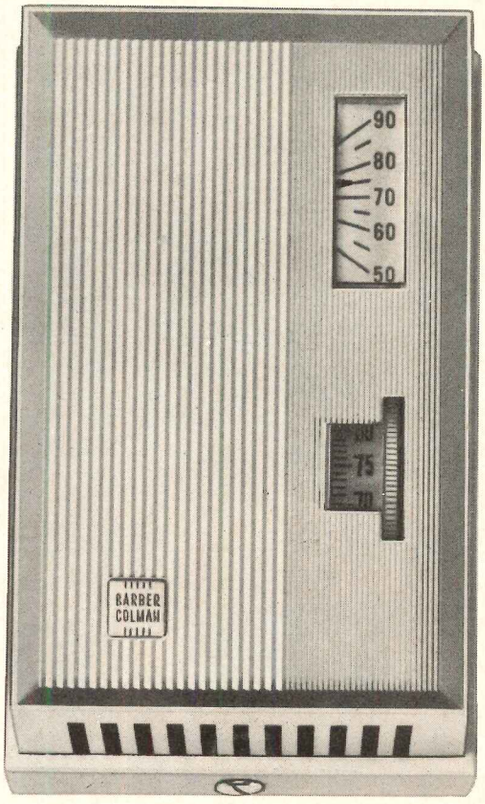
Only the company that first offered all four systems



Solid-State Thermostat
For Hydraulic Actuation



Electric Thermostat With Time
Proportioning Heat Anticipator



Solid-State Thermostat With Controlling
and Indicating Measuring Elements

...now gives you the "look-alikes" with many undercover variations

Think about it for a moment . . . now you can match the specialized advantages of pneumatic, solid-state, electric, or hydraulic control to specific subsystems within your building . . . and match control covers perfectly in the bargain.

Marrying one type of control system to another is easier when you can talk with confidence to one source about all four types. Because Barber-Colman is the only control manufacturer that makes all four, we can be impartial in helping you select the best single control or combination for your application.

When you specify Barber-Colman control systems, you get more than just accurate control. In our systems approach to environmental problems, we take full responsibility for the performance of the complete system —we engineer, design, install, and maintain it for you.

The next time providing the best temperature control demands a "hybrid" system, call your Barber-Colman automatic control specialist. Barber-Colman field offices are located in all principal cities.

Talk to Barber-Colman about Solid-State.

BARBER COLMAN

BARBER-COLMAN COMPANY
Rockford, Illinois 61101
. . . where originality works for you
In Canada:
BARBER-COLMAN OF CANADA, LTD., Ontario

AC68-3

For more data, circle 178 on inquiry card

Lead makes life more liveable

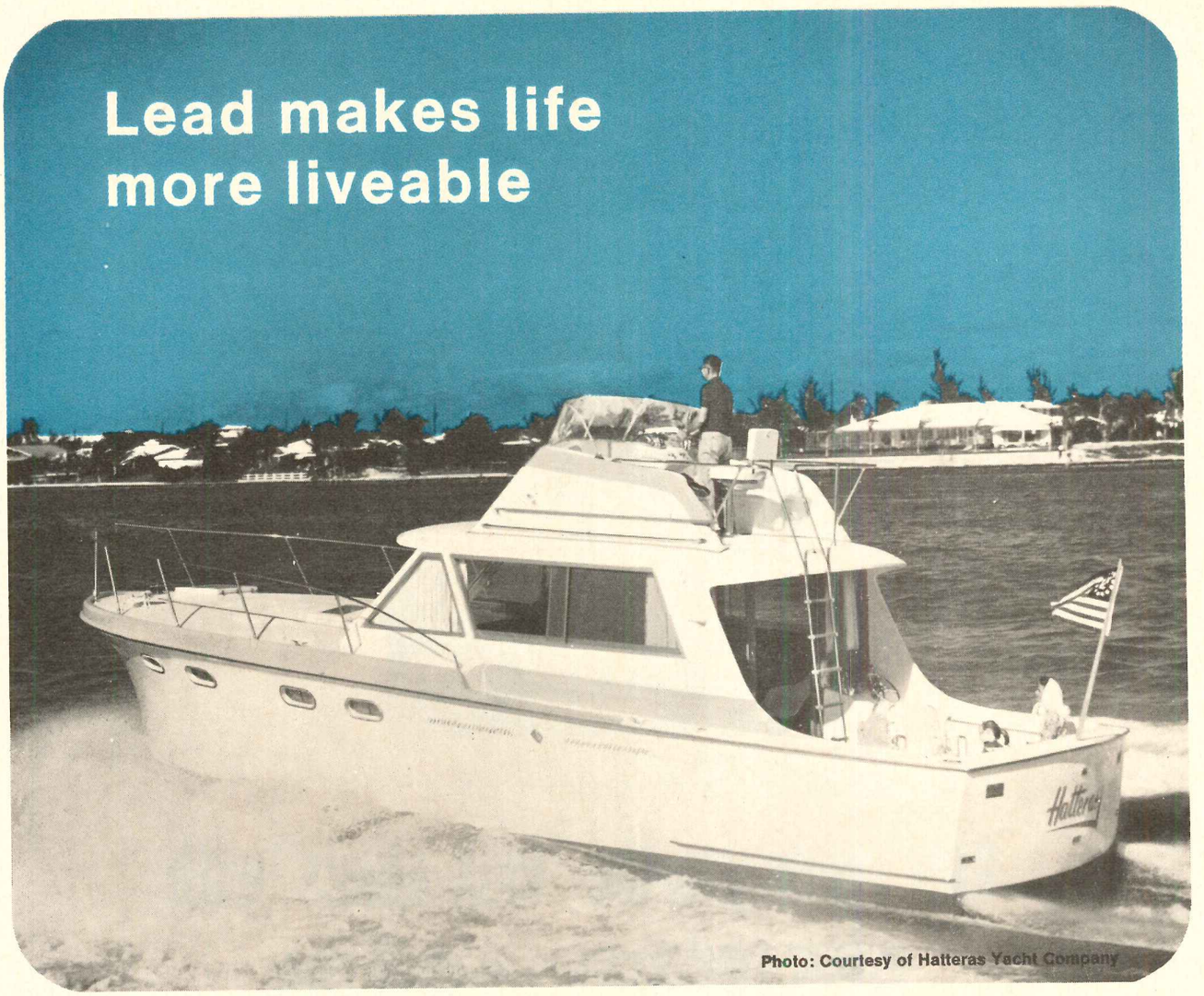
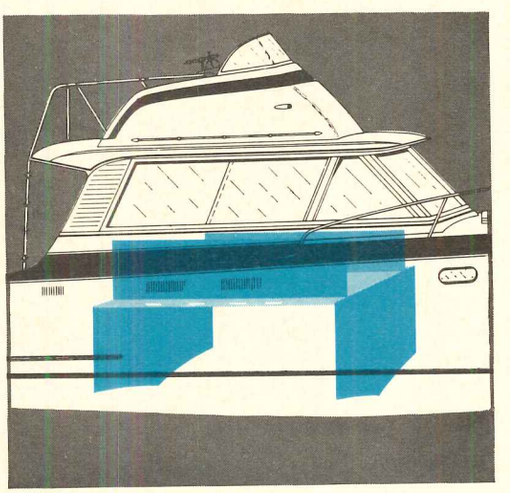


Photo: Courtesy of Hatteras Yacht Company

...by hushing things up

Hatteras yacht owners enjoy quieter cruising because of lead. A lead impregnated vinyl sheet covers the top and ends of the engine compartment, confining engine noise and adding to the comfort of all aboard. ☐ The density of lead makes it a most effective defense against modern man's common enemy — noise. Lead alone and in combination with other materials is being used in planes, boats, offices, schools, hotels, building foundations and industrial applications to defeat noise and vibration. Noise lowers human efficiency, invades our privacy and hurts our health. ☐ Today's designers and architects use lead to control noise. Take a look at what you are designing. Will it be better to live in or live with if you use lead to hush it up?



ST. JOE

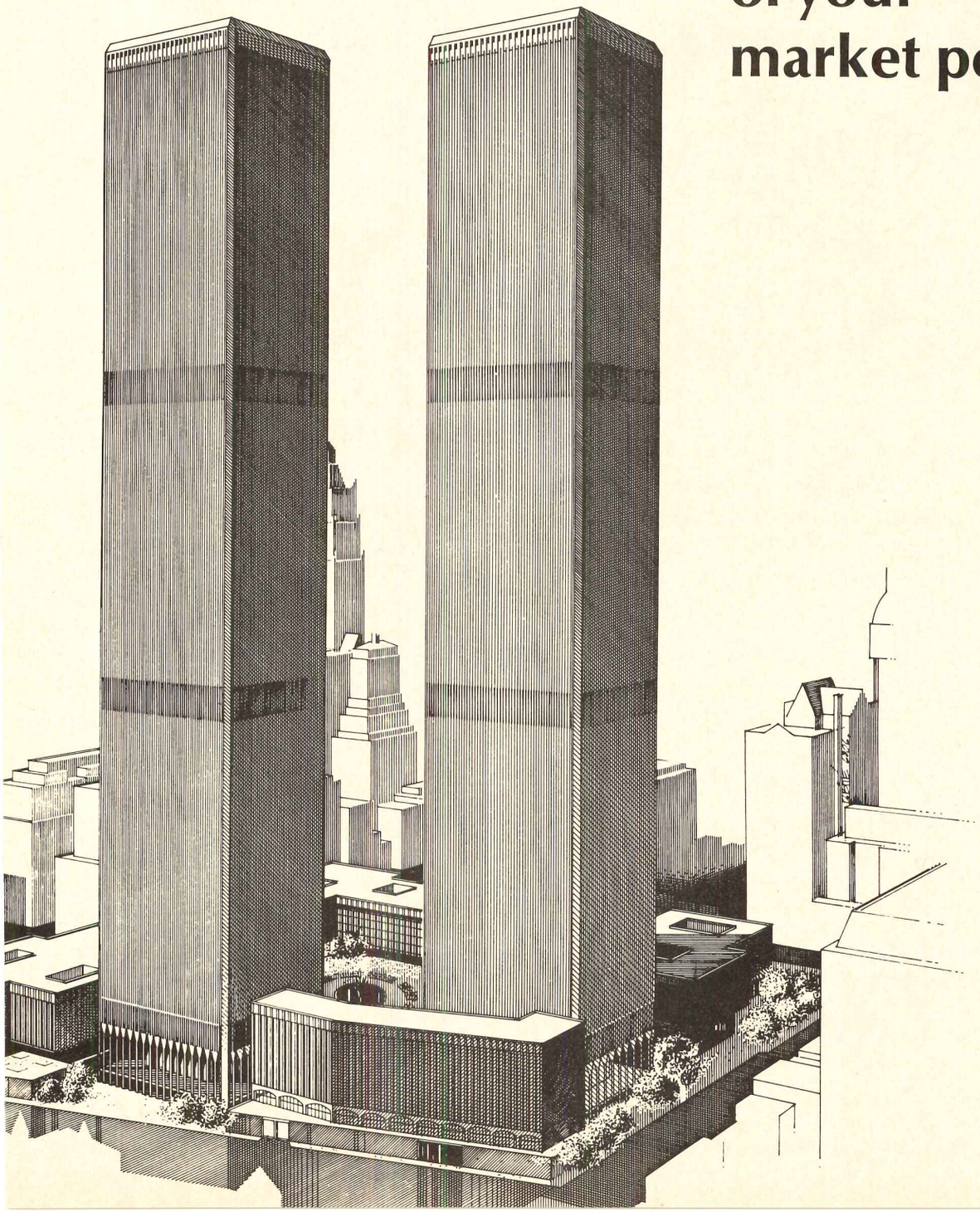
ST. JOSEPH LEAD COMPANY

250 Park Avenue, New York, New York 10017

The Nation's Largest Producer of Domestic Lead and Zinc

PB-340

if you were sure that one publication delivered over 90% of your market potential...



if you were sure that one publication delivered over 90% of your market potential, would it make sense to place all your advertising there?

It would... if you can't answer "Yes" to this question... "Am I doing the job I ought to be doing in the one publication that's strong enough to do the job alone?"

THE PROBLEM YOU FACE

Typically the prime objective of advertising in the building market is to get architects and engineers to specify certain products into the buildings they design. One of the hurdles advertisers must overcome is that architects and engineers are among the busiest and most sought after groups of people in this country. Small in number they control through their specification practices, the selection of virtually every product that goes into our nation's buildings. As a result they are deluged with magazines of all shapes, sizes and quality. Direct mail, catalogs, folders, brochures and salesmen flood into their offices. They can't and don't pay attention to them all. Under these circumstances how can you hope to get their attention? It's simple. Do what they do and cut out waste and duplication. Go where they find value. Take the available dollars and do your advertising in Architectural Record. Our editors already have their full attention and this cuts your work in half. Make the rapport we've spent 76 years building with the profession work for you.

WHAT ARE THE BENEFITS?

The major benefit of using just one magazine in a field rather than two or more is that it frees money to do some of the other things that are necessary to attract the attention of busy, involved people. Achieving a measure of impact in your advertising is a relatively simple thing to do. Let's take a look at some of the elements of impact advertising and see how putting the same dollars to work in a single publication will help you achieve that goal.

Dominant space units... it's a fact that, on the average, larger space units get better readership than smaller ones. The advantages of 12 pages or 12 spreads in one strong magazine over six halves or six pages in each of several magazines is readily apparent. In short you can look bigger, seem more important and increase readership scores at the same time.

Maximum frequency... every available piece of research indicates that advertising readership scores also increase with frequency of insertion. The advertiser who runs in every issue of a publication gets higher scores than those who do not.

Strong copy and layout... while the basic strength of your copy and layout depends on the talent of your specialists, it's possible to enhance these elements through the use of four-color. Architectural Record is now offering substantial color premium discounts, similar to the traditional frequency discounts.

Thus by buying only the Record you get a double barrelled discount, your ads look better and you get the higher readership scores that come with color.

Consistency... the concept of consistency in impact advertising involves planning over a period of years not just months. Although the benefits seem obvious it is one of the hardest elements to sell to top management. In our experience the best way to achieve its acceptance is through the careful application of the other three elements — dominant space units, maximum frequency and strong copy and layout. Apply these three principles effectively and the advantages of consistency follow naturally and rewardingly.

WHY RECORD?

That's where you'll find the active architects and engineers. Record subscribers handle over 90 per cent of the dollar volume of all architect-designed nonresidential and large residential building. This is a fact documented by a continuing state-by-state check of the activity of architectural

firms. We compile the number of projects, the types of projects and the dollar volume as reported by F. W. Dodge. Then we compare this construction activity to the Record's subscriber galleys to determine our market coverage.

Thirty-eight such state-wide checks during a recent 12-month period reveal a coverage of the market that has great significance for advertisers. Here are some of the key findings... over 95 per cent of school dollar volume is in the hands of Record subscribers... over 90 per cent of the apartments... over 95 per cent of the hospital market. The significance to advertisers is that there is a single publication in the architectural field which alone is strong enough to carry their advertising message. Clearly one publication is enough if it's the Record.

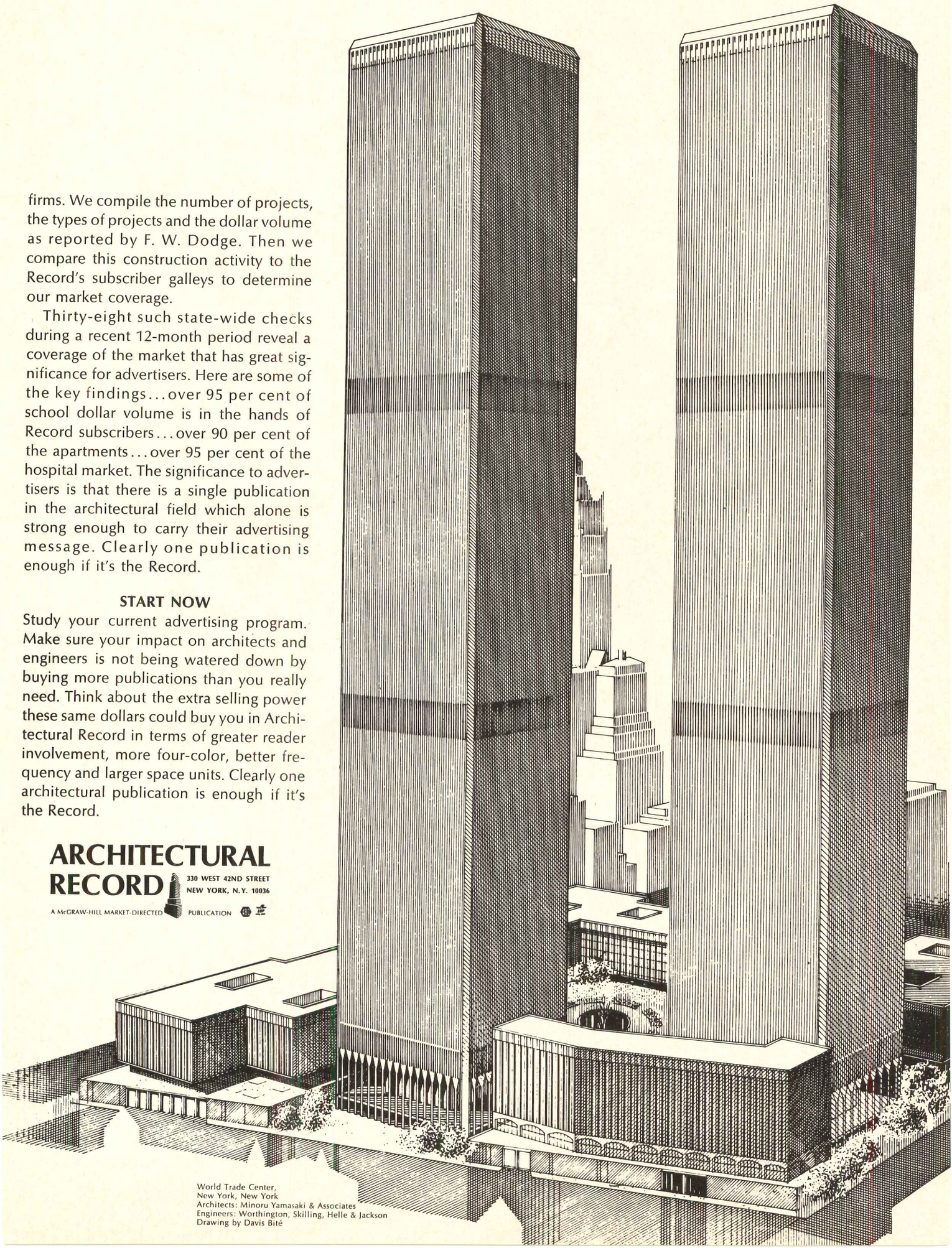
START NOW

Study your current advertising program. Make sure your impact on architects and engineers is not being watered down by buying more publications than you really need. Think about the extra selling power these same dollars could buy you in Architectural Record in terms of greater reader involvement, more four-color, better frequency and larger space units. Clearly one architectural publication is enough if it's the Record.

ARCHITECTURAL RECORD

330 WEST 42ND STREET
NEW YORK, N.Y. 10036

A McGRAW-HILL MARKET-DIRECTED PUBLICATION



World Trade Center,
New York, New York
Architects: Minoru Yamasaki & Associates
Engineers: Worthington, Skilling, Helle & Jackson
Drawing by Davis Bité

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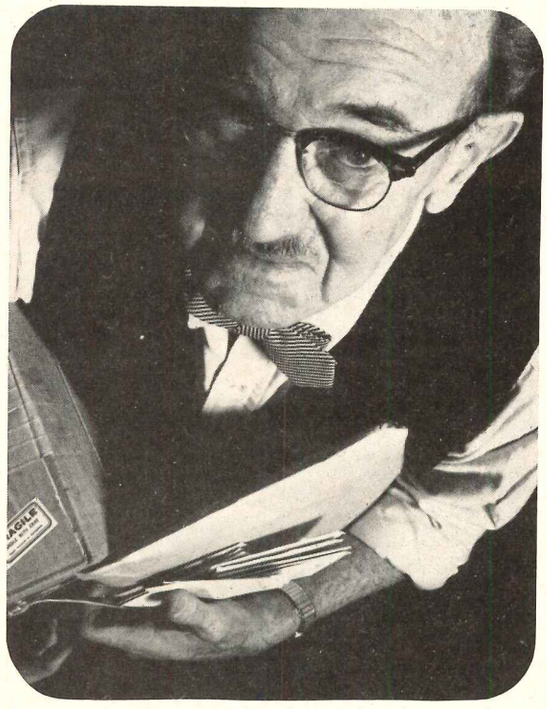
ARCHITECTURAL RECORD

McGraw-Hill, Inc., 330 West 42nd Street,
New York, New York 10036
Advertising Sales Mgr.: Louis F. Kutscher (212) 971-2838
Production Mgr.: Joseph R. Wunk (212) 971-2793
Promotion Mgr.: Sam H. Patterson, Jr. (212) 971-2858
Research Mgr.: Elizabeth Hayman (212) 971-2814

District Offices:

Atlanta 30309 — Edward G. Graves, 1375 Peachtree St., N.E., (404) 892-2868
Boston 02116 — Ted Roscoe, 607 Boylston St., (617) 262-1160
Chicago 60611 — Robert T. Franden, Tom Brown, Edward R. Novak, 645 N. Michigan Ave., (312) 664-5800
Cleveland 44113 — Louis F. Kutscher, 55 Public Square, (216) 781-7000
Dallas 75201 — Wayne L. Loving, 1800 Republic National Bank Tower, (214) 747-9721
Denver 80202 — Richard W. Carpenter, 1700 Broadway, (303) 255-5483
Los Angeles 90017 — Robert L. Clark, 1125 W. Sixth St., (213) 482-5450
Minneapolis 55402 — Edward C. Weil, 1104 Northstar Center, (612) 332-7425
New York 10036 — Donald T. Lock, Ted Roscoe, John S. Renouard, 500 Fifth Ave. (212) 971-3583
Philadelphia 19103 — Robert G. Kliesch, 6 Penn Center Plaza, (215) 568-6161
Pittsburgh 15222 — Bradley K. Jones, 4 Gateway Center, (412) 391-1314
St. Louis 63105 — Richard Grater, 7751 Carondelet Ave., (314) 725-7285
San Francisco 94111 — Wayne C. Carter, 255 California St., (415) 362-4600

Later.



When you need product data to complete a job, you want it now. Not later.

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We know that architects are busy people. They don't have time to wait for someone to find the product data they need. That's why they turn to their Sweet's Files. They know the information is there... by product... by company and by trade name.

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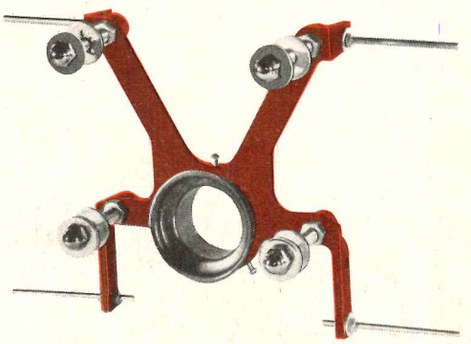

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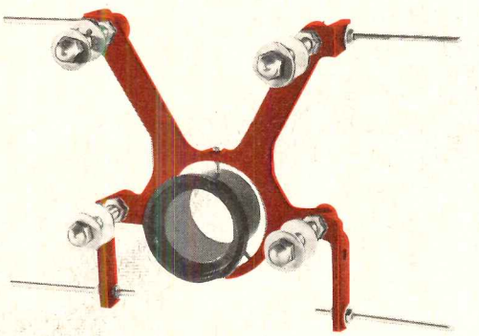

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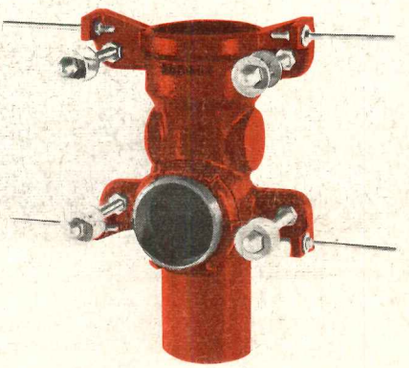

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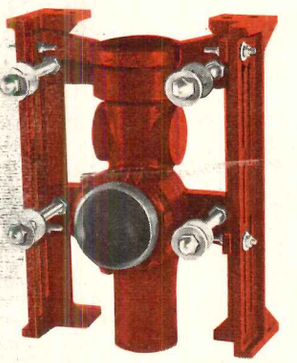

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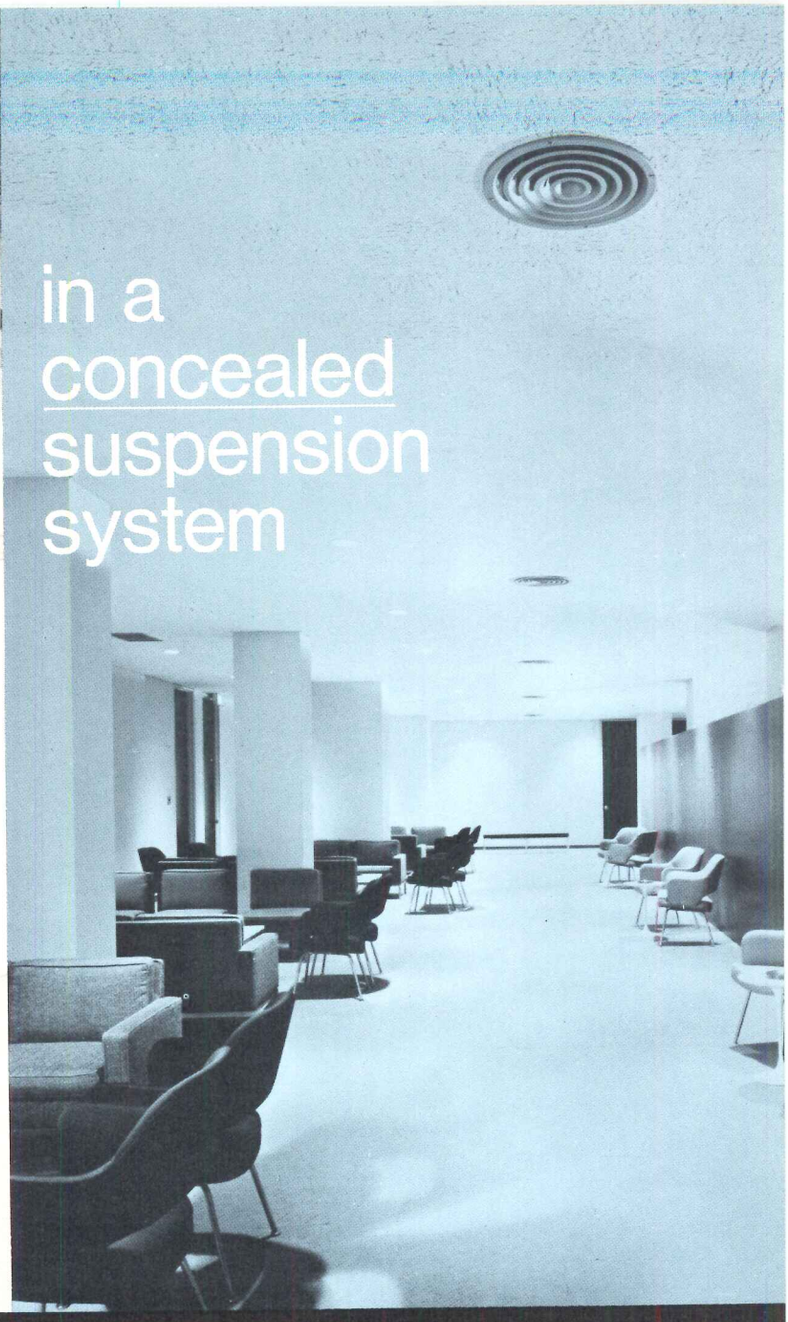

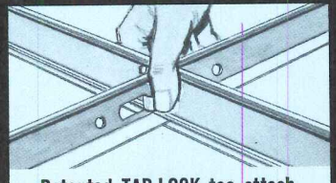

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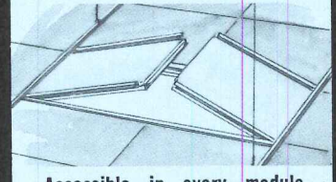

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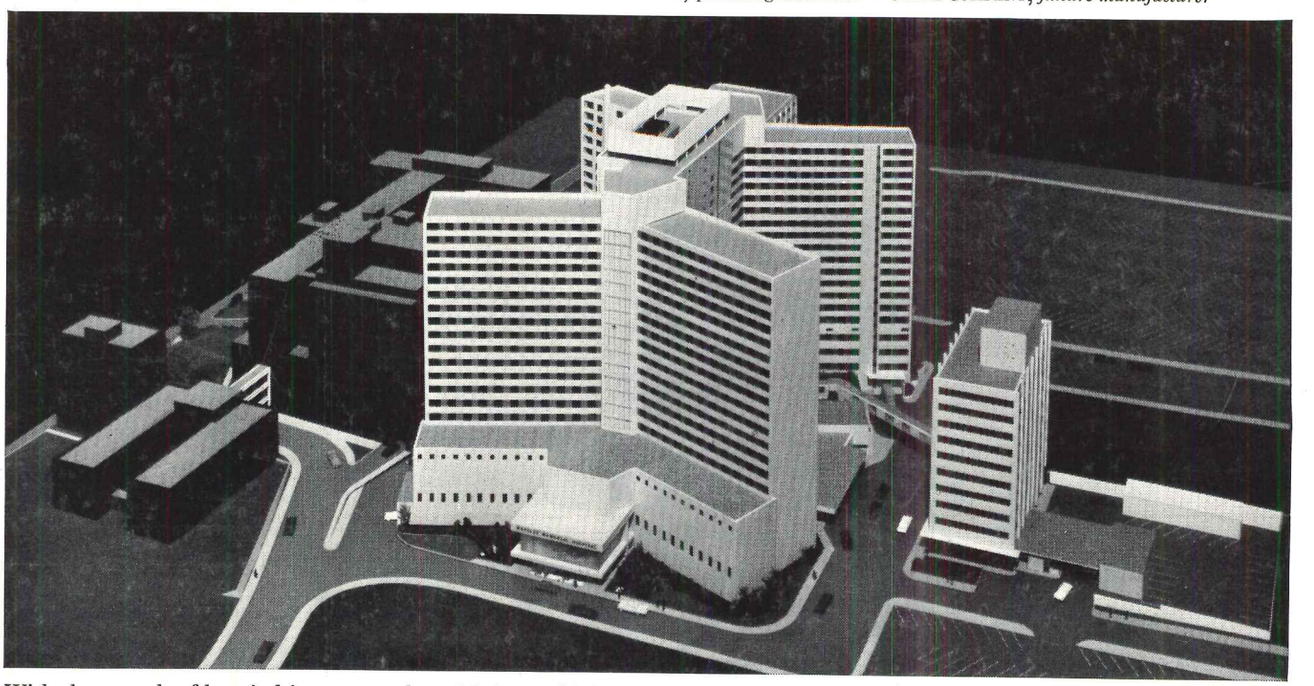

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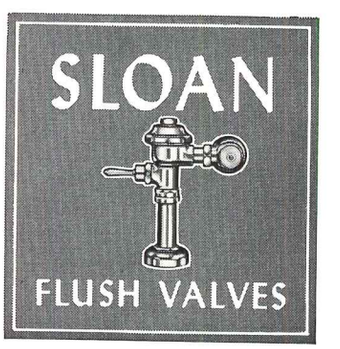

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