RECENT ARCHITECTURE BY MARCEL BREUER

LAST WORKS OF LE CORBUSIER

BUILDING TYPES STUDY: SHOPPING CENTERS AND STORES

PRECAST CONCRETE: TOWARDS FACTORY OR SITE FABRICATION?

FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

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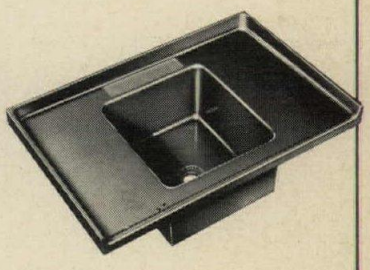

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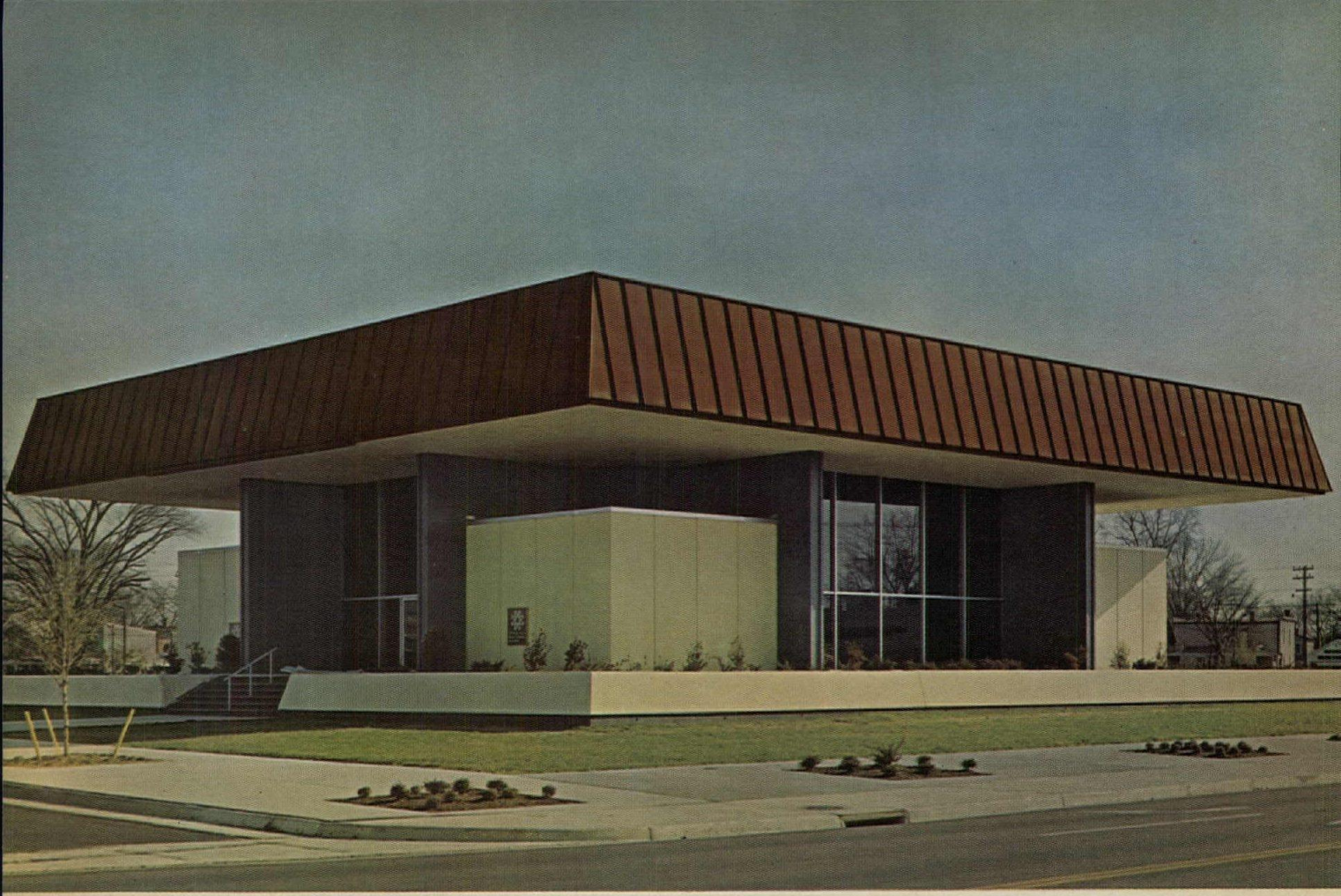

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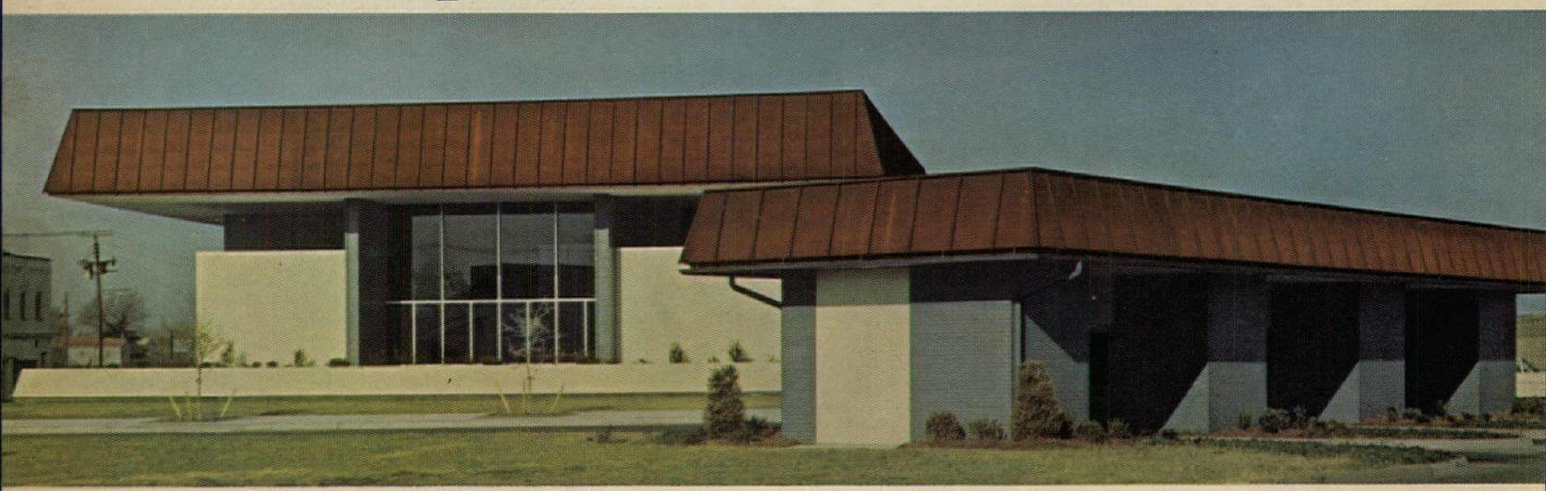

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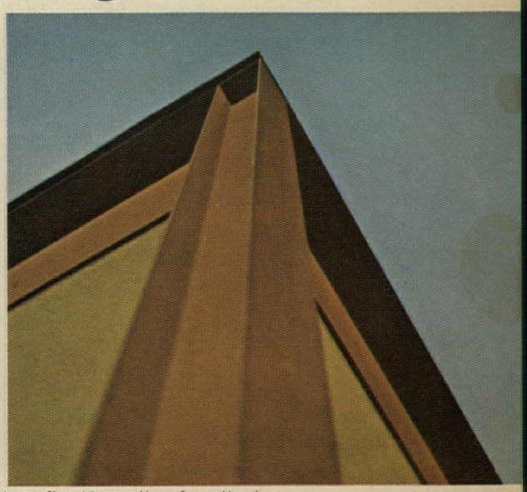

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(Right Page) FRENCH CREEK VALLEY ELEMENTARY SCHOOL,

Coventryville, Pa. Owen J. Roberts School District.
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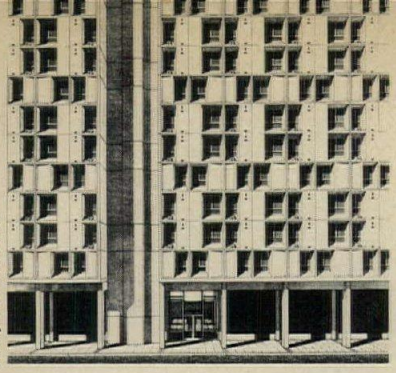

Joseph W. Molitor

Cover: Elevation-perspective of high-rise apartments, new urban development, Bayonne, France. Architects: Marcel Breuer and Robert F. Gatje.

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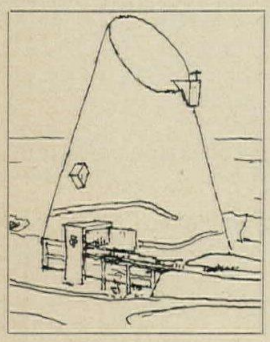

187 LAST WORKS OF LE CORBUSIER

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195 THREE MUSEUMS

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207 A WAY TO INFLUENCE THE ENVIRONMENT

The fourth article in a series about young architects describes the work of Norman Hoberman and Joseph Wasserman, who were part of the design team that won the ill-fated Franklin D. Roosevelt Memorial competition, but whose own practice has been established in large part by doing urban renewal studies.

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The process of evolution from the horizontal street of stores to the vertical center with layered parking is outlined and examples are shown.

150 NORTHPARK REGIONAL SHOPPING CENTER

The single-building concept reaches a peak of development.

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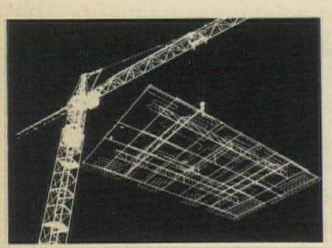

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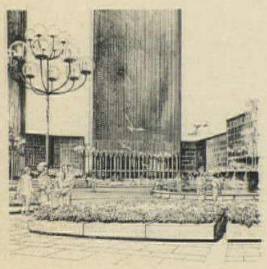

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COMING IN THE RECORD

ARCHITECTURE BY ULRICH FRANZEN

Strong concern with site relationships and highly disciplined ordering of function continue to characterize the work of Ulrich Franzen, but his more recent projects seem to suggest some new directions in his architectural expression of these concerns. A special presentation of new work by Franzen will reflect this development in a wide variety of building types.

NEW OPPORTUNITIES FOR COLLEGE BUILDING DESIGN

As the nation's colleges and universities increase their construction pace to prepare themselves for an enrollment peak that really defies prediction, architects have ever more opportunities—and, it would appear, more challenging opportunities—for creative design on campus. Next month's Building Types Study will provide some significant examples of current architectural response.

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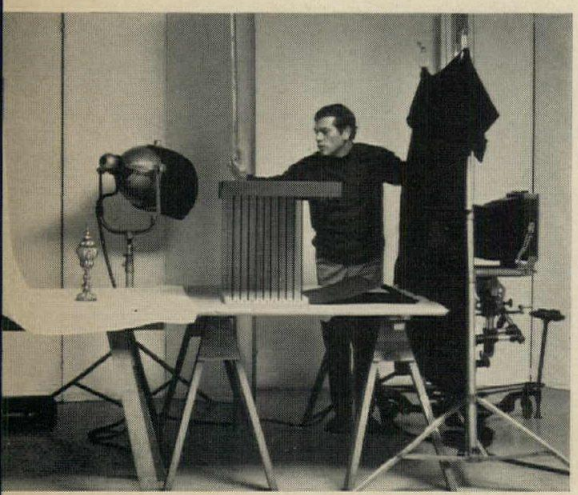

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DEMONSTRATION CITIES: HOW ABOUT DESIGN?

This morning's Herald-Tribune opens with this headline: "Pollution—a Vast U.S. Plan Urged." The opening paragraph: "President Johnson yesterday proposed a legislative war against water and air pollution that could cost the Federal government $10 billion in the forthcoming decade . . ." "Mr. Johnson urges states, counties, cities and communities . . ."

Just a month ago—I have just been reading his speech—President Johnson sent a message to Congress on the rebirth of American cities. "Nineteen sixty-six can be the year of rebirth for American cities. . . . That is why I am recommending today a massive Demonstration Cities Program. I recommend that both the public and private sectors of our economy join to build in our cities and towns an environment for man equal to the dignity of his aspirations. I recommend an effort larger in scope, more comprehensive, more concentrated—than any that has gone before."

Those are noble words, Mr. President, and they deal with vitally necessary objectives of our times. And please consider your humble servant a soldier in those home-bred peace-corps projects. There is an old saying that nothing has more power than an idea whose time has come, or something like that. I shall be happy to serve. When the President pushes such projects, they are likely to show some forward progress.

But—yes, there is a but, in fact there are two—one cannot change one's habits of thoughts. As I read the speech on city demonstration programs, I couldn't turn off the editor's habit of riffling through the words looking for specifics. Two impressions were simply not to be pushed aside.

1. There were specifics in the speech, but they were dreadfully thin.

2. The design aspects of the job ahead left serious doubts.

Please understand that I am not questioning the President's intentions, or merely criticizing his writer. I am bemoaning, as frequently before, the difficulties of the job of city rehabilitation. You just can't find the handle; you find so many handles you suffer from frustration.

The President was pretty specific about his proposal for test projects, and how they were to be handled. But what they were to accomplish was not so easy. They were simply to accomplish everything necessary to improve city living—racial relationships, housing, poverty, education, transportation, family life.

He was nominally asking Congress for the passage of the Demonstration Cities Act. But presumably he was reading his charge to the new Cabinet Officer in charge of Housing and Urban Development, Robert C. Weaver. Dr. Weaver is not showing any reluctance about accepting his duties or objectives, but landing on the moon would probably be easier than fulfilling the President's program.

Design was one of the problems left hanging. Naturally one does not expect the President to punch all the cards for the computers, or to bring up controversial issues while asking Congress for funds, but it must have been a strain to be so vague. He never mentioned the word "architect," and the closest he came to the whole subject of architecture was "there must be a high quality of design in new buildings . . ."

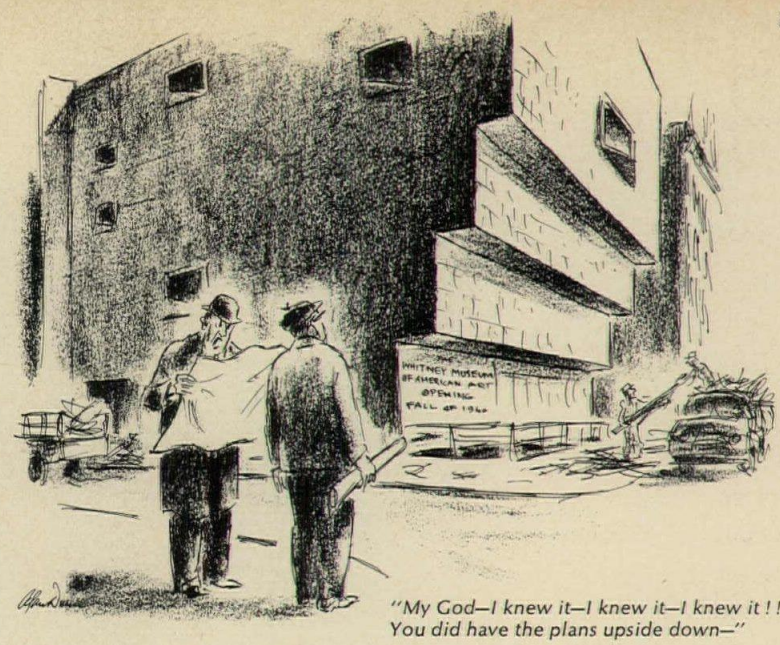
So I assume the right—volunteer though I am—to worry a little about design. What are these "masterpieces of our civilization" going to demonstrate as to design? As one who has frequently noted the general average of government-inspired buildings, I must note a considerable concern lest they demonstrate, once and for all perhaps, that banality is our democratic watchword.

Just picture what has gone before—the typical urban renewal project, the low-cost housing project, the post offices, the government office buildings, and so on and so on.

Perhaps the President wanted to keep this all separate from the City Beautiful campaign. But I have the conviction that all those beautiful new social objectives he talks about are not going to be achieved without some real attention to design, architectural design. Some imagination, some beauty, some order, some liveliness, some esthetics, some surprises, perhaps some shocks.

—Emerson Goble

Drawn for the RECORD by Alan Dunn



"My God—I knew it—I knew it—I knew it ! ! !
You did have the plans upside down—"

Creativity is sacred, or drop that paint brush

A recent newspaper story (New York Times) quotes a Professor Michael Wyschogrod as protesting the cheapening of creativity through its growing abuse in occupational therapy, entertainment or business. Creativity must be served for its own sake, not for psychological needs, and: "We cannot pretend that dabbling with creativity is the solution to the problem of the housewife and the salesman who find their lives empty."

"The person who attempts to create in order to find a meaning in his life, to convert a pointless existence into one that is no longer pointless is using creativity to his own end and that cannot be done."

Well, Professor, you stick to your creativity and I'll stick to mine. George Fred Keck has promised to teach me how to do those great whopping water colors, and if I later indulge in any abuse of the term creativity, that's my business.

Fly to the suburbs—new idea in Europe

Some years ago, in a Paris sightseeing bus, the little microphone man expounded some philosophy. Or maybe it was just plain crabbing. Anyway, he told us that since there were so many cars in Paris, the government had simply limited the sale. A Parisian could buy a used car, but to get a new one he had to get on a list and wait as long as three years. Too many cars, stop the sale. Simple enough.

He also spoke about the government's measures to reduce or control people congestion. French logic, at governmental level, discouraged the building of new industrial plants or office buildings or what not, because naturally these tended to increase the population of the city.

Recently the alert Wall Street Journal reported a well-defined exodus of industry in Europe from congested cities or industrial strongholds. It was happening in England, France and Germany. In Europe the government tells you where you may locate your new plant.

The story also explains one idea for preventing new construction in cities. The builder must pay sometimes fancy sums to dislodge tenants of existing buildings on the site. Another example of the famous French logic.

Well, soon the man with the microphone on the sightseeing bus will be distracting you from the beauties of the Côte d'Azur, to show you the new IBM plant. So maybe you'd just better stay right there in Paris.

Miles-per-hour measure of New York's traffic

Just a little note on the transportation problem (New York's) in terms of miles-per-hour. Somebody (Regional Plan Association, I guess) issued some figures. Average automobile speed in Manhattan's midtown is 8.5 miles per hour. Speeds on the expressways don't average much better, during rush hours, that is, getting up only to 13 miles per hour.

The report said, however, that average door-to-door travel by train is still slower. So: "As long as public transportation is slower than traffic jams and more uncomfortable than a car, any additional highways and river crossings will fill up as soon as they open, leaving the motorist in the same position as he is today."

Congestion a problem in all transportation

Proponents of rail transportation are still doing battle with defenders of the automobile, according to early reports from what was billed as "the first International Conference on Urban Transportation" held recently in Pittsburgh. But it doesn't take any genius to figure out that about all modes of transportation will soon be necessary, and that the problems will not be battles between cars and railroads, but congestion everywhere.

Perhaps right now the railroads could answer that they don't know much about congestion today. But I can observe, on the one I ride, that rush hours have been loading the railroad heavily for 20 years. The poor old New Haven, using the same tracks, may be starving to death, but everybody agrees that it is a vital facility, and that somehow it must be kept operating. It doesn't really seem unimaginable that it could find some congestion later.

The highways can't take any more congestion, and where are all those new people going to ride? Highway congestion, the conference was told, is slowing down door-to-door flying times along the Eastern seaboard. Congestion in the air is a familiar problem, no matter how long it takes to drive to the airport.

New mass transportation systems are under construction in some cities right now, projected in others.

So it would seem time to quit arguing about which system is best, and get busy with all possible methods of transportation, in or out of the city.

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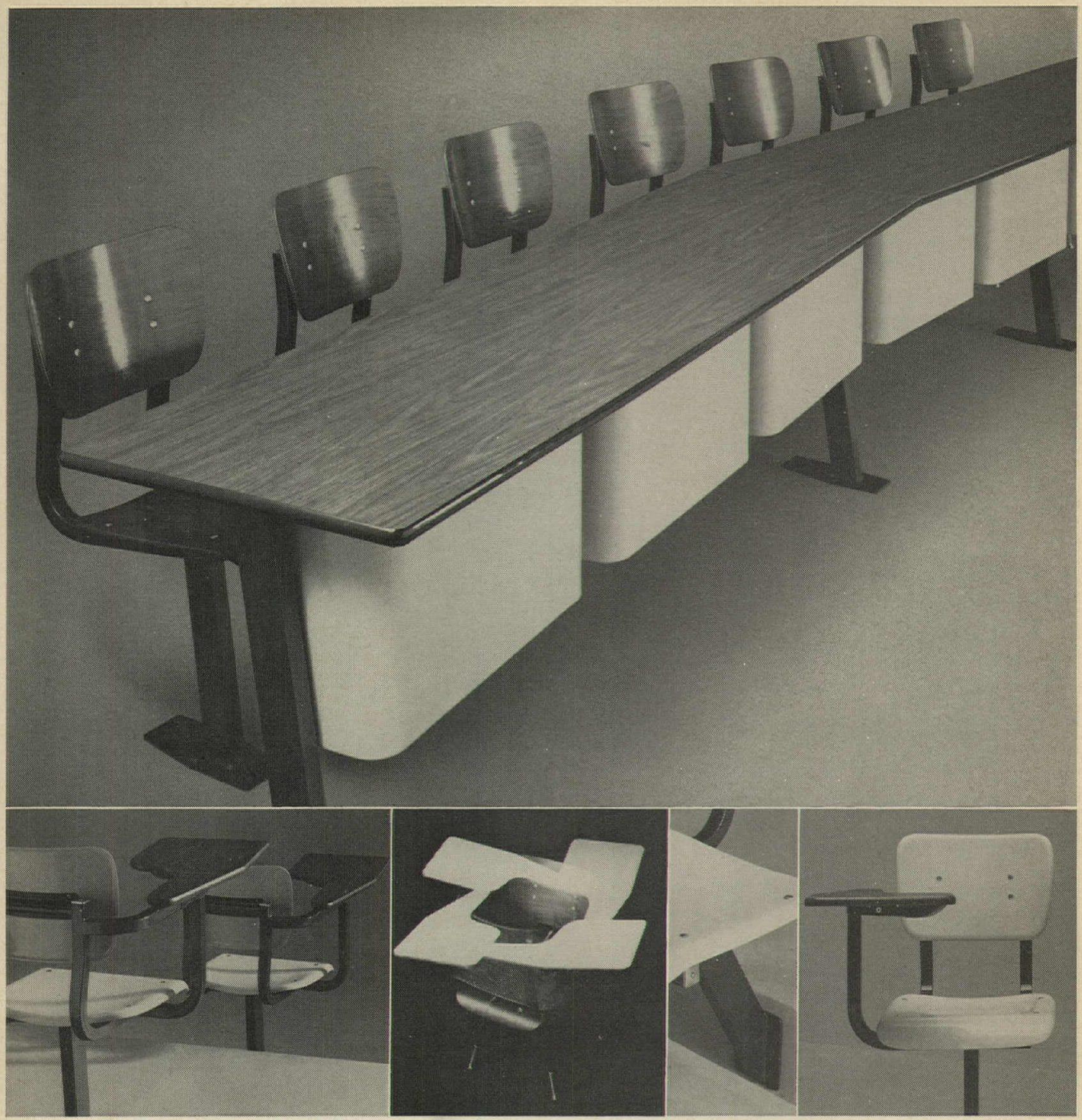

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We're not knocking the look of a wood floor. After all, we took reat pains to duplicate it.

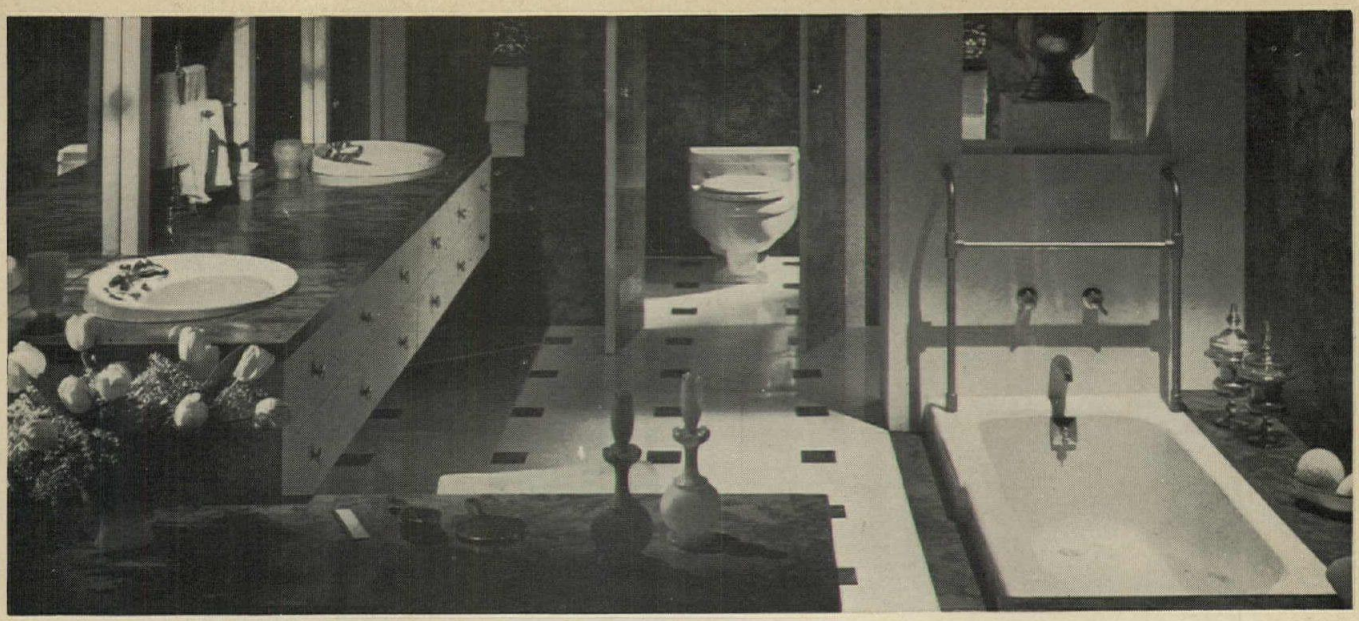
In fact, we say wood is "almost as good" as Trianon because ur solid vinyl tile keeps the look of a beautiful wood floor longer han wood does.

Trianon resists stains. It won't warp. It won't discolor. It's not hard or noisy underfoot. It doesn't have a finish that can wear thin or need varnishing.

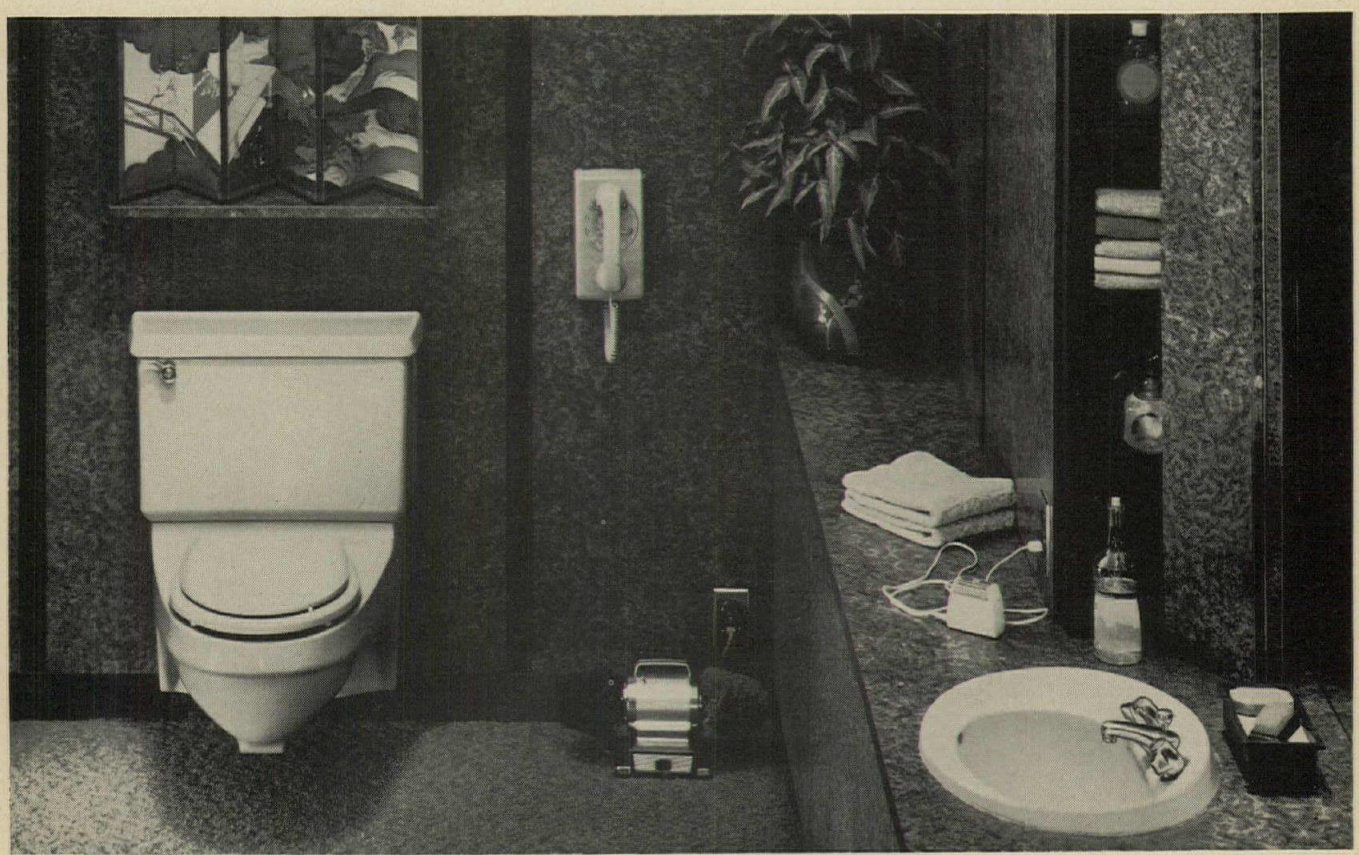
If you think you're going to miss all that, forget about Trianon. Go ahead and spend the extra money for wood.

AMTICO

For more data, circle 8 on inquiry card



Executives who come from homes furnished like this...



...appreciate office lavatories like this

The pictures above make the point. Office washrooms can be as handsomely functional as an executive's own bathroom at home. They can be made just as personal, too—designed to reflect his taste and the dignity of his office.

All it takes is good interior planning, plus a deft application of Eljer Master Crafted fixtures.

Eljer Master Crafted fixtures present an all-new look. You'll find it in the graceful sweep of their lines, the aesthetic appeal of Eljer colors. Their variations in style complement any decor. And Eljer's lustrous, acid-resisting finish provides long life and inexpensive maintenance.

Get the entire story. Call your Eljer representative or write Wallace-Murray Corporation, Eljer Plumbingware Division, Dept. AR, P.O. Box 836, Pittsburgh, Pa. 15230.

MASTER CRAFTED ELJER

SINCE 1904 FINE PLUMBING FIXTURES

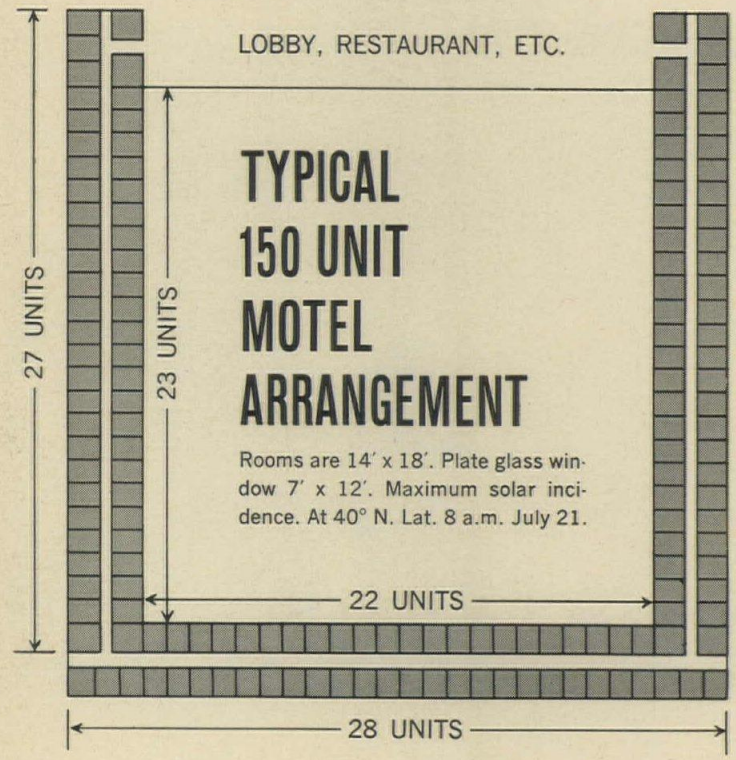
For more data, circle 9 on inquiry card

For more data, circle 10 on inquiry card

$18,000 SAVINGS*

IN AIR CONDITIONING COST WITH

MILIUM® INSULATED DRAPERIES



Area of windows facing west (or east)
50 x (7 x 12) = 4,200 sq. ft.

Solar heat gain with medium drapes
200 x .61 x 4,200 = 512,400 Btuh.

Solar heat gain with Milium insulated lining
200 x .32 x 4,200 = 268,800 Btuh.

SAVINGS=243,600 Btuh or approx. 20 TONS

Think of it! When construction costs are spiraling upwards MILIUM® insulated drapery linings reduce initial air conditioning investments.

After extensive tests at the engineering laboratory of a nationally known University† MILIUM®, with a shading coefficient of 0.32, offers superior insulation at a cost of under $.03½ per square foot as demonstrated in the adjoining column. While these savings were computed for the New York area think of the additional savings in construction and maintenance costs for warm weather areas. MILIUM® is not content with a one-time saving; MILIUM® keeps saving money for you and your investor year after year.

But this is not all...

MILIUM® draperies and drapery linings give longer life to upholstered furniture, expensive carpets and decorative draperies. Consider the light control on bright days, consider the luxurious uniform external appearance that only MILIUM® lined draperies offer to a building. For MILIUM® is available in white and decorator colors and a multitude of fabric types. Now for the first time MILIUM® is also available in white and colored room darkening window shades. Major hotels and public installations throughout the world demand and specify MILIUM® insulated fabrics.

Write for our report on Solar Heat Gain listing Shading Coefficients for each MILIUM® insulated fabric. It is available at no charge to architects and engineers.

*20 TONS @ $900.00 per TON = $18,000 SAVINGS IN FIRST COST.

Against this must be charged the additional cost of Milium lined drapery over the medium drapery. This estimate does not include some small additional savings from other exposures.

ANNUAL TONS PER SQ. FT. OF GLASS

	NYC	Dallas	NYC	Dallas	NYC	Dallas	NYC	Dallas
Medium Dr.	1.21	3.03	1.76	3.80	2.25	4.51	3.03	6.49
Milium Lining	0.60	1.50	0.90	1.95	1.15	2.30	1.50	3.20
Saving	0.61	1.53	0.86	1.85	1.10	2.21	1.53	3.29

This does not include any savings which may accrue due to demand charges. If the demand charge is $1.00 per Kw, then an additional savings of $100.00 for five months of operation would probably be realized.

TOTAL TON HOURS SAVED

	Sq. Ft.		NYC		Dallas
North	22 x 84 = 1,848	x 0.61	1,128	x 1.53 =	2,830
East	50 x 84 = 4,200	x 0.86	3,530	x 1.85 =	7,770
South	28 x 84 = 2,352	x 1.10	2,580	x 2.21 =	5,200
West	50 x 84 = 4,200	x 1.53	6,430	x 3.29 =	10,800
			13,658 ton hrs.		26,600 ton hrs.

ANNUAL SAVINGS NYC 13,658 x 0.025 = $342.00
ANNUAL SAVINGS DALLAS 26,600 x 0.025 = $665.00

MILIUM Dept. L 1045 Sixth Ave., New York, N. Y. 10018

® Registered T.M. of Deering Milliken, Inc. for insulated fabrics

†Name supplied on request

For more data, circle 12 on inquiry card

the beauty of a built-in shower · the economy of exposed pipes
the versatility architects like to work with

MODULAR Showerpac®

BY

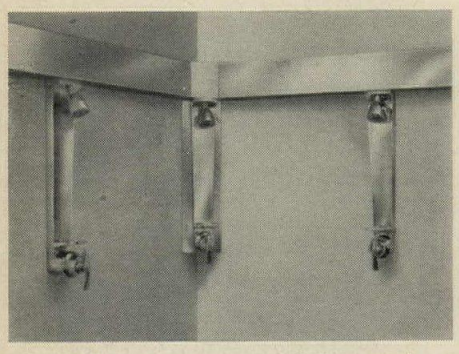
SPEAKMAN

Your ingenuity in modernizing an existing shower area with exposed pipes finds a natural ally in Showerpac.

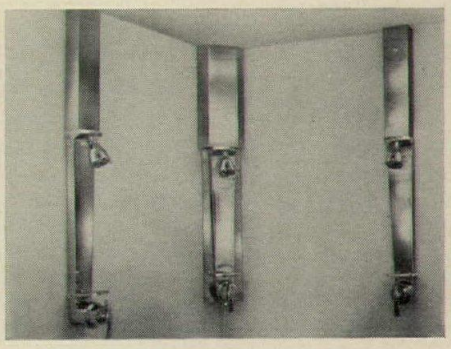
Your imagination in new design, conscious that exposed pipes represent a huge saving, positively demands Showerpac.

In either case Showerpac complements your own versatility. Each unit is self-contained—with hot and cold water lines, mixing or compression valves, shower head—everything pre-assembled in a graceful streamlined housing ready for connection with any variety of piping systems. In addition to flat-against-the-wall units, modular Showerpac includes a corner unit that really helps you cut corners. And there is no limit to how you can fit them in with pipes located —directly through wall with 90° elbows at shower level, horizontal connection at shower level, horizontal connection at ceiling, or vertical connection from ceiling—with a matching modular pipe cover to conceal everything in streamlined, easy-to-clean beauty.

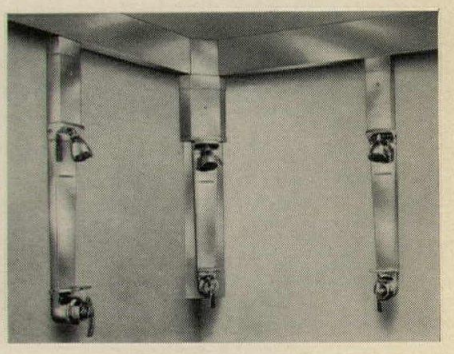
SPEAKMAN® COMPANY
WILMINGTON, DELAWARE 19899



Modular pipe cover conceals horizontal supply at shower level.



Streamlined horizontal covering at ceiling.

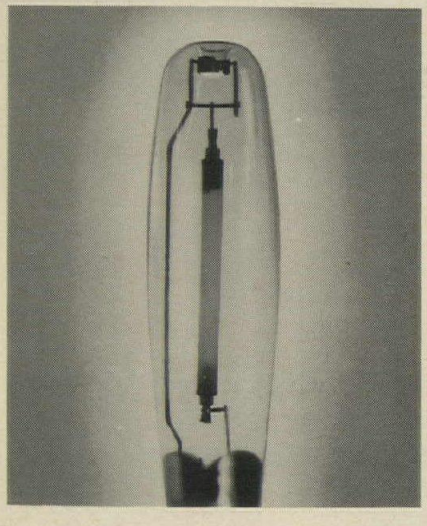


Vertical beauty covers pipes from ceiling.

Send for brochure S-142 . . . LET SPEAKMAN QUALITY SPEAK FOR YOU

For more data, circle 13 on inquiry card

Look what just happened to the revolution we started in good light and good looks.



Lucalox.® From G.E.

You agreed with us that our new Profile™ light is a real revolution in outdoor lighting.

Now we give you another important option. For your light source you now can specify General Electric's new Lucalox lamp. Lucalox puts out 105 lumens per watt, and because all of this light is concentrated in a cigarette-size arc, maximum optical control can be obtained. Combination of Profile Light and Lucalox intensifies the rectangular revolution and makes possible new levels in general area lighting.

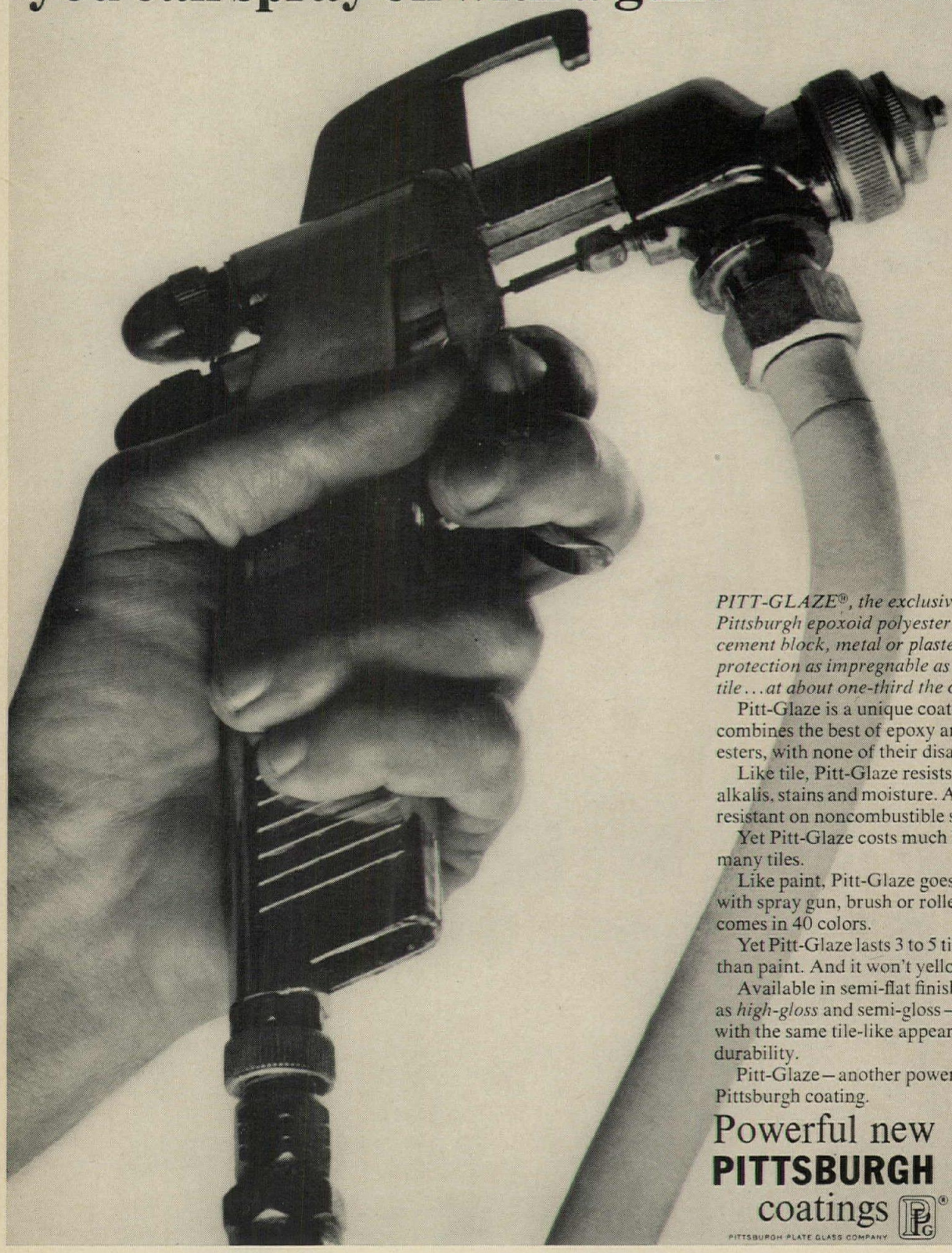
So now you can choose Lucalox, color-true metallic vapor, or conventional mercury lamps. You can put any of them to work in our revolutionary Profile Light, the only luminaire with an asymmetric reflector. The only luminaire that lets you put predictable rectangles of uniform light precisely where you want them.

And rugged, weathertight Profile Light is sleek looking, contemporary in design. Good light. Good looks. An unbeatable combination. Get all the facts from your Crouse-Hinds distributor. Or write: Crouse-Hinds Company, Outdoor Lighting Dept., Syracuse, New York 13201.

CROUSE-HINDS®

Lucalox is a Registered Trademark of General Electric Company

To resist acids, alkalis, wear, stain moisture that paint can't stand up to... here's a "tile" you can spray on with a gun!



PITT-GLAZE®, the exclusive, new Pittsburgh epoxoid polyester, gives cement block, metal or plaster protection as impregnable as ceramic tile . . . at about one-third the cost.

Pitt-Glaze is a unique coating that combines the best of epoxy and polyesters, with none of their disadvantages.

Like tile, Pitt-Glaze resists acids, alkalis, stains and moisture. And it's fire-resistant on noncombustible surfaces.

Yet Pitt-Glaze costs much less than many tiles.

Like paint, Pitt-Glaze goes on easily with spray gun, brush or roller. And it comes in 40 colors.

Yet Pitt-Glaze lasts 3 to 5 times longer than paint. And it won't yellow.

Available in semi-flat finish, as well as *high-gloss* and semi-gloss—all with the same tile-like appearance and durability.

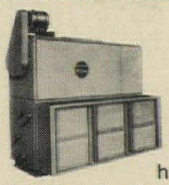
Pitt-Glaze—another powerful new Pittsburgh coating.

Powerful new
PITTSBURGH
coatings ®

PITTSBURGH PLATE GLASS COMPANY

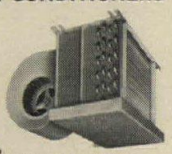
For more data, circle 15 on inquiry card

McQUAY SEASONMASTER® CENTRAL STATION AIR CONDITIONERS



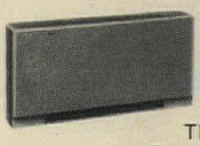
Efficiently handle the Carlyle's large capacity needs such as the swimming pool area and solarium.

McQUAY SEASONMAKER® REMOTE AIR CONDITIONERS



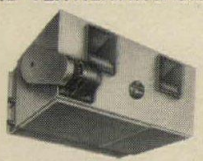
Hideaway, Large Capacity Models. 264 units provide Carlyle tenants with individualized finger-tip temperature and humidity control.

McQUAY SEASONMAKER® REMOTE AIR CONDITIONERS

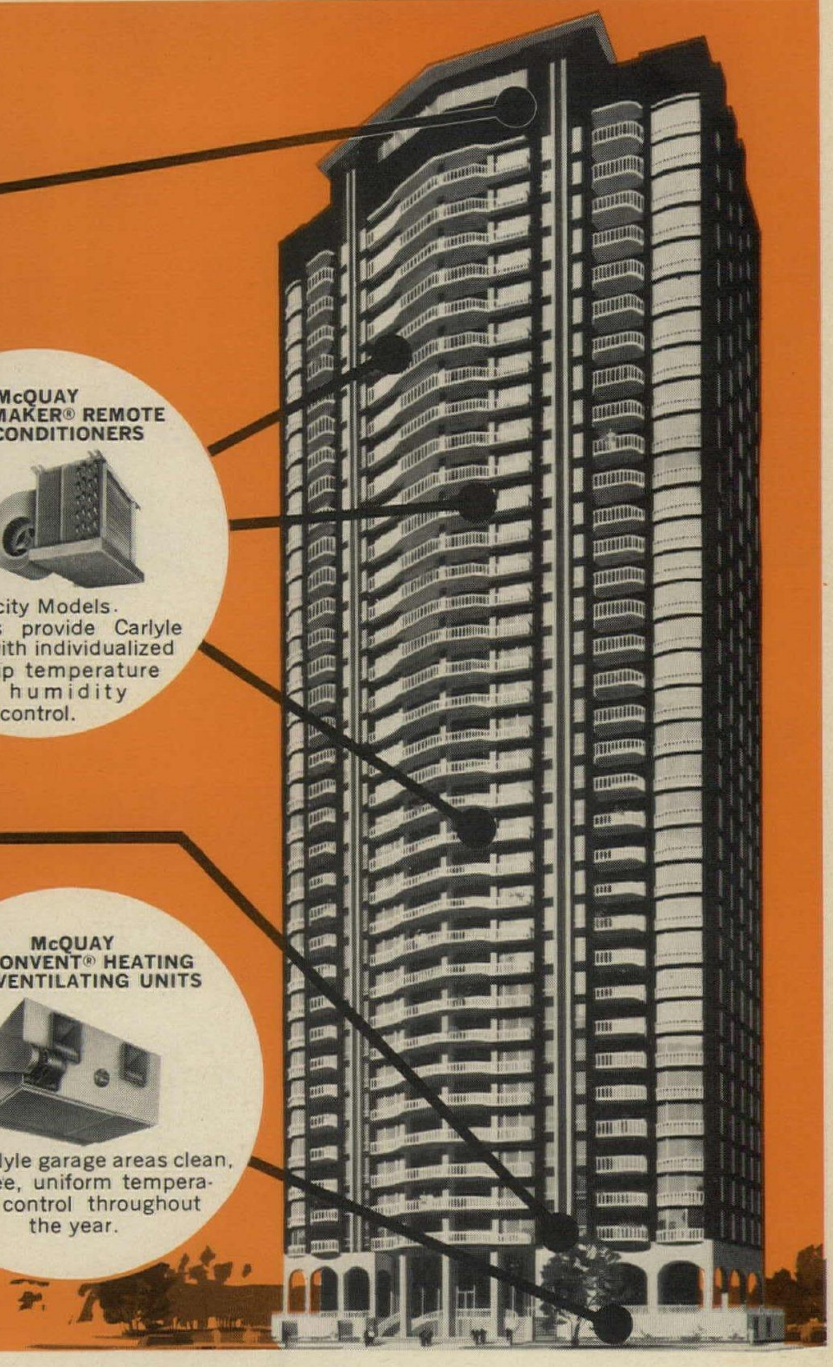


Thin-Line Floor Models. These conditioners, with built-in electric heat coils, handle special requirements for office areas.

McQUAY SEASONVENT® HEATING AND VENTILATING UNITS



Give Carlyle garage areas clean, odor-free, uniform temperature control throughout the year.



Architect: Hirschfeld, Reinheimer & Pawlan
General Contractor: Robin Construction Co.
Mechanical Engineer: William Goodman & Associates
Mechanical Contractor: Adelman Heating Co.
Developers: Albert A. Robin and Futterman Corp., New York
McQuay Rep.: Sweiger-Davidson Co., Chicago

THE CARLYLE CONDOMINIUM, CHICAGO LOOKED TO THE LEADER...McQUAY FOR SINGLE SOURCE RESPONSIBILITY ON ITS AIR CONDITIONING NEEDS

The ultra-modern, 38-story Carlyle condominium looked to McQuay for a compatible air conditioning system with units designed for quick installation and ease of maintenance. McQuay is the world's largest manufacturer of heat transfer coils and that experience makes a big difference. You can meet precisely any air conditioning, heating or ventilating requirement when you specify McQuay. For complete information call your McQuay Representative or write direct.

McQuay INC.

Box 1551, 13600 Industrial Park Blvd.,
Minneapolis, Minnesota 55440

AIR CONDITIONING • REFRIGERATION
HEATING • VENTILATING

MANUFACTURING PLANTS AT FARIBAULT, MINNESOTA • GRENADA, MISSISSIPPI • VISALIA CALIFORNIA

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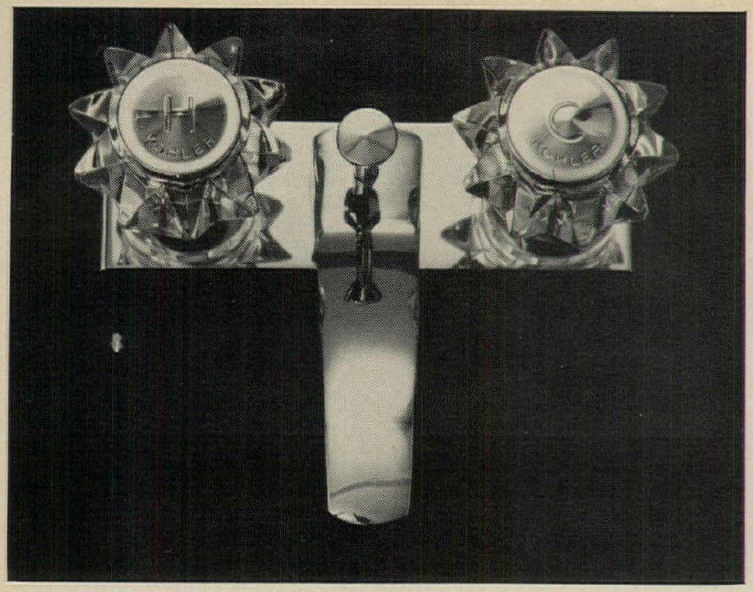
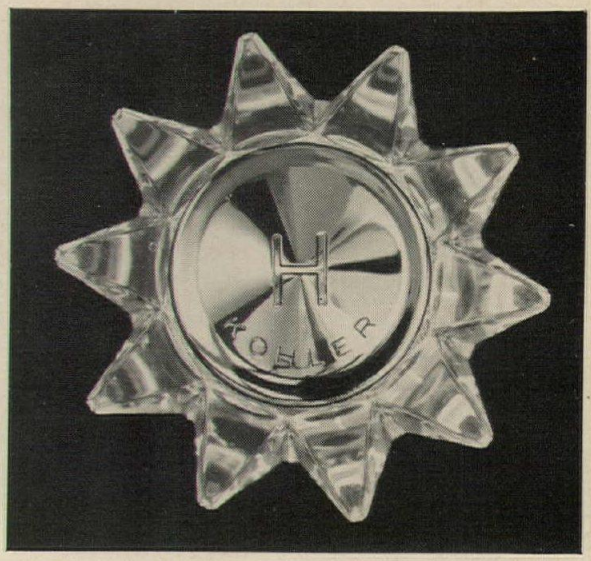


SPARKLE! These are the new *Flair* fittings, by Kohler. Of diamond-bright acrylic.



SPARKLE! Clean of line, crystal clear, *Flair* fittings have a gem-like radiance.

SPARKLE! *Flair* fittings add the crowning touch to Kohler fixtures. Great with the new accent colors!

SPARKLE! *Flair* fittings are genuine Kohler fittings, through and through . . . acrylic and brass in the traditional quality of Kohler.

SPARKLE! Sparkling ads featuring *Flair* fittings are selling your customers now.

ADD SPARKLE TO YOUR SALES...ADD FLAIR!

FLAIR FITTINGS

KOHLER OF KOHLER

Kohler Co., Established 1873, Kohler, Wisconsin

ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS • ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS

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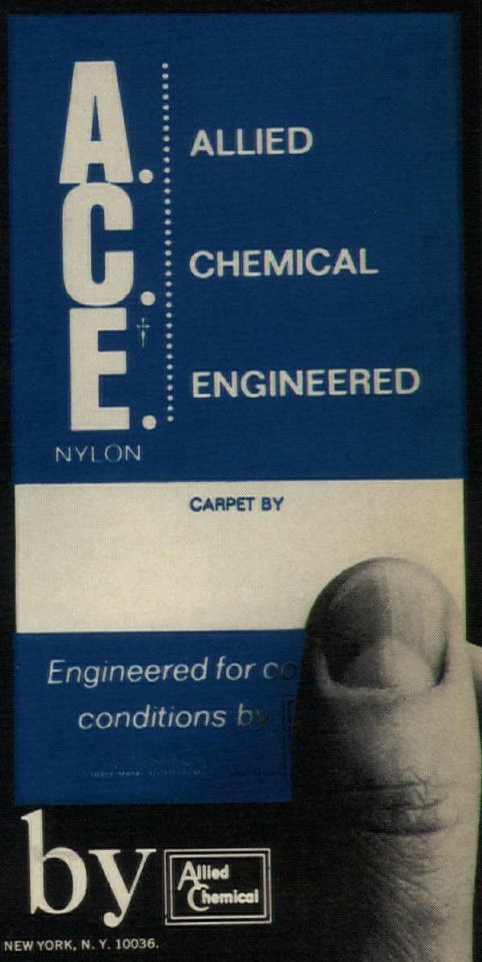
For more data, circle 18 on inquiry card

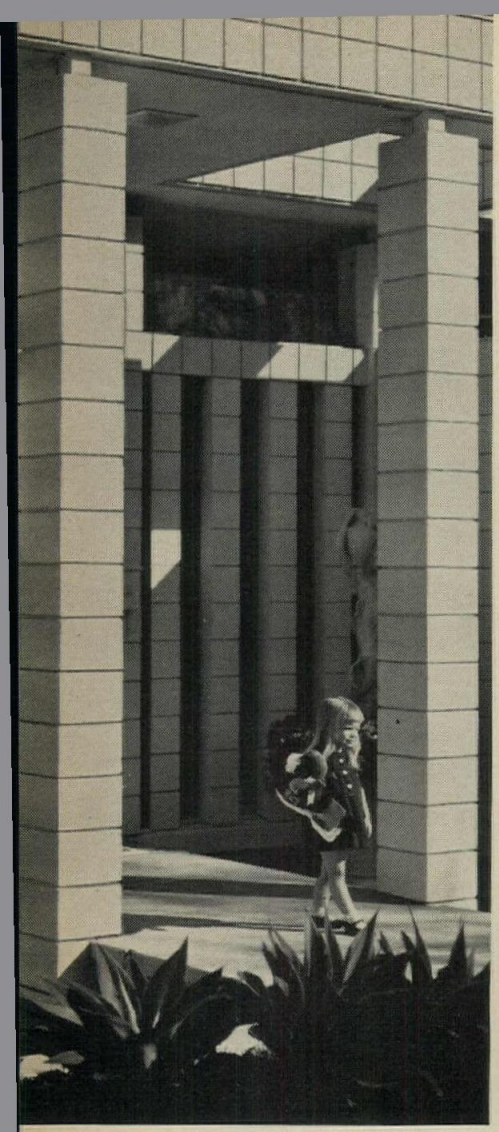
When you're in the market for carpet, look for this label.

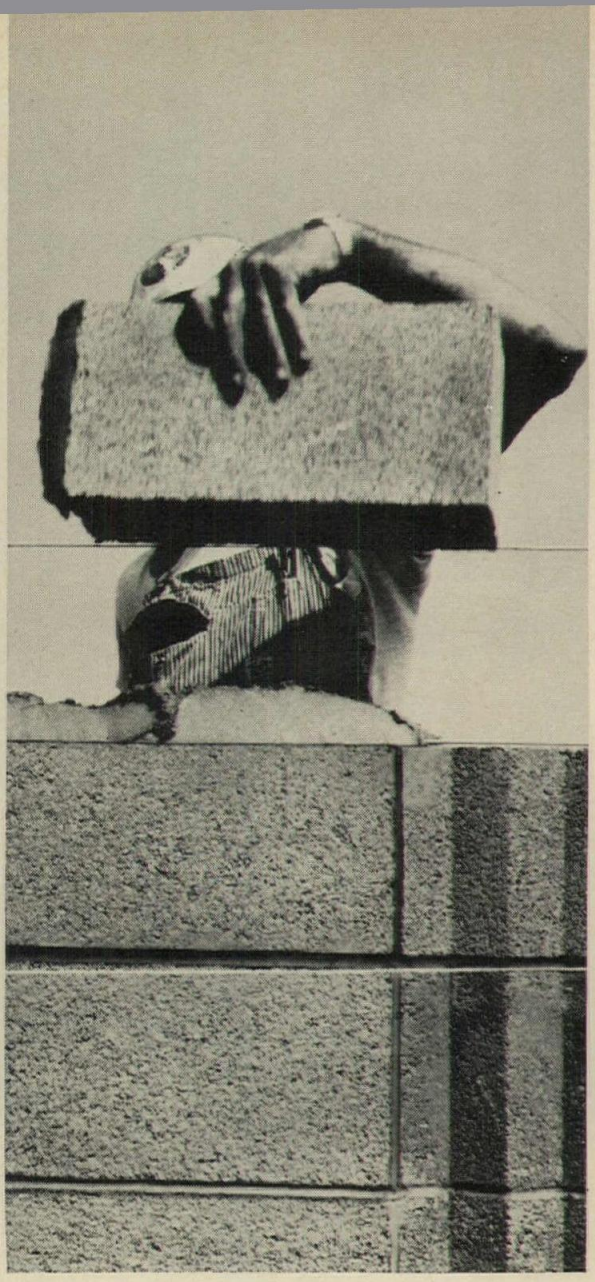
It's the first identification by a fiber manufacturer that its yarn is specially engineered for commercial conditions.



Specify A.C.E. nylon by Allied Chemical

FOR INFORMATION CALL (212) MA 2-7300, EXT. 444, OR WRITE ALLIED CHEMICAL CORPORATION, FIBERS DIVISION, ALLIED CHEMICAL TOWER, NO. 1 TIMES SQUARE, NEW YORK, N. Y. 10036.





The Q BLOCK® Program stacks everything in your favor

WHEN you're working with quality, things just naturally fall into place. Take the new Q BLOCK program for example. It wasn't long after block producers across the country adopted this national quality control program that building professionals were also eyeing its advantages.

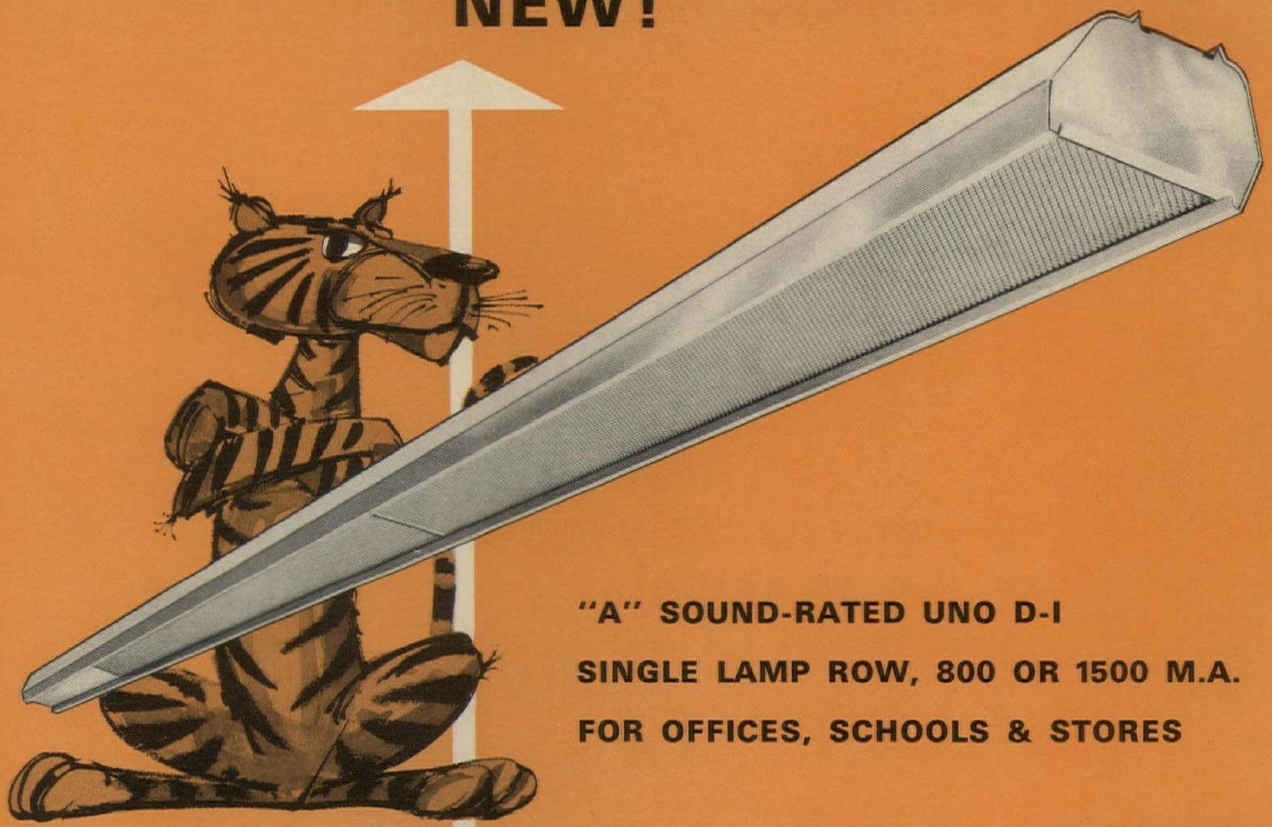
These new standards, set forth by the block industry itself, give architects and builders the opportunity to design and build with maximum assurance of product quality. They have demonstrated their acceptance by *specifying* concrete block produced under the Q BLOCK quality control program—as it reflects all the high standards that modern research and technical development can provide, backed up by regular product testing to guarantee that these standards are consistently maintained.

Concrete block, made to Q BLOCK specifications, is concrete block at its best. And better concrete block will always mean wider opportunities and more confidence for the modern user of building products.

Members of the National Q BLOCK program are identified by this registered mark. Look for it wherever you specify or use concrete block.

National Concrete Masonry Association · 2009 14th Street, North · Arlington, Virginia 22201

NEW!



"A" SOUND-RATED UNO D-I

SINGLE LAMP ROW, 800 OR 1500 M.A.

FOR OFFICES, SCHOOLS & STORES

STRONG AND SILENT TYPE

UNO D-I saves money yet produces ample quantities and quality of illumination.

Use UNO D-I for offices, classrooms . . . yes, even for libraries.

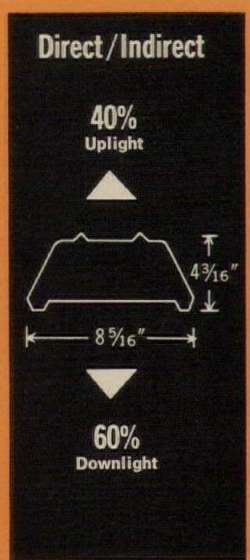
Save up to 20% installation cost (compared to a pendant 430 M.A. Rapid Start System).

Standard units for two 8-foot lamps are 17'4" long.

Fill-in sections ("B" sound-rated) are available.

Choice of Standard GRATELITE®, Prismoid GRATELITE®, or Clear Prismatic OPTILUX bottom enclosures.

Separate compartment for cooler ballast operation and easy access.



Write for complete details on UNO D-I today!

THE EDWIN F. GUTH CO.

2615 Washington Avenue • St. Louis, Missouri 63103

® T. M. Edwin F. Guth Co.

UNO D-I

Guth LIGHTING since 1902

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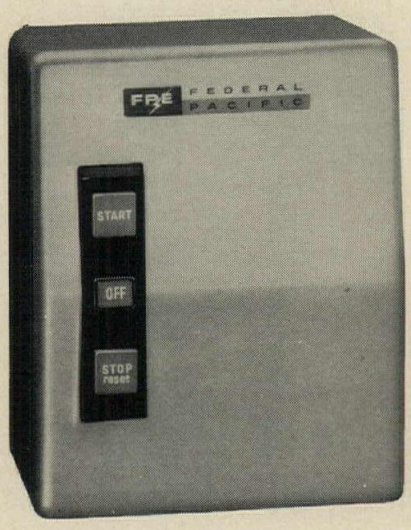
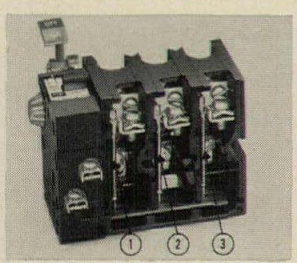


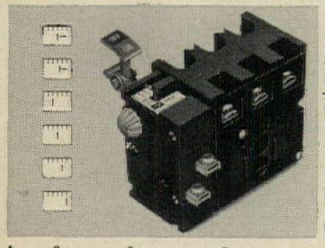
The new GA 4000. The only motor starter that provides total motor protection.

For the first time in the history of motor starters, *total* protection is built into a single overload relay. The exclusive new relay assembly includes the *four* functions needed for total overload protection, eliminating costly motor, burn outs and down time.

Three trip elements



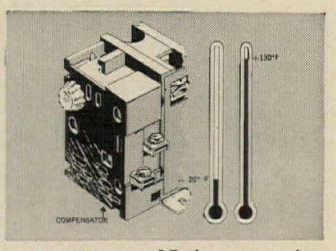
The GA 4000 3 phase overload relay assembly has three bi-metal trip elements instead of the usual two, at no increase in cost. Any or all of the trip elements operate through a common trip bar to actuate a single, trip-free switch in series with the magnet coil.



Adjustable trip

Heater coil stocks are eliminated because, in the GA 4000, adjustable overload relay assemblies are factory installed and calibrated. A simple twist of the dial selects exact seting for each motor horsepower rating within the range of the relay assembly. Only 6 overload relay assemblies are needed to protect all motors rated to 5 HP, 22 V., and 10 HP, 440 V.

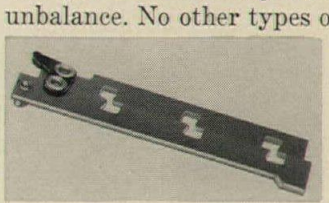
Ambient compensation



This automatic feature is standard in the GA 4000 overload switch. It makes practical, precise protection of a motor when the starter is located remotely and is subjected to different or varying ambient temperatures. Nuisance tripping is eliminated.

Single phase sensor

This exclusive feature detects load unbalance caused by single phasing of even lightly loaded motors. A sensor bar working with the regular common trip bar to adjust automatically the normal trip point for load unbalance. No other types of overload relays provide this protection for your motor.



For more information about FPE's GA 4000 general application motor starter call your local distributor or your local FPE field office. Information can also be obtained directly from Federal Pacific Electric Co. 50 Paris Street, Newark, N.J. 07101.

FPE FEDERAL PACIFIC ELECTRIC COMPANY
A member of NEMA

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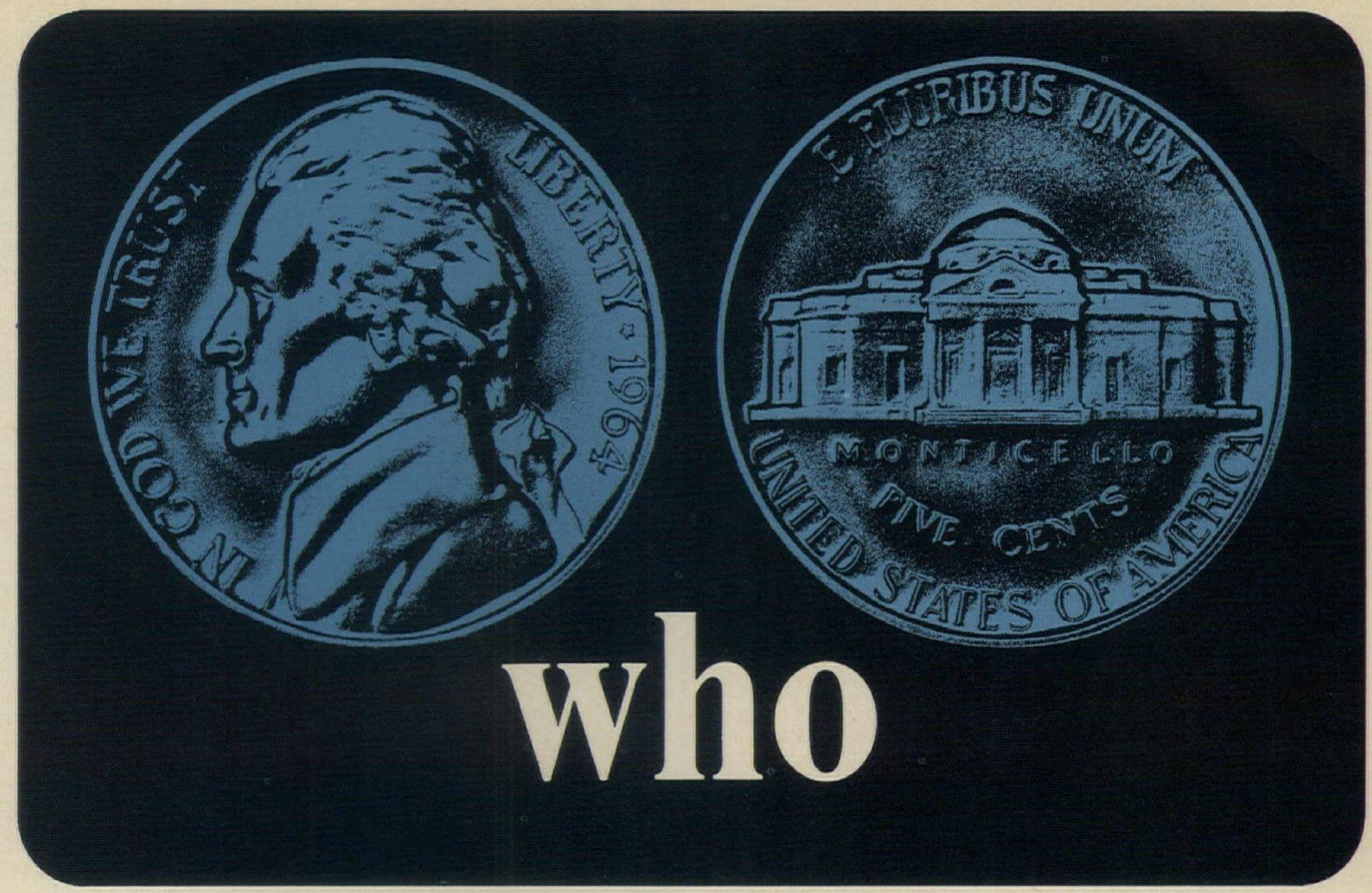

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provides an authentic design service for only a 10¢ phone call?

Answer: Hartmann-Sanders, world's leading manufacturer of classical columns.

Authenticity of detail and adherence to proper proportions as well as correct material choices and true craftsmanship are the important elements in column manufacturing. It is why we are still, after 65 years, the largest custom-manufacturer of classical columns.
Equally important to the success of the total concept are the design and construction details of the other traditional components: the cornice; the portico; or entablature.
While we are well aware of the architect's historic design prerogative, our exposure to and detailing experience in the classical architectural forms may be of some help to you.
At your request a Hartmann-Sanders Company representative will be happy to consult with you, our design staff will review your details or if necessary assist in their development. Production responsibility for these items may be assigned to anyone you choose.
This service is provided wherever Hartmann-Sanders columns are used and costs no more than a phone call or a five cent stamp. Our column brochure is, of course, available upon request.

Hartmann-Sanders Company 1717 Arthur Avenue, Centex Industrial Park, Elk Grove Village, Illinois, Phone 312-439-5600

For more data, circle 21 on inquiry card

BREAKTHR

BY UNITE

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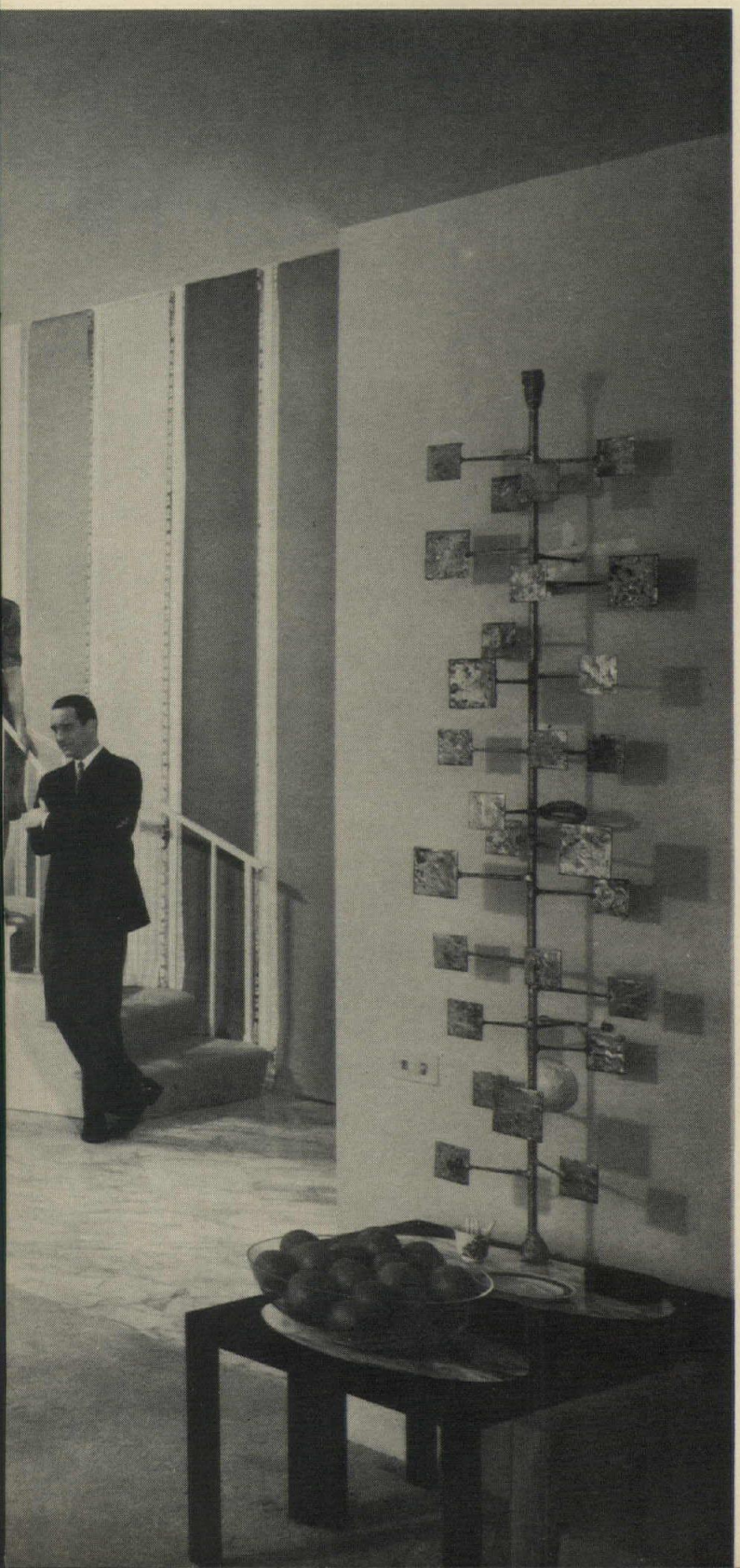

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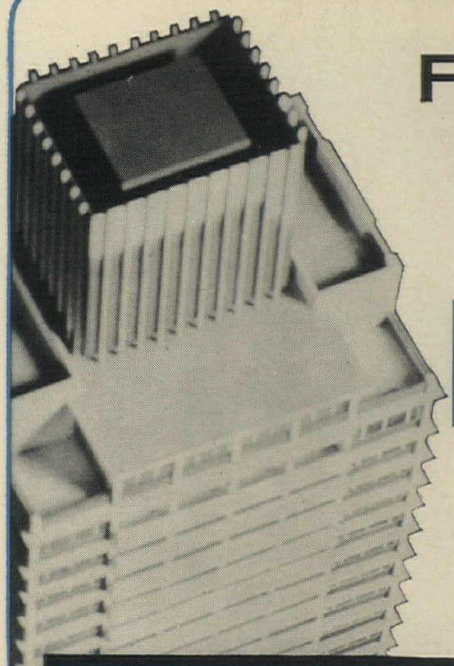

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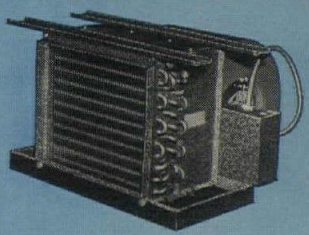

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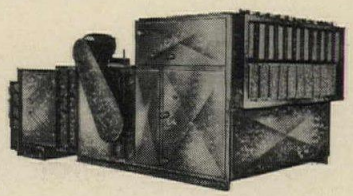

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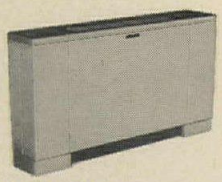

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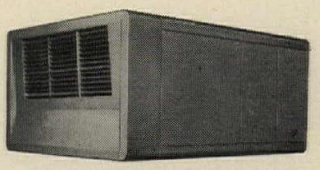

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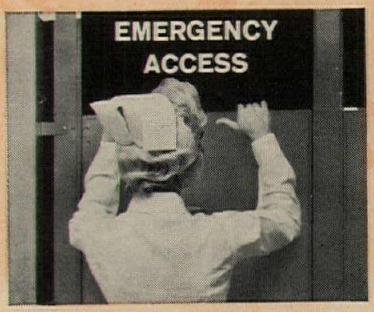

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If "total environment" is our charge, open spaces must also be our concern

With open space already at such a premium in cities, an extra amount of caution on plans to use urban park areas for structures would not seem to be amiss. Strong as may be pressures for good (and free) sites, the overriding value of, and the absolute necessity for, beautiful public open spaces must be the primary determinant—if we are to have an environment of quality.

The pressures for development do not even have to be strong, if the land is there. Just its state of undevelopment is enough to set minds to work on how it could be turned to other use. It is as if, as a nation, we are restless until we have destroyed our means for finding rest. For open space is a place of re-creation, of rest from the pace of city life and the press of city buildings, and the multiplicity of things man makes.

Thus in Los Angeles there has been serious consideration for more than a year (and the discussion is not yet done) of using a pleasant park as a site for a convention center. Laudable as it may be to provide such a facility, and adequate though the park may be in size to serve as the location for it, the question remains: should a city's open space be usurped in such a way?

The fault, of course, is the park's. It is near downtown, it is adjacent to a freeway; the freeway, in fact, crosses over a portion of the park. There are already access ramps at the park. It is convenient, it is large enough, it is unbuilt upon. Who blames the covetous eyes that look at the park? The park makes its own fate: it is there, and it is open.

In San Francisco another kind of problem confronts the citizenry. Should a park be sacrificed to convenience, or worse, to expedience? Although many other factors also must be considered in the decision on this problem, the overriding one must be the longest range good for the city. In the fabric of a city, the city's breathing spaces must have a top priority.

And again the fault is the park's. It is open, it "wouldn't disrupt as many buildings" or "displace as many people" as if a route were chosen through developed property. There is the park, open, undeveloped, undwelt upon.

Even a small city is not immune from pressures of this kind. A businessmen's organization in Berkeley, California, eager to celebrate its centennial with a tangible memorial, asked to give the city a sum of money for an art and garden center *provided* that the city make available a site and that site be in a specific park. The park was small, the location in it unsuited to a building, its character still retaining the fast-disappearing wildness of the hills for which the city is justly known. The money involved was not great enough even to cover a stripped-down program for a center such as the group glowingly described, but the "Athens of the West" accepted this gift-with-strings and made a grateful gift of this piece of land from its small, and dwindling, supply of public open space. The park was there, open, available.

There were few protests, and none from those who, as designers of the *total environment,* must cherish, guard and preserve the open spaces which are the city dweller's release.

But an even more rapacious threat hangs over the people in a whole collection of communities. San Francisco Bay itself is threatened with a piecemeal filling on a scale which, if all the present intentions are carried out for which permits have been issued, would result in alarming changes to the appearance of the Bay. Neither the outcry of alarmed citizens nor the brand-new Bay Conservation and Development Commission have been able to persuade the tideland-fillers to desist.

Who has protested against the desecration of one of the great bodies of the world's geography? The founders of the Save-the-Bay Association, whose voice was the loudest, whose program of action was unwavering and persistent, were ladies of the community of Berkeley. Not architects. As individuals, architects may have participated. As architects, they were silent.

The handwriting is clear: there must be courage to look beyond the project of the moment to the vision of the future, to adjudge the contemporary gain against the inescapable result, to mean *total* when we say total. If it is more than the individual can do himself, then it must be done by the group. But when we say total environment, our concern must be for open space as well as for buildings.

Elisabeth Kendall Thompson

THIS MONTH'S WESTERN REPORTS:

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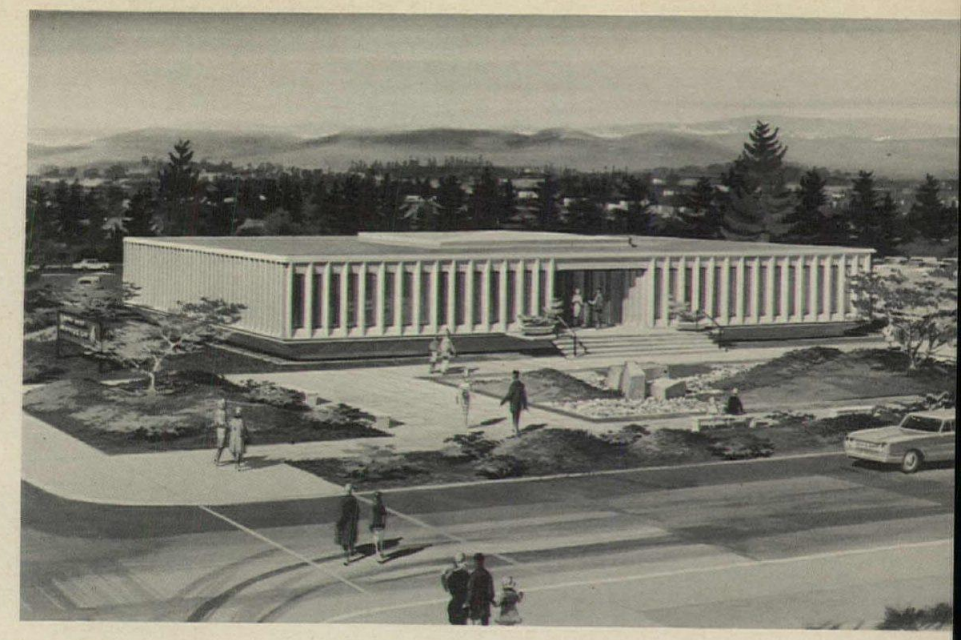
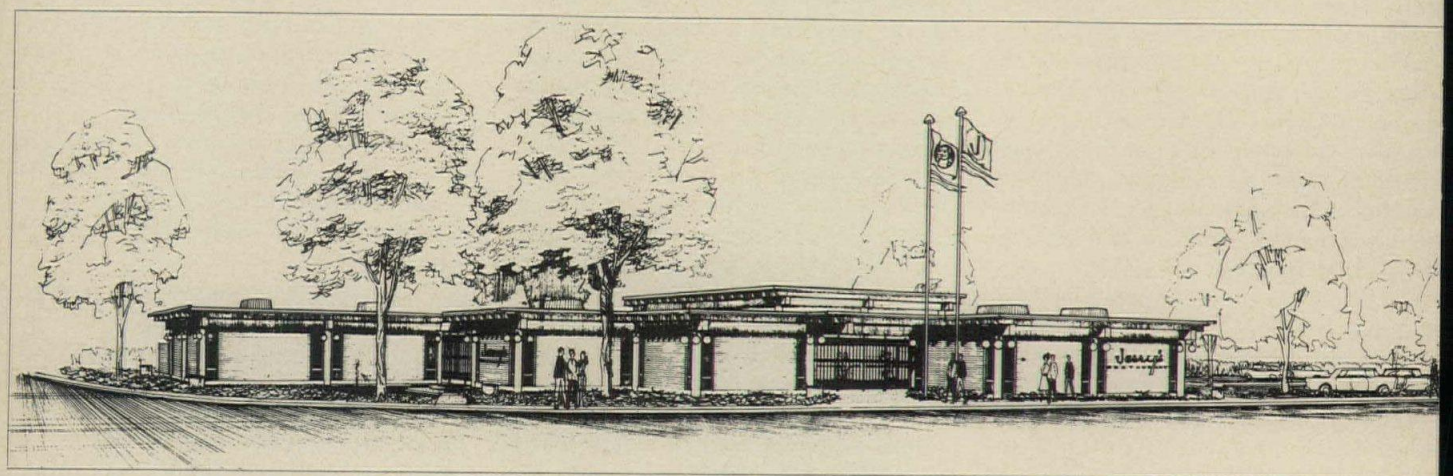
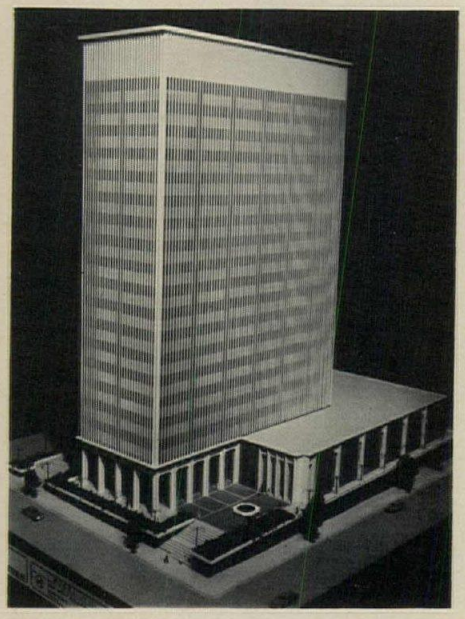
WESTERN BUILDINGS IN THE NEWS



New offices for Washington Natural Gas Company in Bellevue, Washington will be provided late this year in this building-on-a-podium, well set back from the street. Its sparkling exterior is of precast exposed quartz aggregate panels. A large skylight over the central portion daylights the sales display area. In addition to business and executive offices, the building has an auditorium and a demonstration kitchen. Architects: Naramore, Bain, Brady and Johanson; structural engineer: Victor O. Gray; mechanical engineers: Bouillon, Christofferson & Schairer; contractor: Sellen and Hansen.



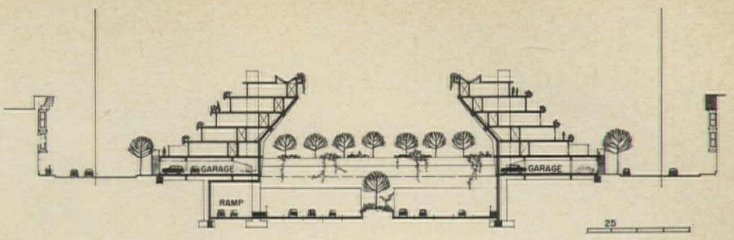
To develop Jerry's Restaurant as the owner and the architects wanted it to be—a community asset instead of the usual hamburger-stand eyesore—it took their combined efforts plus those of two artists, the City Council, the Planning Department and other city officials of Pleasant Hill, California, and the good will and cooperation of residents of areas adjacent to the selected site for the restaurant. The new building will provide both enclosed dining areas and trellised interior patio areas as well as ample food preparation facilities. The land available will provide space for 95 cars. Architects: Kitchen and Hunt.



San Diego's downtown skyline will have another tall office building in 1968 when the 21-story headquarters building for San Diego Gas and Electric Company is completed. Two lower floors (and possibly two additional floors, allowed for in the design) will occupy most of the block-square site. From their roof, a landscaped plaza, a 19-story office tower will rise. Architects: Richard George Wheeler.

The Ritz Tower combines apartments and commercial units in one complex to justify use of an expensive site in downtown Denver. The 12-story, 120-unit apartment tower rises from a two-story office and specialty shop building, gaining both economic value from the commercial use and privacy and quiet for the apartments which are set back from the street and above traffic noise.

SAN FRANCISCO'S DILEMMA: MORE FREEWAYS OR NONE?



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Six years ago San Francisco's courageous *No* vote on freeways echoed throughout the country. Today its Board of Supervisors is confronted with the decision as to whether or not it will accept the two routes and the design which would give it the Federal funds it spurned in 1959.

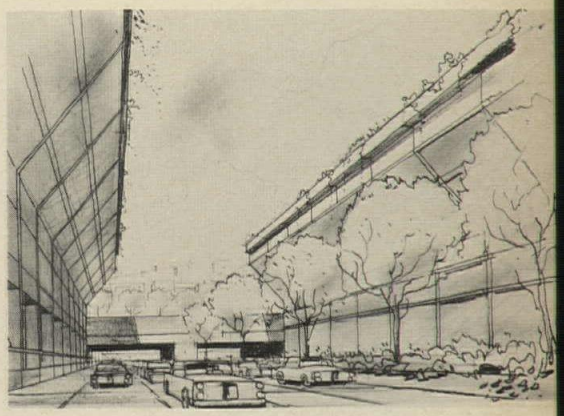
Because public sentiment about freeways—more especially, the two routes in question—has run hot, the city engaged the services of a number of consultants in an effort to get at some tangible, assimilable studies that would help it decide.

"Too little and too late" was the almost immediate reaction of such groups as SPUR, the citizens' organization for planning and urban renewal, and the Northern California chapter, A.I.A. "Too expensive and a duplication" cried other kinds of citizens' organizations. Caught in the middle were the consultants commissioned to do the studies, anxious to aid in so important a decision, concerned because it was obvious that there wasn't time to make the thorough study for the master plan which was so greatly needed before *any* decision should be made.

Both routes are being proposed as parts of a connection to, and from, the Golden Gate Bridge and Marin County. The Panhandle route not only would completely disrupt the handsome trees of the Panhandle extension of Golden Gate Park, and would take away hundreds of living units, but it would pass through and destroy a corner of Golden Gate Park itself. The Golden Gate route would be an extension along the city's northern waterfront of the often-condemned Embarcadero freeway. It too would displace residents of the area, but in far fewer numbers than the Panhandle route.

Both routes are obviously for the convenience of through traffic from the northern to the southern parts of the Bay Area, and vice versa, rather than for local traffic. The number of lanes and the accesses for the freeways are, therefore, important aspects of the whole question. But overriding these and all other considerations is the lack of an up-to-date master plan for the city's circulation system. And this the consultants—Mario Ciampi and John C. Warnecke Associates and Hal Dunleavy Associates—had neither the time nor the scope of commission to undertake, although Thomas E. Creighton, representing the Warnecke firm, did point out at public hearings the need for such a plan and the impossibility of evaluating these or any routes without it.

This call for a true master plan, and some imaginative proposals for use of air rights along freeway strips (see sketches at right) will stand, whatever the outcome of the current deliberations, as plus values in the otherwise disturbing re-run of a now-familiar debate in San Francisco.



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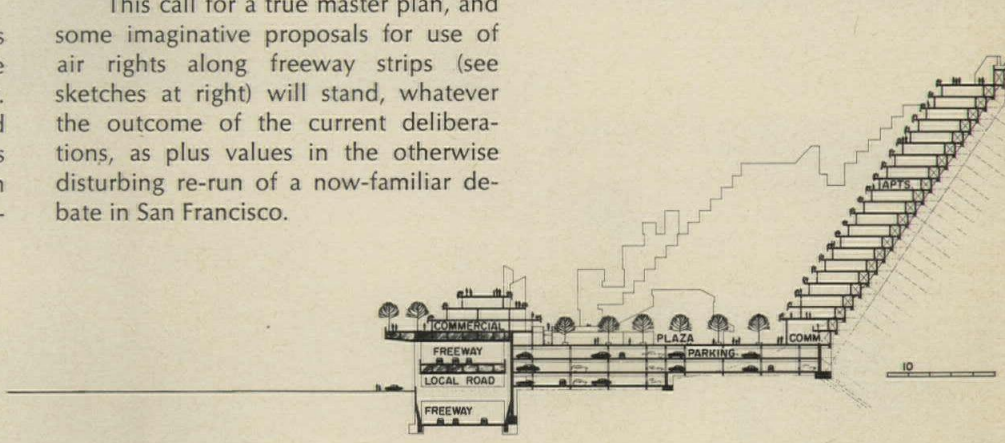

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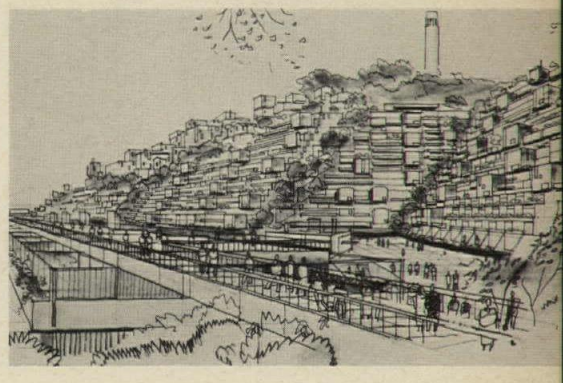
In connection with a study for the city of San Francisco on the impact of freeways on housing made by Hal Dunleavy Associates, architectural explorations of air space use above freeways were also made. Study suggests creating sites for housing by utilizing ground-level space on either side of depressed freeway for parking garages and placing over them medium- and low-rent housing (wood framed, since only three floors are involved at any point) on staggered platforms which back up to and cantilever over freeway. Concrete shield wall would screen out noise. Cost for building basic site (shield wall and parking structure) is estimated at $1,300 per linear foot. (1) Panhandle freeway section; (2) perspective from freeway; (3) housing frontage along local street; (4) Golden Gate freeway section around Telegraph Hill, showing plaza, promenade deck and shops, with parking and two levels of freeway traffic below; (5) perspective from promenade level. Architects: Burger and Coplans, with consultants Donald P. Reay, architect; Eric Elsoesser, structural engineer; Walter Soroka, acoustical engineer.



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Hawaii A.I.A. honors eight, names 1966 P.P.A.C. winner

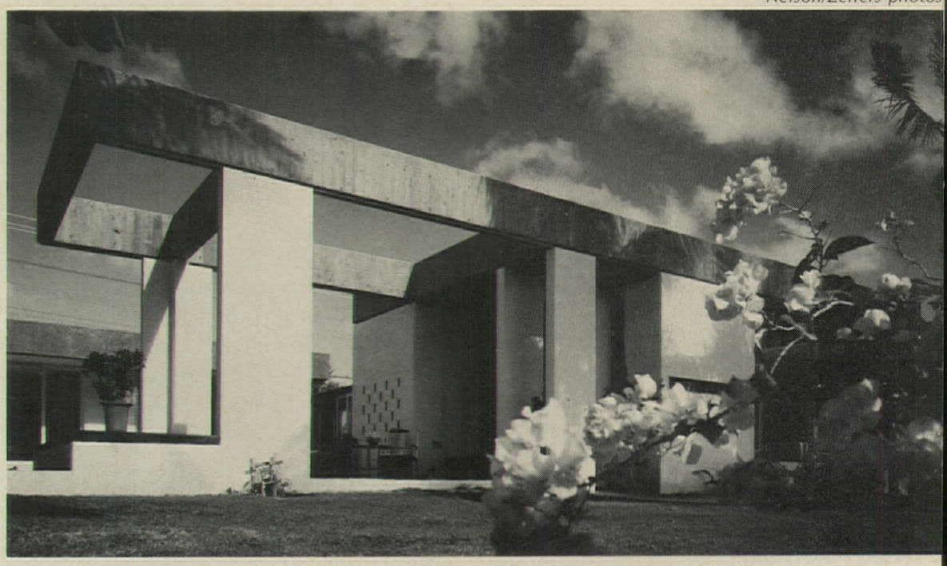
The annual awards program of the Hawaii Chapter, A.I.A., has several features: First, in addition to making awards to buildings by chapter members, it honors an architect (or his firm) from a Pacific Rim country for outstanding contribution to design, and second, a jury for all honors is made up of the previous year's award winners. This year's Pan Pacific Architectural Citation winner is Howard Asheley, F.R.I.B.A., of Kuala Lumper, Malaya. Especially cited among his works was the new National Mosque, located in Kuala Lumper.

Jurors were Vladimir Ossipoff, Gerald Allison, Allen R. Johnson, Thomas D. Perkins and Thomas O. Wells.

All award winning buildings by Hawaii Chapter members are located in the city of Honolulu. The two Honor Award winners and two of the six buildings which received Honorable Mentions are shown on this page. In addition, Honorable Mentions went to: Residence for Dr. James M. Denny—Architect, John P. Tatom; Residence for Dr. Ernest Reese — Architect, Richard N. Dennis; Residence for Peter Song—Architect, Edward Sullam; Residence for E. L. Doheny —Architect, Frank Robert.

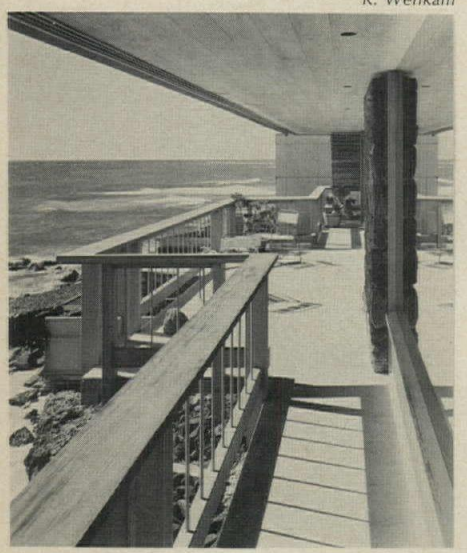
Honor Award. The Gregg Apartments, Honolulu. Architects: Lemmon, Freeth, Haines and Jones with Joseph Farrell, associate. One of the two Honor Awards given.

Nelson/Zellers photos



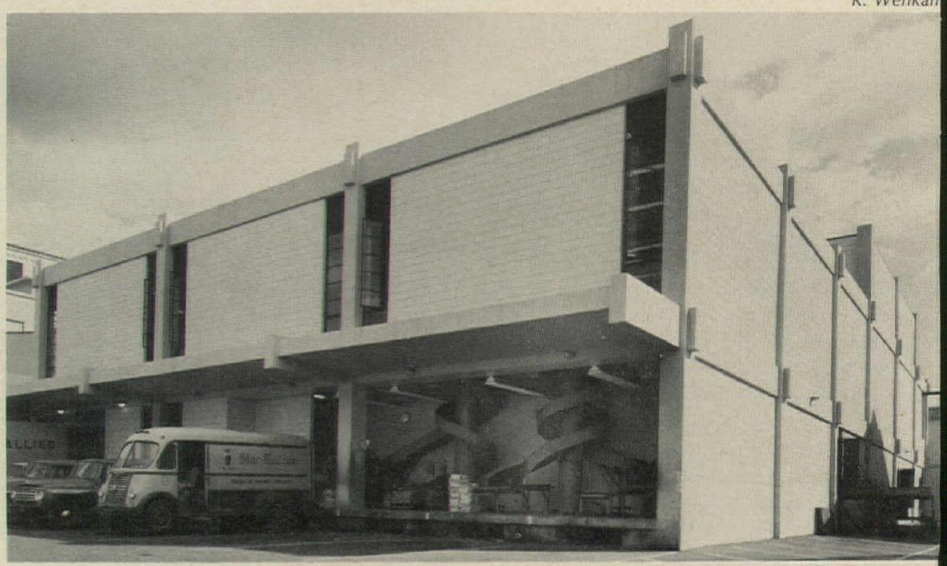
Honor Award. Derek Trotter residence, Honolulu. Architect: John P. Tatom, A.I.A. An Honor Award building from the residential remodeling classification.

R. Wenkam



Honorable Mention. In the new residential class, the Dr. Samuel D. Allison residence, Honolulu, Hawaii. Architects: Akiyama, Kekoolani & Associates.

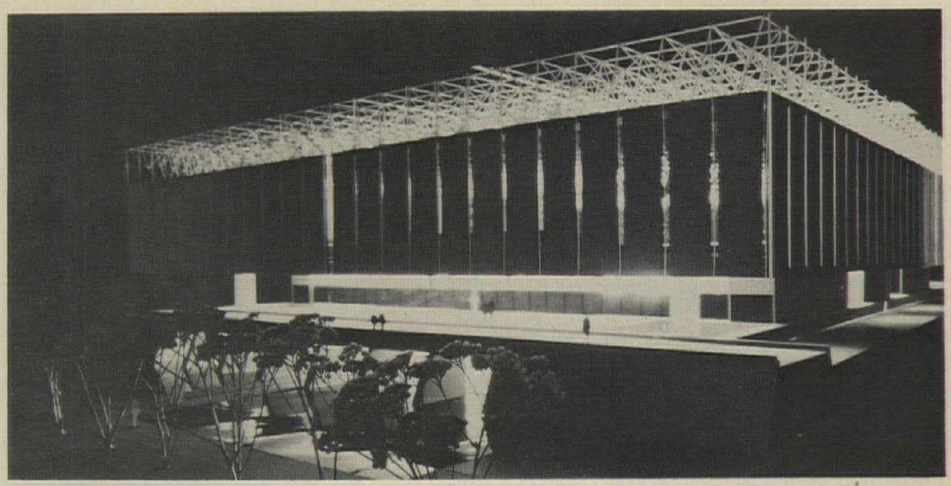
R. Wenkam



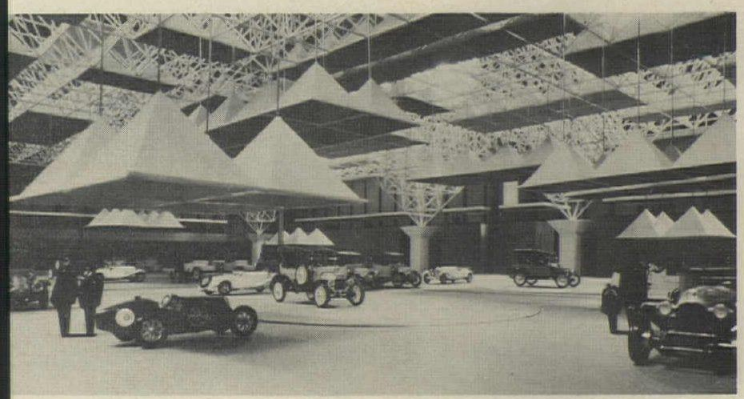
Honorable Mention. Press Building for Hawaii newspaper agency. An industrial building by Lemmon, Freeth, Haines & Jones with Joseph Farrell, associate.

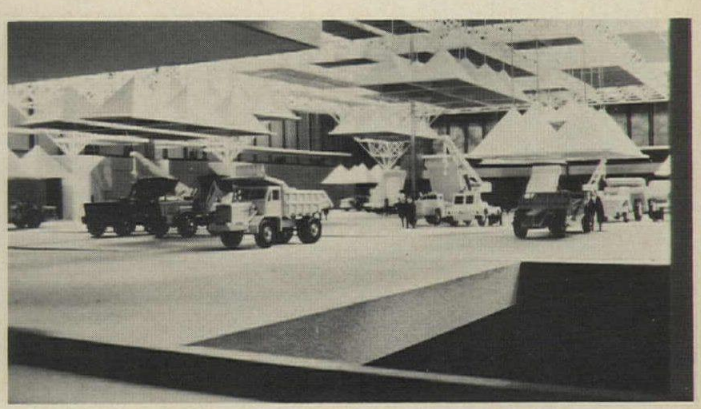
Adjustable ceiling and clear span for exhibition-hall

Denver's new convention center will have an adjustable ceiling system. Pyramidal forms containing lighting fixtures can be lowered in various combinations over exhibits, or can be set at a continuous low ceiling height throughout the hall. The building's structure consists of four steel space frames, each 170 by 240 feet, from which the pyramids are suspended. A large sunken plaza with a reflecting pool forms a sheltered court for public use. The design won a statewide open competition held in 1965. Architects (joint venture): Muchow, Ream & Larson.



Unconventional ceiling system will permit partition of any part of the exhibition space and will overcome the cavernous effect of the usual exhibition building interior.





WESTERN TOPICS

New Dodge House owner will try to preserve it

Pioneer modern architect Irving Gill's masterpiece, the Walter Luther Dodge House in Los Angeles county, has been sold by its most recent owner, the Los Angeles School Board, to the Lytton Savings and Loan Association for $800,000. Architects and historians had fought for months to keep the landmark building in public ownership and in a use which would permit its preservation in an appropriate function.

Financier Bart Lytton was the sole bidder for the property, located in an area recently re-zoned for high-rise buildings. The 16-room house stands on a two-and-three-quarter-acre site. Lytton's voluntary offer to do all possible to preserve the house included promise to keep the property "inviolate" for 10 months while the Citizens' Committee for the Dodge House continues its efforts to raise funds for purchase of the house. He also assured them that they could concentrate on buying only the portion of the property on which the house stands. He intends to use part of the property for high-rise apartments. The property had been bought in 1939 for $68,000.

Two-year, 50-foot height limit for La Jolla

A two-year limit of 50 feet for buildings in all but three areas of picturesque La Jolla, California has followed a bitter condemnation of construction of high-rise buildings along the ocean side of the city. The moratorium will give time needed for development of a master plan which a citizen group and the planning department will formulate.

The three exempted areas are the University of California's San Diego campus, La Jolla Farms, on the northern border, and Park La Jolla apartments on the edge of Pacific Beach.

While the intent was to preserve the particular scale and quality of La Jolla, the arguments in favor of the limitation were based on traffic congestion, overtaxing of sewer and other facilities, and economics. Two existing high-rise structures have not been economically successful as yet.

WESTERN EVENTS

APRIL

5-May 8 Exhibition of the architecture of Louis Christian Mullgardt. Art Gallery, University of California, Santa Barbara.

16-21 International Council of Shopping Centers. Biltmore and Statler Hotels, Los Angeles.

24 Closing date, All-California Art Exhibition. Fine Arts Gallery of San Diego.

26-28 27th National Conference on Religious Architecture. Sheraton Palace Hotel, San Francisco.

24-29 28th Annual Convention of the National Association of Architectural Metal Manufacturers. Mark Hopkins Hotel, San Francisco.

MAY

1 Ninth Annual Home Tour. Women's Architectural League of Southern California: Futher information Southern California Chapter, A.I.A., Suite 810, 8899 Beverly Blvd., Los Angeles.

8-12 National Convention American Society of Landscape Architects. Yosemite National Park, California.

15-21 Mid-Pacific Conference on Landscape Architecture and Urban Design. Princess Kaiulani Hotel, Honolulu.

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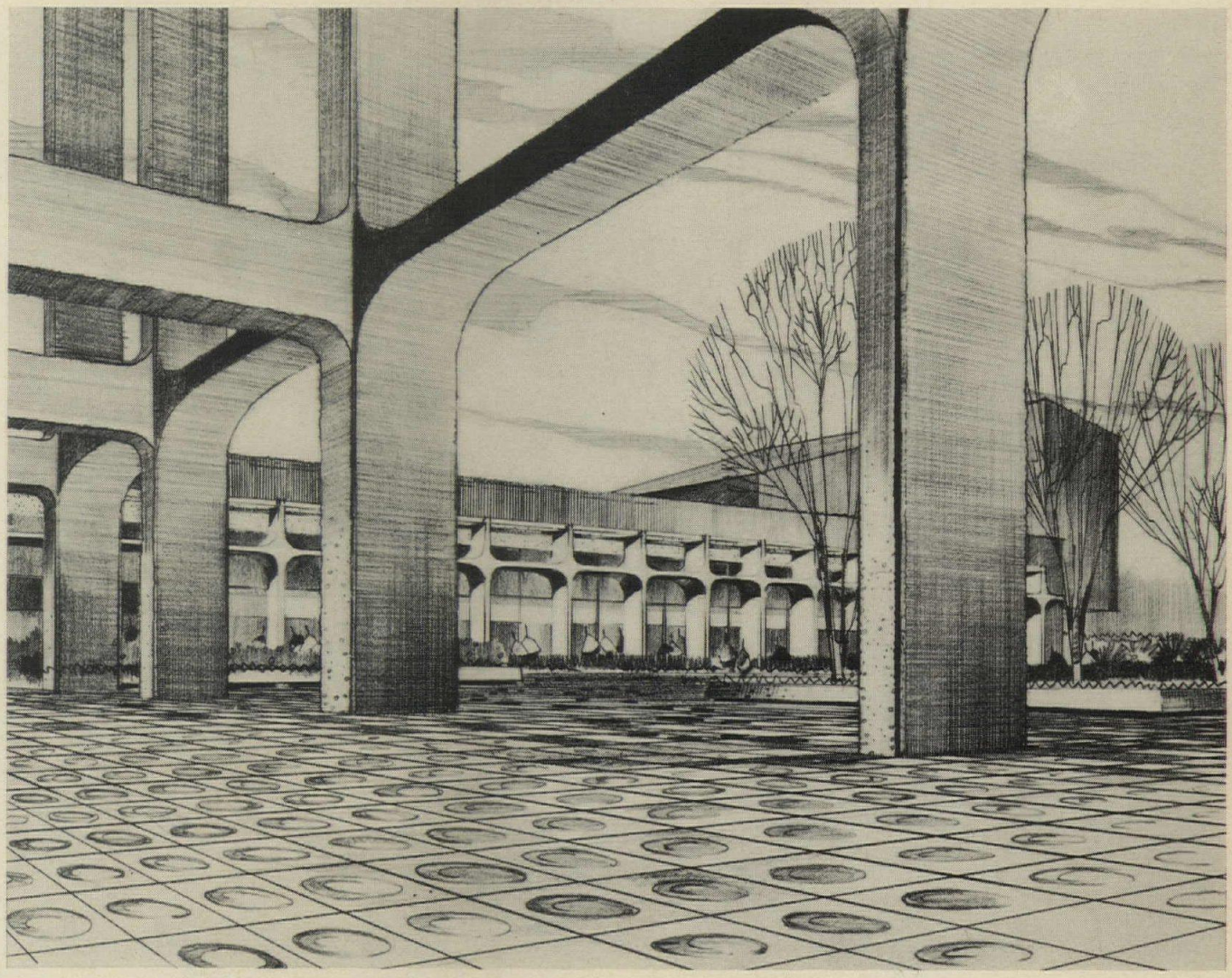
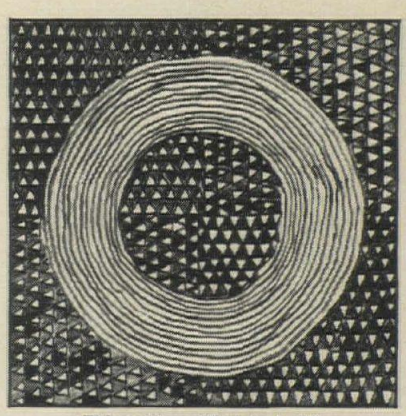
WHAT'S NEW IN ARCHITECTURAL CERAMICS ?





This pattern: "Ship's Awl."

A new concept in residential and commercial flooring, *Franciscan® Terra Floor™*. Textured patterns in bold ceramic colors. An authentic burned-earth look. Here are striking new design opportunities, new ways to add warmth and dramatic appeal to many areas, in residential, commercial and institutional structures. Entryways, atriums, halls and dining areas, especially. Lobbies, offices and corridors. This dramatic new floor tile is both bold–a nominal 12″ x 12″–and beautiful, with all the advantages inherent in glazed-surface ceramics. You have an excellent assortment of colors and patterns from which to choose, with harmonizing grouts available to enhance the dramatic effect. This delightfully different new ceramic flooring costs less than many vinyls. For samples and complete details, see the man from INTERPACE.

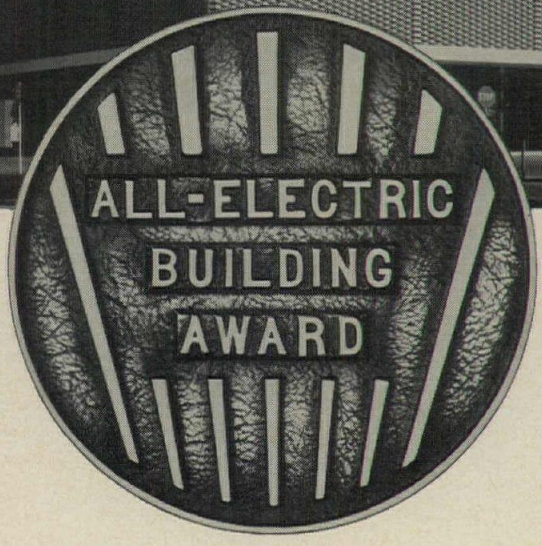
INTERPACE

INTERNATIONAL PIPE & CERAMICS CORPORATION

Los Angeles · San Francisco · San Diego · Sacramento · Santa Clara · Portland · Seattle · Spokane · Salt Lake City · Denver · Phoenix · Honolulu (American Factors)

For more data, circle 27 on inquiry card

The Broadway wins a medal.



Broadway Department Store
Whittier, California
Architect
Charles Luckman Associates

Consulting Mechanical Engineers
Ayres and Hayakawa

The Broadway knows value.

It shows even when they build a *store.*

By going *all-electric,* they obtained a more flexible design and a more attractive building for the same money.

Combined heating, lighting and air conditioning saved plumbing, ducting and space. Lighting also helps to heat the store, which reduces operating costs.

Care to hear more about all-electric buildings? Write Marketing Engineering, P.O. Box 62, Terminal Annex, Los Angeles 90051.

The Broadway won a medal.

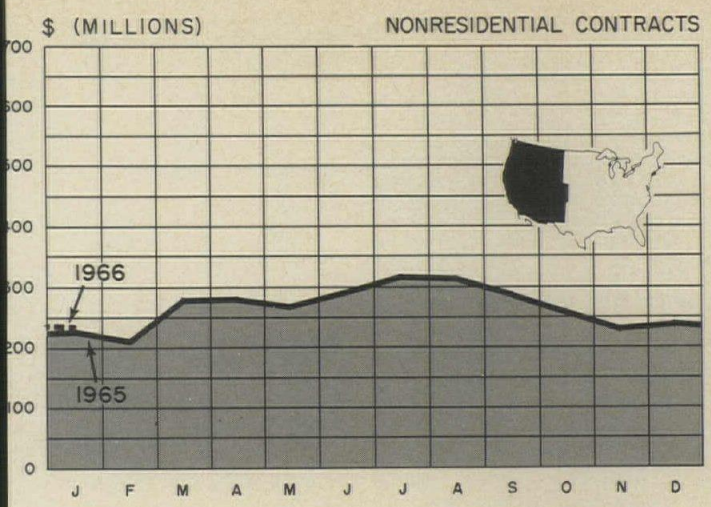
So did more than 800 others in Southern California last year.

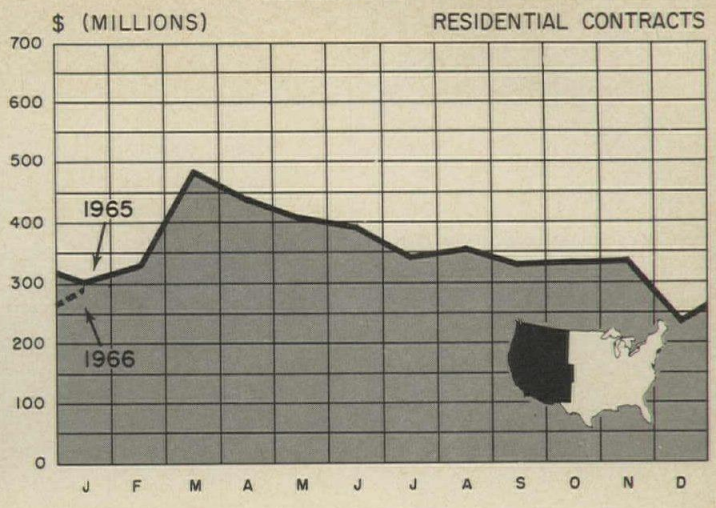
So should you in 1966.

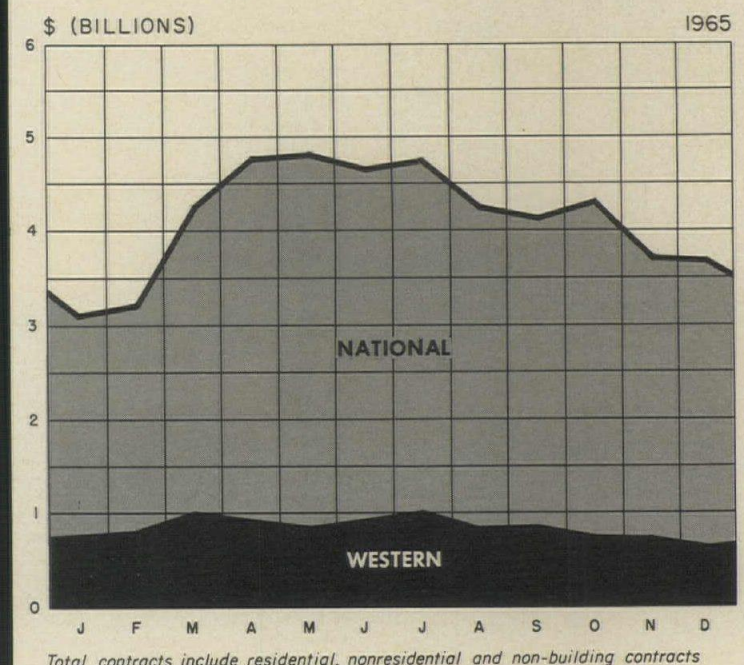
You're money ahead building all-electric.

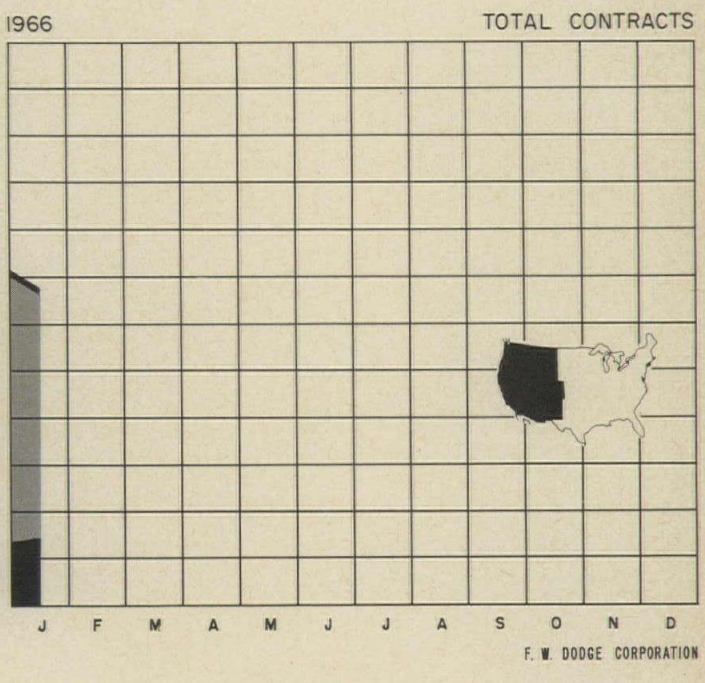
Southern California Edison SCE

For more data, circle 28 on inquiry card









Total contracts include residential, nonresidential and non-building contracts

F. W. DODGE CORPORATION

Western construction trends

FOR ANALYSIS OF CONSTRUCTION TRENDS NATIONWIDE SEE PAGE 44

Declines in both the nonbuilding and residential categories carried total construction into the red during January, as the West's construction markets greeted the new year without enthusiasm. The value of contracts for the 11-state region totaled only $708 million for the month, 7 per cent below January 1965's performance. The nation, on the other hand, stepped off smartly with an 8 per cent gain.

Nonresidential building, ahead by 3 per cent, added some brightness to an otherwise lackluster outcome. There is little resemblance, however, between the recent performances of the nonresidential building types and their standings in January 1965. The major areas of weakness last year were the areas of strength this year, and vice versa. Commercial contracts were down 6 per cent for the month, as a 50 per cent gain in store building could not cancel out a 45 per cent decline in the larger office building component. (Last January, commercial buildings edged ahead 5 per cent as the roles of its two major components were reversed.)

Manufacturing contracts extended last year's fourth-quarter rally into 1966, with a figure twice as large as the January 1965 amount. (This component was down 15 per cent in the first month of last year.) A $10-million project in Southern California was largely responsible for an 80 per cent surge in hospital contracts (hospitals were well into the red last January), while educational and science, public buildings, and social and recreational contracts — all with large gains in January 1965 — were off heavily for the month.

The shower of large utility and dam-and-reservoir projects that sparked the Western nonbuilding category in the first month of 1965 was greatly missed this year. Despite a 26 per cent push by the streets and highways components, total nonresidential contract value dropped 21 per cent below the January 1965 amount.

Contracts for single-family houses showed a promising 11 per cent gain for the month, but a 34 per cent decline in apartment contracts pulled the total residential category, at $295 million, down by 4 per cent. With the exception of December, single-family housing has been showing slight year-to-year gains since last August. The highly depressed state of apartment construction, however, prevented a year-to-year gain in the total residential figure in every month but November.

James E. Carlson, *Associate Economist*
F. W. Dodge Company
A Division of McGraw-Hill, Inc.

Estimator's Guide: Los Angeles and The Southwest

The Estimator's Guide alternates monthly among four Western areas. The prices at right are compiled from average quotations received by LeRoy Construction Services for commercial work of approximately $100,000-$250,000 total value. Except as otherwise noted, prices are for work installed including all labor, material, taxes, overhead and subcontractors' profit Material prices include local delivery except as noted, but no state or local taxes.

EXCAVATION

MACHINE WORK IN COMMON GROUND

Large basement	CY	.80-1.10
Small pits	CY	1.40-1.90
Trenches	CY	1.75-2.50

HAND WORK IN COMMON GROUND

Large pits & trenches	CY	8.00-12.00
Small pits & trimming	CY	11.00-15.00

Hard clay or shale, 2 times above rates. Shoring, bracing & disposal of water not included.

SEWER PIPE MATERIALS

VITRIFIED

Standard 4"	LF	.33
Standard 6"	LF	.66
Standard 8"	LF	.96
Standard 12"	LF	2.03
Standard 24"	LF	8.27

CLAY DRAIN PIPE

Standard 6"	LF	.33
Standard 8"	LF	.48

Rate for 100 LF FOB Warehouse

CONCRETE & AGGREGATES

GRAVEL, all sizes	TON	3.75
TOP SAND	TON	4.00
CONCRETE MIX	TON	4.10

CRUSHED ROCK

¼" to ¾"	TON	4.00
¾" to 1½"	TON	4.00
Lightweight aggregate	CY	10.75
Expanded Perlite	30# Sack	1.45
ROOFING GRAVEL	TON	4.10
SAND (#1 & 2)	TON	5.00

CEMENT

Common, all brands (paper sacks)		
Small quantities	Per Sack	1.40
Large quantities	Per Bll	4.45
Atlas White	Per Sack	3.70
Concrete Mix		
6 sacks in 5-yd loads	Per Yd	15.65
Lightweight 6 Sacks	Per Cy	21.25

CURING COMPOUND

Clear, 5-gal drums	Per Gal	1.45

STEEL MATERIALS

SHEETS

Hot rolled	LB	.115
Cold rolled	LB	.125
Galvanized	LB	.125
PLATE	LB	.115
STRIPS	LB	.135
STRUCTURAL SHAPES	LB	.12

BARS

Hot rolled	LB	.115
Cold finished	LB	.156
Reinforcing	LB	.11

REINFORCING MESH

6 x 6" #10 x #10	SF	.04
6 x 6" #6 x #6	SF	.07

2000# FOB Warehouse

STRUCTURAL STEEL

$365.00 and up per ton erected when out of mill.

$395.00 and up per ton erected when out of stock.

BRICK & TILE

COMMON BRICK

Common 2⅛ x 3¾ x 8¼"	M	49.00
Select 2⅛ x 3¾ x 8¼"	M	63.00

FACE BRICK

Standard	M	78.00
Roman	M	84.00
Norman 2⅛ x 11⅓ x 3⅛"	M	127.00
SCR 2⅛ x 5⅛ x 11⅓	M	182.00
2⅛ x 7⅛ x 11⅓	M	255.00

HOLLOW TILE

12 x 12 x 3"	M	160.00
12 x 12 x 4"	M	176.00
12 x 12 x 6"	M	240.00

MANTEL FIRE BRICK

2⅛ x 9⅛ x 4½"	M	135.00

GLAZED STRUCTURAL UNITS

2 x 6 x 12" Furring	SF	.60
4 x 6 x 12"–1 side	SF	.91
6 x 6 x 12"–1 side	SF	1.32
4 x 6 x 12"–2 sides	SF	1.00
Add For Color	SF	.25

CONCRETE BLOCKS

4 x 8 x 16"	EA	.23
6 x 8 x 16"	EA	.30
8 x 8 x 16"	EA	.34
12 x 8 x 16"	EA	.51
Add for color	EA	.02

BRICKWORK & MASONRY

BRICK WALLS

Back Up Common 8"	SF	2.60
Back Up Common 12"	SF	3.70
S.C.R. 6"	SF	2.00
S.C.R. 8"	SF	2.40

CONCRETE BLOCK, REINFORCED

6" walls	SF	1.25
8" walls	SF	1.40
12" walls	SF	1.80

GLAZED STRUCTURAL UNITS

Facing 2"	SF	2.20
Partition 4"	SF	2.65
Partition 6"	SF	4.40

BRICK VENEER

4" Select Common	SF	1.55
4" Roman	SF	1.70
4" Norman	SF	1.60

STONE WALLS

Veneer 4"	SF	3.25-4.00
Walls 8"	SF	6.50-8.00

BUILDING PAPERS & FELTS

BUILDING PAPER

1 ply per 1,000-ft roll	4.30
2 ply per 1,000-ft roll	6.80
3 ply per 1,000-ft roll	8.80
Sisalkraft, reinforced, 500-ft roll	9.50

SHEATHING PAPERS

Asphalt sheathing, 15-lb	
324 SF roll	2.20
30-lb 216 SF roll	2.95
Dampcourse, 216-ft roll	3.30

FELT PAPERS

Deadening felt, ¾-lb, 50-yard roll	3.00
1-lb, 50-yard roll	3.50

ROOFING PAPERS

Standard grade, smooth surface	
432 SF roll,	
Light, 45-lb	2.30
Medium, 55-lb	2.65
Heavy, 65-lb	2.95
Mineral surfaced 216-ft Roll	3.50

LUMBER

DOUGLAS FIR

Construction 2x4-2x10 MBM	94.00-102.00
Standard 2x4-2x10 MBM	90.00- 96.00
Utility 2x4-2x10 MBM	75.00- 82.00
Economy 2x4-2x10 MBM	57.00- 68.00
Clear, air dried MBM	200.00-230.00
Clear, kiln dried MBM	280.00-400.00

REDWOOD

Foundation grade MBM	135.00
Construction Heart MBM	125.00
A Grade MBM	220.00
Clear Heart MBM	250.00

PLYWOOD (DOUGLAS FIR)	**MSF**
¼" AB	90.00
¼" AD	70.00
¼" Ext. waterproof	77.00
⅜" AB	105.00
⅜" AD	95.00
⅜" CD	70.00
½" AB	140.00
½" AD	120.00
½" CD	91.00
⅝" AB	156.00
⅝" AD	136.00
⅝" CD	102.00
¾" AB	178.00
¾" AD	158.00
¾" CD	135.00
⅝" Plyform	170.00

SHINGLES	**Square**
Cedar #1	15.00-18.00
Cedar #2	12.00-14.00

SHAKES

Cedar	
½" to ¾" butt	18.00-21.00
¾" to 1¼" butt	20.00-23.00
Redwood	
¾" to 1¼" butt	21.00-24.00

INSULATION & WALL BOARD

FOB Warehouse

FIBRE GLASS INSULATION foil backed	**Per M SF**
½" thick	41.00
2¼" thick	49.00
3⅝" full thick	59.00

SOFTBOARDS–wood fiber

½" thick	60.00
¾" thick	128.50

ALUMINUM INSULATION

35# Kraft paper with alum. foil	
1 side only	24.00
2 sides	30.00

GYPSUM WALLBOARD

⅜" thick 51.00
½" thick 62.00
⅝" thick 86.00

HARDBOARDS—wood fiber

¼" thick, sheathing 58.00
3/16" thick, sheathing 73.00
¼" thick, sheathing 85.00
¼" thick, tempered 80.00
3/16" thick, tempered 110.00
¼" thick, tempered 130.00

CEMENT ASBESTOS BOARD

⅛" flat sheets 135.00
3/16" flat sheets 182.00
¼" flat sheets 238.00

ROUGH CARPENTRY

FRAMING

Floors .....BM .25-.30
Walls .....BM .31-.37
Ceilings .....BM .33-.42
Roofs .....BM .27-.32
Furring & blocking .....BM .42-.64
Bolted framing, add 50%

SHEATHING

1 x 8" straight .....BM .22-.28
1 x 8" diagonal .....BM .25-.30
5/16" plyscord .....SF .19-.24
⅜" plywood CC .....SF .27-.32

SIDING

1 x 8" bevel .....BM .45-.50
1 x 4" V-rustic .....BM .50-.60
Bolted framing, add 50%

DAMPROOFING & WATERPROOFING

MEMBRANE

1 layer 50# felt .....SQ 10.00
4 layers dampcourse .....SQ 15.00
Hot coat walls .....SQ 10.00
Tricosal added to concrete.....CY 1.00
Anti-Hydro added to concrete..CY 1.50

ROOFING

STANDARD TAR & GRAVEL	Per Sq
4 ply	17.00-21.00
5 ply	19.00-24.00
White gravel finish—Add.....	2.00- 4.00
ASPHALT COMPO. SHINGLES	20.00-24.00
CEDAR SHINGLES	24.00-28.00
CEDAR SHAKES	27.00-33.00
REDWOOD SHAKES	33.00-38.00
CLAY TILES	50.00-80.00

ROOF FLASHINGS

18 ga galv steel .....SF .80-1.20
22 ga galv steel .....SF .70-1.10
26 ga galv steel .....SF .60-1.00
18 ga aluminum .....SF 1.25-1.75
22 ga aluminum .....SF 1.05-1.20
26 ga aluminum .....SF .95-1.10
16 oz copper .....SF 1.80-2.30
20 oz copper .....SF 2.10-2.50
24 oz copper .....SF 2.40-2.80
26 ga galv. steel
4" OG gutter .....LF 1.10-1.35
Mitres and Drops .....EA 2.00-4.00
22 ga galv. louvers .....SF 2.75-3.75
22 oz copper louvers .....SF 3.50-5.00

CHIMNEYS, PATENT

5" .....LF 1.45
8" .....LF 2.05
10" .....LF 2.85
12" .....LF 3.50
Rates for 10-50 LF

MILLWORK

All Prices FOB Mill

D.F., clear,
air dried S4S.....MBM 220.00-250.00
D.F., kiln dried S4S...MBM 280.00-400.00

DOOR FRAMES & TRIM

Residential entrance .....17.00 & up
Interior room entrance ..... 9.00 & up

DOORS

1⅜" hollow core ..... 8.00 & up
1¾" solid core .....19.00 & up
1⅜" Birch hollow core.....10.00 & up
1¾" Birch solid core.....22.00 & up
Prefitted doors, frames
& trim .....13.00 & up

WINDOW FRAMES

D/H singles .....SF .90
Casement singles .....SF .90

WOOD SASH

D/H in pairs (2 lts).....SF .55
Casement (1 lt) .....SF .65

WOOD CABINETS

¾" D.F. plywood with
¼" plywood backs:
Wall hung .....LF 10.00-15.00
Counter .....LF 12.00-17.00
Birch or maple, add 25%

FINISH CARPENTRY

EXTERIOR TRIM

Fascia and molds .....BM 48-60
Bolted Framing—Add 50

ENTRANCE DOORS & FRAMES

Singles .....60.00 & up
Doubles .....100.00 & up

INTERIOR DOORS & FRAMES

Preset .....17.00 & up
Singles .....36.00 & up
Pocket sliding .....45.00 & up
Closet sliding (Pr.).....55.00 & up

WINDOWS

D/H sash & frames .....SF 2.00 & up
Casement sash & frames....SF 2.25 & up

SHELVING

1 x 12 S4S .....BM .40-.50
¾" plywood .....SF .45-.65

STAIRS

Oak steps, D.F. risers
Under 36" wide .....Riser 14.00
Under 60" wide .....Riser 19.00
Newel posts and rail extra

WOOD CASES & CABINETS

D.F. wall hung .....LF 17.00-20.00
D.F. counters .....LF 18.00-30.00

HARDWOOD FLOORING MATERIALS

OAK 25/32" x 2¼" T&G
Select .....M 245.00
#1 Common .....M 190.00

MAPLE 25/32" x 2¼" T&G
#1 Grade .....M 305.00
#2 Grade .....M 280.00
#3 Grade .....M 200.00

NAILS—1" FLOOR BRADS ....KEG 18.00

HARDWOOD FLOORS

Select Oak
Filled, sanded, stained and varnished
25/32" x 2¼" T&G .....SF .75- .90

MAPLE
2nd grade and better
Filled, sanded, stained & varnished
25/32" x 2¼" T&G .....SF .70-1.00
Wax finish, add.....SF .10

RESILIENT FLOORING MATERIALS

Linoleum, standard gage ....SY 2.65-2.85
Linoleum, battleship .....SY 2.95-3.10
⅛" Asphalt tile, dark .....SF .10- .11
⅛" Asphalt tile, light .....SF .14- .16
.080 Vinyl Asbestos tile.....SF .19- .23
⅛" Vinyl Asbestos tile .....SF .23- .32
.080 Vinyl tile .....SF .67- .70
4" base .....LF .12- .14
Rubber treads .....LF 1.60-2.30
Linoleum paste .....GAL .85- .95

RESILIENT FLOORING

⅛" Asphalt tile, dark colors..SF .22- .25
⅛" Asphalt tile, light colors.SF .25- .28
⅛" Rubber tile .....SF .60- .70
.080 Vinyl asbestos tile .....SF .32- .40
⅛" Vinyl asbestos tile .....SF .42- .52
.080 Vinyl tile .....SF .65- .75
⅛" Vinyl tile .....SF .85-1.05
Linoleum, standard gage....SY 3.75-4.25
Linoleum, battleship .....SY 5.25-5.75
4" Rubber base, black.....LF .25- .35
Rubber stair treads .....LF 2.25-2.75

LATH & PLASTER MATERIALS

METAL LATH

Diamond 3.4# copper-bearing....SY .49
Ribbed 3.4# copper-bearing .....SY .53

ROCK LATH

⅜" thick .....SY .36

METAL

¾" Standard channel .....LF .038
1½" Standard channel .....LF .053
3¼" Steel studs .....LF .088
4" Steel studs .....LF .098
Stud shoes .....EA .026

PLASTER

Browning, hardwall .....Sack .158
Finish, hardwall .....Sack 1.75
Stucco .....Sack 2.60
Expanded Perlite .....30# Sack 1.35

LATH & PLASTER WORK

CHANNEL FURRING

Suspended ceilings ..... SY 290-320
Walls ..... SY 290-330

METAL STUD PARTITIONS

3¼" studs .....SY 3.05-3.40
4" studs .....SY 3.20-3.60
Over 10-0 high, add .....SY .25- .35

3.4# METAL LATH & PLASTER

Ceilings ..... SY 4.40-5.20
Walls ..... SY 4.50-5.25
Keene's cement finish, add..SY .45- .65

ROCK LATH & PLASTER

Ceilings .....SY 3.35-3.80
Walls .....SY 3.45-3.95

WIRE MESH & ⅞" STUCCO

Walls .....SY 4.80-5.65

STUCCO ON CONCRETE

Walls .....SY 3.40-3.90
Metal accessories .....LF .25- .55

DRYWALL CONSTRUCTION

METAL STUD PARTITIONS FOR DRYWALL

1⅜" .....SF .28
2½" .....SF .31
3⅝" .....SF .37

GYPSUM BOARD FINISH

On Wood ½" .....SF .12
⅝" .....SF .15
On Metal ½" .....SF .14
⅝" .....SF .17
Taping Joints .....SF .05
Texturing .....SF .03

TILE MATERIALS

FOB Warehouse

CERAMIC TILE

4¼ x 4¼" glazed.....SF .72
4¼ x 4¼" hard glazed .....SF .74
Random, unglazed .....SF .72
6 x 2" cap .....EA .19
6" cove base .....EA .31
¼" round bead .....LF .18

QUARRY TILE

6 x 6 x ½" red .....SF .51
6 x 6 x ¾" red .....SF .53
9 x 9 x ¾" red .....SF .65
6 x 6" cove base .....EA .23

TILE & TERRAZZO WORK

CERAMIC TILE, stock colors

Floors .....SF 2.00-2.30
Walls .....SF 2.05-2.30
Cove base .....LF 1.40-2.00

QUARRY TILE

6 x 6 x ½" floors .....SF 1.80-2.20
9 x 9 x ¾" floors .....SF 1.95-2.35

TERRAZZO

Terrazzo floors .....SF 2.15-2.65
Cond. Terrazzo floors.....SF 2.30-2.80
Precast treads & risers .....LF 3.60-4.60
Precast landing slabs .....SF 3.00-4.10

WINDOWS

STEEL SASH

Under 10 SF .....SF 2.50 & up
Under 15 SF .....SF 2.00 & up
Under 20 SF .....SF 1.50 & up
Under 30 SF .....SF 1.00 & up

ALUMINUM SASH

Under 10 SF .....SF 2.75 & up
Under 15 SF .....SF 2.25 & up
Under 20 SF .....SF 1.75 & up
Under 30 SF .....SF 1.25 & up
Above rates are for standard sections and stock sizes, FOB Warehouse

GLASS—CUT TO SIZE

FOB Warehouse

SSB Clear, aver 4 SF .....SF .17
DSB Clear, aver 7 SF .....SF .28
Crystal, aver 16 SF .....SF .35
¼" Polished plate, aver 50 SF.....SF .90
⅛" Obscure, aver 7 SF .....SF .35
⅛" Ribbed, aver 7 SF .....SF .45
⅛" Rough, aver 7 SF .....SF .45
¼" Wire plate, clear, aver 40 SF ..SF 1.90
¼" Wire plate, rough, aver 40 SF..SF .90
⅛" Heat absorbing, aver 7 SF.....SF .90
¼" Tempered plate, aver 40 SF...SF 3.60
½" Tempered plate, aver 40 SF.. SF 6.40

GLASS BLOCKS

6" .....EA .85
8" .....EA 1.35
12" .....EA 3.45

GLASS & GLAZING

SSB Clear .....SF .60
DSB Clear .....SF .85
Crystal .....SF 1.00
¼" Plate.....SF 2.00
⅛" Obscure .....SF .85
⅛" Heat absorbing .....SF 1.35
¼" Tempered plate .....SF 4.75
½" Tempered plate .....SF 9.00
¼" Wire plate, clear .....SF 2.80
¼" Wire plate, rough .....SF 1.50

PAINT MATERIALS

All prices FOB Warehouse

Thinners 5-100 gal .....Gal .63
Turpentine 5-100 gal .....Gal 1.59
Linseed oil, raw .....Gal 2.36
Linseed oil, boiled .....Gal 2.43
Primer-sealer .....Gal 3.12
Enamel undercoaters .....Gal 5.54
Enamel .....Gal 5.58
White lead in oil .....LB .36
Red lead in oil .....LB .36
Litherage .....LB .32

PAINTING

EXTERIOR

Stucco wash,
1 coat .....SY .48
2 coats .....SY .80
Lead & Oil,
2 coats .....SY 1.10
3 coats .....SY 1.60

INTERIOR

Primer-sealer .....SY .45
Wall paint,
1 coat .....SY .54
2 coats .....SY .98
Enamel,
1 coat .....SY .65
2 coats .....SY 1.14
Doors & trim .....EA 14.00
Sash & trim .....EA 16.00
Base & molds .....LF .18
Old work, add 15-30%

VENETIAN BLINDS

RESIDENTIAL .....SF .45 & up
COMMERCIAL .....SF .55 & up
VERTICAL .....SF 1.25 & up

PLUMBING

Lavatories .....EA 250.00-300.00
Toilets .....EA 310.00-400.00
Bath tubs .....EA 370.00-400.00
Stall shower .....EA 200.00-250.00
Sinks .....EA 240.00-300.00
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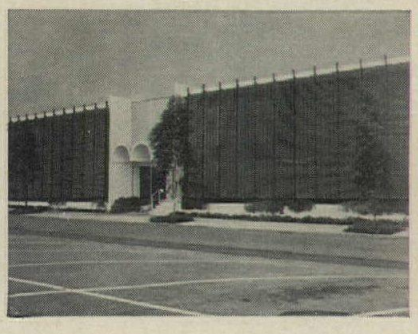

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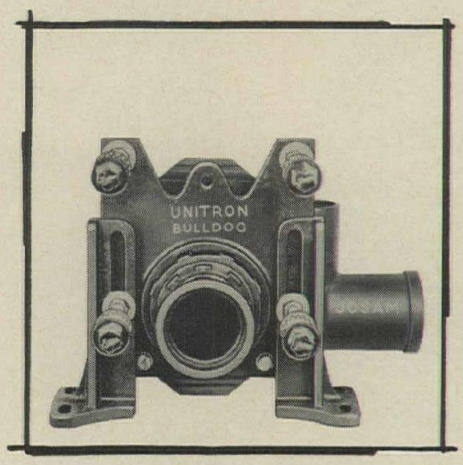

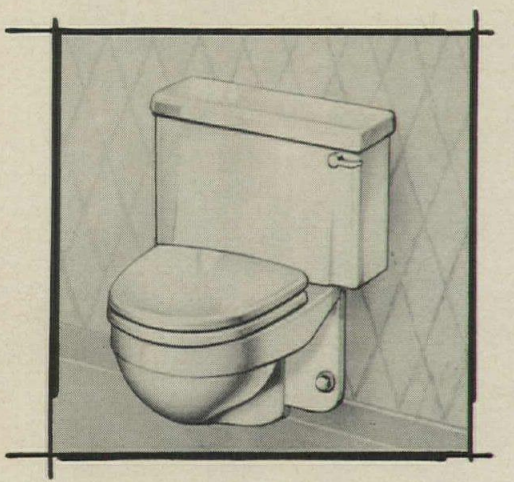

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Engineer: T. Y. Lin, Kulka, Yang and Associates – San Francisco
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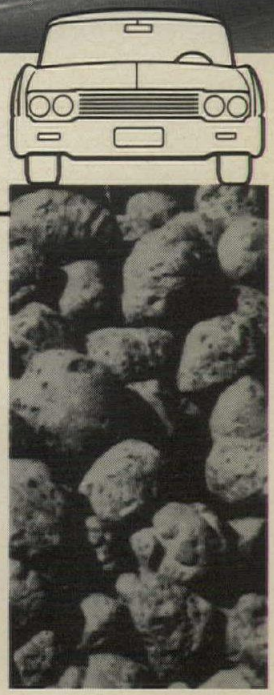

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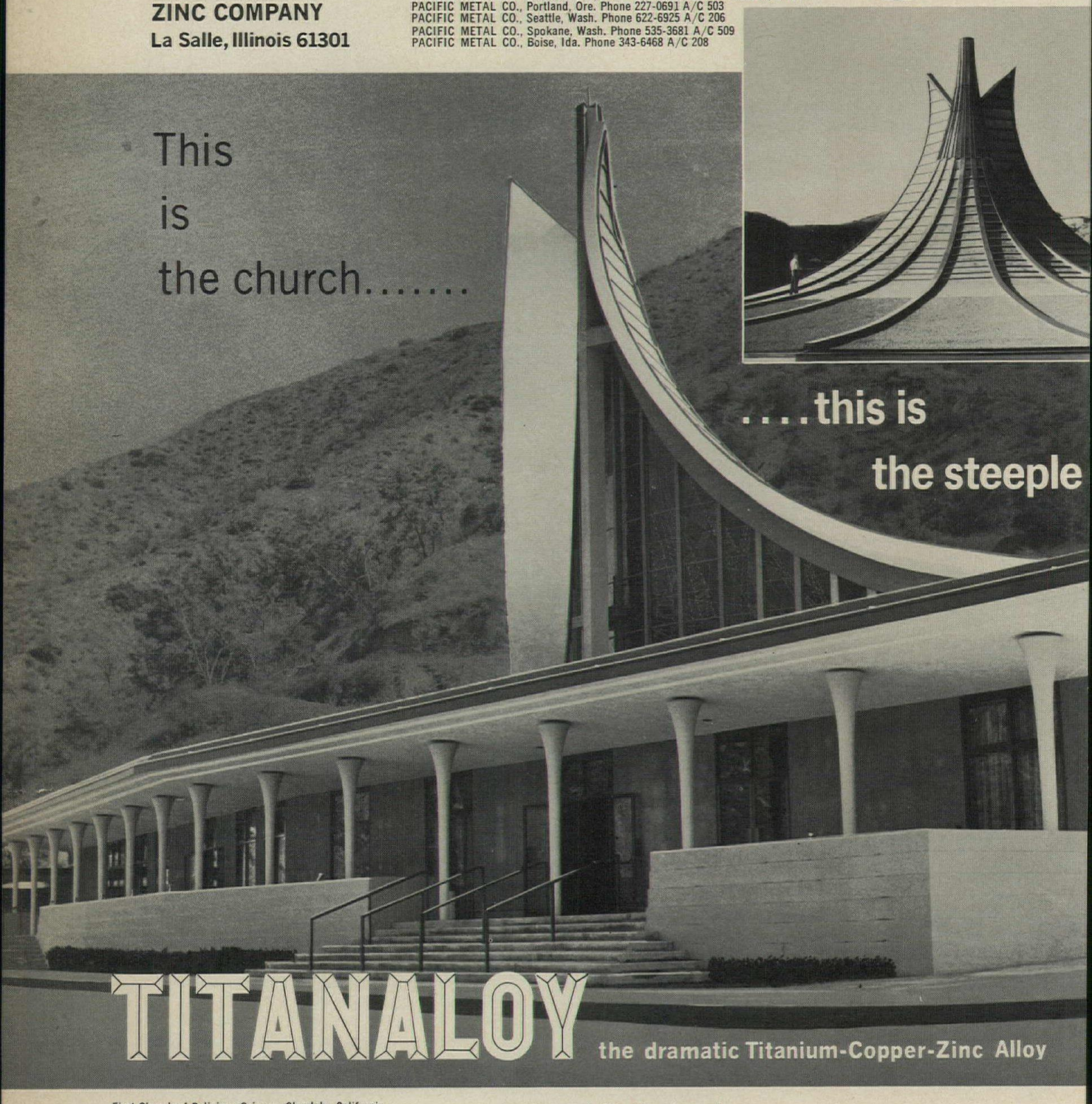

First Church of Religious Science, Glendale, California
Architect: Risley, Gould and Van Heuklyn

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President Johnson sets further environmental goals

President Johnson has submitted two more messages to Congress to implement the environmental goals of his Great Society programs. In the message on conservation and pollution delivered on February 23, the President made three main proposals: a clean rivers demonstration program; further assistance for the control of air pollution; and further expansion of the National Park System to protect forest land, hopefully completing the system by 1972.

In the message on transportation delivered on March 2, a Cabinet-level Department of Transportation was proposed to "bring together almost 100,000 employees and almost $6 billion of Federal funds now devoted to transportation." The new department would cooperate with the Department of Housing and Urban Development in decisions affecting urban transportation.

"The Future of Architecture" will be discussed in Boston

The Boston Architectural Center will hold a series of seminars under the theme "The Future of Architecture" on May 13 and 14. The seminar topics will be: "Forces Shaping the Role of the Architect"; "Education of the Architect"; and "Research and Architecture." The preliminary list of participants includes Dr. Margaret Mead, Julius A. Stratton, I. M. Pei, Charles Luckman, Robert Geddes, Gerald Holten, Christopher Alexander and Ezra Ehrenkrantz.

Balconies are scored by U.S. Comptroller General

Balconies and "high-cost brick" for low-rent housing projects in the Public Housing Administration? No, indeed, says Frank H. Weitzel, Acting Comptroller General of the United States in a 55-page report to the President of the Senate and the Speaker of the House of Representatives issued on February 17. "Our limited review of construction activities for low-rent public housing projects," said Mr. Weitzel, "showed that the PHA permitted three local housing authorities to include balconies in the construction of low-rent housing at 12 project sites and permitted one local housing authority to use high-cost brick in the construction of housing at 19 project sites." Total additional cost at the 31 projects was $3.8 million. ". . . We believe that the incurrence of substantially higher costs for esthetic features not related to providing decent, safe and sanitary housing is inconsistent with the legislative history of section 15(5) of the Housing Act."

The purpose of the report? To inform Congress "of our finding and the views of the PHA for such consideration and action as it considers appropriate." The relationship between the Comptroller General's concern with preventing public housing from rising above the minimum level of "decent, safe and sanitary housing" and President Johnson's concern when he presented his recent message on cities for policies "to refresh the spirit of men and women who are growing weary with jobless anxiety" is not clear.

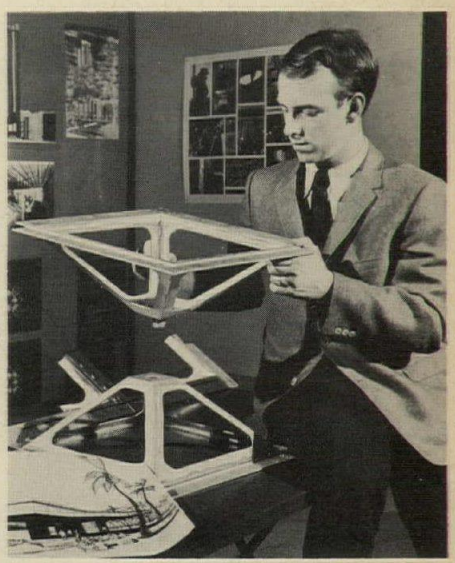
Grant to bring new life to outdated city schools

Studies on the modernization of outmoded schools—with special reference to 15 of the nation's large cities—have received a much needed boost in the form of a $103,900 grant from the Educational Facilities Laboratories. The Research Council of the Great Cities Program for School Improvement, which is undertaking the modernization study under the leadership of Ben E. Graves, has already completed an initial survey, "New Life for Old Schools," which defines the problems and outlines a plan of action. The survey, which was part of the first phase of the Council's study, was also financed by a grant from E.F.L.

The work carried out to date indicates that almost one-sixth of all permanent instructional areas in public schools throughout the nation have been in use for more than 50 years.

THE RECORD REPORTS ON:

Louisiana dormitory will accommodate 400 130
Apartment building planned for Chicago 130
25-story office building has 20-foot arcade at street level 143
Apartment is first structure in multi-use complex 143
1200-unit apartment—"the worm with lumbago" 348
MIT plans courtyard around sculpture by Alexander Calder 356



Aluminum modular unit wins Reynolds student award

A design for "an educational facility for the Peace Corps," the key feature of which is a stretch-formed aluminum module, is the winning design in the sixth annual Reynolds Prize for architectural students. The winning designer is William R. Mitchell, and he and his school, North Carolina State University, will equally share the $5,000 first prize.

"The jury believes that the [modular] unit exploits the unique characteristics of aluminum and is an original application of common practices in the fabrication from metal sheets, nesting of components for shipping, and erecting of prefabricated units in the field to form space frames of great dimensions," the jury report stated. Serving on the jury were: H. Samuel Kruse, chairman, James W. Elmore and Richard W. Snibbe.

Architectural panel will give advice on Navy buildings

The Bureau of Yards and Docks, which designs, builds and maintains the Navy's shore establishment, is forming a nationwide panel of well known architects to review certain Navy projects, and advise on their design. President Johnson's concern over the design quality of Federal buildings is said to have prompted the establishment of this national panel, which will be broken down into regional review boards to deal with projects in specific areas. Architects will serve on the panel for periods of one year, but will only be required to devote a few days in the year to the panel's concerns.

Serving on the panel will be: Lawrence B. Anderson, Cambridge, Massachusetts; Ulrich Franzen, New York City; Paul M. Rudolph, New York City; J. Roy Carroll, Jr., Philadelphia; Charles M. Goodman, Washington, D.C.; Vincent G. Kling, Philadelphia; Herbert H. Swinburne, Philadelphia; Alfred L. Aydelott, Memphis; Henry L. Kamphoefner, Raleigh; Arthur G. Odell, Jr., Charlotte; Gyo Obata, St. Louis; Minoru Yamasaki, Birmingham, Michigan; J. Buchanan Blitch, New Orleans; Arthur Q. Davis, New Orleans; I. William Ricciuti, New Orleans; Robert E. Alexander, Los Angeles; Welton D. Beckett, Los Angeles; Ernest J. Kump, Palo Alto; Richard J. Neutra, Los Angeles; William L. Pereira, Los Angeles; and John Carl Warnecke, San Francisco.

Honors and awards

Ludwig Mies van der Rohe will, on April 13th, be the first recipient of the University of Virginia's Thomas Jefferson Memorial Foundation medal in architecture. The medal, which will be presented annually, carries a $5,000 prize.

Seymour H. Knox, chairman of the New York State Council on the Arts, was presented the Michael Friedsam Medal in Industrial Art, of The Architectural League of New York, at a dinner at the League February 23. The medal is given to persons outside the profession of architecture who have "exerted a most potent influence in promoting the development of art."

A.I.A. announces two more convention award winners

The awards will be presented at the 1966 A.I.A. convention which will be held in Denver from June 26 to July 1. William W. Eshbach of Philadelphia will be the recipient of the Edward C. Kemper Award for his "significant contribution to the Institute and to the professions of architecture."

The medal for Collaborative Achievement in Architecture will go to Ghirardelli Square in San Francisco. Architects are Wurster, Bernardi & Emmons, primarily in collaboration with Lawrence Halprin & Associates, landscape architects. Others cited for the project will be: structural engineer: Gilbert-Forsberg-Diekmann-Schmidt; mechanical and electrical engineer: G. L. Gendler & Associates; general contractor: Swinerton and Walberg Company; graphics: Barbara Stauffacher; design consultant for plaza shops: John I. Matthias; sculptor: Beniamino Bufano; and owner: William M. Roth. The first medal for collaboration was given to the Seagram Building, New York, in 1964.

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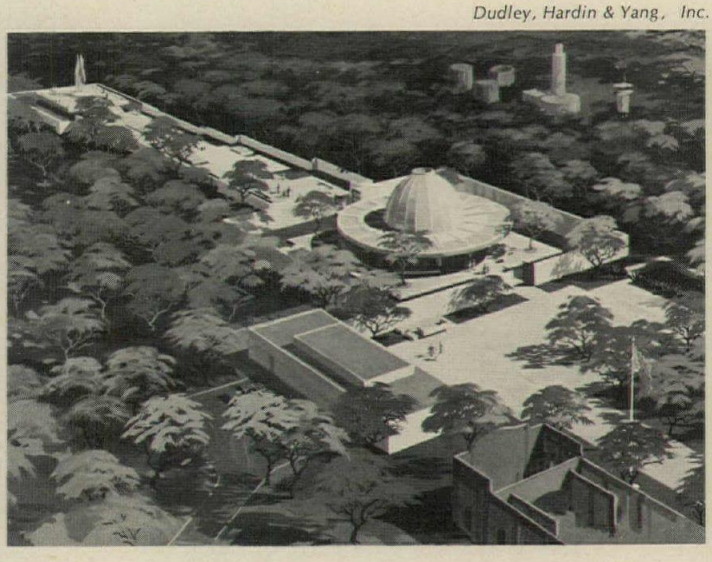


Pictorial Parade Inc

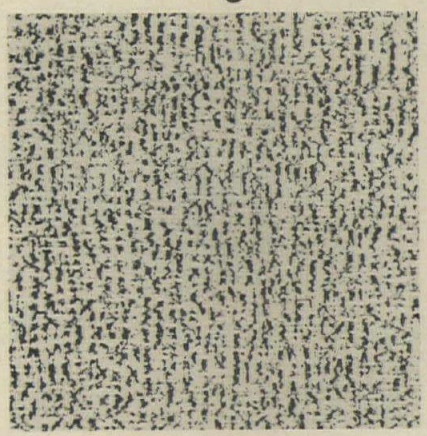
Memorial structures utilize differing architectural solutions to solve sensitive problems

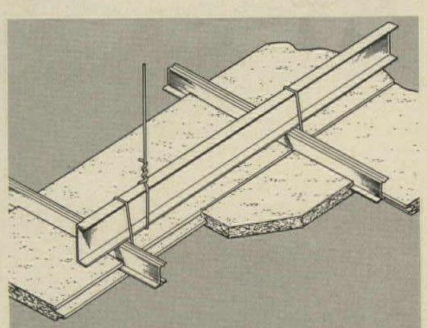
The three memorial structures shown here present a variety of solutions to sensitive architectural problems. The memorial for the German National War Graves Federation (left) in a cemetary near Munich, honors 3,524 dead from 18 nations. The front of the memorial chapel, 43 feet high, consists of 18,000 seven-sided cut-crystal prisms. As the sun moves, the refracted light rays move over the back wall which contains the names of those buried there. Architect is Helnum Schöner.

The Pacific War Memorial (center), to be built on Corregidor Island, commemorates the war effort of the United States in the Pacific during World War II. The Seattle firm of Naramore, Bain, Brady & Johanson originally won a 1957 national competition to design the memorial. Their winning design was based on a budget of $7.5 million. The new and present design is completely different and will cost approximately $1.2 million. The main elements of the new scheme are a 7,300-square-foot tourist center building; a memorial rotunda toped with a 46-foot-diameter precast-concrete dome; and a monumental vista from the rotunda consisting of a series of rough terrazo terraces terminated by a platform with a 45-foot-high bronze monument sculpture. Consulting architect: Leandro V. Locsin; structural engineer: Worthington, Skilling, Helle & Jackson; mechanical – electrical engineer: Bouillon, Christofferson & Schairer; landscape architect: Lawrence Halprin & Associates; sculptor: Aristides Demetrios.

The memorial to President John F. Kennedy set in three acres of Runnymede meadow in England, is a simple kiosk structure over an engraved stone in a paved terrace. The memorial, now marooned in mud because of a rule that prevents use of paved or gravel walks at Runnymede, was designed by G. A. Jellicoe, Royal Fine Arts Commission.

This new tile ceiling will probably deceive you.





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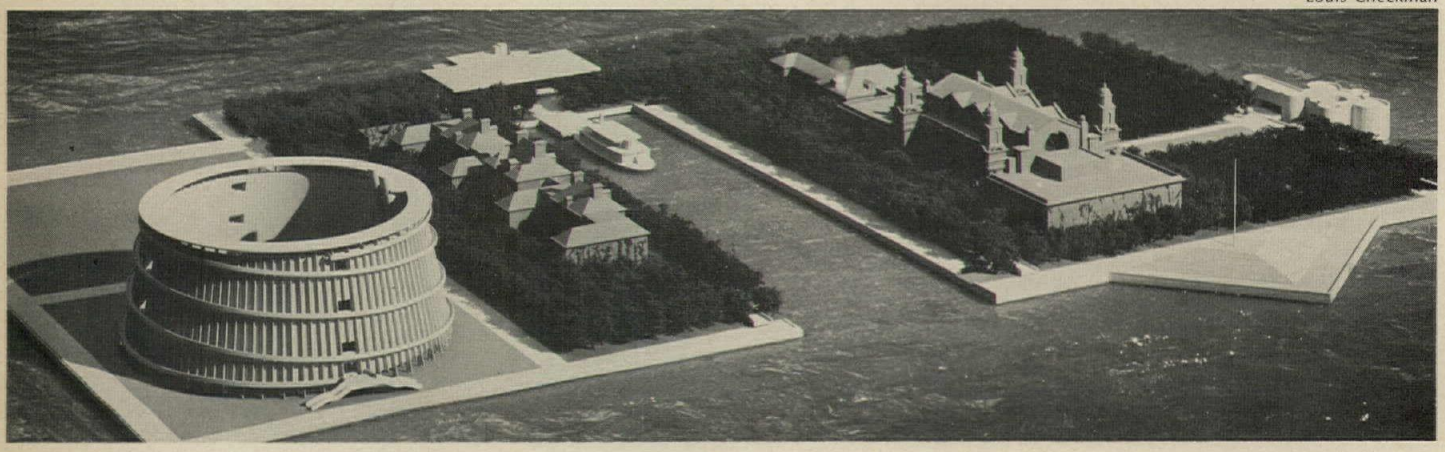
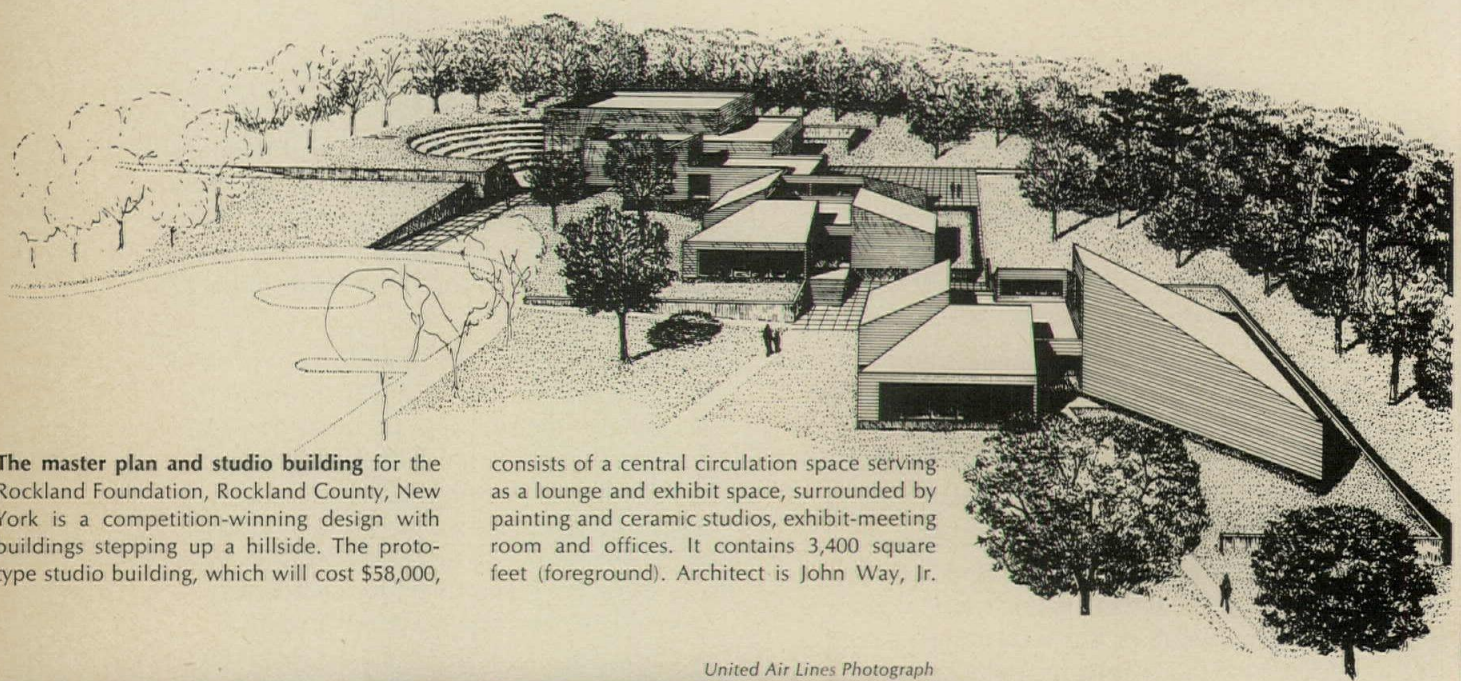
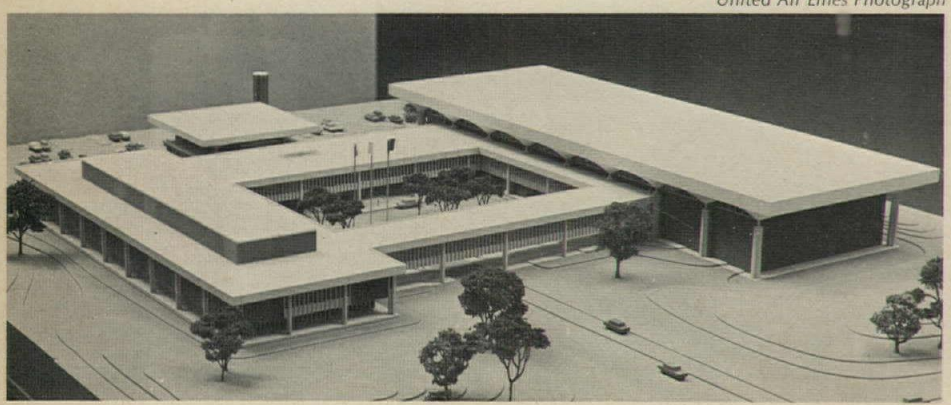


The development plan for Ellis Island in New York Bay, proposed by architect Philip Johnson, will include a 130-foot-high truncated cone structure to be known as the "Wall of the Sixteen Million." Ramps will wind up the inner and outer faces of the cone, lined with photographic reproductions of old ships' manifests which listed names of all immigrants. Another integral part of this new national monument will be the original immigration-station complex, which will be officially established as "historic ruins."

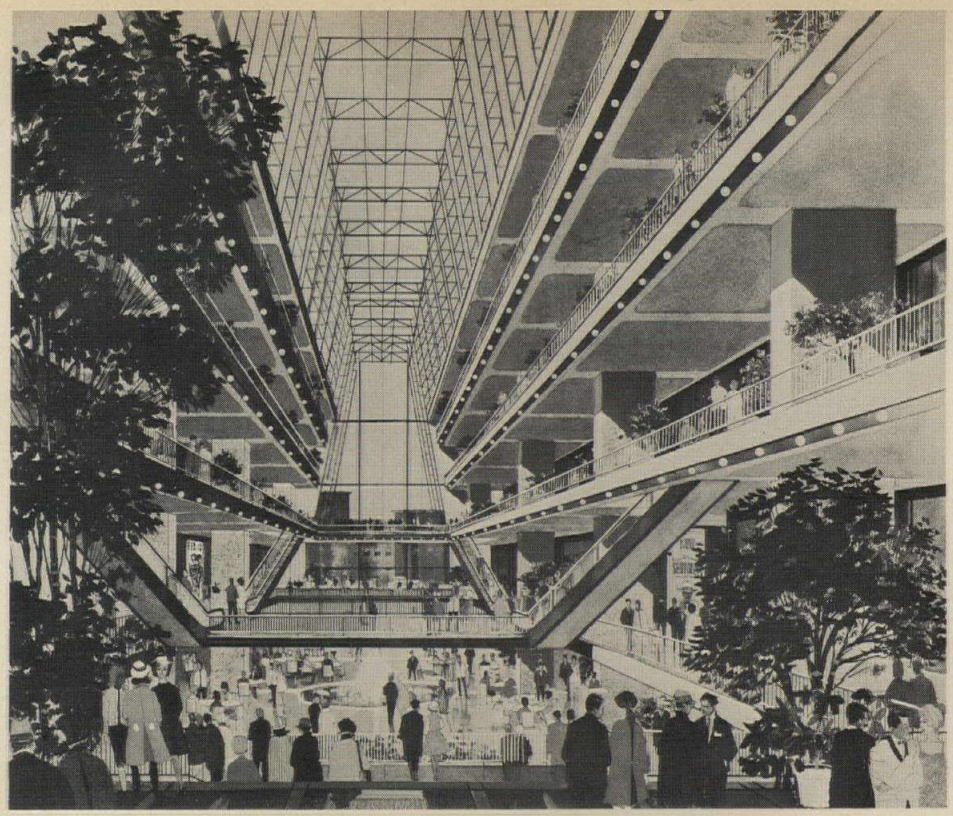


The master plan and studio building for the Rockland Foundation, Rockland County, New York is a competition-winning design with buildings stepping up a hillside. The prototype studio building, which will cost $58,000, consists of a central circulation space serving as a lounge and exhibit space, surrounded by painting and ceramic studios, exhibit-meeting room and offices. It contains 3,400 square feet (foreground). Architect is John Way, Jr.

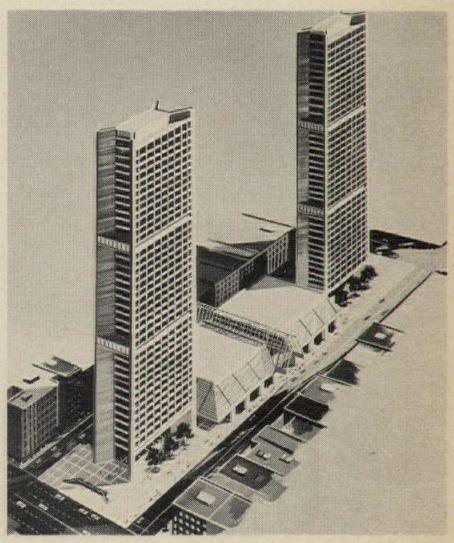
United Air Lines Photograph



United Air Lines' Flight Training Center in Denver, designed jointly by the Perkins & Will Partnership and Paul R. Reddy, will house flight simulators in area at right, classrooms at left, and offices and classrooms in connecting structures. The $7-million complex will provide 210,000 square feet and will serve 750 students.

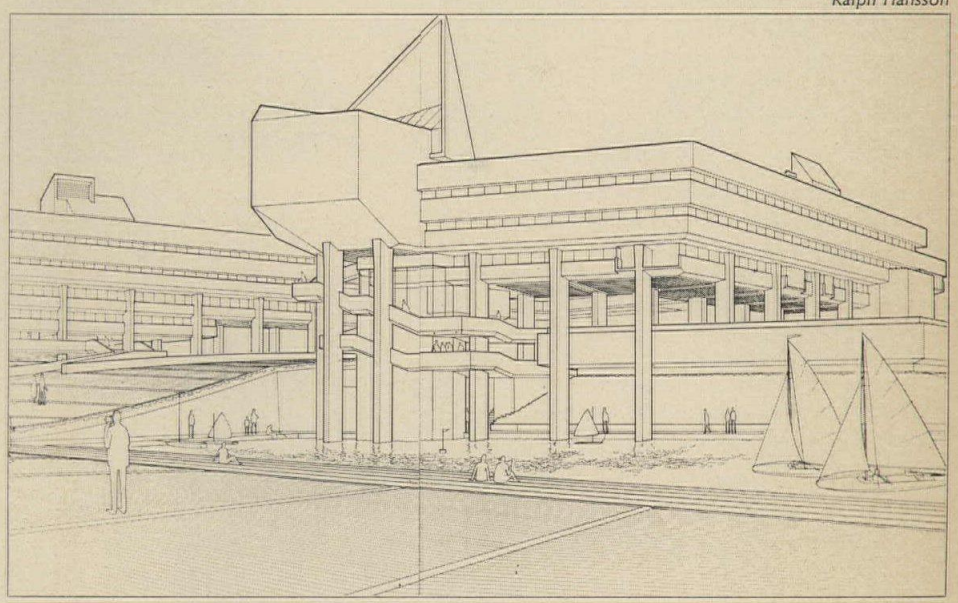


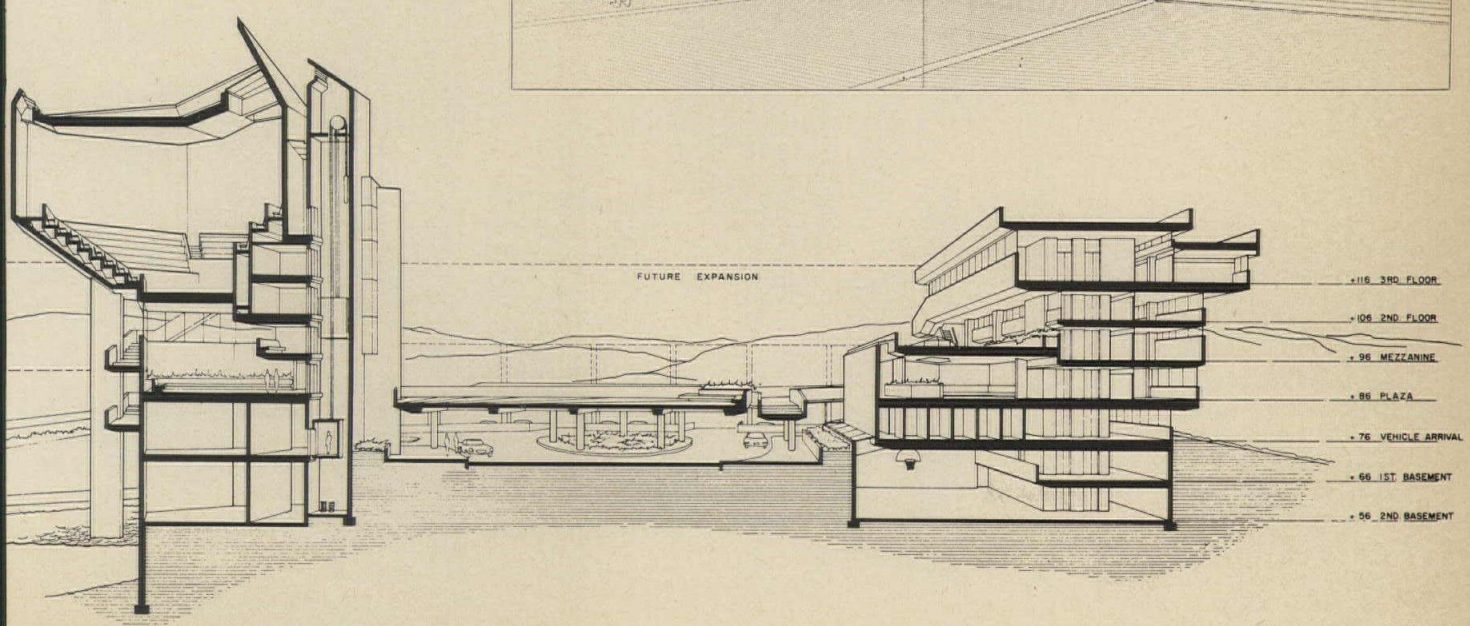
Cinema Center, the $50-million project which will replace the current Madison Square Garden in New York City, will provide film production facilities, four 750-seat movie theaters, two 38-story office towers, two 1,500-seat legitimate theaters, and retail and display facilities. Main feature of the design, by Charles Luckman Associates, is an eight-story-high galleria running a full block.



Ralph Hansson

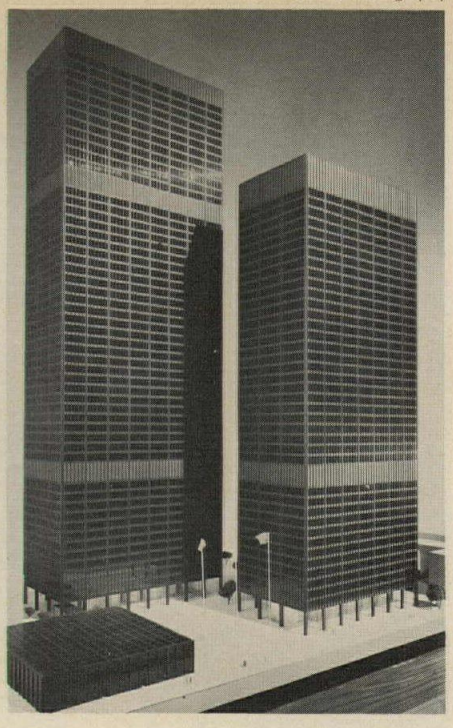
The civic-cultural center in Freemont, California designed by competition-winning architect Robert Mittelstadt, provides a government building, hall of justice, and proposed cultural facilities in continuous buildings which define a plaza. The program stressed making the center a lively place, both day and night, and the architect accomplished this by the "interlocking of the knoll, plaza and lagoon extension" providing "a physical integration of recreation, cultural and governmental activities."



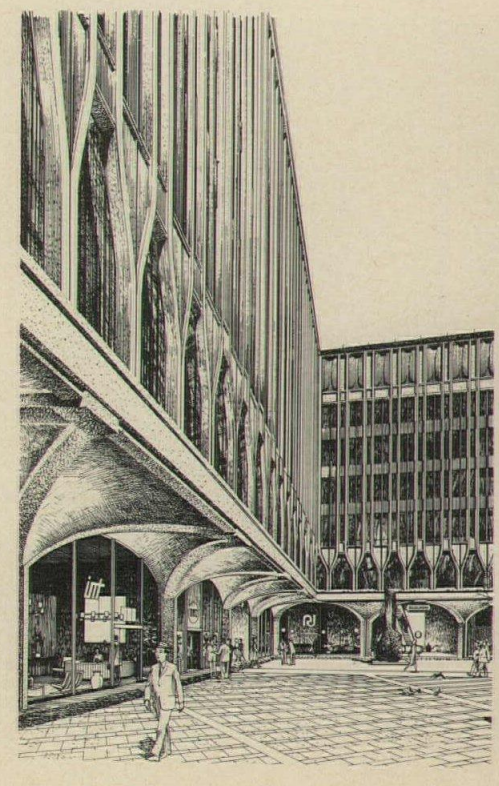


The undergraduate library at the University of Illinois, Urbana is an underground structure designed by Richardson, Severns, Scheeler & Associates, Inc. and Clark, Altay & Associates, associated architects. Why underground? The design retains an open mall and permits preservation of experimental gardens nearby. The first phase of the building will be two levels deep and will be approximately 217 feet by 241 feet with a 72-foot-square court.

Ron Vickers, Photography



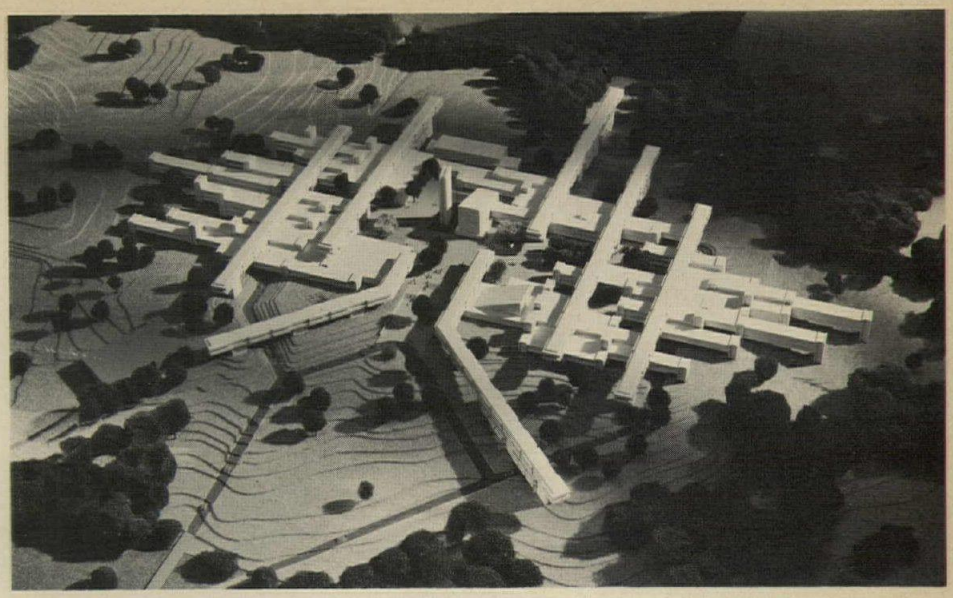
The Toronto Dominion Center, designed by John B. Parkin Associates and Bregman & Hamann, architects and engineers, with Ludwig Mies van der Rohe as consultant, will consist of a one-story, 31-foot-high banking hall and a 56-story office tower containing 1.3-million square feet of rentable area. A 44-story office tower will be part of a second stage. The buildings are clad in black-painted steel. Structural consultant: C. D. Carruthers & Wallance Consultants Ltd.; electrical and mechanical consultants: H. H. Angus Ltd. and general contractor: Pigott Construction Ltd.



The refined design of the World Trade Center, designed by Minoru Yamasaki and Associates and Emery Roth & Sons, will free the two 1,350-foot-high tower buildings from the low buildings which surround the plaza. The massing of the lower structures has been broken up, and the color of the base buildings will be a dark gray to contrast with the silvery metal of the towers. At street level will be a cantilevered arcade rather than a columned arcade, "making the base buildings more interesting in relation to the towers and also making them a form more expressive of our present-day technology," says Mr. Yamasaki.

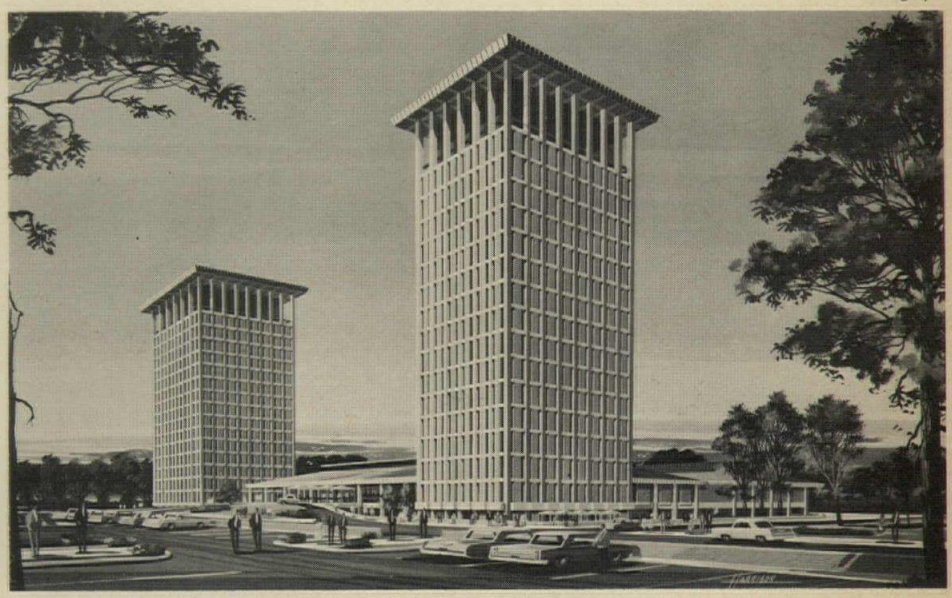
Balthazar

Balthazar



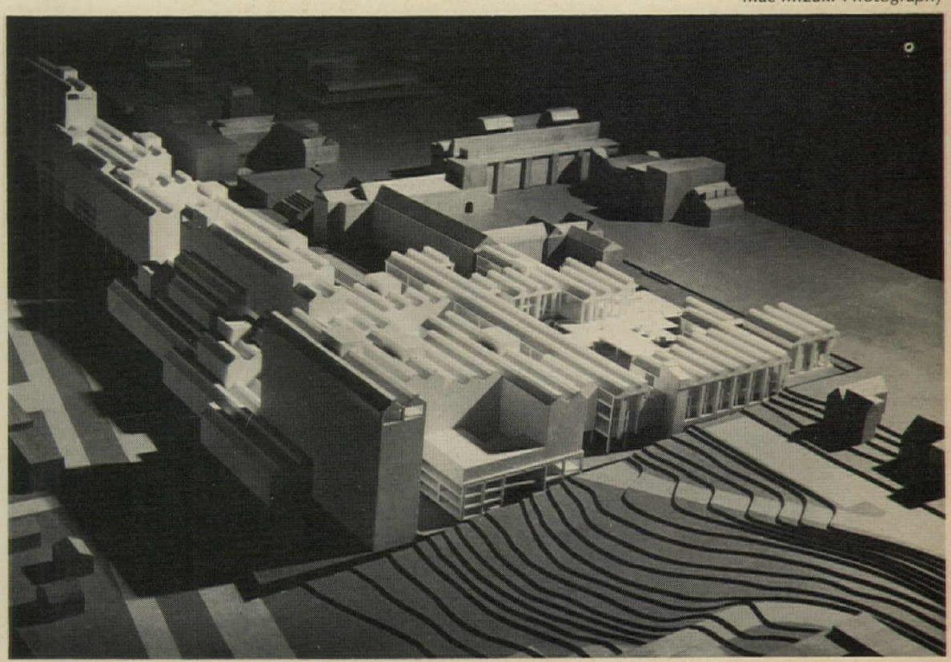
Tougaloo College, Tougaloo, Mississippi, designed by Gunnar Birkerts & Associates under a grant from the Cummins Foundation, takes advantage of a hilltop site and is organized on four levels. The upper level has two-story dormitories. Below this level is a walkway system. The next level, or main ground level contains general academic space of one, two or three stories in height. The plaza level below is open—buildings are supported above the clay soil on concrete piles.

BM Photograph



Dormitory complex at the University of Houston, designed by Pitts, Mebane, Phelps & White, includes two 18-story dormitory towers—one for men and one for women—each having 500 units. Also included will be a central kitchen, separate dining rooms and recreation hall. The complex will be constructed of concrete and brick. Sloping roofs on the two-story dining and recreation halls will "give as much a domestic feeling as possible," says the architect.

Mac Mizuki-Photography



The School of Law building and a Social Science Center at Washington University, St. Louis, is a $3.5-million competition-winning design by Dolf Schnebli, George Anselevicius and Roger Montgomery. The hub of the complex is the law-school library on the first level below ground, the roof of which serves as a plaza. The social sciences building provides a coordinated 42,000-square-foot structure for teaching and research.

Industrial building: more gains ahead

Latest of the barometers to indicate that 1966 is running well ahead of its advance notices is businessmen's plans for capital spending. Instead of easing up a bit after four years of hefty gains (last year's $52 billion of investment outlays were more than 50 per cent over the 1961 recession low, and still growing), the latest survey results indicate still another surge of 16 per cent to $60 billion. That's about twice the gain that had been shown by surveys taken as recently as last October.

Included among these plans for 1966 plant and equipment expenditures are intentions to build additional manufacturing and warehousing capacity, and in the light of recent developments it's time to reconsider the outlook for these kinds of construction.

Planning is one thing; realization is another. Will tightening credit cause some plans to be set aside? Will proportionately more funds be shifted away from new plant construction and into machinery and equipment? And, what are the odds that government will take deliberate steps to slow down the pace of the economy, causing capital spending to fall short of intended rates?

Higher interest costs and general credit scarcity are apt to have only a minimal effect on manufacturing plant construction in the year ahead. Internally generated funds—retained earnings and depreciation allowances—play a large part in financing industrial capital spending, and as a result, dependence on borrowed funds is greatly reduced.

There is likely to be some noticeable acceleration in the shift to more machinery relative to additional plant, however. This trend has been going on steadily throughout the sixties, from a ratio of almost one out of every three investment dollars spent on building back in 1961 to only one out of four last year. Now, with a critical scarcity of skilled and semi-skilled labor, the problems posed by staffing a newly-built factory are becoming formidable. More emphasis on labor-saving machinery seems to be the most efficient way to increase productive capacity today.

Finally, there are increasing signs that the President is not going to sit idly by and watch an inflationary situation snowball. So far in 1966 we've already seen excise taxes reinstated on auto and phone service, as well as a speedup of personal and corporate tax collections. Next step might be a suspension of the 7 per cent investment tax credit and, if it becomes necessary, a general tax increase. Steps like these would certainly discourage some current capital spending plans.

On balance, there's quite a bit more "go" in industrial building now than was apparent only half a year ago, though just how much more will depend on whether and when fiscal restraints are brought to bear. Instead of tapering off in 1966, contracts for factories and warehouses are now headed for another gain of between 5 and 10 per cent over the record value reported in 1965—more like 5 per cent if the brakes are applied soon, and nearer to 10 per cent if today's conditions hold for a while.

George A. Christie, *Chief Economist*
F. W. Dodge Company
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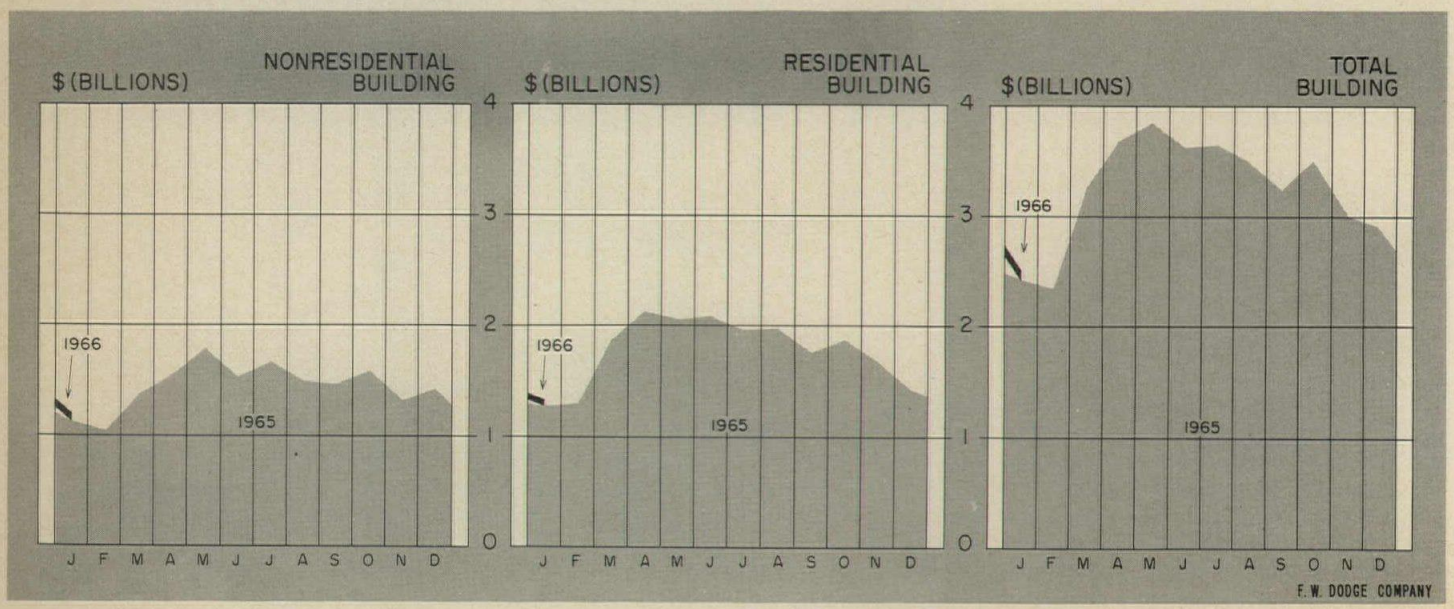
Building activity: monthly contract tabulations



Architect: Walton & Madden, Riverdale, Md.
Screen erected by: Acme Iron Works, Inc., Washington, D.C.

BORDEN DECOR PANEL AS BUILDING FACADES

Shown above is Deca-Grid style Borden Decor Panel used as a facade for the Pargas, Inc. building in Waldorf, Maryland. Set off by piers of white precast stone, the sturdy aluminum Deca-Grid panels are finished in blue HINAC, Pennsalt's new finish for metals.

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BUILDING CONSTRUCTION COSTS

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.

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

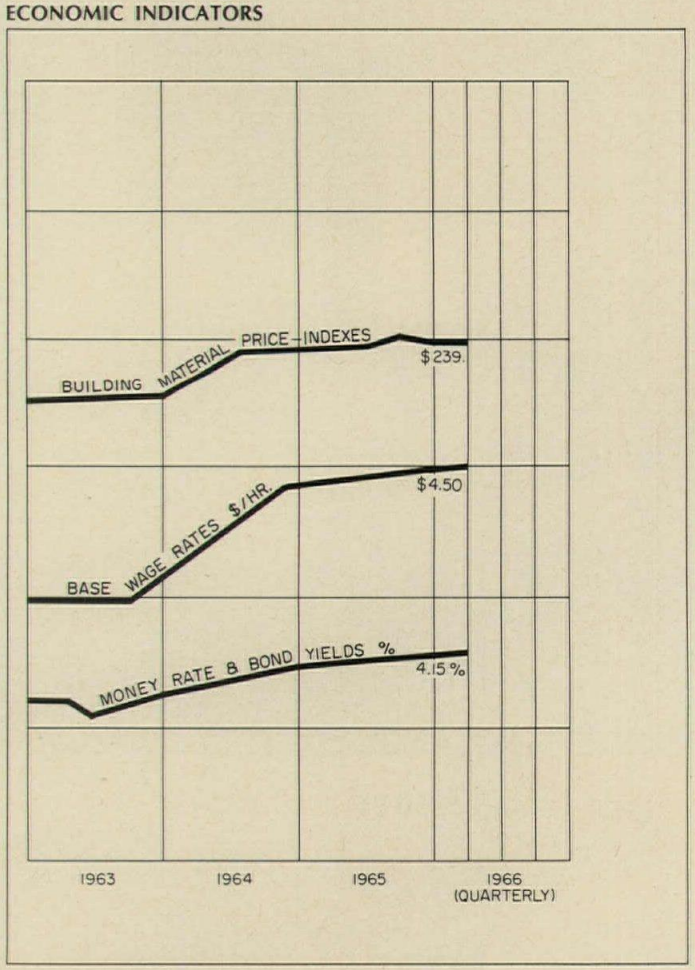
JANUARY 1966 BUILDING COST INDEXES

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	8.5	273.0	290.8	+2.21
Atlanta	7.2	307.7	326.4	+1.57
Baltimore	7.7	276.2	293.8	+2.88
Birmingham	7.5	251.9	270.8	+1.40
Boston	8.5	247.6	262.1	+2.70
Chicago	8.9	301.6	317.3	+1.99
Cincinnati	8.8	262.1	278.5	+1.96
Cleveland	9.2	279.8	297.4	+3.79
Dallas	7.7	255.9	264.3	+1.78
Denver	8.3	280.4	298.1	+2.39
Detroit	8.9	275.5	288.9	+2.47
Kansas City	8.3	246.5	260.9	+2.42
Los Angeles	8.3	278.6	304.8	+3.14
Miami	8.4	268.6	282.0	+1.45
Minneapolis	8.8	272.0	289.1	+1.63
New Orleans	7.8	246.0	260.7	+1.86
New York	10.0	283.5	304.9	+1.56
Philadelphia	8.7	271.5	285.1	+2.25
Pittsburgh	9.1	256.0	272.1	+1.85
St. Louis	9.1	270.1	286.1	+2.46
San Francisco	8.5	351.7	384.8	+2.59
Seattle	8.4	249.1	278.4	+2.26

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÷10.0=80%) or they are 20% lower in the second city.

ECONOMIC INDICATORS

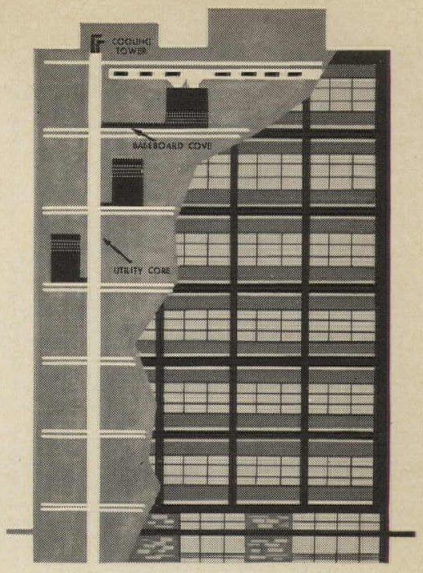


HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1952	1959	1960	1961	1962	1963	1964	1965 (Quarterly) 1st	2nd	3rd	4th	1966 (Quarterly) 1st	2nd	3rd	4th
U.S. Average	213.5	255.0	259.2	264.6	266.8	273.4	279.3	279.5	281.0	288.7	284.9	286.3	–	–	–
Atlanta	223.5	283.3	289.0	294.7	298.2	305.7	280.6	280.5	281.0	284.7	285.7	322.2	–	–	–
Baltimore	213.3	264.5	272.6	269.9	271.8	275.5	260.9	261.2	264.1	264.9	265.6	288.6	–	–	–
Birmingham	208.1	233.2	240.2	249.9	250.0	256.3	252.1	251.7	252.6	256.3	257.8	267.1	–	–	–
Boston	199.0	230.5	232.8	237.5	239.8	244.1	306.6	306.5	307.3	310.2	311.7	258.5	–	–	–
Chicago	231.2	278.6	284.2	289.9	292.0	301.0	313.7	313.9	317.9	320.6	321.5	312.6	–	–	–
Cincinnati	207.7	250.0	255.0	257.6	258.8	263.9	269.5	269.4	270.2	272.9	274.0	274.7	–	–	–
Cleveland	220.7	260.5	263.1	265.7	268.5	275.8	283.0	282.3	283.4	290.8	292.3	293.0	–	–	–
Dallas	221.9	237.5	239.9	244.7	246.9	253.0	256.4	256.9	257.9	259.5	260.8	261.7	–	–	–
Denver	211.8	257.9	257.9	270.9	274.9	282.5	287.3	287.3	288.2	292.7	294.0	294.6	–	–	–
Detroit	197.8	249.4	259.5	264.7	265.9	272.2	277.7	277.7	279.3	283.5	284.7	285.5	–	–	–
Kansas City	213.3	239.6	237.1	237.1	240.1	247.8	250.5	251.2	252.0	255.0	256.4	257.3	–	–	–
Los Angeles	210.3	263.5	263.6	274.3	276.3	282.5	288.2	288.9	289.7	295.8	297.1	298.0	–	–	–
Miami	199.4	249.0	256.5	259.1	260.3	269.3	274.4	274.4	275.4	276.6	277.5	278.4	–	–	–
Minneapolis	213.5	254.9	260.0	267.9	269.0	275.3	282.4	283.4	283.6	283.9	285.0	285.7	–	–	–
New Orleans	207.1	237.5	242.3	244.7	245.1	248.3	249.9	250.5	253.1	255.1	256.3	257.1	–	–	–
New York	207.4	260.2	265.4	270.8	276.0	282.3	289.4	290.2	294.0	296.0	297.1	297.8	–	–	–
Philadelphia	228.3	262.8	262.8	265.4	265.2	271.2	275.2	275.5	276.4	279.5	280.8	281.7	–	–	–
Pittsburgh	204.0	241.1	243.5	250.9	251.8	258.2	263.8	264.0	264.9	265.9	267.0	268.9	–	–	–
St. Louis	213.1	246.9	251.9	256.9	255.4	263.4	272.1	272.9	276.1	279.9	280.9	282.2	–	–	–
San Francisco	266.4	321.1	327.5	337.4	343.3	352.4	365.4	366.6	366.9	367.7	368.6	376.2	–	–	–
Seattle	191.8	232.7	237.4	247.0	252.5	260.6	266.6	265.1	266.3	267.8*	268.9	271.1	–	–	–

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



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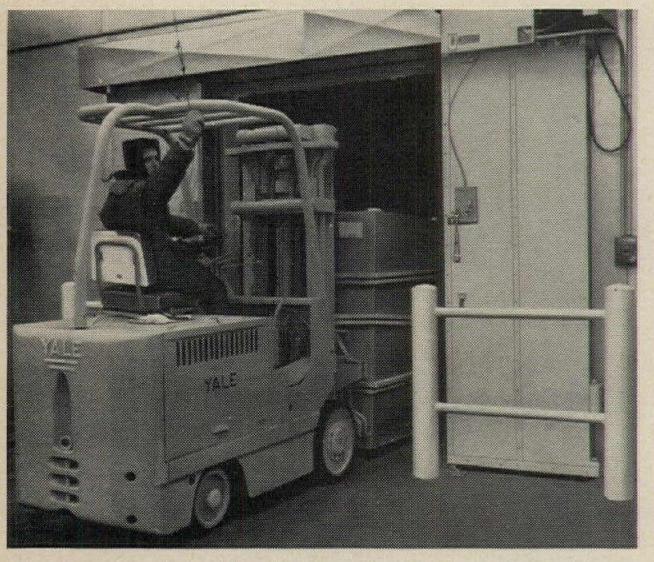

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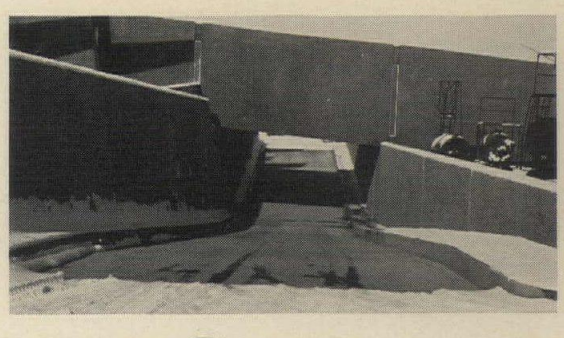

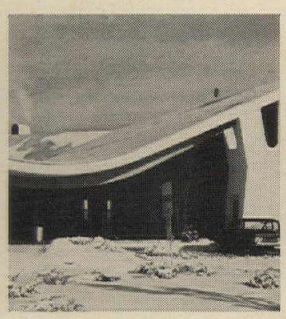

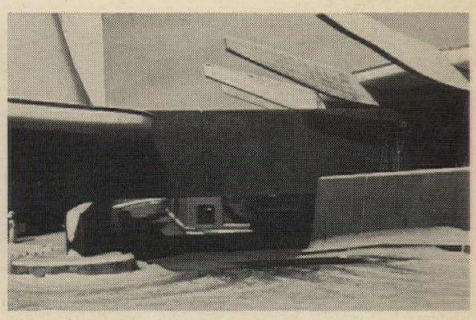

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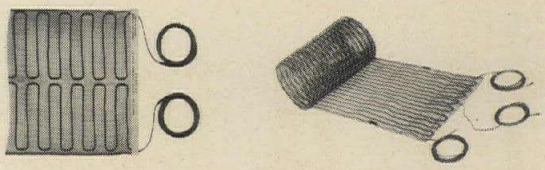

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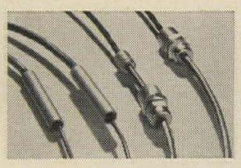
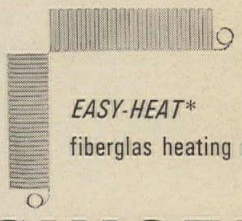


mineral insulated cable



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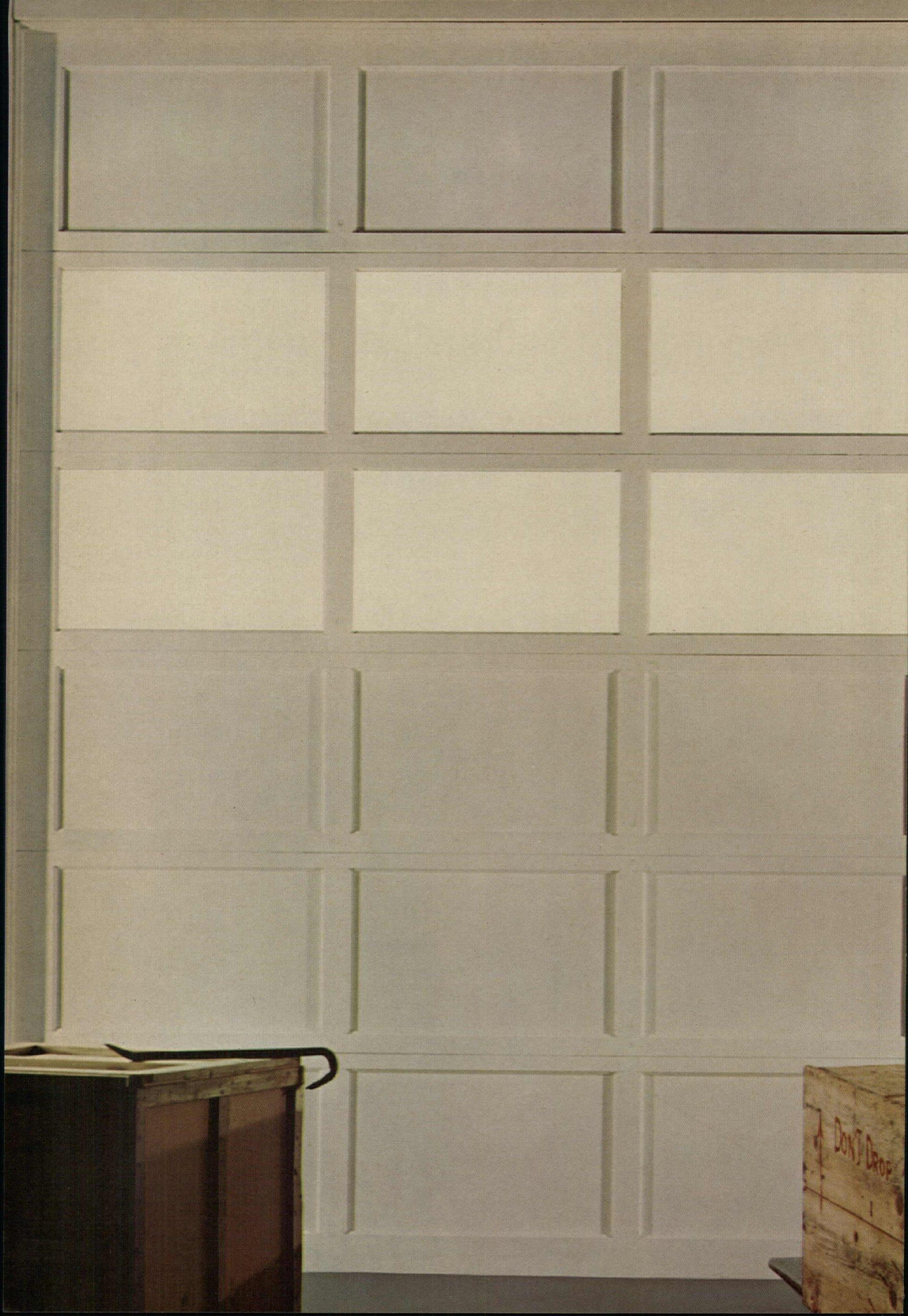
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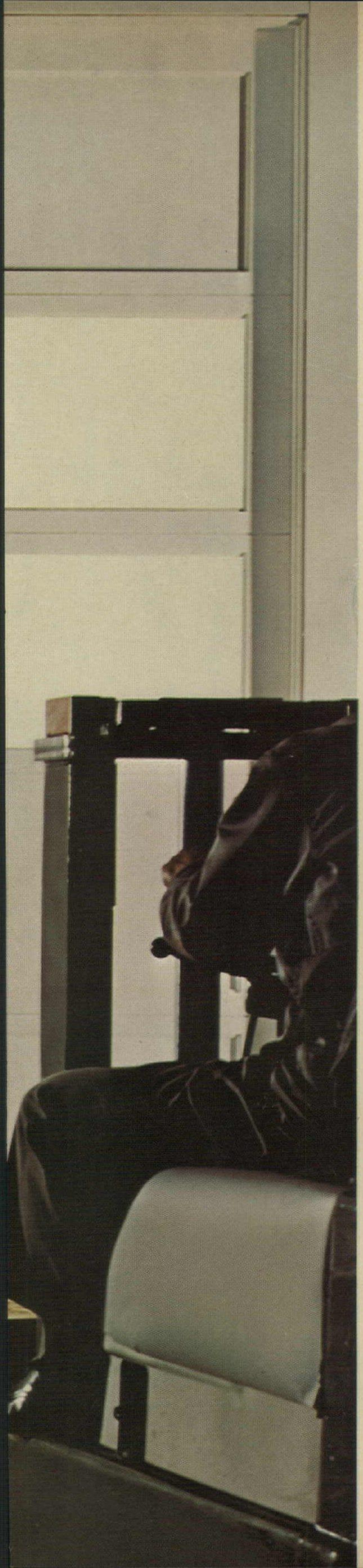

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Tomorrow's urban world

TRANSACTIONS OF THE BARTLETT SOCIETY: *Volume 3, 1964-65. Bartlett School of Architecture, University College, London. 156 pp., 12s 6d ($1.75).*

Since the general purpose of the Bartlett Society is to encourage the direction of architectural research towards "a concern with the wider issues of urban affairs, economic policy and political structure" this publication could well become an important forum for the exchange of ideas in the growing international dialogue on the problems of the city. Volume 3 of the Society's Transactions contains, for the first time, contributions by people outside the United Kingdom and the editors announce their intention of including papers others than those actually read at the Society's meetings. This implies that the Transactions could provide a much needed opportunity for the publication of research in relation to architecture.

The multi-disciplinary emphasis of the Bartlett Society is reflected in the selection of papers published in this Volume, which are by people from a number of different disciplines dealing with a number of different aspects of the urban scene. David Donnison, Professor of Social Administration of the London School of Economics, describes the effect of the political structure of Eastern Europe on housing policies in these countries; Peter Cowan, architect, and Jill Nicholson, sociologist, give the results of a study of the growth and change of a sample series of hospital buildings; a French and an English economist—Edmond Lisle and Professor Parry Lewis—present papers on the interaction of economic and physical planning; and the subject of privacy and social interaction is dealt with by John Madge, research architect at University College.

Unquestionably the most significant contribution to this volume is the publication of two lectures delivered in London last year by American anthropologist, Dr. Margaret Mead on the subjects "The City as a Point of Confrontation" and "Megalopolis: Is It Inevitable?" In these, Dr. Mead traces some of the intricate web of influences which shape our urban patterns and examines the sort of actions we might take today to avoid the choked city centers and endless, meaningless suburbs which many fear will be the inevitable environment of tomorrow. Dr. Mead seems to envisage numbers of small cities as cultural centers — to which people will travel from their various residential districts—whose many influences will counteract the one-way pull of today's few, great metropolitan areas. She characterizes this pattern, perhaps rather idealistically, as a situation in which "instead of being drawn uni-directionally toward some one magnetic center, we will be free to move within the pattern of lights that represents the glowing network of thought in the world."

The wit, wisdom and human insight displayed in these lectures makes a refreshing change from the curves, charts and heavy, statistical analyses of which so much of our planning studies consist. To read of the problems of the city in the evocative language of the anthropologist who seems able to keep the human scale and frame of reference constantly in view is to get a fresh outlook on the urban situation. Moreover Dr. Mead's style of writing is mercifully free of the sort of professional jargon which to some extent mars the other papers in this volume. Where Dr. Mead describes the city as a place which "opens the way to new friendships," others—no less profound but much less appealing—would say that in a city a person can "interact with a fair cross section . . . so that suitable balances of sentiment patterns can be achieved."

Dr. Mead has recently been the victim of the "too popular to be profound" type of criticism—but if lucidity of thought and expression, coupled with a well documented belief that man has at least the chance of a tolerable future on this planet is the reason for popularity—this turns out not to be a criticism at all. —*Susan Braybrooke*

THIS MONTH'S BOOKS

REVIEWS

"Transactions of the Bartlett Society: Volume 3" 67
Robin Boyd, "The Puzzle of Architecture" 67
Maxwell Silverman, "Contemporary Theatre Architecture" 70
R. L. Gregory, "Eye and Brain" 78
David B. Van Dommelen, "Designing and Decorating Interiors" 84
Books Received **84**

Twentieth century developments

THE PUZZLE OF ARCHITECTURE. *By Robin Boyd. Cambridge University Press, 32 East 57th St., New York, N. Y 10022. 188 pp., illus. $12.50.*

Any close observer of the architecture of the 20th century and certainly the architect should appreciate this author's evaluation of it in his attempt to answer a more general question: *What is the architect trying to do?*

Mr. Boyd delves deeply into the International Style, its makers and the end of its road. More often than not he is amusing, but his keen perception is not lost at the cost of it. After treating the International Style he does an admirable job of putting into perspective all the hard-paced developments occurring after the mid-point of the century of which he says, "Whatever the limitations of this second phase of modern architecture, the monolithic and engineered shapes together made an important contribution to the 20th century architecture: the restoration of artistic unity in reaction to loose diagrammatic Functionalism."

Of the same period he later adds: "So much had happened since 1950, so many new shapes and techniques and surface treatments had been devised, that the modern movement may have seemed, in the early 1960's, to be bursting with creative vigor. Yet those many effects and fashions really had

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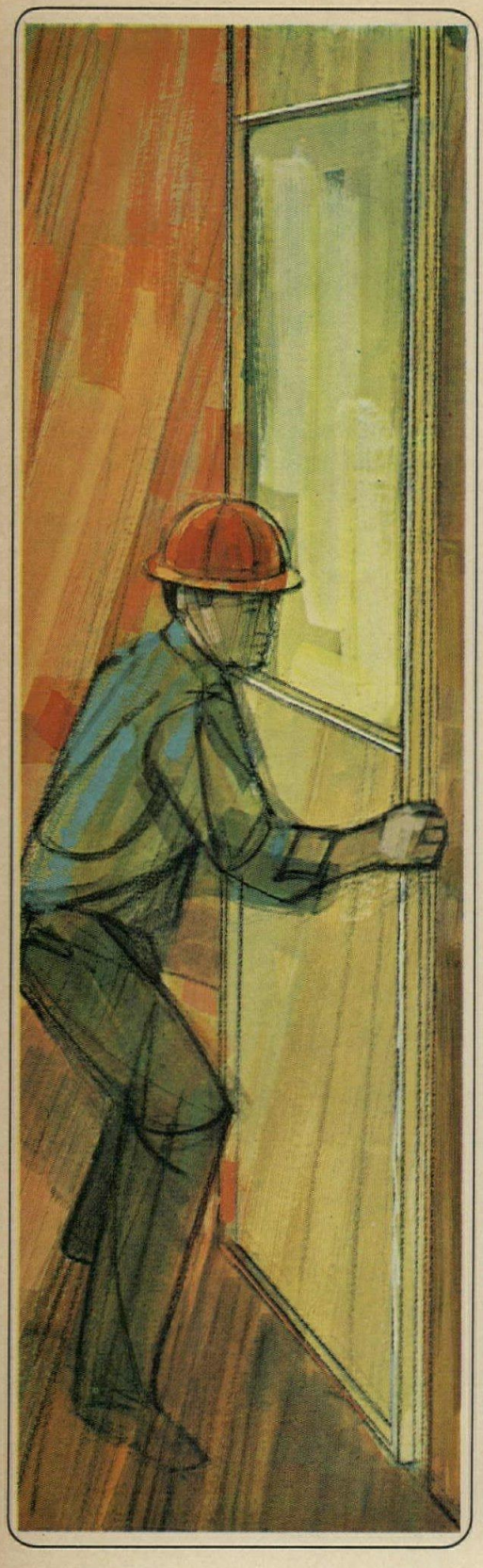

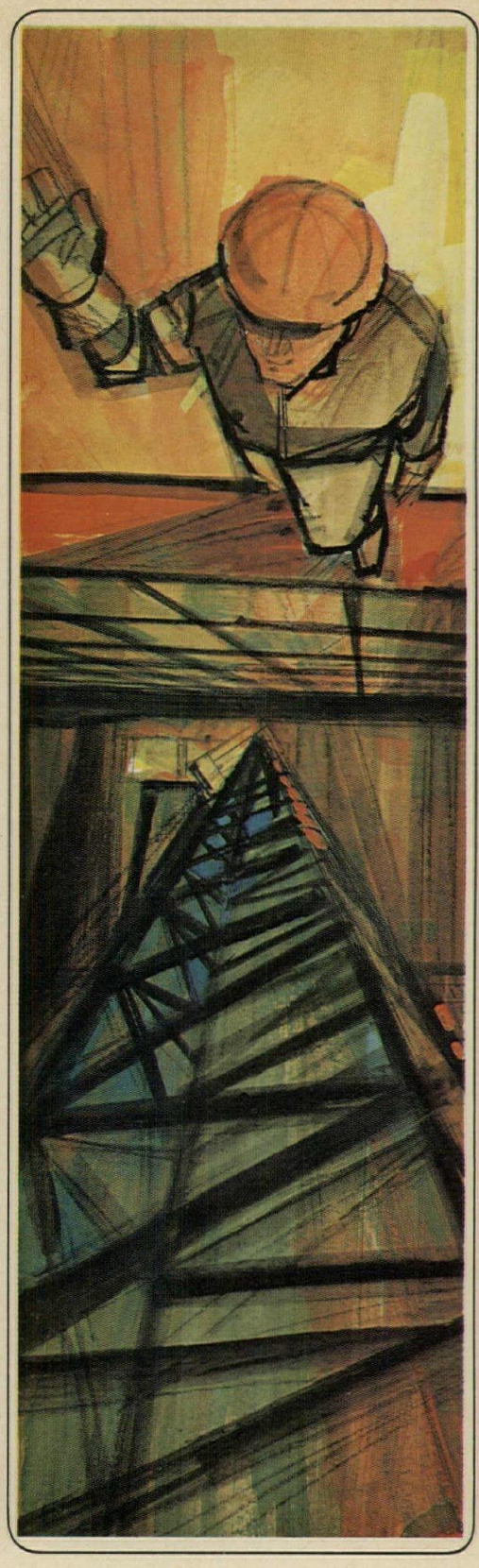

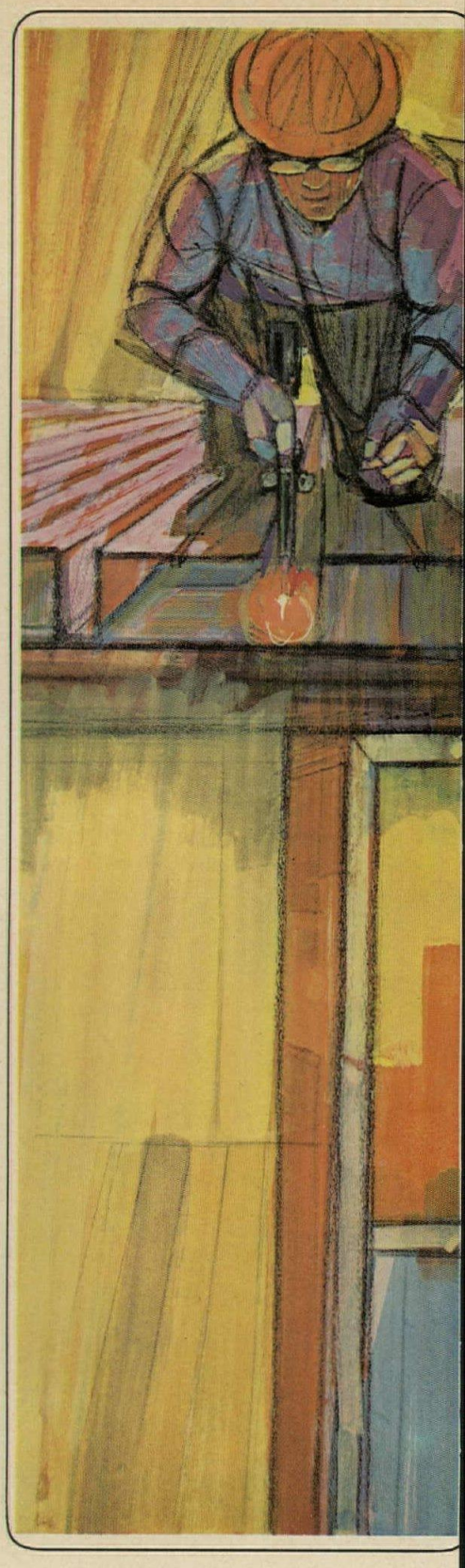

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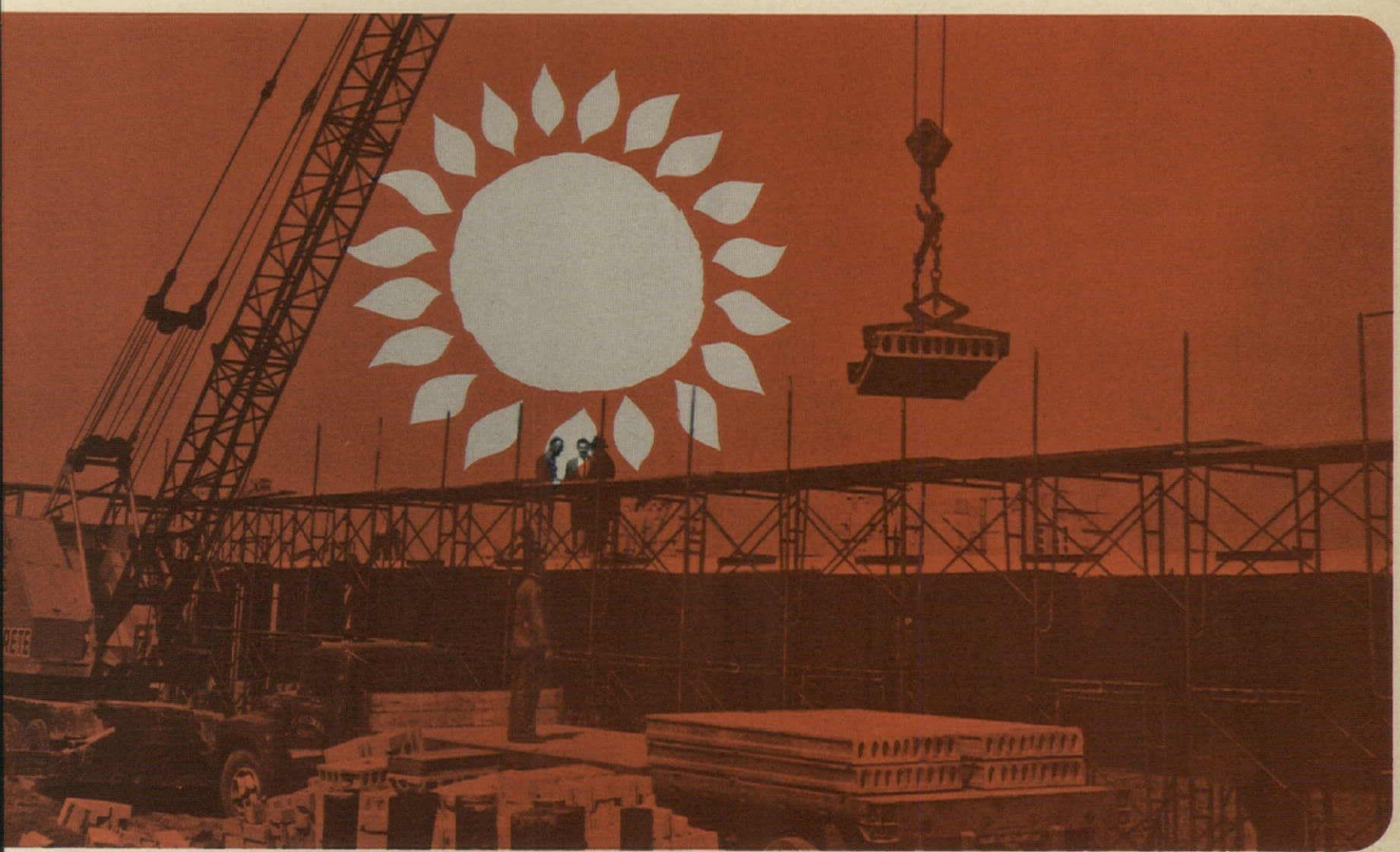

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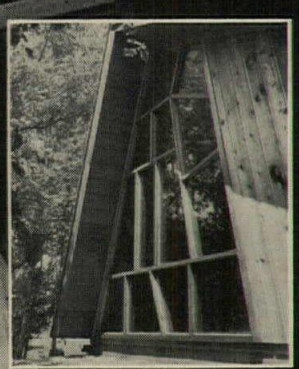

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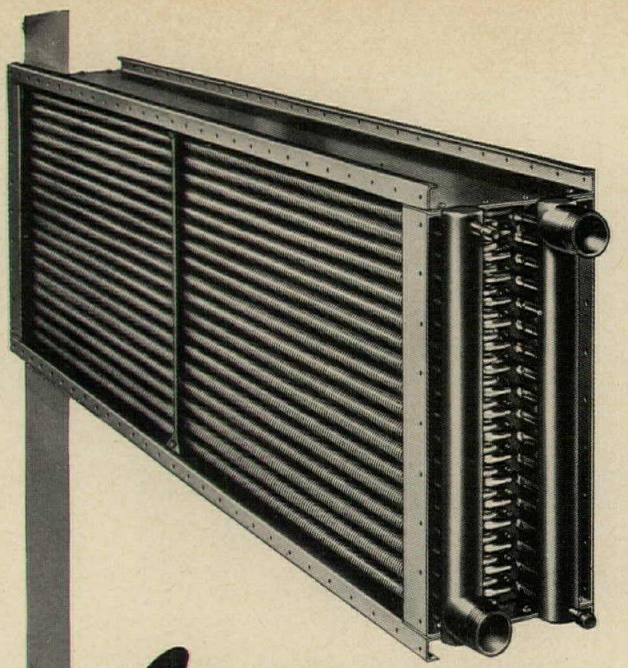

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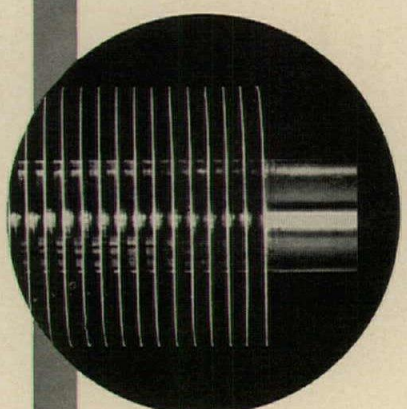

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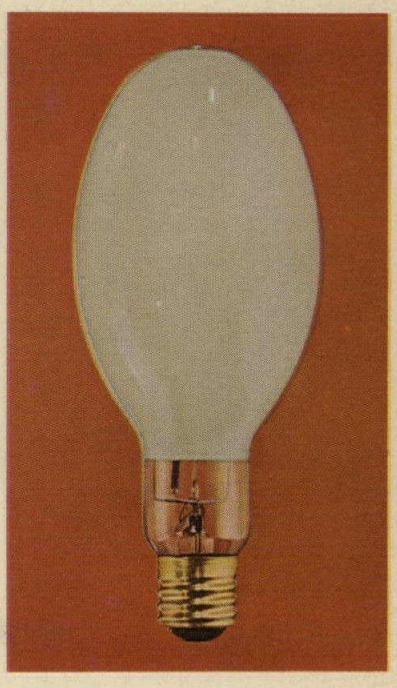

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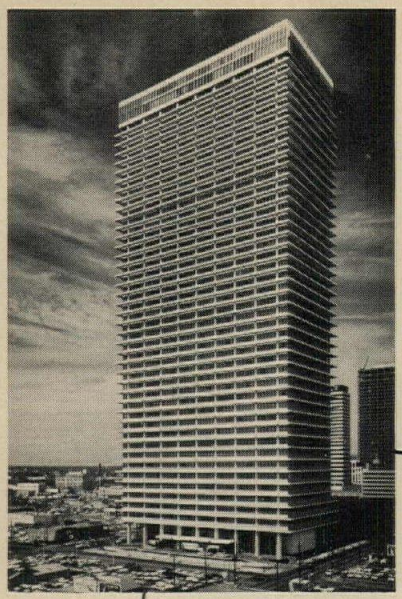

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continued from page 70

off-Broadway plays, presents an illustrated survey of theater trends since World War II and includes 50 examples grouped according to stage form (arena, peripheral, thrust, end, proscenium and variables). He gives pertinent information and shows black-and-white photographs and plans for each.

Mr. Bowman, faculty member of the Speech and Theater Arts Department at the University of Pittsburgh, has compiled an excellent international bibliography of over 1,700 entries "to serve as a point of departure for research into contemporary theater architecture."

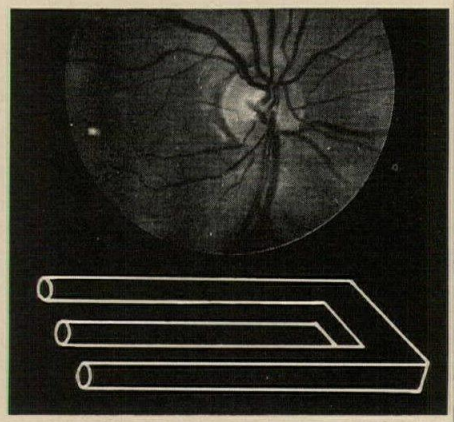
This book should be of great interest to the architect or engineer concerned with theater building.

Perception

EYE AND BRAIN. *By R. L. Gregory. World University Library, McGraw-Hill Book Company, 330 W. 42nd St., New York, N. Y. 10036. 254 pp., illus. Hardbound, $4.95; Paperbound, $2.45.*

This book brings together experimental discoveries of both physiology and psychology and provides considerable revealing detail to the problems of seeing objects in the real world.

R. L. Gregory, a British psychologist, has pointed to several important phenomena concerning the perceptual processes of vision and their dissimi-



larity to the photographic conversion of objects into images. He has concluded that perception is merely a matter of the brain's testing hypotheses about the information presented to it on the retina. The pattern of neural activity represents the object and to the brain *is* the object—no internal picture is involved. Professor Gregory puts forward a general theory of illusions which give distortions of visual space, relating them to the artist's problems of portray-

continued on page 84

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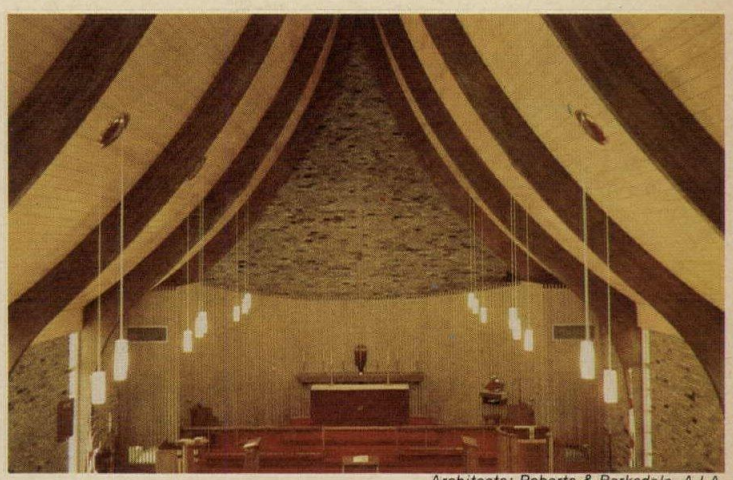

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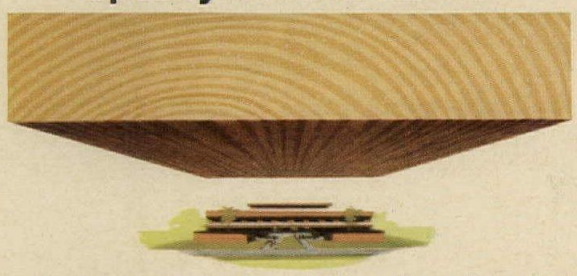

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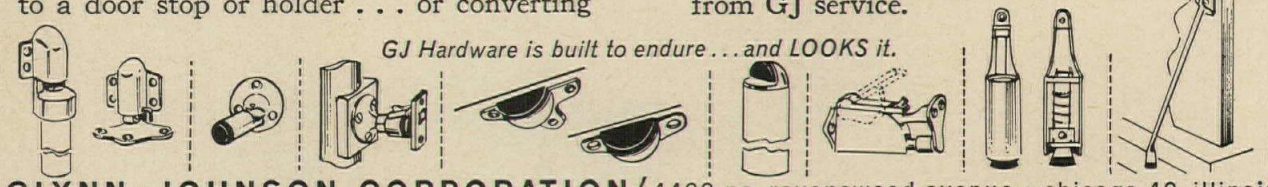

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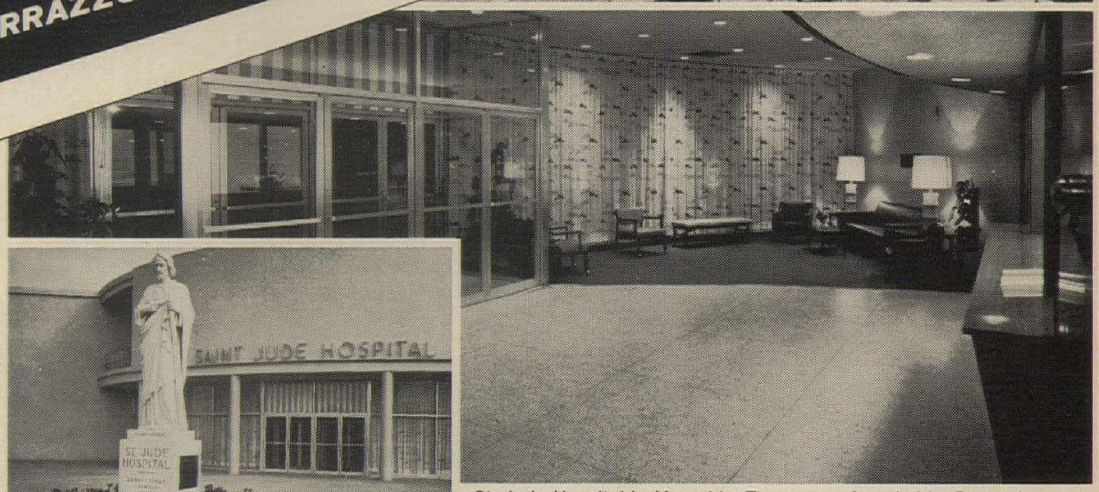

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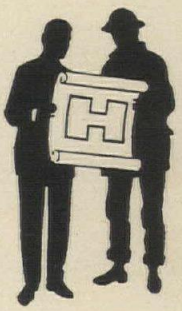

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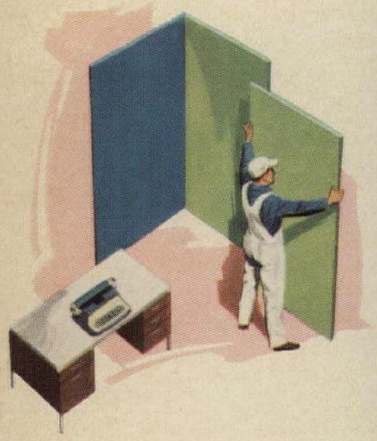

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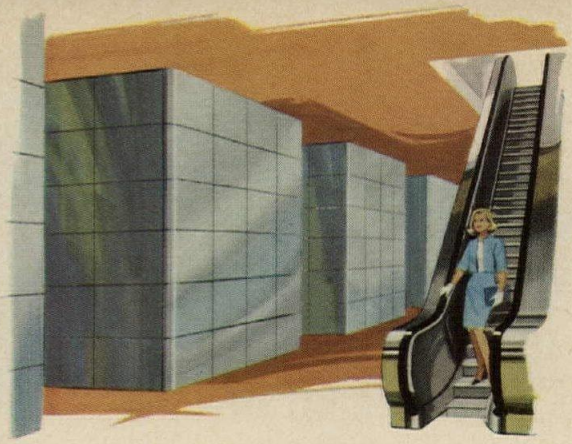

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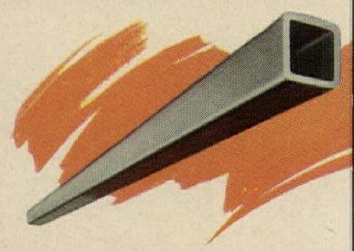

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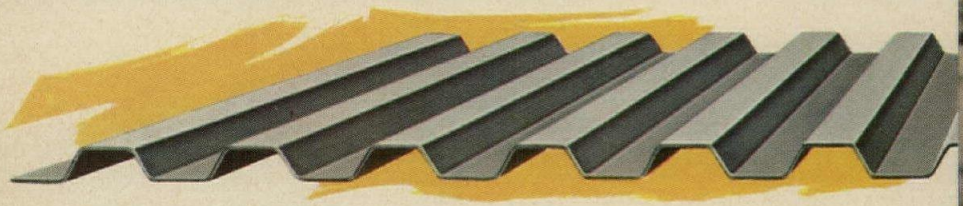

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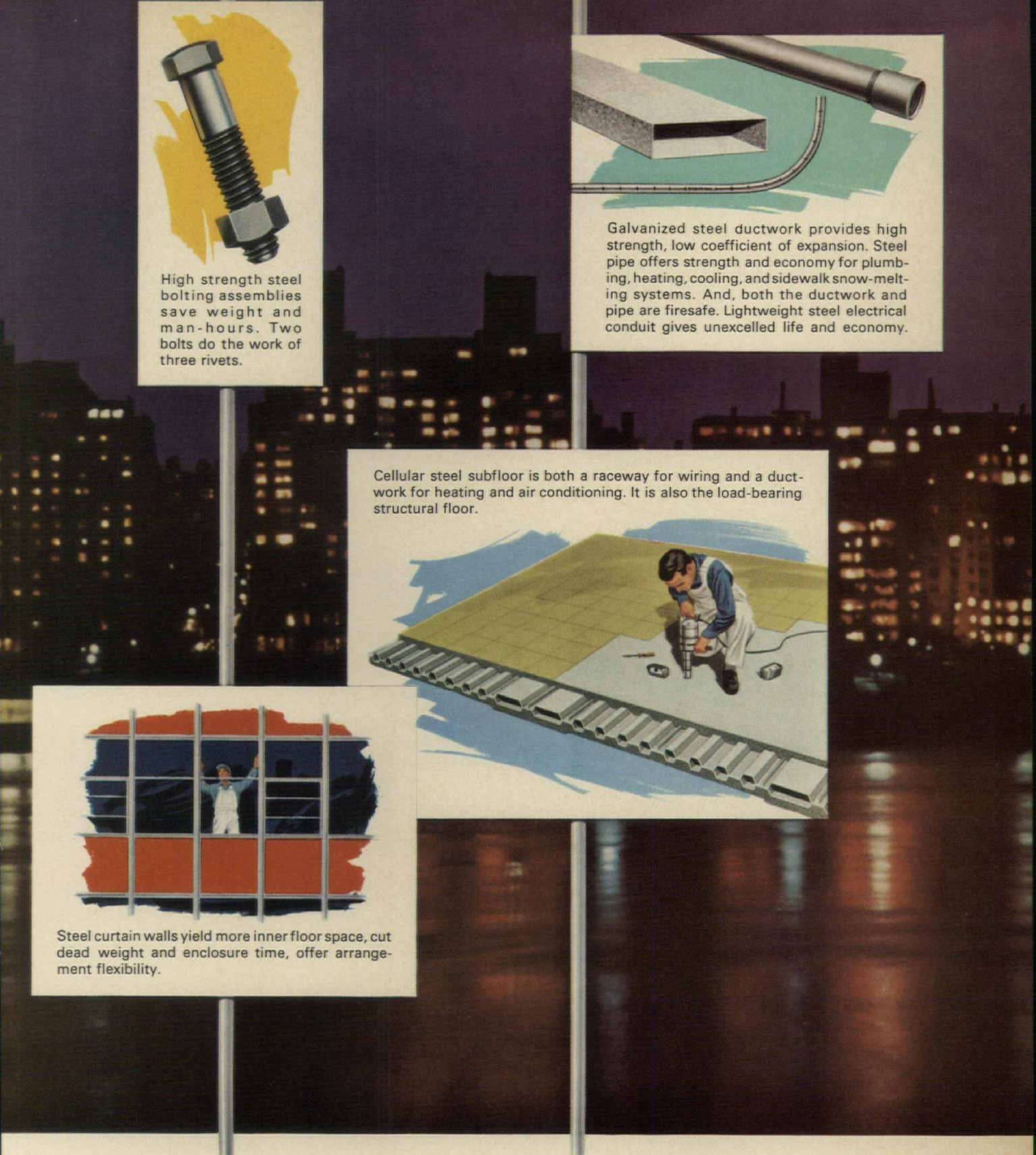

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Who but Crane would think of a hidden soap dish?

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Soap dish out of sight
Crane's exclusive concealed soap receptacle (as shown in the mirror here) puts the soap where it belongs—out of sight. Keeps your countertop neat and clean; also doubles as an overflow.

Leak-proof faucets
Exclusive Crane Dial-ese control keeps stem threads dry, free from corrosion. Lasts years longer than conventional controls. Valve closes with water pressure. No more washers to change. Cuts maintenance costs and water bills.

Step in and out with safety
Unusually low silhouette (only 14" high) of Crane's Fairfax tub makes getting in and out safe and easy. Pleasing sculptured styling features full-length rim seat.

Sweat-free tanks
Crane's Neu-Sahara tank stays dry even when the bathroom steams up to 80° and 70% humidity! Ends wet floors. (Shown here with Crane Radcliffe toilet.)

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For details, contact your Crane sales office, Crane wholesale distributor, or write for full-color brochure, "The Bathroom Beautiful." Crane Co., Dept 008, 4100 S. Kedzie Ave., Chicago Ill. 60632.

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When a roof must be more than a roof, choose Ruberoid T/NA 200® roofing (with Du Pont TEDLAR*)

This new auto showroom for Cann Ford Inc., Batavia, Ohio, was designed to be an attractive standout building in the community—so everyone would remember where the local Ford dealer is!

Basic to this goal was the *roofing* of Ruberoid T/NA 200. T/NA 200 is a tough, flexible prefinished membrane that easily conforms to roofs of unusual contour, on any slope. With its attractive white surface, it was ideal for this dramatic folded-plate design. And the roof will stay weathertight and maintenance-free for years to come.

Installation is easy and quick. T/NA 200 can be handled on-site with conventional roofing techniques; or, as in this case, factory-applied over modular plywood sections.

For a slight contrast, the front peak was roofed with white Ruberoid Sovereign® 300-lb. asphalt shingles. These heavyweight self-sealing shingles give maximum protection and blend pleasingly with the T/NA 200.

Precision Buildings, Inc., Cincinnati, Ohio, prefabricated the roof, factory-covering the plywood sheets with T/NA 200 and hoisting the sheets in position for joining. Additional T/NA 200 and tape were used to weather-seal all roof joints.

Whenever a roof must be much more than just a roof, consider Ruberoid T/NA 200. Besides white, available in green or gray pastels. Send for full details.

RUBEROID®

The RUBEROID Co., TECHNICAL SALES AND FIELD ENGINEERING DEPT.
DEPT. AR-46, 733 Third Avenue, New York, N. Y. 10017

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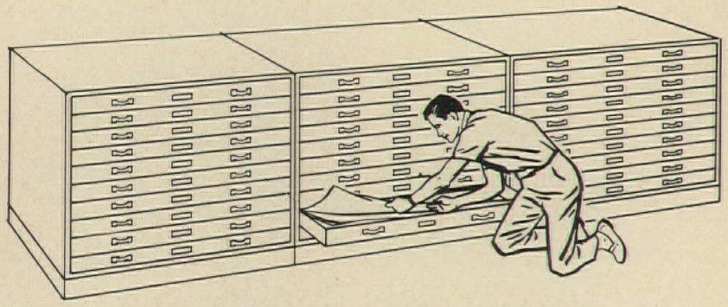

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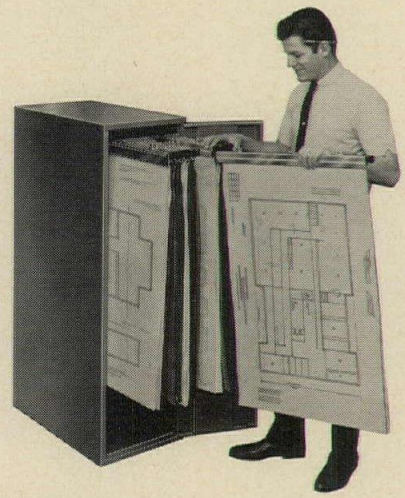

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continued from page 84

PARTICLE BOARD AND HARDBOARD. *By L. E Akers. Pergamon Series of Monographs on Furniture and Timber, Vol. 4. Pergamon Press Inc., 44-01, 21st St., Long Island City, New York 11101. 172 pp., illus. $6.00.*

A HISTORY OF CLASSICAL ARCHITECTURE. *By Bruce Allsopp. Pitman Publishing Corp., 20 E. 46th St., New York, N. Y. 10017. 215 pp., illus. $10.95.*

Part 22, 1966 BOOK OF ASTM STANDARDS ON SORPTIVE MINERAL MATERIALS; SOAP; ENGINE ANTIFREEZES; WAX POLISHES; HALOGENATED ORGANIC SOLVENTS; ACTIVATED CARBON. *American Society for Testing and Materials, 1916 Race St., Philadelphia Pa. 19103. 472 pp. $8.00.*

ANCIENT EGYPTIAN ARCHITECTURAL DESIGN, *A Study of the Harmonic System. By Alexander Badawy. University of California Press, Berkeley, Calif. 94720. 195 pp., illus. $6.00.*

THE BRITISH BUILDING INDUSTRY, *Four studies in Response and Resistance to Change. By Marian Bowley. Cambridge University Press, 32 East 57th St., New York, N. Y. 10022. 488 pp. $13.50.*

ANCIENT ARCHITECTURE OF GREEK AND ROMAN COINS AND MEDALS. *By T. L. Donaldson. Argonaut Inc., Publishers, 737 North Michigan Ave., Chicago, Ill. 60611. 361 pp., illus. $10.00.*

LA ARQUITECTURA COLONIAL EN VENEZUELA. *By Graziano Gasparini. George Wittenborn Inc., 1018 Madison Ave., New York, N. Y. 10021. 379 pp., illus. $30.00.*

THE ARCHITECTURE OF PURCELL AND ELMSLIE. *Introduction by David Gebhard. The Prairie School Press, 117 Fir St., Park Forest, Ill. 96 pp., illus. Hardbound, $6.50; Paperbound, $4.00.*

STEEL CONGRESS 1964, *Progress in Steel Construction Work. By the High Authority of the European Coal and Steel Community. Communauté Européenne Du Charbon Et De L'Acier, Haute Autorité, 2. Place De Metz, Luxembourg. 714 pp., illus.*

COMPOSITE MATERIALS. *Edited by Leslie Holliday. Elsevier Materials Science Series. American Elsevier Publishing Company, Inc., 52 Vanderbilt Ave., New York, N. Y. 10017. 540 pp., illus. $24.00.*

ARCHITECTURE: FORM AND FUNCTION. *Edited by Anthony Krafft. George Wittenborn Inc., 1018 Madison Ave., New York, N. Y. 10021. 262 pp., illus. $11.00.*

TEACHING A TECHNOLOGY. *By E. W. N. Mallows. Witwatersrand University Press, Jan Smuts Ave., Johannesburg, South Africa. 94 pp. $3.50.*

HOUSES AND HOUSE-LIFE OF THE AMERICAN ABORIGINES. *By Lewis H. Morgan. The University of Chicago Press, 5750 Ellis Ave., Chicago, Ill. 60637. 319 pp., illus. $6.95.*

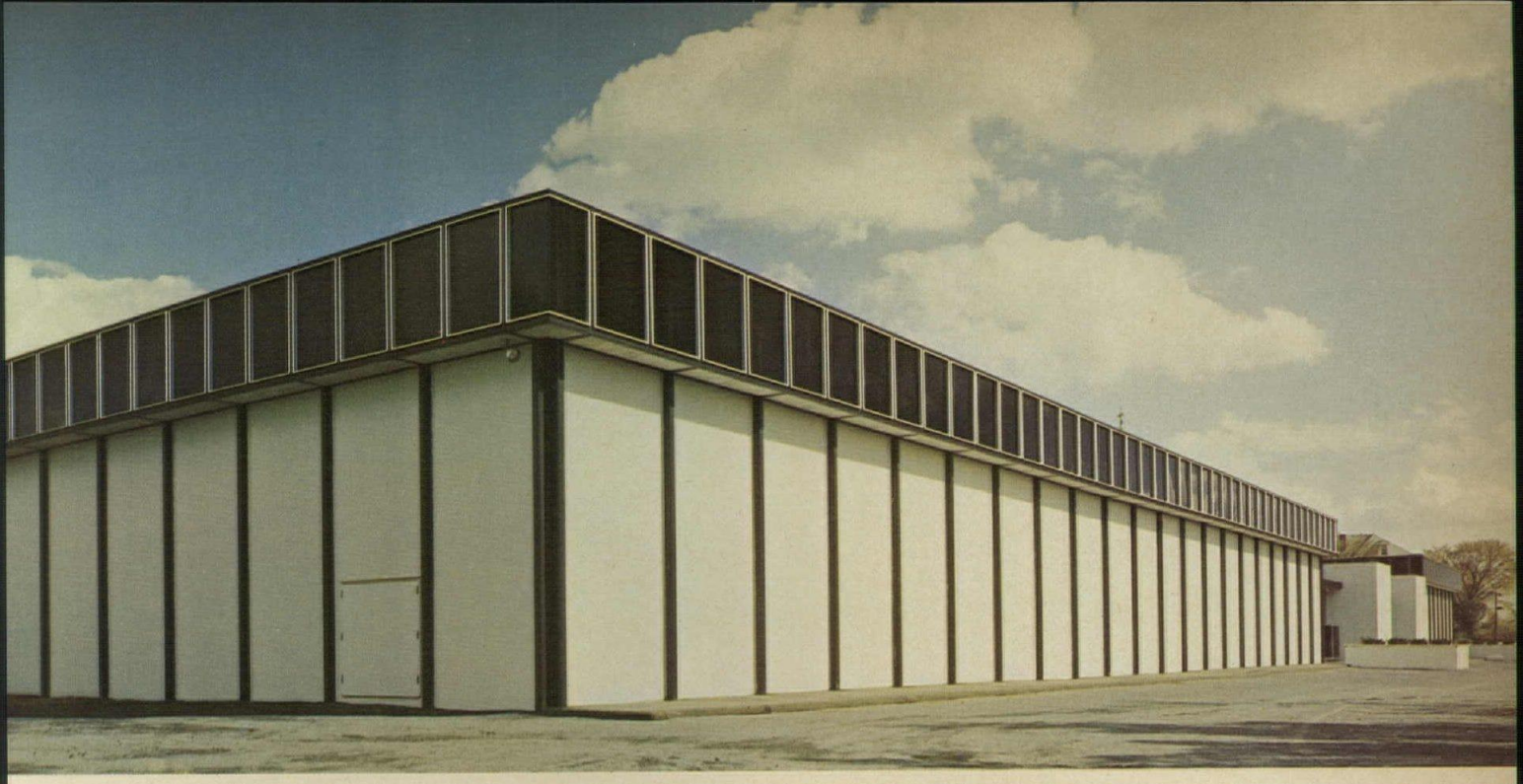
PROCEEDINGS OF THE FALL, 1965 MEETING OF THE SOCIETY FOR THE ADVANCEMENT OF FOOD SERVICE RESEARCH. *Richard T. Keating, 4301 West Madison St., Chicago, Ill. Unpaged. $7.00.*

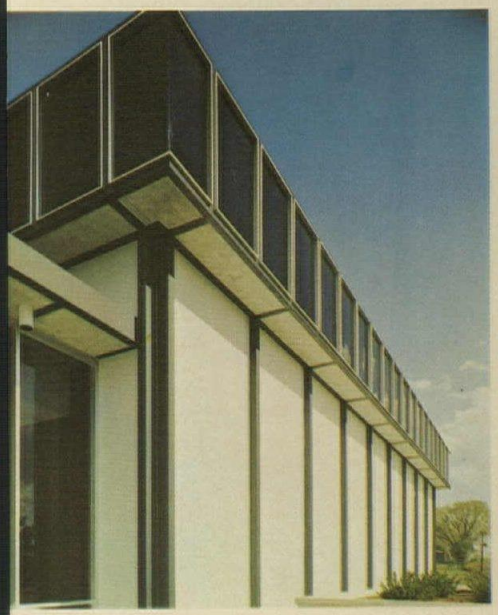
BUILD WITH ADOBE. *By Marcia Southwick. Sage Books, 2679 South York St., Denver, Colo. 80210. 184 pp., illus. $3.50.*

WITH HERITAGE SO RICH. *By the Special Committee on Historic Preservation, 1707 H Street, N. W., Suite 604, Washington, D. C. 20006. 230 pp., illus. $10.00.*

THE LIVES OF THE ARTISTS. *By Giorgio Vasari. Translated by George Bull. Penguin Books, 3300 Clipper Mill Road, Baltimore, Md. 21211. 478 pp. Paperbound, $1.95.*

BOSTON IN THE AGE OF JOHN FITZGERALD KENNEDY. *By Walter Muir Whitehill. The University of Oklahoma Press, Norman, Okla. 208 pp., $2.75.*





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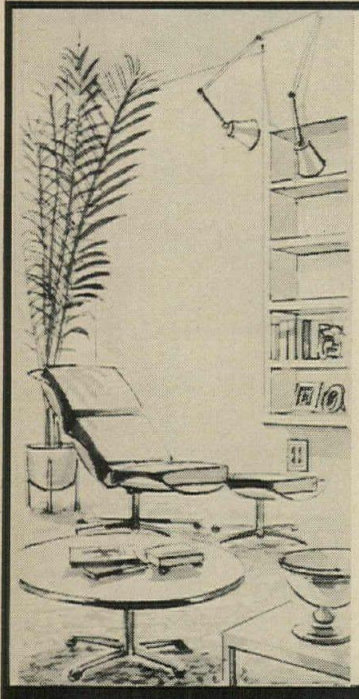

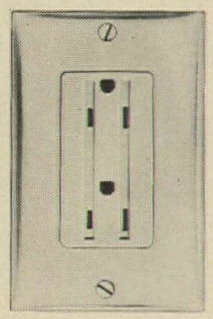

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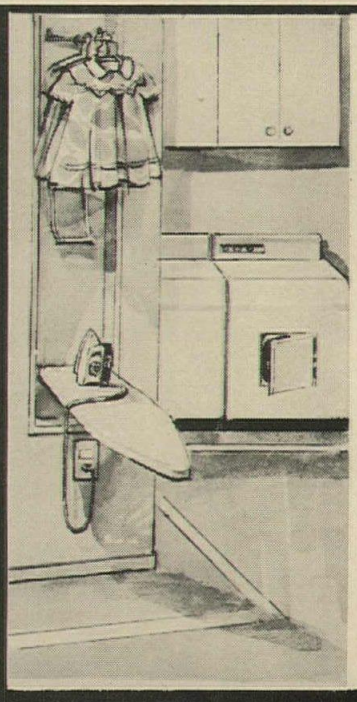

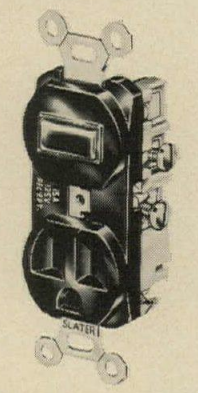

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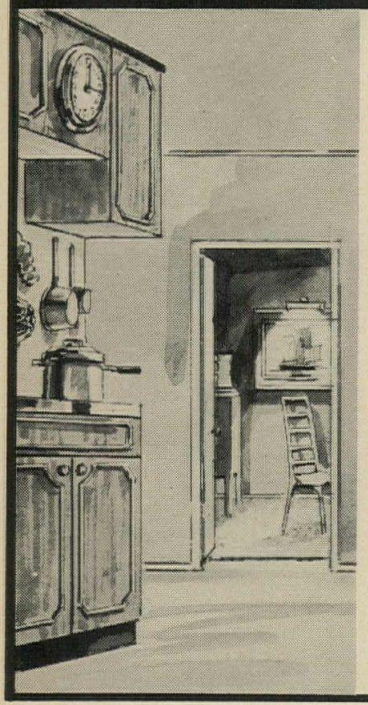

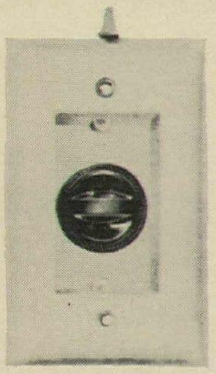

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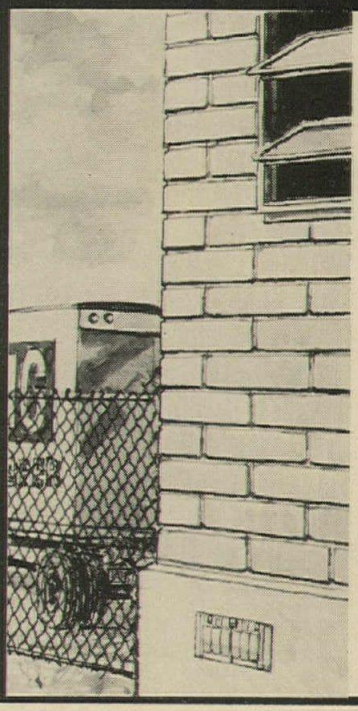

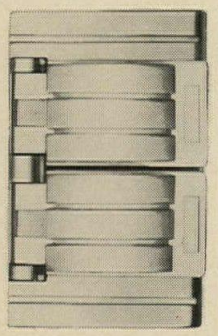

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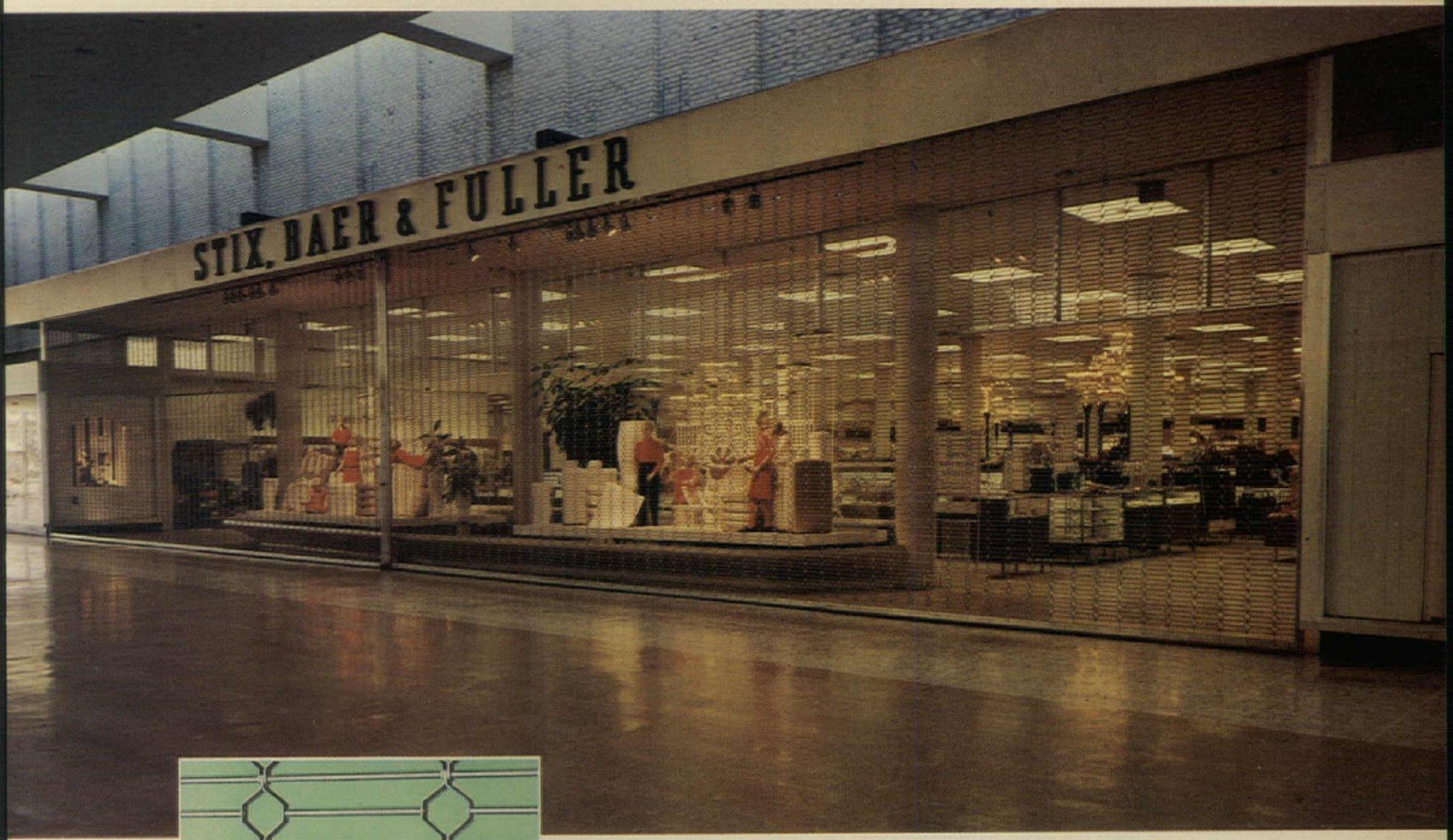

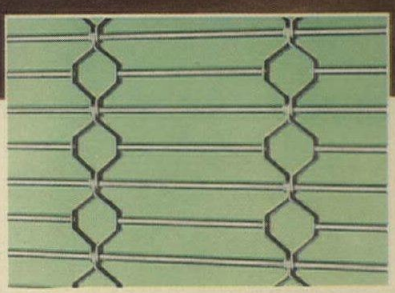

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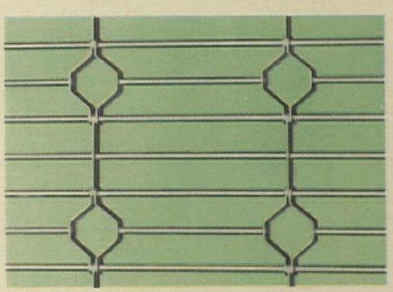

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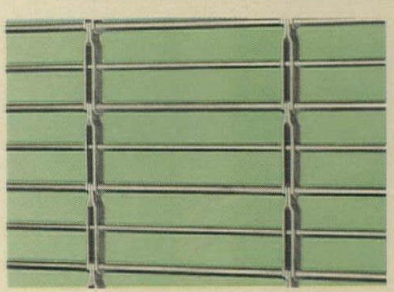

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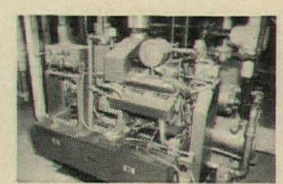

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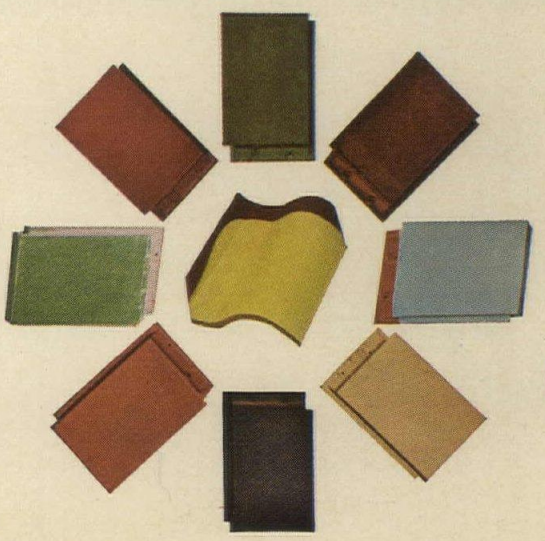

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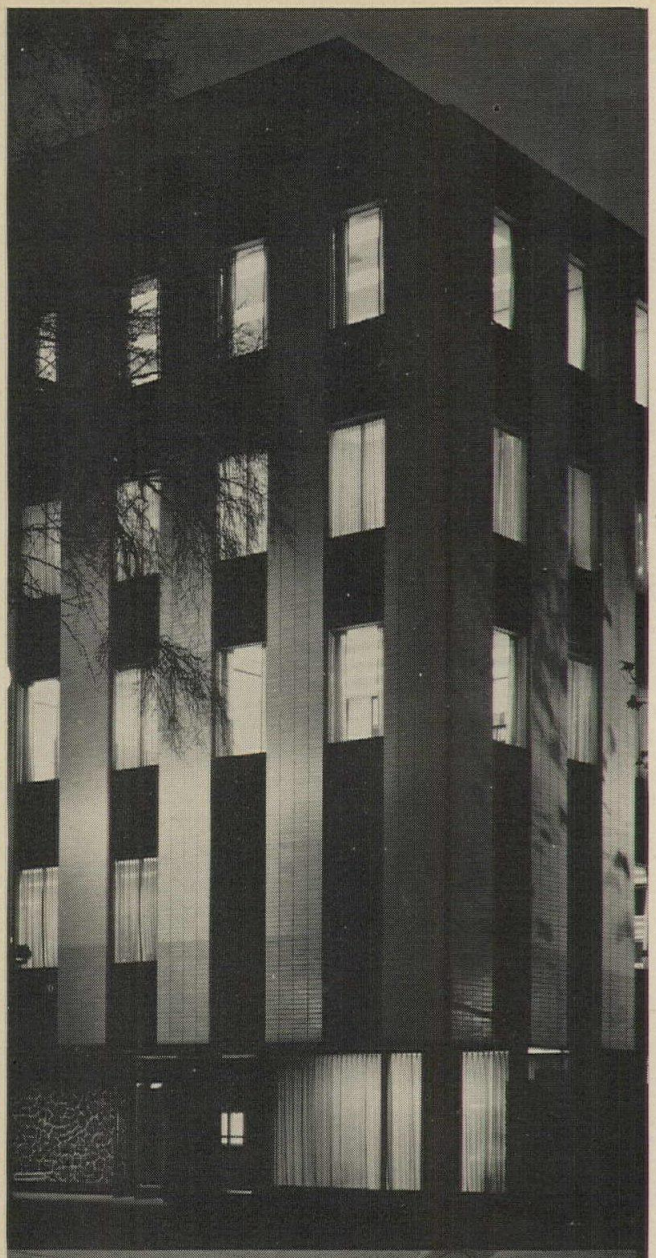

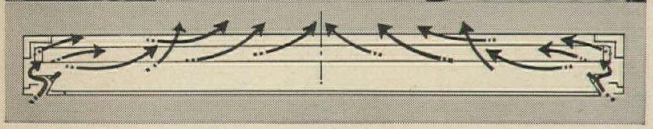

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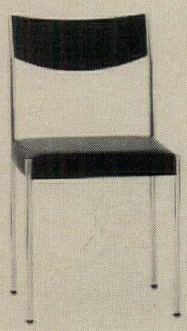

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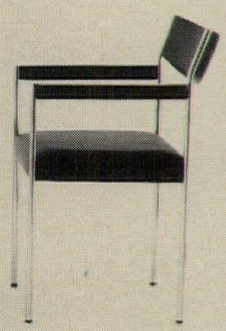

No. 80050

...talk about tables

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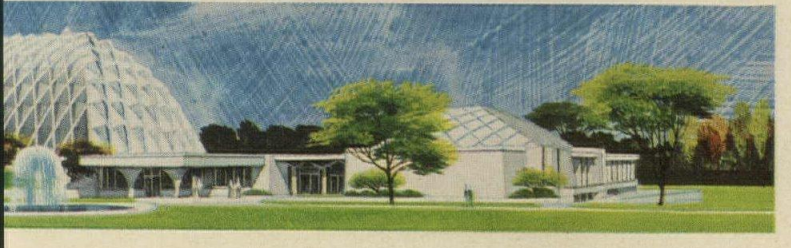
aceful, curving ribs of concrete roof a modern tropical garden. In the new Boettcher Con-rvatory of Denver's Botanic Gardens, concrete achieves a striking departure in design and construction. Ribs of reinforced concrete are used to create the 450-window roof. Rising in a 50-foot high curve, they ere entirely cast in place with integral condensate reglets and glazing channels. □ Boldness of the concrete centuates the transparency of the unique pyramidal plastic lights. Progressing upward in diminishing size, e linked window shapes produce a new and pleasing visual experience. □ Throughout the structure, even to the balconies for high-level viewing of the plant exhibits, concrete brings aesthetic rewards – along with minimized maintenance in the humid, tropical atmosphere. Across the nation, today's most imaginative structures of every pe and size demonstrate the unequaled versatility of modern concrete.



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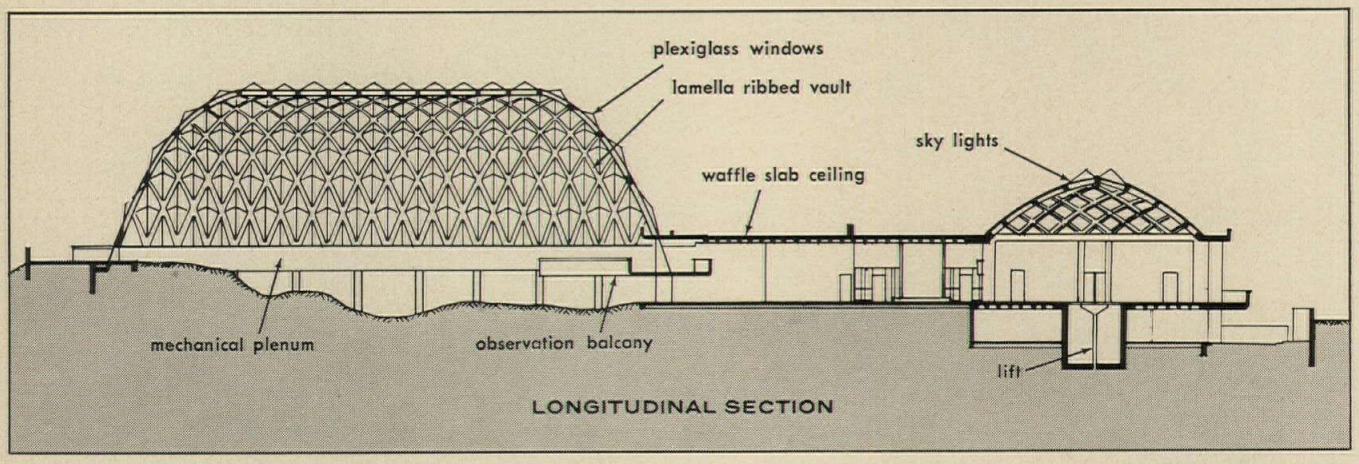


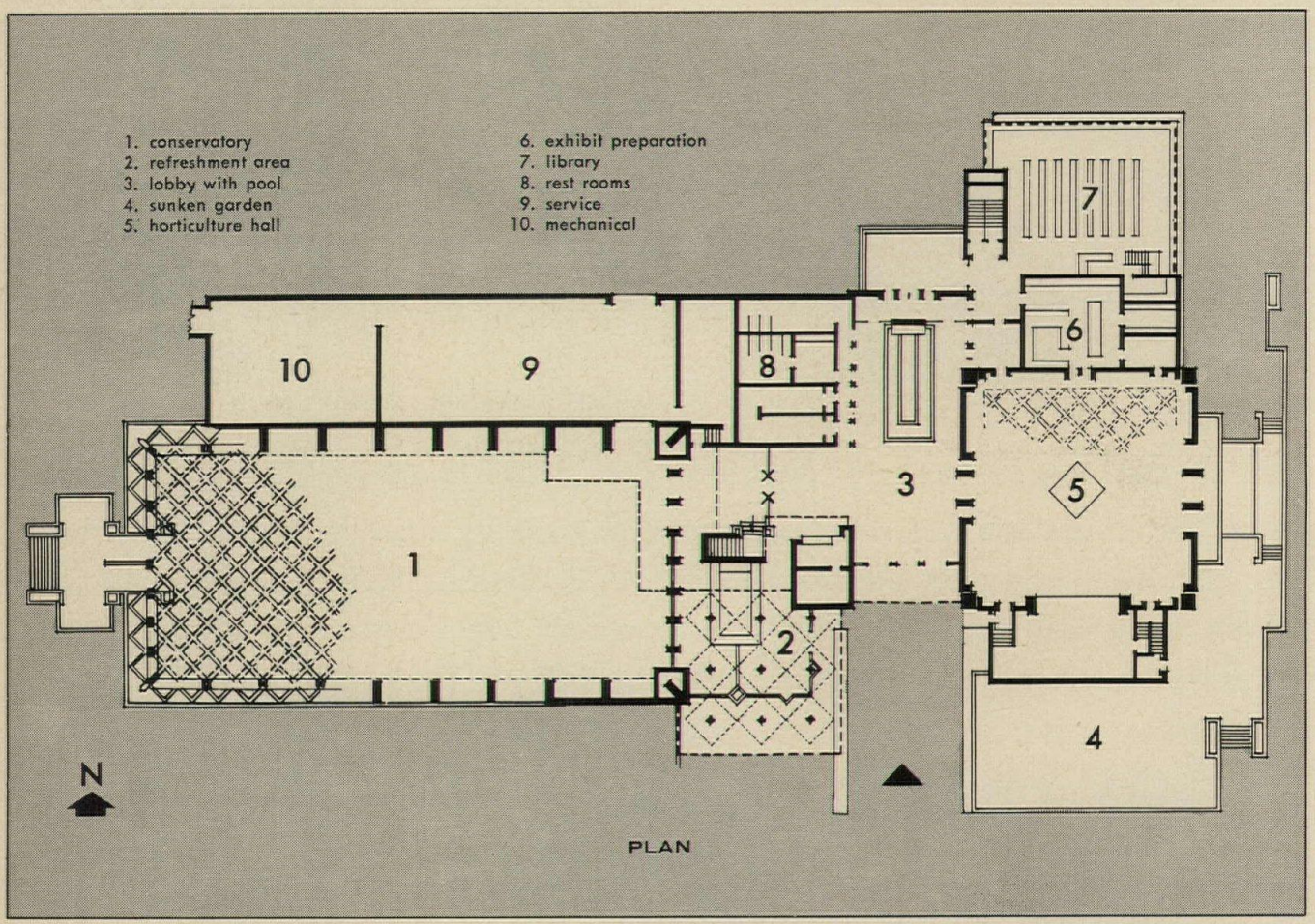
LONGITUDINAL SECTION

Architects exploit esthetic potential of concrete in Denver Botanic Gardens

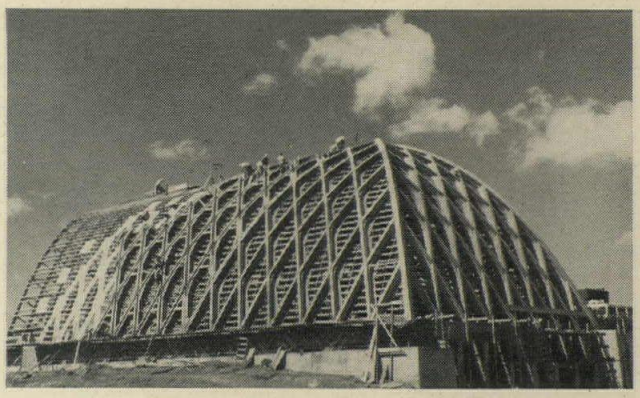
Designed to an educational function, as well as for public enjoyment, the new Denver Botanic Gardens are located on an 18-acre site with a view of Colorado's Rocky Mountains. When completed, the Gardens will embrace a complex of integrated building units for the study and exhibition of plant life, as shown above and below in the longitudinal section and plan drawings.

Dominating the Gardens is the recently completed Boettcher Conservatory. More than a full year of study and design went into its planning. Problem solutions for the 72-ft. by 160-ft. facility are projectable to similar structures many times its size.

Esthetic potential was a vital factor in the choice of concrete. However, concrete also offered the low maintenance characteristics and durability that met important owner requirements.



PLAN



Conservatory frame designed to translate full load into compressive force

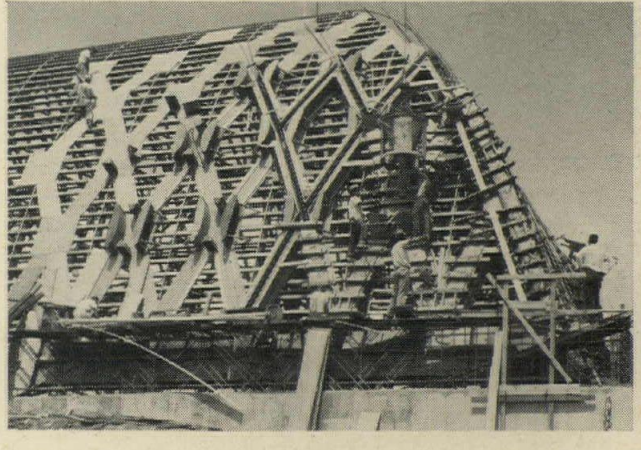
The Conservatory's lamella-type vault is designed as an inverted catenary curve and intersects with half catenary end sections.

The frame is based on an 8-ft. module. When projected in plan, frame ribs intersect at 45 degrees to form diamond-shaped openings of nine different sizes. These openings, square at the peak of the vault, become progressively longer toward the bottom. Alternate ribs bear on narrow concrete buttresses spaced 16 ft. apart, while intermediate ribs are carried on a continuous grade beam.

Theoretically, there is no bending in the 10-in. by 16-in. rectangular frame members. They carry only compressive forces.

The required frame strength was readily achieved with a structural lightweight concrete of the following mix proportions:

Portland cement, Type I	658 lb. per cu. yd.
Expanded shale, #8 max.	720 lb. per cu. yd.
Expanded shale, ⅜ in. max.	885 lb. per cu. yd.
Water	333 lb. per cu. yd.
Entrained air, average	11 percent
Slump	5 inches
Unit weight, average	92 lb. per cu. ft.
Strength at 28 days	5200-6200 psi

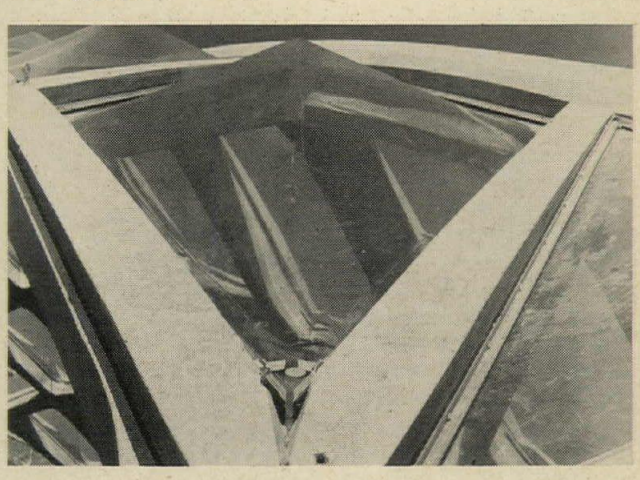


Rib members constructed without use of detailed drawings

Formwork for casting the Conservatory frame was supported on a series of bow-string trusses, acting in pairs and hinged at the top. Outlines for the arch ribs were drawn on plywood panels, as shown in the photo, and the formwork for each rib was built up from the bottom.

No detailed shop drawings were used. Instead, the architect worked closely with the contractor from the beginning of the project to develop an efficient system of construction.

Concrete was placed in 10- to 15-yard increments permitting repeated reuse of the forms. Ribs in the lower portions of the vault required cover forms to retain concrete during placement. Each rib was filled in 16-in. increments, and the concrete was vibrated through access holes in the cover forms, which were later plugged.

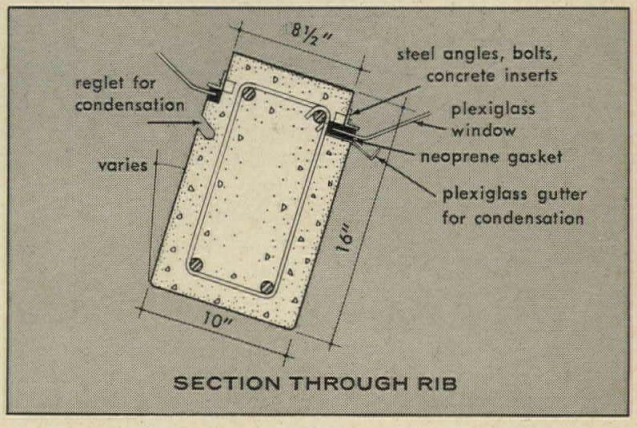


Unique tetrahedronal windows include miniaturized gutter system to prevent condensation drip

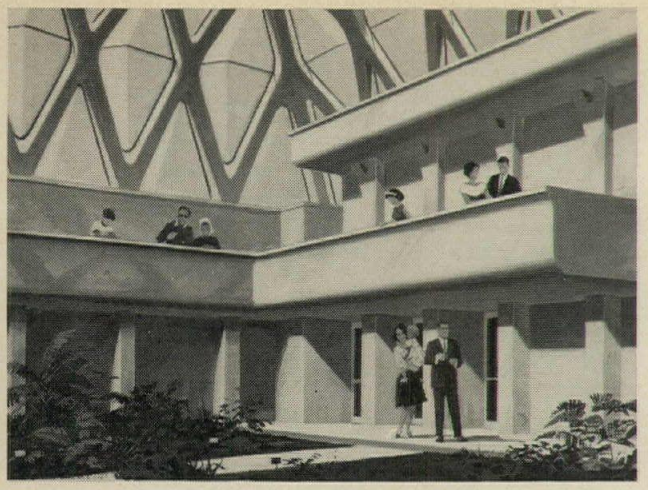
Glazing of the diamond-shaped frame openings is ¼-in. clear plexiglass, shaped as tetrahedrons of varying height. (See photo above.) Each is formed from a single sheet, except for the larger units in the bottom two rows. Setting in neoprene gaskets, as shown in the detail below, provides a permanently tight seal.

The system devised to collect condensation from the windows and prevent drip is both effective and inconspicuous. Small reglets have been cast into the concrete on the upper side of the ribs; plexiglass gutters are mounted on the lower side. Condensation collected then drains to the outside through weep holes at the lowest corner of each diamond.

Full-scale mock-up panels of the window units were constructed and tested to check gasket seal retention and efficiency of the condensate handling system.



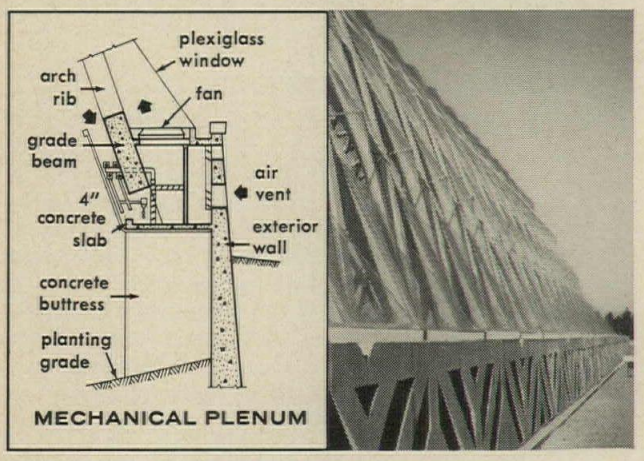
SECTION THROUGH RIB



"Hilltop view" achieved with multi-level balconies

Recognition that indoor gardens, just as outdoor scenes, take on an added dimension in beauty when viewed from above made high observation points a prime requirement.

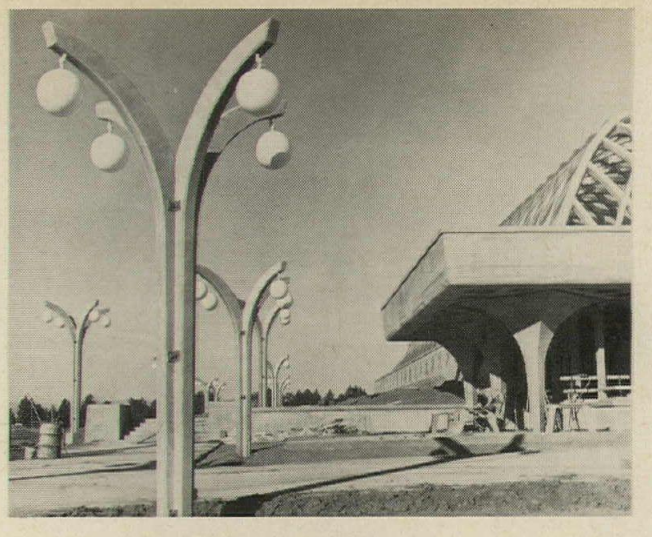
Varied viewer perspective has been provided in the Conservatory by cantilevered balconies at approx. 8-ft., 12-ft. and 17-ft. levels. 8-in. reinforced slabs of structural lightweight concrete are used, with integrally cast railings. Integration of the balconies with the garden scene was enhanced by Colorado red quartzite stone overlays for floors and trim for copings.



Mechanical plenum integrated into concrete design

Mechanical equipment for heating, cooling and ventilating is concealed and integrated into the structural system forming a continuous plenum at the base of the ribs. Fresh air intakes in the exterior walls of the Conservatory are concealed behind a decorative chevron design (see photo above). Fresh air or recirculated air can be forced upward from the plenum by 32 propeller fans around the base of the Conservatory.

In the summer, cooling is accomplished by evaporation making use of air vents at the base of the Conservatory and 11 ventilating skylights at the top of the vault. In the winter, fans blow air through steam fin tubes to heat the Conservatory.



Precasting permits custom-designed lamp posts at low cost

Specific design ideas in lighting fixtures for the Gardens were made possible by concrete. The architect wanted an atmosphere of a park at night. 15-ft. tree-shaped lamp posts, comprised of four identical sections bolted together, were cast on the site.

Use of a single form shape for all sections speeded reinforcing, casting and handling, resulting in economy. Posts have a smooth hand-rubbed finish. Bolted connections will be concealed with bronze-plated cover boxes.

Lamp posts inside the Conservatory are of the same design but also serve as ventilators. Fans in boxes at the base of the posts force air up through the center of the posts.

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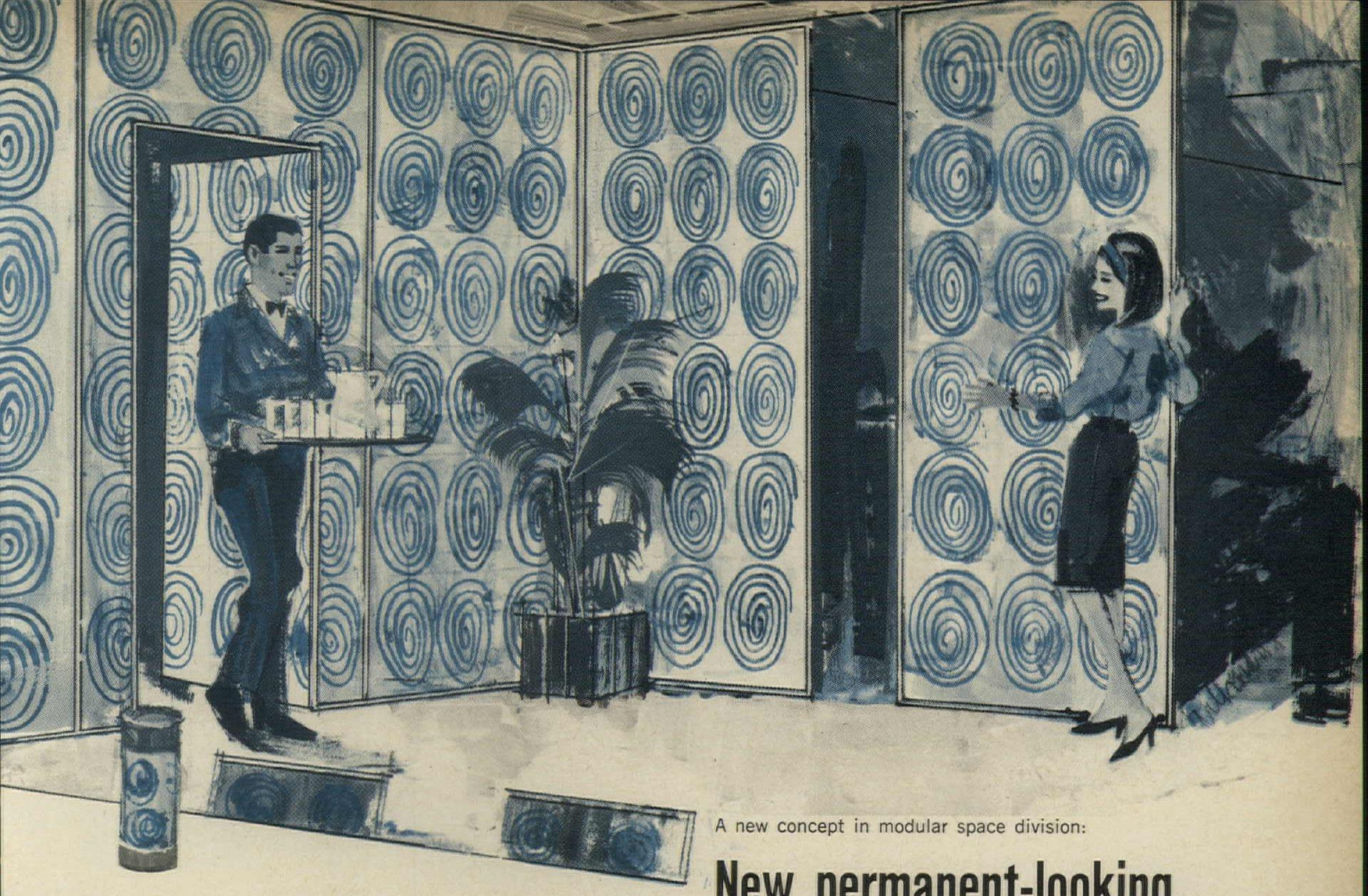

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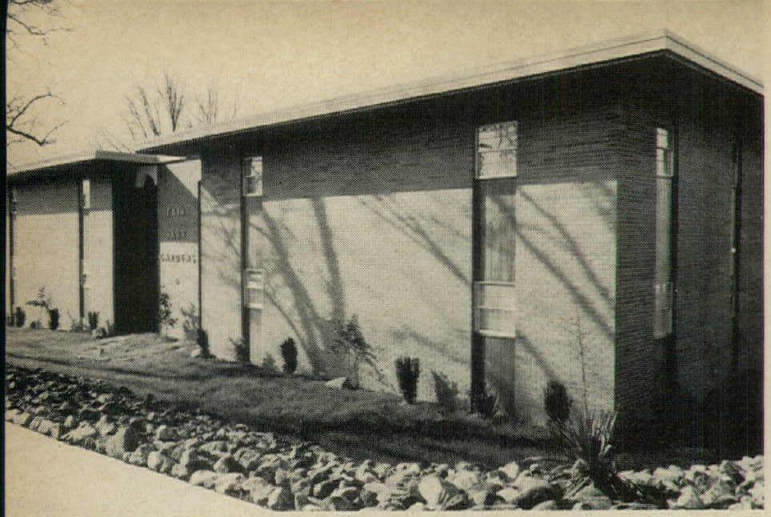

$24,500 SAVING: 35,400 sq. ft. Fair Park Gardens Apartments, Little Rock, Ark. *Architect:* Cowling and Roark, A.I.A., Little Rock, Ark. *Electrical Engineer:* George Ellefson. *Contractor:* Glenn Henry, Little Rock, Ark.

$20,000 SAVING: 19,000 sq. ft. Den-Mar Nursing Home, Rockport, Mass. *Architect:* Di Meo Associates, Stoneham, Mass. *Engineer:* Joseph Sestito & Associates, Malden, Mass. *Contractor:* Feldman Construction Co., Rockport, Ma

$10,000 SAVING: 5,200 sq. ft. Home Federal Savings and Loan Association of Cincinnati Building, Wilmington, Ohio. *Architect/Engineer:* Richard R. Grant, A.I.A., P.E., Wilmington, Ohio. *Contractor:* A. P. Eveland and Sons, Wilmington, Ohio.

$13,700 SAVING: 120,000 sq. ft. Wachovia Bank and Trust Co. Building, Raleigh, N.C. *Architect/Engineer:* A.G. Odell & Associates, Charlotte, N.C. *Contractor:* T. A. Loring Co., Goldsboro, N. C.

$10,000 SAVING: 18,500 sq. ft. Gloria Lutheran Church, Forestville, Conn. *Architect:* Jeter & Cook, Hartford, Conn. *Engineer:* James S. Minges & Associates. *Contractor:* Wadhams and May Co.

$63,000 SAVING: 675-student, 60,000 sq. ft. Hampshire High School, Romney, W.Va. *Architect:* Robert J. Bennett, Morgantown, W. Va. *Engineer:* Ballard & Mayfield, Canton, Ohio. *Contractor:* Baker & Coombs, Inc., Morgantown, W. Va.

$13,000 SAVING: 32,000 sq. ft. stamping plant of McIntosh, I Berne, Ind. *Architect:* C. E. Notzel, Detroit, Mich. *Heating E neer:* Berne Electric Co., Berne, Ind. *Contractor:* David P Construction Company, Warsaw, Ind.

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A STRONG VOICE IS RAISED FOR INTEGRATED TRANSPORTATION PLANNING

The top executive echelons of Pittsburgh's major industries recently joined forces with local political leaders and educators (see box) to sponsor the First International Conference on Urban Transportation. The encouraging result: big business gave a boost to the establishment of better urban rapid transit facilities within U.S. cities, and high-speed passenger railway systems to interconnect them. Implication to architects and planners: a judicious balance of all means of transportation may become a reality sooner than most professionals have hoped.

Business men were in the great majority at the Pittsburgh conference. Its invited audience came from all over the United States, and formed a capacity turnout of 1,300. Several speakers from abroad, including Captain Koichi Hatagawa who described Japan's high-speed railway, the "New Tokaido Line," and Roy Spence, British planner who discussed transport problems in the United Kingdom, justified the use of the word "International" in the conference title. A few architects and planners were there, but their number unfortunately did not reflect the importance of the occasion, nor did the speeches of the two architects who were included among the 47 panelists affirm the relevance of the conference issues to future urban and regional planning policy.

The purpose of the conference was two-fold. It is in the tradition of Pittsburgh leaders, known for their concerted efforts to revitalize their own city, to be among the first to back rapid transit for Pittsburgh, and to call for integrated transportation systems for all U.S. cities and regions.

Since the constant effort to develop new markets is also a local custom, the eventual prospect of larger public expenditure for rapid transit and high-speed railway systems calling for newly engineered lightweight cars as well as special track, bridges and computerized control devices, is an attractive one to a city of Pittsburgh's particular industrial configuration and campus-based research facilities. President Johnson's recent message to Congress calling for the establishment of a Cabinet-level department of Transportation had been anticipated by the conference planners and attests to the excellence of their timing.

One of the most eloquent foes of our present U. S. transportation policy, which encourages uncontrolled multiplication of automobiles and highways, giving but token support to other modes of ground transportation, was the keynote speaker, Leland Hazard, a former vice president and general counsel of the Pittsburgh Plate Glass Company, and now professor of Industrial Administration at Carnegie Institute of Technology. He spoke in his role as a member of the Board of Directors of the Port Authority of Allegheny County and chairman of its Rapid Transit Committee. After referring to the private automobile as "the 20th-century opiate of the people," Hazard went on to explain why good rapid transit, long feasible, has until now lacked public support. "From about 1900, and now for six and a half decades, America has been enamored with the automobile. Why not? It is the best instrument of aggression since the cave man's knarred club. While we Americans were getting civilized, it was probably as harmless a device—that is, the automobile—for working off aggression as any, although we have killed more people on our highways every year since 1957 than were killed in battle in the Korean

continued on page 128

The conference was sponsored by the Urban Transportation Council, Chamber of Commerce of Greater Pittsburgh.

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"Here is the challenge: do we have the wit to get rapid transit out of the ground? Do we have the engineering imagination to translate lower-weight cars into lower costs throughout the whole system; to make bridges across rivers, structures winding up hills, loops, and loops within loops, spindling compared with the massive structures we are accustomed to for railway bridges and six- to eight-lane traffic? Can we make total rapid-transit costs decline exponentially with the reduc-

continued from page 125

War. "But now we are growing up in many ways. For one thing there are more of us: in 1900, only 76 million, in 1960, 180 million, and moving fast to 200 million. In 1900 only 30 percent of us lived in urban areas; in 1960, 70 percent; by 1975, 80 percent. Aggression is a luxury our society can no longer tolerate in its urban areas. But we have been suffering from a cultural lag. There are still pavers and trafficists who think we can put our motorized camels through the eyes of our municipal needles. And to this day city planners and authorities are building more and more of those tax-exempt shrines to the automobile known as parking stations. But that era is ending."

Persuading the local electorate

Hazard hopes to hasten the end of this era through the work of the Port Authority's Rapid Transit Committee which has commissioned civil engineers Parsons, Brinckerhoff, Quade and Douglas to prepare a rapid transit study of Pittsburgh. At the time the study is completed, early in 1967, the people of Pittsburgh will be asked to vote on a bond issue of several hundred million dollars to finance a new rapid-transit system for the city, which will be paid for out of the new wealth it creates. During the interval, public resistance will be softened by Hazard's persistent arguments. He warns: "a community which does not plan for rapid transit becomes a sprawling image of ever-proliferating concrete strips, which take up more and more of the space needed to house business, institutions and other activities. For example, if everyone came to the Golden Triangle by private car, almost all of it would have to be occupied by parking garages. So there would be no point in coming. Even more startling is the cost comparison: An eight-lane freeway has a person-trip capacity of 9,000 at a capital cost of $1,600 per person. A subway or elevated, express or local, has a person-trip capacity of 50,000 at a capital cost of $440 per person. Rapid transit does five times the work at one-fourth the cost."

Labor's concern

The presence as a key conference speaker of I. W. Abel, president of the United Steelworkers of America, indicated the strong wish on the part of Pittsburgh's Chamber of Commerce for broad-based citizen support for rapid transit. Abel forcefully stated that little has been done to improve mass transit systems because of the "highway lobby" which includes automobile manufacturers, gasoline companies, tire companies, motor clubs and their allies, the highway contractors, the trucking industry, cement and asphalt companies and others. Mass transit has also suffered because state and Federal levels of government are still oriented to rural rather than urban areas. Abel believes that the major job should be done by the Federal government, but asserts that "the Federal government's expenditures for research and development show that mass transit has been given more lip service than real financial support. For the fiscal year 1966, the administration requested nearly $15.5 billion for research and development. But most of the funds—$13 billion—were earmarked for the Department of Defense, space and atomic energy."

Abel warns that a poor transit system can induce industry and people to leave an area. Workers find it expensive to drive to work and in many cases the use of private automobiles is a real hardship. Most would prefer to use rapid transit if it were available. Industry when forced to provide parking facilities for its employees must often use valuable land for this non-productive purpose. In summing up Abel said: "Labor also favors coordinated city planning to insure prompt, efficient and effective public transportation in all urban areas. Metropolitan area planning must include not only planning for sewer, water and road systems, but for mass transportation services. We must seek, through planning, the development of transportation systems which not only provide good local transportation but conform to sound patterns of economic growth. It's time to concentrate on the moving of people as such, rather than on the movement of vehicles as such. Perhaps we should insist that no highway be allowed to enter a metropolitan area unless it is coordinated with local mass transit systems. Perhaps we should insist that no highway be built unless it has a median strip for the exclusive use of bus or rapid transit vehicles. We also believe that current outlays for mass transit should be sharply increased and accelerated so we can get on with a job too long ignored. Labor believes that a mass dosage of money is needed to answer the mass transit crisis. And it is a crisis, believe me."

Governors discuss state action

Governor William Scranton told the audience that he deplores the "rapidly growing tendency to bypass state governments in favor of direct cooperation between the federal government and the municipalities," and cited with pride certain modest steps taken by Pennsylvania since his election. In 1963 the State Legislature authorized the creation of the Southeastern Pennsylvania Transportation Authority or SEPTA to develop a regional, integrated system serving the five-county Philadelphia area. In 1963 and 1964 small grants ranging in size from $50,000 to $200,000 and reaching a total of $500,000 were allocated for urban transit activities . . . "still of course, a drop in the bucket," Scranton concedes. "In 1965 the Commonwealth dropped the other shoe—a $13-million shoe—as the Legislature enacted the Pennsylvania Urban Mass Transportation Assistance Law; the first program of its kind in our history." It authorizes this state to undertake transportation research, to make grants to local public bodies for research, to allow matching grants for the portion of capital improvements which cannot reasonably be financed from revenues, to provide matching grants for local advertising and promotion to stimulate greater use of mass transportation, and lastly to make available emergency assistance.

Massachusetts' former governor Endicott Peabody described his state's program which commits $250 million in borrowed funds for a comprehensive

tion in the weight of the car?... Here we see a whole new dimension and scope for rapid transit. The old assumptions that people will have to use their automobiles anyway (Park and Ride or Kiss and Ride) or take lurching feeder buses to the collection points on the roaring rapid—these old assumptions might yield to a new concept of quiet, graceful transit which spins its gossamer threads throughout the community with the felicitous skill of a spider making its web."

Keynote speaker **LELAND HAZARD**

program in the Boston area which includes new subway lines, commuter railroad subsidies and capital outlays.

The corridor concept

"Corridors," in transportation terms, are regional arteries of movement through Megalopolis, which are rapidly becoming clogged as population densities increase. Senator Claiborne Pell, Democrat from Rhode Island, was an honored speaker at the conference as the recipient of the first Urban Transportation Award for his efforts toward unclogging the corridors. He has been described as the force behind last year's High-Speed Ground Transportation Research and Development Program, enacted by Congress to allocate a total of $90 million, which will test two new lightweight trains between Providence and Boston; will place 50 new high-speed multiple-unit cars in service on the Pennsylvania Railroad between Washington and New York by the spring of 1967; and will devote the remainder of its funds to long-range research and development effort to bring the United States into a new era of high-speed ground transportation.

"We have already reached the point," said Pell, "where we can perceive inherent limitations to the phenomenal post-war developments which have been made in the field of highway engineering, automobile ownership, safe air service and efficient and economic bus service. We are discovering that in the special context of Megalopolis, these alternative modes of transportation may reach a point of diminishing efficiency.

"A supreme example of what the future holds in store for our automotive society occurred last fall on the Sunday following Thanksgiving when so many cars choked the New Jersey Turnpike that traffic virtually ground to a halt. Some 217,783 cars tried to use the turnpike on that day, causing traffic jams 10 miles long and delays of two hours or more to get over the Delaware River Bridge. For some travellers between New York and Washington, the trip was stretched out to about the length of time it had required in the days before the turnpikes and superhighways were built.

"There is comparable, and in some respects more serious, congestion in the air above Megalopolis, particularly around the New York metropolitan area. On an average day, 2,600 flights enter or leave the major airports of the New York metropolitan area, and an additional 1,500 are served by smaller fields nearby. As all air travellers know, traffic is much denser at peak hours, when the volume is about 150 flights per hour over New York and may raise to over 400 by 1980. This density leads to prolonged stackups over the area, which regularly run to 20 or 30 minutes on busy days and can go much longer in bad weather.

"It is in view of these circumstances that the New York Port Authority for the past 10 years has been engaged in a thus far futile search for a fourth major jet port. But interestingly enough there has developed in recent years an alternate proposal that the cost of this airport might be avoided, and congestion overhead reduced, if somehow the short-haul air traffic connecting points within Megalopolis could be diverted to other modes.

"There is one further factor which tends to encourage diversion of some short-haul traffic, and that is the fact that in many places congestion on the ground uses up the time advantage gained by air travel over distances up to 300 miles. Between 1948 and 1963, there was a 38 per cent increase in average ground time required to get from city centers to airports in the 15 leading cities of Megalopolis. This increase actually offset reduced flight time, so that it actually took longer to travel by air between many points in Megalopolis in 1963 than it did 15 years before.

"Thus we have, it seems to me, the makings of some rather fundamental public policy choices regarding regional transportation systems in megalopolitan areas. Should we continue indefinite and somewhat haphazard expansion of existing air and highway facilities, or should we coordinate their expansion with some kind of efficient ground transportation?

"And here, it seems to me is where the long-unused potential of rail transportation could be brought back to full and useful service. Railroads are efficient by any measure when compared with today's highway system. As an urban transit system, operating at very close headways and moderate speeds, a rail line can carry up to 20 times as many people per hour as a single lane of highway, assuming the usual low level of automobile occupancy. In intercity service, where headway between trains is greater and train seating capacity less dense, a rail line still can do the job of five highway lanes.

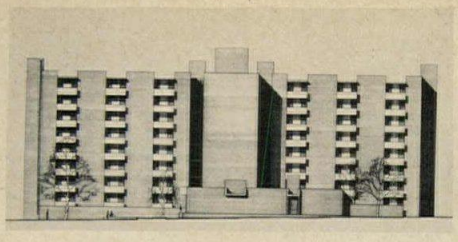
"Moreover, with modest improvements and no new advances in technology, trains can compete with aircraft within 300 mile ranges, largely because of the problem of ground congestion around airports. A recent Commerce Department study showed that the flight time from New York to Washington was 82 minutes, but that an additional 85 minutes was required for ground trips at each end of the flight.

"Present train times now allow about 3 hours and 35 minutes for the 226 mile trip, but another Commerce Department study showed that if top speeds could be increased to 125 miles per hour, the scheduled time could be cut to two hours and a half for the Washington to New York run—thus making it competitive with air travel."

Pittsburgh institution receives grant

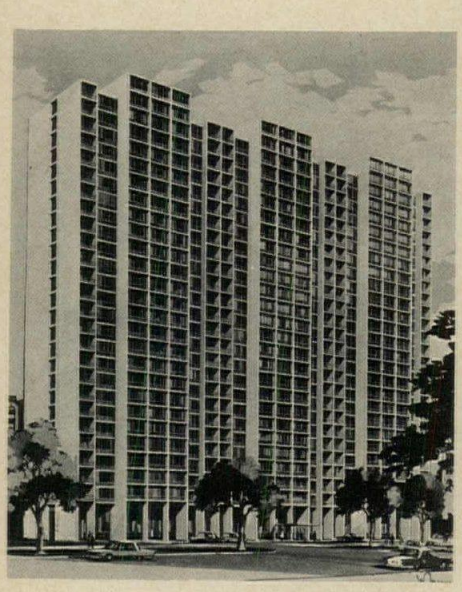
At the closing luncheon Dr. H. Guyford Stever, president, Carnegie Institute of Technology, announced the receipt of a $300,000 gift from the Richard King Mellon Foundation to be made over a three-year period to establish at Tech a Transportation Research Institute. Staff members of the new Institute will include representatives from the departments of architecture, planning and electrical engineering. It will be headed by professors from the schools of civil and mechanical engineering and will collaborate with the Graduate School of Industrial Administration.

Mildred F. Schmertz



Louisiana dormitory will accommodate 400

The new women's dormitory at Louisiana Polytechnic Institute in Ruston, Louisiana will accommodate 50 girls on each floor of the eight-story structure in a conventional suite system—four girls sharing a bath. Structure will be of reinforced concrete in a flat slab system. The underside of the slab will be sprayed with a thin layer of acoustical plaster and the resulting savings over the usual ceiling construction will be applied to the carpeting in the corridors, lounges and study areas in the rooms. Total area is 75,000 square feet and the budget is $1,450,000.



Apartment building planned for Chicago

Harbor House, a 28-story, $9-million apartment building in Chicago, will have three towers within one reinforced concrete structure. The end towers will have 100 apartments each and the central one will contain 75 units. Also provided is a commercial arcade, a 175-seat restaurant, a more than 10,000 square foot recreation deck, a year-round enclosed swimming pool and a garage for 230 cars. Architects are Hausner & Mascai and general contractor is Morris Handler Company, Inc.

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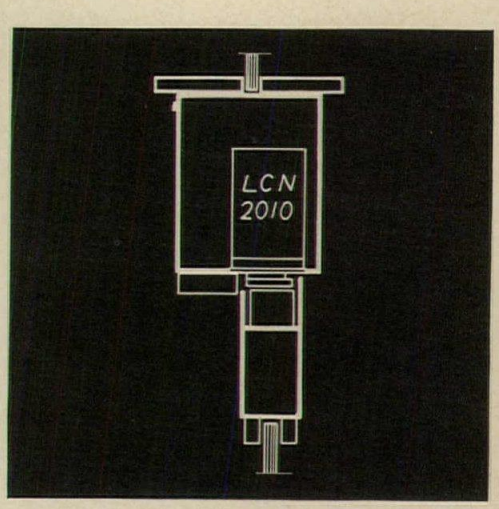
for modern door control



Detail at head for LCN overhead concealed closer shown in photograph

Main points of the LCN 2010 series closer:

1 Provides efficient, full rack-and-pinion, complete control of the door

2 Fully hydraulic, with highly stable fluid giving uniform operation over a wide range of high and low temperatures

3 Easily adjustable general speed, latch speed, back-check and spring power (may be increased 50%)

4 Closer arm disappears over door in closed position

5 Available with regular or hold-open arm (choice of 85°, 90°, 100° or 110°)

Full description on request
or see Sweet's 1966, Sec. 19e/Lc

LCN

LCN CLOSERS, PRINCETON, ILLINOIS
A Division of Schlage Lock Company

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PHOTO: National Headquarters Building, American Society for Testing and Materials, Philadelphia, Pennsylvania; Carroll, Grisdale & Van Alen, Architects, Philadelphia

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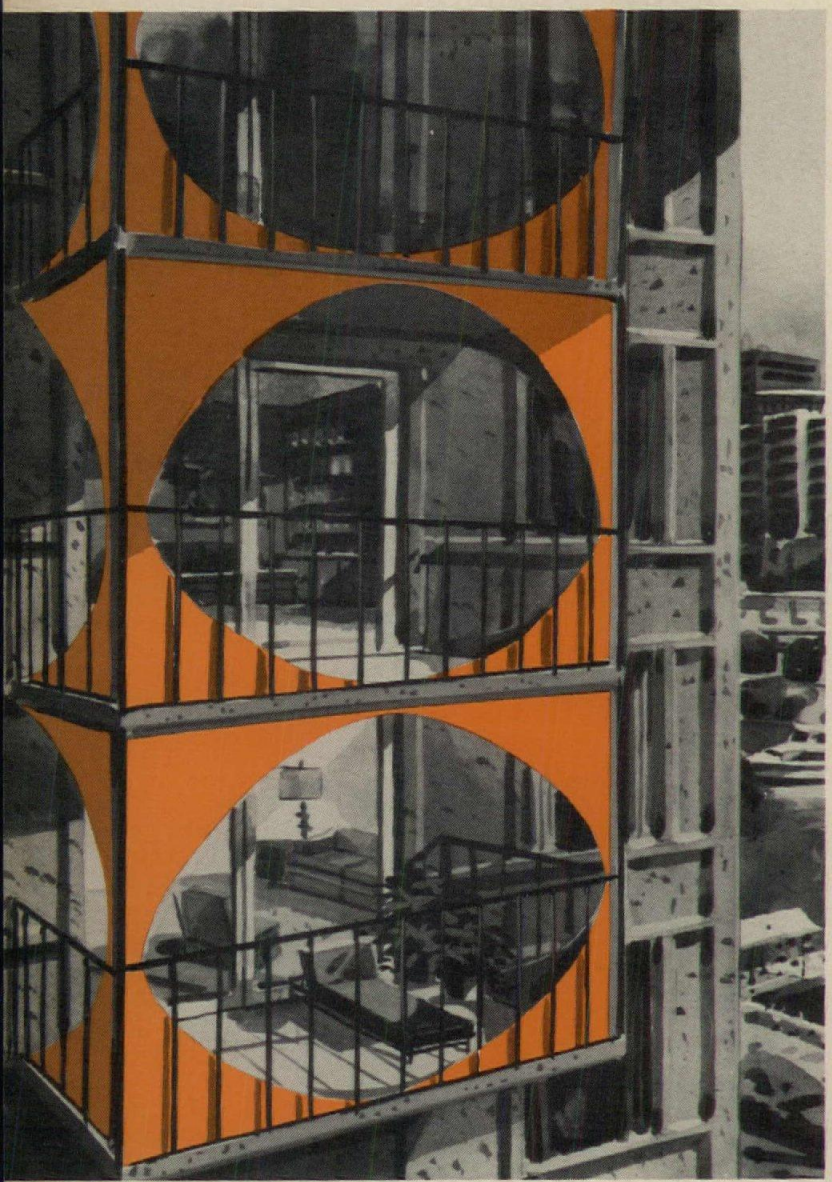
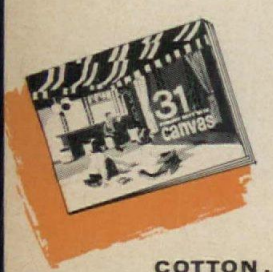


LATEST COLLECTION of imaginative new canvas designs by Ving Smith, A. I. D., includes ideas for apartment balconies, commercial buildings, poolside and patio. Free, 16-page color booklet available on request.



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No architect or engineer would *knowingly* force his client to pay the price of his "omissions."

Ask yourself this: Do we appreciate the enormous amount of money our client will be *forced* to spend on paper or cloth towels when we fail to provide the wiring for and specify electric hand dryers?

The facts: Your client will spend *nine times more* for paper or cloth towel drying than for electric drying.

Equally important, he will be *forced* to use methods of drying that are obsolete, inconvenient and (by medical documentation) dangerous to health.

When you provide the space, the wiring and specify the name and features of a *good* electric dryer, you save your client the cost, time, the trouble of "after the fact" installation—which he is usually ill equipped to do . . . and rarely does.

A little thing? Is it not this attention to "little things" that makes the difference between an architect who considers the result of his "omissions" as diligently as those of his "commissions" in answering the *total* requirements of his client.

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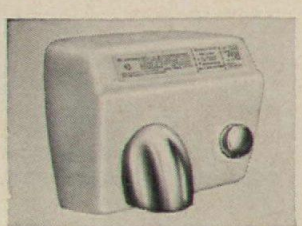

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Wood windows vs. metal windows:

here are the facts about heat loss.

A metal window frame is cold. Cold to touch. Cold to be near. It's the nature of metal, caused by what heating engineers call excessive thermal conductivity.

Are metal windows really "refrigerators?" Unfortunately, it's true.

Findings listed below show heat loss of various materials 1" thick, 12" square, with only 32 degree difference between inside and outside temperatures:

HEAT LOSS	Wood . . . 25 BTU's per hr.
	Glass . . 186 BTU's per hr.
	Steel. . . 9,984 BTU's per hr.
	Aluminum . . . 45,312 BTU's per hr.

Data derived from: ASHRAE Guide and Data Book 1965, Chapters 4 and 24. By permission.

The chart tells the whole sad story. Aluminum conducts heat over 1770 times as fast as wood.[1] Thus a wood window frame is over 1770 times as effective in preventing costly heat losses through radiation as aluminum, the most common type of metal window.

Cold metal surfaces, as they conduct heat from a room, also conduct heat from the body, causing chills. In addition, as warm air comes against a cold surface, it cools and drops rapidly to the floor. This creates a cold draft.

In fact, these metal-caused cold drafts can reach velocities of *12 feet per second*.[2] Pretty windy for a family living room, don't you think?

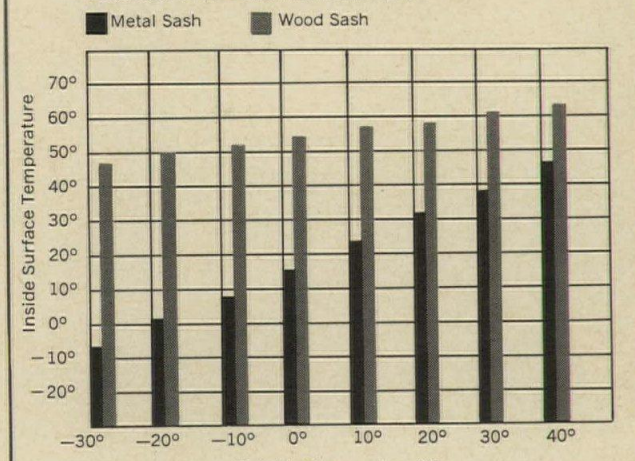
1. ASHRAE Guide and Data Book 1965, Chapters 4 and 24.
2. Electricity in Building Magazine, September, 1964.

Wood by its very nature is a superior insulator. This chart gives you the facts. Quality windows with wood sash are plainly more comfortable to live with. See for yourself.

Here are the cold hard facts about metal windows.

Inside Surface Temperature of Aluminum and Wood Sash.
Room temperature 70°. Outside wind velocity 15 mph.

Chart shows comparative inside surface temperatures as outside temperature drops. Example: when air outside is 20° wood sash is 59°—aluminum sash is 32°!



Data derived from: ASHRAE Guide and Data Book 1965, Chapters 4 and 24. By permission.

Free: For the facts on window condensation send for the exclusive Window Condensation Calculator. This unique slide rule, based on ASHRAE data, lets you determine condensation problems in your area before you build. Just mail your request on your letterhead to:

PONDEROSA PINE WOODWORK
and the Western Wood Products Assn.
Dept. AR-3, 39 South La Salle Street
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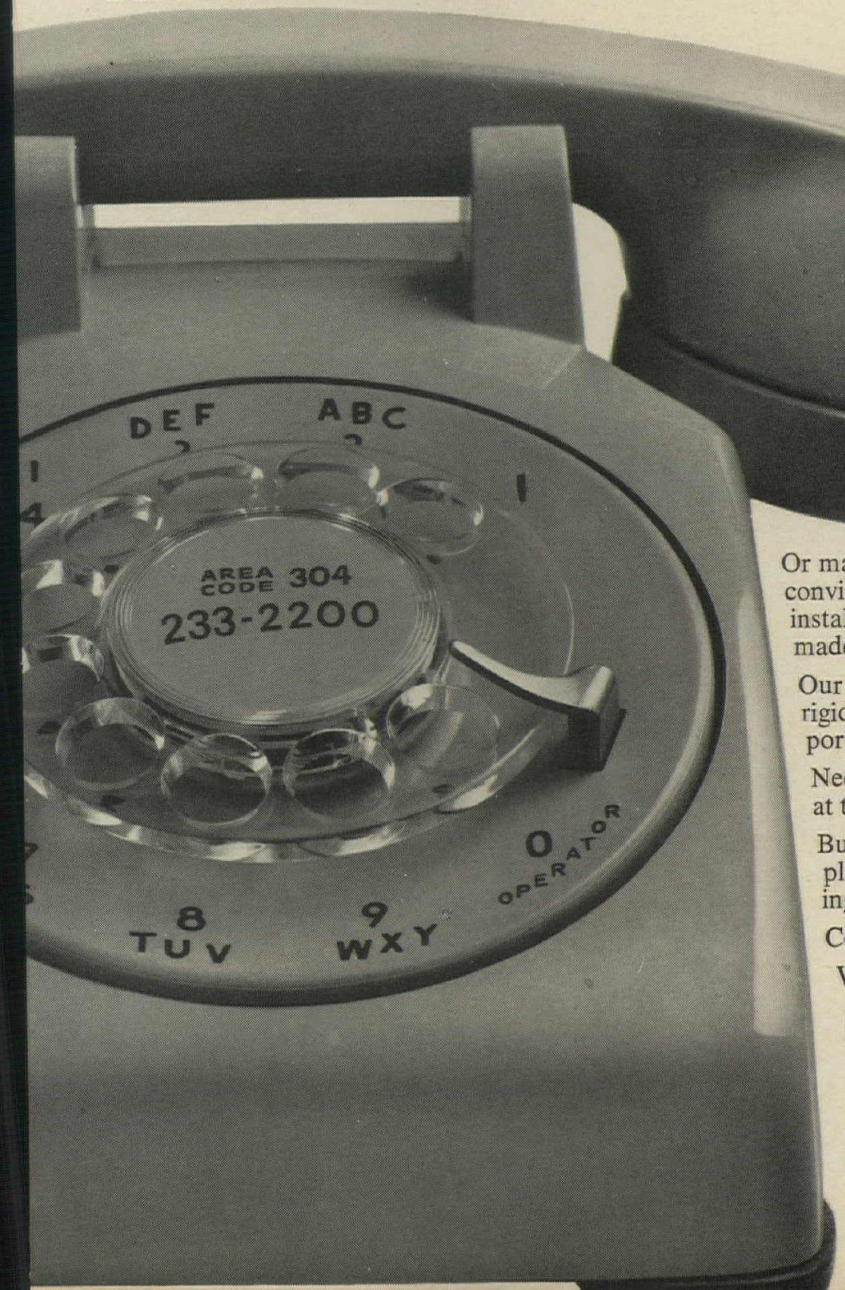
ou have to go hing about Wheeling's nap-in stud system orner bead?

This far. Call collect.



Or maybe these few simple points will be enough to convince you: our steel stud system is a snap to install. Provides strength and rigidity because it's made from Wheeling Steel.

Our Double-Ex Corner Bead is five times more rigid than others. It has stiffening ribs in the outer portion of the wings.

Need more nudging? We're ready to deliver both at the drop of a receiver.

But if you'd prefer some friendly conversation plus a couple of dozen other reasons why Wheeling products are just right for you, call us.

Collect.

What have you got to lose?

Have you looked at Wheeling lately?

Wheeling

Wheeling Corrugating Company
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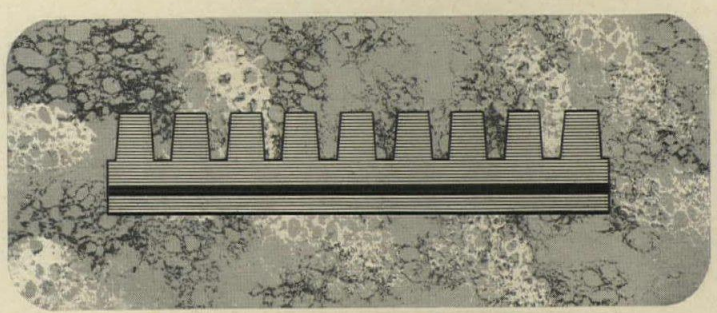
100,000 Frenchmen per day ride a SANDVIK MOVATOR in the Paris Metro. In Sydney, Australia, a 700 ft. SANDVIK rubber-covered belt — the world's longest moving walk — carries shoppers from stores to parking area. In a modern department store at Vaxjo, Sweden, people and shopping carts glide smoothly from floor to floor on a SANDVIK MOVATOR. ■ These are just a few examples of the successful design and engineering experience which the Sandvik Movator Division can apply to your requirement anywhere in the U.S.A. *now.* ■ Over the past ten years, architects and owners around the world have selected Sandvik to solve traffic flow problems via moving walks. There are two basic reasons for this continuing success: The design, manufacturing, installation and service experience of the world's leading manufacturer of moving walks featuring rubber-covered steel belts. The inherent advantages of the SANDVIK cold-rolled steel belt with grooved rubber covering, shown below. This combines non-slip safety with the rigidity to assure a smooth, safe and comfortable ride. ■ Write for SANDVIK MOVATOR booklet.



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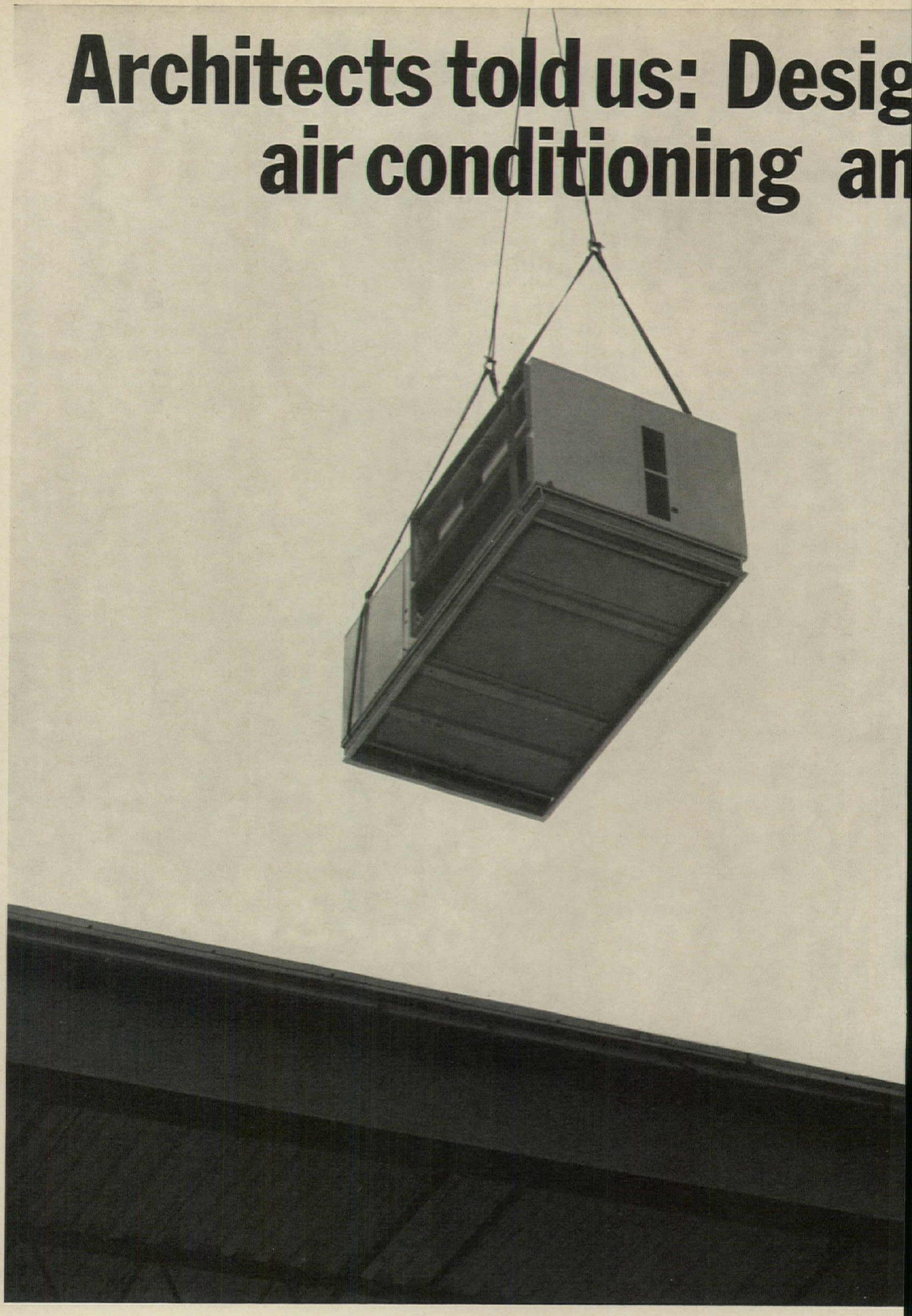
air conditioning an



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Special isolators eliminate vibration problems. Heavy insulation reduces even further the already low operating sound.

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And, there's even more: Fedders designed this electric air conditioning, gas heating unit with your requirements in mind. Cooling from 28,000 BTUs to 180,000 BTUs. Heating: from 60,000 BTUs to 275,000 BTUs.

Important Note: When specifying roof top equipment insist that the condensing section be U.L. listed for outdoor application; insist, too, that the entire air handling and heating section be AGA approved for outdoor application. Fedders Adaptopak carries both these important labels.

We'd like to send you a spec sheet that details why Fedders offers the most outstanding unit available. Don't wait. Mail coupon today!

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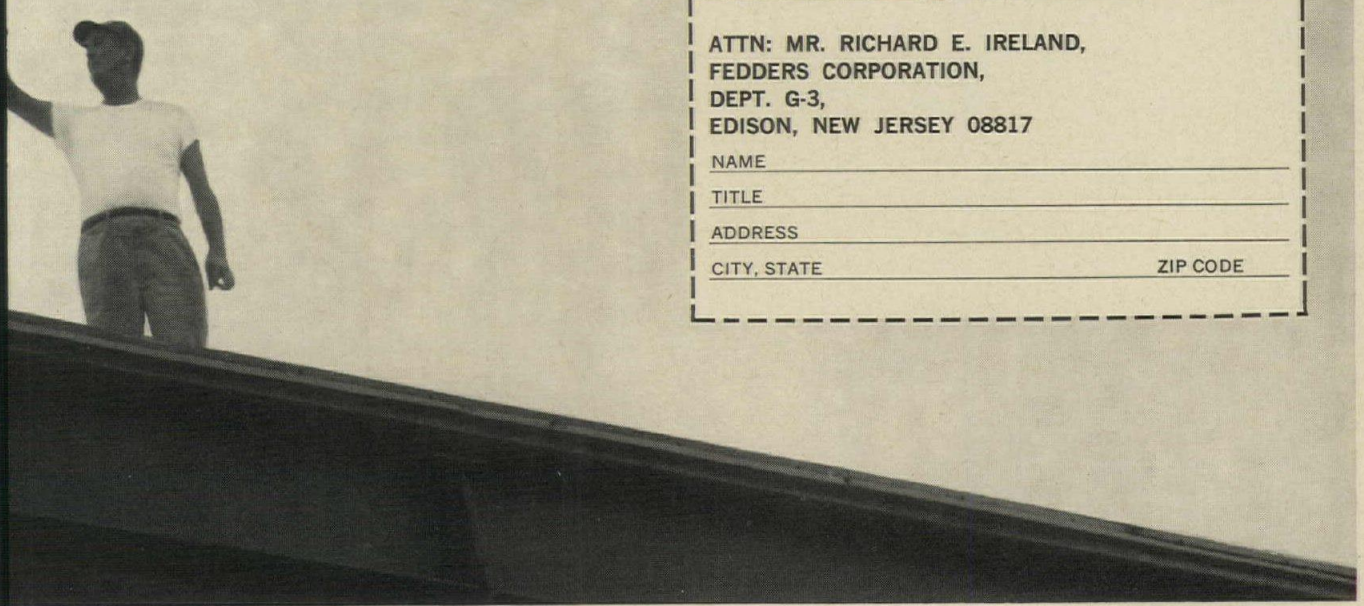

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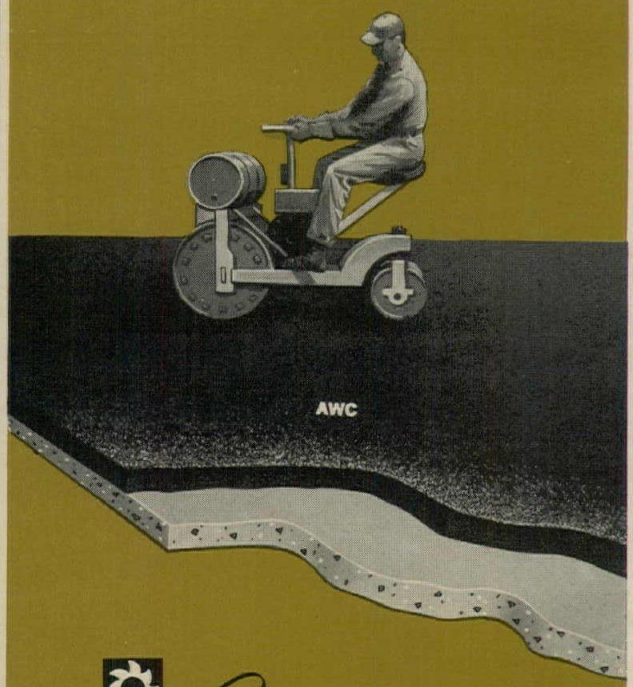

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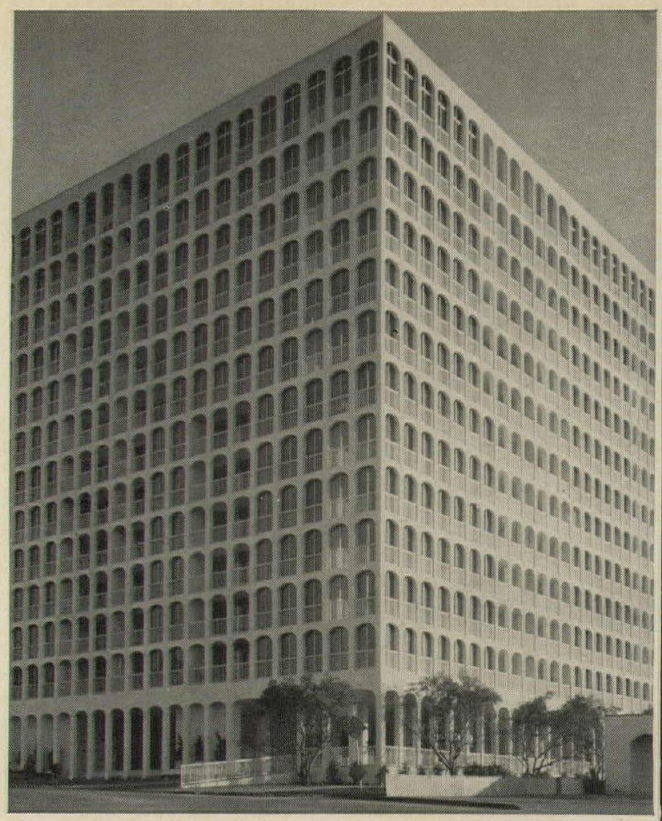

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The Post Office has developed a farsighted Vertical Improved Mail (VIM) System for fast, continuous service in high-rise buildings. At the heart of this system is the selective vertical conveyor.

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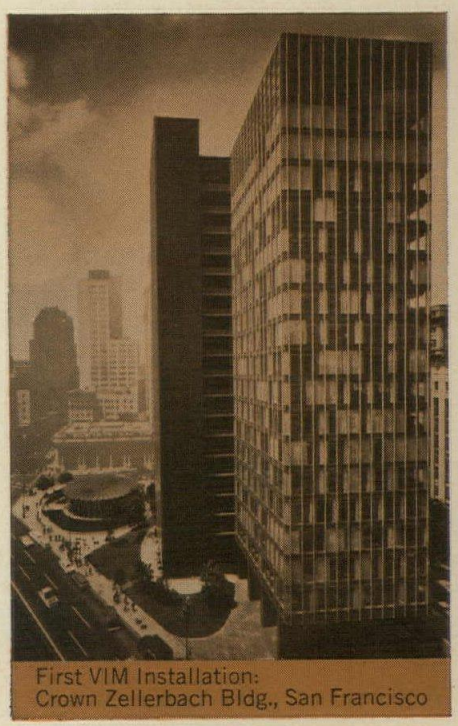
VIM offers many advantages: mail is delivered early to all floors . . . security is improved . . . congestion from bags and carts in building is relieved . . . day-long mailing permits faster processing to and through the main Post Office . . . contract messenger service is reduced. Equally important: major tenants occupying several floors can use conveyors for their own interoffice distribution of mail, supplies, EDP tapes and cards, etc.

Continuous, high-speed mail service is the lifeline of any business. In building or moving to new office space, carefully evaluate provision for VIM facilities. For additional details on selective vertical conveyor systems, consult your architect or write to: LAMSON CORPORATION, 183 Lamson Street, Syracuse, New York 13201.



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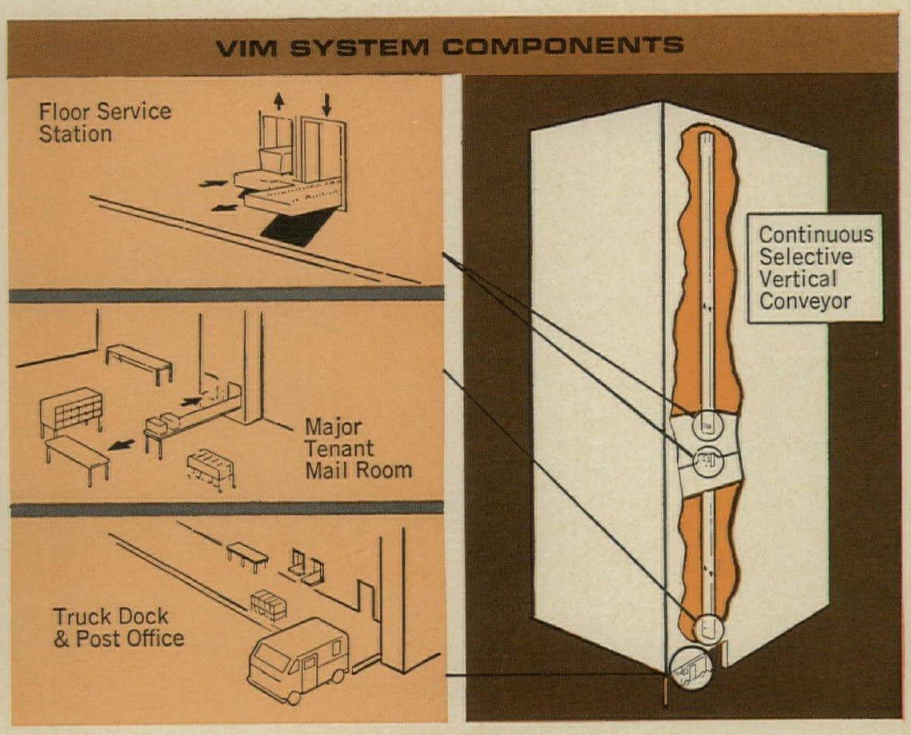

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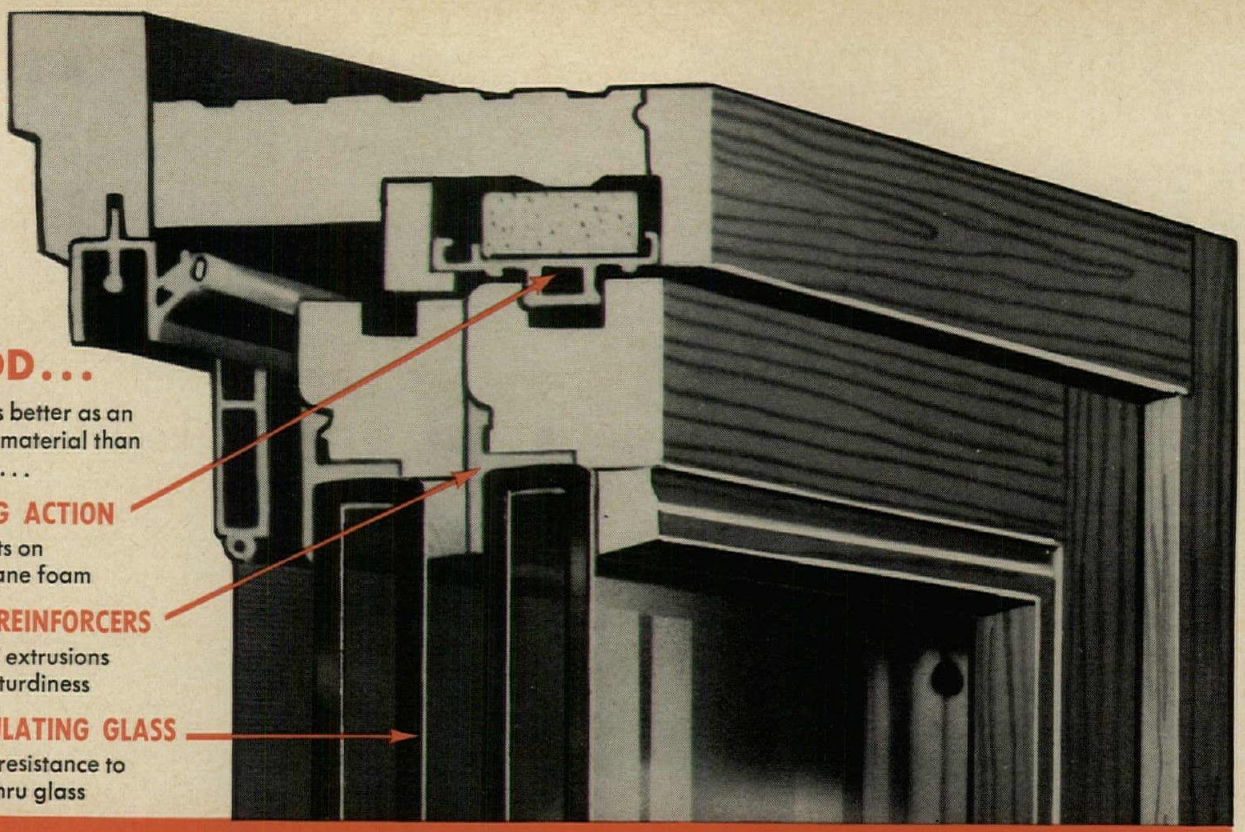

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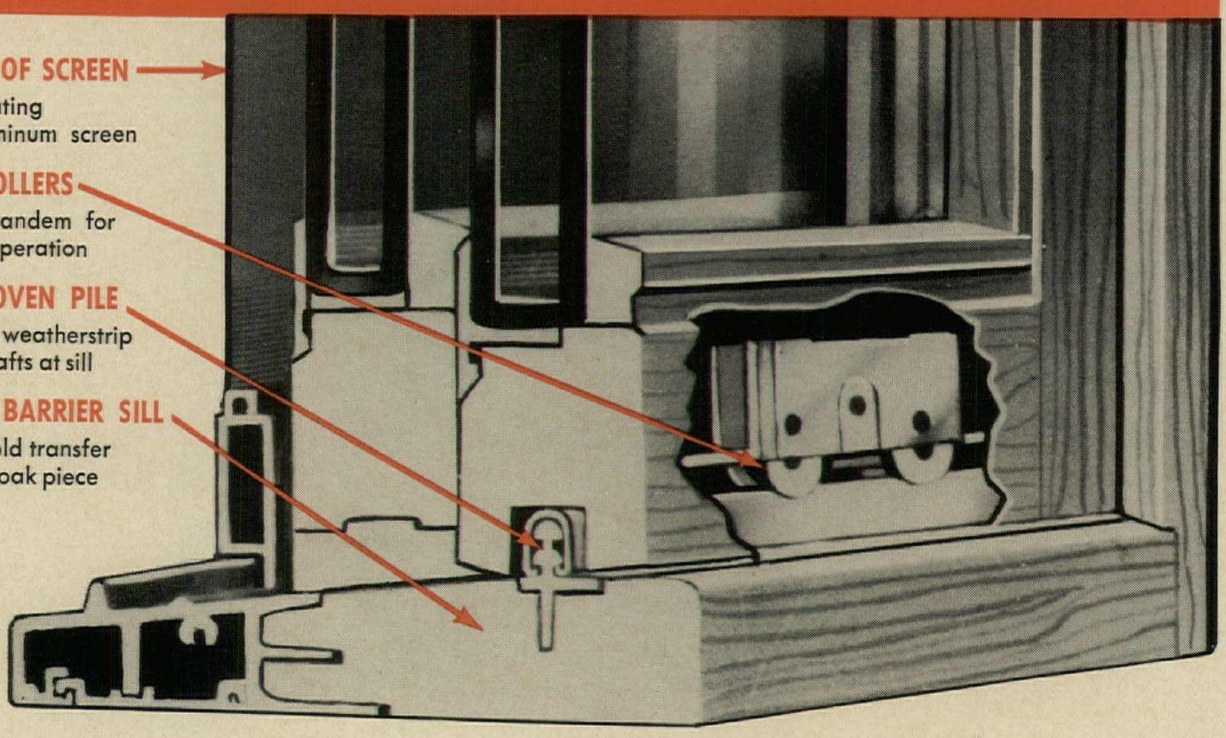

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Easy operating sturdy aluminum screen

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Rollers in tandem for effortless operation

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Woven pile weatherstrip seals out drafts at sill

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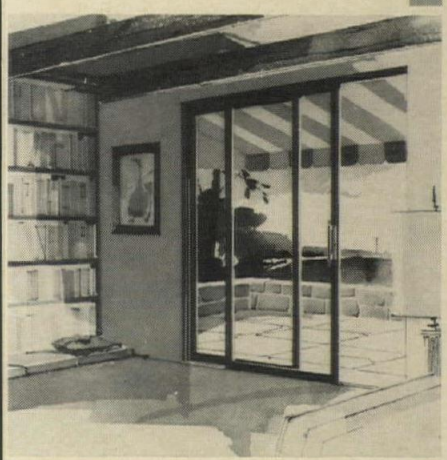
Caradco Wood Patio Doors have the solid feel of genuine quality from top to bottom and inside out . . . no flimsy, rattle-trap metal door to clatter closed to reflect unfavorably on the homes you build. This unit is immediately identified as "Grade A" all the way.

It's so obviously good that it speaks for itself; but you'll *want* to brag about it. So point out first that it's made of wood, which means better appearance, better insulating and acoustical qualities, unlimited choice in decorative treatment. Point out the floating, rigid vinyl head track and how it provides year 'round double weatherstrip contact. Explain that the hidden "T" reinforcers of heavy extruded aluminum are stronger themselves than some door units. The ⅞' 'Insulating Plate Glass . . . how it resists heat loss and inside frosting in winter . . . reduces air conditioner load in summer.



Remember to mention the jump-proof screen . . . the nylon rollers for smooth, easy operation . . . the dense pile weatherstrip that seals out sill drafts and the thermal barrier construction of the sill which stops carpet soil by not conducting cold in.

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25-story office building has 20-foot arcade at street level

A new 25-story office building on North Michigan Avenue in Chicago will contain more than 300,000 square feet of rentable area. The building will provide on-premises parking facilities and specially designed floor structure for use by firms which utilize heavy equipment. The building was designed by Skidmore, Owings & Merrill. General contractor is the Turner Construction Company.

Apartment is first structure in multi-use complex

Construction has begun on the first unit — an apartment building — in the $20-million Weybosset Hill development in Providence, Rhode Island. The apartment tower, which has an exterior of aluminum and concrete, will contain 192 units. The complex will also contain several smaller apartment buildings, a townhouse area of 80 homes, two office buildings, a 250-unit motor hotel and a service station. The community is being designed by Curtis and Davis, architects. Site planning was by I. M. Pei and Associates, and owners and builders are Reynolds Metals Development Corporation and Gilbane Building Company.

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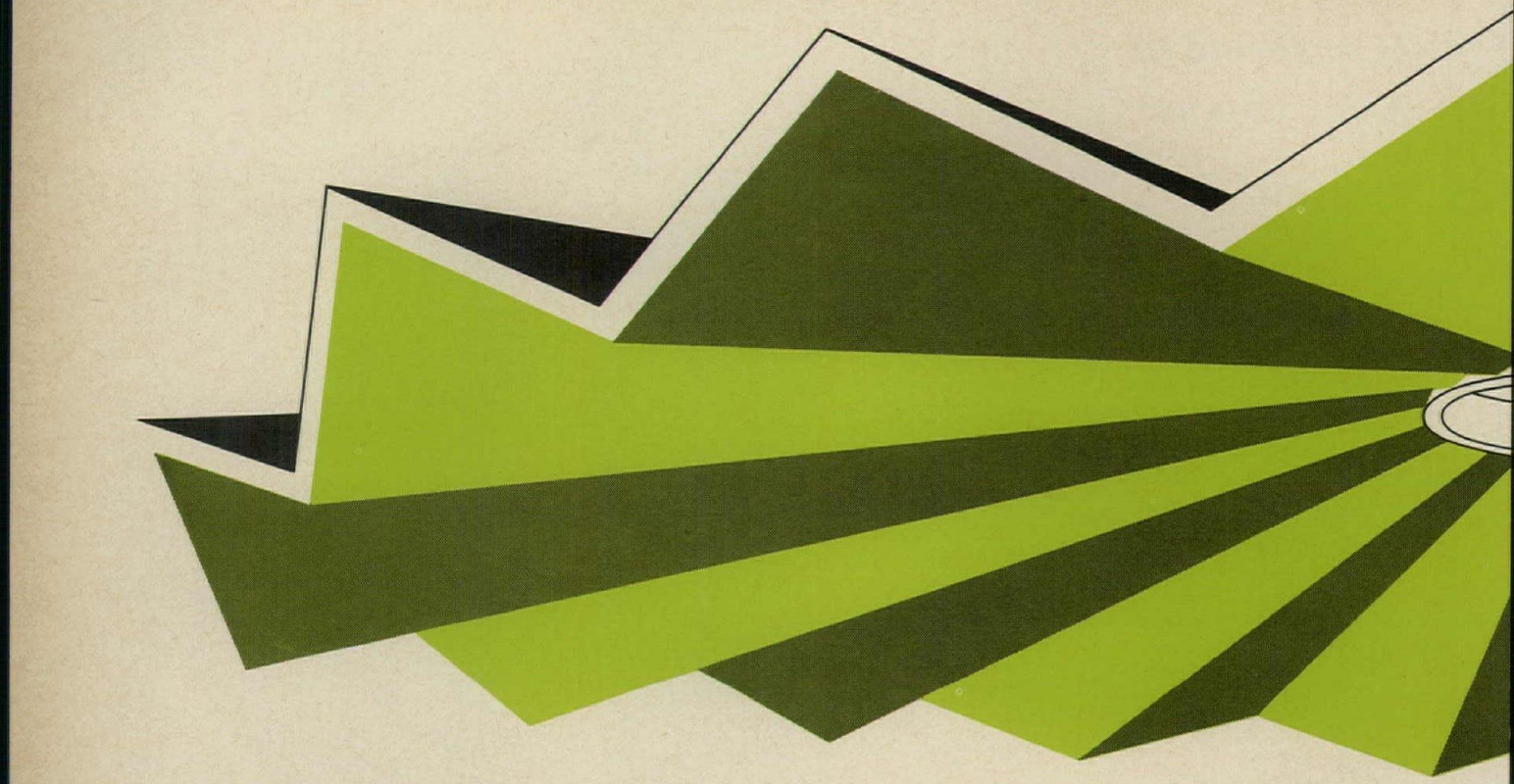
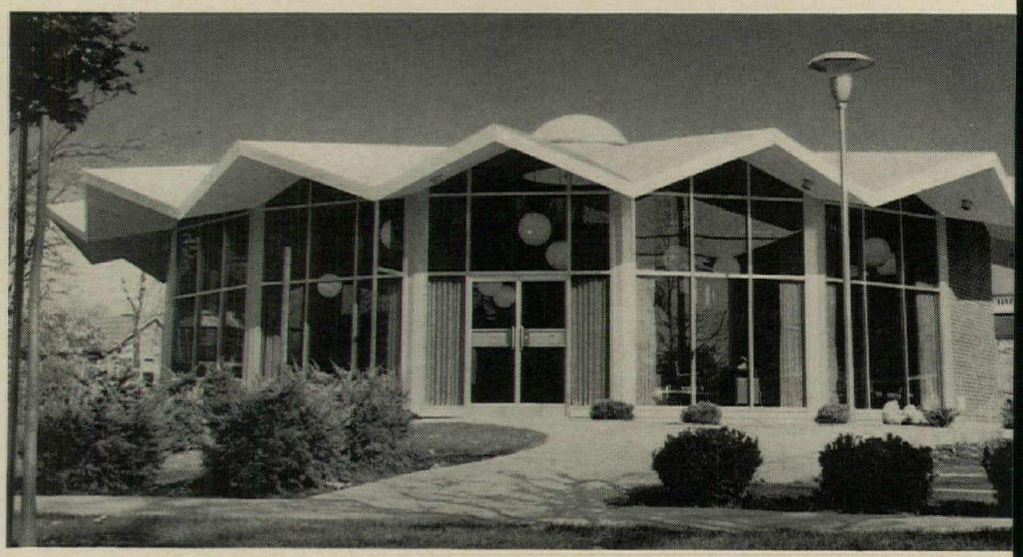
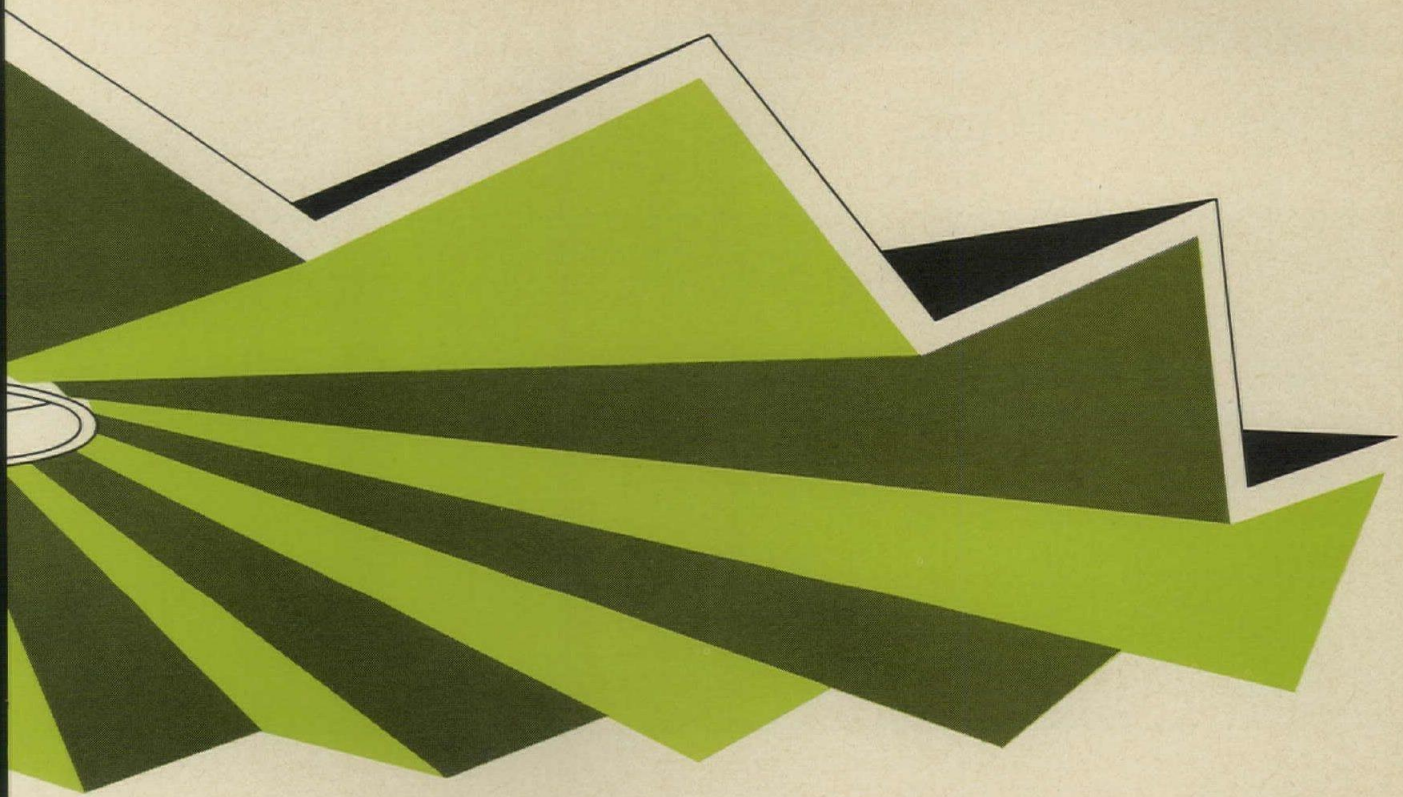


the most exciting ideas take shape in plywood





Whirlpool Employees Credit Union Building, St. Joseph, Mich./Edward R. Duffield, Architect/Holland Construction Co., Contractor/Plywood Components Corp., Fabricator

The jaunty cap on this glass-walled office building is a plywood radial folded plate. Its use here proves the versatility of the design idea, more often seen in the august context of churches and public buildings. This plywood roof cost less than any alternative and went up faster. Besides saving money, radial folded plates give large clear-span interiors because no center supports are needed. For more about this and other time-saving, high-strength plywood building systems, send for the new, free booklet "Plywood Construction Systems." We're at Tacoma, Wash. 98401 (USA only).

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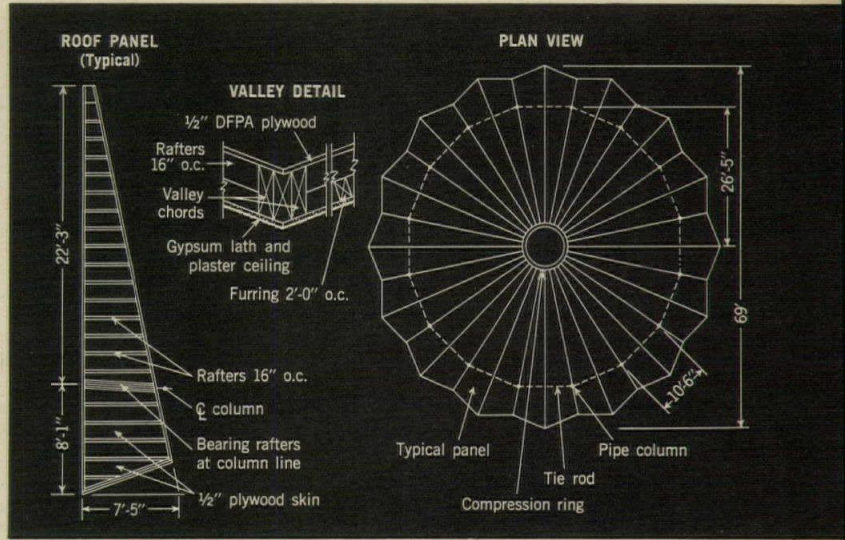

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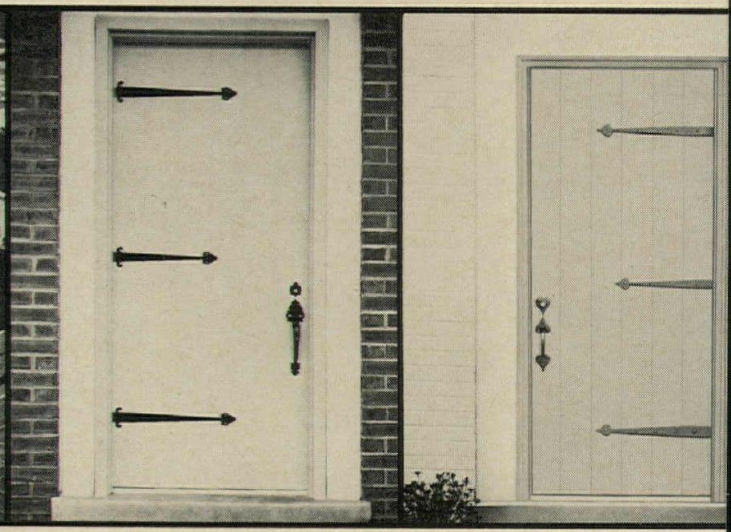

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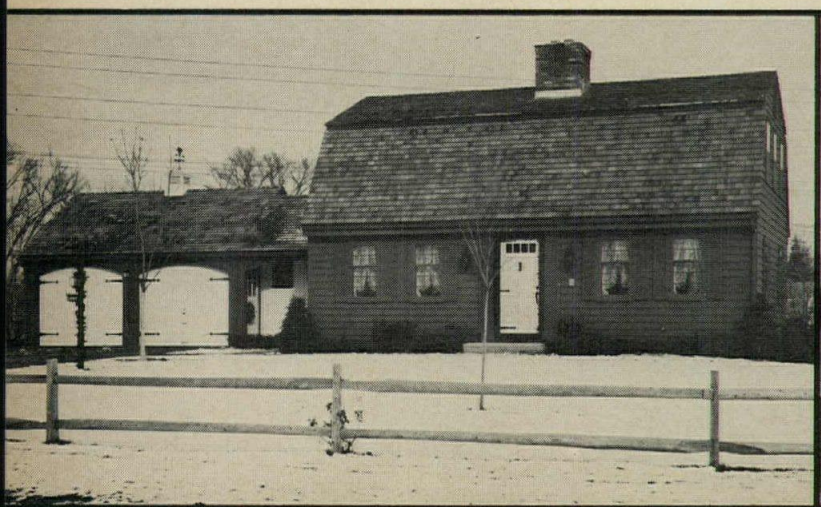

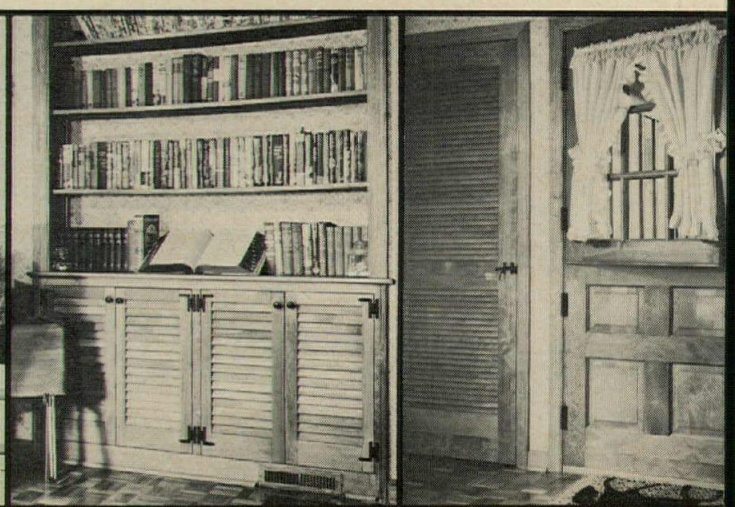

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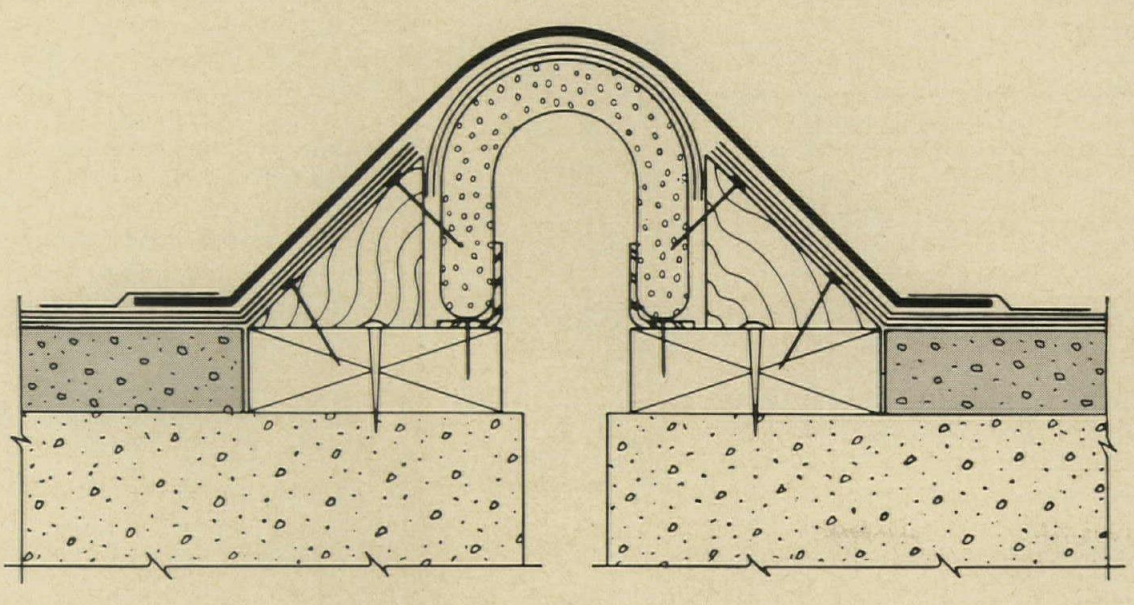

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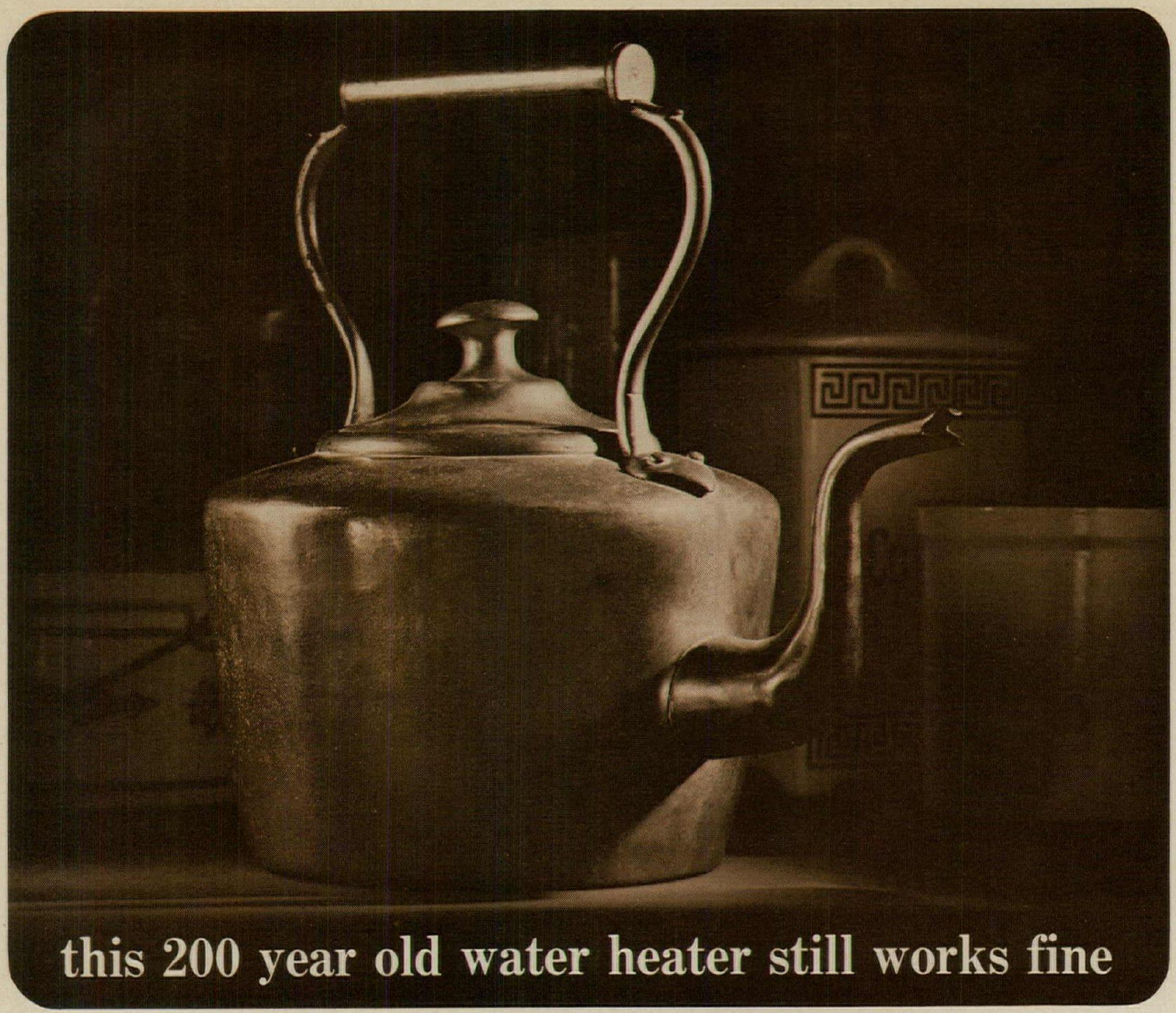

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ARCHITECTURAL RECORD
APRIL 1966

SHOPPING CENTERS AND STORES

are evolving into new forms, architecturally more sophisticated and structurally more ambitious, relating themselves more consciously and more conscientiously to the communities and regions they serve. Three primary forces are impelling this evolution: (1) the simple multiplication of automobiles—no newcomer as a problem, but hopefully graduating to solutions rather than anguished protest; (2) the explosive multiplication of people who tend to congregate in ever-more-costly metropolitan regions; (3) the high costs of land and construction, which are causing investors in shopping centers as well as their prospective tenants to research with a hard eye the garish failures of the past—and to acknowledge the power of order, amenities and quality for which architects have been pleading all along.

The new forms have come a long way from the street of stores, to the asphalt-encompassed sprawl of the open mall, to the roofed-in closed rectangle of the early air-conditioned mall, to the culmination of the horizontal concept of the single building on the fringes of open country serving both city and surrounding regions. Such a peak of development is North-Park, shown on following pages. And the next phase of evolution, on high-cost, densely populated land, will almost surely be the vertical center with layered parking. Both Lathrop Douglass and Lawrence Israel have something to say about this trend in articles incorporated in this study, and Macy's Rego Park branch is shown as one example of what can be done.

But the process of evolution involves more than the imposition of new disciplines by a changing world. Internal, and perhaps fundamental to the process, is deeper understanding of the target human, the shopper. Over-simplified assumptions, based on the success of the point-of-sale display, catered to a mindless bundle of uncommitted funds who was fair game for the most insistent, the most garish, the most obtrusive shoving forth of massed goods. Today's shopper, however, is acknowledged to have wants and needs firmly in mind before she ventures forth—and she has the mobility to go where they can best be satisfied. Further, overriding conscious practicality is the non-verbalized motivation of all creatures to avoid stress, to respond positively to convenience, comfort and beauty—and negatively to danger, tension and ugliness.

So the designs of architects and the machinations of merchants must be more subtle than obsession with store fronts, visibility and prime traffic locations. The shopping mall is not a street of stores. It is a starting place for errands and adventures, a stopping place for meetings and for relaxation. It must have the character of such a place; and it is encouraging to note that, as their architecture has evolved, some do.

BUILDING TYPES
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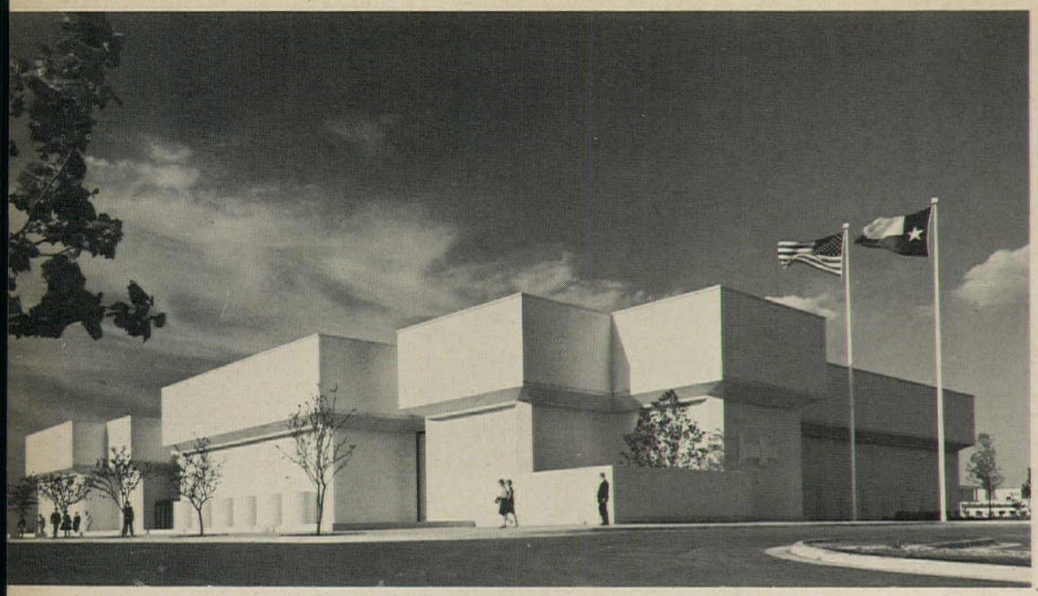
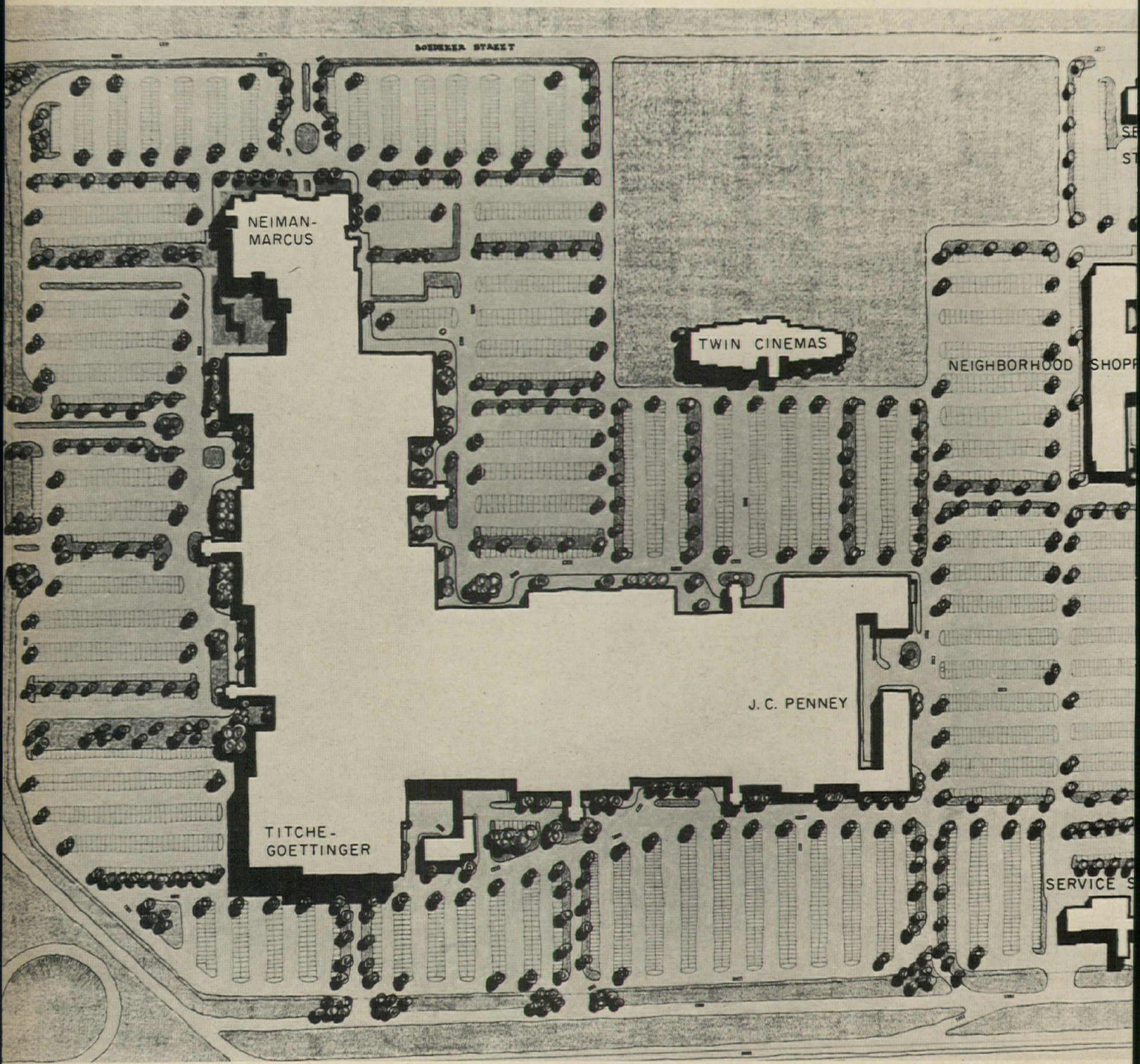
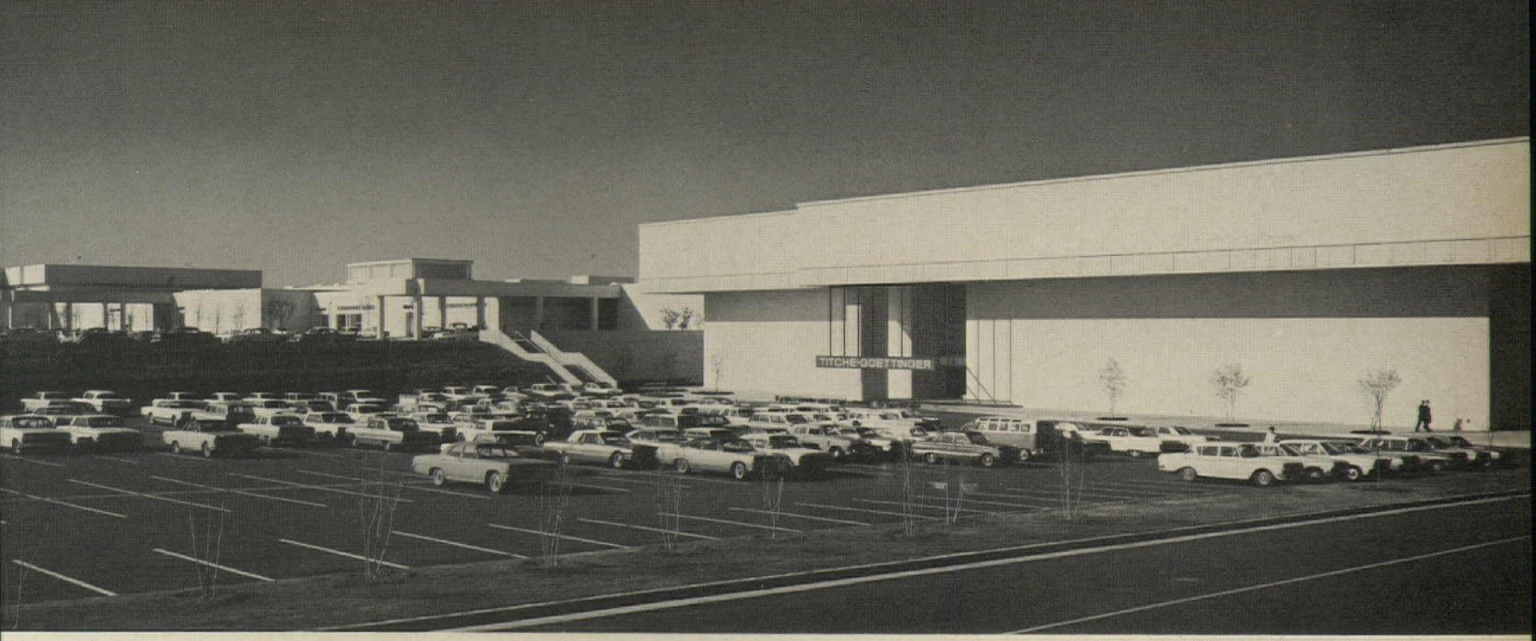


White brick (about five million of them) and cast-stone coping (about five miles of it) make up the basic fabric of the world's largest (1,300,000 square feet) air-conditioned mall at NorthPark. Three major department stores establish the "L" shape of the structure. Neiman-Marcus, left, while somewhat richer in detail with its rounded light boxes and reflecting pools, participates nevertheless in the over-all theme without ostentation or dissonance. Setbacks express the rental units within and break the huge wings (the shortest leg of the mall is 1,260 feet) into visual modules of human scale. They also provide indentations for the unobtrusive loading and unloading of trucks at key service points. Separate buildings are: a cinema, two service stations, a food store and banking building at the plot's north end.





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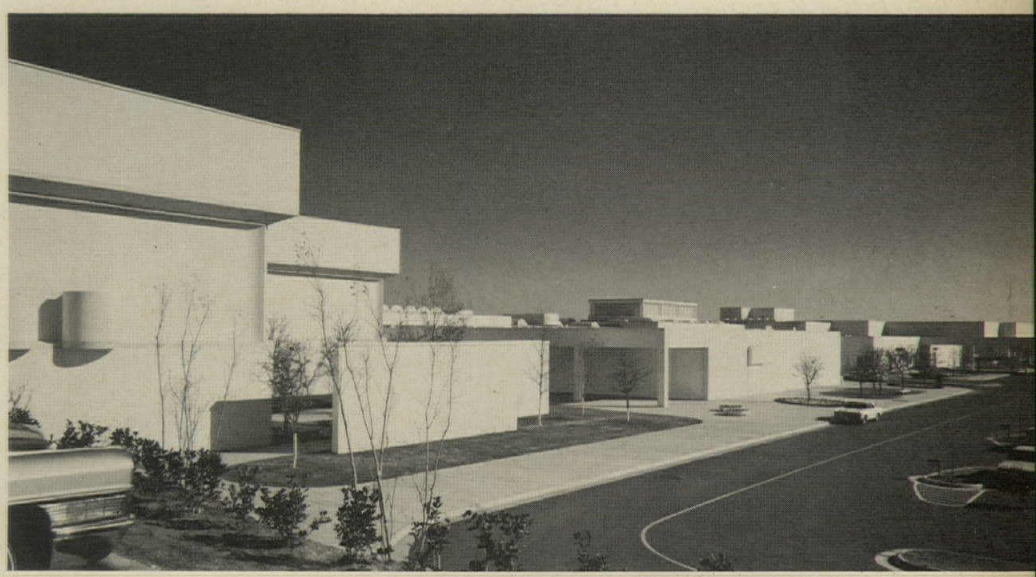
NORTHPARK REGIONAL SHOPPING CENTER encloses in its three-level "L" over 25 acres of a 94-acre site five miles north of downtown Dallas. "In NorthPark," says E. G. Hamilton of Harrell & Hamilton, partner in charge of the over-all project, "we have attempted to answer the problems of diverse, assertive occupancy and gigantic scale by recognizing that we are dealing with one building. Our solution has attempted to create a sense of unity by the use of a single, simple palette of material (white brick, cast stone and concrete), and to manage the scale by variations in the form—establishing visual areas to which one can respond pleasantly at any point." The parking lot, too, is humanized by breaking it into room-like enclaves with trees and plantings, by the elimination of signs, and by simplification of lighting using only 24 poles 60 feet high. Grade changes also help break down the expanse of 6,000 parking spaces laid out so that none is more than 350 feet from a mall entrance.

This unity of concept and execution prevails in spite of the fact that the project has doubled in floor area since preliminary design and was developed through three separate architectural commissions: one for Neiman-Marcus (Eero Saarinen & Associates), one for Titche-Goettinger and one for the over-all project (both of the latter by Harrell & Hamilton). Unity was made possible, in fact almost inevitable, by a

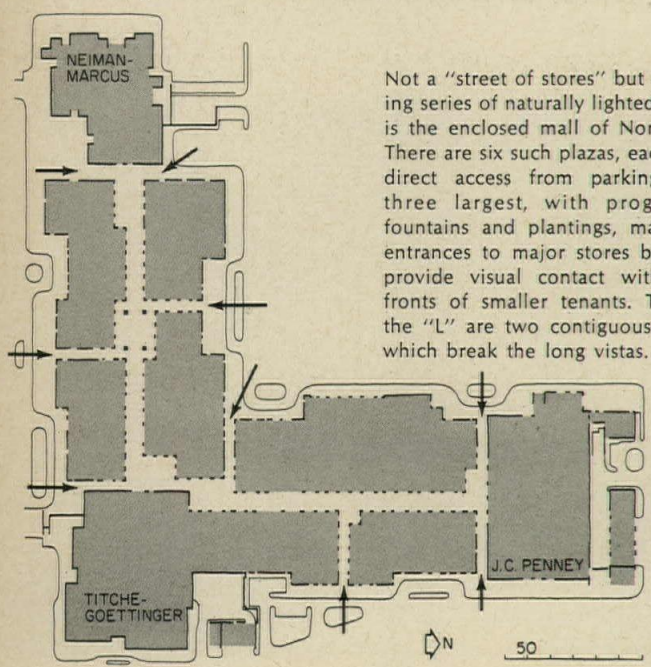


Six entrances to the public mall from the parking areas are marked by long, drive-under canopies, above, formed in precast concrete. The traffic patterns surrounding the building provide free circulation both near the building and peripheral to the parking area so that cars can move easily to the area nearest a desired entrance but cannot criss-cross at high speed over the parking lot even when it is relatively empty of cars. Grading of the sloping site puts parking on three levels, the highest at the west end of Neiman-Marcus and the lowest turning the corner around the three-story facade of Titche-Goettinger. A one-story separate annex near the north corner of T-G is for auto accessories. Another auto store is in the shorter arm embracing Penney's forecourt.

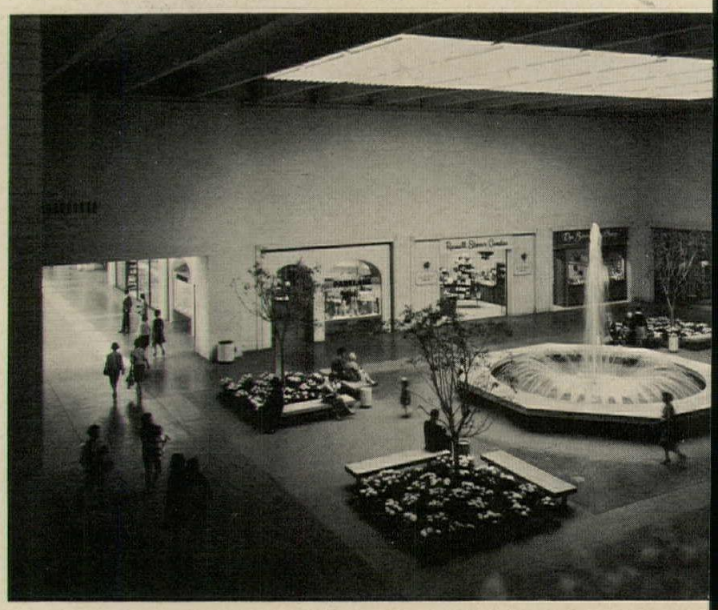
fortunate combination of owners, architects, tenants and consultants who recognized from the beginning that this center had to be the logical and disciplined culmination of shopping center evolution from the chaos of unbridled competition to the superior drawing power of order and delight. Owner-developer Raymond D. Nasher of Dallas determined at its inception that this center should be a single, unified, community-oriented first step in a prospective development to eventually include office and medical buildings, apartments and recreation facilities. Some 20 acres of the site are grassed and set aside for that purpose.

Exterior materials are carried inside the entries, courts and malls creating a sense of continuity for all public areas. Tenant openings on the mall are strongly defined, permitting individual expression without overpowering the continuity.

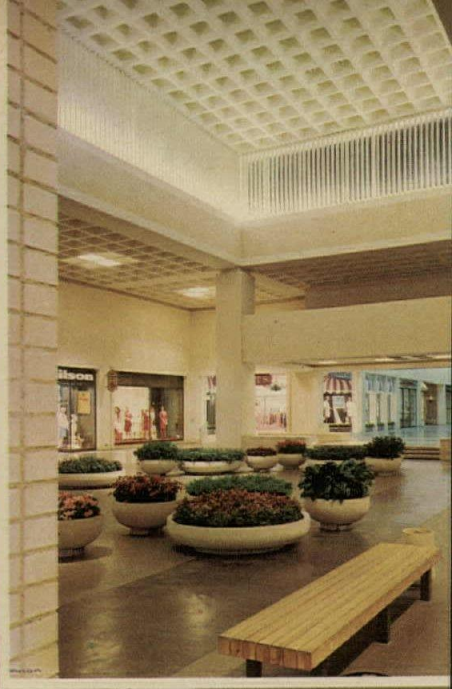
NORTHPARK CENTER, Dallas, Texas. Owner-developer: *Raymond D. Nasher.* Architects for the center and for Titche-Goettinger: *Harrell & Hamilton;* architects for Neiman-Marcus: *Eero Saarinen & Associates:* landscape architects: *Lawrence Halprin & Associates;* civil engineers: *Raymond L. Goodson;* structural engineers: *Mullen & Powell;* mechanical and electrical engineers: *William K. Hall;* planning consultant: *Marvin Springer & Associates;* graphics consultant: *Herb Rosenthal;* general contractor: *Henry C. Beck.*



Not a "street of stores" but a flowing series of naturally lighted plazas is the enclosed mall of NorthPark. There are six such plazas, each with direct access from parking. The three largest, with programed fountains and plantings, mark the entrances to major stores but also provide visual contact with mall fronts of smaller tenants. Turning the "L" are two contiguous plazas which break the long vistas.

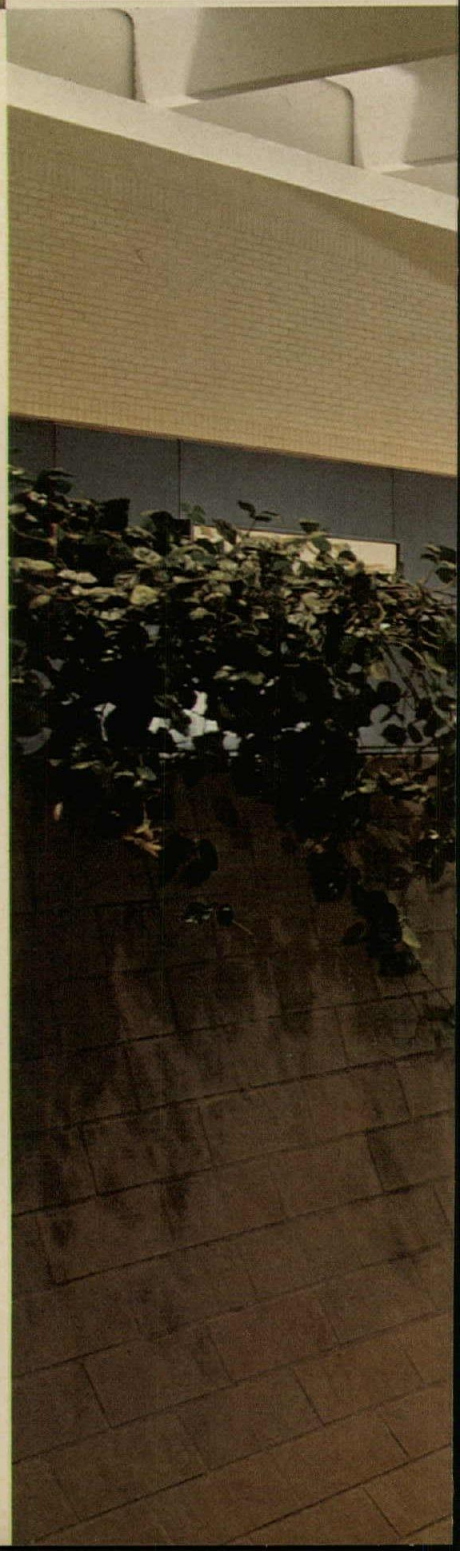


Looking north from the main plaza in front of the T-G store, above, a secondary plaza and the approaches to J. C. Penney are given human scale by a fountain and banyan trees against the lowered opening through the wall. The expanse of the 40-foot-high ceiling is relieved by texture of exposed, precast members, painted white, and by huge skylights which admit daylight and house part of the night lighting system. Looking west from this same plaza, left, the prospect is similarly humanized. Looking north again from the secondary plaza, right, one sees the techniques of plantings and gentle changes of level of the mall. Entrance from west parking is at the right of the Shoe Box store. Entrances and arches are marked by air-conditioning grilles served by self-contained units, totaling 400 tons.



View toward the west from the mid-plaza of the west wing, above, shows a change of pace in the pan-joist ceiling and modified height accomplished by typical three-step rise in floor level. Corridor to an entrance from west parking begins immediately right of the Card Corner. Approaches to the Neiman-Marcus plaza can be seen in the distance at center, above. Handling of skylight and plantings is detailed above right. The Neiman-Marcus plaza itself, right, with its pyramidal cascading fountain, a shape echoed in planters and tiled pedestals, has an air of spaciousness, albeit somewhat complex under foot in this view; and the entrance of this major store seems to be rather conservative in relationship to the strength of its approaches.

There are about 100 store fronts on the mall with plate glass windows framed in bronze anodized aluminum, firmly isolated one from another by white brick pillars and columns. Thus each can establish its own merchandising motif within the graphic disciplines laid down for the center without conflict with its neighbor. Pavement of the mall is quarry tile and colored concrete.



NEIMAN-MARCUS

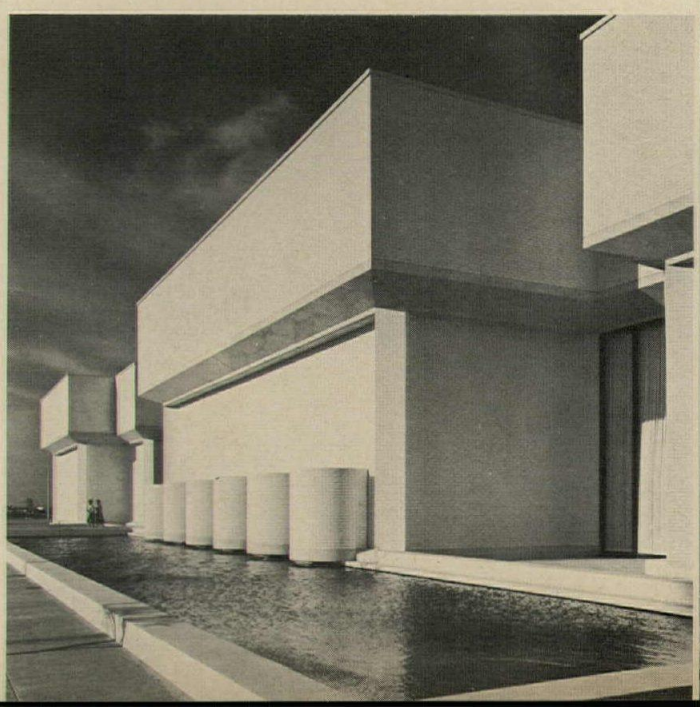
THE NEIMAN-MARCUS STORE WITH ITS DISTINCTIVE DETAILING

DETAILING terminates the west wing of the "L"-shaped NorthPark mall and dominates the highest level of the site. In his handling of exteriors, architect Kevin Roche has worked well within the vocabulary which he and the other architects developed for NorthPark, but with an enrichment in the flared corners of perimeter recesses, the massive parapet (anticipating an additional floor), major exterior entrances from grade at both floors and other embellishments consistent with the prestigious character of this store. Reflecting pools flanking the main entrance on the west side of the upper level are overhung by rounded projections which are skylighted shields admitting daylight through the windows of fitting rooms. Similar forms overhang a stairway on the south side which descends to a garden court (opposite).

Architectural interiors are carefully related to the plans of interior designer Eleanor Le Maire, who worked closely with the architects in preliminary phases of design. Departments and boutiques are reflected in sculptural ceiling recesses and lighting alcoves, while five different floor finishes and carpeting articulate divisions of traffic and function.

NEIMAN-MARCUS NORTHPARK, Dallas. Architects: *Eero Saarinen and Associates;* interior designers: *Eleanor Le Maire Associates;* structural engineers: *Mullen & Powell;* mechanical engineers: *William K. Hall Co.* and *J. Guerrero;* landscape architects: *Lawrence Halprin & Associates;* general contractor: *Henry C. Beck.*

Neiman-Marcus NorthPark is a two-story building with major grade-level entrances serving each floor. Total area: 140,000 square feet. The upper level is a women's world of accessories, jewelry, gifts and apparel. The mall level has men's shops, luggage, cameras, children's wear, food shop and snack bar. All stock areas, fitting rooms, offices, rest rooms and service areas are placed at the periphery of the building, leaving the central area for display and traffic. The sculptural quality of the exterior is recalled inside with dome-like acoustical-plaster ceiling recesses of varied size forming the major organizational element of the display spaces. There are no interrupting dividing walls. Columns faced in the same white brick as the exterior surround these domed areas and emphasize unity.



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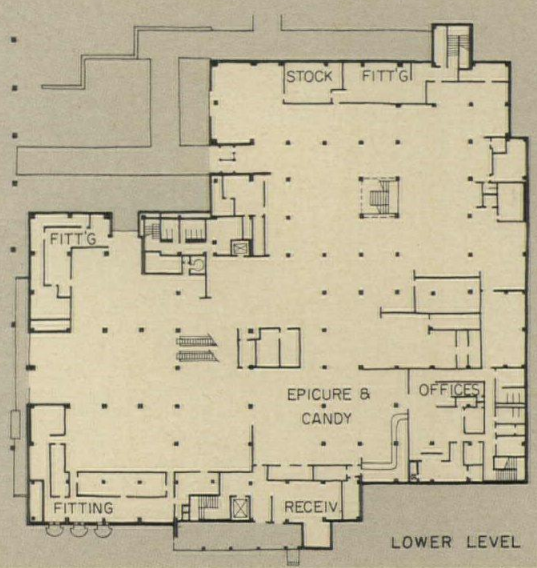
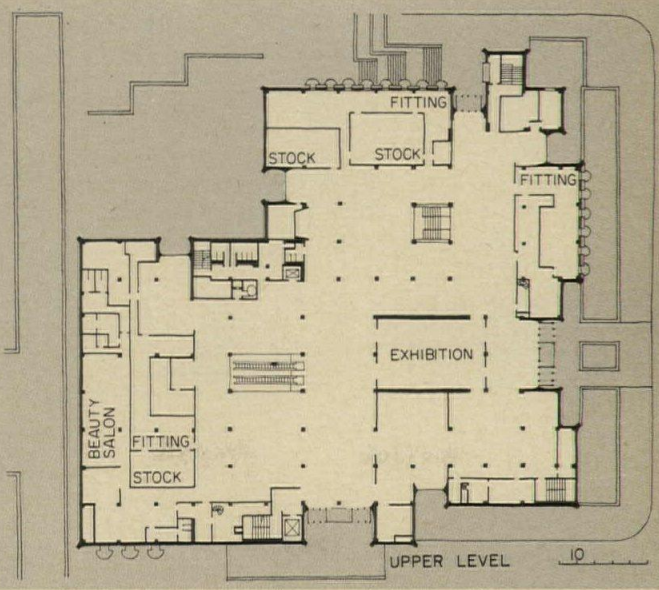


LOWER LEVEL



UPPER LEVEL

Eleanor Le Maire's interior design makes a lively and youthful use of color and texture with each department marked by contras without conflict. A central feature of the upper level is an exhibition hall, bottom left, currently showing "fun sculpture" by William Accorsi and a stretched-fabric sculpture by Charles Forberg similar to one he exhibited at the Milan 1964 Triennale.

ELEMENTS OF SHOPPING-CENTER DESIGN:

CHECK LIST AND COMMENTARY

By Lathrop Douglass

Today's shopping complex is like a vast jigsaw puzzle involving economics, traffic, planning, merchandising, financing, promotion, leasing and many other facets—in addition to architecture and engineering. Its success depends on fitting together all these parts in proper relationship to each other.

As shown by extensive studies of shopping habits, today's customer shops in many centers, not just one. A shopper may drive 30 or 40 miles to a center of her choice. Therefore, the architect must weigh every aspect of the project in the light of this competitive situation.

Of all the criteria over which the architect has control, convenience is of highest importance. And the keys to convenience are access and circulation. Over many years I have found that certain problems—most of which influence convenience—seem to recur with some frequency in shopping-center development. Here are some of the problems which in my opinion are of particular consequence.

The multiple-level center is a compromise with urbanization

High land prices, especially in central urban redevelopment projects, are forcing the use of multiple-deck parking and multiple-level malls. This makes a project more compact and, by shortening walking distances, increases customer convenience.

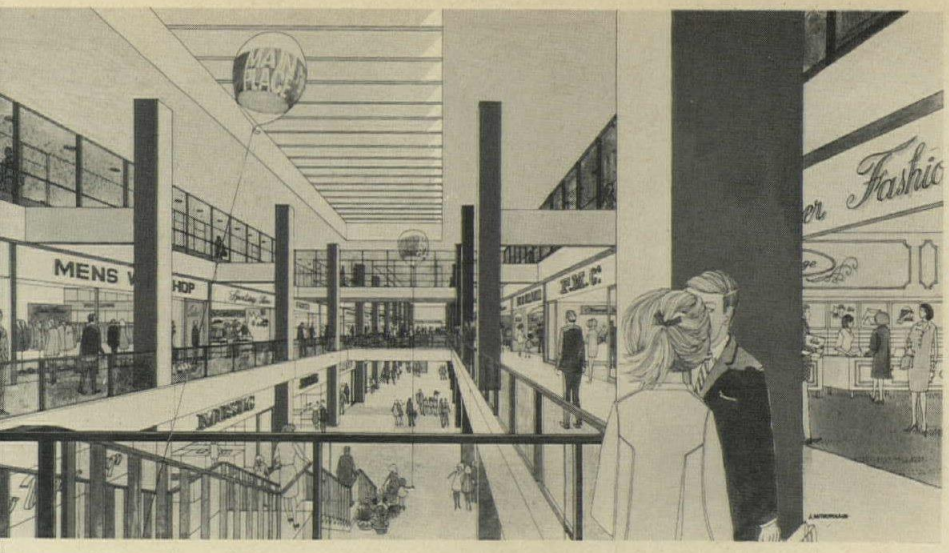
Multiple-deck parking has the added advantage of giving the customer rain and snow protection from car to store. But at current customary parking ratios of about five cars per 1,000 square feet or retail space, and with parking decks costing $1,600 or more per car, it is easy to see the added cost to the project.

While a double- or triple-level mall is scarcely more expensive to build than one on a single level, the double-level mall has its own problems. It must be so planned that both levels are of equal convenience. Furthermore, the leasing broker must lease both levels on the basis of equal merchandising importance. Otherwise, it will not be possible to rent the less desirable level at figures that will justify its construction. (For more detail on multiple-level shopping, see page 166.)

The covered mall makes unity essential

An enclosed mall, heated in winter and cooled in summer, has become an established criterion in today's development. Many problems must be resolved however, for its use to achieve the maximum potential. For instance: In theory all stores should have open fronts, i.e. sliding glass doors that are pushed out of sight during store hours, thereby allowing stores to become fully integrated with the mall. But this in turn raises certain problems. Without store fronts spotlighted displays are more difficult to utilize. In addition, if there is too much light in the mall, either natural or artificial, the impact of the stores' interiors on the customer is lost. Without store fronts the matter of atmospheric pressure also becomes vital. If the mall has a lower pressure than the stores, odors from food markets and drug stores pervade the mall. Conversely, if the mall has more pressure the owner is supplying the stores with free heat and cooling.

One curious problem in the covered mall involves the use of fountains. Fountains in open malls have no



A three-level mall presents problems in visibility, vertical transport, natural and artificial lighting and control of graphics.

Horse sculpture and fountain at Dadeland in Coral Gables is a popular meeting place.

been successful because wind blows the water—but the covered mall should be ideal in that respect. Yet if the fountain is really large and spectacular, it has to be reckoned as a major humidifying factor to be compensated for by the air-conditioning system. (A fountain can be used as a humidity control or a dehumidifier by controlling the water temperature.)

Over-all visual effect must not be compromised

Increasing competition gives the architect a much stronger argument on this subject. At last developers are becoming aware that an attractive project is a business asset. Dirty, badly finished concrete pavements in malls and walks are giving way to terrazzo and tile. Roof-located mechanical equipment is being concealed, and by masonry walls rather than flimsy enclosures. Exterior walls and details are beginning to have a look of more stability, and sometimes, even of simple elegance. These visual improvements are not expensive if properly designed.

The landscape architect must generate immediate impact

More than anything else, proper landscaping, especially on the exterior, is an inexpensive way of creating customer acceptance and good will. As competition grows keener between centers, the drawing power of suitable landscaping will be more and more apparent to developers.

But the first year is the most critical in any suburban shopping center's life. If it is to have major impact and establish its position, everything must be at its best the first year of operation. Therefore, planting material must be put in at the largest size possible. The fact that smaller plant material will grow and be handsome in 10 years is no argument for meager plantings.

Furthermore, landscaping must be in proper scale with this type of project. A building mass 2,000 feet long and perhaps only 20 feet or so high must have massed effects—not just isolated little trees that are completely lost visually against such an expanse.

On the mall, too much landscaping can be a problem if it obscures the stores and occupies important mall space so that it restricts circulation on crowded days. It is often hard to make an exact compromise between a mall that is barren looking in the early morning hours but convenient at crowded times and one that is attractive early and restrictive of circulation at five o'clock on a busy afternoon.

Signs and graphics need rigorous, long-term control

Signs are still the greatest offenders in the matter of visual effect. Suitable identification signs are vital for the tenants and can enhance the appearance of the project. But how are the necessary harmony and homogeneity of effect achieved?

We have found that written sign criteria in the leases are not enough. The architect must have the right to decide whether or not a sign satisfies not only the written criteria but the over-all effect. Signs, no matter how well designed, may still conflict with each other. It is this conflict that the architect must be in a position to resolve through continuing surveillance.

One of the factors of convenience is simplicity in both graphics and over-all plan. A customer likes to know where she is going and what choices she has. Conversely, a store owner wants to be sure that his store will be exposed to the greatest number of customers. Therefore, the more direct and simple the plan and guideposts, the better the project's chances for commercial success.

Incidental costs must be controlled by good judgment

Too often the architect or his client makes careless and costly choices of roof or mechanical systems, drainage plans or a host of other items entirely invisible to the public. Or too often a carelessly chosen construction system necessitates inordinately expensive insurance. Suddenly, toward the end of the job, these unnecessary costs have devoured the client's available resources. Something must give. Frantic changes are made on the only items not yet completed. Cheaper exterior materials are substituted, roof enclosures omitted and, most frequently of all, landscaping reduced or omitted. The visual effect of the project is ruined and its competitive value irretrievably damaged.

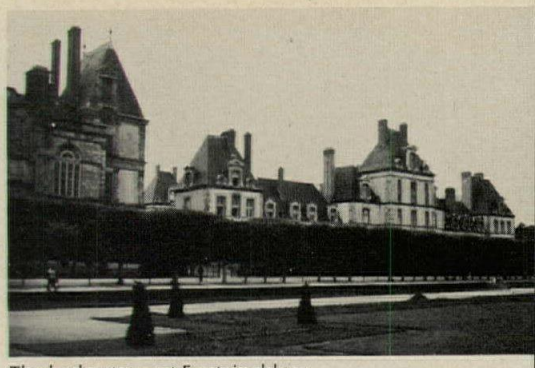
This points up the need for careful planning of each element. More study, let us say, of possible roof systems might effect a saving of 10 cents or more a square foot, which, if applied over the vast roof area of the job would pay for adequate landscaping, and then great many other amenities.

Service tunnels and basements may be worth the investment

In the past, basements and service tunnels were considered requisites to regional shopping centers. Today they are requisites to urban projects because of the limited areas and high costs of the land involved. But with the added costs of enclosed, air-conditioned malls, a philosophy has developed that considers basements and service tunnels a financial detriment to a suburban project.

I think this is wrong. Obviously, a

The enclosed, air-conditioned mall should be spacious but not barren, with a balance of lighting and daylight enhancing visibility of store fronts.



The hedge trees at Fontainebleau suggest one mode of screening.

service tunnel is a great asset from the community's and the customers' point of view, for it removes from sight all the trash and garbage, the waiting trucks, the dirty service yards with their ugly walls and docks. But the service tunnel, with its necessary basement adjunct, has economic as well as esthetic values. Prime parking replaces service yards with a saving in land and improved convenience. Reserve stock areas, toilets and other functions can be put in the basement freeing the entire mall level for sales. With less sales-level storage, store depths can be reduced, again freeing more land and reducing the more expensive mall level construction. And last but not least, there results a built-in opportunity for store expansion at a minimum cost and with minimum changes to the plan.

The key to this approach, however, does not rest with the architect alone. As an asset for the leasing broker, basements must be properly promoted as to their economic value to tenants, and the broker must turn this value into rent. Furthermore, the design of the tunnel must be for maximum economy and esthetic effect, not for the mere convenience of truckers. It is to be hoped there will be a renewed trend to service tunnels for the lasting benefit of owner, tenant, customers and community at large.

Windows on the parking side; to be or not to be

For the huge suburban complex or urban redevelopment project the question always arises: Since the mall is the center of shopping activity, and all customers must enter it, why should there be any show windows on the exterior of the project? Some experienced architects recommend that the exterior be blank, so that customers immediately enter the mall. Others contend that exterior show windows have a value. Furthermore, although the customer in a suburban center is a "captive" once she is in the parking lot, the potential customer of an urban redevelopment complex may be looking in store windows across the street. If the project does not have an appeal, she presumably will not cross the street or enter the mall. This last factor is recognized by tenants who are willing to pay higher rent for the potential of exterior exposure regardless of the mall.

Total energy and central systems solve some problems and create others

Design of the mechanical system should proceed hand-in-hand with the over-all design of the project if proper economy is to be obtained. But today, a new major factor is creating a difficult decision, which must of necessity rest upon the developer and not the architect, although the architect should acquaint himself with the judgment and economic factors involved. There is a strong trend toward total energy systems in localities where the laws permit. Electric power companies, gas companies, and non-utility corporations such as diesel and turbine producers, are vying for the right to produce the entire power requirements of shopping centers. And total energy works best with a single, central mechanical system.

If load factors, diversity factors, fuel costs, operating costs and over-all energy balance work out to warrant an integral system, a central plant supplying the entire power can provide all-around economies. Final decision should rest on the long term stability of the system, acceptance by the tenants, and general economics. At any rate, the trend is to one central system freeing the architect from many of the design problems involved in designing individual mechanical plants for each separate tenant space.

Expansible construction can divert emphasis on quality of plan

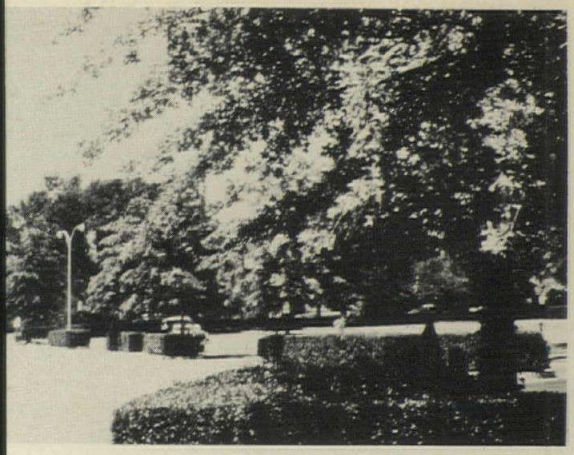
The owner's request that a project be so designed that it can be expanded—sometimes in three or more stages—poses a serious responsibility for the architect. It is virtually impossible to make the initial stage and the final stage of equal excellence. The obvious tendency for an architect, trained as he is in master planning and future values, is to envision the final stage, too often leaving the initial stage in an interim situation. This can be a dangerous error.

As previously pointed out, the critical time in any shopping complex is the first year of its operation. It either makes the grade and slowly gathers steam or it is a failure. By the same token, no expansion program will ever be undertaken unless the initial stage is a large enough success. Therefore, as hard as it may be on the ingenuity of the architect, the initial stage must be as perfect as it can be planned.

The budget is a fixed reality

Most important of all the criteria discussed here is the budget. The mortgage for any shopping complex is calculated on the total of the minimum rent agreements of the tenants, more particularly the prime tenants. Therefore, the available mortgage becomes a criterion completely outside the architect's control but one with which he must live.

Let us assume that a developer has scraped together all his resources and comes up with a total available equity of $500,000. He knows he can normally work out a project that will involve, say, 10 per cent equity so with his



Hedges and trees grace parking and approaches at Reistertown Plaza.

Bridges and walkways in a three-level mall preserve sense of open space but should be designed for people with climbing children or a height phobia.

$500,000 he can build a $5 million project. Let us say he is fortunate enough to obtain the necessary $4.5 million mortgage. This is the most he can borrow.

As the project proceeds the architect may, through inexperience, produce a design that is responsible for only a little over-run on the budget—10 per cent, or $500,000, let us say. But what does this do to the developer? Based on rent agreements in hand, he can get no more mortgage, even though the project is $5.5 million instead of $5 million. So his equity requirement has risen from the $500,000, representing his total capital, to $1 million. Unless he can scrape together more equity money, he has no alternative but to cut everything he can out of the project. Normally, this means all the amenities, landscaping and quality exterior materials must be given up.

Integration with surroundings is both architectural and economic

The architect should, for over-all effect and community values, integrate the building masses with the surrounding city or village and avoid the appearance of an isolated island of low buildings in a sea of asphalt.

Regrettably, there has been limited progress to date in solving this problem. The developer has little more than enough land for the shopping center. Consequently he is interested in the best plan for his own enterprise regardless of the neighborhood. And for proper merchandising, the center of activity must be the central mall—therefore the buildings look inward with their rear facades to the parking area, an uninviting prospect.

Also a ring of peripheral parking is more convenient for the customer and produces a greater number of parking stalls than any other type of layout. If the housewife sees an available parking space but cannot go to it directly because of planting islands and curbs, she becomes resentful.

In addition, the parking area must be easy to maintain and kept reasonably free from leaves, snow and the drip of tree sap on cars.

Solutions, however, seem to be within reach. More and more developers are obtaining hundreds of acres and building entire integrated communites with apartments, office buildings, community centers and major shopping complexes. This gives the architect, in his job as land planner, a chance to make a worthwhile contribution to the over-all effect and permanent attractiveness of the community.

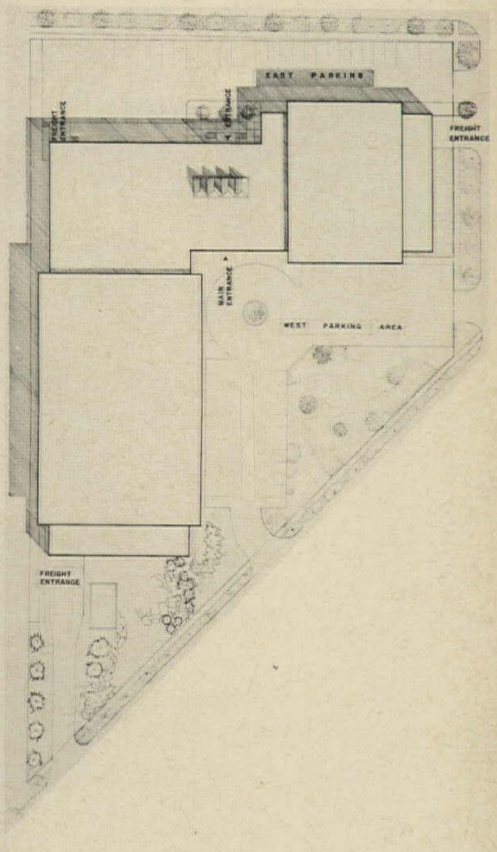
Also, there are methods available for camouflaging the asphalt ocean at reasonable cost, and without impairing its convenience or ease of maintenance. Long lines of clipped hedges at least three feet high can be planted wherever there are changes in the direction of parking lanes and also where lanes join the roadways. These hedges can be installed and maintained at reasonable cost and take up only limited space. Because of the low eye level angle in an automobile, they are very effective.

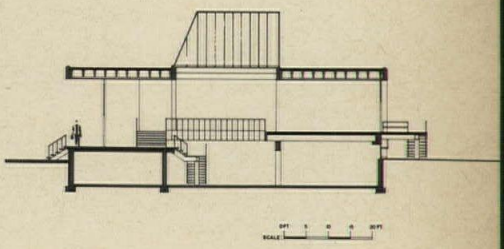
In addition, island-like clumps of closely planted trees can be placed strategically in the parking lot with a minimum loss of car spaces. They will not only improve the looks of the parking area but will enchance the appearance of the buildings, provided they are placed close by and in proper relation to the structures. Trees on the periphery of the project, however, are a complete waste of money as they do nothing to help the visual effect of either the parking or building area.

MEDICAL MERCHANDISE MART, a study in two-level spaciousness with low profile, was designed to provide high visibility in exhibition spaces where doctors, hospital administrators and consultants could see and purchase a variety of medical equipment. The client, a manufacturer of X-ray equipment, also distributes other kinds of medical hardware.

Handling of the entrance to the building at a level midway between upper and lower floors provides a large platform lobby offering a full view of both sales floors and relieving the lower level of any aspect of a basement. Load-bearing precast window wall of the upper level is raised on concrete pedestals to permit light to enter the lower level. The structural system is precast, pre-stressed concrete using standard manufactured members.

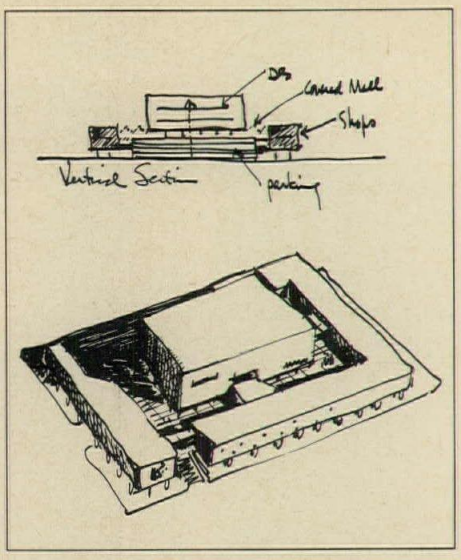
MEDICAL MERCHANDISE MART, Lincolnwood, Illinois. Owner: Universal X-Ray Company. Architects: *Fridstein and Fitch;* engineers: *George Kennedy & Associates;* contractor: *Fred Berglund & Son, Inc.*

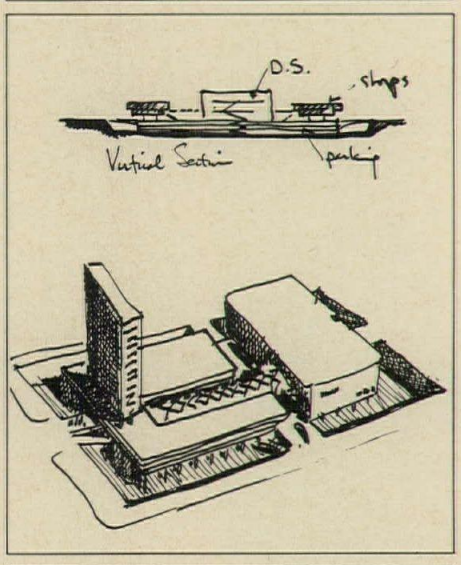


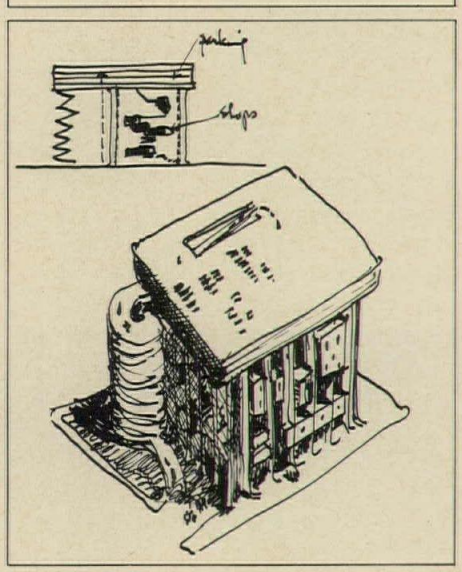


Robert Noel Ward photos

THE NEXT LOGICAL STEP: MULTI-LEVEL SHOPPING CENTERS







By Lawrence J. Israel
Copeland, Novak & Israel

While it sometimes seems that our roads are already lined with shopping centers, each year more shopping centers are being built. And they will continue to increase along with our population.

But increasing costs and scarcity of suitable land in suburbs and cities is going to force a major change. Where the one-story shopping center is no longer economical—as it is not now in many regions—the multi-level center is its logical and perhaps inevitable successor.

There are several basic concepts for the design of the multi-level center

The first concept is that of a multi-level parking facility as a core, surrounded by several stories of perimeter small stores connected to it at all levels. Above the parking core emerges a department store structure which is fed by a central group of moving stairs from the parking facilities. Here, within a few acres, can be housed all of the functions of the conventional sprawling shopping center. Obviously, great care would have to be taken in the assignment of space of the rental units to assure cohesion and association of types for comparative shopping purposes, and to organize rental scales in vertical-horizontal relationships. These should be as even as possible.

A second solution is based on the same principle as the Guggenheim Museum in New York. In this concept, parking levels could be placed at the top of a vertical structure, wrapped around the core, or built as a separate but connected multi-level structure. Where parking is on top, the shopper descends on a spiraling walkway around a central court, and stops at any of a series of platforms. On each platform could be grouped associated selling units. Obviously, not all of the platform locations would have equal importance or accessibility, but careful planning would pro-

vide a good balance of construction, customer convenience, and rental opportunities for various kinds of stores.

The third concept, similar to that used at the Toronto Airport, places the department store in the center of a circular mall. The mall and department store are elevated above the ground and attached by means of bridges and ramps to a multi-level parking structure built on top of the department store. The accompanying sketches show a few of the possible variations on these schemes.

Some basics of shopping-center design are hard to work into a multi-level unit

Without attempting to put them in any order of importance, one of the first of the special problems of the multi-level center is access and customer convenience. The conventional shopping center is based on easy traffic flow, on simple driving to close-to-the-stores parking positions, on a maximum walking distance of 400 feet, and on a one-level gradeless scheme where the customer has ease of entrance into any number of points where she may do her shopping.

The proposed multi-level shopping center might increase the difficulty of driving access, even though drivers are becoming more familiar with vertical parking facilities. On the plus side, vertical parking does compress walking distances, even though it also introduces a need for mechanical vertical transportation). Further, vertical parking conceals the automobile and eliminates the wasteland of exposed parking that now blights the approaches to most shopping centers; and the nature of the construction provides shelter for both automobile and pedestrian. In many climates this is becoming increasingly important.

Another problem: shoppers are now accustomed to a quality of openness produced in the one-story traditional center, with its variety of shops, open courts, and malls spread out to the pedestrian. Such centers can have a park-like attraction, while the multi-level development can become much more monumental and less open from the highway. Properly designed, the multi-level center can have an ambiance and openness inherent in the design of a vertical space structure. The image of illuminated clusters of shops, with their signs and displays suspended in a transparent prism of space, could be arresting and attractive at once. The advertising and architectural possibilities are wide open.

Another special attribute of the conventional shopping center is its use as a social and community center. The one-story spread layout provides a mall which becomes a promenade for people, a suburban social center reminiscent of the boulevards of Paris. On a multi-level basis, this boulevard is fragmented and stratified. However, imaginative architectural design of high interior spaces can induce the same social functions in different shapes.

For multi-level centers, the rules on costs and rental scales are different

Cost of land vs. cost of construction is the fundamental point. Multi-story construction involves heavier foundation work, more sophisticated structural systems, more fire-proofing, vertical transportation facilities, and many other elements which substantially increase the cost. The simplest solution of parking facilities on the multi-level basis will certainly exceed the cost of parking on grade. Each job will require its own analysis.

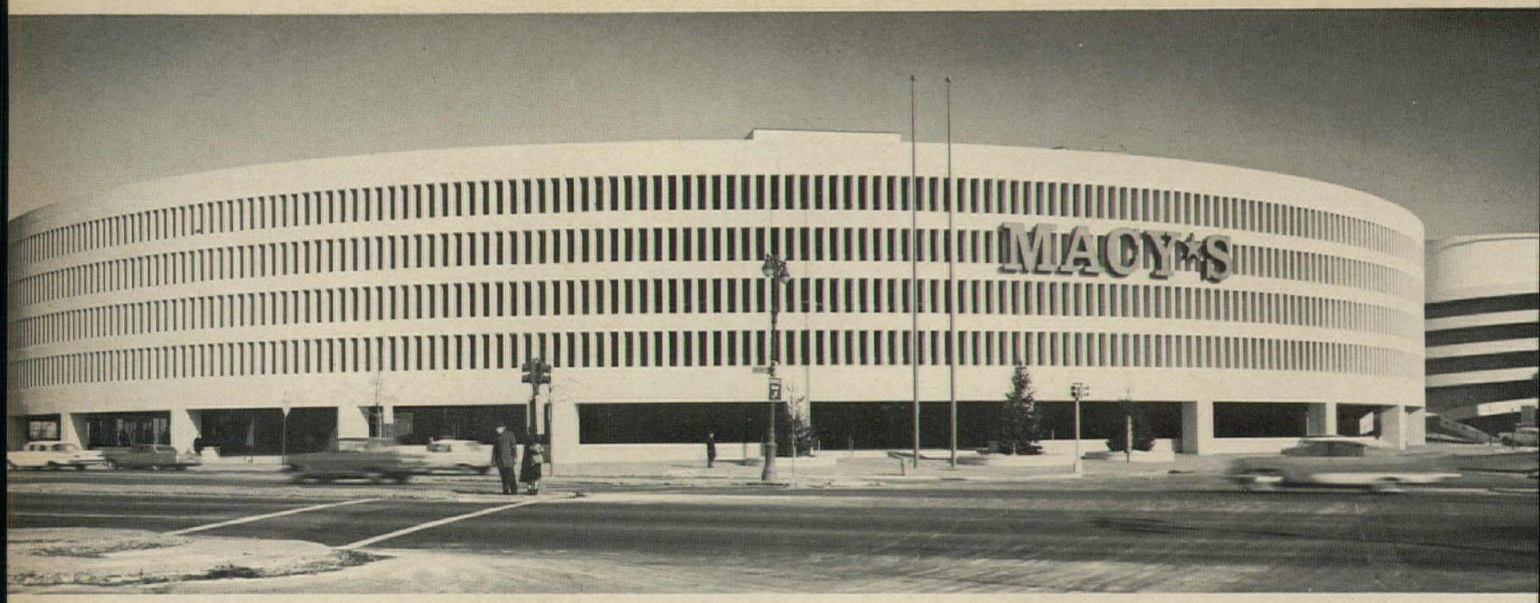
The establishment of rental scales for the multi-level shopping center also becomes more complicated. In the one-story regional center, rentals vary according to traffic expected at a given location, but traffic approaching every space can be anticipated. In a multi-story center, obviously, the tenant at the top of the line will receive far less (or far more) potential traffic depending on parking location. Rental scales will have to reflect this.

More multi-level centers are already on the boards

Our office, in its current study of shopping centers here and abroad, is already facing difficult sites that are pointing to multi-level solutions. In some instances, we have excavated land in order to provide multi-level parking. It is the concept of the iceberg. Above ground one sees a conventional structure; below there are many levels for supporting facilities. In Brussels, for example, we are developing plans for a shopping center to be on less than 20 acres. The small area available for parking led to the elevated mall solution. In fact, the mall was placed at an elevation high enough to allow for the construction of a future intermediate parking level, should the traffic demand it. Meanwhile, the second level of small shops and service offices surrounds a central hall served by moving stairs.

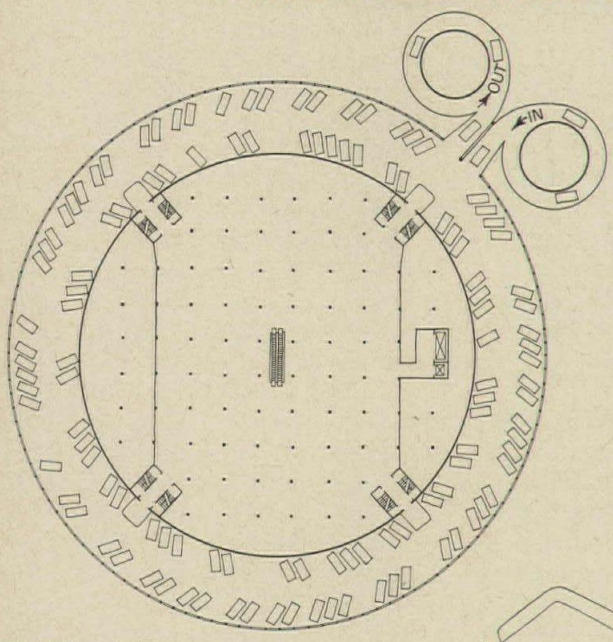
Department stores themselves in their expansion of extremely large units in the suburbs — ranging beyond a 300,000-square-foot structure — have faced and are solving some of the problems created by land scarcity. The Macy's store, recently completed in Rego Park, New York is an excellent example (see the following pages).

One could find many more transitional examples already built, and project infinite variations of these concepts to meet the challenges set forth by dwindling amounts of good land available in our large suburban centers.

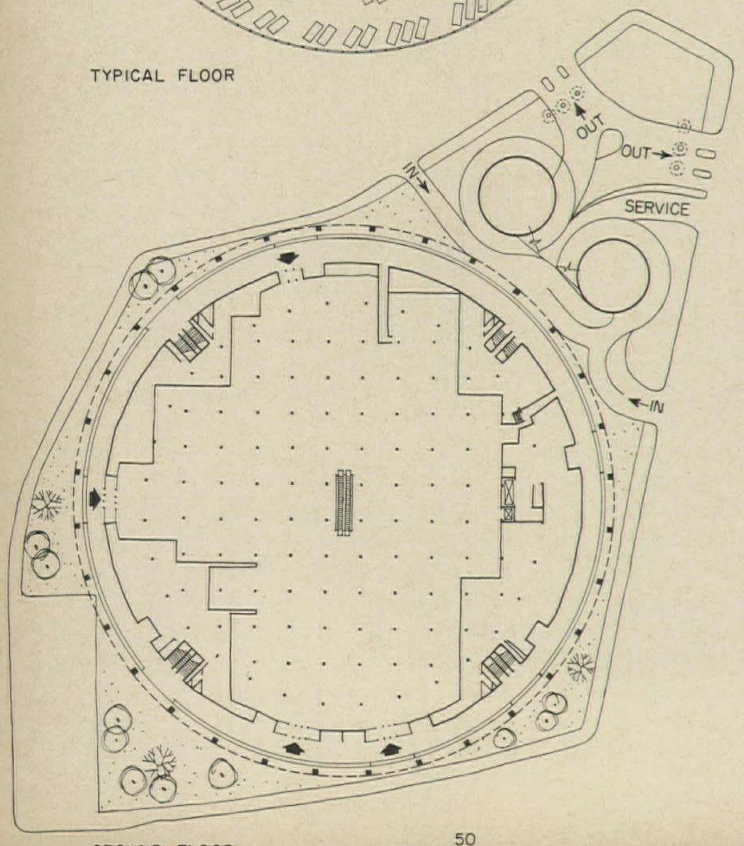


A MULTI-LEVEL STORE WITH WRAP-AROUND PARKING—Macy's Rego Park branch in Queens, New York developed logically into its round shape on a roughly hexagonal plot. Vertically layered parking was the rational means of handling shoppers drawn from adjacent expressways and thoroughfares to this tight, high-cost, metropolitan site. Parking at the circumference of round sales floors, in addition to the obvious area advantage in cars per floor, provided an opportunity for the striking, perforated facade, an asset to the neighborhood. In spite of construction costs higher than normal because of structurally poor soil conditions, provision is made for future addition of another floor and two parking levels.

Three round sales floors, 426 feet in diameter, and a service basement are surrounded by five parking levels 56 feet wide from which customers can walk up or down half-flights of stairs to the sales floor of their choice. Access and exit ramps for cars are provided in two separate helical structures, the cores of which house mechanical equipment for the building. Electronic signals direct cars to available parking spaces.



TYPICAL FLOOR

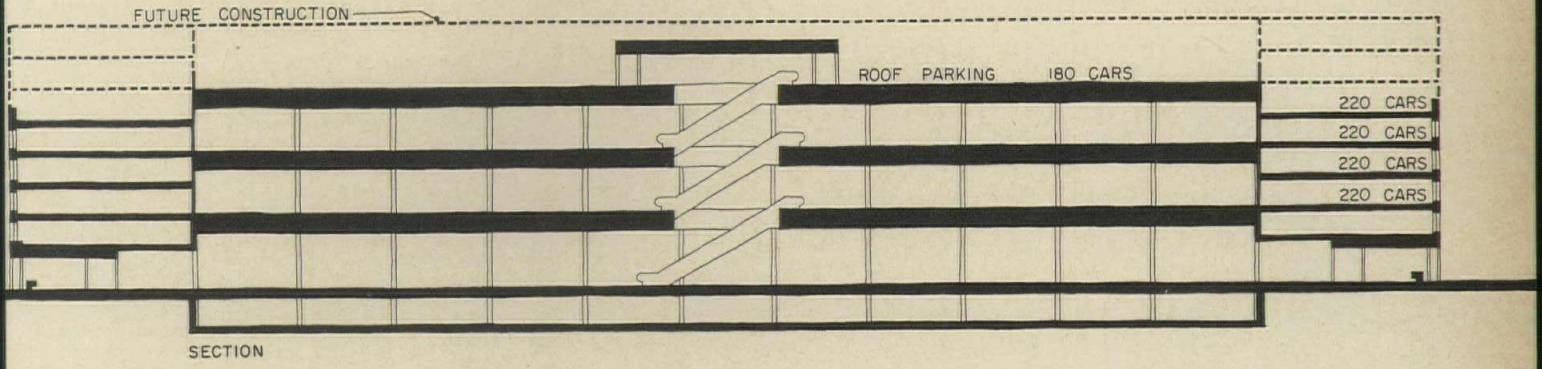


GROUND FLOOR

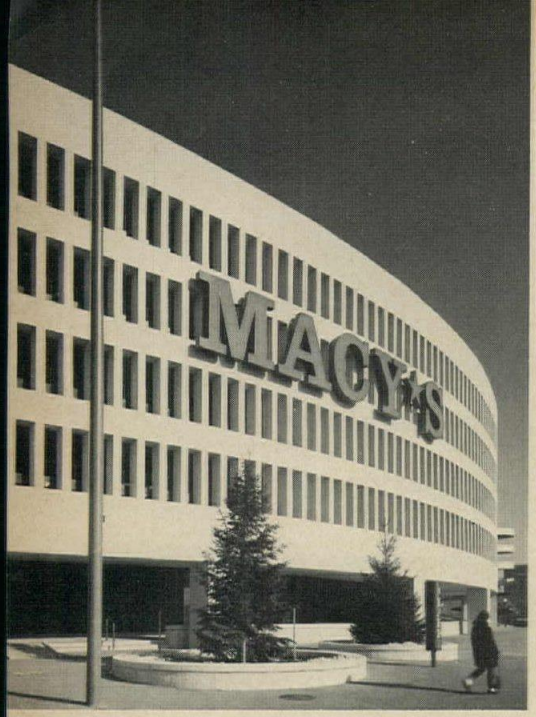
50

MACY'S REGO PARK, Queens, New York. Architects: *Skidmore, Owings & Merrill;* structural engineers: *Seelye, Stevenson, Value & Knecht;* mechanical engineers: *Syska & Hennessy;* interior architects: *Copeland, Novak & Israel;* general contractor: *Walter Kidde Constructors.*

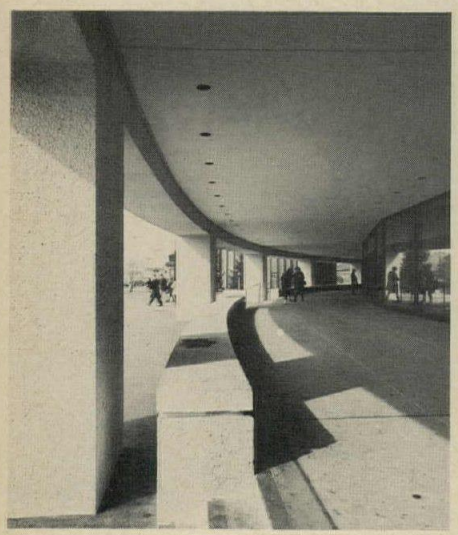
The street floor of Macy's Rego Park branch is extended about 35 feet under the first parking level leaving a generous sheltered arcade around the whole building. Since much of the traffic to this store will be pedestrian from its densely residential environs and from public transportation, eight major display windows face on this arcade, and the plazas round about are planted and furnished for pleasurable loitering. First floor gross area is 113,500 square feet, of each upper floor 78,000 square feet. Total gross area is 326,500 square feet; of the whole building including parking and ramps, 850,000 square feet.

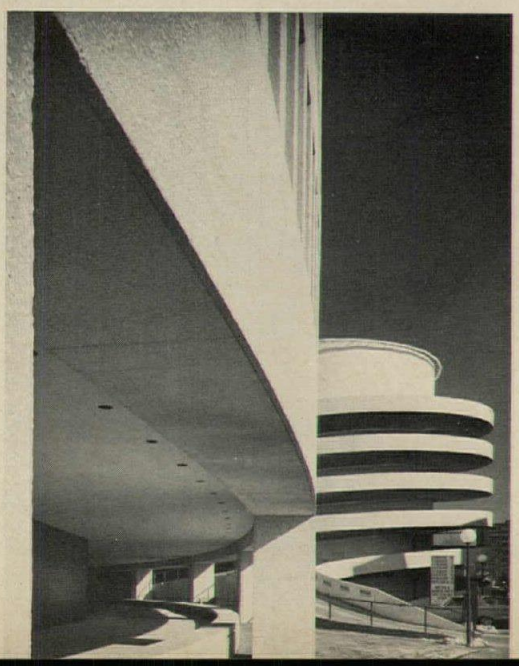

FUTURE CONSTRUCTION
ROOF PARKING 180 CARS
220 CARS
220 CARS
220 CARS
220 CARS

SECTION



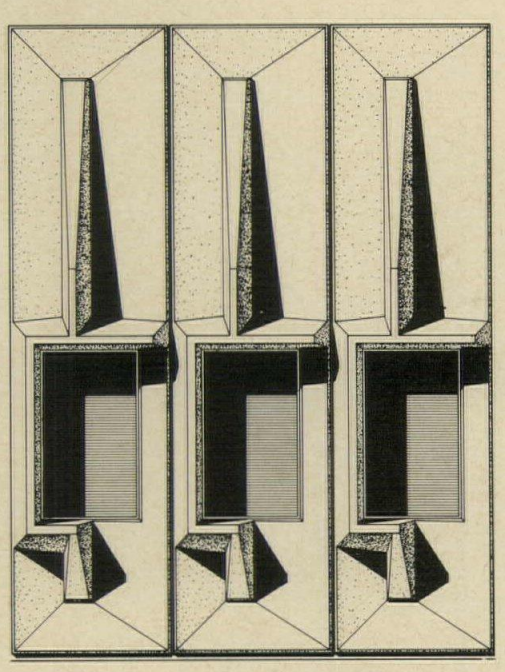
The parking structure and perforated facade of Macy's Rego Park is poured-in-place concrete finished in sand-blasted white quartz aggregate. Open grille of the facade makes mechanical ventilation of the parking levels unnecessary. The building will be serviced by six truck docks located in the basement with access by ramp from street level. Night lighting of the parking decks and helix cores produces a dramatic effect, and brighter lighting of the street level arcade accents colored mosaic tile walls of the store itself.





THE MOST RECENT ARCHITECTURE OF MARCEL BREUER is no longer a visual manifestation of the exterior wall considered as a skin stretched over a structural skeleton, but is an assemblage of prefabricated, load-bearing structural units shaped to provide sun shading and capable of housing utilities. In the statement below, architect Breuer sets forth the reasoning behind his newest design thinking.

THE FACETED, MOLDED FACADE: DEPTH, SUN AND SHADOW



That sheet of enclosure—that division between indoors and outdoors, the skin of a building—has again requested new answers to its problems, which have given a sharp turn to the course of architecture in recent years. The concept of a large building, expressed by regularly spaced structural supports and non-bearing, lightweight separations—including the outside wall—although logical, has left unanswered some problems of structure, climate, and equipment. Various elements ask to be part of the exterior wall: the thin, transparent sheet either cannot receive them, or loses its identity in trying to do so. Consider:

1. The exterior columns, if placed just inside the skin, are in the way. If placed just outside, they become a technical

tour de force. They belong to the plane of the skin, but there they conflict with the underlying esthetic idea of the architecture.

2. The light, possibly all-transparent enclosure admirably provides the sensation of view and a liberated interior-exterior relationship—and this is important. But it is poor protection against climatic fluctuations, including the radiant heat of the sun, a formidable discomfort factor.

3. Important parts of the heating-cooling system are best placed either in or close to the exterior wall. The elements of the air-conditioning system—its ducts and equipment—should be there where the climate is tamed and transformed. All this equipment endangers the very existence of our ethereal enclosure, while asking for legitimate consideration. The glass wall—as an expression of modern technology—seems to conflict with technology itself.

The search for an exterior which would integrate the demands of an enclosure goes parallel with a new approach to the technique and esthetic of precast concrete. Both lead us to architectural solutions which can be called "molded," and which have the characteristics of a facade, unattainable in any other familiar modern material. The large prefabricated panels can be designed for a variety of technical requirements: they may be load bearing and structural; they may offer chases and hollows for pipes, ducts, and heating-cooling equipment; they may form projections for sun protection; they may be solid or may contain large openings; they may combine all of these.

What about esthetics? A new *depth* of facade is emerging; a three-dimensionality with a resulting greatly expanded vocabulary of architectural expression. Sun and shadow.

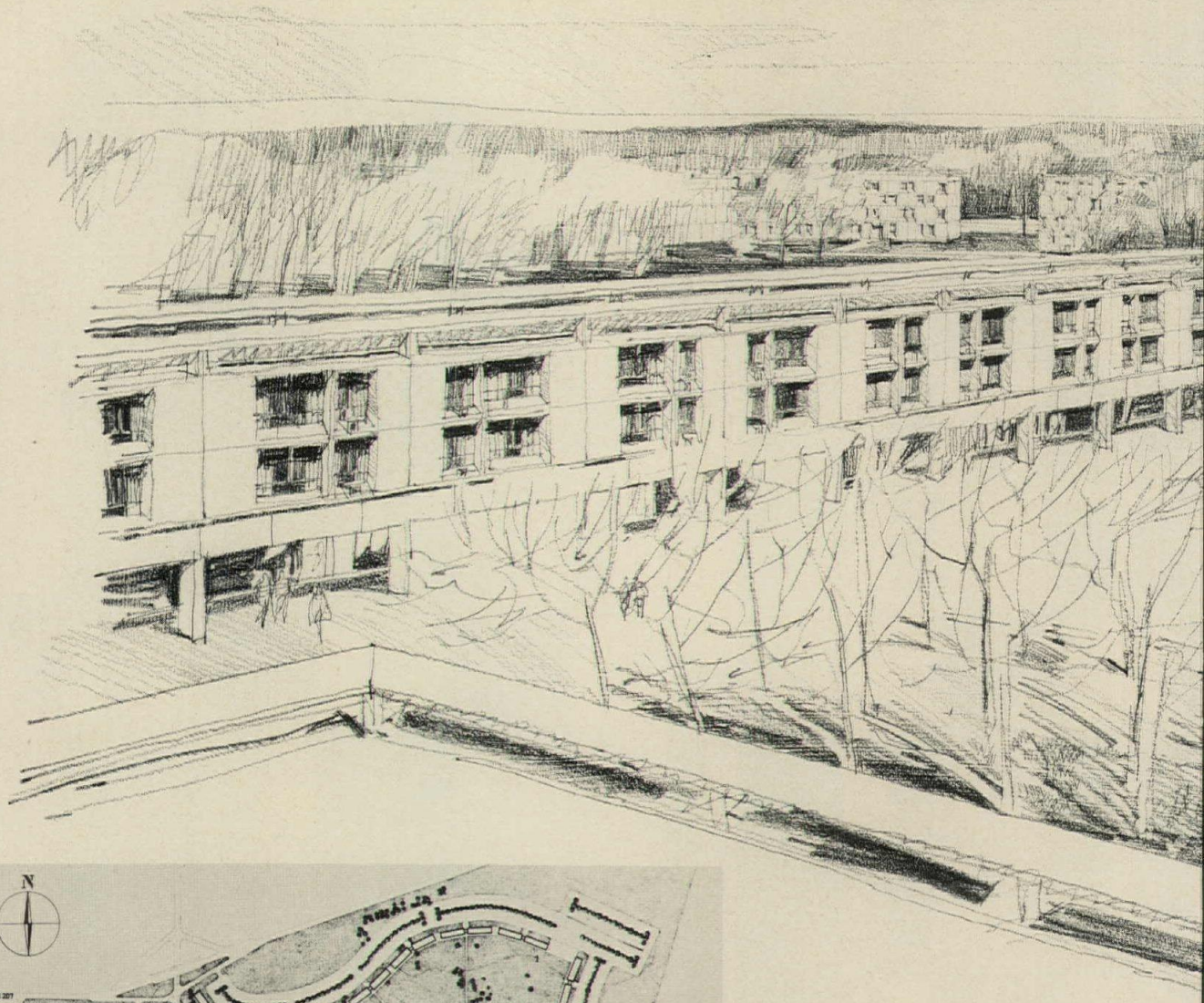
Marcel Breuer

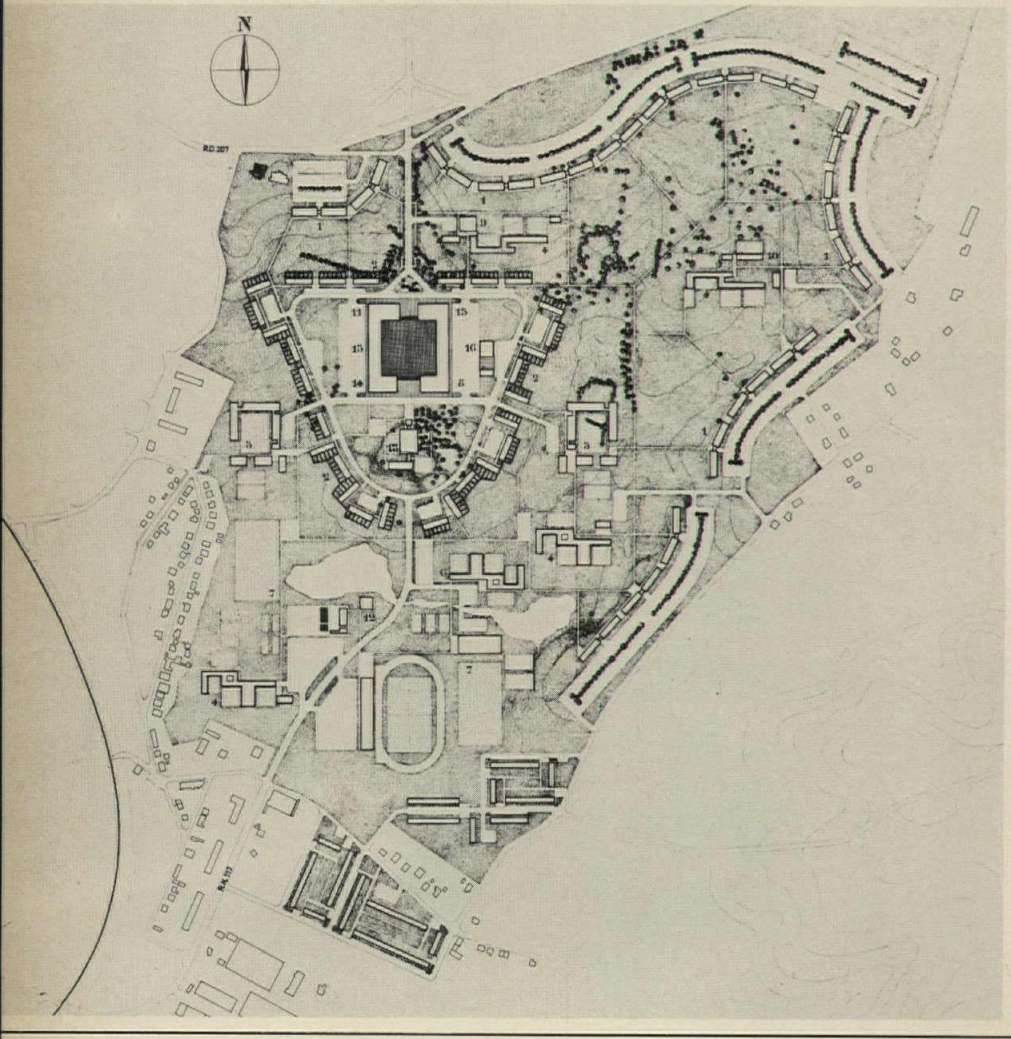
Z.U.P. Project, Bayonne, France. Architects: Marcel Breuer and Robert F. Gatje; collaborating architects: Bernard Darroquy and Andre Laurenti; project manager: Guillermo Carreras.

BAYONNE, FRANCE: URBAN PLANNING

This project consists of the design and construction of a completely new segment of 332 acres in the French city of Bayonne, urban center for 40,000 people which has long served as the commercial, industrial, and marketing center of the *Pays Basque*. When completed, the new Z.U.P. development will provide 14- and 4-story apartment buildings to house 15,000 inhabitants; a new town center; and shopping, hotel, entertainment, school, and traffic facilities. The project will receive financial support from the French government under legislation dating from 1952, which aims to control urban sprawl by giving selected municipal authorities powers of condemnation, traffic control, and government backing for urban planning.

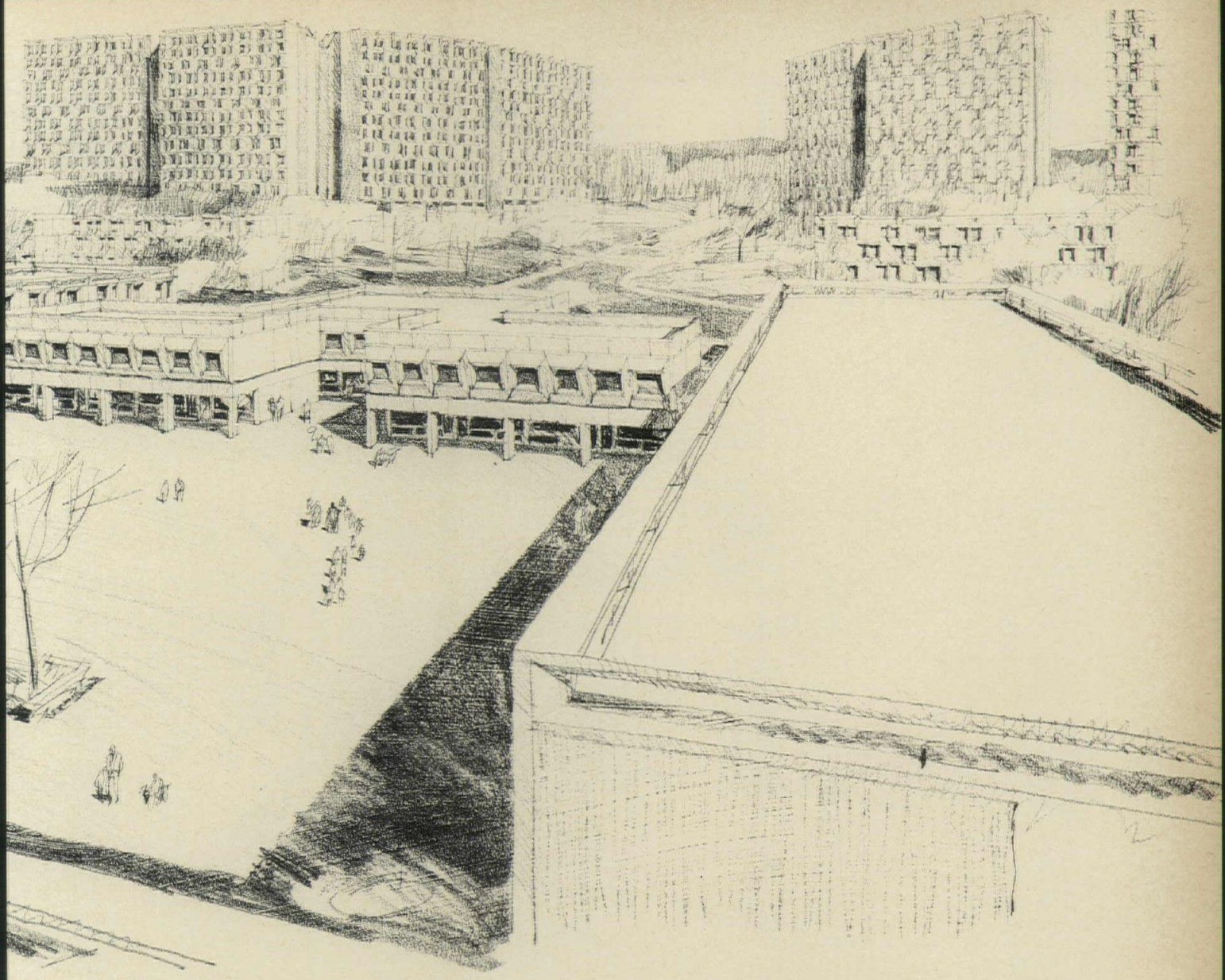
Drawings on the following four pages will reveal architect Breuer's plan for the site, and designs for some of the buildings. An elevation-perspective of a typical high-rise apartment building is shown at right. Two principles that will be followed as the project advances were developed during discussions between the architect, his group, and town officials: first, the continuation of a tradition of shopping arcades, established in the old town of Bayonne; and second, the utilization of industrialized building techniques wherever possible. The architecture will thus make wide use of standardized precast concrete units, with deep-set windows and prefabricated closets making up exterior walls and creating three-dimensional facades characterized by strong chiaroscurist patterns of sun and shadow. Such a facade treatment—logical enough for most locations—seems particularly appropriate for southern France, where sun shading can contribute greatly to the comfort of building inhabitants.

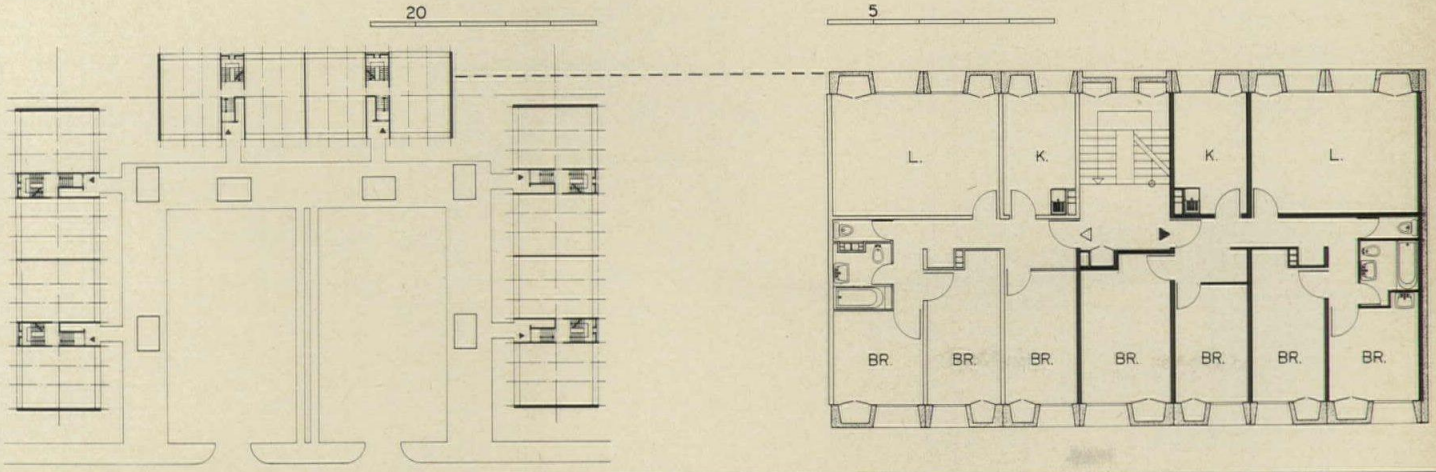




The general plan of the new development is shown at left and pictured—as viewed from the south—in the rendering above. The plans at right show, in diagrammatic form, the grouping of the low-rise buildings as they cluster about courtyards; and in more detail, the three- and four-bedroom apartments t contain. Note the use of prefabricated closet units, in pairs, as outer wall elements.

The central idea of the site plan is to provide a series of spaces within spaces, the whole focusing on a formal square created by public buildings—administrative, cultural, and commercial in nature. The more casual type of commerce—everyday shops and services—will be strung along the arcaded walks at the base of the high-rise apartment buildings. The site is defined by the curving line of 14-story apartments, which will be located to follow natural contour traces.

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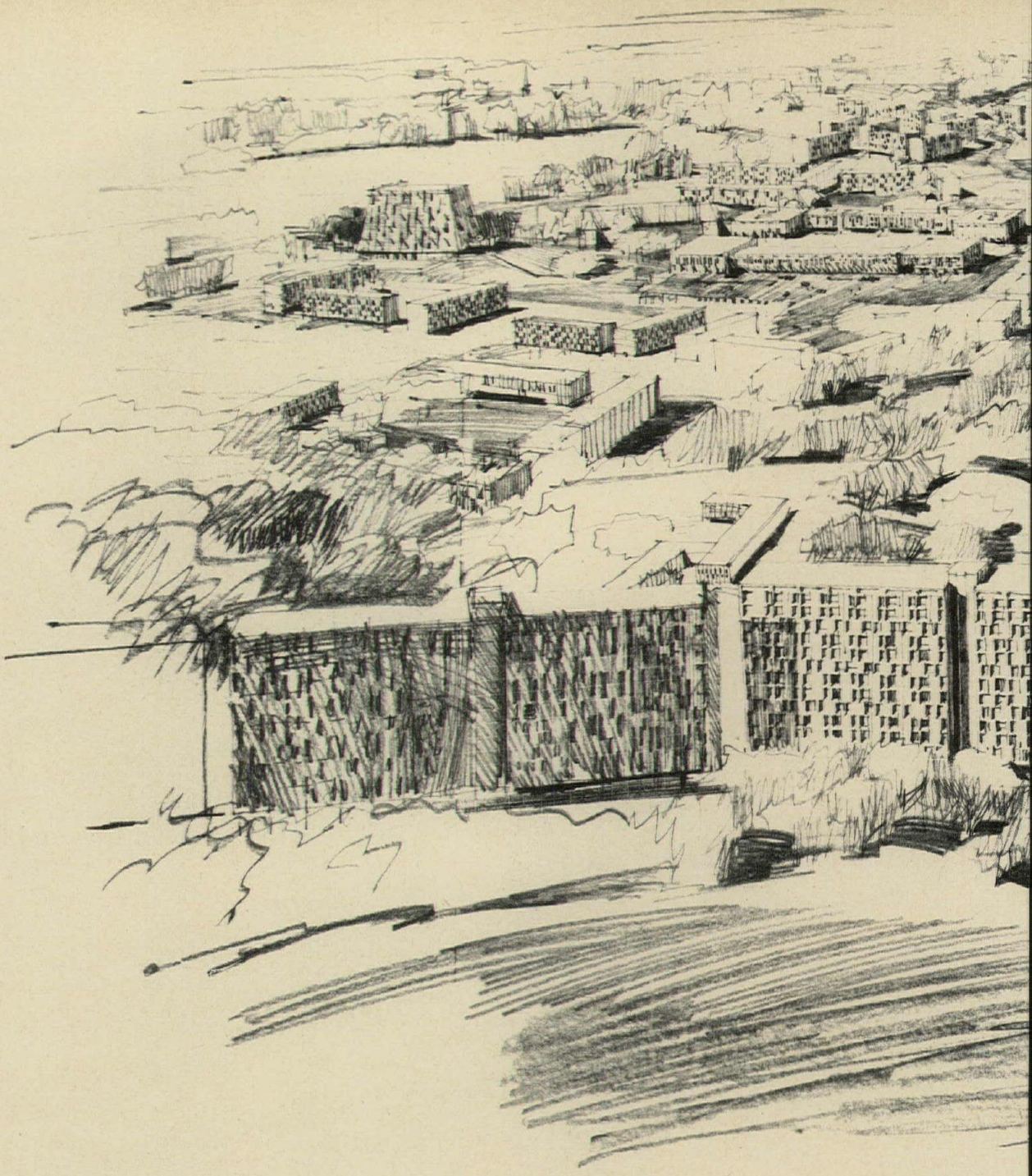
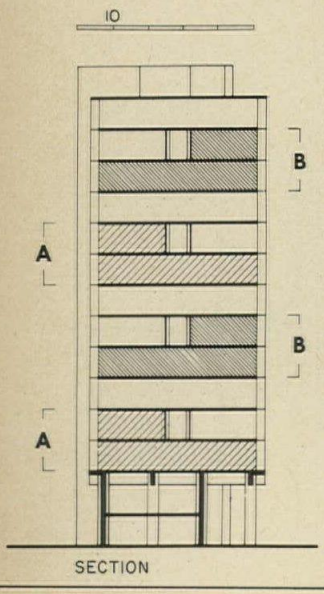
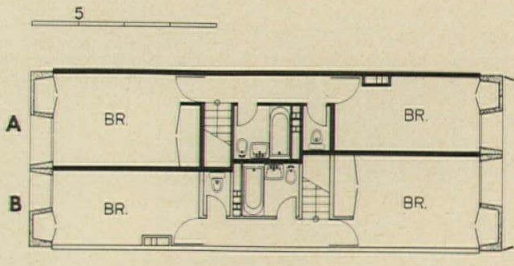


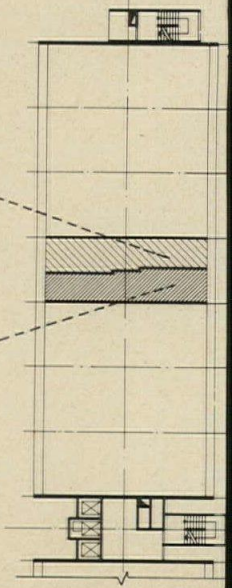


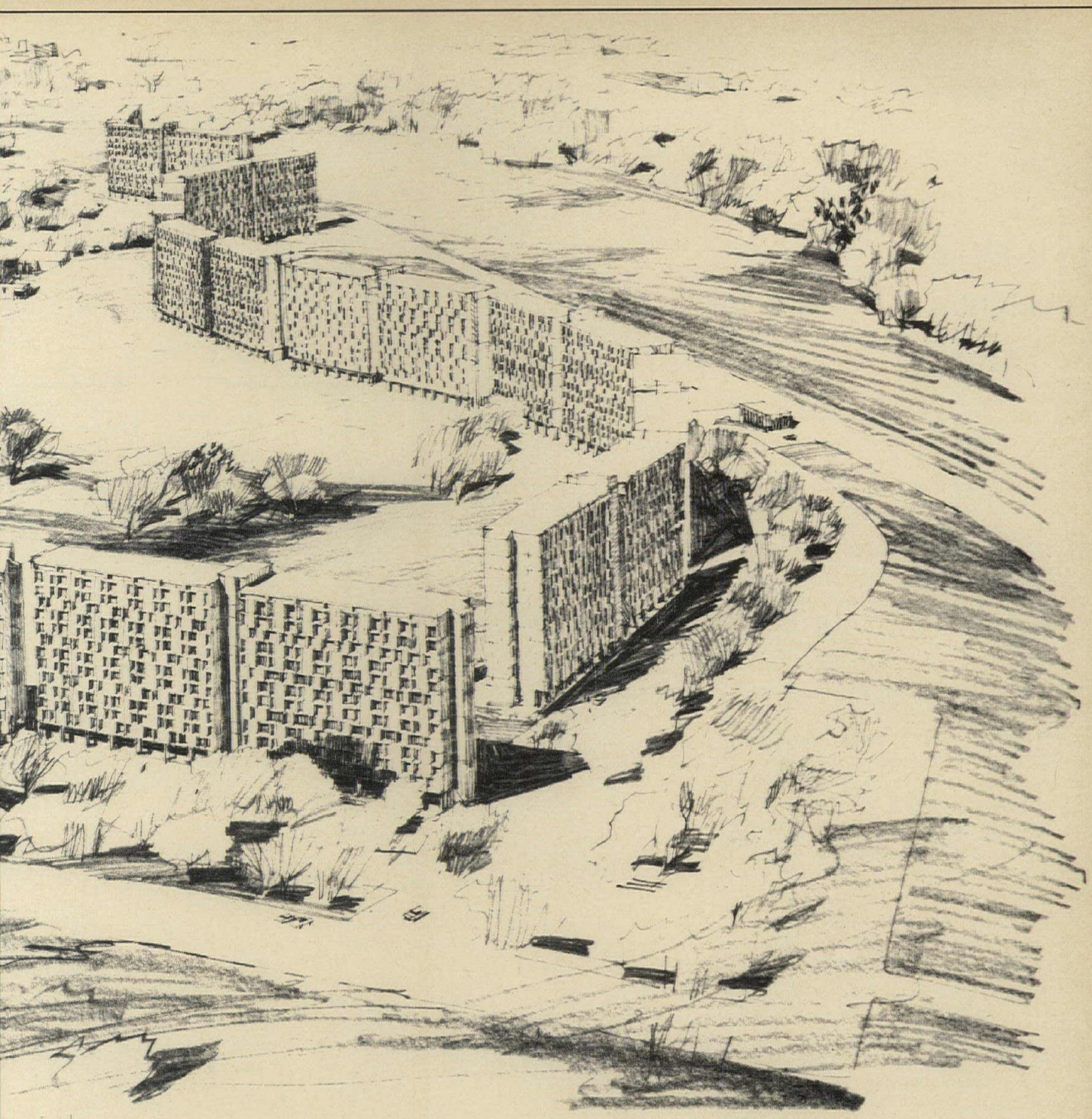
SECTION

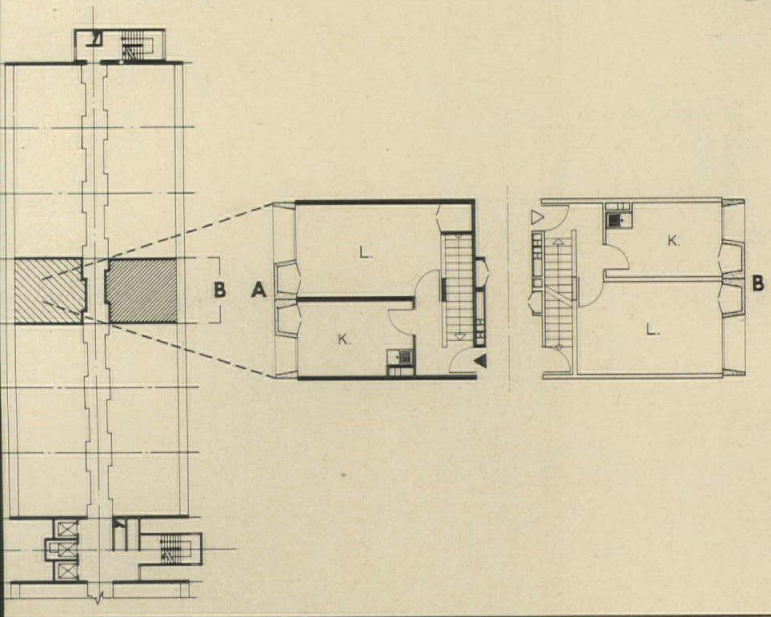
The view above pictures the project from the east and makes clear the way in which the sinuous line of high-rise apartments serves to define the area to the north and east. Diagrammatic location plans and comprehensive floor plans of the duplex living units in the high-rise buildings are shown at right, while the diagrammatic section at left shows how apartment types are disposed in the tall buildings. Note the skip-level arrangement, which requires fewer elevator stops and also accounts for the unusual, staggered fenestration pattern that occurs on the facades. Again, closet units, in pairs, make up the outer wall.



DUPLEX APARTMENT PLANS



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Saint Luke's Episcopal Church, Perinton, New York. Architects: Marcel Breuer and Herbert Beckhard.

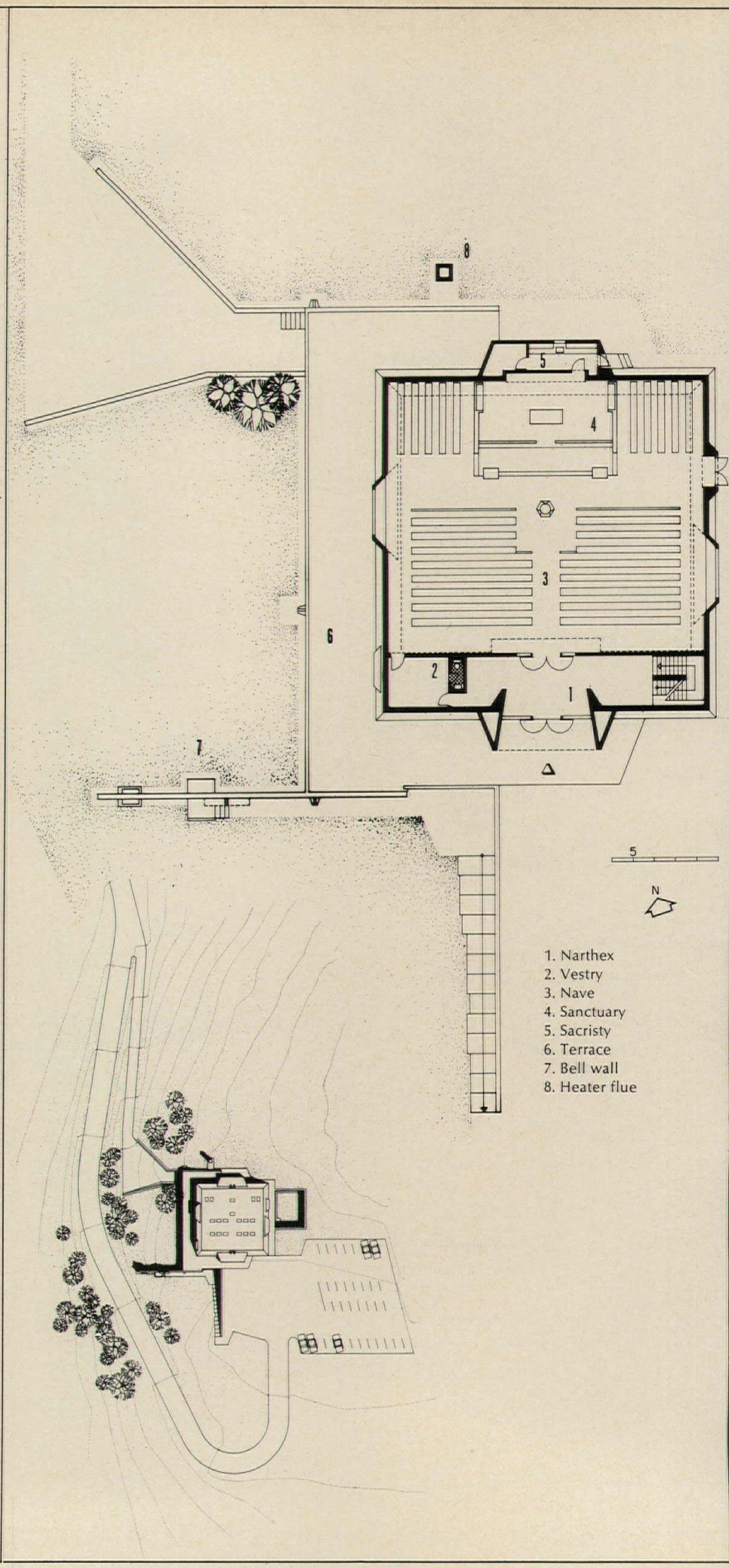
ST. LUKE'S EPISCOPAL CHURCH

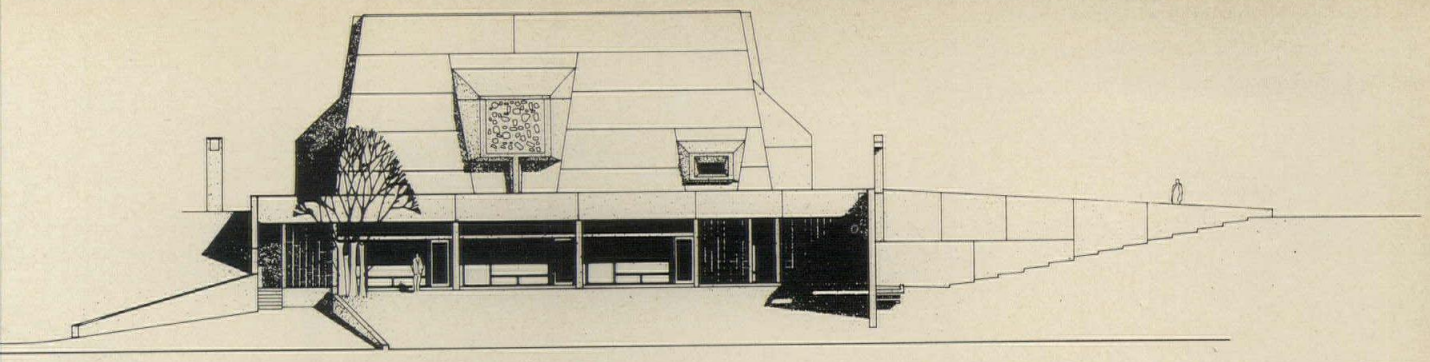
To be located in a suburb of Rochester, New York, this small church will have battered walls of *in situ* concrete with a rough finish. Projecting elements—such as the entrance and stained glass windows—will be concrete with an applied finish of stucco. The sloping church walls and retaining walls will be constructed with open expansion joints, to prevent the development of unpleasant patterns of cracks. Windows and entrances will be pulled outward from the plane of the wall in which they occur. From inside, this treatment will create deep splays, adding visual importance to these elements, and suggesting a reaching outward towards daylight or universal space. Breuer used a similar expression in his design for the Whitney Museum in New York, soon to be opened; an expression that seems to have become one of the hallmarks of his latter-day vocabulary.

This church has a simple plan, basically symmetrical, with the added piquancy of an asymmetrical variance brought about by the need for a side entrance. The choir and organ will occupy an open loft at the rear of the church. The floor will be of common red brick, waxed; the pews will be of laminated wood, heavy in cross-section and stained dark; the altar will be made of concrete and stone; the enclosing walls and roof will be natural concrete. The sides of the roof coffers will be painted in a range of brilliant colors which, in combination with the pattern of skylights (see roof plan and section), should create a most interesting kaleidoscopic effect.

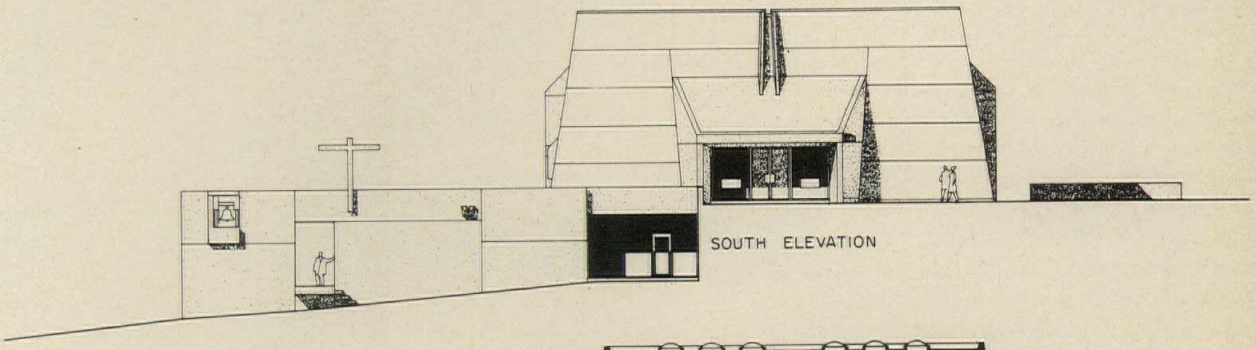
The lower floor will contain the rector's office, two nursery classrooms opening to a sunken courtyard for protected outdoor play, a kitchen, and a large general purpose room which may be used as a fellowship hall or divided into three classrooms.

Architect Breuer explains the sloping walls as "an expression of a structure growing out of the ground, but not attempting to imitate nature."

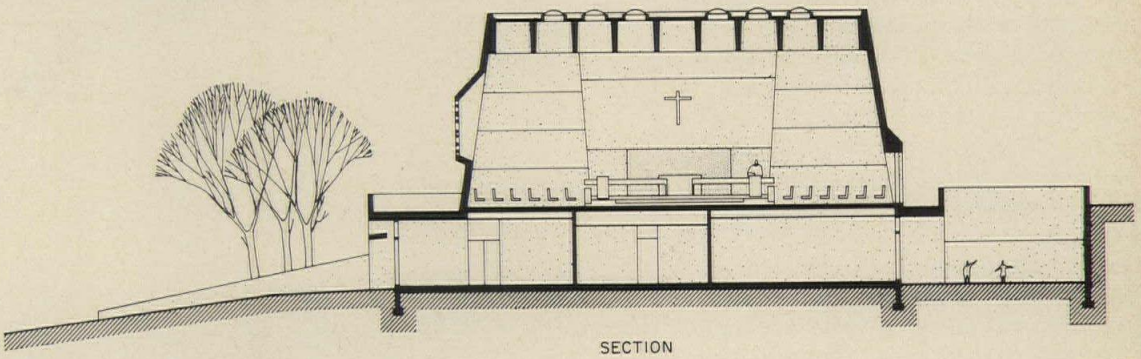




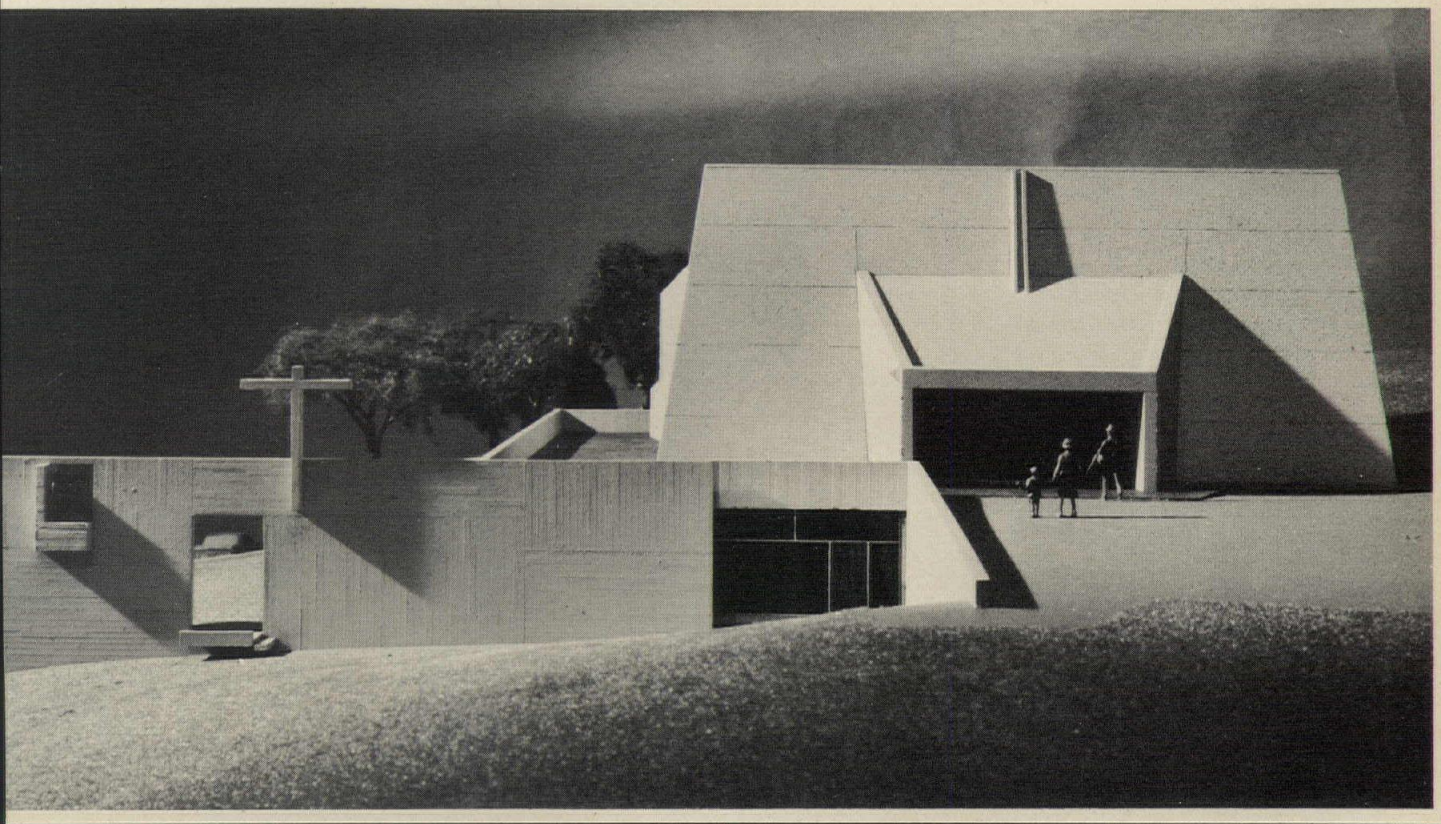
WEST ELEVATION



SOUTH ELEVATION



SECTION



Resort Town of Flaine, Haut Savoie, France. Architects: Marcel Breuer and Robert F. Gatje; economic planning: B.E.R.U.

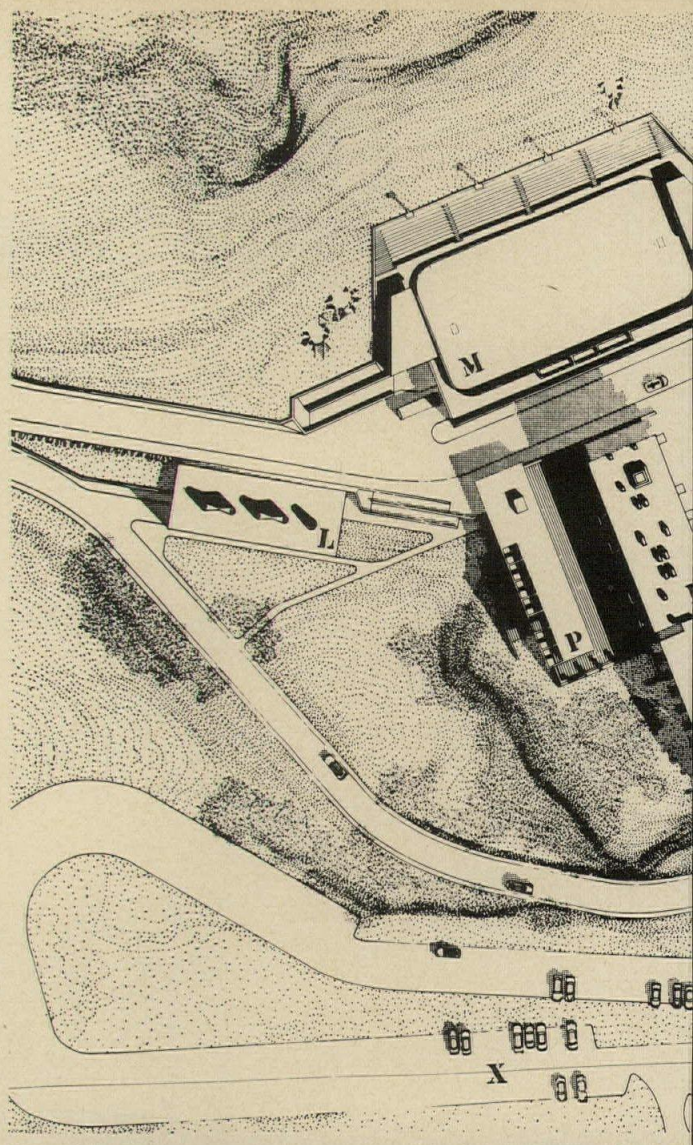
NEW SKI TOWN IN THE FRENCH ALPS

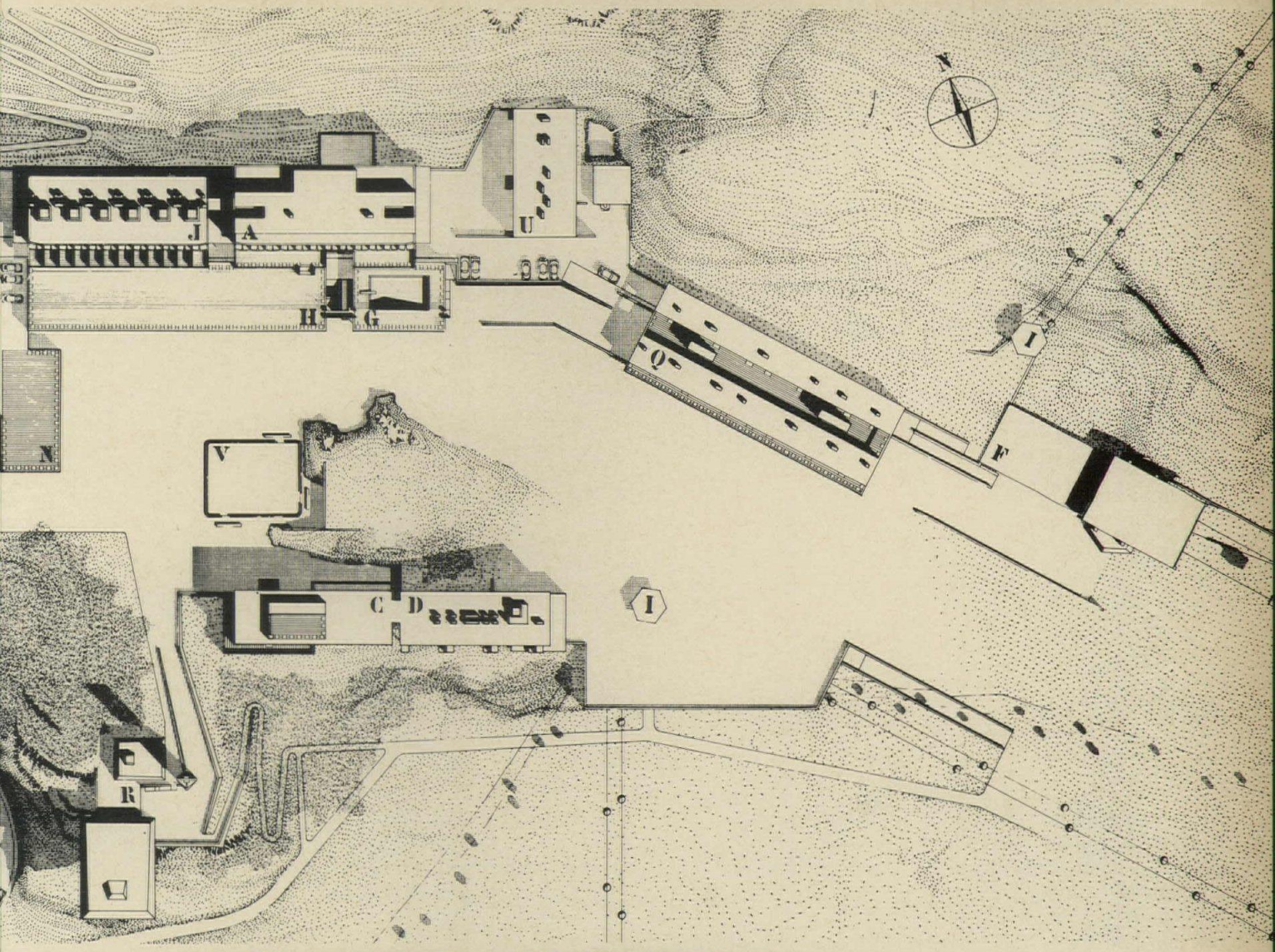
A lovely but lonely valley in the French Alps, bypassed by the explosive growth of winter tourism because of its rugged approaches, was chosen as the site for this completely new resort town, to be called Flaine. The valley possesses the qualifications of an ideal ski town: broad northern slopes which will retain the snow for skiing; and terraced southern slopes for buildings which can open to a view of skiers crisscrossing the opposite wall of the valley. A French combine is backing the venture, designed by a group of planners headed by architect Marcel Breuer, who guided the development of the master plan and designed the buildings that will form the town center.

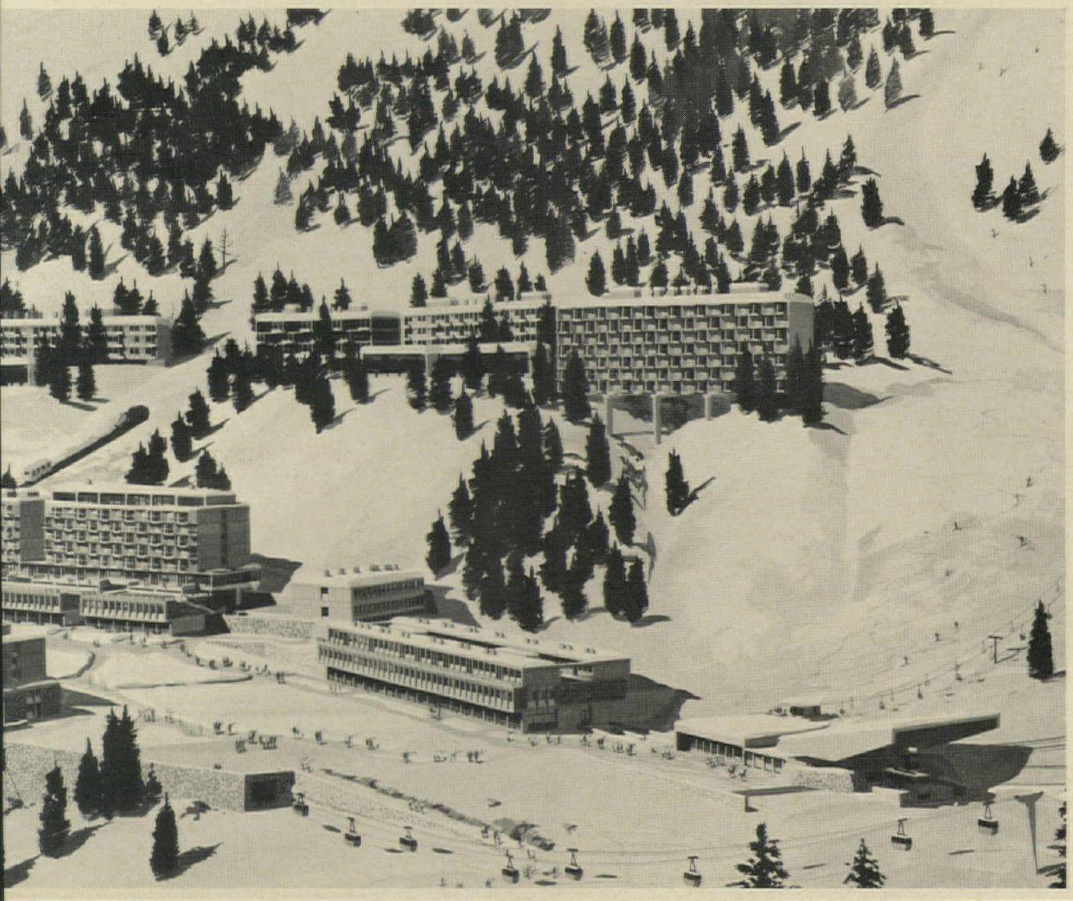
A new road over the mountains and into the valley has been built, and the first stage of town construction—a group of hotels, apartments, shops, service buildings, and ski runs to accommodate about 500—is under way. A network of ski lifts will rise 4,600 feet to open a new skiing area with magnificent vistas in every direction. The resort population is expected to grow to about 8,000 in 10 years, and building will parallel its growth.

Automobile traffic will be barred from the town center; hotels and apartments will be serviced only by secondary dead-end roads; parking for weekenders (see X in plan) will be located only a short walk from the town center and ski station.

Since the long winters limit construction activity to a period of four months per year, almost the entire town will be built of prefabricated, standardized concrete elements, produced in a neighboring valley where water, power, and transport are available on a year-round basis. All building materials reach the site by way of a *téléférique* especially constructed for that purpose. All buildings will be heated by hot water from a central community heating plant.

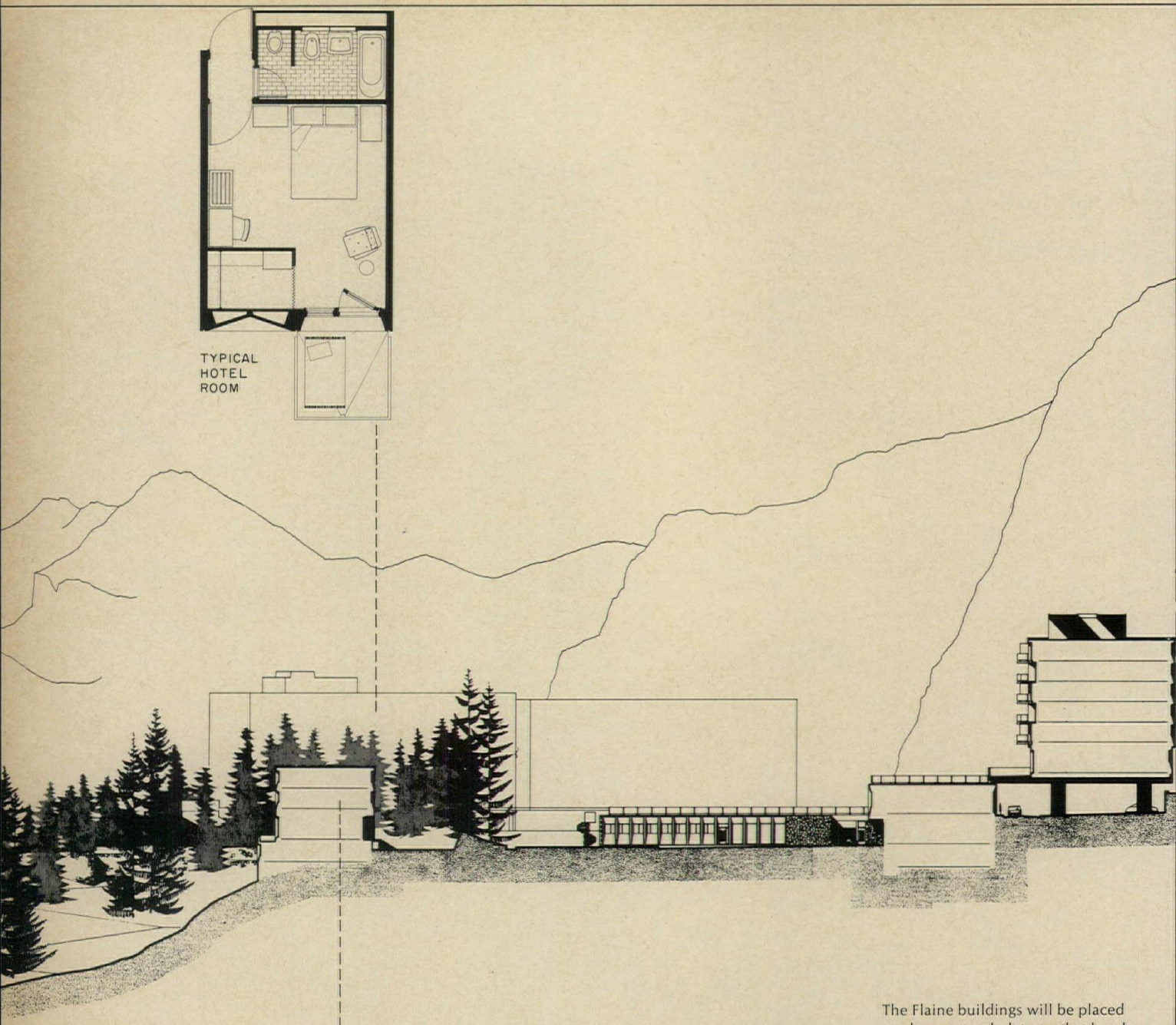


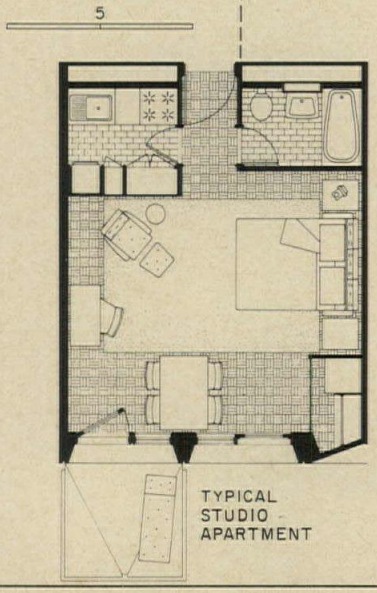




PLAN LEGEND

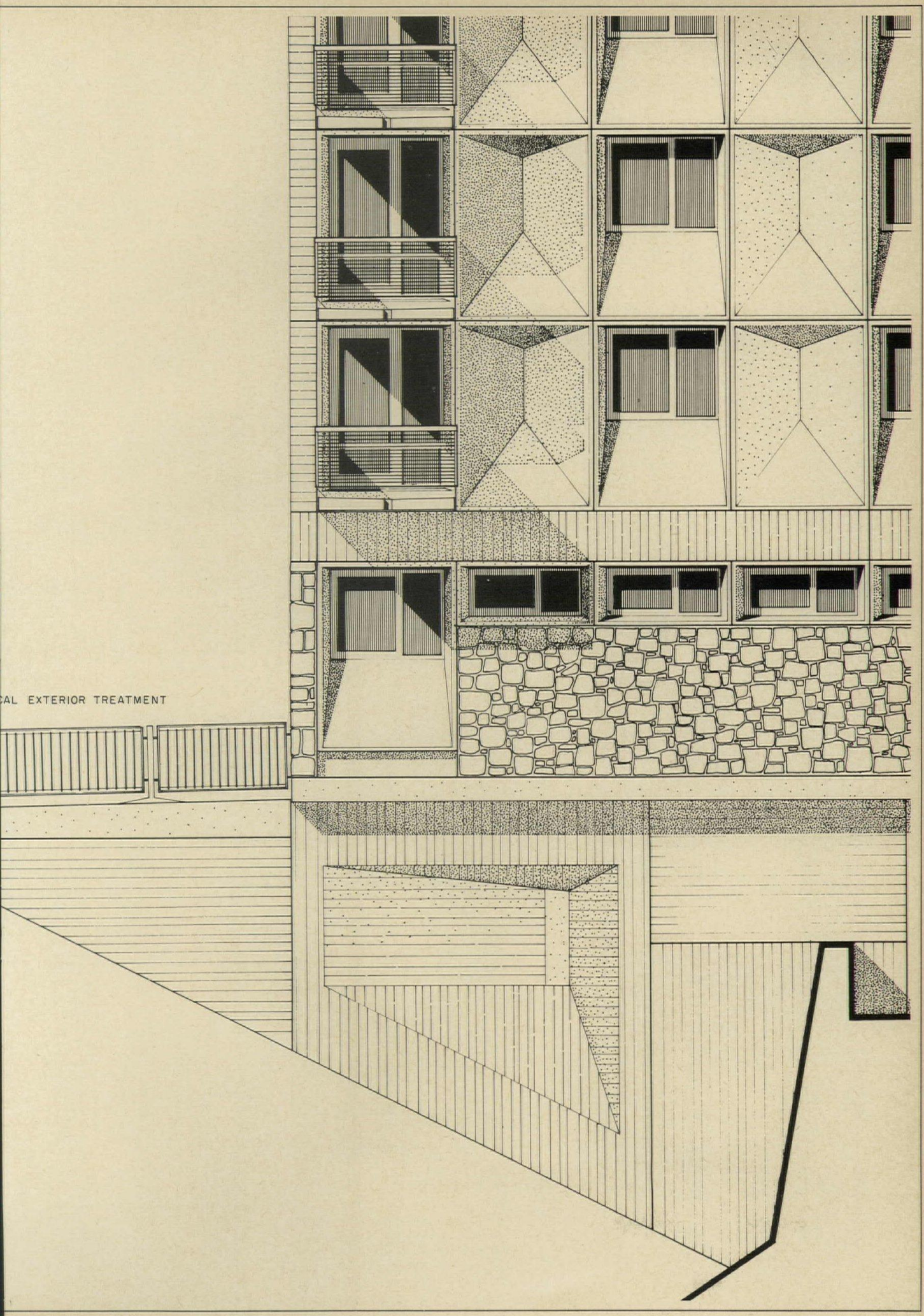
A. 4-Star Hotel
B. 3-Star Hotel
C. 2-Star Hotel
D. 2-Star Apartment Building
F. Téléphérique ski lift
G. Shops
H. Shops
J. 4-Star Apartment Building
K. 3-Star Apartment Building
L. Central heating plant
M. Bus station, hockey pitch, (tennis courts)
N. Tourist office and ski instruction school
P. General purpose hall and cinema
Q. Shops and apartments
R. Church
S. Funicular railway and path to Upper Flaine
U. Maire's office, post office, bank, and medical center
V. Skating rink
X. Transient parking





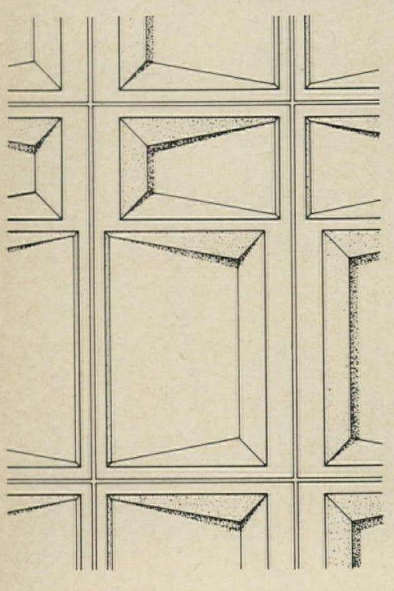
The Flaine buildings will be placed on three natural plateaus that break the sharp rise of the southern slopes. Most of the buildings will be raised above the terrain by means of columns and cantilevers so they will not interrupt the natural gradient of the snow-covered hillsides. In many cases the spaces beneath buildings will be used for sheltered parking and for access roads, which will reduce to some degree the large and continuing job of snow removal and the task of digging out buried automobiles. Supporting the buildings on columns will minimize required foundation work in a rugged terrain, and will reduce the volume of snowdrifts that would otherwise accumulate about the buildings at ground level.

The exterior detail at right shows how the design of the buildings respects the fact of their assemblage from prefabricated elements, and how the three-dimensional, faceted facades will exploit that fact in visual terms. Surface textures and modulations in actual depth will create attractive, slowly changing patterns of sun and shadow.

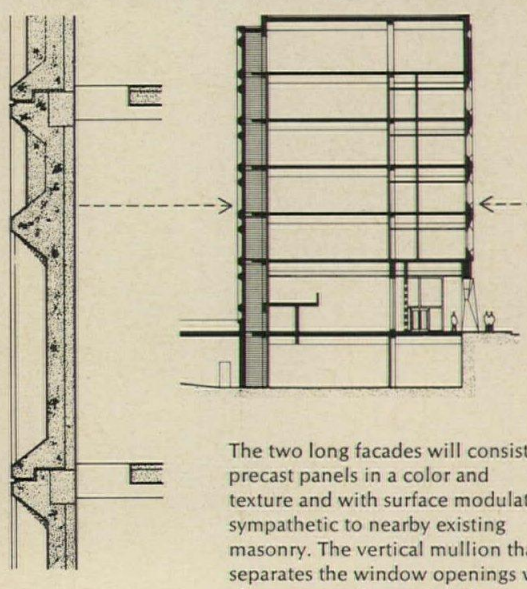


CAL EXTERIOR TREATMENT

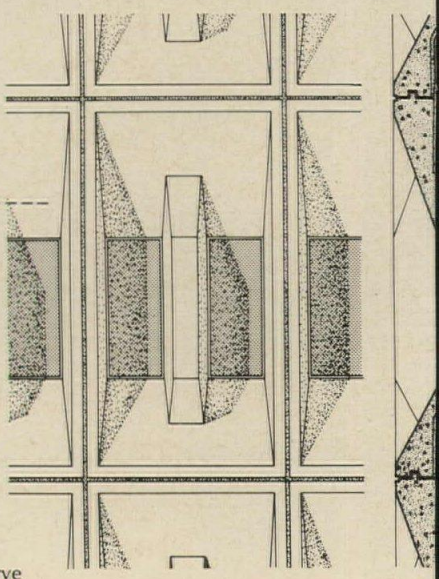
VIEW FROM PROSPECT STREET



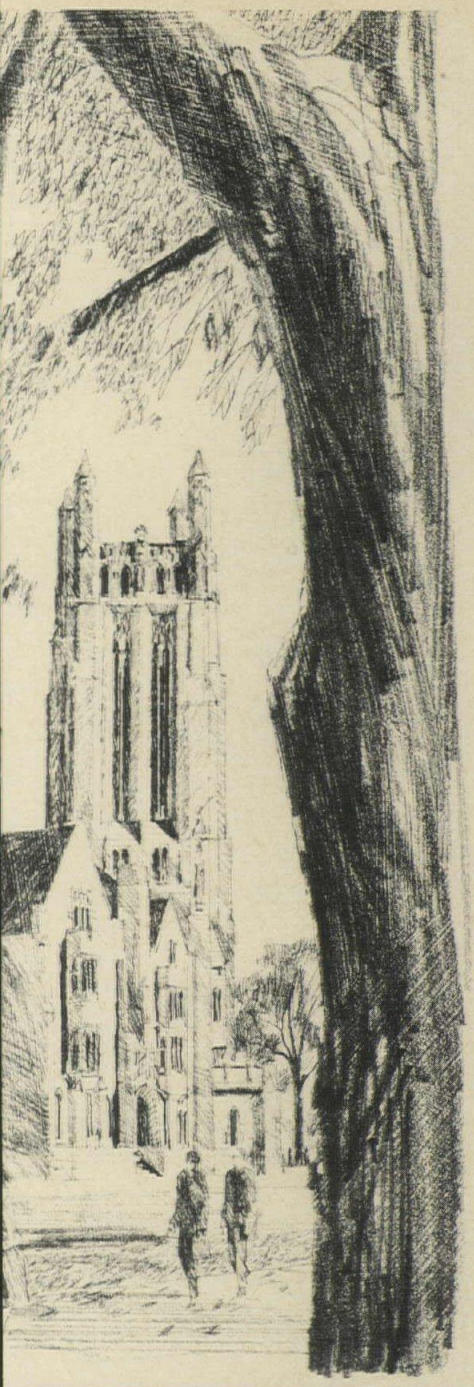
REAR WALL PANELS

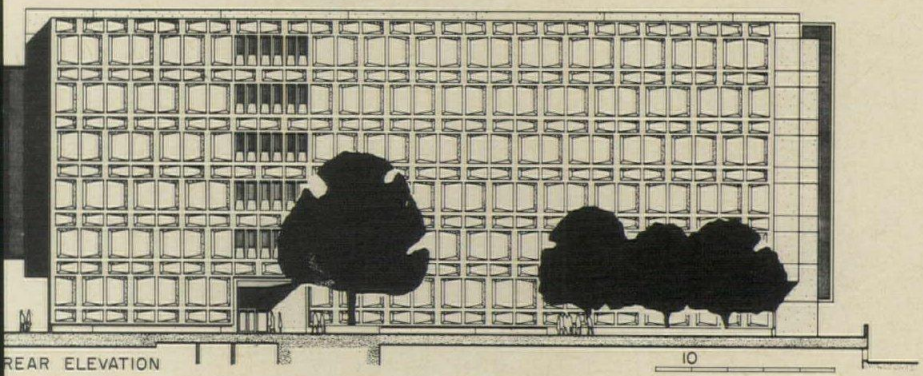


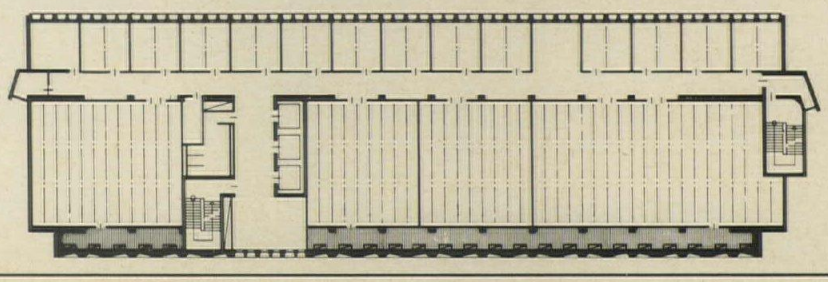
The two long facades will consist of precast panels in a color and texture and with surface modulations sympathetic to nearby existing masonry. The vertical mullion that separates the window openings will serve also as protection against the western sun on the street facade.



PROSPECT STREET PANELS







Laboratory Building for Engineering and Applied Sciences, Yale University, New Haven, Connecticut. Architects: Marcel Breuer and Hamilton Smith.

ENGINEERING LABORATORY

This design for a new engineering and applied sciences laboratory at Yale University had to provide two kinds of spaces: first, research laboratories and offices; and second, support facilities for the Yale science and engineering community as a whole—especially for faculty and students in the three nearby connected buildings that form the engineering and applied science complex.

Architect Breuer explains the rationale of his solution by pointing out that "both laboratory and office space can be standardized and fit within a modular system and efficiently developed as a multistory building. On the other hand, the support facilities (auditorium, lecture hall, storage, truck dock, etc.) are non-typical, having in some cases special structural and mechanical requirements inconsistent with the laboratory-office systems. These diversified facilities were thus organized within a simple, uniform enclosure and were grouped, partly below grade, in the inner courtyard of the block and decked over by a paved terrace."

The laboratory-office block will house five typical floors with offices and laboratories on opposite sides of an off-center corridor. The offices will face the street; the laboratories will be windowless and will be served by a five-foot-wide, outside corridor providing uninterrupted runways for the vertical and horizontal distribution of pipes, ducts, vents, and conduit. Locating these services on the exterior wall will free the corridor wall so doors and partitions can be located as desired.

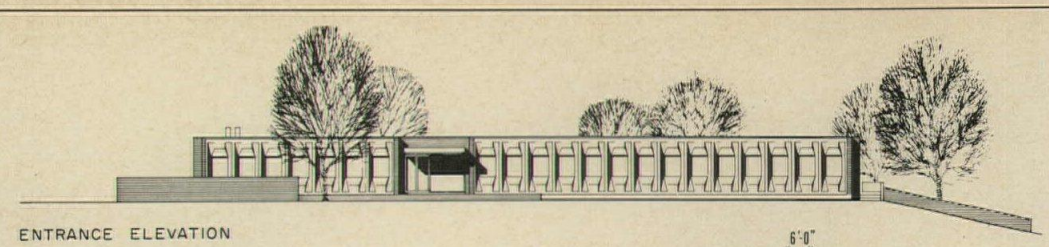
At ground level, the enclosing wall will be recessed to create a broad arcade along the street; the first-floor interior will house a technology library and student lounge. The basic structure will be of reinforced concrete. The precast facing panels will be structural and will supplement the interior post, beam, and slab system.

Administration Building, Torrington Manufacturing Company, Torrington, Connecticut. Architects: Marcel Breuer and Herbert Beckhard.

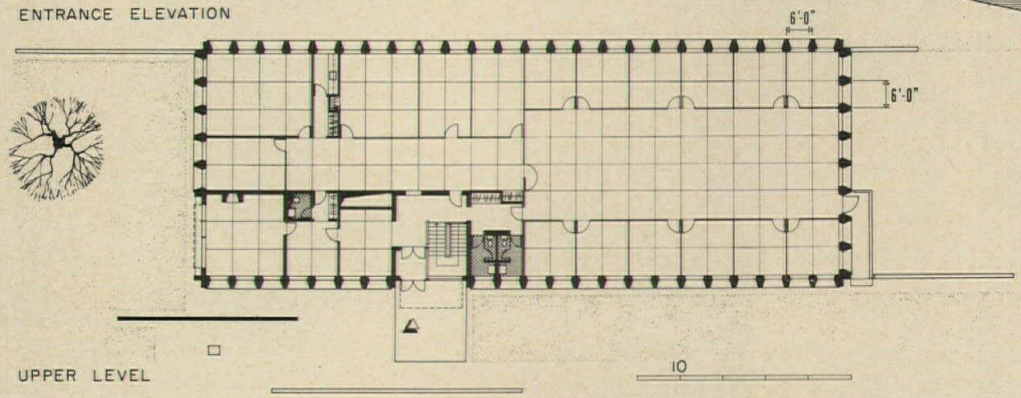
TORRINGTON OFFICE BUILDING

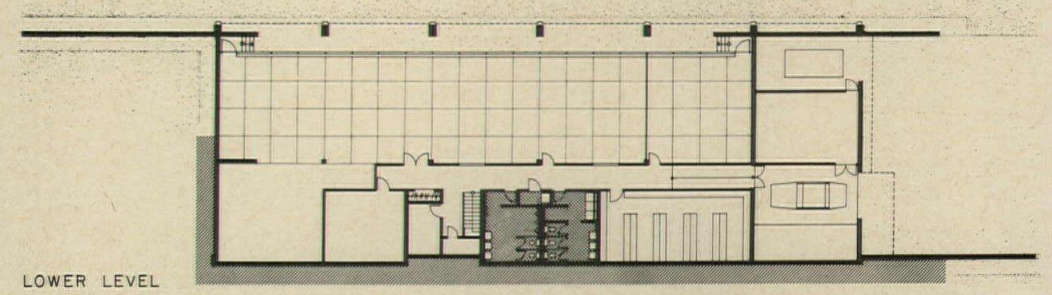
This small office building, now under construction in Connecticut, will have exterior bearing walls of precast panels of only one type. Several of the panels —stacked at the site in readiness for use—are shown in the photograph at right. The architectural expression of the modularity of the construction is rigorously carried out, with elements or parts other than the prefabricated panels in a different material; black brick in this case. The negative angles of brick at the outer corners, and the entrance treatment—again in black brick— are examples. The two-story building is set against a hillside, with entrance at the upper level. This fact is expressed by making the lower-level construction and retaining walls of brick, so that the precast elements become in effect a superstructure on a level base.

The plan is a simple one, with the usual office spaces at upper level, a cafeteria and additional office space, plus service areas, below. The precast panels serve as both exterior and interior finish; other walls are of black brick and partitions of enameled metal. The suspended ceilings are of dark-colored natural cork; floors are finished with resilient tile or carpet, except for the entry and entrance platform, which are of red common brick. A laboratory building—the next project in the company's building program—will be connected to this office building in the future.

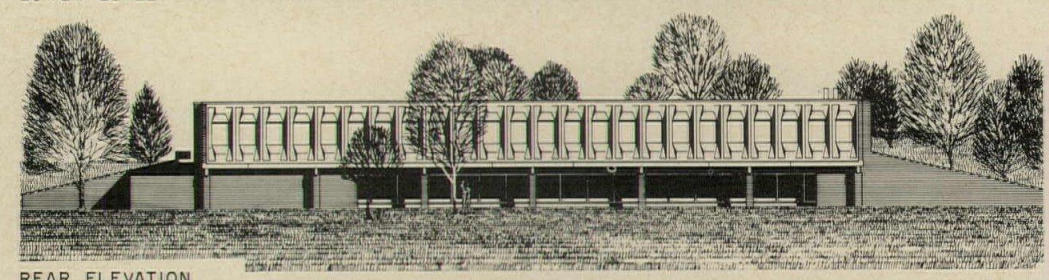


ENTRANCE ELEVATION



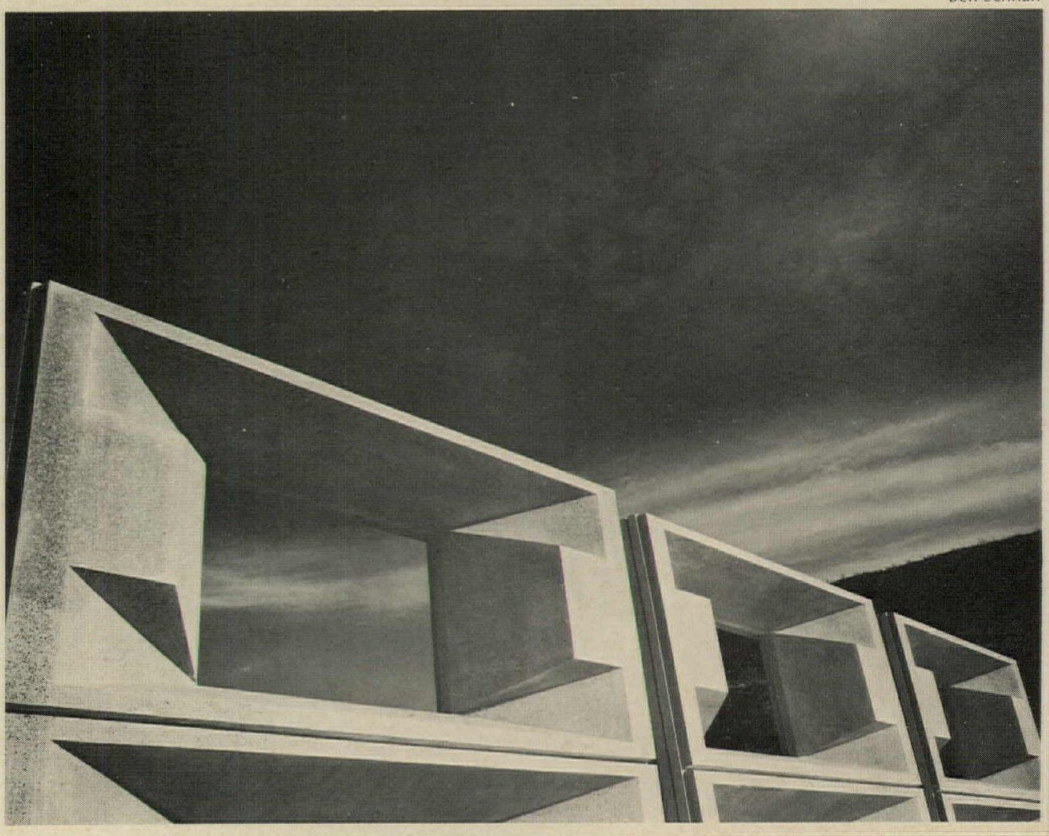


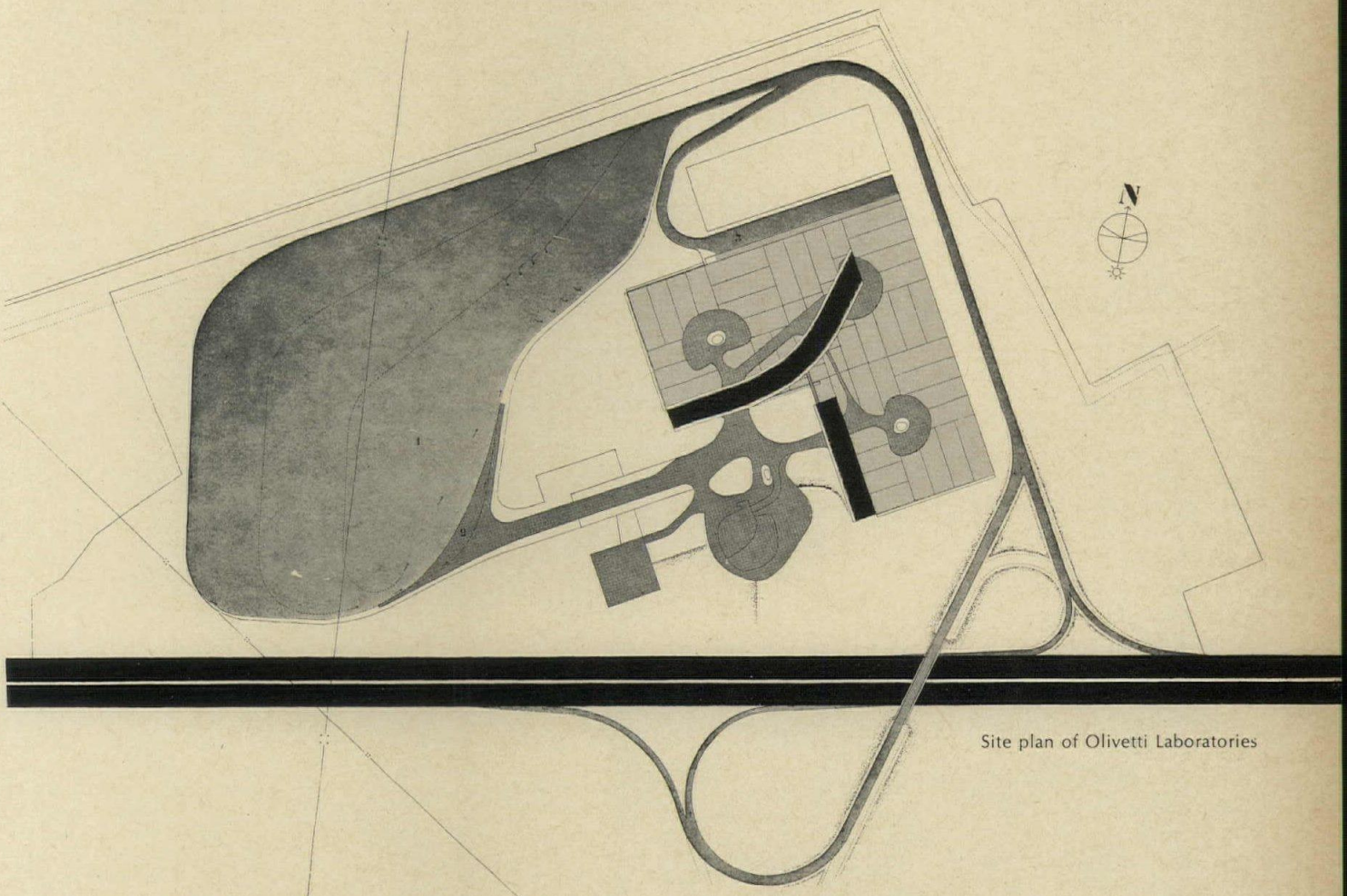
LOWER LEVEL



REAR ELEVATION

Ben Schnall



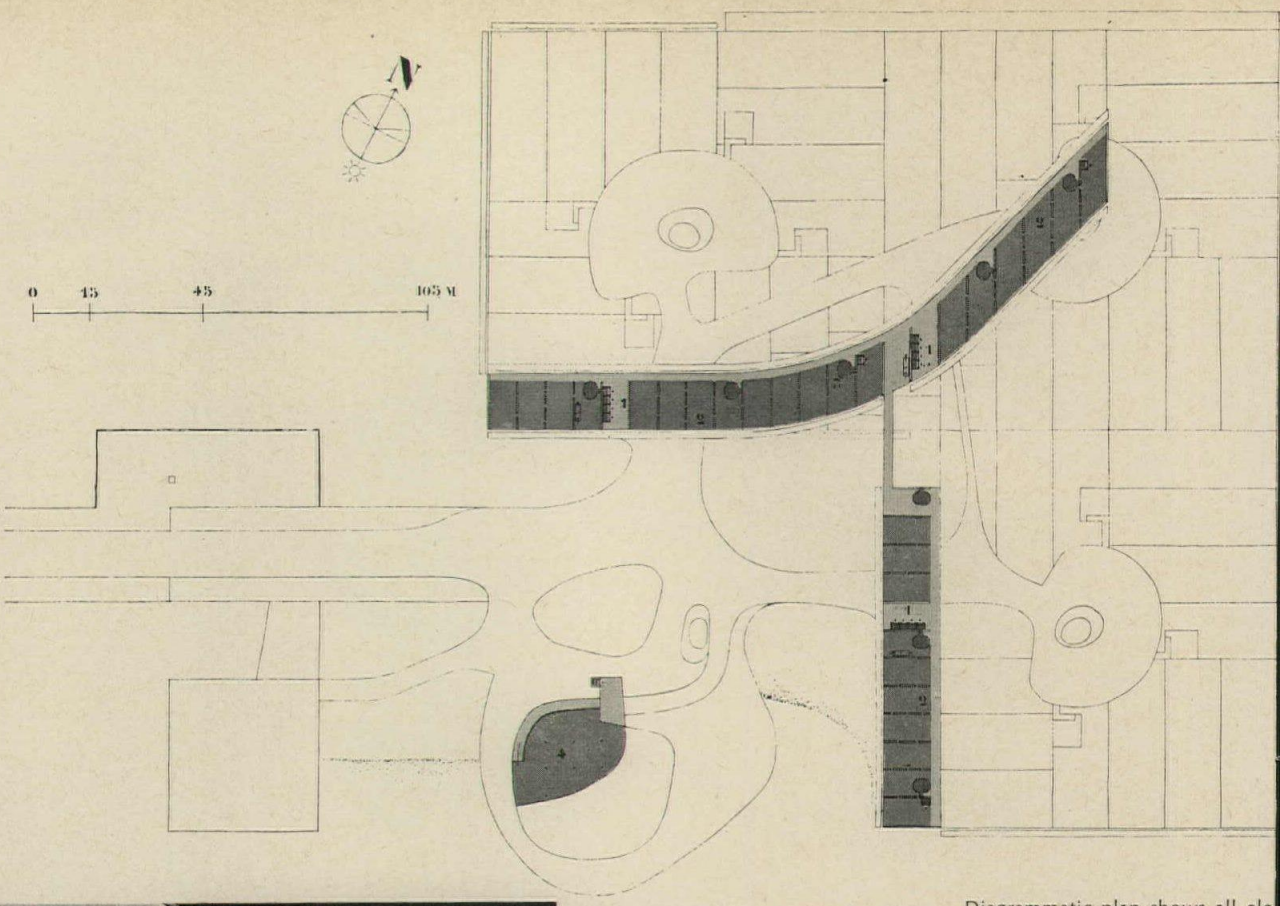


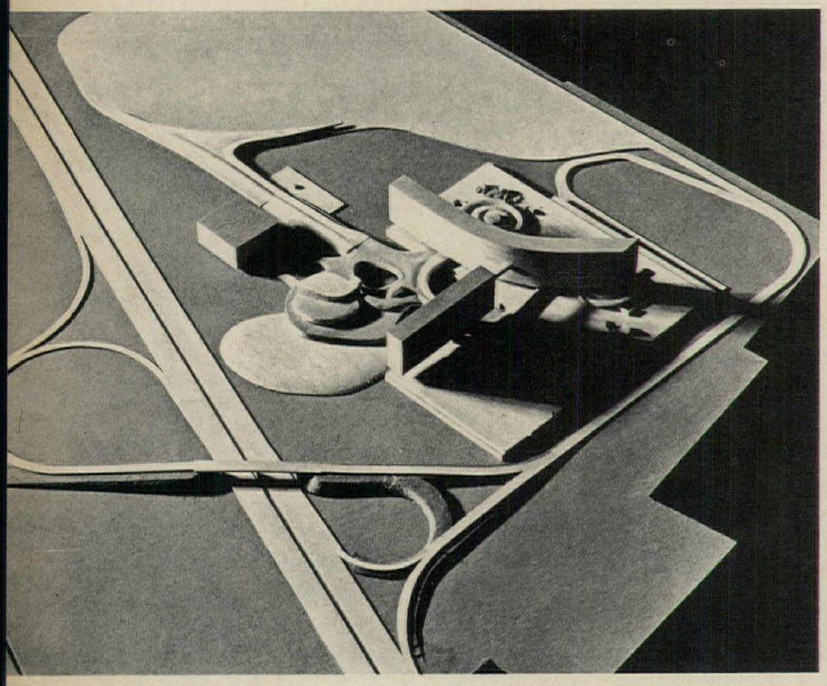
Site plan of Olivetti Laboratories

LAST WORKS OF LE CORBUSIER

Le Corbusier has had the last word. After all the special memorials and appraisals of his work have appeared, his publishers have brought out the final volume of the *Oeuvre Complète,* which includes a significant number of projects that have never been made public before. These late designs reveal a new aspect of Le Corbusier's work. presenting solutions to building types, such as hospitals and laboratories, that often occur in architectural practice, but which he never had any real opportunity to study until the last years of his life. The drawings on the following pages make it clear that Le Corbusier's extraordinarily inventive mind went on producing original concepts right to the end. They add a final chapter to the account of Le Corbusier's continuing search for the nature of architectural form.

Illustrations by courtesy of George Wittenborn, Inc., 1018 Madison Ave., N.Y.C., N.Y. 10021

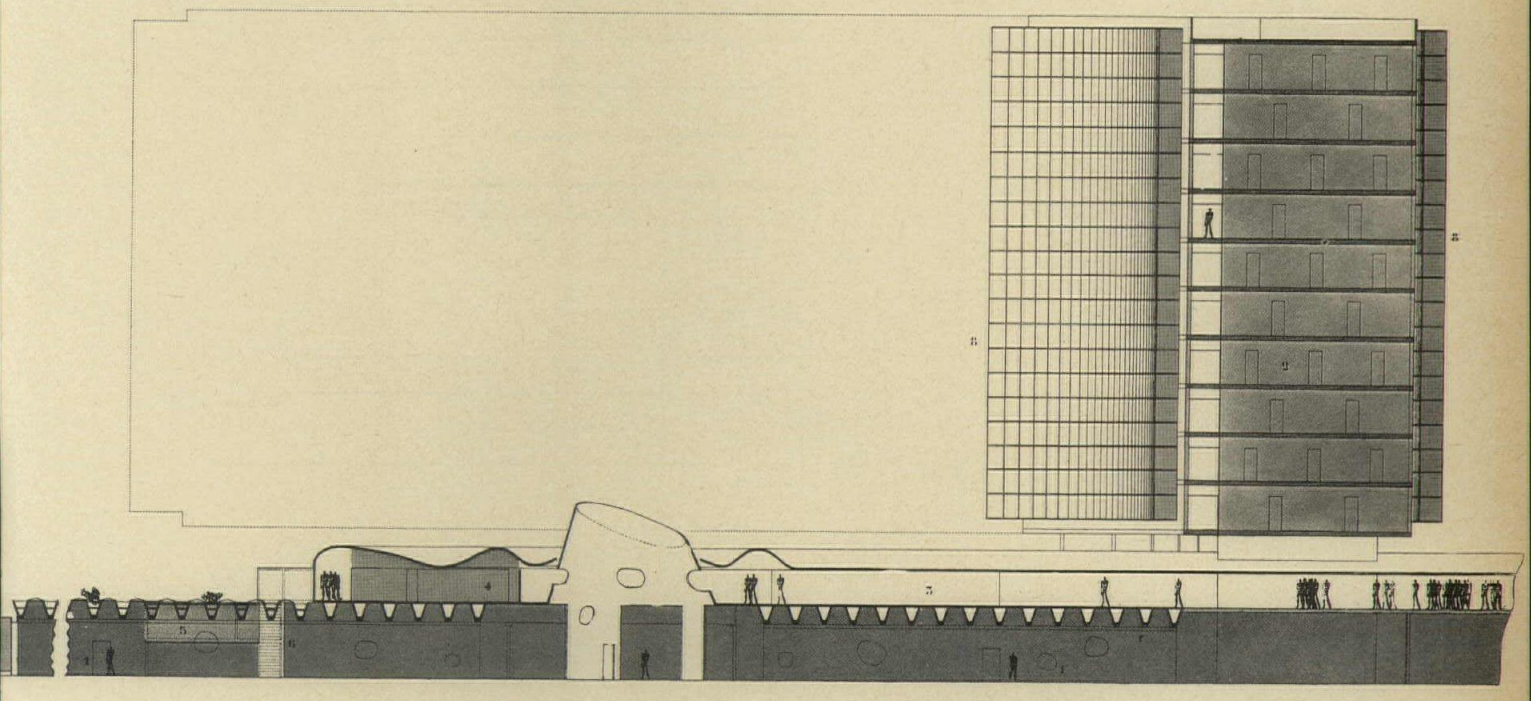




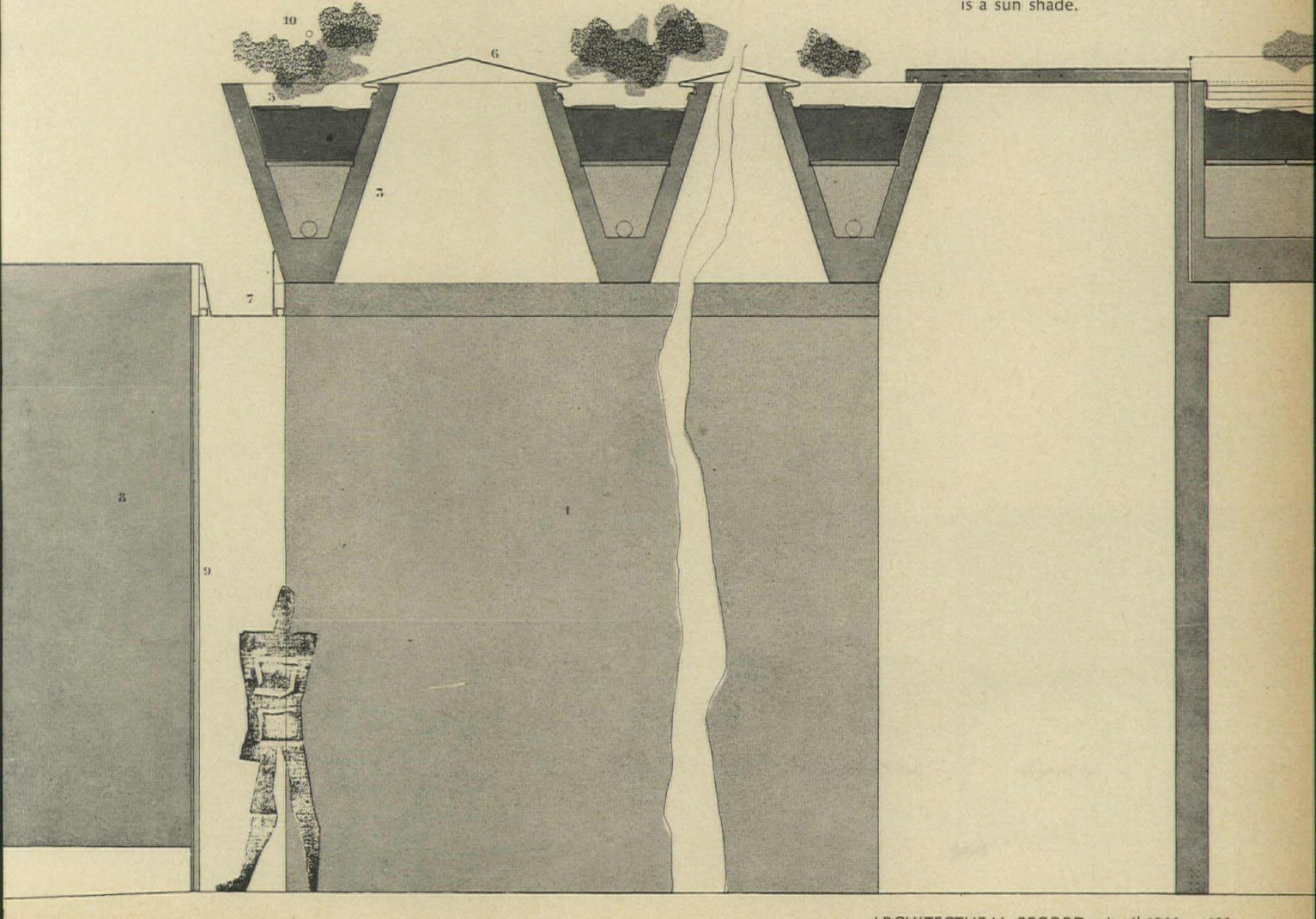
Diagrammatic plan shows all ele ments of building complex. Curv ing lines are covered pedestrian circulation passages. Framing o assembly plant follows a pin wheel pattern, with channel sec tions spanning between the mai beams shown here. Note tha supports for the laboratory build ings follow the grid of the fac tory. Left: Model photograph o whole complex shows access fron the main highway between Mila and Turin. Parking lot will also grow in increments to matc the building.

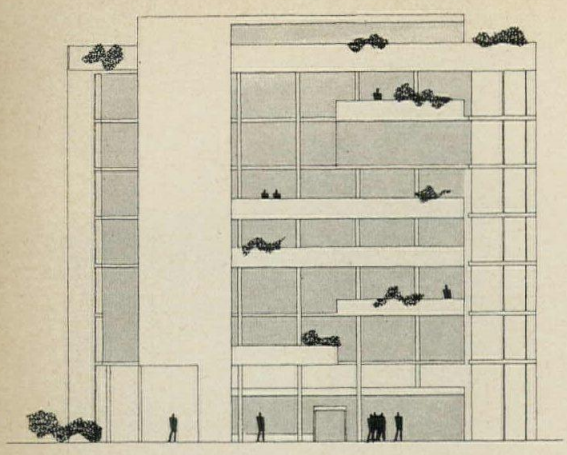
1 OLIVETTI LABORATORIE

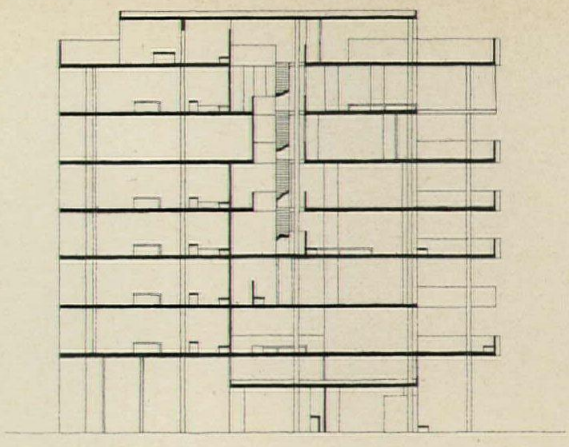
This project succeeds in creating a strong architectural relationship between the variou parts of an industrial complex. The long, low bulk of the assembly plant is treated a if it were part of the landscape; channel sections containing greenery alternate wit skylights to form the roof. Automobiles are parked at the entrance to a series o covered pedestrian passages, which lead past a display area and employe facilities build ing, through the elevator lobbies of the electronics laboratories, and over the roof o the assembly plant to circulation points in the center of each factory unit. Instead o the familiar unresolved division between horizontal factory and narrow, vertical offic and laboratory space, the two are made integral parts of a single composition. Assembl plant, laboratory units and parking lot are each planned to be built in three stages with the same basic relationship preserved throughout.

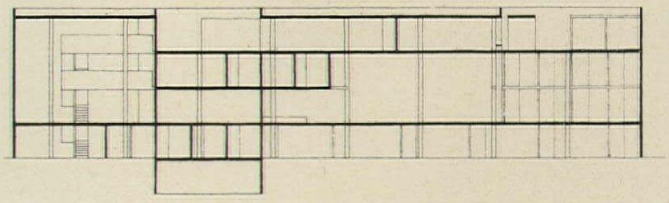


Section through building complex showing covered pedestrian passages on factory roof. Drawing below shows roof structure in detail. Large panel to left of glass is a sun shade.

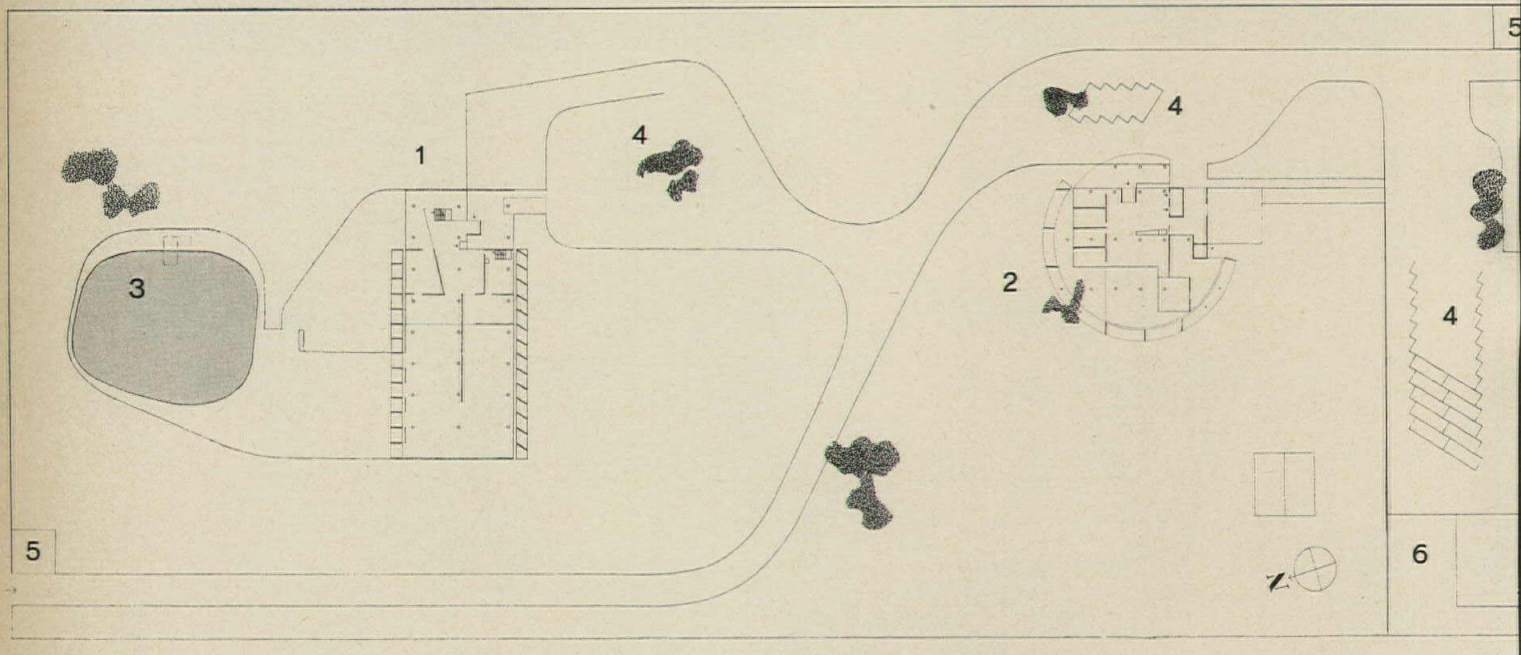




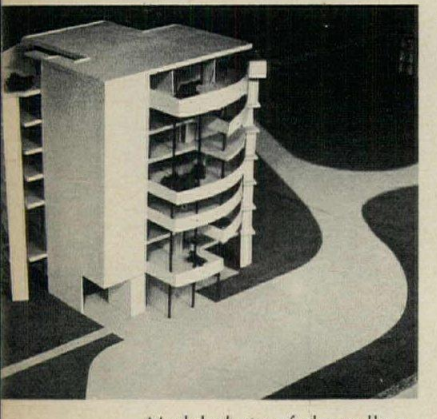




1. Chancellery, shown in section at right; 2. ambassador's residence, shown in elevation and section above; 3. swimming pool; 4. parking; 5. door-keeper; 6. servants' quarters.

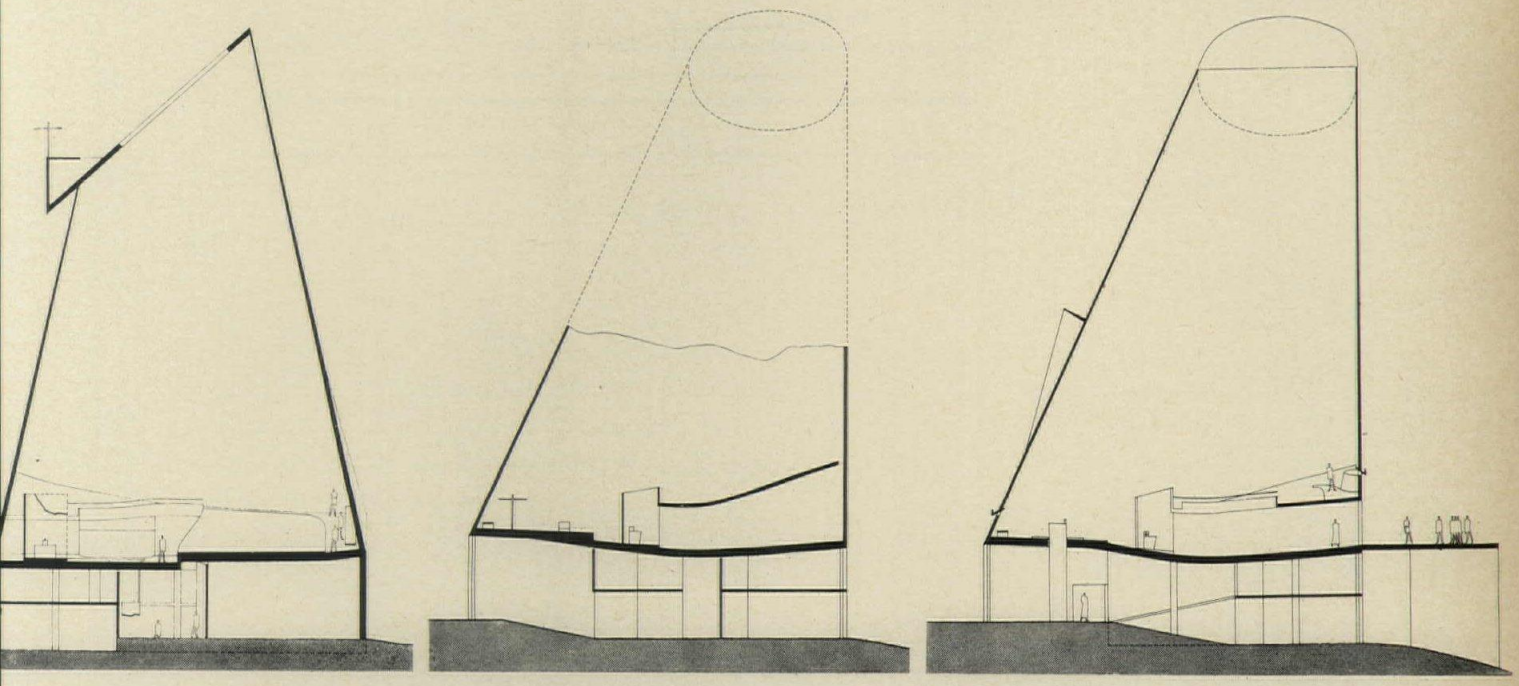


2 THE FRENCH EMBASSY AT BRASILIA

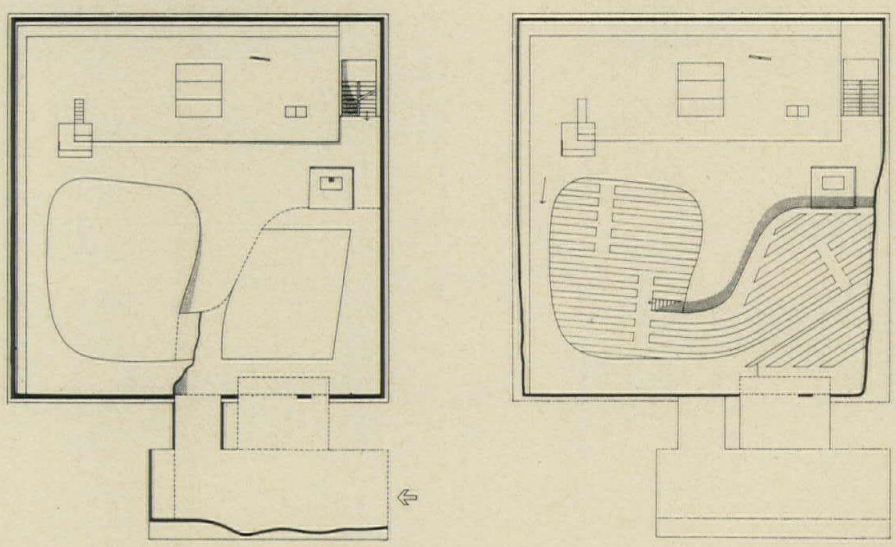


Model photo of chancellery.

Embassy programs have two important parts: the ambassador's official residence and the chancellery, or embassy office building. These two elements very frequently turn out to be of approximately equal size and importance, as they have in this case, presenting the architect with an exceedingly subtle relationship problem. Le Corbusier has handled the situation in virtuoso style, first by making each building as unlike the other as possible, and then by carefully relating their proportions and the general configuration of the space. The office building is vertical and essentially cylindrical in form; the residence horizontal, its plan a long rectangle—but the sun shades and the high interior spaces create correspondences between the two. It is appropriate that Le Corbusier should have designed a building for Brasilia, where his ideas have been so influential; perhaps his architecture will one day be influential there as well.

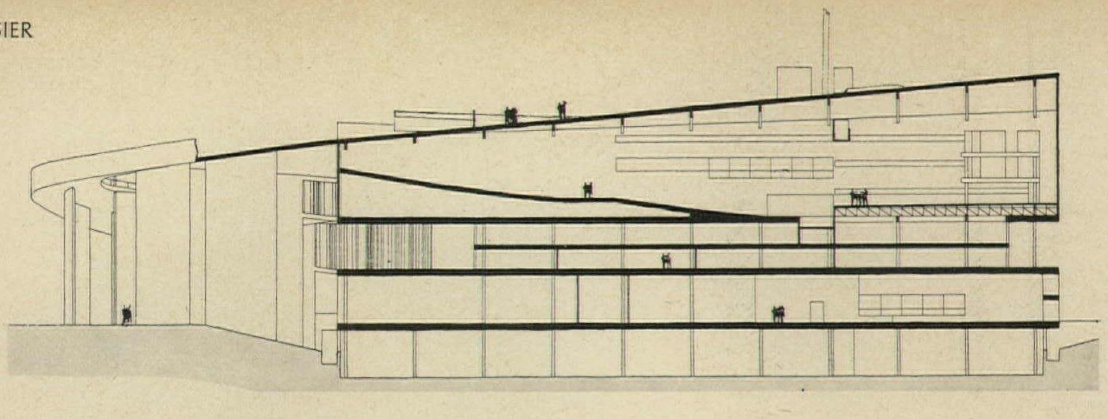


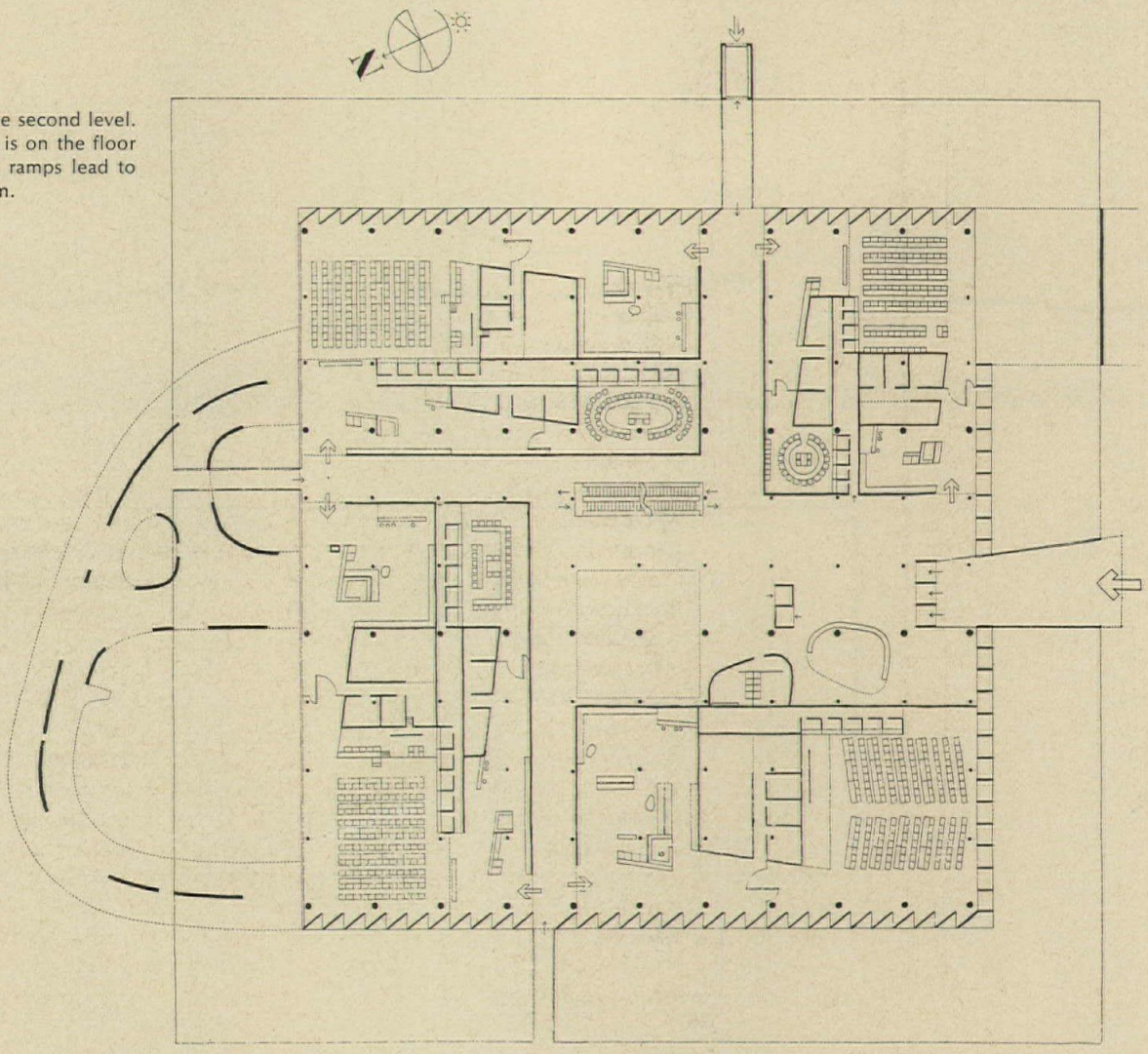
North-south and east-west sections of church. Structure is hyperbolic paraboloid shell.



3 CHURCH AT FIRMINY-VERT

Le Corbusier has invented an unusual architectural form for this church: a truncated cone that rises from a square base, with the cone tilted so that one side is perpendicular to the ground. The surfaces of this figure are hyperbolic paraboloids, which means that the form work can all be straight-line timbers. The auxiliary functions of the church, such as the parish hall, classrooms and sacristies are all in the rectilinear base. Within the cone of the church itself, the plastic form of the seating rises continuously to form a gallery. Le Corbusier had used an analogous hyperbolic paraboloid cone for the assembly chamber at Chandigarh, but there the form was much more geometric and rationalized. At Firminy the apparent simplicity of the church's basic shape masks considerable complexity of spatial organization; and the slope of the gallery blends with the curve of the walls to create a new, self-contained system.





Plan shown is of the second level. The main entrance is on the floor above, from which ramps lead to the main auditorium.

4 CONFERENCE CENTER IN STRASBOURG

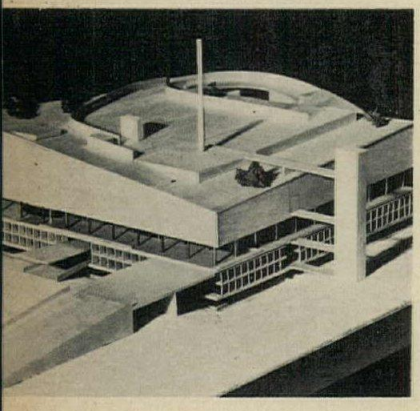
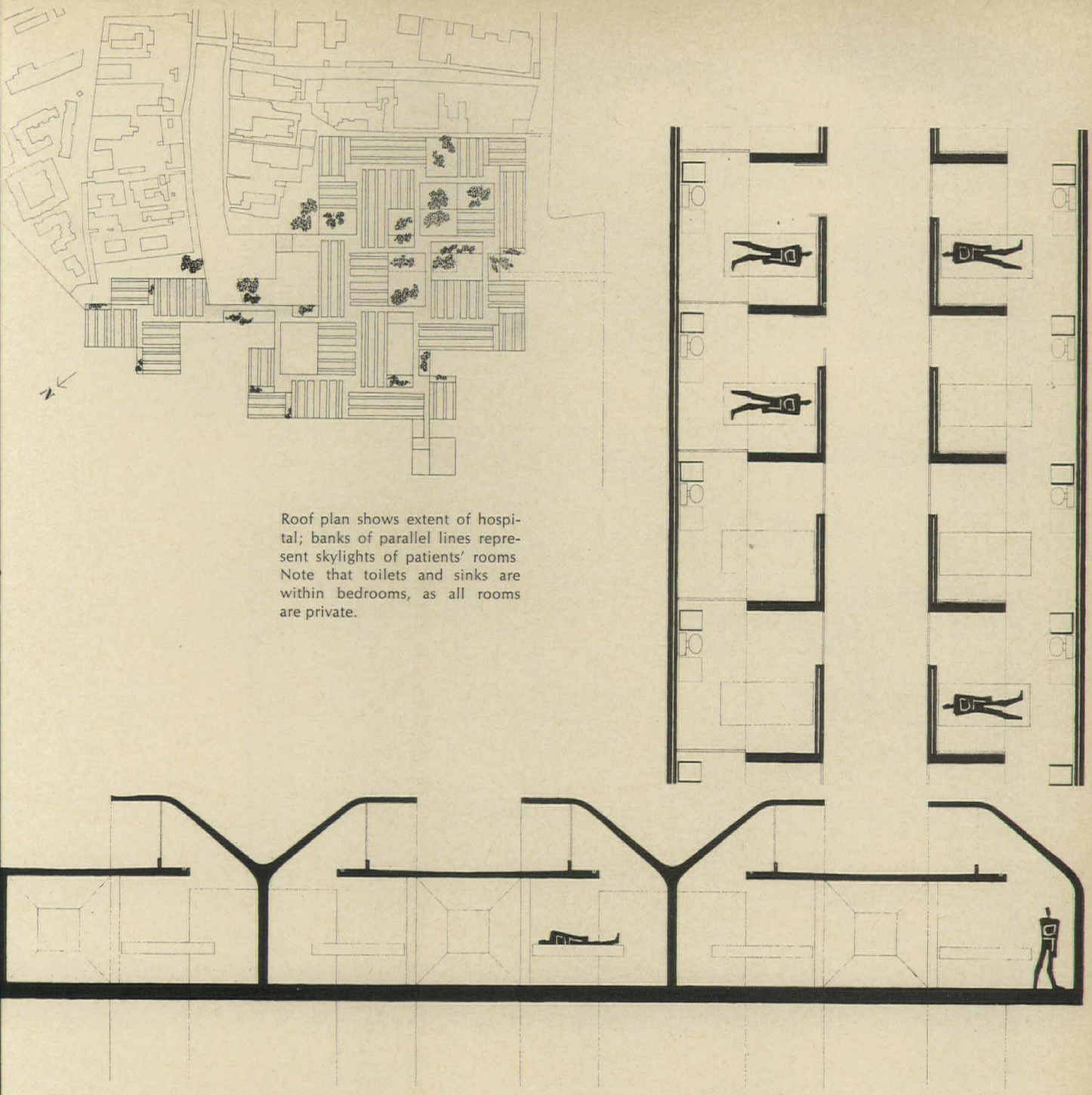


Photo of model shows entrances.

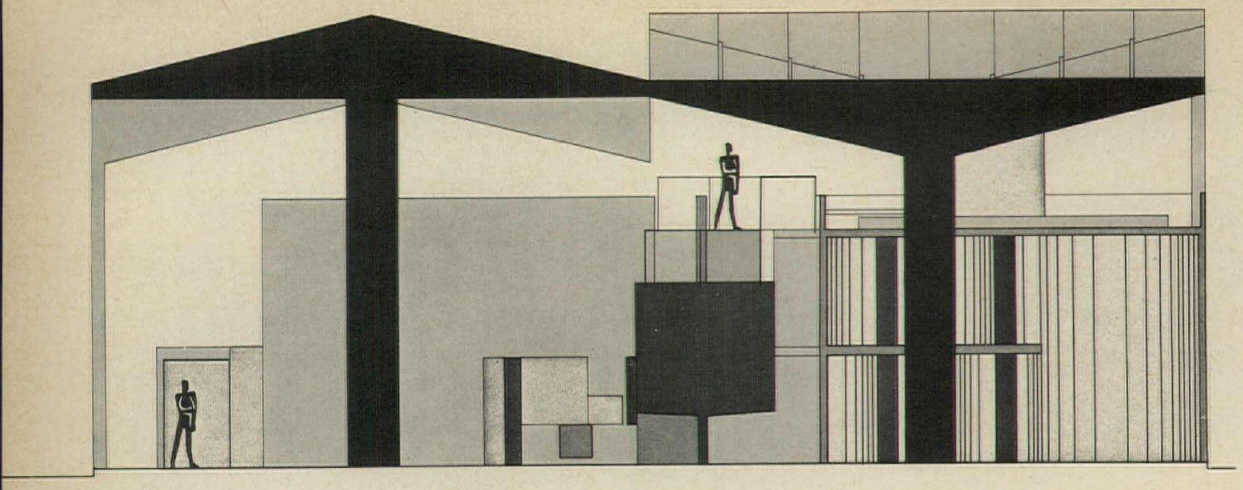
Le Corbusier felt that a building, no matter how complex its program, should have a strong shape that could be easily read from a distance. The complicated requirements for this conference center, involving many auditoriums of different sizes and an intricate circulation pattern, have been contained in a square plan and a hyperbolic paraboloid roof plane. The plan shown is that of level two. The principal entrance level is on the floor above, and from it the broad ramps curve upwards to the large hall at the top of the building. For once in Le Corbusier's stormy career he felt himself on good terms with his client: "Mr. Pflimlin, the mayor, and the excellent administrators of the city had conceived a perfect program. Under such favorable conditions an architect can say he works as if for God: with conscientiousness, integrity, loyalty. Then only can one appreciate the fact that architecture is of passion . . ."

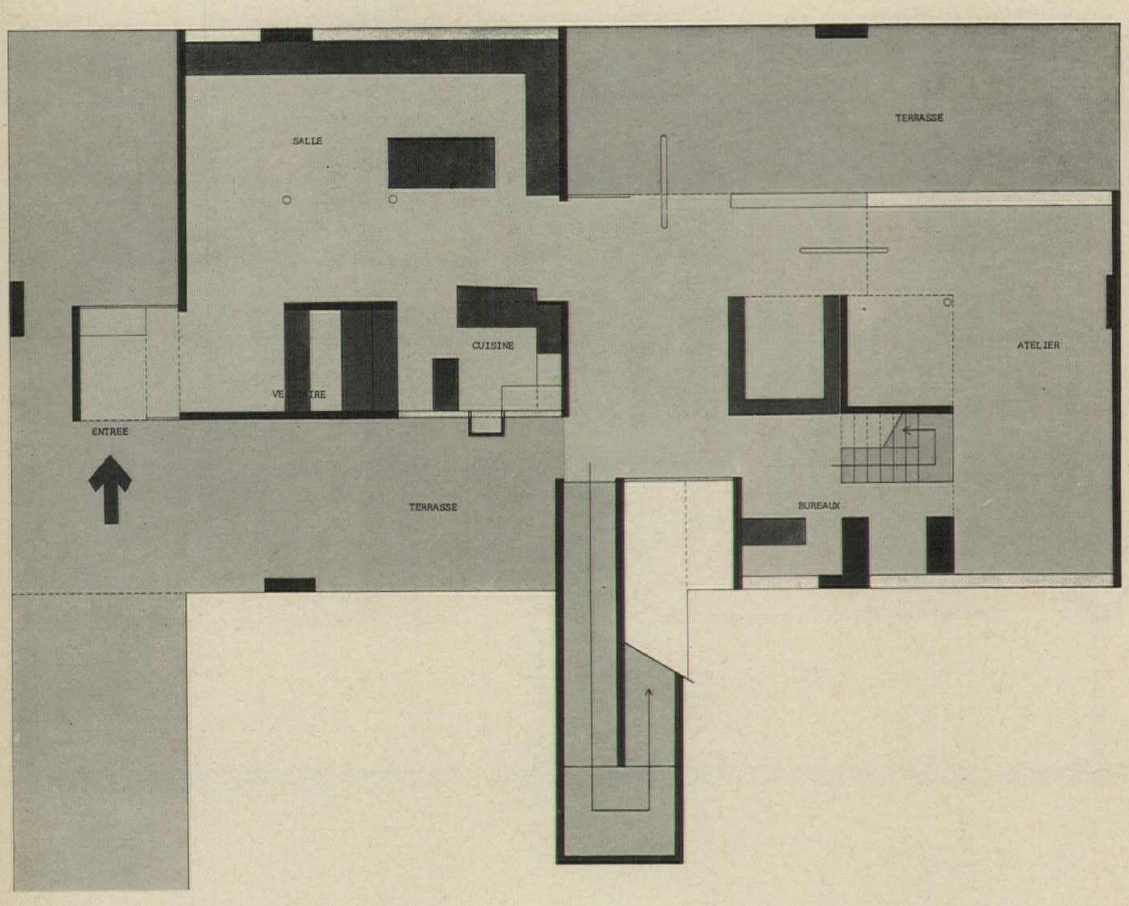


Roof plan shows extent of hospital; banks of parallel lines represent skylights of patients' rooms Note that toilets and sinks are within bedrooms, as all rooms are private.

5 HOSPITAL AT VENICE

In order that this large hospital would not break Venice's low skyline, Le Corbusier completely rethought the program in terms of a horizontal circulation system, instead of the generally accepted vertical arrangement. The hospital is divided into four levels. On the first are the entrances, administrative offices, and the kitchens. The operating suites and the nurses' residence are placed on the second level. The third level is given over entirely to three completely segregated circulation systems, for supplies, patients, and maternity patients. The bedrooms themselves form the top floor. It is the unusual design of the bedroom that makes this composition possible. By substituting skylights for windows, Le Corbusier was able to group the rooms in compact blocks, which can be directly related to the operating suites below. As the hospital is entirely for intensive-care patients, this is a highly appropriate arrangement.





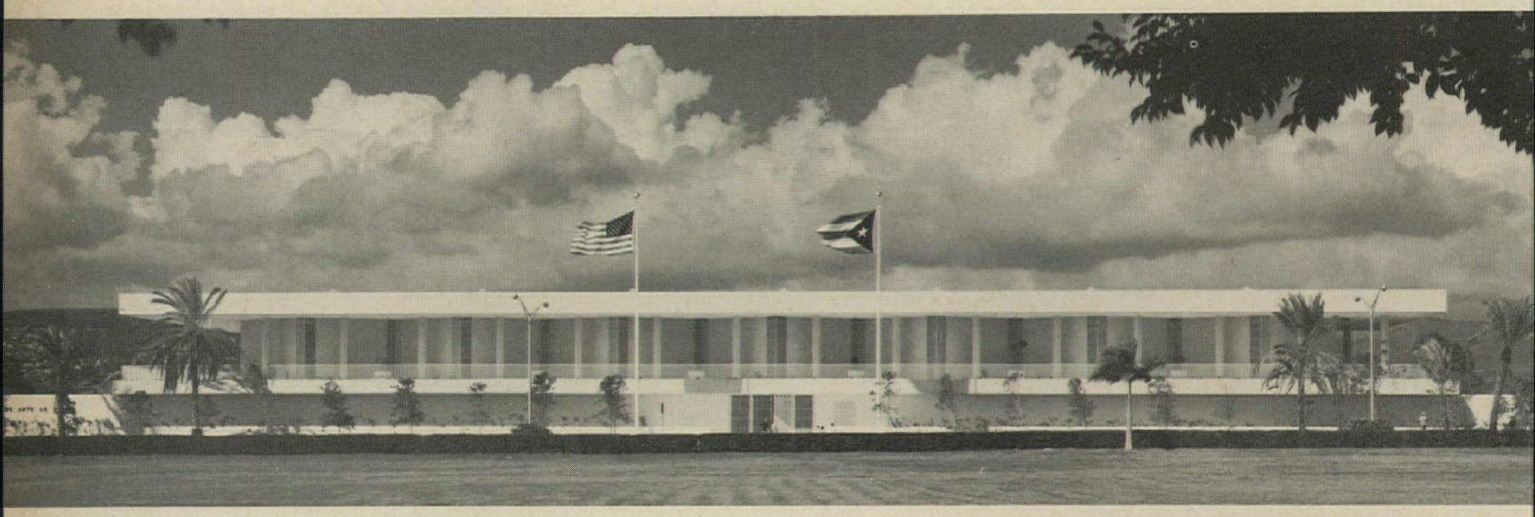
6 RESIDENCE AND GALLERY IN ZURICH

This building will be both a residence and a gallery for Mrs. Heidi Weber, who has represented Le Corbusier's painting, sculpture and graphic work in Zurich for a long time. It will be located in a park by the lake shore, and, in a way, will now become a memorial. Its design brings together a number of recurring themes from Le Corbusier's work: the roof composed of two hyperbolic paraboloids of opposed directions (which eliminates the need for a central support), the separation of the roof from the building itself, and the use of a seven-foot, five-inch module. The left-hand portion of the plan contains the residence; the gallery is on the right. Upstairs are two bedrooms, and further display space is located on a balcony overlooking the gallery. The roof will be of sheet metal painted battleship gray, the walls of blue porcelain enamel panels. The ramps lead to an outdoor terrace under the shelter of the roof. *—Jonathan Barnett*

THREE MUSEUMS

With the vast new public involvement and interest in the arts, a museum has to be more than a totally flexible space, designed solely for the most effective display of art objects. Museums are fast regaining their role as examples of major public and civic spaces, and the architect must exercise much discretion and sensitivity in interpreting each program to strike a balance between the curator's ideal loft space and the architect's ideal designed space. Edward Durell Stone in his Ponce Museum in Puerto Rico (see overleaf) chose to achieve a close and subtle relationship between the outdoor temperate climate and the naturally ventilated gallery spaces in a small structure. William L. Pereira at the Los Angeles Museum (page 200) attempted to create a "sense of place" in the civic space created by the interrelationship of three major buildings. James Sudler and Gio Ponti at the Denver Museum (page 204) have made clear the organization of exhibits by stacking galleries in an easily understood vertical arrangement.

Julius Shulman



PONCE:
DESIGN FOR A TEMPERATE CLIMATE

Architect Edward Durell Stone has developed two main objectives in the design of this small museum: to have naturally ventilated gallery spaces that take advantage of the temperate Puerto Rican climate, and to create ideal circumstances for the viewing of art.

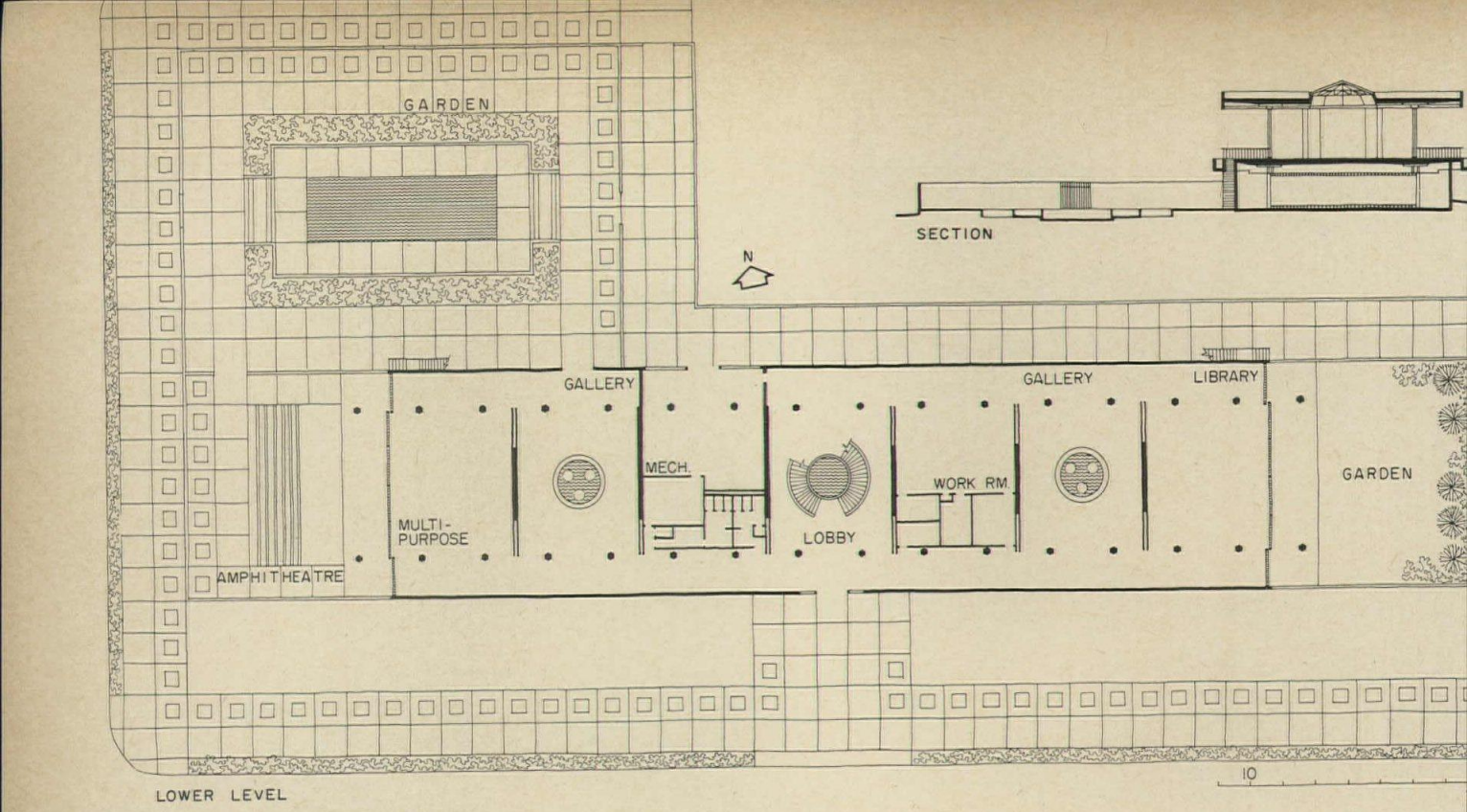
The two-story rectangular structure derived from an original conception of the museum as essentially an outdoor exhibition space covered by a great concrete space frame. In this scheme, the exhibits would be hung on a series of screens which would pivot to close the museum at night. Security problems and sudden changes in weather ruled out this solution, but vestiges of the concept remain. On the second floor are a series of seven connected hexagonal galleries. At each fold on the long sides of the building are open grilles, permitting cross ventilation, diffused light, and views of the landscape. Sixteen-foot-high mahogany doors slide to close these openings at night.

Around the galleries on the second floor is a 12,400-square-foot terrace where there will be a continuous row of planting, and which is intended as a sculpture display area. At the lower level, walled in on three sides, are three patios—one of them (at the west end) with a semi-enclosed amphitheater.

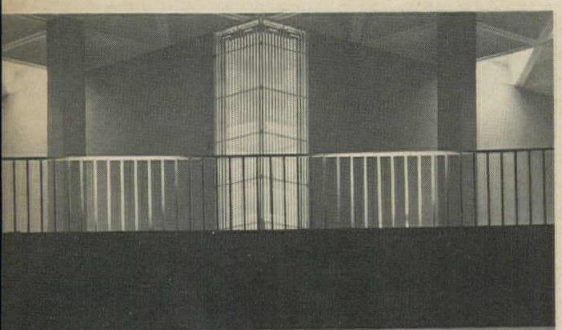
The $1.7-million building is of reinforced concrete frame construction. The exterior walls are faced with trowelled-on marble aggregate in an epoxy binder.

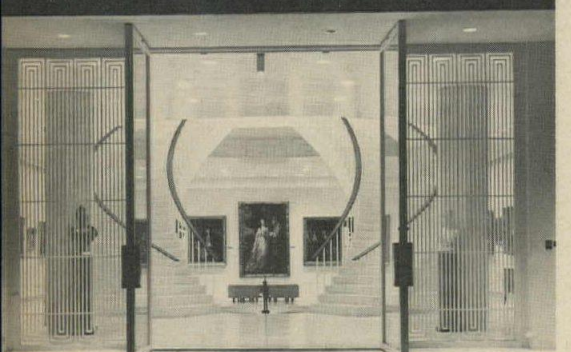
Surrounding the galleries is a 12,400-square-foot terrace, left, intended for display of sculpture. Triangular motif in roof overhang is repeated in flooring and interior hung ceiling. Grille openings permit cross ventilation and diffused light for galleries. The north or Puerto Rican patio at the rear of the museum, below, is one of three walled gardens on three sides of the structure. The west or American patio, containing a semi-enclosed amphitheater and a bust of Lincoln, is connected by a door to the north garden. At the east end is the Spanish patio, containing a 17th-century Spanish fountain.

©Ezra Stoller Associates photos



LOWER LEVEL





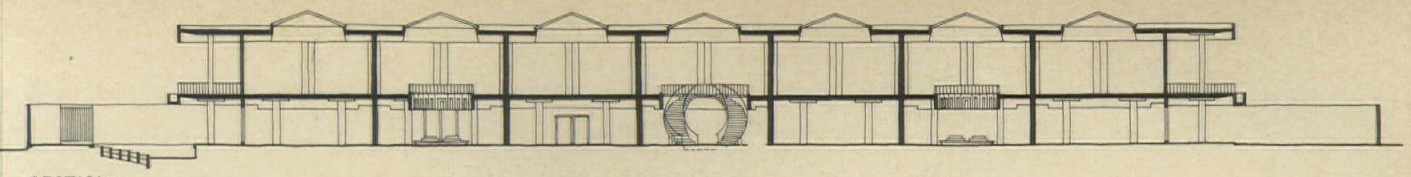
Entrance, left, at ground level, has metal grille pattern echoing openings at second level. One of the two ground-level interior courts, left, below, under the skylights of the second level.

Ponce:
Gallery spaces take advantage of breeze and ligh

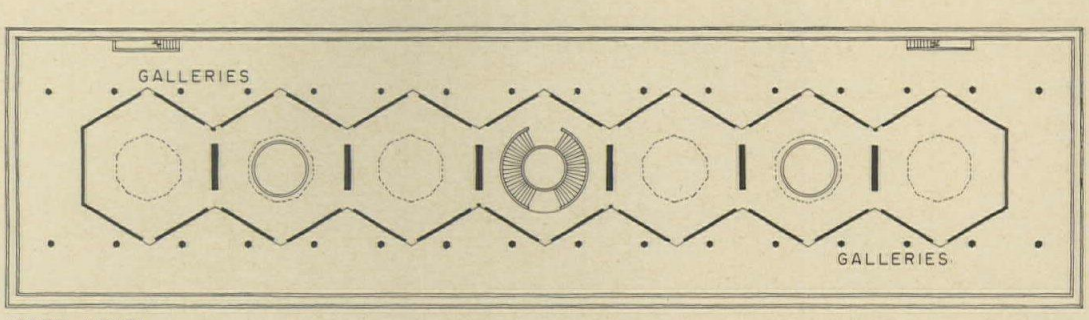
"Horizontal organization is the most natural solution for small museum. Where short distances are involved, you ca let the visitor get around on his own," says the architect.

The visitor enters centrally on the first floor. To his le and right are galleries for changing exhibitions, organize around interior courts under light wells open to diffusing sky lights. Immediately confronting the visitor is a horseshoe stai way leading to the hexagonal galleries for the permanent co lection. Why hexagonal? "Better display results from a limite number of paintings being shown on each wall plane," M Stone says. Further, the viewer can get a quick panorama of subjective grouping of paintings in each gallery space. Oper ings at the apex and re-entrant angles of the hexagons allo diffused natural light while avoiding reflections. In additio natural lighting is provided by 22-foot-diameter, 18-sided double-glazed skylights over each hexagon. Suspended unde the skylight is an open-hung ceiling of triangular shapes withi an hexagonal pattern, and the triangular shape is repeated the terrazzo floor. Artificial lighting is recessed in the plast tracery and cove lighting is provided.

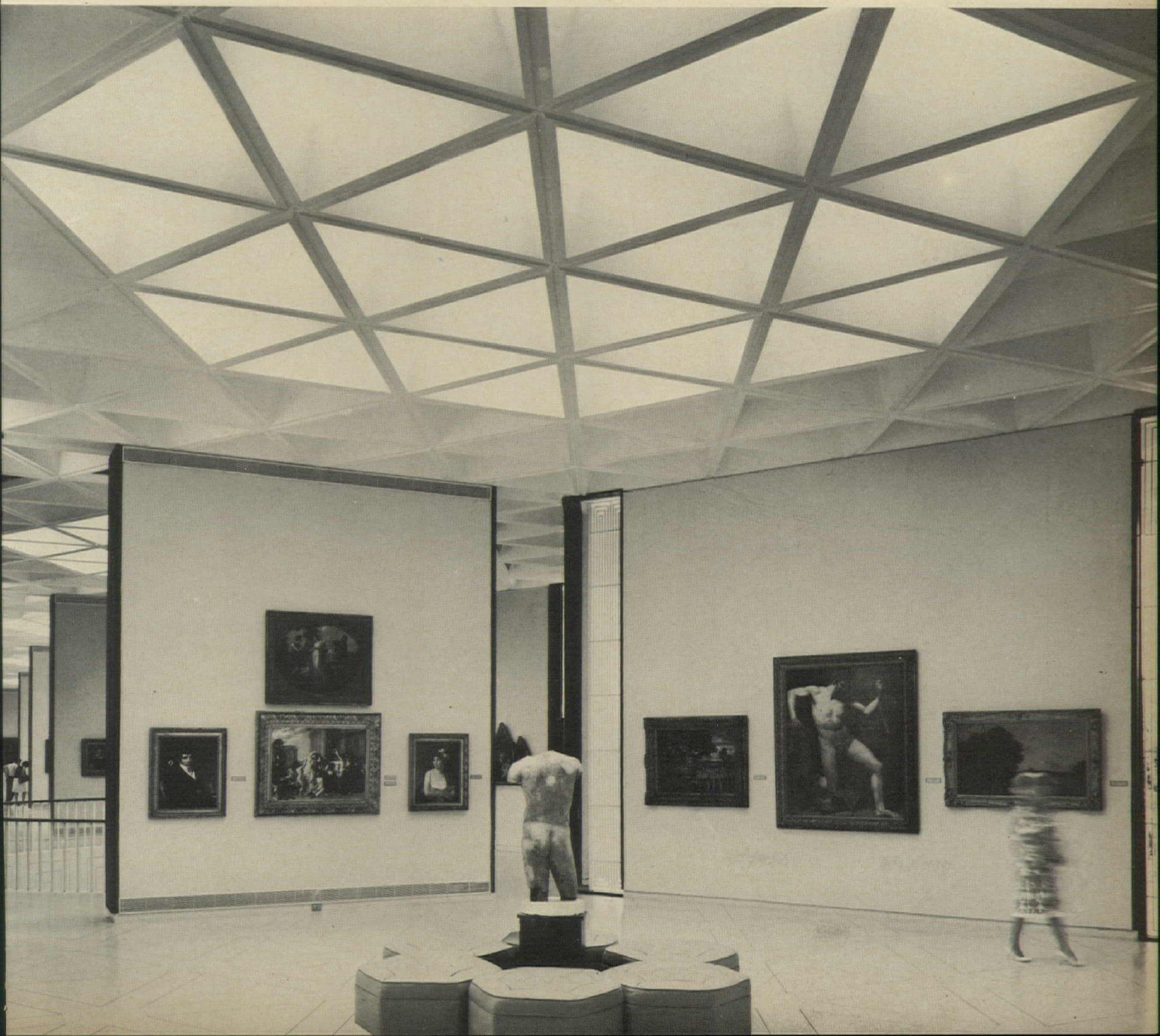
THE PONCE MUSEUM OF ART, Ponce, Puerto Rico. Architect: *Edwa Durell Stone;* supervising architect: *Carlos Sanz;* structural enginee *Paul Weidlinger;* mechanical engineer: *Cosentini and Associate* landscape architect: *Edward Durell Stone, Jr.;* general contracto *Edward J. Gerrits.* Financed and run by the *Luis A. Ferre Foundatio*

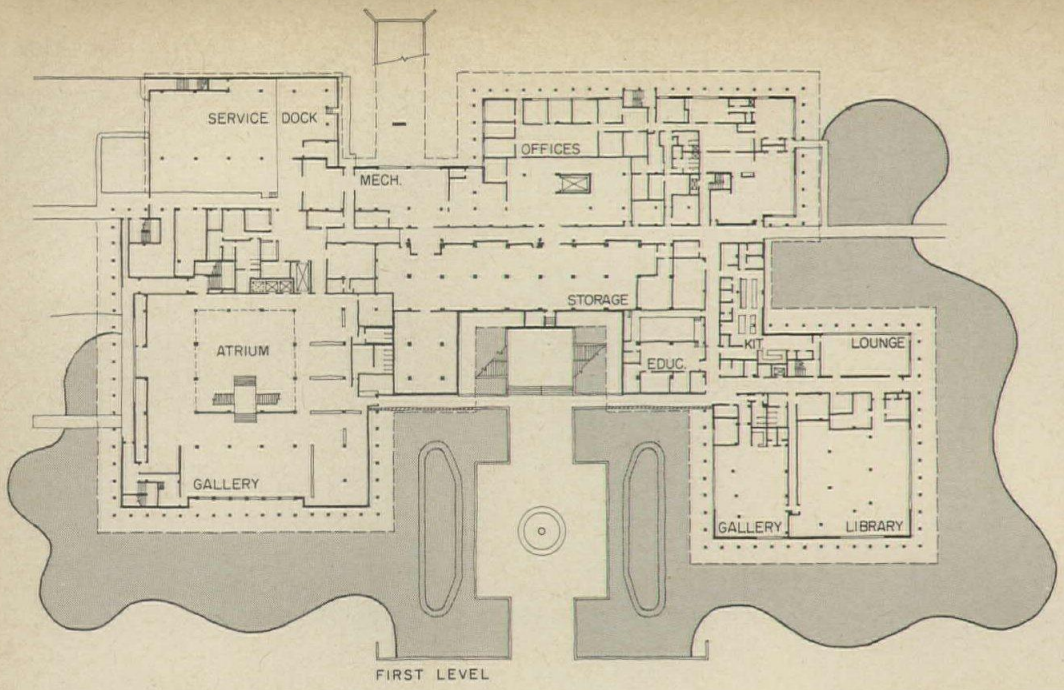


SECTION

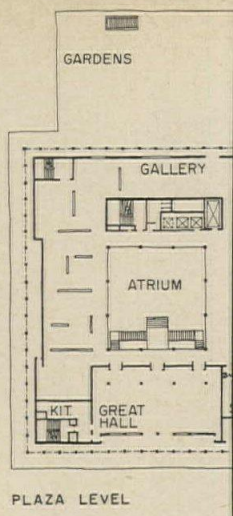


UPPER LEVEL





FIRST LEVEL

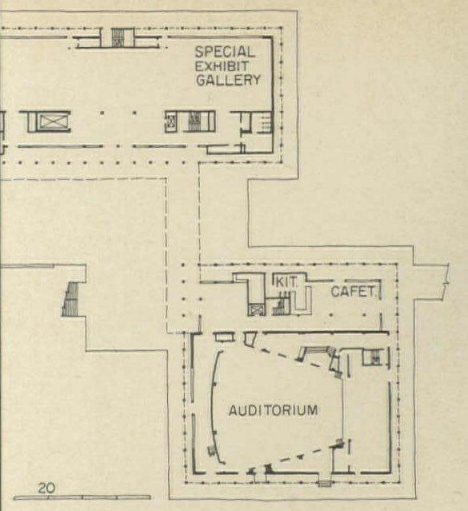


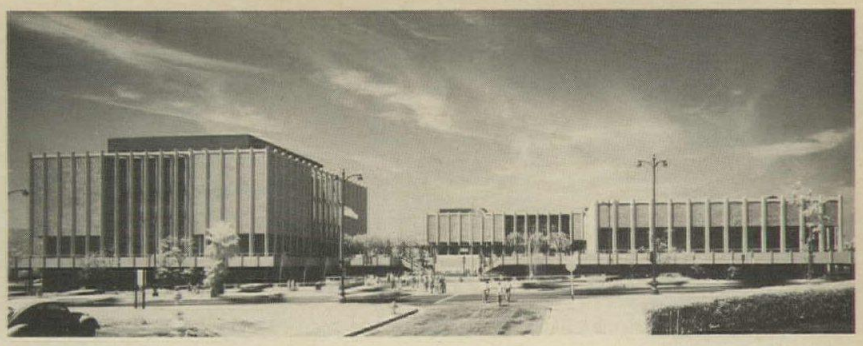
PLAZA LEVEL

LOS ANGELES: COMPLEX CREATES A CIVIC SPACE

"The final design of the art museum represents the result o an attempt to create a 'sense of place'," says William Pereira "by emphasizing the void defined by the buildings rathe than the structures themselves, with the design characte established by the open plazas and promenades." The archi tect chose to segregate the functions of a large museum int three distinct structures: the Ahmanson Gallery of Art, four-level, 85-foot-high structure planned around a centra atrium, which houses the museum's permanent collections the Lytton Gallery, a three-level structure containing galleries for temporary exhibits, sculpture garden, and offices; an the Bing Education and Auditorium Building containing 45,000-volume library, children's art gallery and auditorium

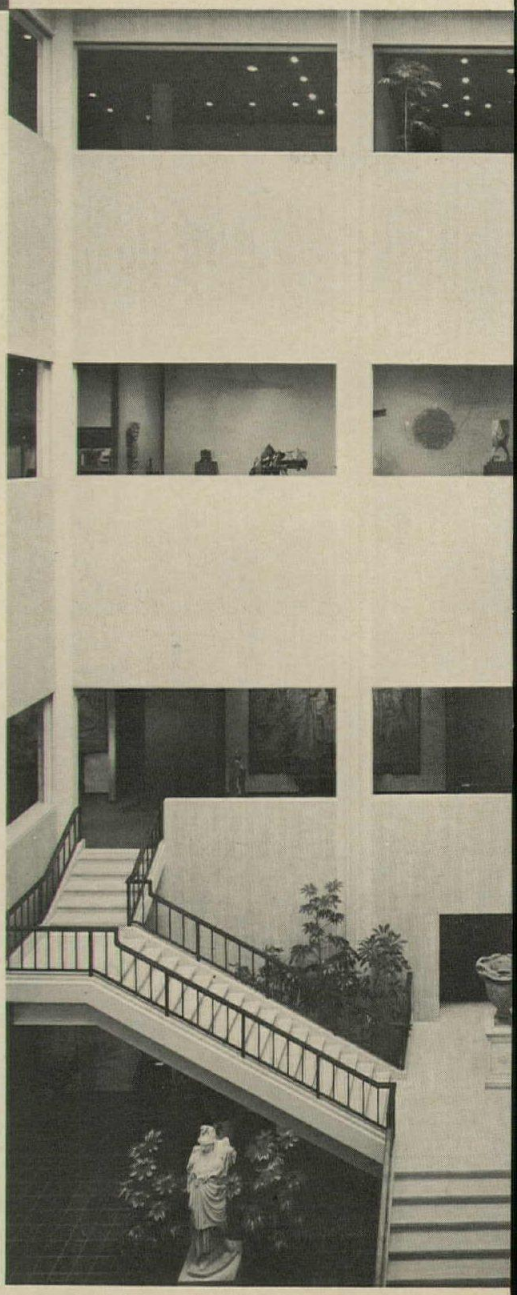
The extremely low bearing value of the foundation so over tar pits made necessary the design of structurally light weight buildings—hence the use of steel frame. The archi tect wished to "convey a sense of classical simplicity withou overwhelming monumentality." To achieve this he use slender columns on 10-foot centers, using as infill a facin of split-face marble tile. All columns function as structura elements and exterior columns are covered with poured-in place concrete. Because of the severe limitations of the site the architect used a reflecting pool "to encourage the illusio of a more generous setback" than there is. The $11.5-millio complex was financed entirely by private funds.





From left to right, above, are the Ahmanson Gallery of Art, the Lytton Gallery and the Bing Education and Auditorium Building. The complex, located over tar pits, presented a sensitive engineering problem. Particular attention was given to achieving lightness in the four-story Ahmanson Gallery to balance loads against the adjoining one-story plaza and three-story Lytton building. Warren trusses were used in lieu of deep beams on spans 50 feet and shorter over the galleries—permitting unrestricted layout of air-conditioning ducts and of piping within the attic plenum spaces.

Julius Shulman photos

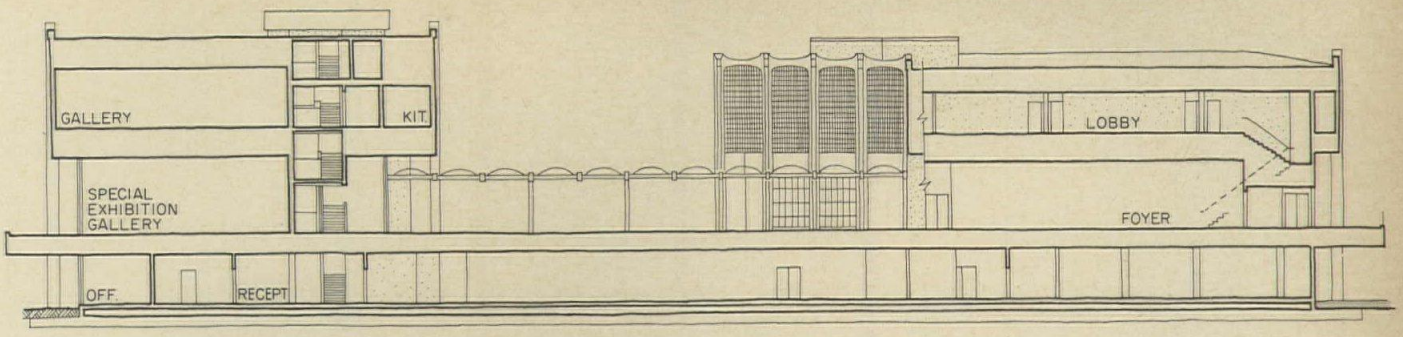


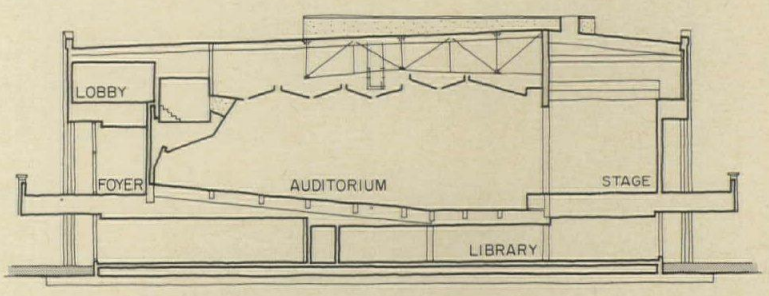
Los Angeles: Interior spaces are shaped to varied needs

The requirements of a large museum call for a great diversity of display areas and techniques. The principal unit of the complex, the Ahmanson Gallery, has four levels of galleries arranged around an 85-foot-high central court topped by a 60-foot-square skylight that admits natural light to all four levels. The skylight also simulates sunlight for dull days or nighttime use. The dividing walls are laid out to permit continuous circulation with no closed partitions to interrupt the flow. Additional artificial lighting has been designed for maximum flexibility, with each painting receiving its own lighting from a group of flush incandescent fixtures in the ceiling. Also within the Ahmanson Gallery is the two-story Great Hall, which is planned for the display of large scale works.

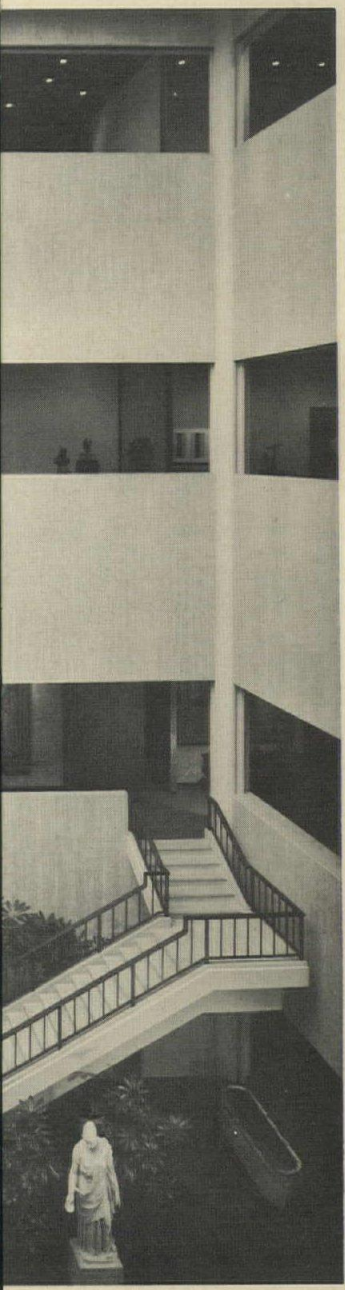
Located within the Lytton Gallery are facilities for temporary exhibitions. On its main level, off the plaza, is a gallery designed with a special ceiling grid to accommodate modular partitions that can be arranged to meet the special requirements of changing, temporary exhibits.

THE LOS ANGELES COUNTY MUSEUM OF ART, Los Angeles. Architect: *William L. Pereira & Associates, James H. Langenheim, partner in charge, Charles Kratka, associate in charge of interiors;* structural engineer: *S. B. Barnes & Associates;* mechanical engineer: *Ralph E. Phillips, Inc.;* electrical engineer: *Frumhoff and Cohen;* foundation engineering: *L. T. Evans;* acoustics: *Paul Veneklasen;* consulting landscape architects: *Thomas D. Church & Associates;* resident landscape architects: *Robert Herrick Carter & Associates;* and builder: *Del E. Webb Corporation.*

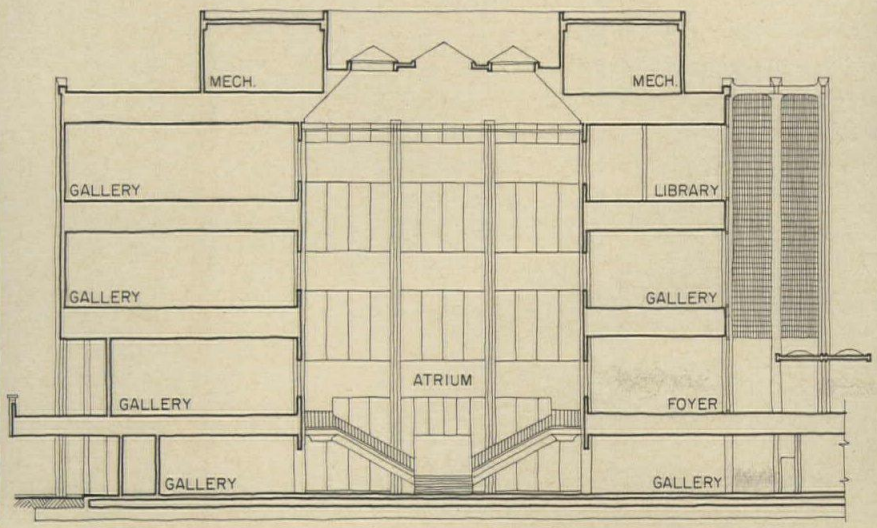


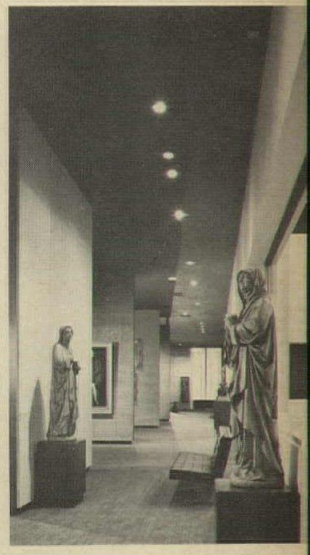


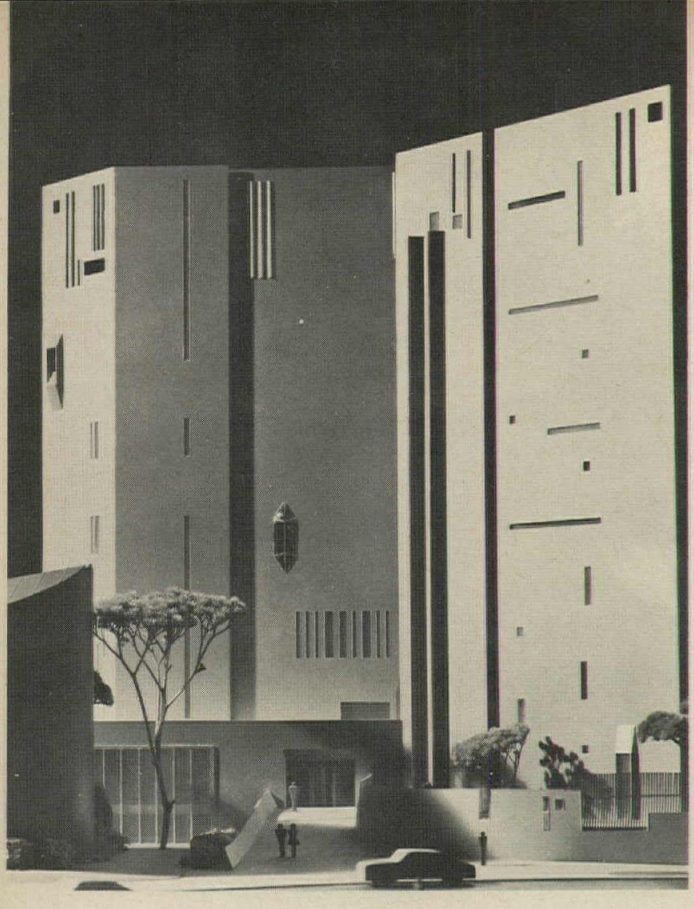
The interior of the Lytton building, far left is designed for maximum flexibility for changing exhibitions. The ceiling grid accommodates modular partitions that can be rearranged. The 600-seat auditorium, left, was built over a library and children's gallery with very limited vertical space possible. Again, because of the weight and because of the headroom problems, the underfloor air plenum was constructed of steel decking and lightweight fireproofing instead of concrete slab.

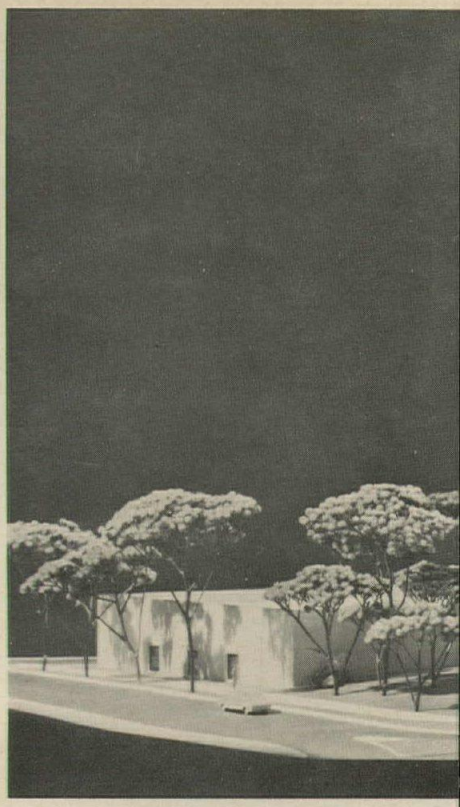


The Ahmanson Gallery arranges some of its exhibition spaces around a central 60-foot-square atrium. The skylight admits natural light to each floor and simulates natural light on dark days or at night. Circulation between levels is achieved by three elevators and the grand staircase. Wall coverings on the first level are varying shades of velvet. A monk's cloth covering is used on the top three levels. The partitions, below right, are arranged to permit a continuous flow through the galleries of each level. Never do the partitions create a dead end.





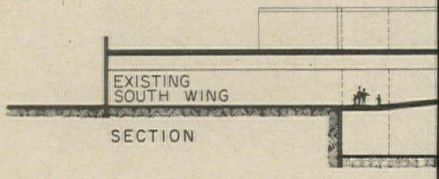


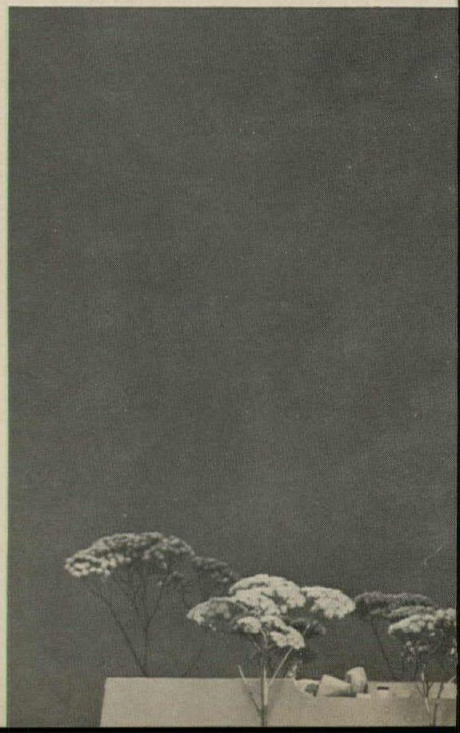


DENVER:
THE CASE FOR STACKING GALLERIES

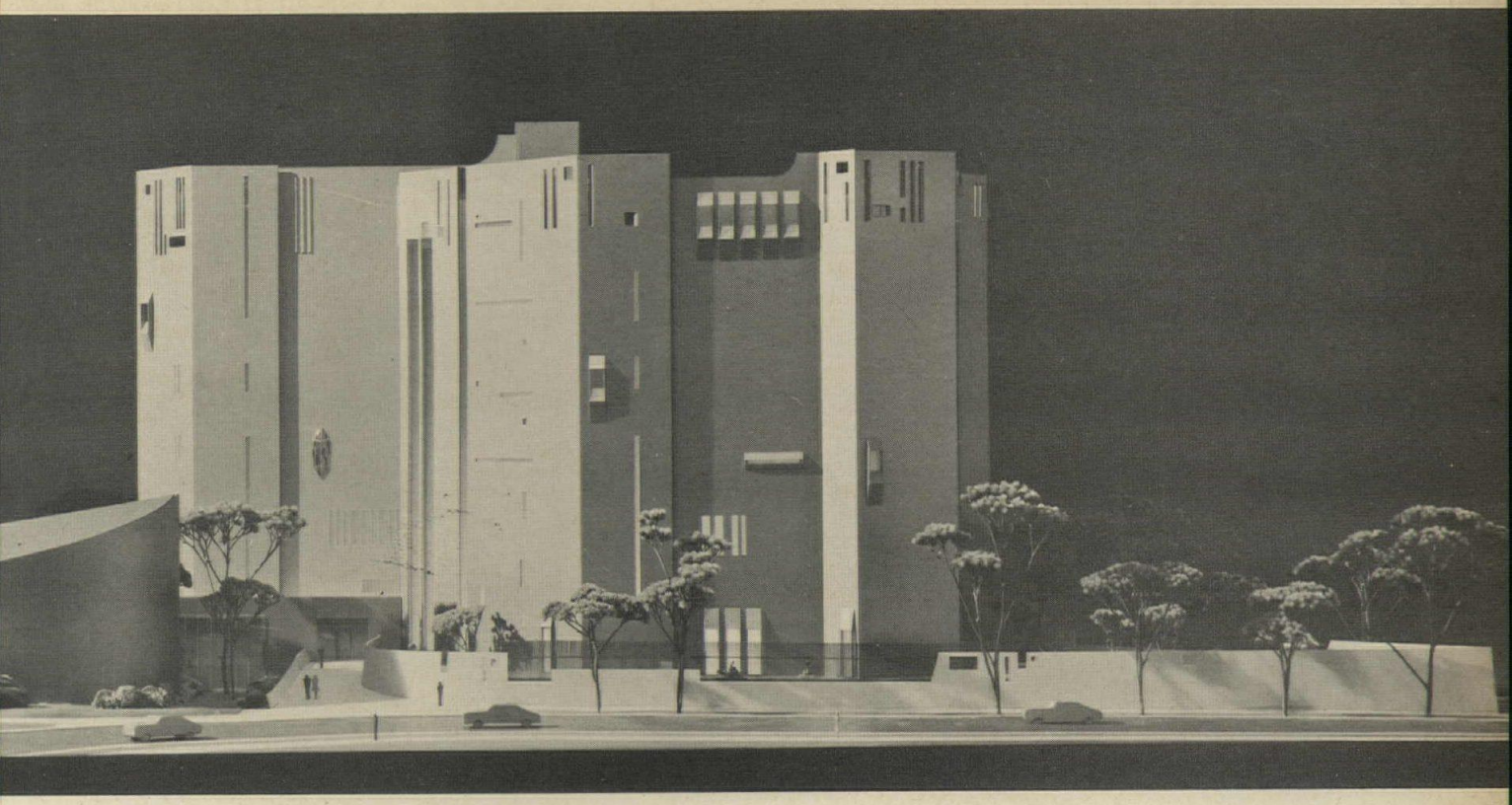
"If we'd had a 200-acre site, we still would have designed a vertical structure," says James Sudler. The Denver Art Museum, designed jointly by James Sudler Associates and Gio Ponti, will have six floors of galleries stacked vertically. While solving the problems of circulation—less hallway space and less doubling back through exhibit areas to exit—a vertical museum creates other difficulties. The worst, says Mr. Sudler: "an esthetic problem in disposing of the uninteresting cubical masses." His solution: "Wall surfaces were broken up and proportioned into pleasing vertical units." This was accomplished by changes in plane, by the unusual fenestration pattern, and by the strong break in the wall for the open line of the fire stair. The structure is wrapped with "a thin wall envelope, a broad ribbon around the total massing."

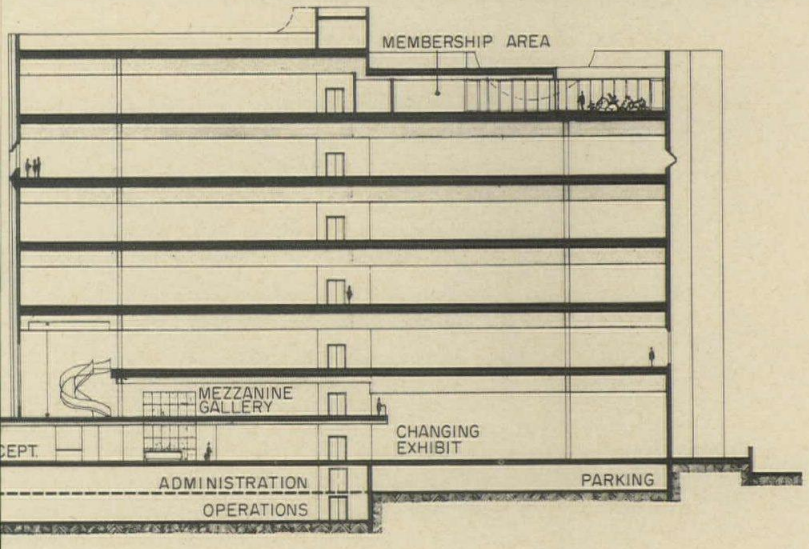
The director of the Denver Museum, Dr. Otto Karl Bach, believes in almost total use of artificial illumination. The fenestration is so handled to permit light where desired: in offices; in lounge areas; in the first floor gallery area, to permit simultaneous interior and exterior exhibition; in the north sixth-floor area for membership functions; and in various other parts of the exhibition areas "to achieve accent day lighting and occasional views of the landscape . . . and to achieve a studied and exciting effect of night illumination."



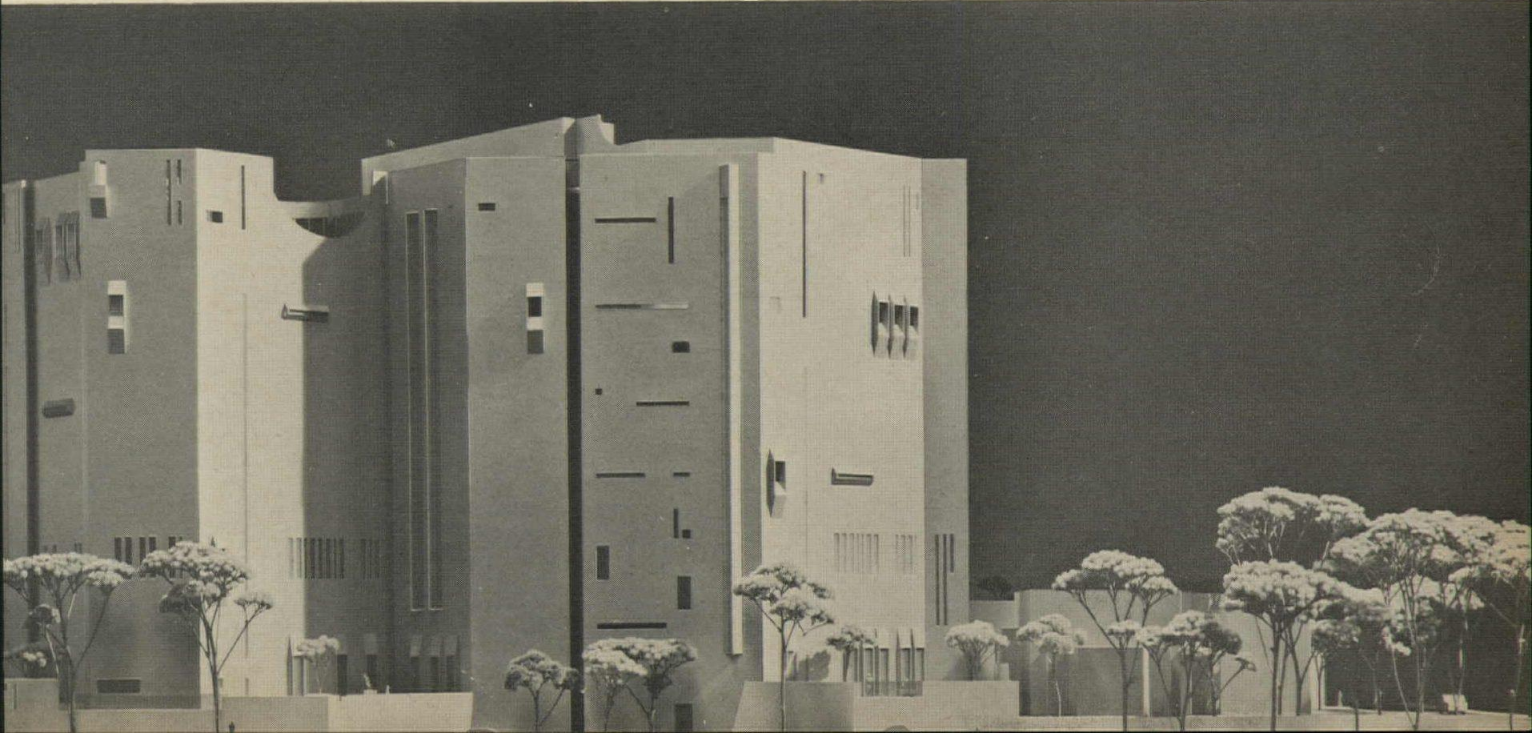


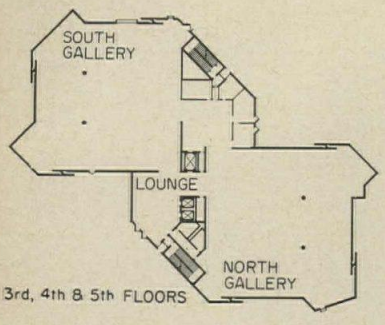
THE DENVER MUSEUM OF ART, Denver. Architects: *James Sudler Associates, Joel Cronenwett, senior associate;* and *Gio Ponti,* Milan.

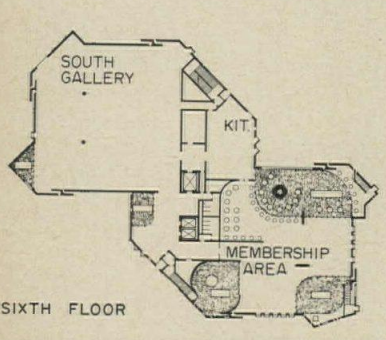


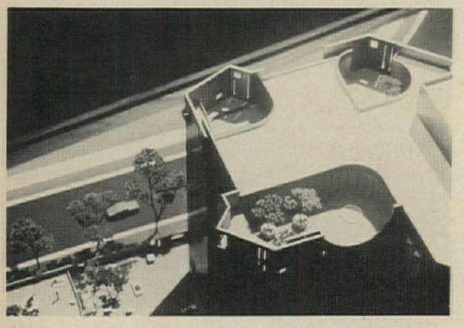


Elliptically-shaped structure to the left, above, is a 300-seat lecture and projection auditorium. Fortress-like windows in opposition to vertical window slits in these preliminary designs serve to emphasize the thinness of the "broad ribbon" around the total massing. The wall planes intersect, further emphasizing the thin wall. The entrance to the museum, across-page top, is to the right of the auditorium at the core where the two six-story wings are connected. The section makes clear the connection to the existing structure. A dramatic two-level gallery space is created by connecting the mezzanine gallery by stairway to the second-floor south gallery. The rear of the building, below, continues the fenestration pattern.

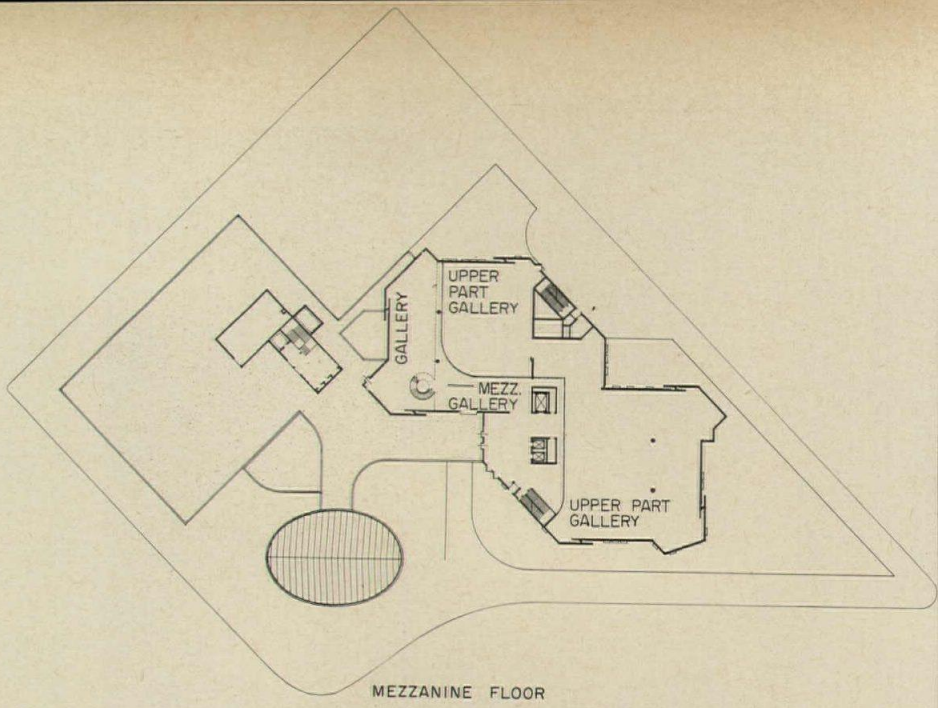


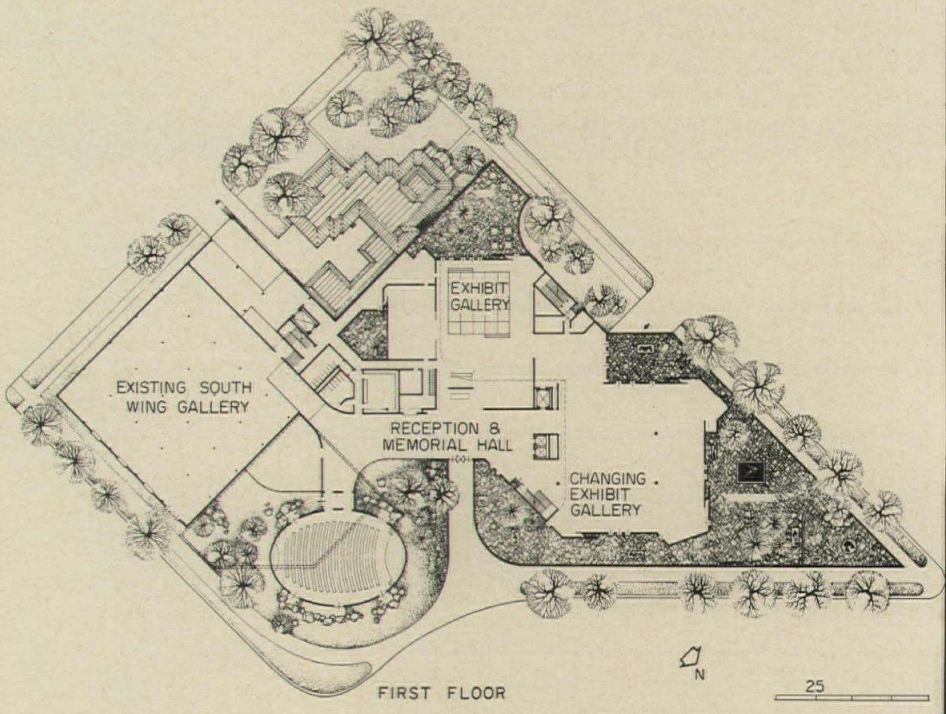


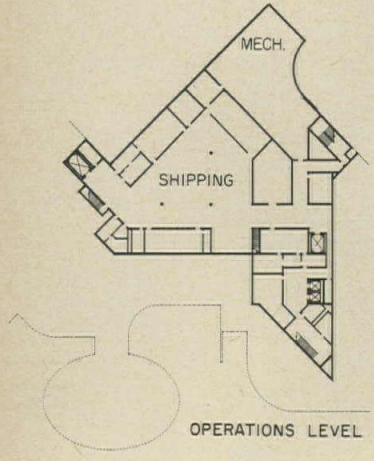


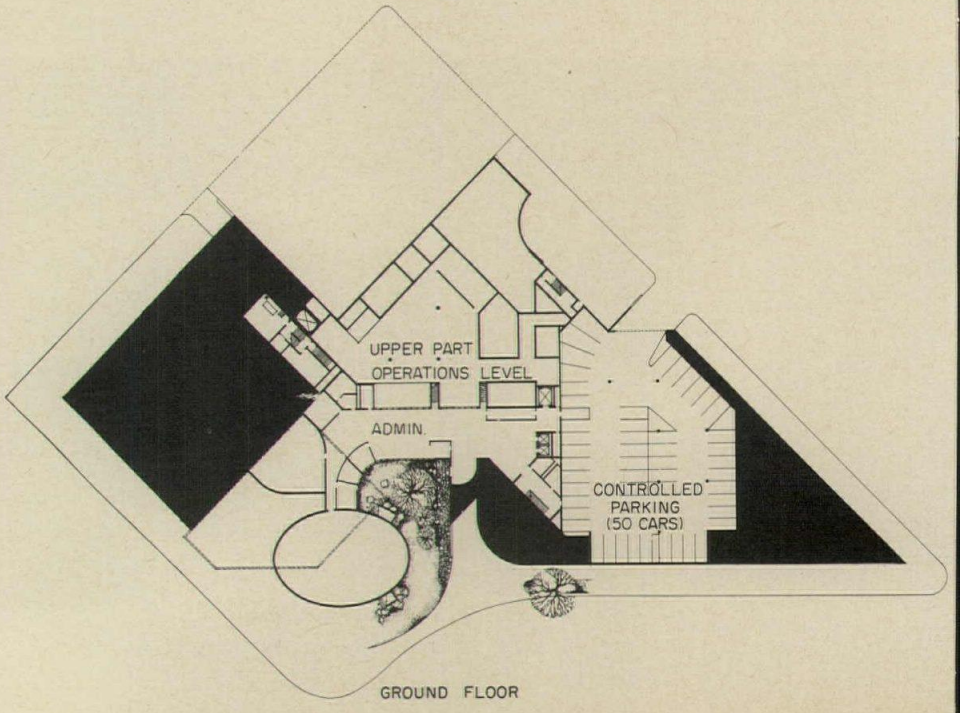


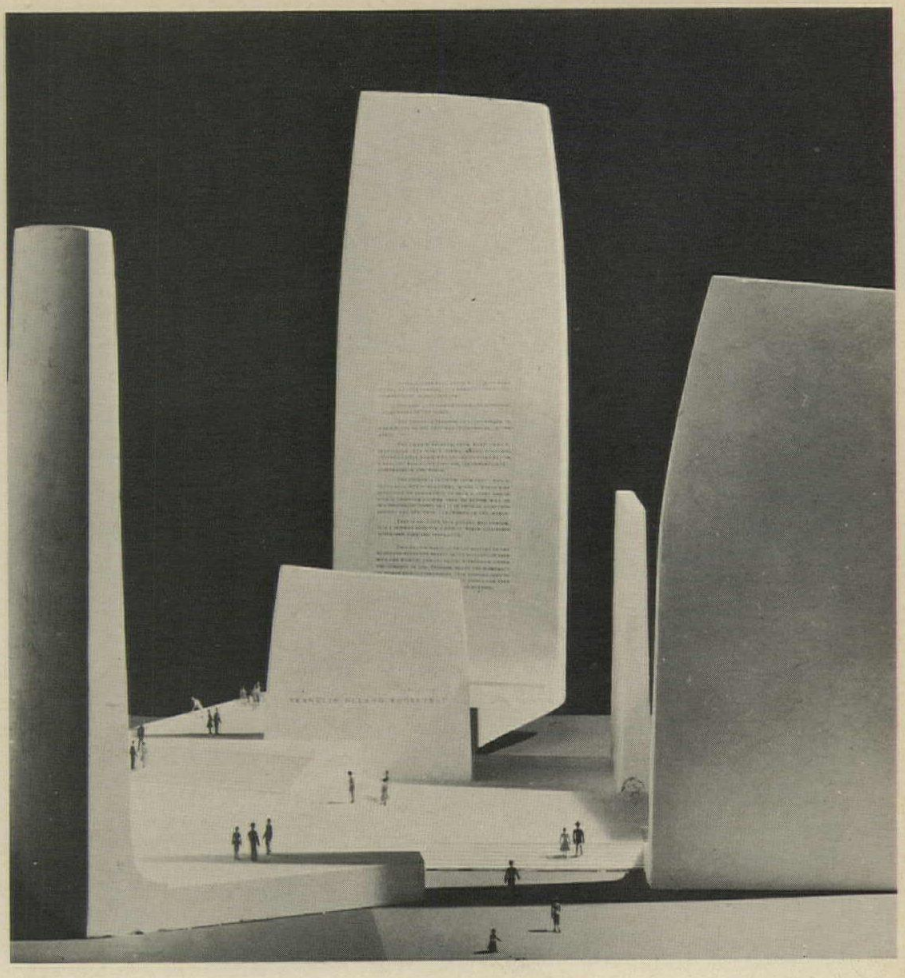
Open roof decks will be provided with excellent views of the mountains and downtown area. The building, which will cost $5.5 million, will be constructed in two phases. The $3.8-million first phase is scheduled to include completion of the entire six-story building, with the interior finishing of the first three floors—doubling the museum's present exhibition space. The second phase will provide the auditorium, seminar rooms and meeting facilities and the finishing of the top three floors.











Fourth in a series about young architects
who build a successful practice
with work of notable quality:

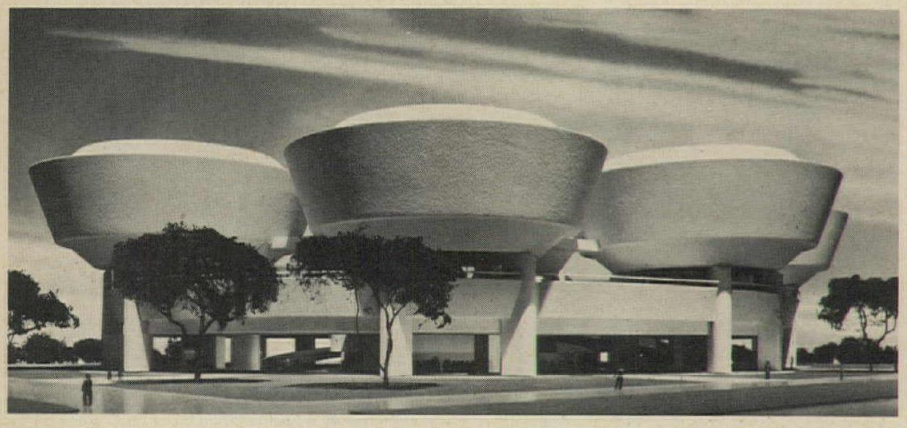
A WAY TO INFLUENCE THE ENVIRONMENT

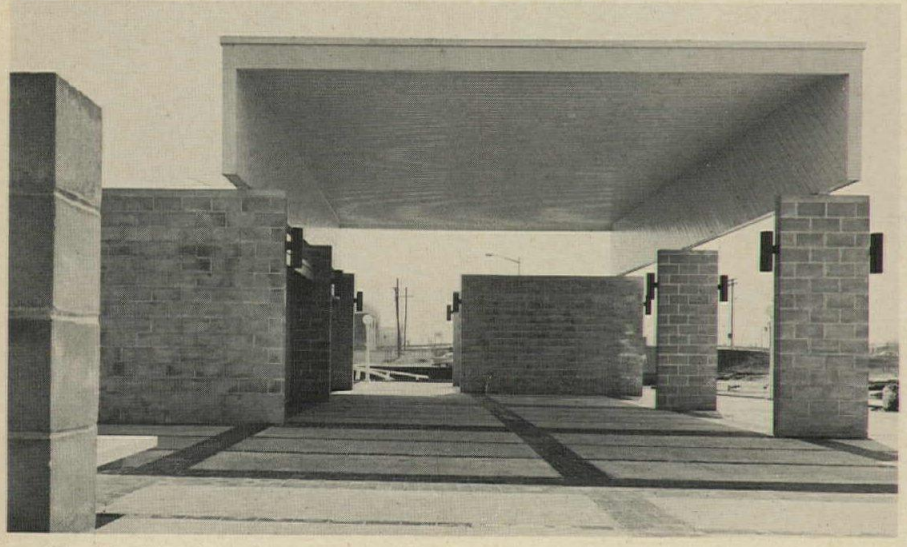
Norman Hoberman and Joseph Wasserman first came to public attention as members of the team that produced the spectacular (but ill-fated) winning design for the Franklin D. Roosevelt Memorial Competition. Since they have started their own office, however, much of their work has been in rather a different category, consisting of urban renewal studies and illustrative site plans done with the planning firm of Candeub, Fleissig and Associates. Producing designs of this kind can be a frustrating experience: as Joseph Wasserman says, "In some ways, urban renewal is a bird that is not designed to fly." But such work offers an opportunity to influence a much larger portion of the environment than architects usually succeed in reaching.

Redesign of winning submission in Franklin D. Roosevelt Memorial competition, done with Pedersen and Tilney and David Beer. New design incorporates a statue not required in original program.

Project '64, center, a pavilion for a group of exhibitors at the New York World's Fair. Structure was not built.

Pavilion, bottom, at Milburn Creek Park, Nassau County, New York. A small building completed in 1964.





Hoberman and Wasserman first began to think of a future architectural partnership in 1957, when they were still students at the Harvard Graduate School of Design. In 1961, when they were both working at the office of Pedersen and Tilney, they and another associate, David Beer, were asked to help develop an entry for the Roosevelt Memorial competition; and it was Hoberman, who is also a sculptor, who evolved the shape of the great plaques. The design won, and, at the same time, the two architects saw prospects of other work, including a large pavilion for the World's Fair and a substantial house. Pedersen and Tilney gave Hoberman and Wasserman assurances of their continued participation in the Roosevelt Memorial, and the way was clear for them to go out on their own. The omens were propitious and it seemed as if all concerned would live happily ever after.

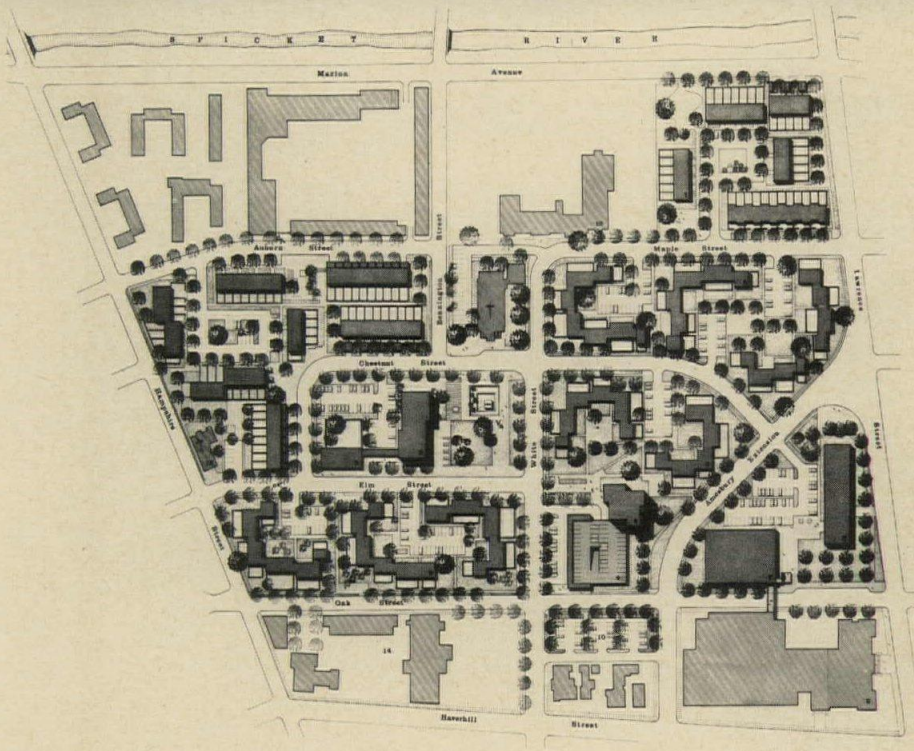
Unfortunately, things were not to be so simple. The Roosevelt Memorial has had a stormy and confusing history. At one point the architects were asked to redesign it to incorporate a statue, which had not been a requirement of the original program. At present, the whole situation seems to have gone back to square one, with the Commission considering 40 architects for the job of designing the Memorial.

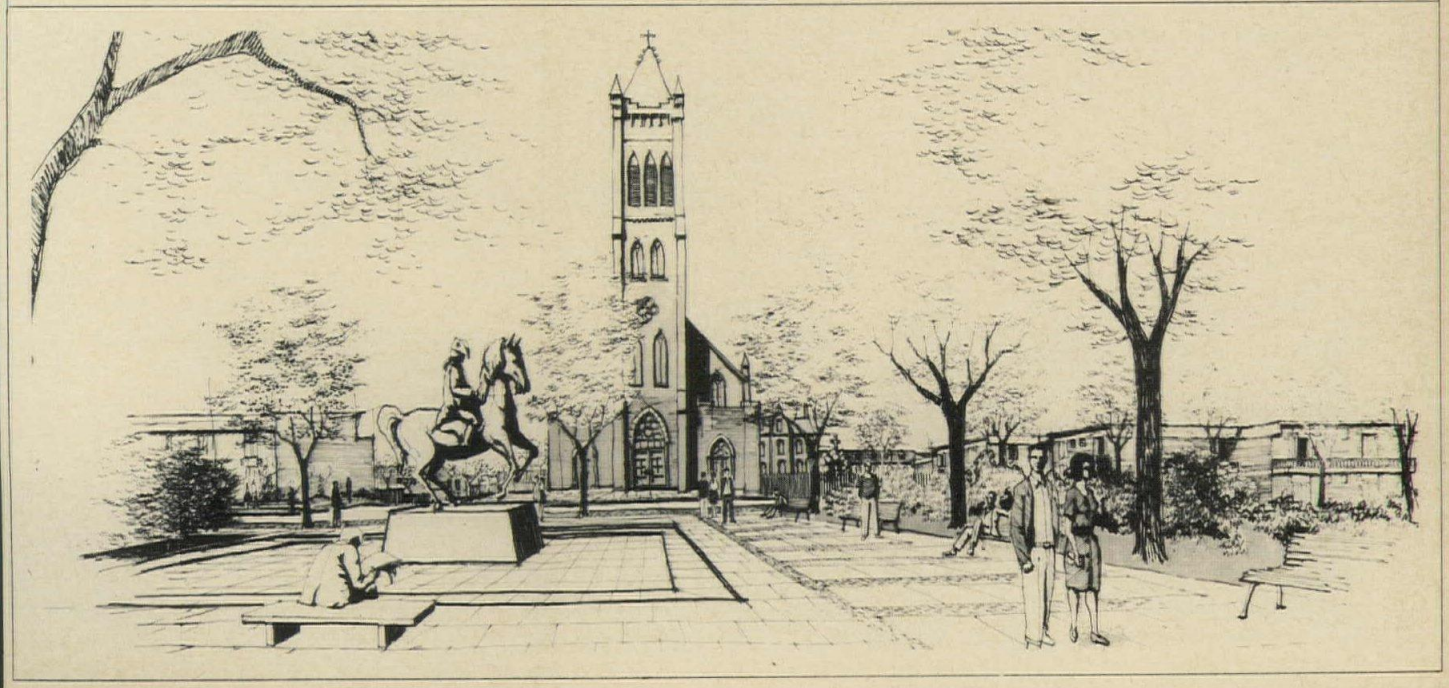
In the meantime, conditions at the Fair were not proving favorable for the Pavilion, named, perhaps prophetically, Project '64; and the house clients had changed their plans. The situation was not yet serious—in Norman Hoberman's somewhat surprised phase, "our clients pay their bills"—but it was certainly far from promising. The partners had followed a course that had seemed likely to lead to an independent practice, but, although they had some apartments to remodel and a number of small buildings to do, the road ahead showed signs of not leading anywhere very fast.

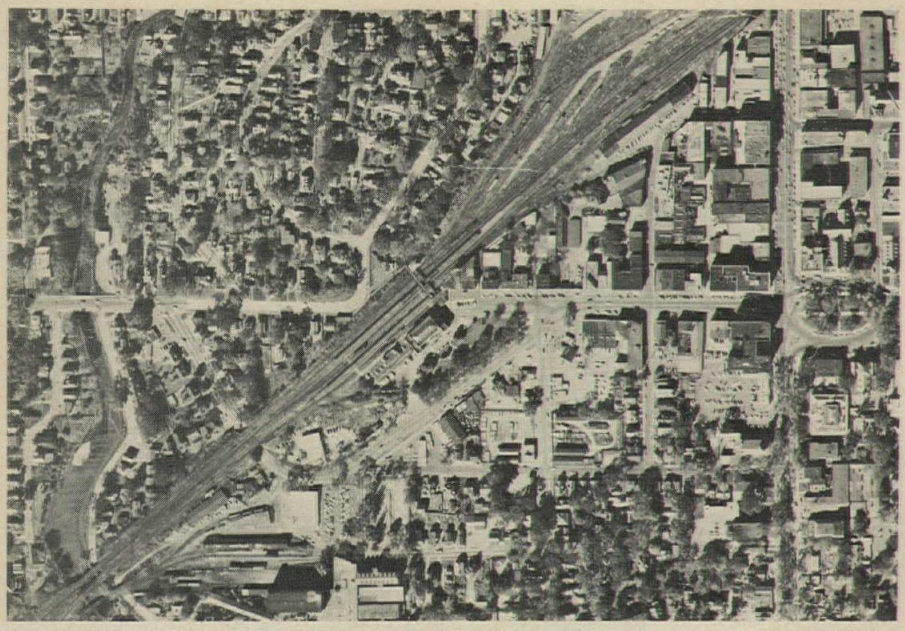
The practice finds a new type of work

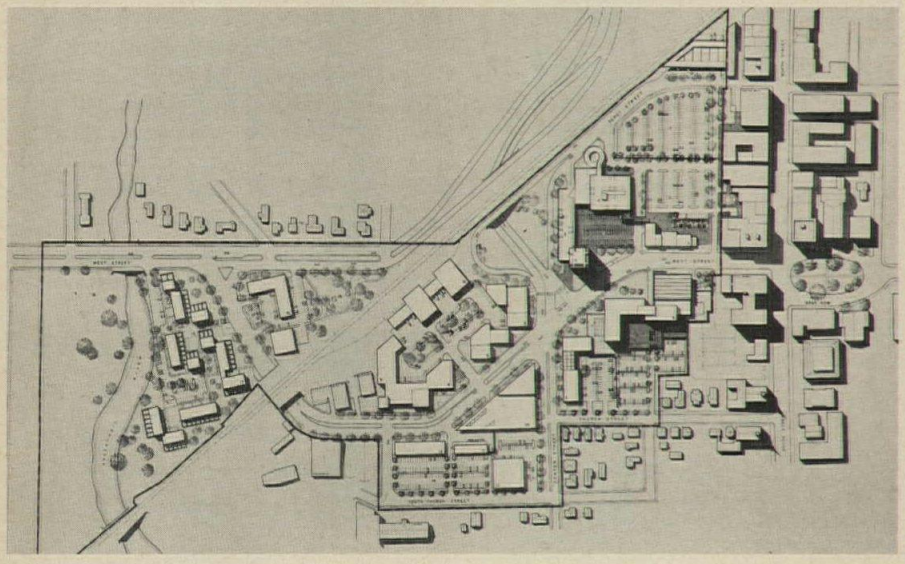
The partners determined on a change of direction, and composed a number of letters to large planning firms, offering their services for the design aspects of urban renewal studies. The letter happened to hit the firm of Candeub, Fleissig and Associates at the right moment. They were in the process of doing a study for Lawrence, Massachusetts, which included a downtown area that the planners wished to see developed as garden apartments. They did not wish to close all the streets and isolate the housing from the rest of the downtown, and they were anxious to have a plan that was sufficiently detailed

Lawrence Plains project
in Lawrence, Massachusetts was the first illustrative site plan study that Hoberman and Wasserman did for the firm of Candeub, Fleissig and Associates. Changes in the street pattern, and the creation of a square in front of the church, turned the area into a coherent neighborhood unit.

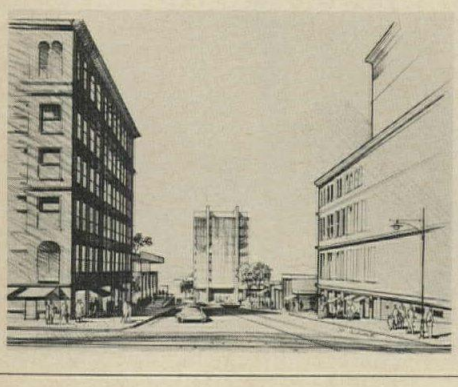


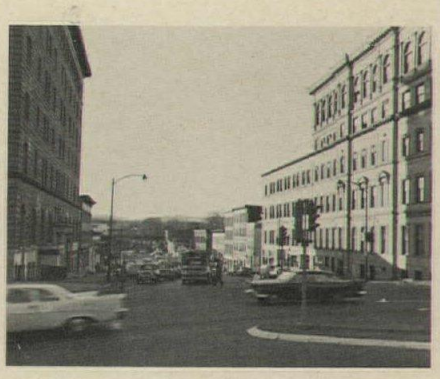






Pittsfield, Massachusetts downtown renewal plan was designed for an unspecific and changeable set of conditions. Architects developed cross axis to main street, placed tall building to terminate axis. Most of off-street parking required had to be accommodated at grade, but cars have been hidden behind buildings as much as possible.





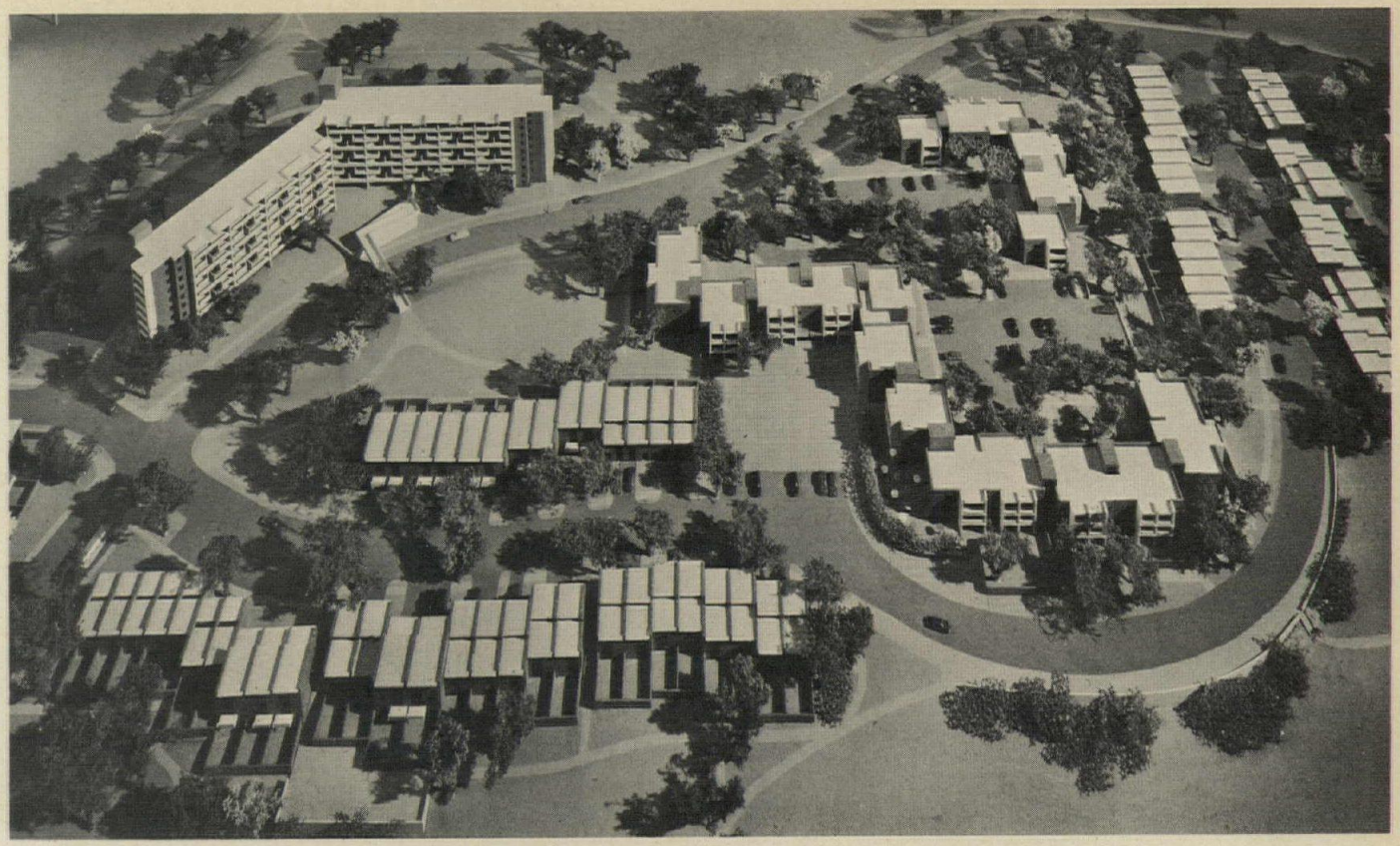
that the developer could not change it substantially. The fact that Hoberman and Wasserman had helped win a major competition attracted the attention of the Candeub, Fleissig firm, and they decided to let the young architects try their hand.

A plan is made from what exists already

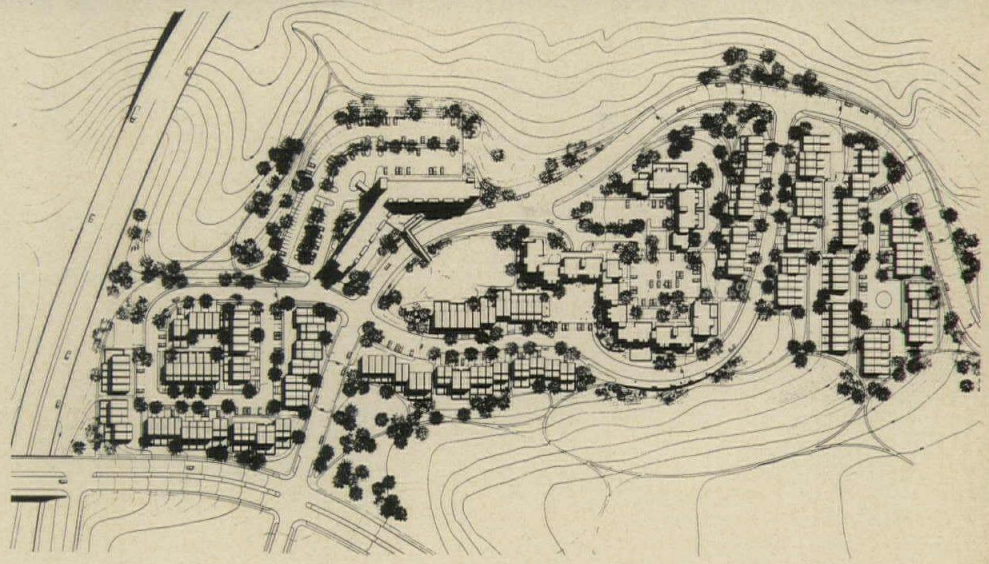
The result was the Lawrence Plains Project, shown on page 209. The design utilized the area's natural boundaries to develop a cohesive neighborhood of 440 dwellings, of which about half were in row house units, a quarter were specially designed for the elderly, and another 25 percent were in high-rise buildings. The number of through streets was reduced, and a new one-acre neighborhood green was created; at the same time a new traffic connector will permit better access to the central business district. Isadore Candeub's expressed his firm's reaction: "We found that we were delighted with what Hoberman and Wasserman gave us. Many architects don't recognize the distinction between planning and architecture, and the peculiar nature of renewal. You don't have a free hand; you can't change everything; you have to respond to the challenge by doing something creative with what is there already. We found Hoberman and Wasserman not only creative, but very able concerning all the problems involved."

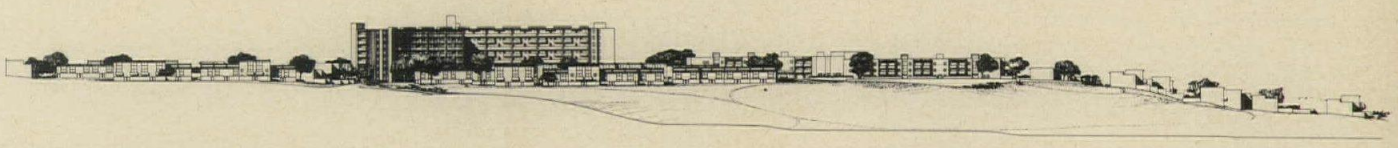
Since Lawrence Plains, Hoberman and Wasserman have done 10 other studies for Candeub, Fleissig and Associates. This long relationship does not mean that the two firms are in complete agreement on all philosophical questions, but both have learned respect for the other's position. Again, in Candeub's words: "We argued with them, we fought with them; but we found we could work with them." The difficulty lies in the sequence of events, built into the law, which requires that design decisions be made before a "client" comes into the picture at all. It is difficult to question commonly held assumptions, or to do something unfamiliar, when the plan has to be acceptable to a number of unknown parties. As a result, the "illustrative site plan," although it may look like an explicit design, is frequently only a diagram. Over a period of time it is possible to refine and develop this diagram into a real plan, with an ever increasing degree of exactitude, provided that the original designer continues to exercise control.

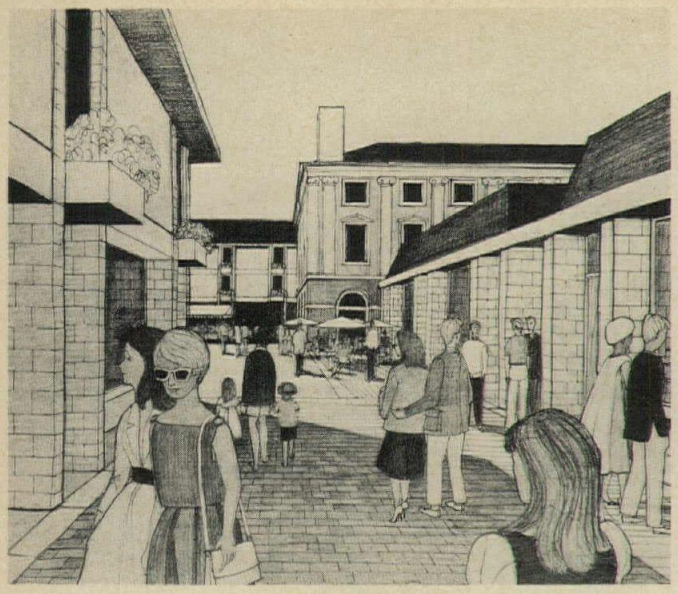
The process is obviously far from perfect, but Hoberman and Wasserman have found that they are able to make substantial contributions at a number

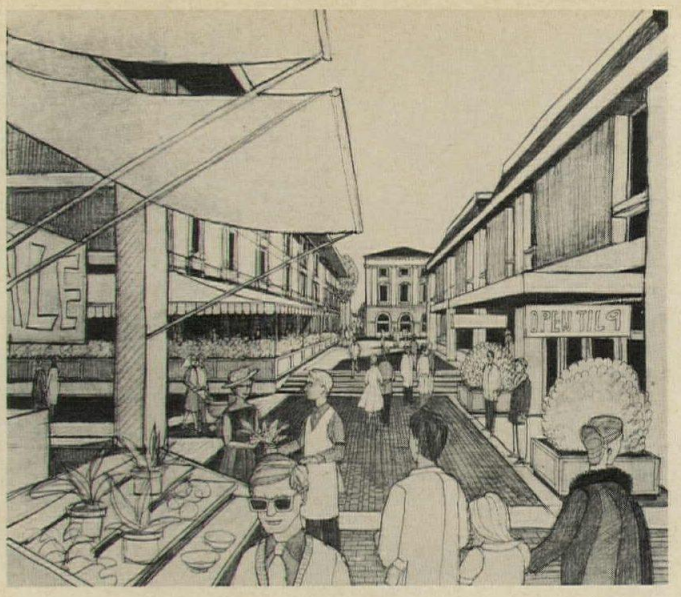


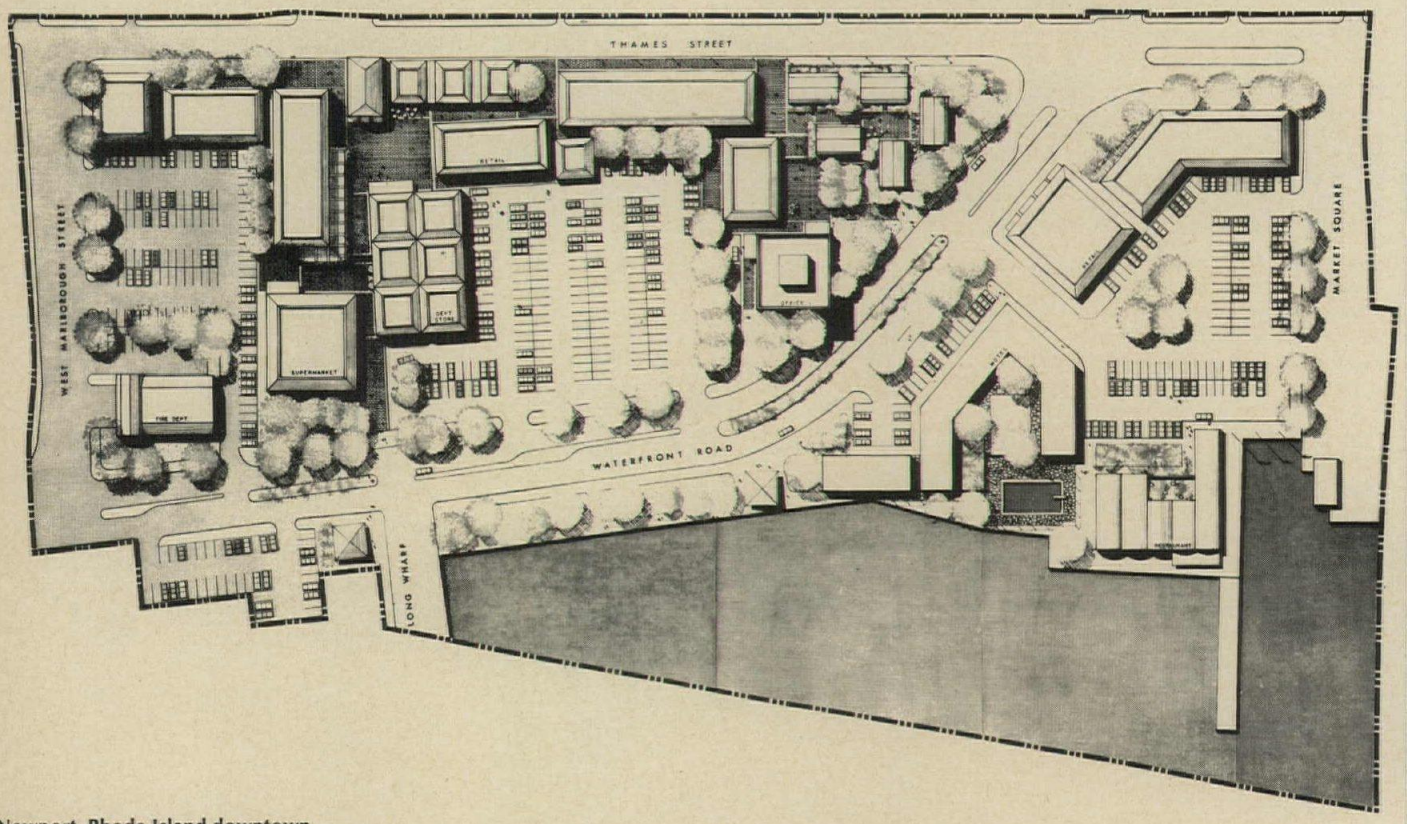
Dudley Heights,
a portion of the Arbor Hill urban renewal project in Albany, New York, for which Hoberman and Wasserman did the illustrative site plan, is a steep tract of land, sloping down to the Hudson River. There will be 178 row houses, varying in size from two to four bedrooms and in cost from approximately $13,700 to $16,900. There will also be housing for rent: 96 garden apartments, and a nine-story building with 167 units reached by an ingenious system of alternate floor access. Project is designed to be built in increments by a number of developers. Hoberman and Wasserman devised the basic unit plans, will exercise design review control.



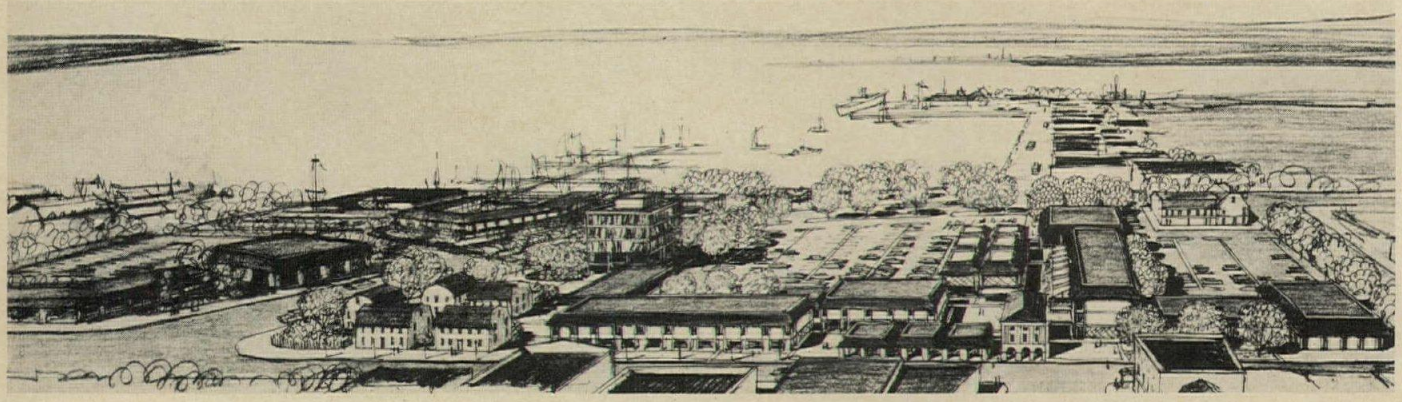








Newport, Rhode Island downtown renewal, shown at the illustrative site plan phase, creates a new shopping center behind Peter Harrison's historic market building. It also greatly increases public access to the waterfront, where there will be a marina, motel and restaurant.



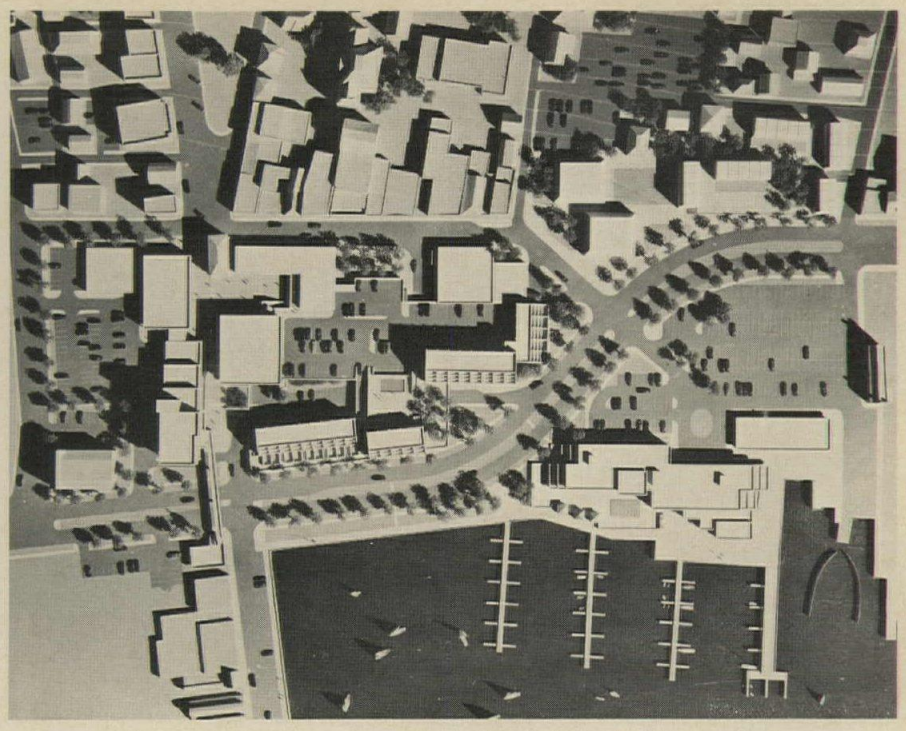
of stages. In addition to drawing the illustrative site plan during the survey and planning phase, they also write the controls that become the legal document governing the renewal design; serve as design review consultants; become involved in helping the community act as client; and work with the developer.

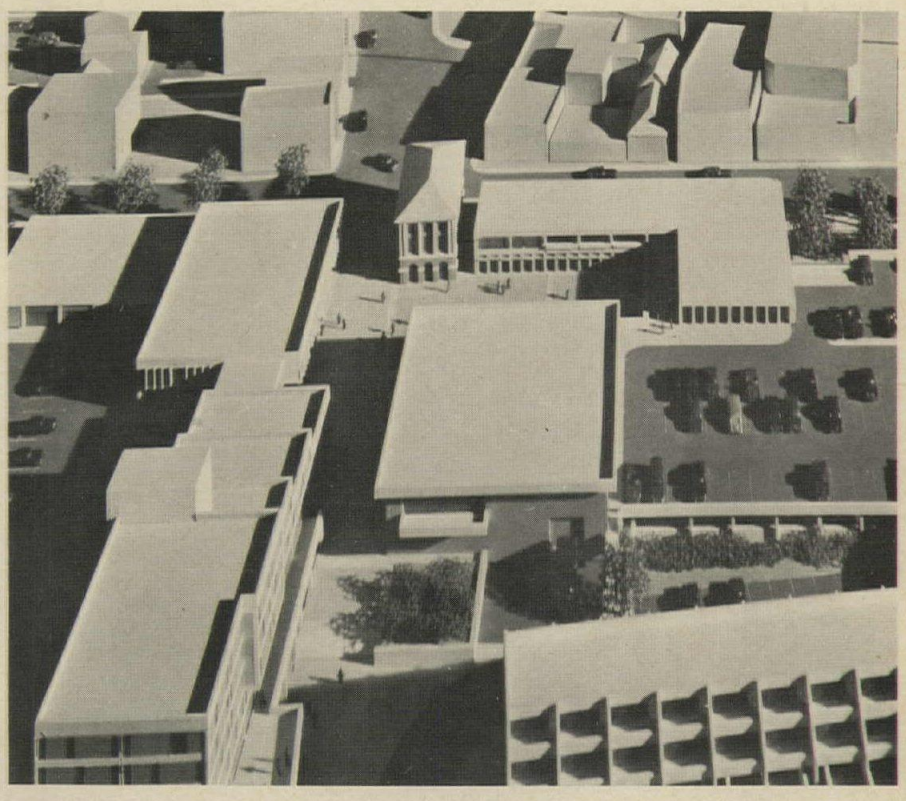
In the case of the Pittsfield downtown renewal plan, shown on page 210, the architects developed a cross axis for an essentially one-main-street business district and placed a tall building at the curve of West Street to terminate the axis. The quantity of off-street parking required set a limit on the intensity of land use, but the architects were able to keep much of the parking out of sight behind the buildings. Hoberman and Wasserman have just been retained as design review consultants, now that actual projects are under way.

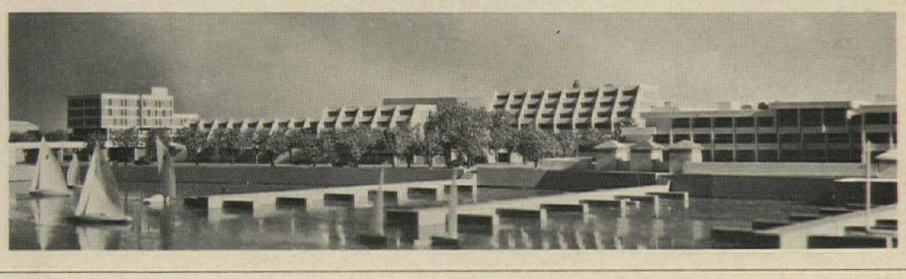
The Arbor Hill project in Albany, New York was designed for an 158-acre area that comprised a deteriorating neighborhood and a rough tract of unbuilt land that slopes steeply down to the river. The site was planned to provide housing for middle-income families not eligible for public housing; but who were also not served by the private market. The design called for regrading and a new street pattern throughout the area, to encourage rehabilitation and the construction of a new school and 1,200 new housing units. The Dudley Heights portion of the project, designed for 29 acres of vacant land, will house some 1,560 persons in surroundings designed as a community, and not as a "project." The plaza in front of the apartment house will serve as a neighborhood core, with access to shops, a restaurant, a community room and a kindergarten housed in the lower floors of the main building. There is plenty of community open space, and almost all dwellings will enjoy a magnificent view of the Hudson. The whole district has been divided into increments of a size suitable for small developers, with Hoberman and Wasserman holding design review control over the work of the architects employed.

The architects become developers

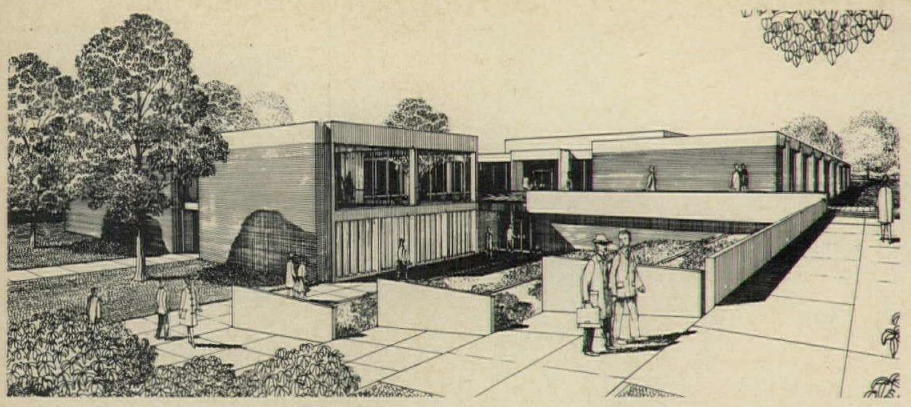
With the Long Wharf project in Newport, Rhode Island, Hoberman and Wasserman's practice has entered a new phase. After they drew the illustrative site plan with Candeub, Fleissig and Associates, they joined with the Corinthian Conservation Company, Inc. and the William L. Crow Construction Company to become the developer. Hoberman and Wasserman will be the architects, giving them an opportunity to de-

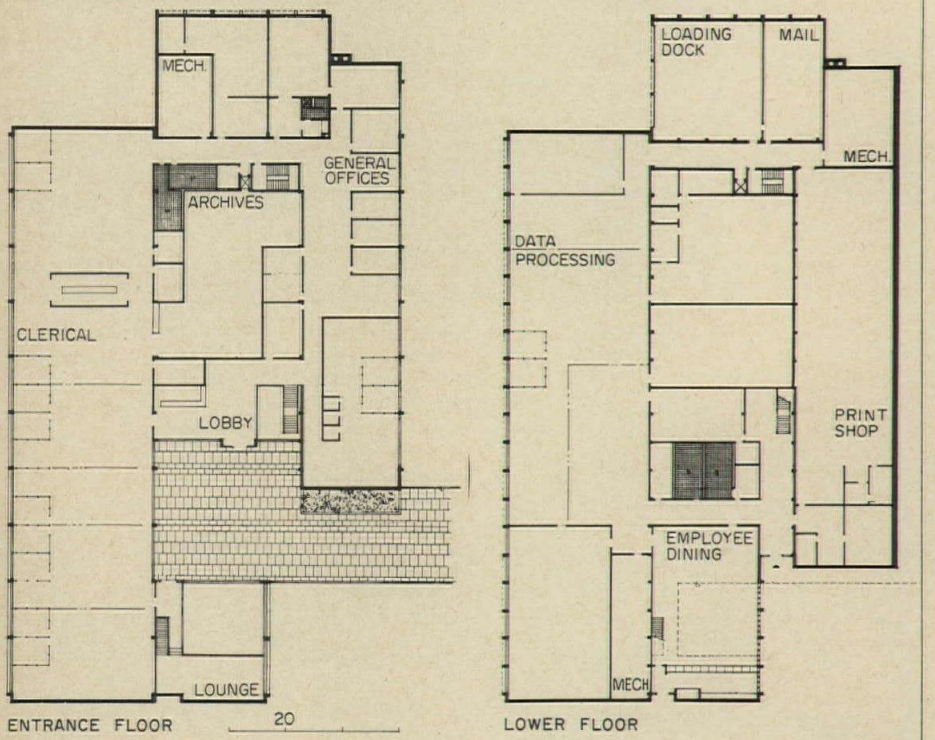




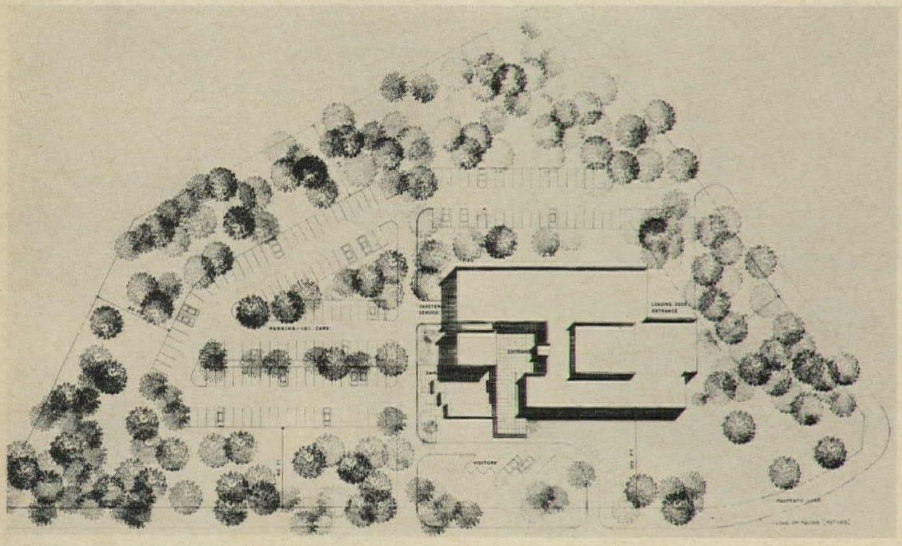


Model photographs of Newport renewal project show how design has progressed since the illustrative site plan on the opposite page was drawn. Architects joined with the Corinthian Conservation Company of Newport and the Crow Construction Company to form the developing partnership, called the Thames Street Company.





New headquarters and data processing center for the American Research Bureau is located in Beltsville, Maryland. Visitors enter along a bridge that overlooks the terrace outside the employes' cafeteria.



sign the actual buildings as well as the plan; and they also have a chance to profit by a real estate investment.

The Long Wharf Project seeks to give Newport a compact downtown shopping center, to supplement the long string of shops along Thames Street, and also to reunite the historic city core and the waterfront. The development will focus on a pedestrian plaza, located directly behind the 18th-century market hall designed by Peter Harrison, and on a waterfront motel and marina. The drawings (page 212) show the project at the illustrative site plan stage, the model photographs (page 213) show the present state of the design.

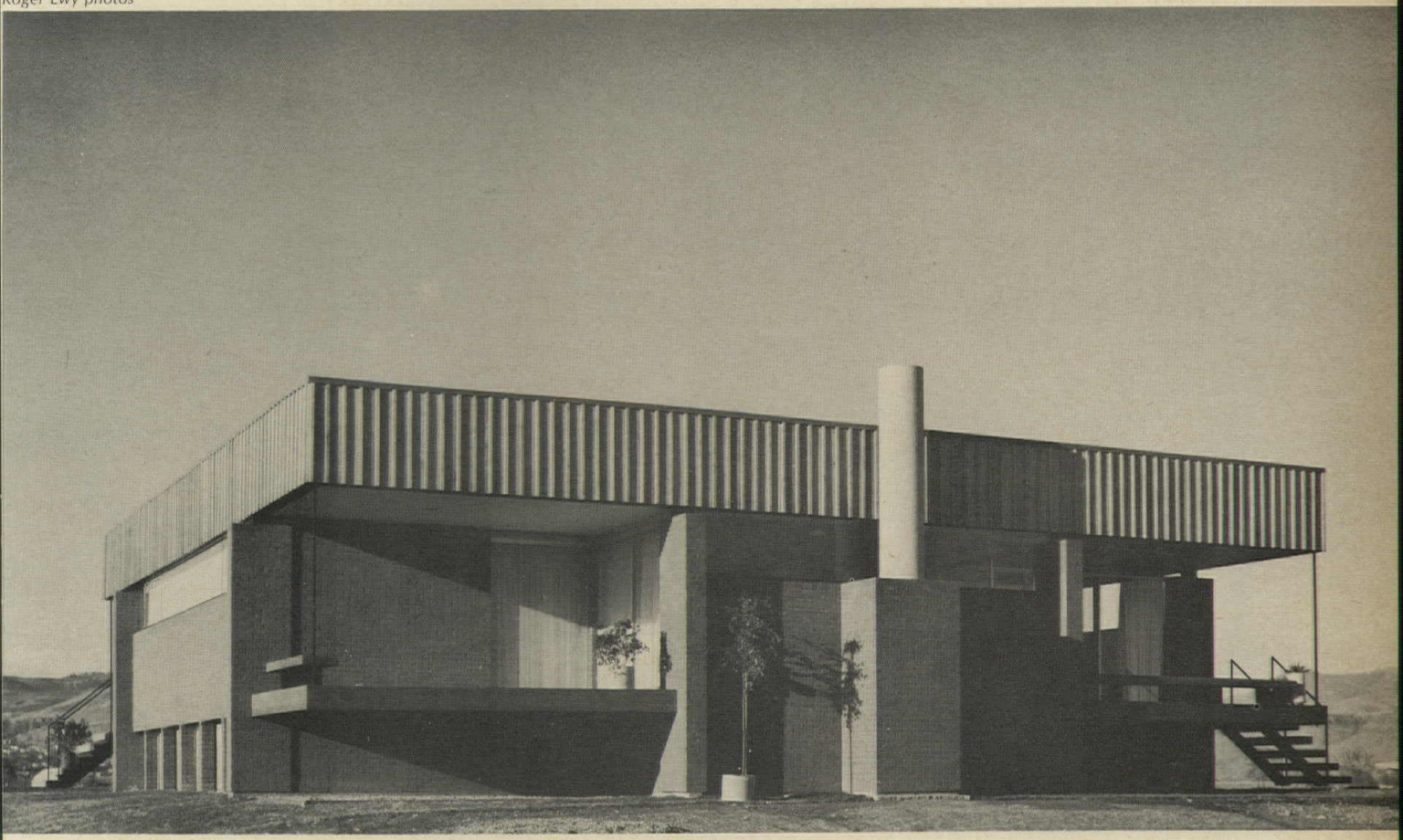
The first stage of the project will be an 108-unit waterfront motor inn, with a restaurant that can seat 400 persons and a marina for 88 boats. The site is a now un-needed U.S. Navy ferry landing, which was the first parcel acquired by the redevelopment agency. The next stage will be the office building and shops at the north end of the project area. When these buildings are complete, they can be used to relocate the businesses along the Thames Street side of the renewal district. Once this is done, the way will be clear to begin the shopping center, which will include a supermarket, a junior department store, a parking structure for 523 cars, and 60 residential units, apartments and town houses. The total cost of the project is estimated at $6.5 million.

The firm still does buildings too

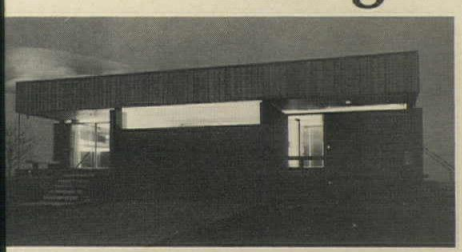
Along with all this activity in the planning field, the partnership has been able to continue doing individual buildings. The most important of them to date is the administrative and data processing center for the American Research Bureau, a company that does rating studies of radio and television shows. The building, which is shown at left, comprises some 60,000 square feet on two levels and is located in Beltsville, Maryland. John Gallagher, another Harvard Graduate School of Design classmate, came back from his practice in Texas to work on this building. Since January of this year he has also been a partner of the firm.

A renewal plan, like politics, involves the art of the possible, rather than solutions that might be best on an abstract scale of values. So, from time to time, does an individual building. What the Hoberman and Wasserman partnership has gained over five years, is a method of dealing with a wide range of architectural situations without losing either principles or a sense of basic values.

Roger Ewy photos



A house whose strength is in the roof



The prime factor in the evolution of this powerful design was its dramatic site. The location is a high exposed knoll at the western edge of the Denver metropolitan area, with an almost unbroken 360-degree view of the city to the east and the Rocky mountains to the west. To take full advantage of the view and preserve its continuity all around the house, the main living level was raised four feet above the summit of the knoll, and a very special design solution adopted which avoided the visual interruption of frequent perimeter supports or bearing walls.

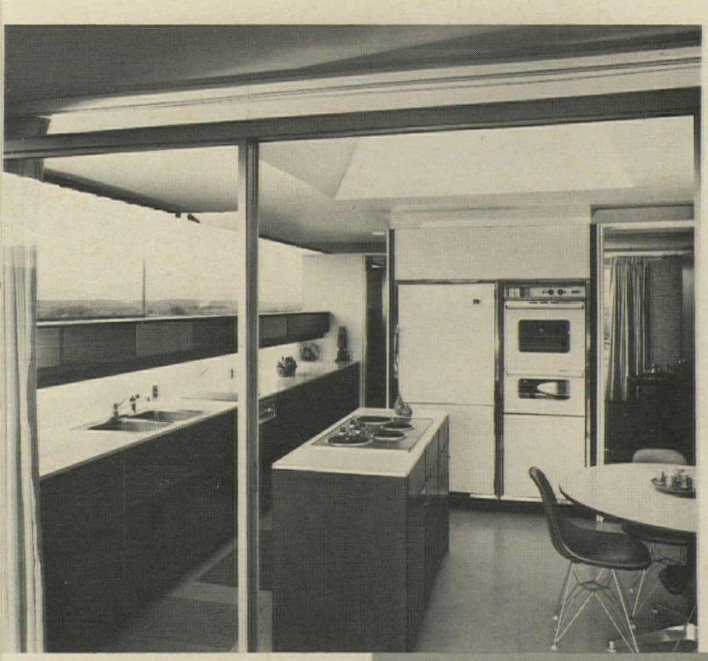
The four-foot-deep, 52-foot-square box-roof, framed with standard shop-fabricated wood trusses, has sufficient integral rigidity to require the support of only four central brick piers flanking a gallery, and eight perimeter piers —two on each 52-foot edge.

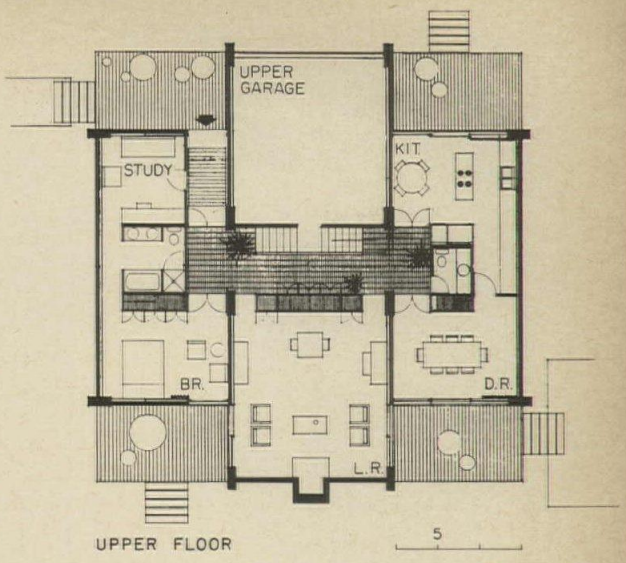
As well as dominating the elevation of the house, the roof is also a powerful factor in the way in which the interiors are worked out. The depth of the roof volume, as the architect puts

it, "permits interior space to be molded by simply turning up the ceiling between the trusses to produce high ceilings where desired." These high ceilings rise in the form of truncated pyramids over the living room, gallery and the four corner rooms, and are capped by light diffusing skylights. Spherical light fixtures are suspended in some of these recesses.

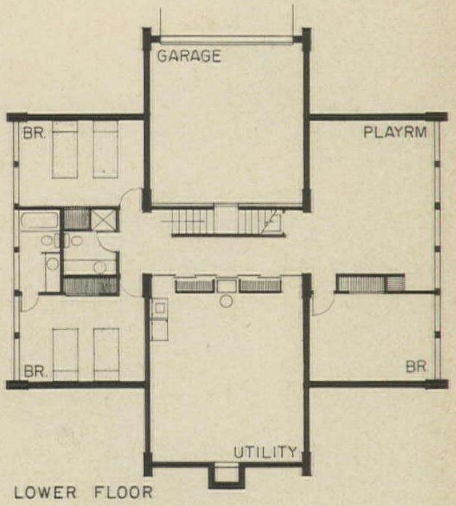
The roof space has the additional advantage of providing a large interior air volume which, when ventilated, gives sufficient summer air change to prevent heat build-up and eliminate the need for air conditioning. The rigidity of the roof structure allows it to cantilever several feet beyond the supporting piers at the corner of the house and to carry four deck platforms on suspension rods. Sliding glass doors connect these outdoor areas to each of the main interior living spaces. The absence of view-blocking railings emphasizes the floating quality of the balconies. Strategically placed benches and planting pots afford the required protection. Approximate cost was $43,500.

RESIDENCE FOR MR. AND MRS. J. WILLIAM SORENSEN, Jefferson County, Colorado. Architect: *James Ream;* associate: *George Hoover;* structural engineers: *Ketchum, Konkel, Ryan & Fleming;* contractor: *Harold Bergkamp.*



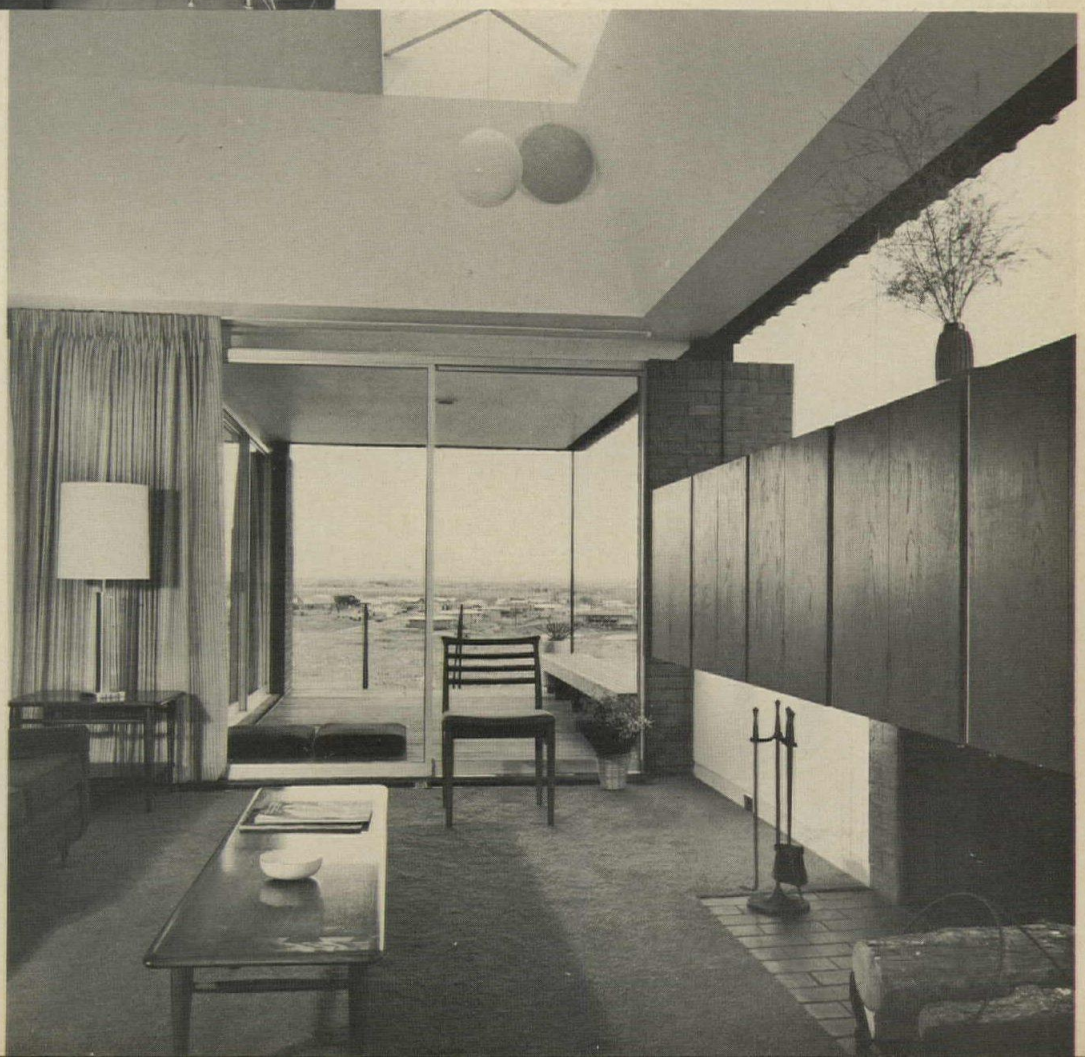


UPPER FLOOR

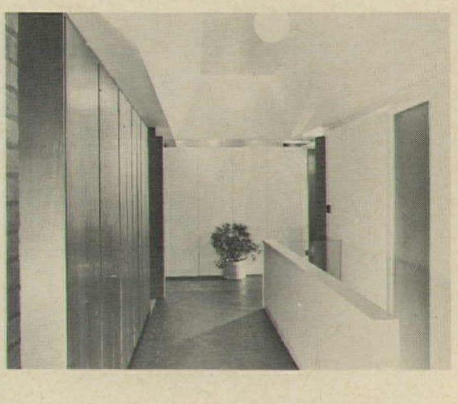


LOWER FLOOR

The brick base of the house encloses a plan which the architect himself admits is "almost traditional in its formality." Dominated by the paved central gallery, the upper level includes separate living and dining rooms, kitchen, breakfast room and master suite. Continuous sliding glass panels give daylight to the childrens' and guest bedrooms on the lower level, while glass areas above the sink in the kitchen and above the living room fireplace are constant reminders of the view.

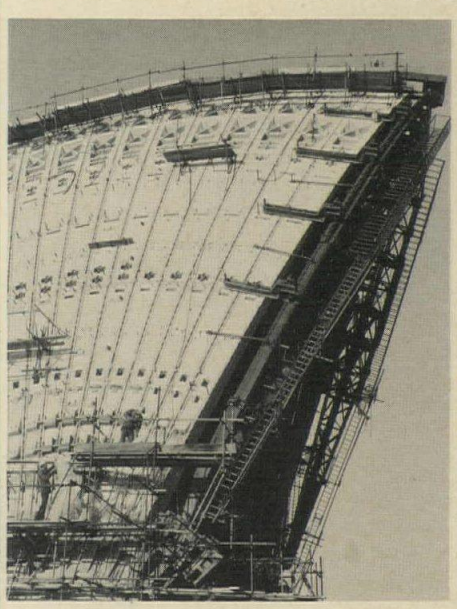


Warm, natural materials tend to offset the sometimes hard, rather cold effect which large areas of glass can produce. Sandface-finish brick, western red cedar, and of course glass, characterize the exterior; white-painted, gypsum-board interior walls and ceilings are relieved by exposed brick areas, quarry tile floors, and a line of wood paneling in the living room.



Trouble in Sydney

As if to signify the wrath of the gods at the dispute leading to the resignation of Sydney Opera House architect Jörn Utzon, a 4-ton, 200-ft-high section of steel frame scaffolding collapsed from the main shell structure of the opera house—following the resignation—and fell 32 ft onto the lower-shell structure.



The fundamental disagreement between Utzon and the New South Wales Ministry of Public Works is said to be over financial control of the project—with the government wanting closer financial control and Utzon wanting a freer hand. The matter appears to have come to a head with a government proposal to let future contracts on the basis of detailed drawings and prices which Utzon evidently feels places intolerable limits on his freedom of action.

Attempts to recruit a panel of architects to replace Utzon seem so far to have failed. The general opinion in the profession is that only Utzon can succesfully complete the job, and architects were prominent in a 1,000-strong protest march from the Sydney opera house to Parliament.

The Government is determined that the Opera House be finished with or without Utzon, and it is not surprising that they should be anxious to find some way of controlling the spiraling costs of the project. However, it seems unlikely that anyone else can adequately execute Jörn Utzon's imaginative and highly personal design.

The cable-supported roof won't move up and down

Structural engineer Lev Zetlin has achieved considerable recognition for his design concept for cable-supported roofs in which two layers of cables are used, stretched to different degrees of tension so as to prevent flutter problems. The two layers of cables, with different amounts of tension in each layer, have different natural frequencies. Thus when the two layers are kept apart by struts, or held together by tension elements (depending on the curvature of the cable layers), any vibration in one layer of cables will be damped out by the other layer.

When he was designing his first cable structure (Municipal Auditorium, Utica, N. Y.) he naturally checked on the possibility of the roof rising and falling with temperature change. But, he said at a recent seminar in Cleveland, it was determined that this would not happen for these reasons: When the temperature rises, the cables want to stretch; but, at the same time, the compression ring at the perimeter of the structure wants to expand—and the expansion of the ring sufficiently compensates for the lengthening of the cables to pose no problem. When the temperature drops the reverse happens.

Zetlin was one of six speakers at a seminar last February on "Cable Construction in Contemporary Architecture," sponsored by Western Reserve University.

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How temperature affects exposed columns

Many multistory apartment and office buildings are being built with exterior concrete columns partially or fully exposed to the weather, and some of these structures have run into trouble because the effects of changing outdoor temperatures have not been taken into account. The exposed columns change in length in response to the weather, but interior columns stay the same in the controlled environment. This phenomenon has been cited, in a number of cases, as the cause of cracked plaster partitions and ceilings and stuck doors.

Structural engineer Paul Weidlinger has calculated that if there were no restraining action of floor slabs, the difference in length between exterior columns and core of a 30-story building could be 2¼ in. with a temperature difference between indoors and outdoors of 100 F.

In reality, however, free elongation is restrained by slab stiffness. While the elongation is reduced considerably, still

bending stresses and strains are introduced in the slabs, and at the top floor the stresses can be quite large. Weidlinger says that reinforcement in the range of 1 lb per sq ft has to be added to slab in the upper floors to resist this bending. The effects of slab stiffness on restraint were brought out in Weidlinger's article "Temperature Stresses in Tall Reinforced Concrete Buildings," (Civil Engineering, August 1964).

As mentioned earlier, one of the difficulties resulting from temperature-induced movement is cracking of partitions. A study on this aspect was conducted several years ago by Wiss, Janney, Elstner & Associates for United States Gypsum.

A recent development is the publication of criteria for analysis and design guides for computations of concrete structures with exposed columns by Mark Fintel, a senior structural engineer of the Portland Cement Association, and Fazlur R. Kahn, a senior engineer with Skidmore, Owings and Merrill in Chicago. Presented in the December, 1965 issue of the Journal of the American Concrete Institute, the paper proposes a method for determining temperature gradients and considers stresses induced by elongation and shortening.

A.S.A. drafts proposals to expand its role

A draft of proposed articles of incorporation for a "United States of America Standards Institute" has recently been drawn up by the American Standards Association. Ostensibly this is in response to the La Que Committee report of a year ago proposing a U.S. Standards organization which would be established by legislative action and have sufficient authority to gain international recognition on par with that of standards bodies of other countries.

In implementing this recommendation, the Committee suggested that preference be given to reconstituting the American Standards Association and that provisions should be made for organizational structure, staffing and financing for an activity level substantially greater than that at which A.S.A. had been operating.

Purpose of the "Institute" would be to: (1) act as the national coordinating organization for voluntary standardization; (2) assure that interests of the public would have appropriate protection and representation in standardization activity; (3) provide means for determining the need for new standards; (4) promote knowledge and use of approved standards; (5) stimulate the work of existing committees and organizations competent to formulate standards; (6) assist and cooperate with departments and agencies of federal, state and local governments; (7) be the accredited representative of the U.S. to international standardization organizations, and (8) serve as a clearing house for information on standardization work in the U.S. and foreign countries.

What bothered the La Que Committee was that while private standards bodies were competent and effective, in the Committee's view they were not moving far enough and fast enough. According to the Committee, of over 13,000 nationally used standards that it identified, only 2,300 had been advanced through the American Standards Association.

When use a lighting consultant?

The hiring of an independent lighting consultant is not a practical possibility these days unless the client is sensitive to the spatial and emotional aspects of light, suggests consulting architect John E. Flynn. Writing in the February issue of Lighting Magazine, Flynn says that architectural fees are often too tight to permit much more than superficial use of independent lighting consultants. Technically, the art of lighting comes within the province of the architect, Flynn states, and when his training and experience are adequate to permit him to guide the engineer, there may be no need for a lighting specialist. But, he continues, this experience is rare in an architect who is absorbed with the complexities of general practice.

New theory developed on concrete deterioration

Two geologists at Rensselaer Polytechnic Institute say that water that does *not* freeze is the chief cause of disintegration of much crushed rock used in concrete. They report that the less ice that forms in proportion to the total water present, the more sensitive are the rocks to deterioration. Drs. James R. Dunn and Peter R. Hudec discovered certain rock deterioration is caused chiefly by simple wetting and drying combined with natural temperature changes. The effect of freezing and thawing are negligible they say, the real culprits being clay minerals contained in the rock. This form of deterioration would apply to fine-pore rocks such as dolomite and limestone, shales and porous cherts.

The reason given by the geologists for deterioration of rocks is the adsorption of water in micro-thin layers against mineral surfaces within rocks' cavities and pores. The rocks are said to be "torn apart" by the constant ordering and disordering of internal water caused by temperature changes in both warm and cool climates.

Findings at Rensselaer are expected to generate controversy among some of the leading aggregate authorities, since the value of these rocks quarried throughout the nation is approximately $600 million per year.

A national building code—the talk begins again

Four model building code organizations are planning to set up a new coordinating office in Washington to assure quicker and better contact with all Federal agencies concerned with building codes. This move apparently was triggered by concern about recent Federal Government moves recommending the establishment of a national building code.

Likely to be appointed head of the coordinating office is Paul Baseler, executive director of the Building Officials Conference of America. The three other code groups are the International Conference of Building Officials, Southern Building Code Congress and American Insurance Association.

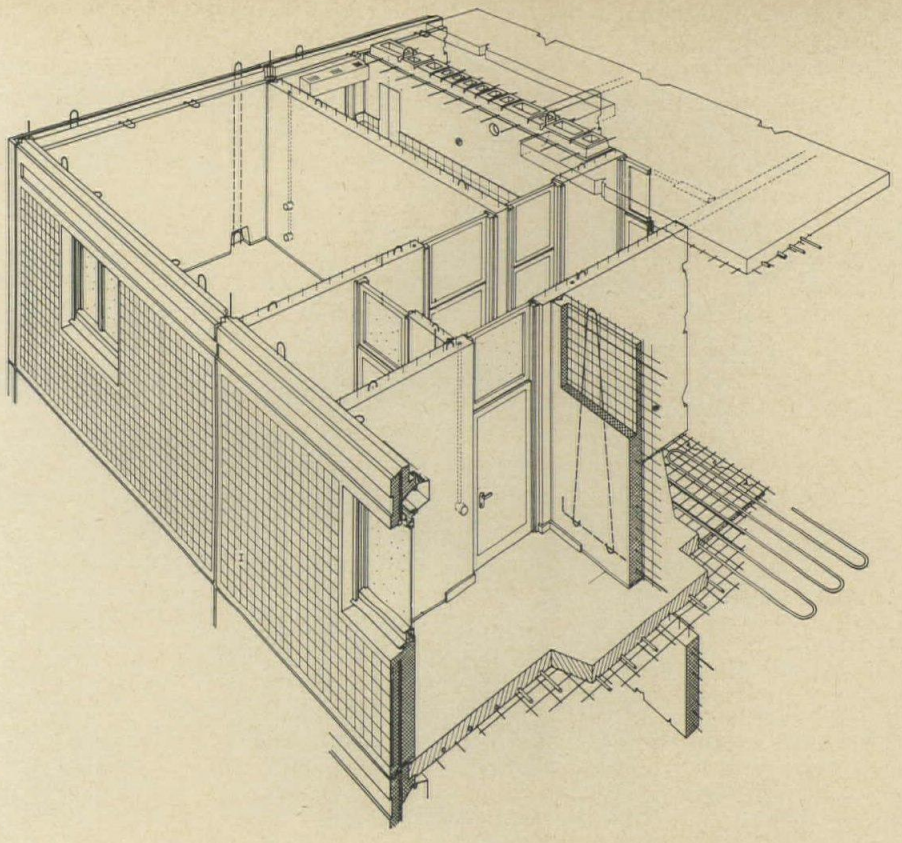
A national building code has been recommended by both the Advisory Commission on Intergovernmental Relations and the National Commission of Technology, Automation and Economic Progress. Membership in the Advisory Commission is drawn from all levels of government—Federal, state and local.

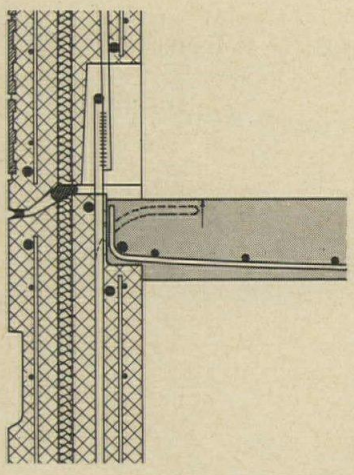
A position paper to present a refutation and objections to the recommendations for a Federal building code as proposed by the Advisory Commission is currently being prepared by the Special Panel of the Construction Industry Advisory Council. The latter group, representing construction industry organizations and model code agencies, is coordinated by the Construction and Community Development Department of the U.S. Chamber of Commerce.

It also has been rumored that a national code might be developed by a special committee appointed by the Secretary of the Department of Housing and Urban Development.

The Advisory Commission on Intergovernmental Relations called for development of a national code by a Presidential committee or by a proposed Temporary National Commission on Codes, Zoning, Taxation and Development Standards. HUD Secretary Robert Weaver was expected to receive a prospectus for such organization some time last month.

In-factory or on-site for concreting?





The Balency-MBM System uses factory-made wall panels and stairs, but a poured-in-place floor slab. Specially designed trailers bring factory-produced components to the site at such intervals as to insure a continuous flow of production. Tower cranes lift the panels to their correct location. The cranes are also used to handle the cage of pre-assembled reinforcing steel and heating pipes. The detail, right, shows a welded connection between two exterior wall panels, and reinforcement for tying in the floor slab.

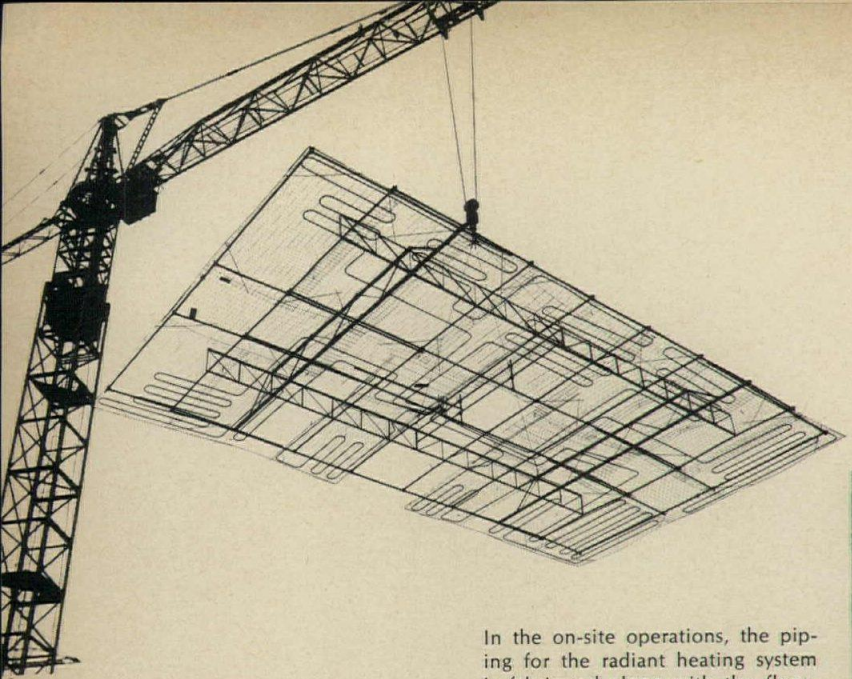
EUROPEAN SYSTEM COMBINES BOTH

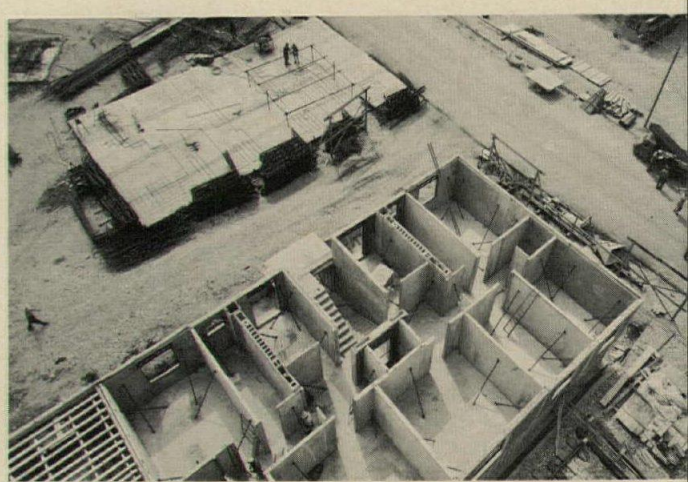
By Guy G. Rothenstein

In Europe, precasting has led to a new technology of building, especially in the field of housing. There it has become a major factor in solving the problem of shelter economically, speedily and with a minimum of skilled labor, which is in short supply in most European countries. Most populated centers in Western Europe have sizable precasting plants, usually operated by builder-developers, using one of the several well established and quite sophisticated systems under license.

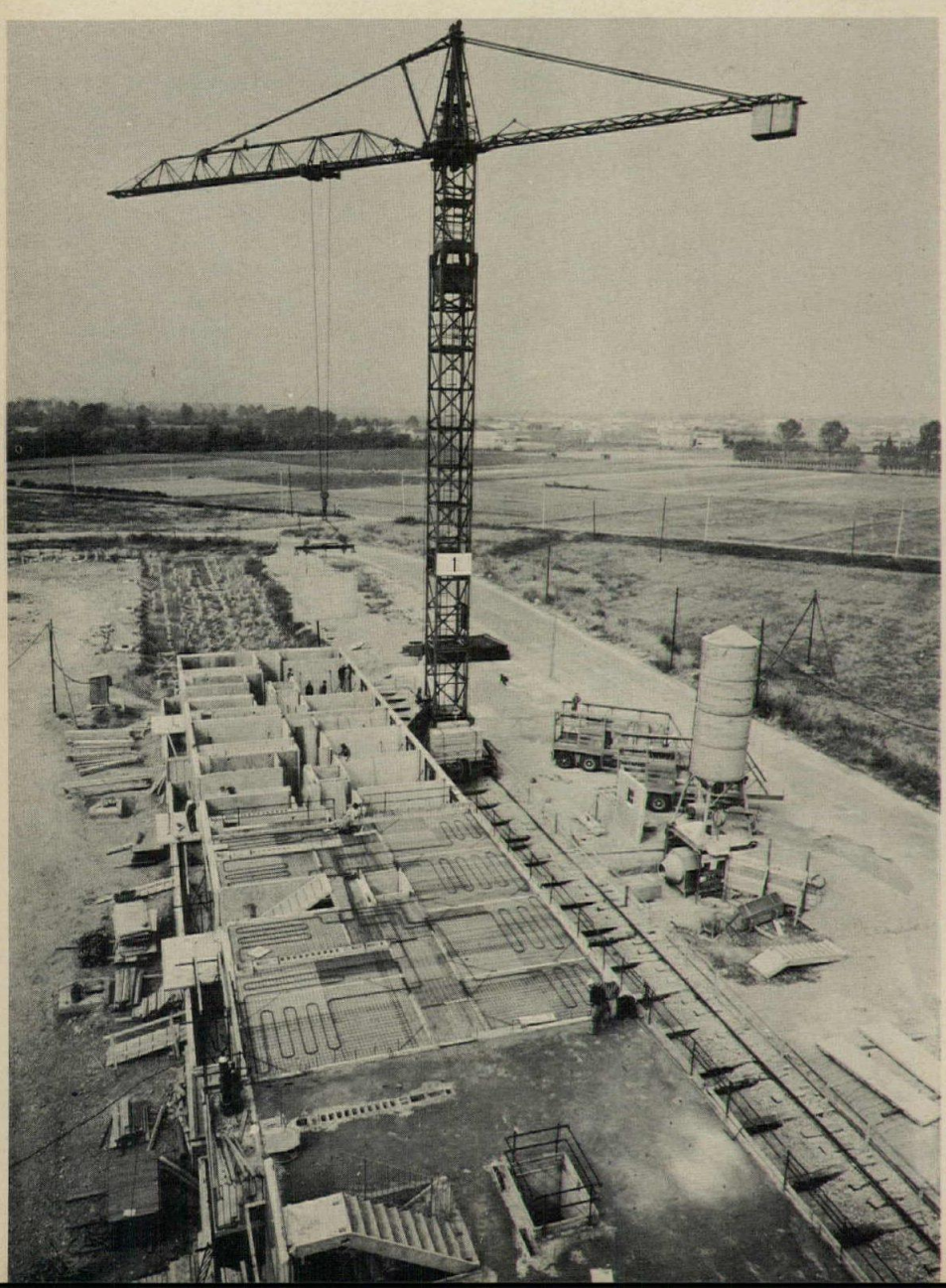
After having observed and studied several of these, the writer became particularly interested in the "Balency-MBM" system, developed by a French-Italian combine, because it seemed to hold the promise that its essentials would be usable in the U.S., where a breakthrough towards better housing at reduced cost is long overdue.

The Balency-MBM system emphasizes industrialization of the building process rather than advocating all-out precasting, as some of the other systems do. Essentially, the Balency-MBM system is a method of complete industrial production of load-bearing building shells of reinforced concrete, one- or multi-story. The shell includes all exterior walls (insulated), interior walls or partitions, slabs and stairs. Depend-





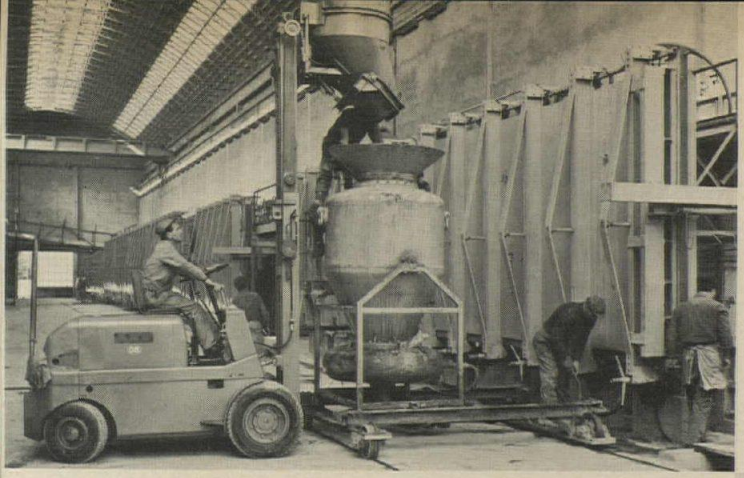
In the on-site operations, the piping for the radiant heating system is fabricated along with the floor-slab reinforcing steel on a jig at ground level. The assembly is then put in place by crane. The photo, right, shows partitions ready to receive the reinforcement. The photo, below, shows reinforcement in place and one slab already poured. Crane lifts 27 panels for one apartment in four hours. Production rate is eight apartments a week.

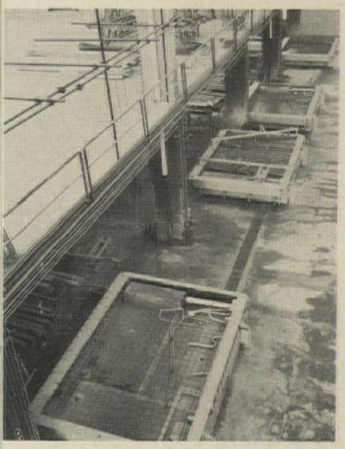


ing on the type of use, codes and practicality, the shell may also be equipped with integrated electric, heating, ventilating and plumbing systems which contribute greatly to the overall cost savings. Cost of these structures is estimated to be 10 per cent less than conventional construction.

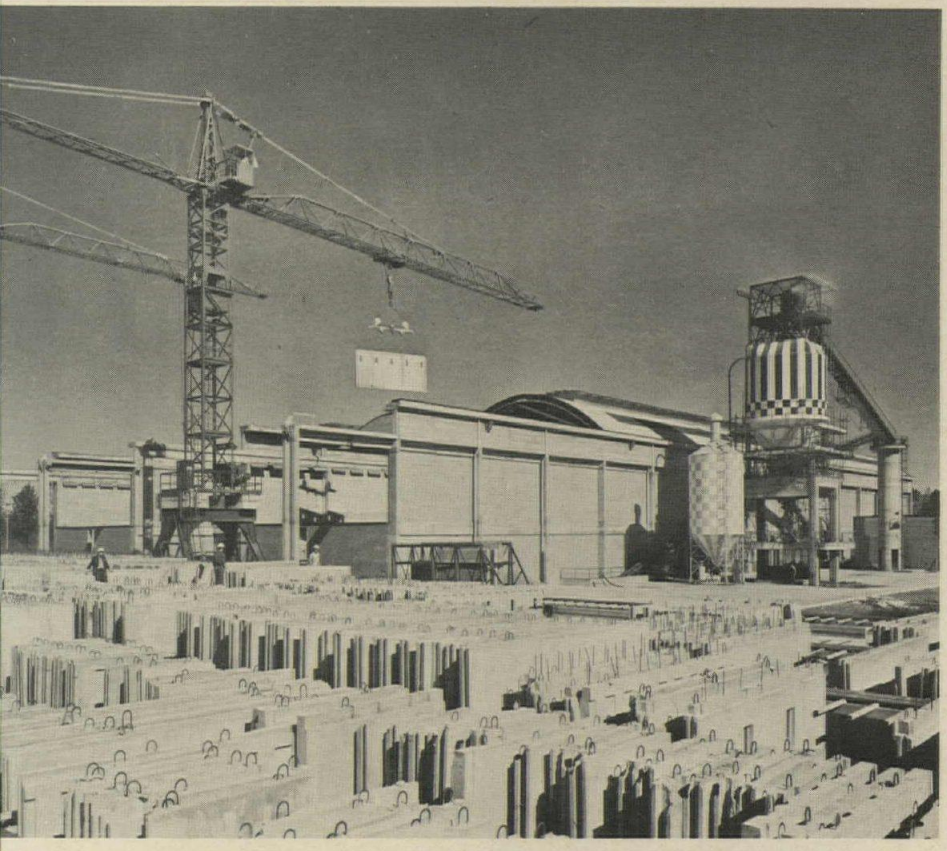
The Balency-MBM System uses off-site and on-site fabrication in a completely programed and coordinated flow of production. This is accomplished by: 1) A mechanized concrete casting plant where all vertical load-bearing wall and partition panels are fabricated in casting machines with rigid quality control. (Stairs and certain horizontal elements are included in the minutely scheduled production runs.); 2) A transportation system using specially designed trailers to transport all factory produced components to the site, assuring a continuous production flow; 3) A building-site system in which components are lifted by tower cranes from trailers and placed immediately in their final position in the structure. Floor slabs are generally cast on the site on prefitted forms with pre-assembled reinforcing steel. (For one-story buildings it is generally preferable to precast slabs in the plant.

The different tasks, whether in plant or on-site, are performed by crews of from three to seven men trained for their specialities. They are repeated with great efficiency in regular cycles, and require very little supervision. The finishing of the building i





At the factory, interior partitions are poured vertically, with the concrete being introduced at the bottom of the form to avoid air pockets. Heating of forms enables panels to be produced at rate of one every three hours. Battery of 11 casting machines produces 10,000 sq ft of load-bearing walls per day. Exterior wall panels are poured horizontally, in order to introduce exterior finish and insulation (right). Interior partitions containing plumbing are also poured flat (left).



The MBM plant in Milan produces four dwelling units (27 precast units each) in one day. Tower cranes move the panels from the factory out to the yard for temporary storage. The photo at right shows a precast stair being loaded onto a truck. Special trailers have been designed so that one dwelling unit can be transported in three loads.

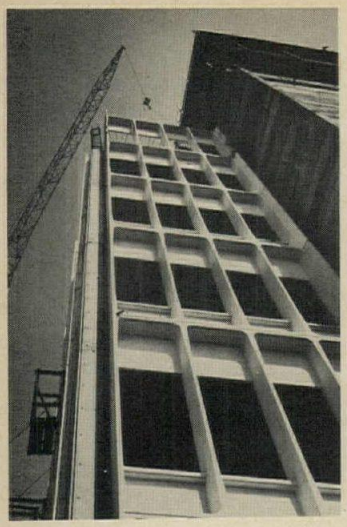
done on a rigid production schedule with conventional techniques.

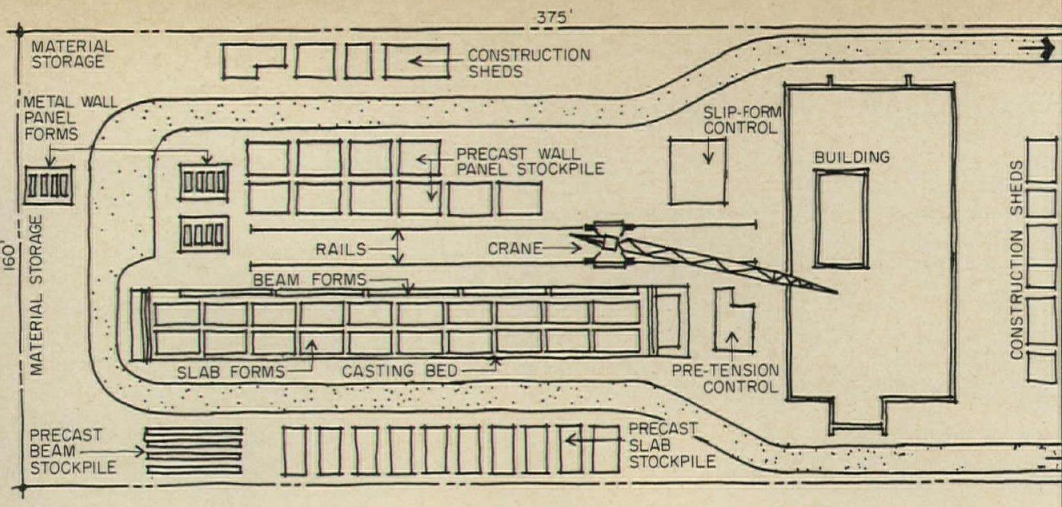
As an example, the production of the MBM Plant in a Milan suburb is set up for four dwelling units (14 U.S. construction rooms) per day or approximately 1,000 dwelling units per year.

The integration of mechanical systems is of particular interest. While in the U.S. mechanical systems are integrated in respect to design, Balency-MBM actually integrates mechanical and structural elements physically in plant and site fabrication. Wet walls, with cast-in plumbing are placed as fast as structural panels.

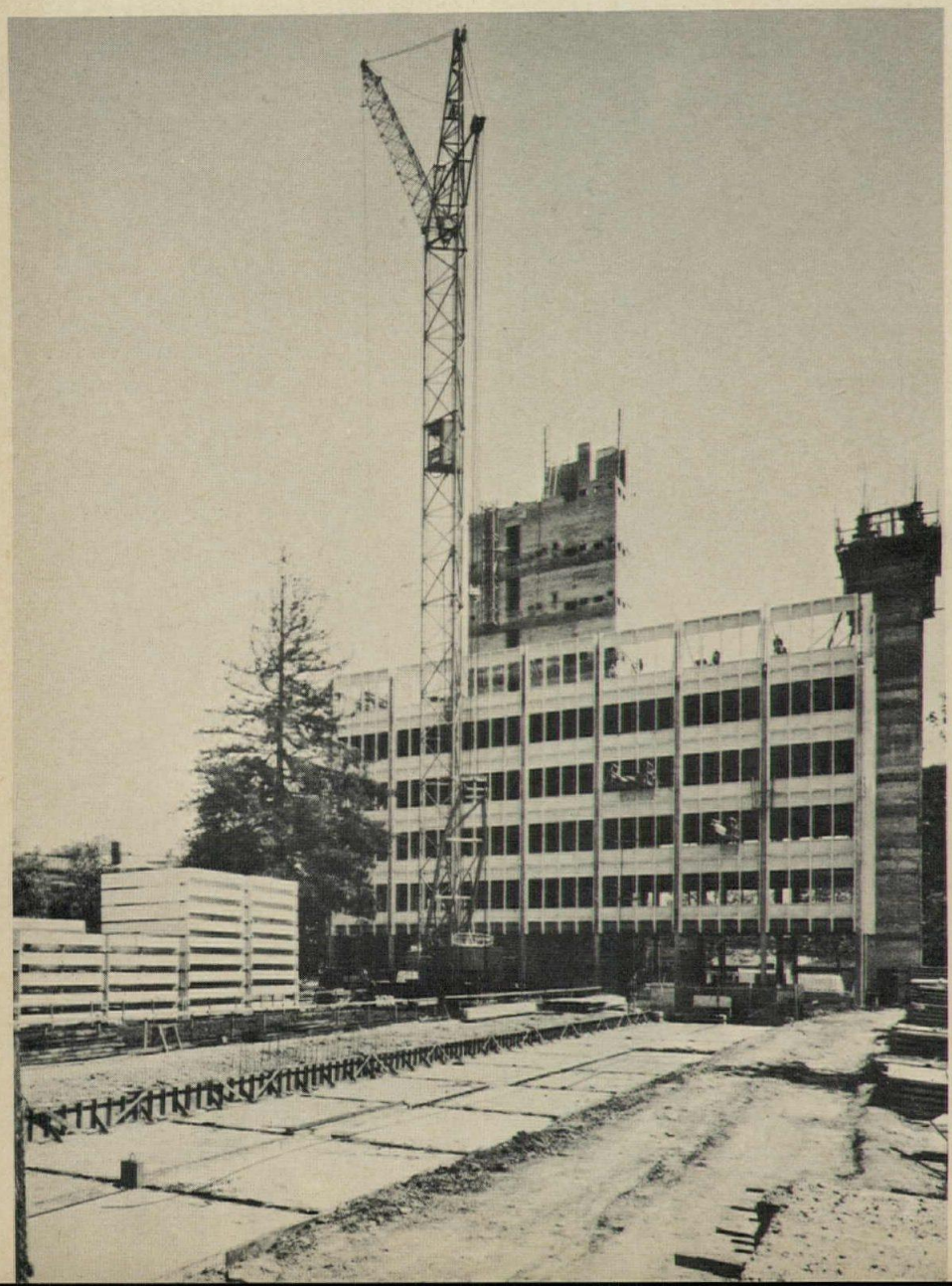
A radiant heating system is integrated with the site-cast floor slab, which is fabricated in a template on the ground together with the steel reinforcing of the slab. Electrical wiring is also fully integrated with the structure—waterproof flexible plastic type cables or raceways for outlet boxes are cast into the panels. Wiring for slabs is shop assembled on the site.

A cost comparison was made of an apartment-house shell built near Milan, Italy, and a middle-income apartment house in New York City. The following savings appear possible, applying U.S. labor and material cost to the Milan shell: approximately 40 to 50 per cent in site labor and 30 to 40 per cent in material. Combined labor and material savings of approximately 15 to 20 per cent might be possible, corresponding to about 6 to 8 per cent of total construction cost.





A complete production line was set up on the site of the nine-story Alameda Building in San Jose, California for precasting walls, girders, and pretensioned slabs. Columns, spandrel beams and slab topping were poured in place, and the core was slip-formed. A tower crane, moving on rails, handled precast components and hoisted concrete for *in-situ* operations. Architect: Allan M. Water & Associates; structural engineers: T. Y. Lin, Kulka, Yang and Associates.



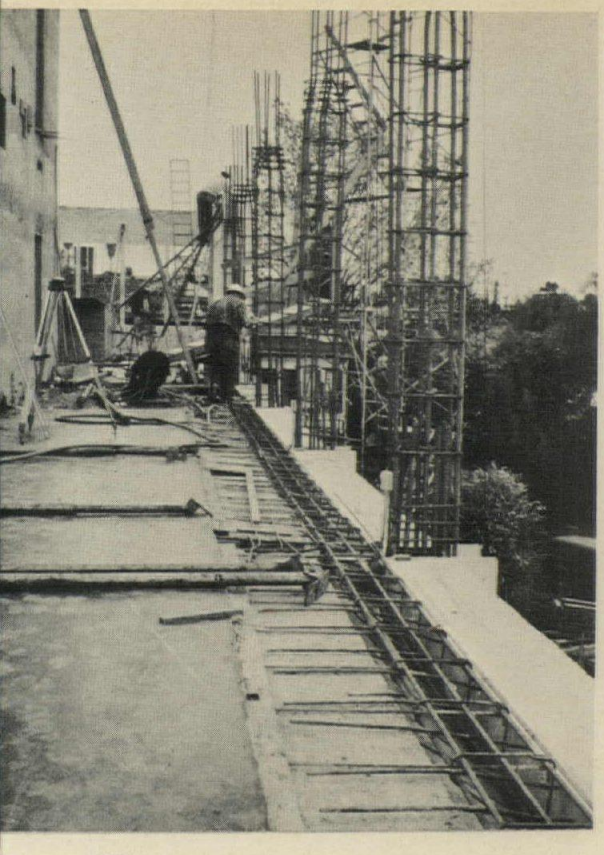
PRECASTING IS DONE ON-SITE IN CALIFORNIA

A complete on-site precasting and pre-stressing operation was developed fo construction of a nine-story office build ing in San Jose, California. The on-site factory was set up on the site in space earmarked for a future parking lot. A fully compatible scheme of architecture and structure was necessary in order to benefit from economies of precasting.

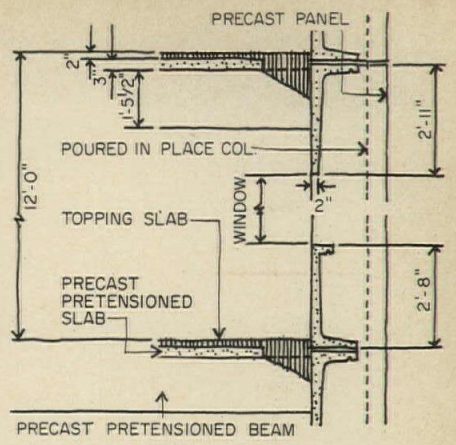
Key to the success of job-site pre casting was the precision with which the building operations could be co ordinated. Obviously, the dove-tailing of crane capacity and weight of build ing components was a guiding criterion. Use of lightweight concrete expanded the possibilities of design, and job effi ciency was greatly increased by simplic ity of connections.

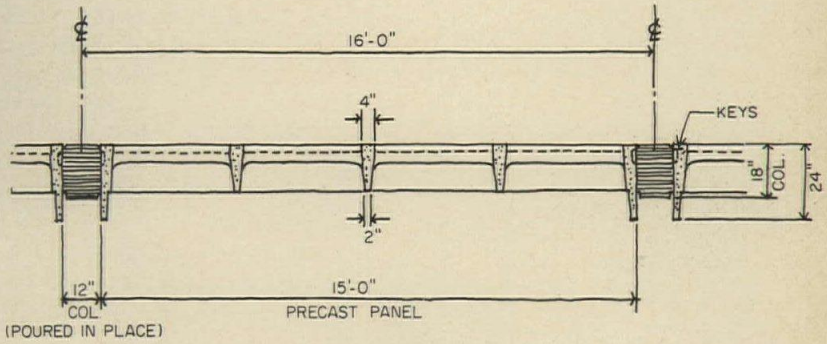
By using the central elevator and service core for beam supports, the beams could be arranged so that only three interior columns were necessary. These were cast-in-place to be joined with the beams into a continuous frame essential for earthquake resistance. Ele vator core and stairwell shafts were slip-formed ahead of the other buildin operations in order to speed construc tion and to provide bracing for the erection of precast construction.

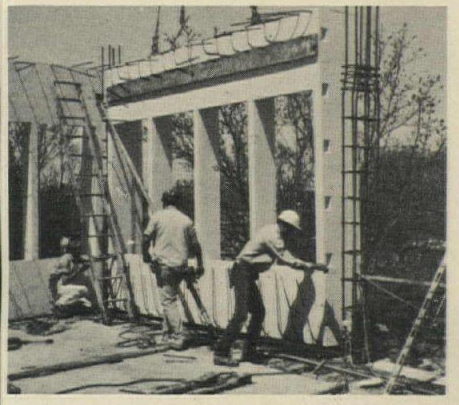
To achieve a compact type of con struction, the variety of building ele ments was kept to a bare minimum

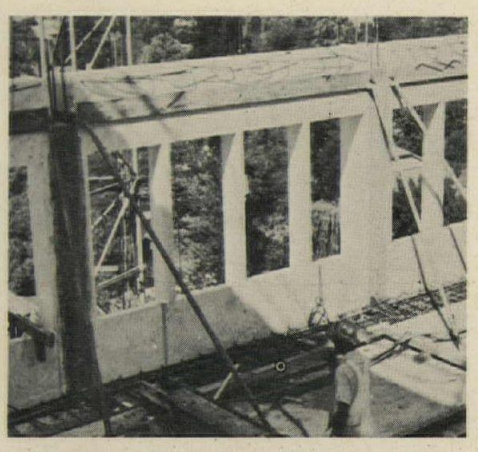


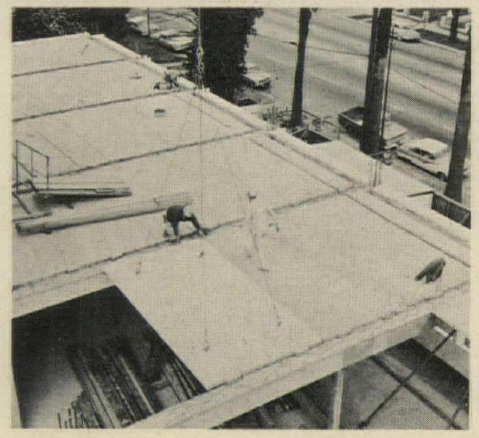
Exterior wall panels span one 16-ft bay. The closure between panels is a poured-in-place column. The weight per panel was 3½ tons—about the maximum the crane could erect with the necessary reach. Precast-pretensioned slabs, 3-in.-thick, are covered by a 2½-in., cast-in-place topping; spandrel beams were poured at the same time. The topping constitutes an earthquake-resisting diaphragm and works in composite action with the beams and slabs to increase strength.











After exterior wall panels were set, columns were poured. Next, beams spanning 36 ft were placed between exterior panels and the poured-in-place core, or, as in the photo, an interior column. By using a structural core, only three interior columns were required. Job efficiency was increased by simplicity of the connections. Steel reinforcement projecting from wall panels, beams and slabs ties them to the topping. Total construction time for erecting the nine-story structure was four months.

Simple rectangular, pretensioned beams provide a medium-range span of 36 ft, while 3-in.-thick pretensioned solid slabs span 16 ft between beams. A 2½-in.-thick topping, acting in composite action with beams and slabs, adds to the strength and stiffness of the structural system, houses electrical conduits and other inserts, and provides a diaphragm for earthquake resistance. Precast architectural wall panels were shaped to screen the sunlight. They are arranged so that the space between them could be used for poured-in-place columns.

Beams and slabs were pretensioned on a 200-ft bed in timber forms, while the wall panels were precast in steel forms which permitted the design of extremely thin-rib sections. Lightweight aggregate concrete was used to make greater use of the crane's capacity, as well as to save on prestressing and reinforcing steel, foundations and earthquake resisting elements. Type III cement was used in the pretensioned products to eliminate the necessity for steam curing. The wall panels were made of white cement and lightweight aggregate. Their weight of 3½ tons was easily handled by the traveling tower-type crane.

The stressing beds for the slabs and girders and the casting yard for the panels were laid out so that one track-mounted traveler crane could service all aspects of construction—including the casting, erecting, slip-forming and handling of materials.

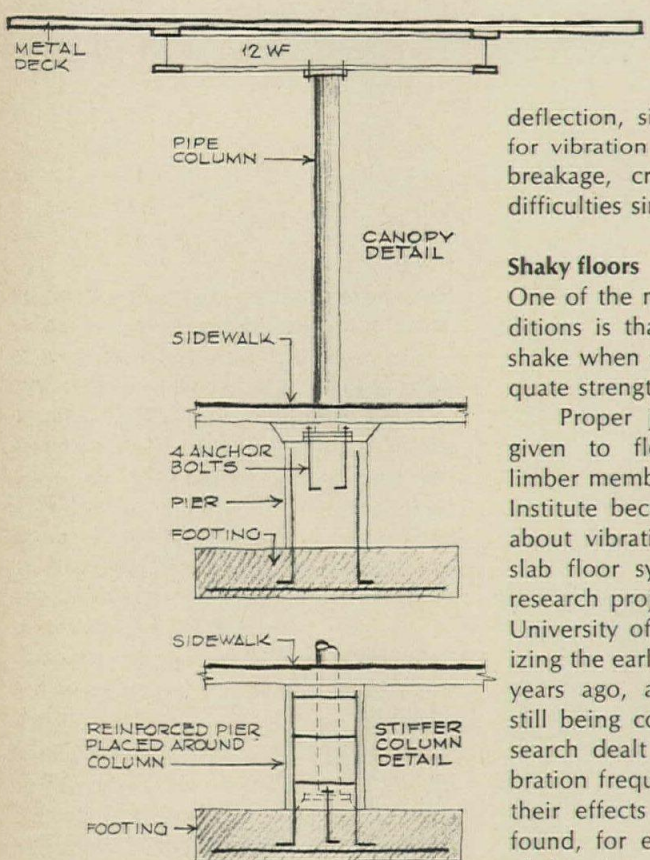
Structures should have stiffness as well as strength

By Harold S. Woodward, Structural Engineer

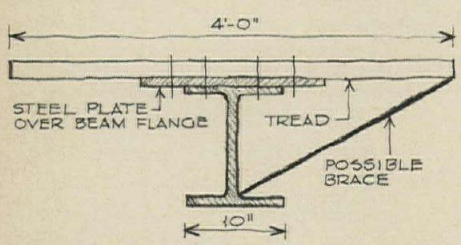
The trend toward lighter-weight structures has had one often-overlooked by-product: it has aggravated the problem of annoying vibrations in buildings.

Vibrations set up by footfalls or by the wind are generally of little or no consequence as far as safety to life is concerned—but it is nonetheless a real problem since users of these buildings may question the safety of the design. The result is that either the architect or engineer must take time to reassure these people, or they may actually have to take some remedial steps to prevent the vibration. But the point is, they can be avoided.

Higher working stresses now used for structural materials may result in quite slender members—if they are designed for strength alone. But the structural design must also take into account deflection, since it can be responsible for vibration problems as well as glass breakage, cracked ceilings and other difficulties similar in nature.



This cantilever canopy may shake unduly when workmen walk on it during construction, unless the columns are anchored solidly to the foundation, as shown in the detail directly above.



A person walking near the rail of stairs supported only by a center string may encounter considerable vibration due to deflection of the tread. This could be reduced by bracing.

Shaky floors

One of the most familiar vibration conditions is that of floors in houses that shake when walked on—they have adequate strength, but are not stiff enough.

Proper judgment must always be given to floors supported by light, limber members. In 1958, the Steel Joist Institute became sufficiently concerned about vibration of steel-joist concrete-slab floor systems to have initiated a research project on the problem at the University of Kansas. A report summarizing the early work was published three years ago, and additional studies are still being conducted. Much of the research dealt with measurements of vibration frequencies and amplitudes and their effects on human beings. It was found, for example, that the presence of damping action could keep vibrations from being perceptible. Teachers working alone in classrooms in a school reported annoying vibrations, but vibrations were not perceptible by either teacher or students when the room was full. The researchers found that many structural components contribute to damping, the most effective being partitions of all types. Flooring, rugs and ceilings assist to a reduced extent.

The researchers pointed out that in the design of large open areas, such as encountered in churches and school buildings, sufficient damping to avoid vibration problems may not be available. In such cases, joists deeper than those indicated by loading tables should be used—increasing the depth of joist is more effective in gaining stiffness than increasing the slab depth. But where headroom is important, a heavier joist of the same depth with added slab thickness can accomplish the same purpose, the report states.

Wobbly cantilevers

Cantilevers can be a vibration hazard, and construction men often complain of long roof cantilevers of lightweight concrete. Again, while these may be adequate for strength, they lack sufficient rigidity, and extra depth beyond that required for strength is advisable.

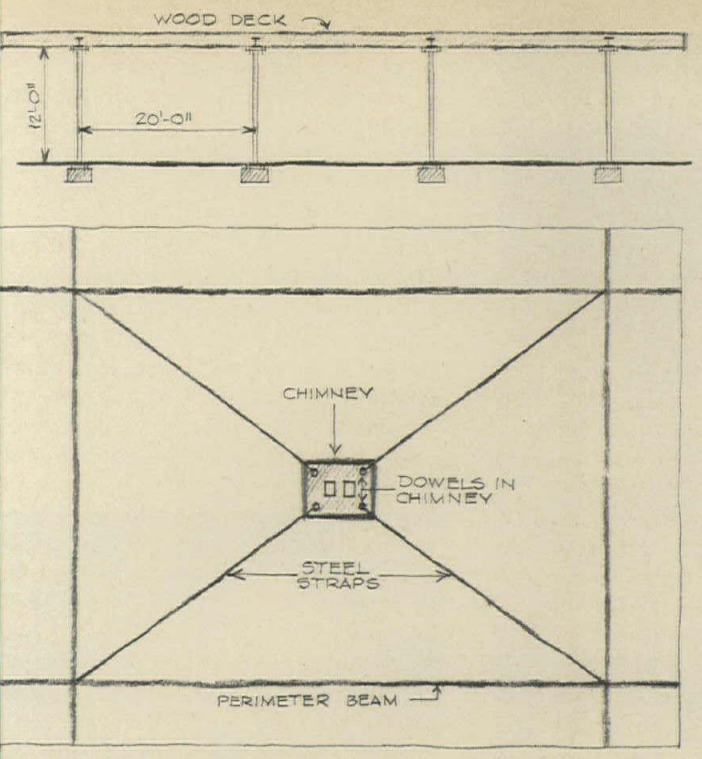
If a metal deck is used for roof construction any cantilever condition should be carefully checked, and, particularly, relative deflections of adjacent cantilevers should be investigated. For example, when the framing is such that different length cantilevers occur, use of the same depth of deck throughout will result in different deflections and a ragged line in the fascia.

Stairs which are supported only by a center string with the treads cantilevering either side, can be a source of considerable vibration. A person walking near the rail on one side throws torsion as well as bending in the supporting string. Any slight rotation in the string or the tread connection will throw a big deflection out at the rail.

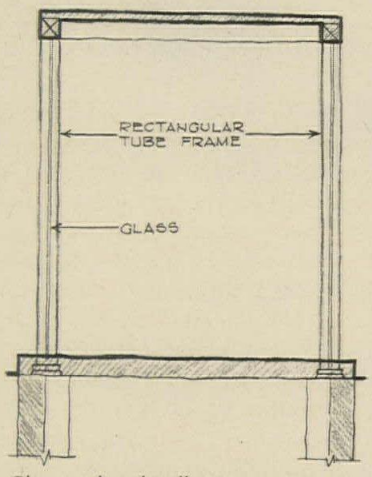
Lack of lateral rigidity

Deflection and vibration due to wind can be very disturbing to building occupants. Even slight movements are noticeable. This sometimes happens in residences with a lightweight structure of pipe columns and steel beams when the connections between them are not rigid enough. Two case histories will illustrate: In one house which had continuous glass walls and flat roof, the architect opposed using knee or diagonal braces. He was advised that the structure would be safe but that vibrations would occur. When the roof was being built the workmen complained that the structure was vibrating. The solution: the edges of the roof were tied into a very large central chimney with steel straps.

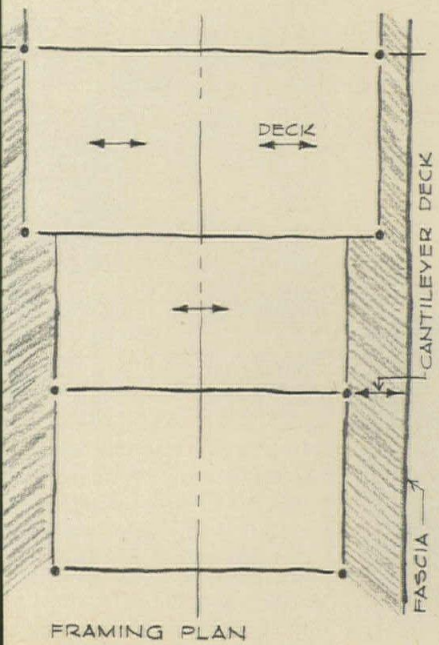
The other residence had ocean frontage and was two stories high. When the structural frame was erected, but not enclosed, the owner complained of considerable vibration under wind loading. The field connections were bolted, and even when they were supplemented by welding there was still a problem. Field measurements indicated small deflections of less than ⅛ in. After other expedients were tried and found unsuccessful, the architect finally approved the use of small knee braces. While this remedied the situa-



A structure consisting of a platform for the roof supported by light, limber columns needs some type of bracing to provide lateral rigidity. In the house shown above, the workmen complained of vibrations during construction operations. Since the architect would not permit bracing which would show, the engineer suggested that the roof structure be tied to a central chimney by means of steel straps placed diagonally.



Glass-enclosed walkway structures should be checked carefully for lateral rigidity. Otherwise movement due to wind could crack the glass. Connections between columns and beams, and columns and footings should be stiff.



Cantilevers of different lengths shown in this framing plan will have different deflections if their depths are the same. This can result in a ragged edge in the building fascia.

tion to a noticeable extent, the owner was never fully convinced that the design was adequate.

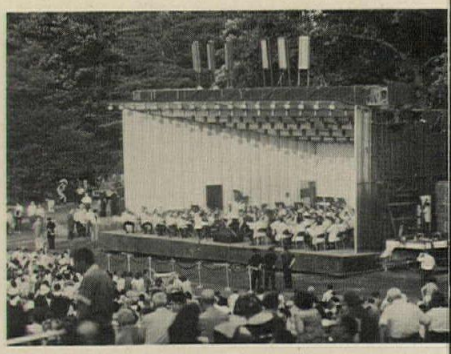
Limberness of pipe columns is yet another problem: In the final stages of construction of a building, a bow was noticed in a pipe column. It was thought that the column was defective and so it was replaced. When the new column was put in place and bolted, the same bow reappeared. The difficulty: the horizontal beam bearing on the column cap was not exactly level, and when the bolts were tightened between the two members a bow in the column resulted.

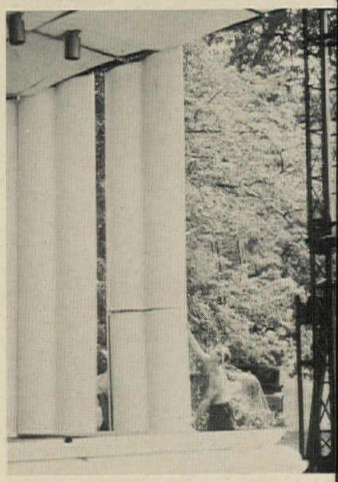
Similar to the structures cited are canopies that are built over walks between buildings or at entrances. In many cases these are not enclosed and are, therefore, subjected only to light wind loads. The trouble occurs during construction when workmen complain of vibration. Anchorage of the column bases to the foundation by means of anchor bolts will not, in many cases, give satisfactory stability; and knee or diagonal braces are seldom satisfactory from an esthetic point of view. The most satisfactory solution has been to carry the column down at least a couple of feet into a heavy concrete pier to fully fix the column end at this location.

The extreme case is that of a single central column supporting a canopy. Here we have a compounded felony: a cantilever column supporting cantilever beams supporting a cantilever deck. Unless large-size columns (relative to vertical-load capacity) are provided the situation is pretty hopeless. The severe conditions occur during construction when workmen are on the edge of the deck. Once the structure is finished the possibility of unequal live loads is remote. The reasons here are pretty obvious. The deflections from all the structural components are additive and to those are added the rotation at the top and bottom of the column due to flexibility in the connections.

Another reason for limiting deflection in structures is the safety of the glass in the exterior walls. Vertical mullions should be investigated for wind loading in many special cases. Window manufacturers are apt to be optimistic and need checking when out of their usual range of spans. The sketch, left, shows an enclosed walk with a light frame where lateral deflection could cause damage. When such a design is used the connections between vertical and horizontal members should either be tightly bolted together with high-strength bolts or welded. The columns should be carried down below grade and be rigidly fixed to the piers.

Malcolm Smith

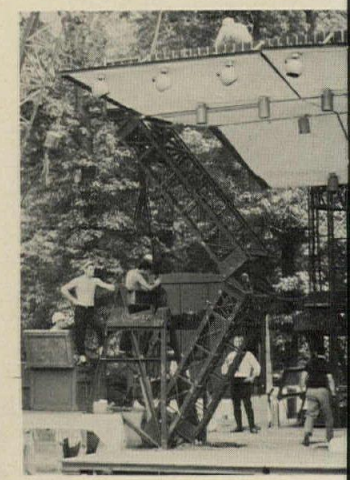




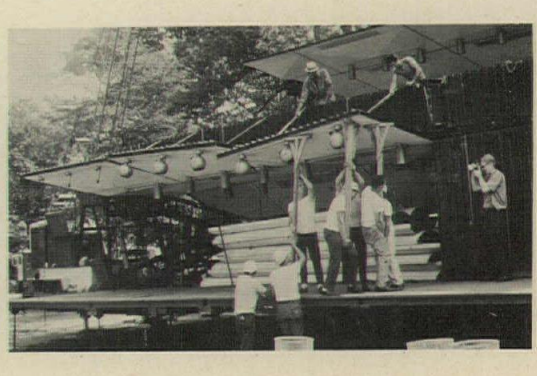
Mobile shell for outdoor concerts

A mobile concert stage and shell designed by Christopher Jaffe enabled the New York Philharmonic Orchestra to give open air concerts in the city's parks last summer to audiences of as many as 70,000 people.

The shell, which takes only about 11 hours to erect and dismantle, consists of two sets of two trailers, each comprising two identical platforms at right and left hand, that interlock to form the stage which can carry an orchestra of 250 with all of its musical equipment. The forward and rear trailer platforms each provide hinged floor and ceiling panels. The ceiling panels are lifted into place by hydraulic equipment. The fiber-glass reinforced plastic sidewall panels are erected by hand. Cast aluminum light fixtures and sound equipment are built into the trailers and erected at the same time.



When in the open position, each of the trailers forms a quarter-section of the stage. The shell is constructed of fiber-glass reinforced plastic wall panels and multi-faceted roof panels. Lighting consists of a fixed system of downlights covering the whole ceiling area and accent lights along the front.



Some finishes start things.

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Things like new possibilities in design.

The richly glowing finish of this J&L stainless steel was just one consideration of the Sumitomo Bank in choosing these handsome doors. Stainless offers so many other benefits. But because finish is so important, J&L offers a special one, in addition to the standard grades. GRAIN LINE (from .018″ to .078″) awaits the architect or designer who starts things with new finishes.

Maximum light floods through these doors because stainless steel is strong enough to permit narrow-stile design, while it provides vital security. (Not every architectural metal can.) Perfect alignment and close tolerance are possible because stainless is warp-resistant. Stainless entrances are now available, from stock, at prices sure to interest architects and builders. Other benefits are gleaming beauty . . . easy care . . . and long life. Wherever metal is a possibility, stainless is the probability. Its finish gets a lot of exciting things started!

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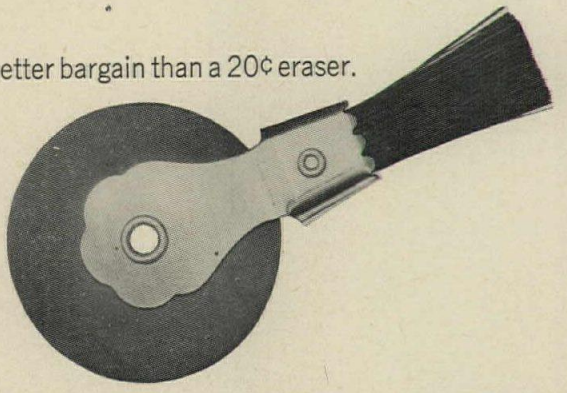

The new IBM Magnetic Tape Selectric® Typewriter, (MT/ST for short), costs ten thousand dollars.

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Before, when a typist made a mistake, she had to stop typing and erase it. Or maybe even start all over again.

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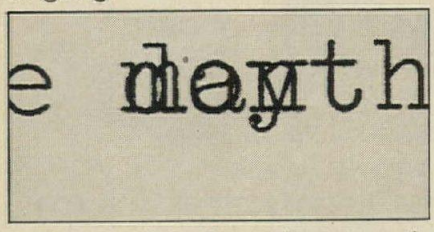

The mistake is changed on magnetic tape, where all typing is recorded and played back correctly at incredible speed. (Roughly 15 characters per second.)

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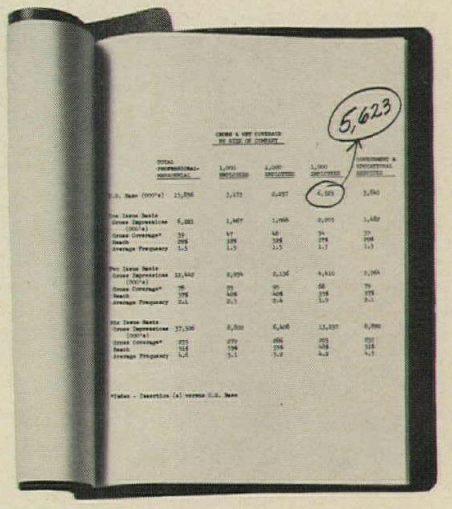

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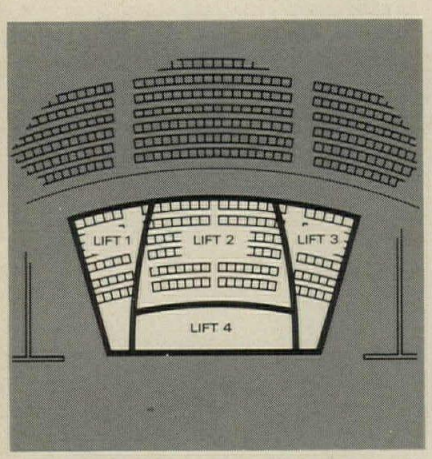
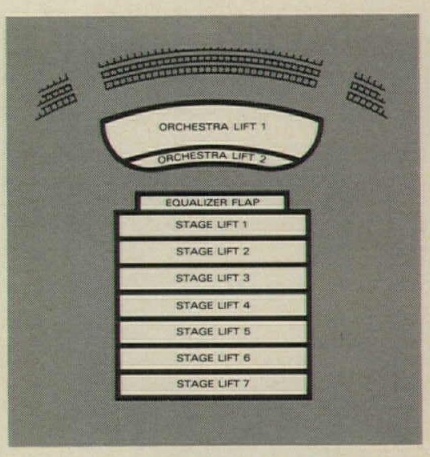
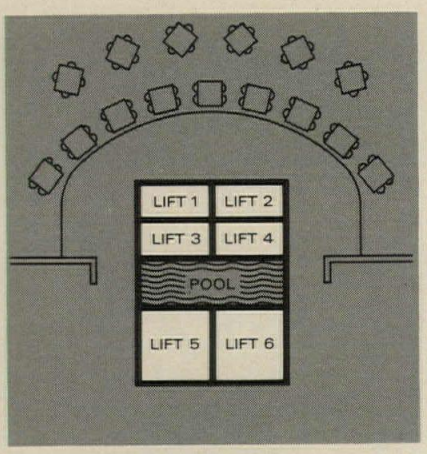
DOVER STAGE LIFTS



Loeb Drama Center, Harvard University—Four Dover Stage Lifts are used to create a theatre that easily converts for three different kinds of staging.



Metropolitan Opera House, New York City—The new home of the Metropolitan is equipped for fabulous stage effects with seven Dover Lifts on stage and two in the Orchestra.



Stardust Hotel, Las Vegas—Six Dover Stage Lifts, operating in combination or independently, bring performers and sets into view from below stage level.

These diagrams illustrate three of the more than 100 entertainment centers equipped for flexibility with Dover Stage Lifts. Dependable, smooth-running Dover hydraulic lifts produce elaborate theatrical effects, save valuable floor space, and help in the design of multi-use halls. There are practically no limitations on platform size, lifting capacity and systems for controlling combinations of lifts. For theatres, concert halls, opera houses, auditoriums, night clubs, wherever you need a rising stage, specify Dover Stage Lifts. Send your preliminary requirements for analysis and recommendation.

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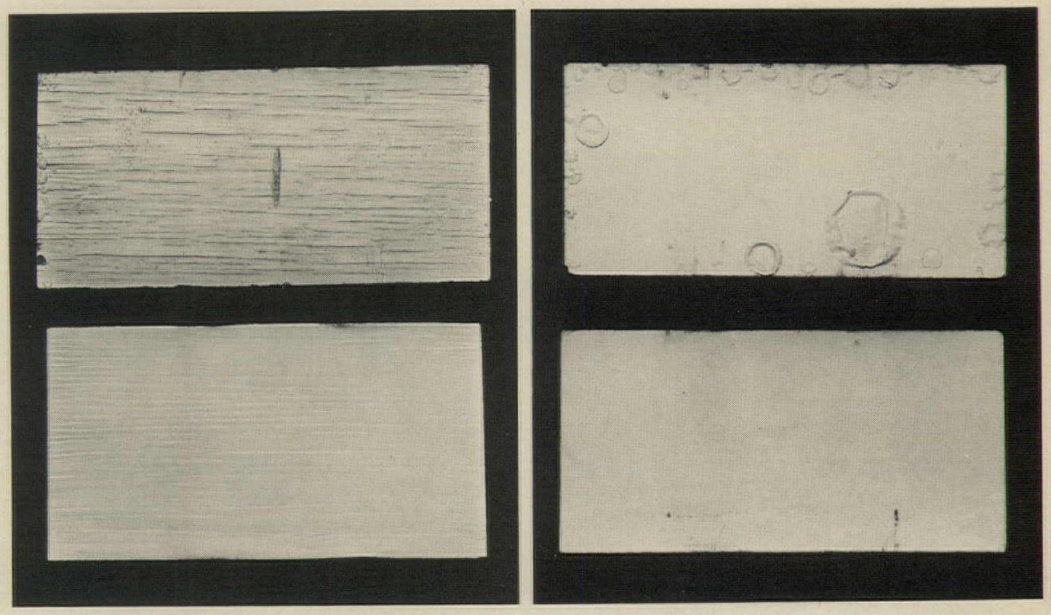


Vinyl-urethane paint coating for exterior-type sanded plywood withstood the severe cycling tests required for certification by The American Plywood Association, near right, bottom. The conventional paint, top, blistered, chipped and cracked. The tests include recurrent soaking and drying, boiling and drying, and soaking, freezing and drying. The photos far right show results of the same tests on the vinyl-urethane coating used on medium-density overlaid plywood.

Paint for pre-coated plywood

By Temple C. Patton, Manager, Technical Service Department
The Baker Castor Oil Company

The advent of prepainted sidings provides the architect with a method assuring long life for the first coating of almost any siding material. The advantages of prefinished siding of all varieties have been clear for several years. Metal and asbestos siding have been available prefinished for some time. And while the technology to perfect truly workable factory-finished sidings of wood has lagged behind the obvious need, the problems have now been effectively solved.

Raw material suppliers, paint manufacturers, and the lumber industry have all devoted a great deal of effort to testing and developing finishes that can be guaranteed for 10 years or more, and that will be suitable for production-line application. The dimensional instability and variability of wood substrates makes this goal difficult to achieve, although progress has been made.

Only in recent years have suitable factory-finished coatings been available for wood siding exteriors. And, until a few months ago, no time-tested paint had been available for exterior-type sanded plywood. The work done in the area of paints for medium-density overlaid plywood paved the way for this latest development.

A new vinyl-urethane coating formulation, developed by Baker Castor Oil, that has received certification by the American Plywood Association provides a paint system that can be used on both exterior-type sanded plywood and medium-density overlaid plywood.

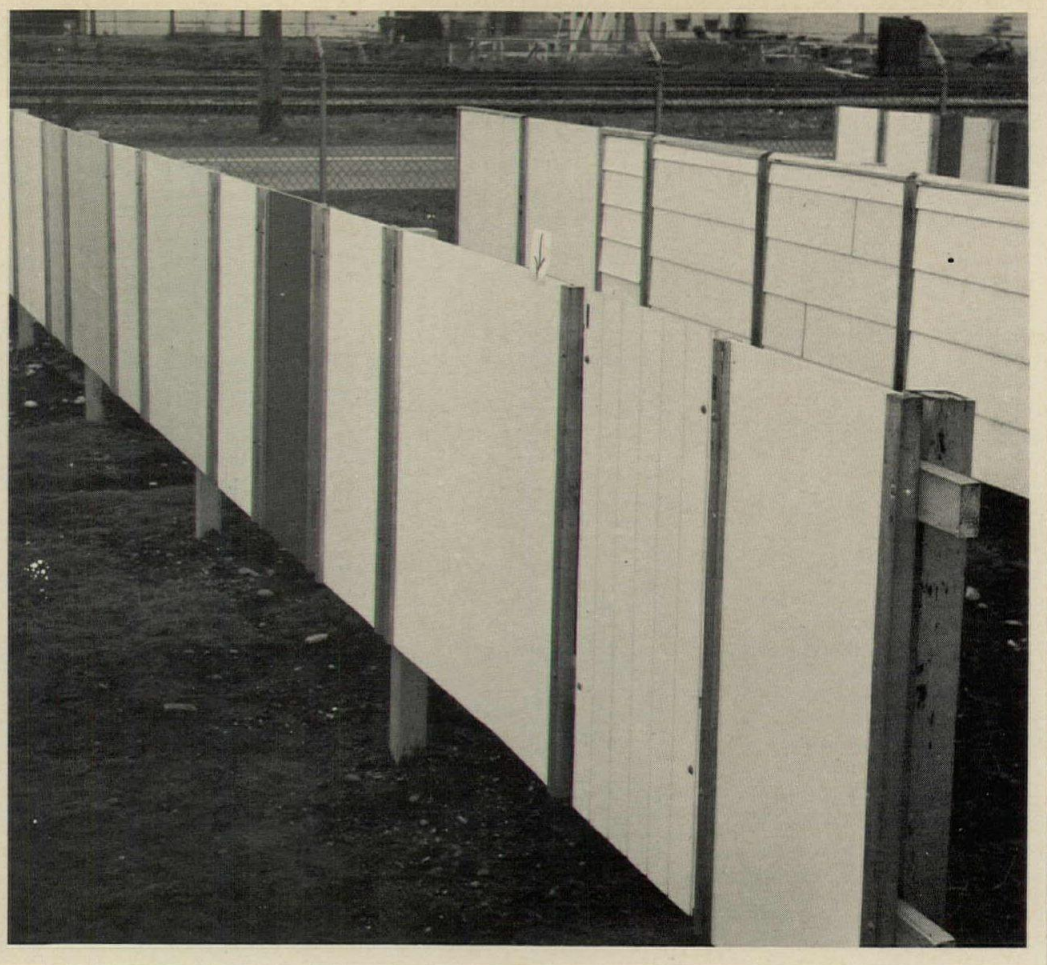
One of the problems of wood as a substrate material is that no two pieces are exactly the same. Temperature, humidity, sunlight and other climatic conditions affect both the physical and chemical properties of wood during its growth period. Grain is highly variable as are various sections of the tree during the year-round growing season. The effects of these factors become magnified when plywood is the substrate.

How coatings must perform

There are at least three major requirements that a coating or paint for wood must meet to be considered acceptable for factory finishing and subsequent marketing. The coating must: (1) withstand the wood's dimensional changes —which means that it must have outstanding adhesion, cohesion and excellent flexibility so that it can expand and contract with the wood substrate; (2) have excellent exterior curability, whether serving as a self-priming top coat or as a primer, so that it can withstand weathering for 10 or more years; (3) lend itself to production-line finishing, which means that it must be applied and cured within a few minutes.

In an effort to provide a more suitable facing for plywood to assure a more "paintable" surface, phenolic-treated kraft paper overlays were developed. This provided an improved and predictable surface for primer and final coatings, eliminating grain swelling and checking problems which have hurt the performance records for paints, regardless of their effectiveness as coatings or their durability.

One such exterior system that has received American Plywood Association certification for use on medium-



In addition to passing the accelerated laboratory tests, coatings must successfully go through tests that include six months' outdoor weathering (test panels shown here), a machine-induced equivalent of 10 years outdoor exposure in all-weather conditions, and five days of alternate heating and cooling from 180 F to ambient temperature.

density overlaid plywood is based on the vinyl-solution resins of Union Carbide Corporation. This system comprises a 1.5- to 2-mil vinyl-urethane primer and a 2- to 3-mil topcoat.

At the present time several major plywood producers in the country are conducting commercial test runs using this formulation. Substrates for these pilot runs include all forms of exterior plywood and hard board panels and siding particularly for application where exposure is most rigorous.

Coating for bare plywood

Recent American Plywood Association approval of Baker's formulation for both overlaid and exterior bare plywood has been a significant breakthrough for paneling and siding. This marks the first time that exterior plywood with a thin paint coating has withstood the severe A.P.A. tests. Based on correlation data obtained to date, these accelerated laboratory tests closely reproduce the dimensional changes that may occur after many years of exposure. They include 25 cycles of soaking coated plywood for eight hours in ambient temperature water followed by oven exposure at 145 F for 16 hours; 25 cycles of soaking in boiling water for four hours followed by force drying for 20 hours at 145 F; plus several intermediate tests (one at 0 F); and finally, actual exterior test fence exposure. In receiving A.P.A. certification these panels exhibited no extensive loss of adhesion, no coating rupture and no extensive chalking, discoloration or over-all appearance degradation.

The success of this recent breakthrough in exterior plywood coating technology will depend to a great extent on careful quality control of the prefinishing operation.

Advantages

As the cost of painting conventional wood siding increases with steadily mounting labor rates, the durability of painted plywood and lumber become more critical. The long life implicit in a completely prefinished system is clearly an attractive feature. At the same time the capability of the lumber yard to stock and sell precoated exterior siding creates a new market.

Union Carbide reports that builders estimate the average house would cost only $500 more with the most expensive line of prepainted siding, in contrast to conventional on-site painting jobs. Factory-finished vinyl-urethane siding has the additional advantage of a uniformly good appearance when it is compared to the gradual chalking and erosion experienced on conventionally painted houses between paintings.

Installation methods are similar to those for other prefinished siding materials, and the usual precautions against hammers, shoe-nails and other rough handling methods are recommended. One advantage with the Baker formulation is that no delamination will develop on properly coated surfaces of the siding, whether it be overlaid or bare plywood. Panels thus need not be end-sealed. The A.P.A. tests have been designed to assure this advantage in the coatings, which means that the edges need not be coated to protect the panel surfaces.

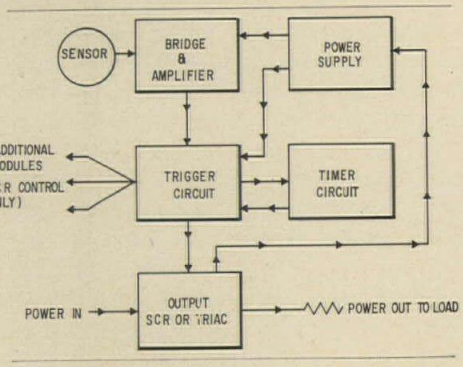
For the architect, these new developments mean a new flexibility in the choice of exterior materials, particularly natural materials like wood. Plywood has already proven itself to be an extremely versatile material in home building, but until the advent of these new vinyl-urethane coating systems it has had a somewhat limited utility as an exterior finishing surface. Now plywood has been given an added dimension in building application.

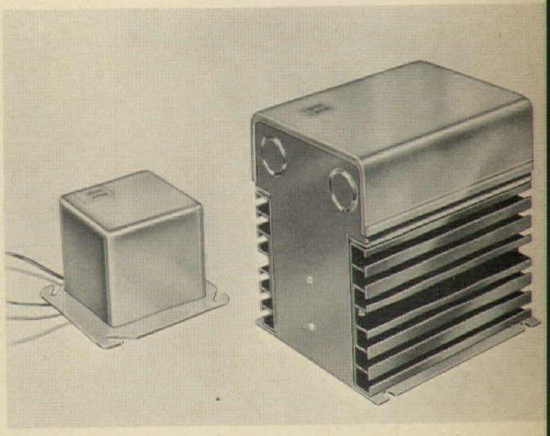
for more information circle selected item numbers on reader service inquiry card, pages 339-340

Solid state controllers can modulate electric heat output

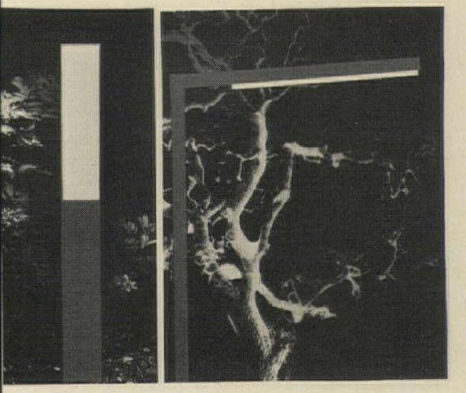
New electric-heat controllers for commercial applications automatically regulate heat output to provide precise temperature control and eliminate the uncomfortable "roller-coaster" effect produced by on-off controllers. The small model uses a solid state "triac" to handle loads up to 2kw, while the large unit has two silicon-controlled rectifiers giving it a 6-kw capacity. ▪ Honeywell, Inc., Minneapolis.

Circle 300 on inquiry card





New shapes for outdoor lighting units



Panorama outdoor lighting units are constructed of high-strength, heavy-wall aluminum extrusions, die-castings or spinnings, finished with a baked epoxy primer and matte black textured enamel for extra weather resistance. One-piece diffusers of white acrylic plastic may be easily removed for relamping and cleaning. Fluorescent fixtures are equipped with rapid-start, low temperature ballasts or starters. Power-groove and mercury-vapor units, as well as *Lightguard* photoelectric controls are available for most models in the line. ▪ Prescolite Mfg. Corp., San Leandro, Calif.

Circle 301 on inquiry card

Hospital music, paging and radio in transistorized system

Motorola has announced the introduction of a complete line of solid state hospital music and voice paging facilities including AM/FM radio, a tape playback deck and record changer, and a variety of speaker systems. Solid-state amplifiers are available in 50 and 100 watts; all input connections are of the plug-in or screw-terminal type to facilitate installation. The transistorized AM/FM tuner has temperature compensated circuits to eliminate tuning drift. ▪ Motorola Inc., Chicago.

Circle 302 on inquiry card

Compact videotape recorder for closed circuit use

Designed for instruction, training and other inter-building communication purposes in schools, hospitals or office buildings, the Ampex *VR 7000* recorder features instant playback and can be incorporated into new buildings at relatively low cost. The 78-lb recorder is self-contained in a 29- by 18- by 15-in. cabinet and gives a full hour of recording and playback on a 9¾-in. reel of tape. A portable model for use with existing closed circuit television systems is available as well as the console which includes television camera, receiver and related television equipment combined in a single package. ▪ Ampex Corporation, Redwood City, Calif.

Circle 303 on inquiry card

more products on page 240

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 339-340

STEEL ROOF DECK / Produced in both standard-design and long-span sections to meet a wide variety of commercial, industrial and institutional applications, this steel roof decking is the subject of a 16-page technical bulletin, no. D-66. Both types of structural sections are concisely described and clearly illustrated. One section covers the use of standard steel decking as sound-conditioning deck for ceilings or combined roof-ceilings, while another discusses the application of long-span *M-deck* to provide structural roof, finished ceiling and acoustical treatment in one easily erected component, which can be readily adapted for the incorporation of recessed-troffer lighting. Section property and load capacity tables are given for each type of deck. *The Mahonaire* ceiling system is also described. ▪ R. C. Mahon Company, Detroit.*

Circle 400 on inquiry card

CEILING SYSTEMS / Detailed information on more than 50 different types of commercial ceilings, including sample specifications, engineering data and performance tables, is given in a new 74-page illustrated catalog. A special section on ceramic ceiling systems contains a description of the *Ceramaguard* system—a fire-rated acoustical ceiling which is said to be completely resistant to moisture. The company's new *Luminaire C-60* system, designed on a 30 in. by 60 in. module and consisting of ceiling panels set to form deep troughs, is also featured in the brochure. ▪ Armstrong Cork Company, Lancaster, Pa.*

Circle 401 on inquiry card

DIRECTORY OF AIR CONDITIONERS / A complete listing of all certified air conditioners—window and through-the-wall types—is contained in the first 1966 edition of this N.E.M.A.-sponsored brochure, published three times a year. The information contained in the new edition combines data previously divided between two separate publications—a general and a builders' directory. Information given in the directory includes Btu/hr cooling capacity, current and power requirements for each model. ▪ National Electrical Manufacturers Association, New York City.

Circle 402 on inquiry card

FIBERGLAS INSULATION/A new 15-page brochure describes the applications and advantages of Fiberglas insulation, lists the residential thermal and acoustical products available and gives recommendations on installation techniques. Information is also given on the heat resistance of various types of building materials to aid in the selection of correct size heating and cooling equipment. Formulas for calculating heat loss, cooling factors, heat gain and operating costs are also included as well as information on control of condensation, noise control and construction techniques. ▪ Owens-Corning Fiberglas Corporation, Toledo, Ohio.*

Circle 403 on inquiry card

LIGHTING CYLINDERS / Gotham's new *Cylinderlites*—a coordinated group of lighting fixtures for interior and exterior use—are introduced in a descriptive brochure. Two basic types of cylinder are available, one with a polished black *Alzak* reflector, and the other with a new baked matte black coating. Both are made for use with reflector lamps in a range of sizes from 30 to 500 watts, and are designed for efficient glare reduction. Surface, pendant and bracket mountings are available for each fixture. ▪ Gotham Lighting Corporation, Long Island City.

Circle 404 on inquiry card

FIRE RATING GUIDE / A new guide describing time-rated floor and ceiling constructions which incorporate *Celotex Protectone* acoustical tile and lay-in panels is now available in the form of a series of individual sheets in a loose-leaf folder. Materials, applied under UL numbered design requirements, are described and proper construction components are itemized and keyed to drawings. Specifications for all 11 *Protectone* patterns are included. ▪ The Celotex Corporation, Tampa, Fla.*

Circle 405 on inquiry card

GLASS AND WINDOWS / Sixth in the series "Glass and Windows Bulletins," this brochure features two articles, one on sunlight and model studies and one on channel glazing. ▪ Pilkington Brothers, Toronto, Ontario, Canada.

Circle 406 on inquiry card

STRESSES FOR ALUMINUM/Data on allowable stresses for a number of widely used aluminum alloys is presented for the first time in a hardcovered handbook, "Alcoa Handbook of Design Stresses for Aluminum." Arranged in three sections, the 180-page book first discusses design data and the various elements—mechanical properties, buckling formula coefficients, safety factors—employed in the general formulas used to calculate allowable stresses.

Part II contains 11 tables of mechanical property data and buckling constants for more than 150 aluminum alloys, tempers and products, and allowable stresses for 19 alloys and tempers considered of primary interest for structural applications. Both welded and nonwelded construction are included.

The final section is an American Society of Civil Engineers report presenting specifications for allowable stresses in the structural field for alloys 6061-T6, 6062-T6, 6063-T5, and 6063-T6. Copies obtainable by letterhead requests to ▪ Aluminum Company of America, 714 Alcoa Building, Pittsburgh.

ARCHITECTS AND LIGHTING / "Lighting Fundamentals for Architects" emphasizes the importance of effective architectural lighting and discusses such topics as the process of seeing, the importance of balancing "task" and "surround" lighting, how to improve visibility, light sources, light distribution curves, comfort in lighting and control of light. Line drawings, curves and photos document the text. ▪ Holophane Company, Inc., New York City.

Circle 407 on inquiry card

STORE FURNITURE/Two brochures give details and illustrations of an attractive new line of store furnishings. The first brochure shows photos of components and assembled counter, shelf, table and drawer units, the second contains a chart setting out dimensions, materials and prices of all the different assemblies and components and includes a separate color chart. ▪ American Fixture Inc., Joplin, Mo.

Circle 408 on inquiry card

**Additional product information in Sweet's Architectural File.*

more literature on page 284

DAP BUTYL-FLEX®... World's largest-selling all-round butyl construction sealant

DAP Butyl-Flex is a one-part sealant that is remarkably tough and flexible. Ready to apply as is. No mixing or special preparation.

An elongation factor of 50% makes Butyl-Flex a sound choice for many curtain wall and most general caulking applications calling for a superior seal. Especially recommended for sealing joints between dissimilar materials. Forms a lasting waterproof bond between aluminum, concrete, steel, glass, marble.

DAP processes its own butyl solution from 100% butyl solids. Nobody else does. That gives us complete quality control from raw butyl to finished product. High butyl content gives you a trouble-free waterproof seal that withstands exposure from −20° to +180°.

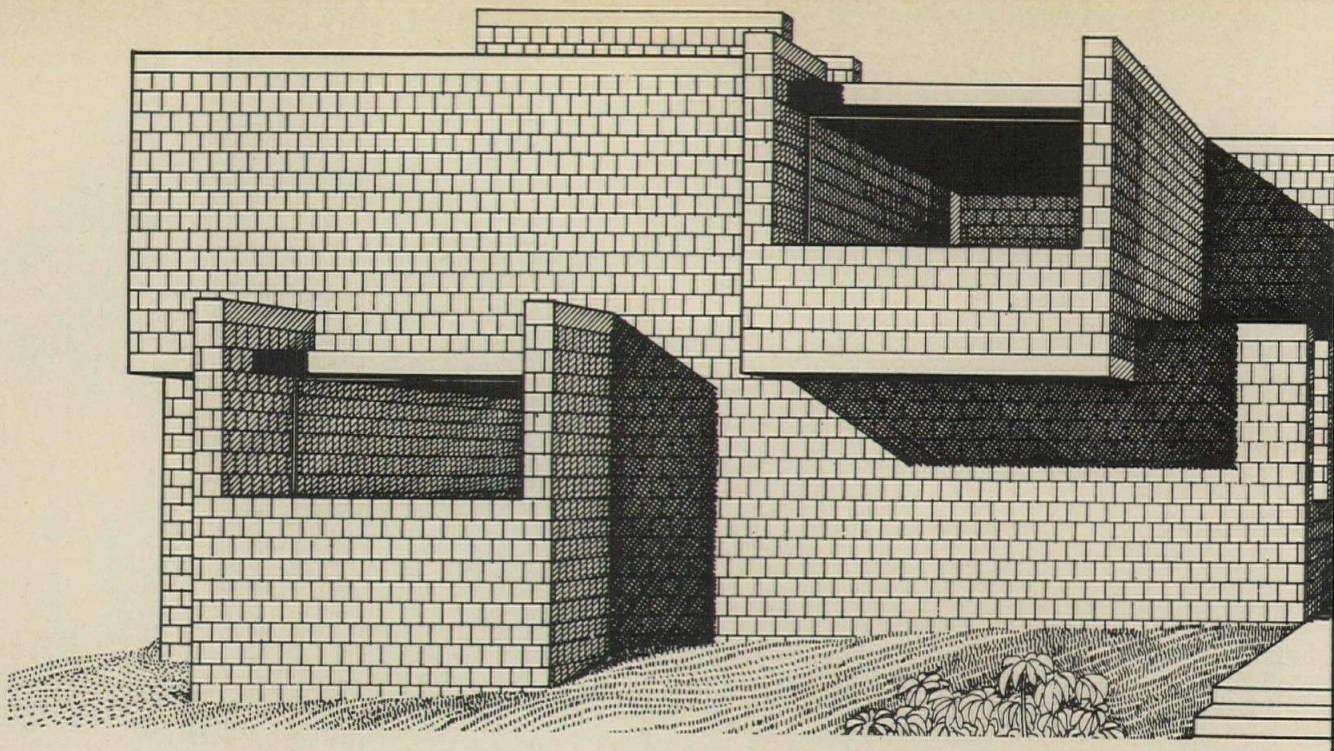
Available in cartridges, and bulk drums for pressure gun application.

With 10 strategically-located plants throughout the nation, DAP assures you prompt on-site delivery anywhere, anytime. And remember: only the DAP Technical Service Department offers you laboratory assistance in specifying the architectural sealant that best meets your specific needs. Write us or check Sweet's File 3c/Da.

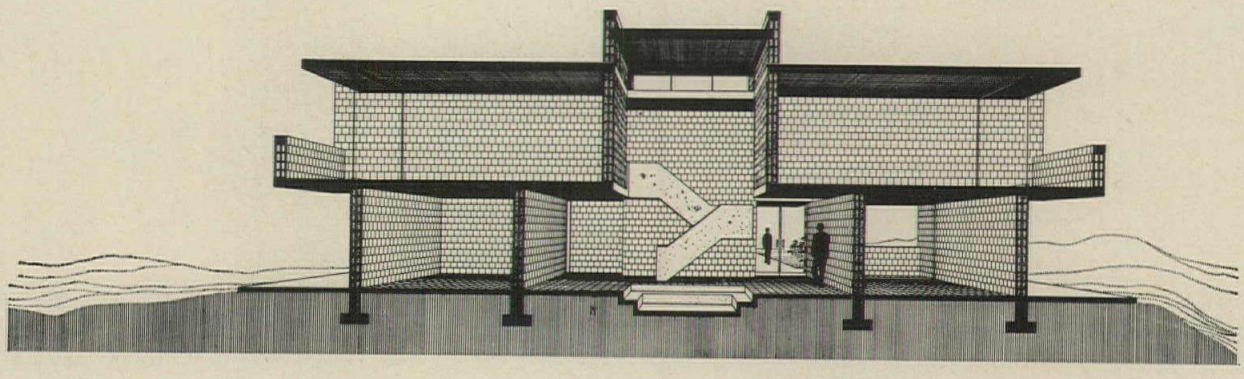
DAP® ARCHITECTURAL SEALANTS

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

For more data, circle 106 on inquiry card



Architect Marvin Hatami designs a college dormitory



At –10°, indoor wall surface temperature is increased from 50° to 62° by insulating the block walls with Zonolite Masonry Fill Insulation.

The project consists of the first section of a dormitory complex, located on a hilly meadow site, accommodating fifty-two single rooms.

It was designed by Marvin Hatami and engineered by Cator, Rüma & Associates, both of Denver, Colorado.

The rooms are composed around a two story central lounge and every three rooms share common bathroom facilities. Developed modularly, the second floor is superimposed over the ground floor in a way to express each individual room in an interwoven and interlocking manner.

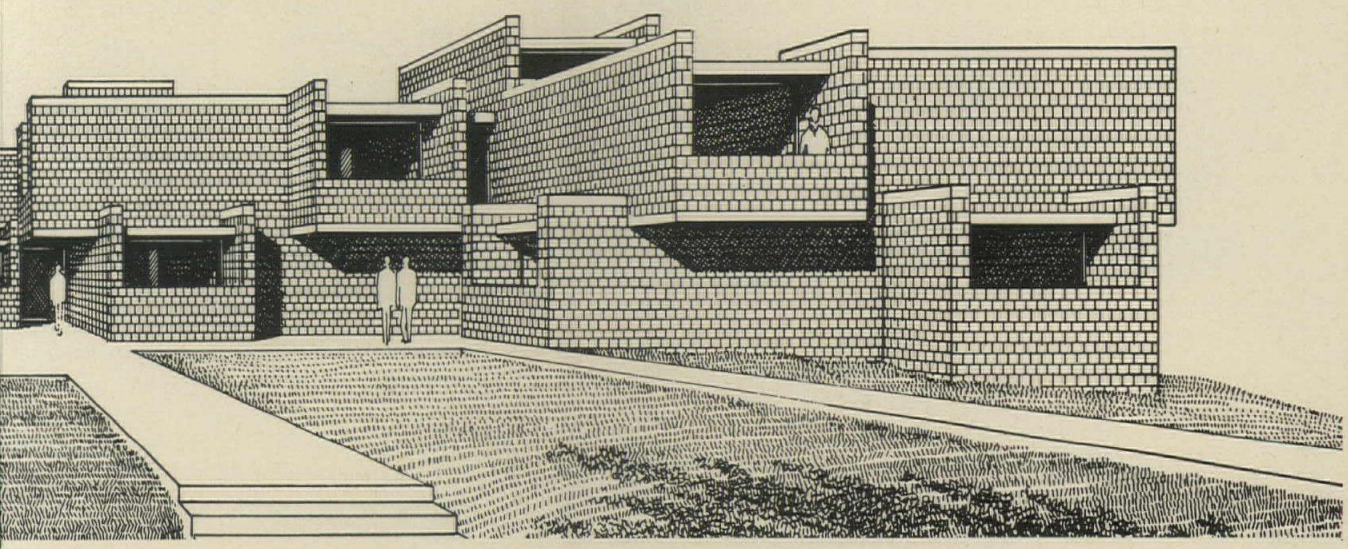
The structure is composed of 12″ x 8″ x 8″ reinforced lightweight concrete block bearing walls, insulated against thermal and sound transmission with Zonolite Masonry Fill Insulation.

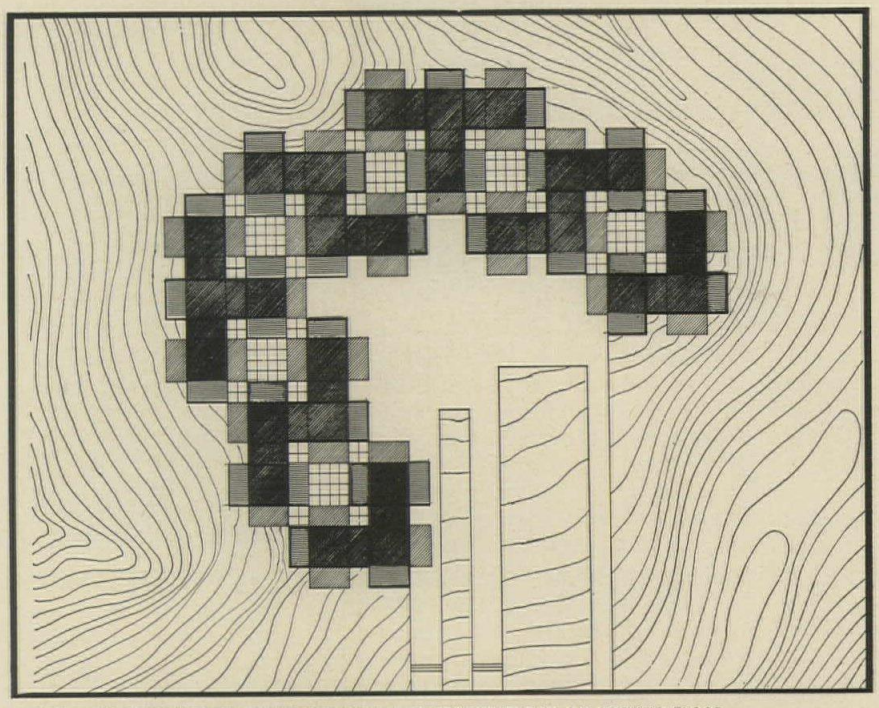
It cuts thermal transmission through the walls by 50% (se chart), raises the interior wall su face temperature from a miserabl 50° to a comfortable 62°, thus re ducing heat transfer and convectio currents in the rooms.

This cut the operating costs 9.2% or about $90 a year.

The savings more than pay for th cost of the thermal insulation ove the 20 year mortgage period.

Zonolite® prototype building #10: a college dormitory





BLOCK PLAN SHOWING THE SUPERIMPOSITION OF SECOND FLOOR ON GROUND FLOOR

For complete information about Zonolite Masonry Fill Insulation, write for our Bulletins MF-79 and MF-80, Dept. AR-46, 135 South LaSalle Street, Chicago, Illinois 60603.

ZONOLITE
GRACE ZONOLITE DIVISION
W. R. GRACE & CO.
135 SO. LA SALLE ST., CHICAGO, ILL.

DESIGN CONDITIONS			Winter Heat Loss in BTU/HR. Assuming 70° F Indoor —10° F Outdoor	
	Without Masonry Fill	**With Masonry Fill**	Without Masonry Fill	**With Masonry Fill**
Walls	12" x 8" x 8" Lightweight Concrete Block	12" x 8" x 8" Lightweight Concrete Block (Cells Filled)	142,000	**71,000**
Roof	Roofing, 8" Concrete 2" Insulation		98,000	**98,000**
Floor	4" Concrete on Grade		26,000	**26,000**
Glass	1" Insulated Glass		242,000	**242,000**
Ventilation	3600 CFM		260,000	**260,000**
Totals			768,000	**697,000**
% Savings with Masonry Fill			$\frac{768,000-697,000}{768,000} \times 100 = 9.2\%$	

1. Increased wall attenuation characteristics reduces sound transmission considerably.

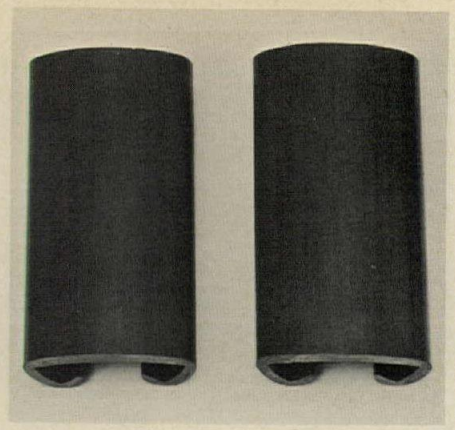
2. Raised indoor wall surface temperature from 50° F to 62° F provides added comfort.

3. 14,100 sq. ft. of walls (includes 8200 sq. ft. of interior walls) @ 18¢ sq. ft. = $2,538 installed.

4. Additionally the operating costs are reduced by over $90 per year based on 5673 degree days $.053 per therm gas boiler.

For more data, circle 107 on inquiry card

continued from page 235



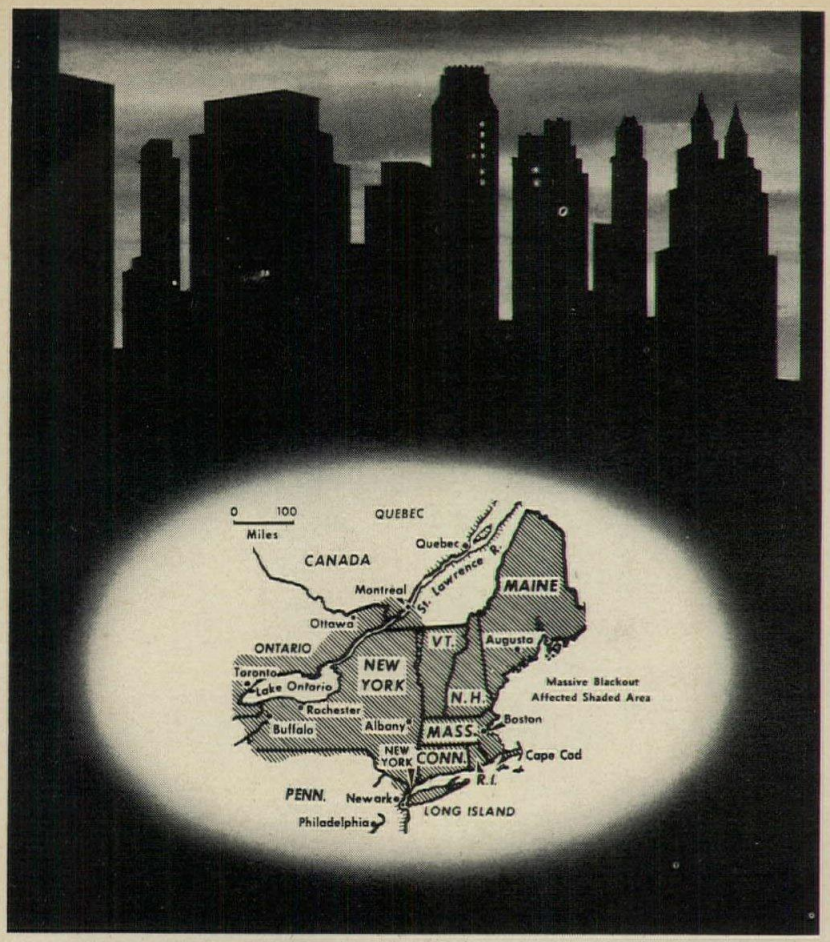
WOOD-GRAIN-VINYL HANDRAIL / The new *Rucorail* vinyl handrail with an authentic wood grain effect is being manufactured in six standard profiles for flat bar and U-channel installations. The product is packaged in 25-ft rolls and is currently produced in a Brazilian walnut shade. ▪ RC Division/Hooker Chemical Corporation, Hicksville, N.Y.

Circle 304 on inquiry card

CUSHIONED VINYL FLOORING / Development of a vinyl flooring which combines a foamed cushion backing with a new nubbly surface texture has recently been announced. The flooring is particularly suitable for commercial and institutional applications where a soft, quiet, durable surface is required which can be easily maintained. *Cambrian Vinyl Corlon* flooring consists of a specially processed foamed vinyl backing, a durable .040-in.-thick wear surface of inlaid vinyl chips and .010-in.-thick inner layer of glass fiber. Tests so far conducted on the new flooring indicate a significant reduction of impact noise within a room and of downward transmission of impact noise. ▪ Armstrong Cork Company, Lancaster, Pa.

Circle 305 on inquiry card

more products on page 244



ALTEC FAIL-SAFE SOUND SYSTEM GIVES YOU NEW ROLE IN PUBLIC SAFETY

The panic that surges through communities during the nation's plague of power blackouts is not limited to the streets. It strikes occupants of even the most thoughtfully designed and planned structures. *Your* structure.

You are now more than ever responsible for the safety of occupants when blackouts strike your city. For only *you* can specify sound systems unaffected by a power failure. And only Altec makes them!

With one of the new Altec fail-safe amplifiers as the heart of your sound system, officials can speak reassuringly to crowds, giving directions for their safety. Order is restored, panic and possible death and injury avoided. And you can provide this measure of safety without the expense of massive emergency-power equipment!

WHEN THE ELECTRIC POWER GOES OFF, Altec's solid-state amplifiers automatically and instantaneously switch to standby battery power for uninterrupted performance!

FOR THE LARGEST STRUCTURES, ALTEC'S NEW 200-WATT MODEL 1590A all-silicon power amplifier is ideally suited. This amplifier keeps a 28-vdc battery trickle-charged while on AC operation. Solid-state dissipation-sensing device protects transistors against improper load impedances, even a short circuit at driving level.

AVERAGE-SIZE SOUND SYSTEMS ARE EASILY POWERED BY ALTEC'S NEW 40-WATT Model 352A mixer/power amplifier. All-solid-state circuitry operates on 12- to 14-vdc power source, permitting use of an ordinary 12-v car battery for standby. Battery is trickle-charged when amplifier is on line power.

FOR COMPLETE DATA check with your local Authorized Altec Sound Contractor or write Dept. AR-4.

ALTEC LANSING

ALTEC LANSING

A Division of LTV Ling Altec, Inc.

ANAHEIM, CALIFORNIA

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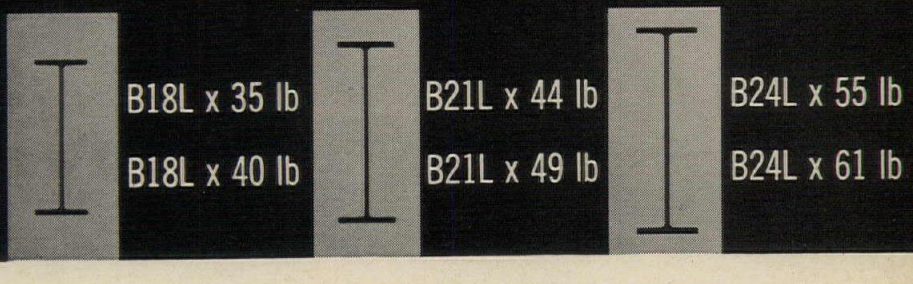
For more data, circle 108 on inquiry card

Bethlehem announces...

6 new lightweight sections



All immediately available from regular rolling schedules!

Advertising Division, Industrial and Public Relations Department
Bethlehem Steel Corporation
Bethlehem, Pa.

☐ Send more information on your 6 new lightweight sections.

☐ Send revised pages for Catalog 1836, Bethlehem Structural Shapes.

*Name*_____

*Company*_____

*Address*_____

*City*_____ *Zone*____ *State*____

These new sections are tailored to today's modern design techniques, to today's new high-strength steels. They are a logical addition to the BL series engineers have found so useful and economical.

Steel

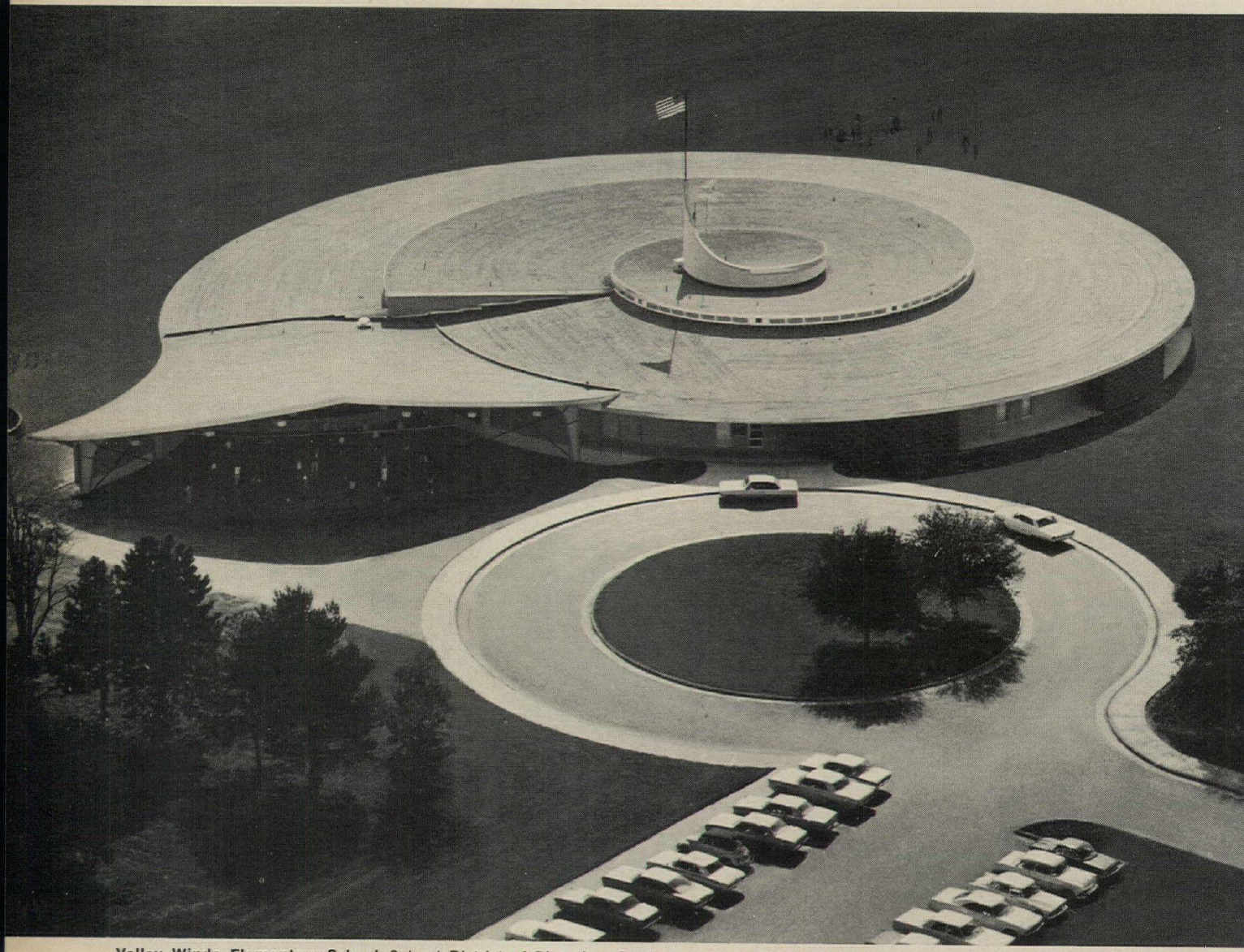
These six new sections increase Bethlehem's BL series to 18-in., 21-in., and 24-in. nominal depths. And we'd just like to add that Bethlehem has now introduced a total of 17 new lightweight sections in the past five years. If you'd like to know all about them, mail the coupon. Or phone our nearest sales office. Bethlehem Steel Corporation, Bethlehem, Pa.

BETHLEHEM STEEL

BETHLEHEM STEEL

For more data, circle 109 on inquiry card

Talk to Trane for total school



Valley Winds Elementary School, School District of Riverview Gardens, St. Louis County, Mo. Winner of NATION'S SCHOOLS award as one of 12 outstanding elementary schools in the country. Unique snail-shaped building, with wedge-shaped classrooms, employs TRANE air-cooled condensers, reciprocating compressors and central station TRANE Climate Ch ers. Building was erected at $13.60 per sq. ft. Architect: Shaver & Salina, Kansas. Consulting Engineer: Burgess, Latimer & Miller, Kar City, Missouri. Contractor: St. Louis Sheet Metal, St. Louis.

From St. Louis to Louisiana, for today's most contemporary school designs, TRANE offers you one-source equipment responsibility for your total school needs—heating, cooling and ventilating.

Today's total air conditioning needs for schools require specialists in many fields. With TRANE you get all the answers from a single source.

35 years' experience in school field

TRANE knows the school market and what is needed to provide the ideal climate for learning. It has 35 years' experience in the school market and is also a major manufacturer of air conditioning and refrigeration products. That's why TRANE has long been recognized as the company to call upon to air condition schools of all types.

There is only one *best* way to air conditior a school . . . now or later . . . and you get objective advice from TRANE

Because TRANE offers broad lines of many types of equi ment—to meet any requirement in any school plan—it c provide impartial assistance to school boards, architec and consulting engineers in selecting the best system fo school. Means you're free to pick and choose and ba your specifications entirely on *what's best for your pla*

Single source responsibility

With *all* the air conditioning, heating and ventilati equipment for your school from TRANE, you can look *one* manufacturer for equipment performance and servi needs. There's no "buck passing." TRANE assumes sponsibility. *That's single source responsibility!*

ir conditioning requirements

lousas High School, Opelousas, La. One of the first air-conditioned ools in Louisiana. TRANE equipment provides complete heating and tilating to all parts of the building and cooling to all parts except kit- n and locker rooms. Building was erected at $11.05 per sq. ft.—a cost below other non-air-conditioned schools in the area. Architect: D'Avy & Veltin, Opelousas, La. Consulting Engineer: Robert L. Wolfe, Opelousas, La. Mechanical Contractor: Daniel Ryder, Opelousas, La. Installing Contractor: Air Conditioning Appliance, Inc., Alexandria, La.

Local offices sell and service only TRANE equipment

th TRANE there's the added assurance of on-the-spot ention. There are 120 TRANE sales offices located ategically throughout the United States. They're ffed by graduate sales engineers and factory-trained vice engineers who sell and service only TRANE uipment. Their only concern is your satisfaction.

Talk to TRANE

r greater school design flexibility, plus the air condi- ning that's best with your plans, contact your local ANE sales office. Your TRANE Sales Engineer will be ppy to give you specific information on the complete ANE lines of school heating, cooling and ventilating uipment. Just contact him.

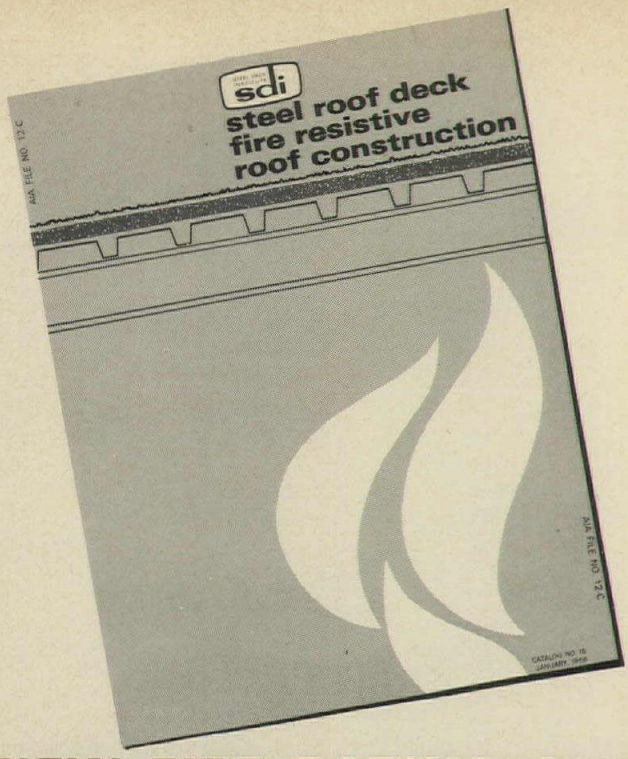
TRANE

FOR ANY AIR CONDITION

MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING, VENTILATING AND HEAT TRANSFER EQUIPMENT

The Trane Company, La Crosse, Wisc. • Scranton Mfg. Plant, Scranton, Pa. • Clarksville Mfg. Plant, Clarksville, Tenn. • Salt Lake Mfg. Plant, Salt Lake City, Utah • Lexington Mfg. Plant, Lexington, Ky. • Trane Company of Canada, Limited • Trane, Limited, Donibristle, Scotland • Epinal, France • 120 U.S. and 20 Canadian Offices

continued from page 240



NEW FIRE RATING GUIDE

Gives complete summary of Steel Roof Deck fire ratings and construction details.

Underwriters Laboratories recently assigned a Steel Roof Deck assembly without concrete covering, a two-hour fire resistance rating. This means you can now save as much as ten to twenty percent over conventional fire resistance roof construction.

This new Rating Guide explains how you can make substantial savings and gives complete information on the recent two-hour Underwriters Laboratories test. All other Steel Roof Deck fire ratings along with construction details are also included.

The Guide serves as a quick reference for your next roof design.

STEEL DECK INSTITUTE

STEEL DECK INSTITUTE sdi

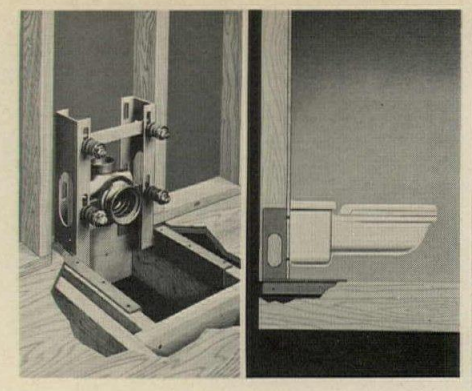
Airtherm Manufacturing Co. • Armco Steel Corp., Steel Division • Bowman Building Products Division, Cyclops Corp. • The Ceco Corp. • The Goldsmith Metal Lath Co. • Granco Steel Products Co. • Inland Steel Products Co. • Macomber, Inc. • The R. C. Mahon Company • Plasteel Products Corp. • Republic Steel Corp., Mfg. Division • H. H. Robertson Co. • Wheeling Corrugating Co.

Fill in coupon and clip to your letterhead for your free copy

STEEL DECK INSTITUTE 9836 Roosevelt Rd., Westchester, Ill. 60156
Please send me your New Fire Rating Guide

Name..... Title.....

☐ Also send revised edition of True Cost of Full Fire Resistance Construction.
This popular booklet which gives cost comparison examples between "fire-resistance" and "non-combustible" construction has just been revised.



WALL-HUNG TOILET / A wall-hung but floor-supported closet kit designed specifically for copper DWV systems meets national and metropolitan plumbing codes and provides all the convenience of a wall hung system without producing wall stresses. The L-frame, made of structural steel, puts all the toilet weight on the floor joists, thus eliminating the sideways pull which frequently occurs with conventional wall mounting. The unit can be installed in any standard 2- by 6-in. plumbing wall, in any wall thickness, on floor joists running in any direction, and can be adjusted for depth and height. ▪ NIBCO Inc., Elkhart, Ind.

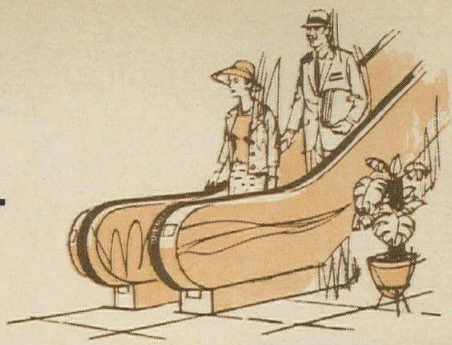
Circle 306 on inquiry card

SILICONE TRAFFIC TOPPING / A silicone rubber material which vulcanizes to a flexible concrete-like substance has been developed by General Electric to provide a durable, water-resistant surface for highways, patios and other traffic-bearing areas. Although the material has a texture and appearance similar to concrete, its ability to bend, elongate, and resist water is said to give extra durability where severe exposure to weather or corrosive conditions apply. The silicone compound comes premixed in pails in a variety of standard colors. It can be applied like concrete in a single operation after initial priming of the substrate. ▪ General Electric, Silicone Products Department, Waterford, N. Y.

Circle 307 on inquiry card

more products on page 256

Just add people.
Haughton Escalators do the rest.
Beautifully.



Architects: Welton Becket & Associates, Albert C. Martin & Associates, Paul R. Williams & Associates;
Contractors: J. W. Bateson Company, Inc. and J. W. Bateson Construction Company, Inc.

You're looking at the compact, space-saving Haughton Escalators in Los Angeles' new Federal Office Building. Beautiful to see? Yes. And, equally important, they incorporate a number of exclusive design advancements that make them exceptionally beautiful performers, too.

For example: The handrail is positively-driven at a speed synchronized with the steps. Positive drive eliminates the "creeping" associated with traction-drive handrails . . . enhances passenger comfort and confidence.

What's more, the handrail extends *beyond* the inside panel mouldings. Passengers with children or an armful of packages can lean against it without fear of being upset. And the handrail has a clean, "live" feel that inspires complete confidence.

We've made boarding a Haughton Escalator easy and comfortable, too, by enlarging the track radii at the lower end. This makes the transition from horizontal to the 30° incline smooth and gradual.

There are a lot more reasons for including Haughton Escalators in your new construction or modernization plans, when you want to move up to 8,000 people per hour with comfort, safety and reliability. You should know about them. Ask your Haughton representative for details. He's listed in the Yellow Pages. Or, write us.

The new Los Angeles Federal Office Building is also served by 16 Haughton Passenger Elevators and 2 Haughton freight elevators.

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For more data, circle 112 on inquiry card

Wheeling will embroi
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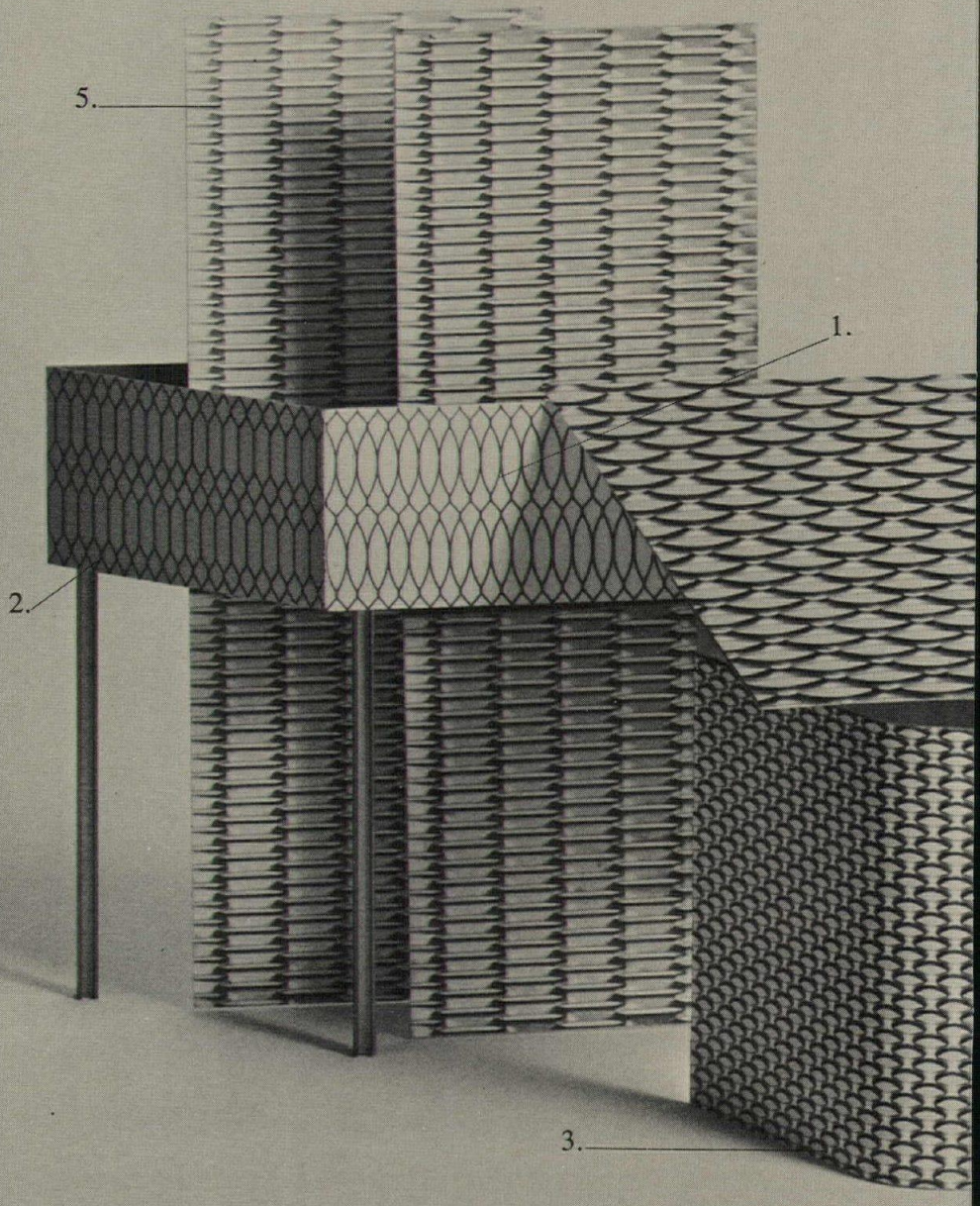


Look. Look at Wheeling's eight decorative architectural expanded metals. Then let your imagination go to work. On these:

1. Cadet 2. Arrowline 3. 1½″ Facade 4. ½″ Facade. 5. Louvermesh 6. No. 4 Facade 7. Castle 8. Drape Mesh.

Architects across the country have already found many striking uses for them.

In new buildings as room and area dividers, stairway enclosures, and ceilings. Outdoors, as dramatic balcony railings an as shading materials on patios.

And on older buildings to create uniqu contemporary facades.

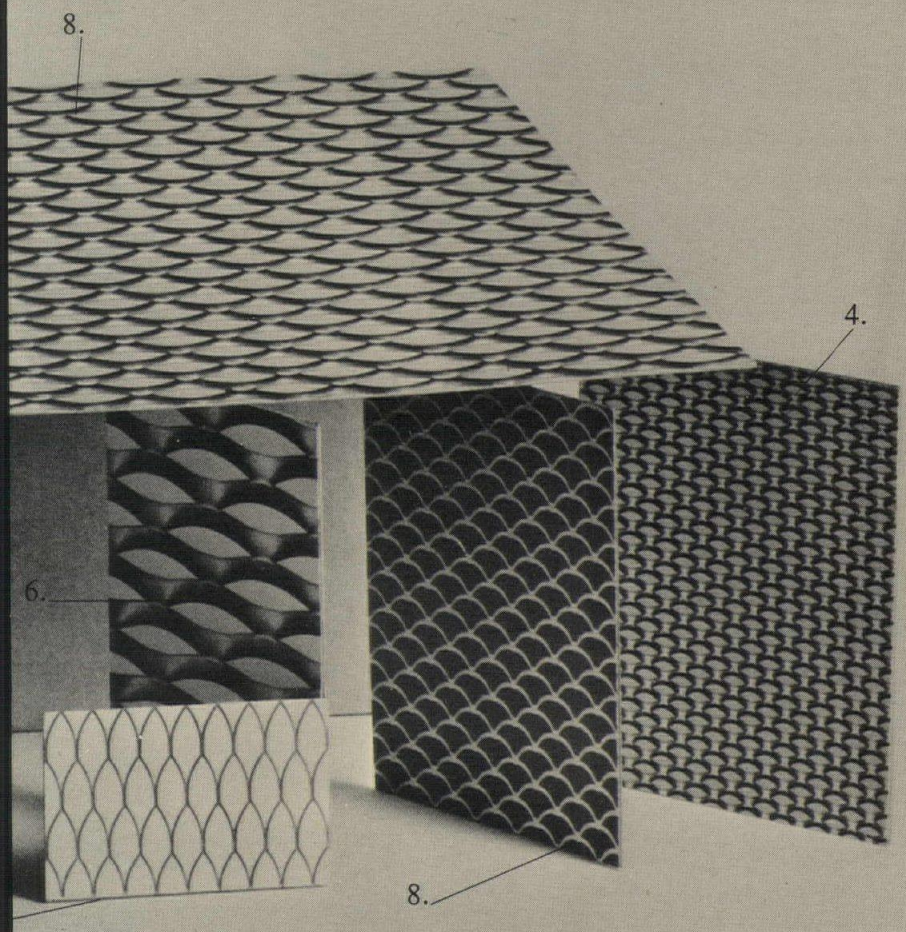
Now we'll tell you why our expande metals are better than someone else's.

Because Wheeling has been expandin metal for over thirty years.

Longer than anyone.

And that means we have the know-ho

ou in a mesh the likes
ever specified.



the equipment. The most up-to-date ipment.

You can depend on our expanded metal ause we control the steel it's made from e cut it, expand it, pack it, deliver it.

Besides.

You'll do better to specify Wheeling be- se only Wheeling has that new P.T.O. ice-at-time-of-order) policy.

t guarantees for six months that the price you order at is the price you pay. No matter what. (Unless prices go down—then so do yours.)

So like we said. We'd really like to mesh up your specifications.

Have you looked at Wheeling lately?

Wheeling

Wheeling Corrugating Company/Wheeling Steel Corporation, Wheeling, West Virginia

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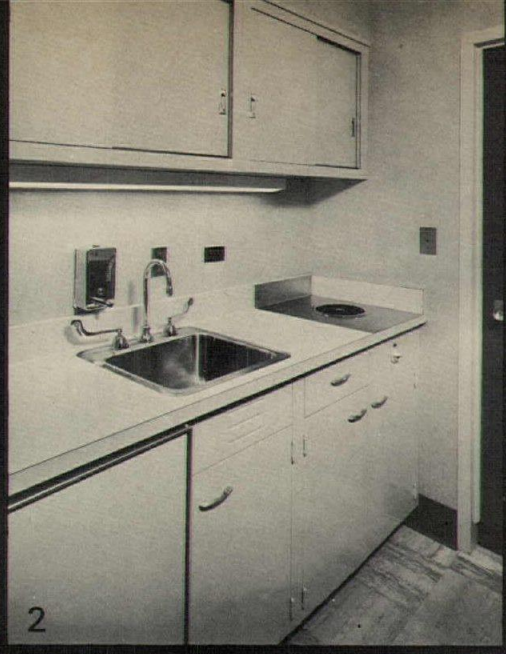
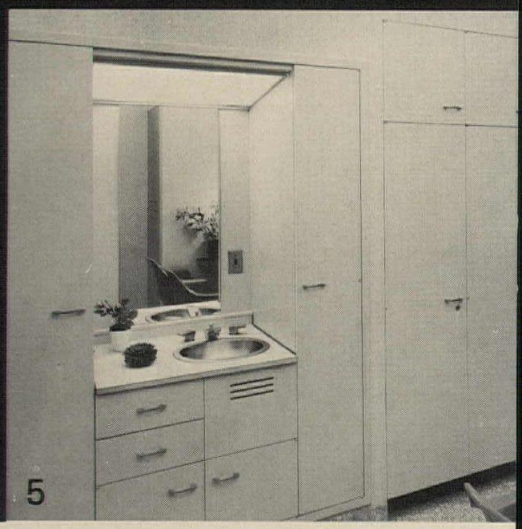


1. Receptionist Station
2. Employee Convenience Center
3. Executive Washroom
4. Executive Dining Room
5. Wardrobe and Storage Wall
6. Laboratory Test Kitchen



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There are over 200 St. Charles storage specialists conveniently located to serve you.

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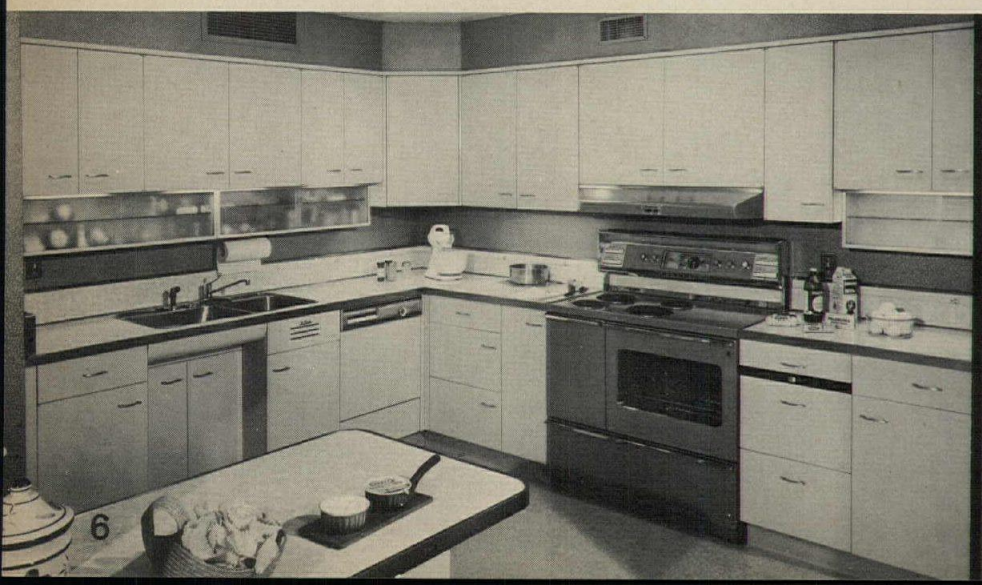

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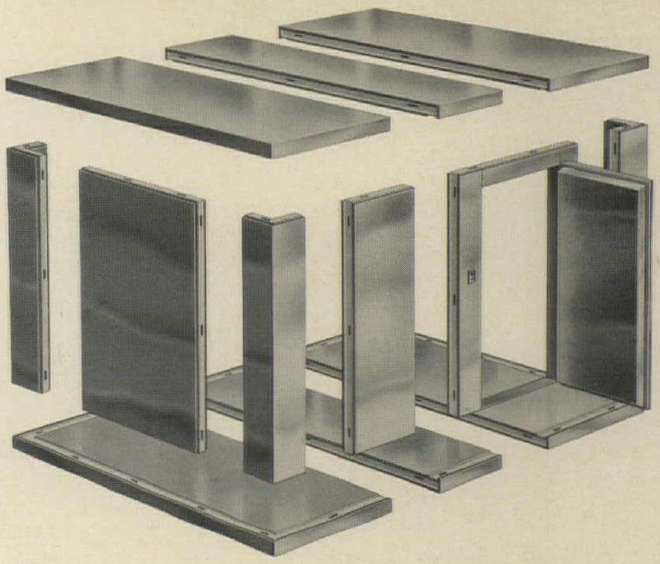
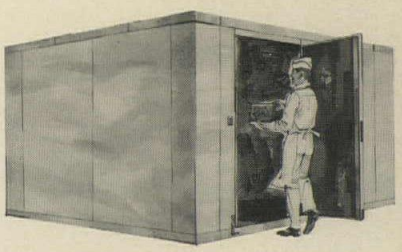


for a

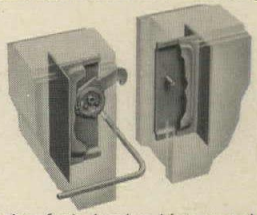
WALK-IN COOLER, FREEZER OR COMBINATION

that fits your design... exactly



The modular, pre-fabricated design of Schaefer walk-in coolers, freezers and combinations gives you complete design flexibility, with a unit that will fit virtually anywhere—indoors or out. Schaefer "Froth Foamed" urethane insulation permits thinner wall construction—only 3⅝"—for more usable capacity, at the same time providing full protection even under tropical conditions. A full line of accessories and either self-contained or remote refrigeration equipment lets you customize a Schaefer walk-in to your client's precise needs. Glass doors are available for merchandising applications in all types of stores.

Consult Sweet's Catalog or write Schaefer for complete information



Schaefer's Lock-a-Line panel locking system provides a positive foam-to-foam seal, makes the walk-in easy to erect, expand or relocate.

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FACTORIES IN MINNEAPOLIS • ABERDEEN, MARYLAND • GALT, ONTARIO

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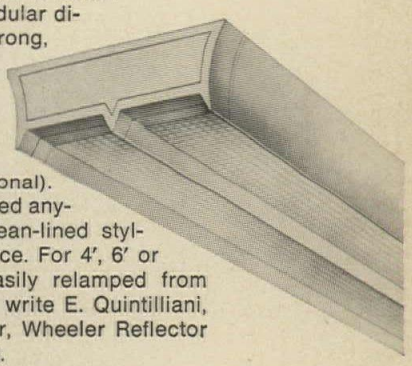
The best commercial fixtures made come from Wheeler.

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



Designed by Paul Lamson Illuminating Engineer

WR

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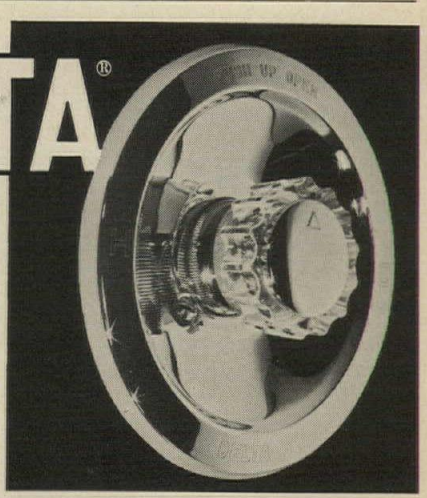
DEL-DIAL

the "perfect pair"



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THINK COPPER...

13 miles of copper plumbing*

save time...

save costs...

save space...

*70,000 ft. of Anaconda Copper Tube in sizes ½" thru 6".

Model of Life of Georgia Tower, Atlanta. Architects: Bodin & Lamberson, Atlanta. Associate Architects: Eggers & Higgins, New York City. General Contractor: Daniel Construction Company of Georgia, Atlanta. Engineers: Brewer & Mundy, Charles F. Howe, Atlanta. Associate Engineers: Syska & Hennessy, New York. Plumbing, heating, airconditioning and ventilating: Sam P. Wallace & Co. and the Huffman & Wolfe Co. Anaconda Distributor: Atlas Supply Co., Atlanta.

The firm of Brewer & Mundy had good reason for specifying copper plumbing for this 29-story, 414,200 sq. ft. area building soon to add new beauty to Atlanta's skyline. ■ It is lighter, easier and faster to work with, so installation costs are less. ■ Copper tube and the compact fittings can be placed in areas where other piping would be too bulky and cumbersome. This advantage, if used in the engineering stages, often results in construction economies and more useable space.

The engineering firm also pointed out that "dependability" was probably the most important reason for recommending copper. In multistory buildings, repairs to the plumbing system are difficult and costly work. ■ Copper eliminates the possibility of rust-caused trouble in future years, and solder connections, tube to fittings, are superior to threaded joints for leak-proof joints.

Above is one of many majestic structures, completed or in progress, whose owners will benefit from copper plumbing. Their architects and engineers know that to effect speed, space and labor-saving economies, it pays in the early planning to specify copper . . . Anaconda copper.

Anaconda plumbing products include Copper Water Tube, Copper DWV Drainage Tube, Copper Tube Fittings and Valves, Red Brass and Copper Pipe. For further information, write: Anaconda American Brass Company, Waterbury, Connecticut 06720.

ANACONDA®
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65-0734

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Selectra installation in the offices of Kingston Products Corp. Vacuum Cleaner Division, Bronson, Michigan

LOOK AT THE INSIDE STORY...

the Kingston Products Corp. did – and found **Workwall Selectra movable partitions** gave them all the benefits they required and more.

They wanted partitions that would install easily, quickly and economically and be maintenance free. Selectra gave them all this – plus an unlimited choice of paneling.

To voice their approval they have again specified Selectra for a new building now under construction in Kokomo, Indiana . . . **proof** that Selectra partitions offer plus benefits that add up to client satisfaction.

See us in Sweet's Architectural File 22a/Da or write for complete details.

WORK WALL SELECTRA MOVABLE PARTITIONS

DIVISION OF L. A. DARLING COMPANY
Box 130, Bronson, Michigan

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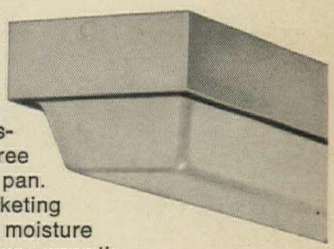
The best food processing fixtures made come from Wheeler.

Wheeler Clean Lite II is the ideal fixture wherever food is processed or served. In 4′ and 8′ lengths with 1 or 2 power groove lamps. *Only fixture of its type that uses 1500 MA lamps and can be surface mounted.* Unique can latch suspension for positive, stress-free support of straight, modern pan. Non-porous, closed cell gasketing surrounds housing . . . provides moisture and dust resistance. Continuous, smooth-welded seams. Clean, shadow-free bottom shielding. Available in clear or white acrylic plastic. For information write E. Quintilliani, General Sales Manager, Wheeler Reflector Co., Inc., Hanson, Mass.



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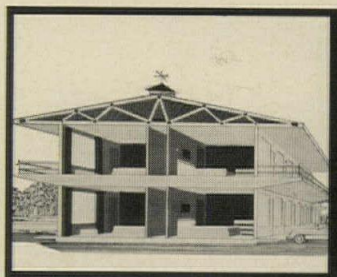

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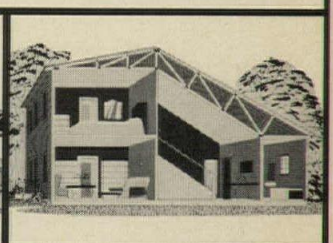
SPECIFY SANFORD ROOF TRUSSES

Look to the biggest for the best. Your Sanford dealer is backed up by the most experienced engineering department in the industry. What's more, there are 4 strategically located Sanford plants in the U.S.A. to provide rapid dealer service. Write us for the dealer nearest you or for the 24-page Sanford A.I.A. booklet showing the wide variety of uses for money-saving Sanford manufactured trusses.



World's Largest Roof Truss System

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With an office like this, he's got to be in

To be sure you're in, too, send for your copy of the Alma 8000 Series catalog and price list.

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DESK COMPANY
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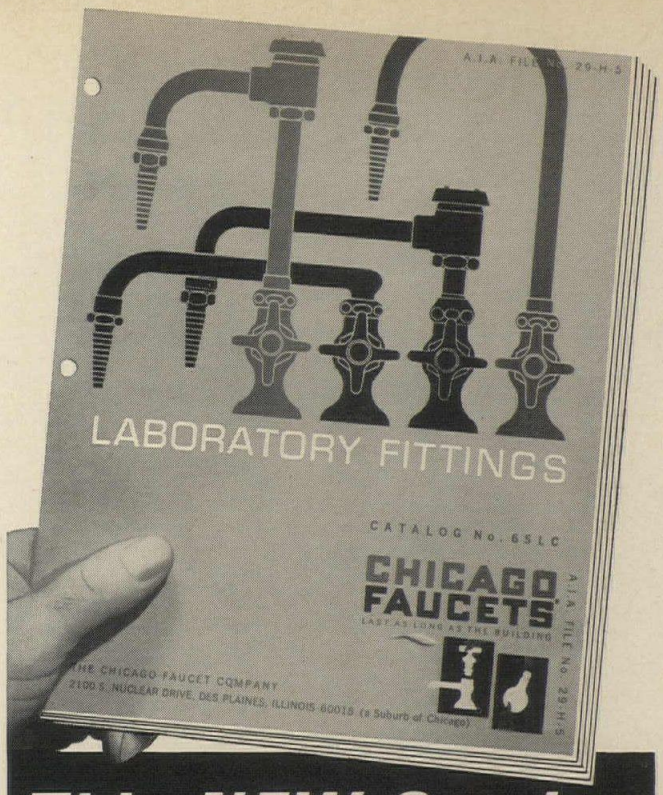

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Try to find a laboratory fittings requirement that isn't covered — *FULLY covered* — in the 27 fact-filled pages of this new catalog dedicated solely to the ever-growing needs of the laboratory.

In its pages you will find the most comprehensive array of laboratory fittings ever presented. Models for just about every use . . . supplemented by readily interchangeable parts for converting them into all the special and exacting requirements that arise in the laboratory.

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The best commercial fixtures made come from Wheeler.

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

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MAKE KNIGHT LETTERS THE FINISHING TOUCH THAT REFLECTS YOUR PROFESSIONAL PRIDE

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SATIN OR BUFFED ALUMINUM & BRONZE INTERIOR AND EXTERIOR FROM ¼" TO 14"

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METAL LETTERS & FIGURES
14 Lane St., Seneca Falls, N. Y.

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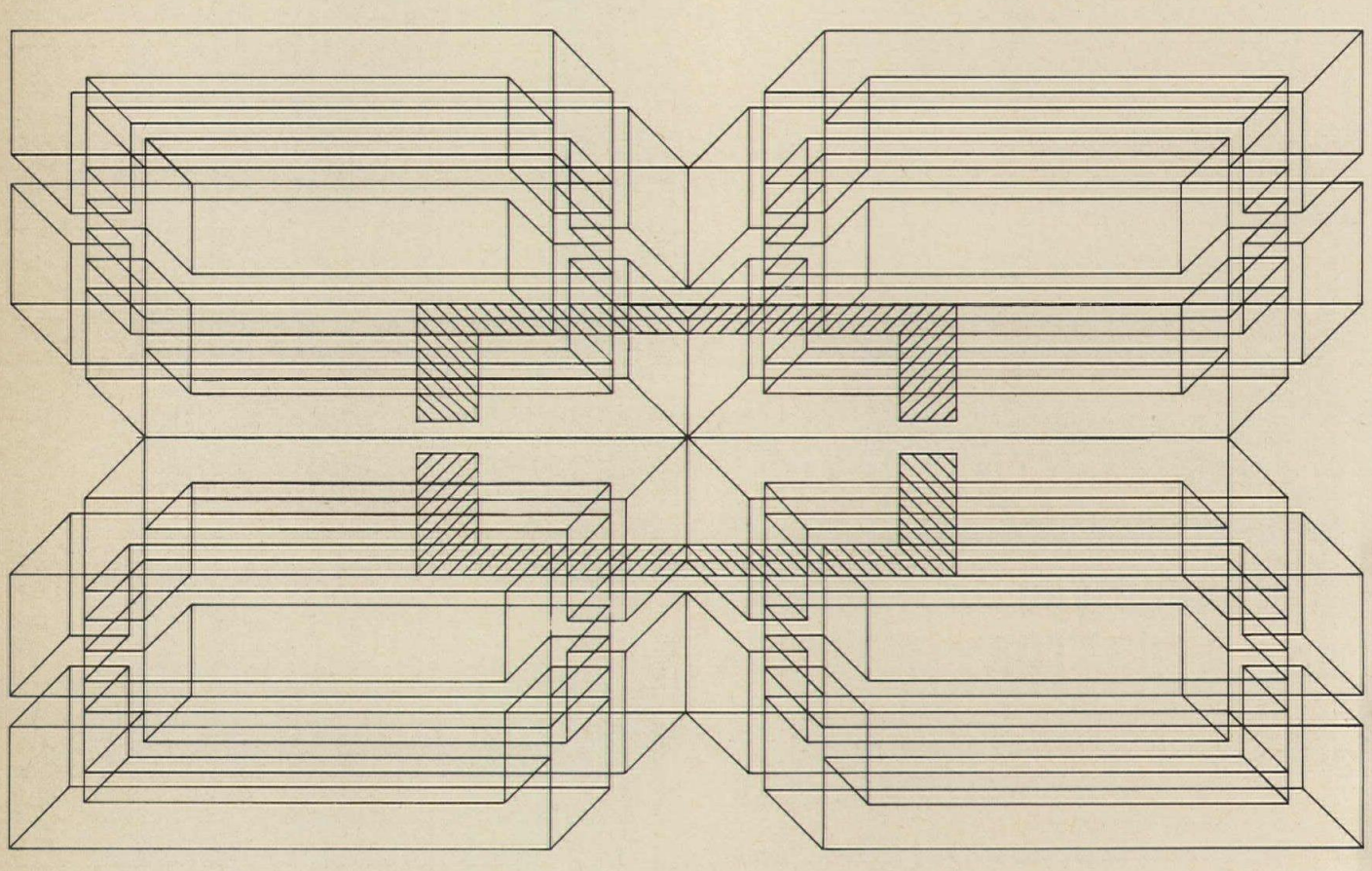
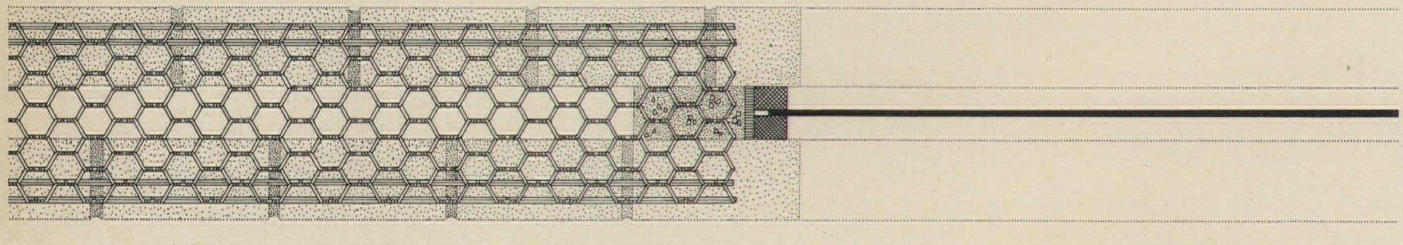
The formal generators of masonry structure:



The exploration of masonry's formal generators is continued here by architect Stanley Tigerman. From a rectangle projected three dimensionally, Mr. Tigerman proceeds from parti to floor plan to complete structure—here utilizing load-bearing walls.

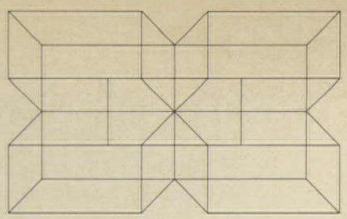
Throughout this series, we shall continue to show how the basic orthogonal shapes of masonry construction—the square, lozenge, rectangle, pinwheel, cross and linked form—can be developed and projected. We hope the drawings offered here will serve as both idea-stimulators and time-savers.

Our purpose is wholly practical: We have two products,

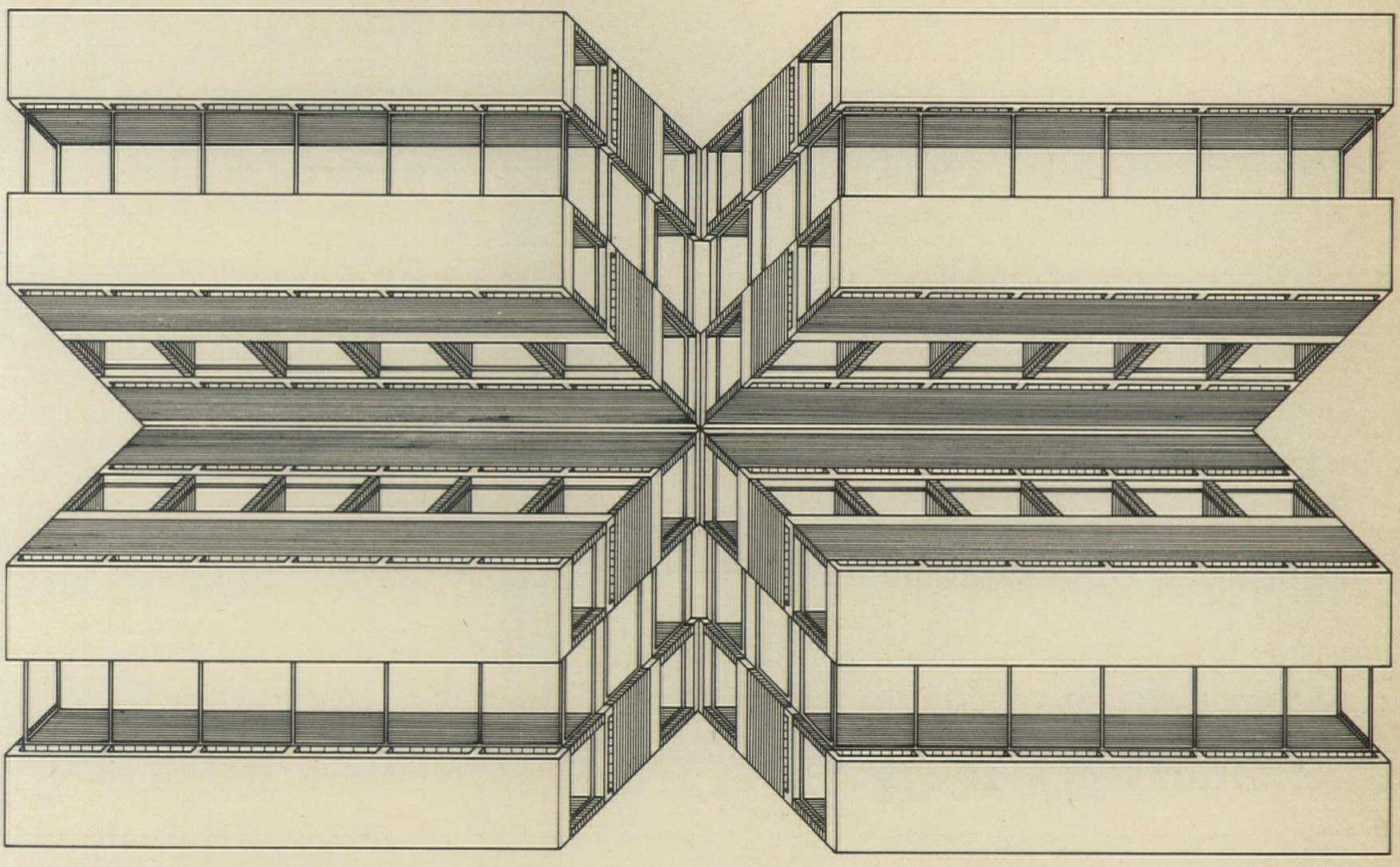


Keywall Roll comes in 5 widths for 4, 6, 8, 10 and 12" walls, 200' per roll.

the rectangle



no. 2 of 36

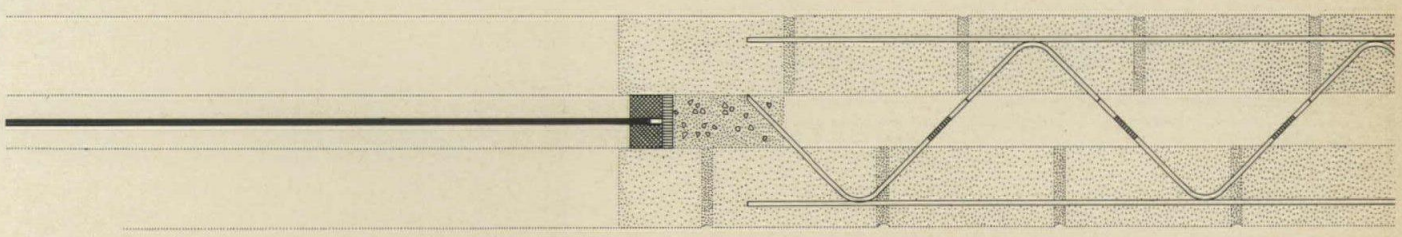


STANLEY TIGERMAN, ARCHITECT

roll-type and rod-type Keywall® masonry reinforcement, which can help you improve the usage and quality of masonry construction. In fact, we have gone so far as to include them in the details shown below.

This building and its details—drawn to 3" = 1'0" and easy to trace—are reproduced on convenient 8½"x11" sheets. To receive these and the entire series, write:

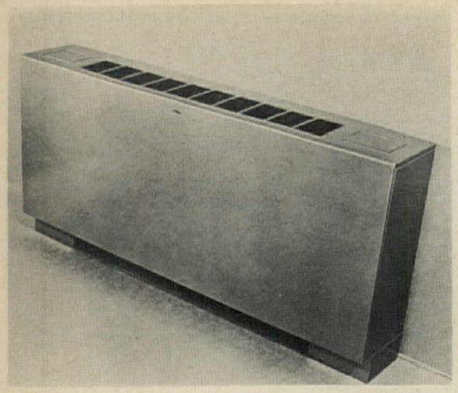
Dept. AR-115
KEYSTONE STEEL & WIRE COMPANY
Peoria, Illinois 61607



Keywall Rod comes in 9 ga. wire and 3/16" rods for 4, 6, 8, 10, 12, 13 and 14" walls, 10' lengths.

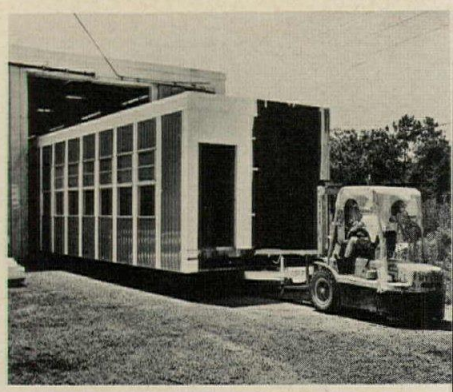
For more data, circle 123 on inquiry card

continued from page 244



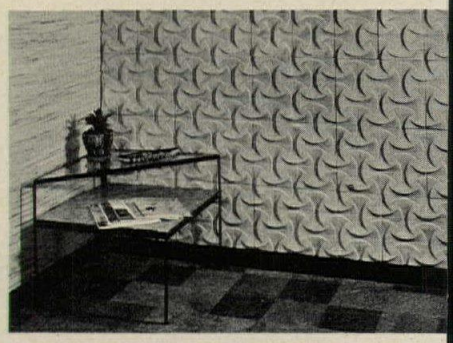
FAN COIL UNITS / A range of 16 new models in four basic styles suitable for a wide range of commercial and industrial heating-cooling applications has recently been introduced. Features of the new line are integral louvered grilles, rounded corners on the metal cabinets, and increased end-compartment accessibility for easier installation. Deluxe and concealed models are available in either horizontal or vertical configurations. In each of these four basic styles, units of 200-, 300-, 400-, and 600-cfm air delivery capacity are included in the line. All units have 3-speed motors with double-shaft, direct mechanical drive to the blowers. ▪ Crane Co., Chicago.

Circle 308 on inquiry card



RELOCATABLE CLASSROOMS / To help demands for additional space in schools throughout the country, School-Cor prefabricated classrooms are made in two modules which can be transported to the site, and locked together on the foundation to create a 42-ft by 24-ft room which is ready for use within a matter of hours. Each individual classroom is equipped with boys' and girls' restrooms, teacher's storage locker, cloakroom, sink and water fountain, hot water heater, and air conditioning. Interiors of the classroom are in a choice of prefinished hardwood paneling. A suspended ceiling contains fluorecent lighting; floors are vinyl covered; outer walls are lined with torquetier windows with separate screens. ▪ School-Cor, Division of Sportcraft Homes, Inc., Clearwater, Fla.

Circle 309 on inquiry card



SCULPTURAL WALL FACING / Fourteen new designs by Perli Pelzig and Erwin Hauer have been added to the existing collection of three-dimensional blocks to give architects and designers a wider choice of facings for interior and exterior walls. Eight of the new patterns are in 12-in.-square sizes, five are 8-in. by 16-in, and the other one 11-in. by 16-in. The facings are available in steel-reinforced concrete and in lightweight *Nova-Stone*. ▪ Arts for Architecture, Inc., Garden City Park, N. Y.

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more products on page 27

New **TALK-A-PHONE**

Provides instant and direct 2-way conversation between any Apartment and Vestibule . . . Greater Performance with Exclusive Talk-A-Phone Features:
• Ample Volume—Whispers, shouts and normal voice are heard clearly without "boom" • Automatic Privacy—On all Apartment Units • Volume Selector—Each Apartment selects own volume. Concealed yet easily accessible • Built-in Buzzer—Pleasant sound, in each Apartment Unit • With one or two independent talking circuits and one or two independent door opener buttons.

Distinctively styled. Quality Engineered. Built to withstand continuous use.

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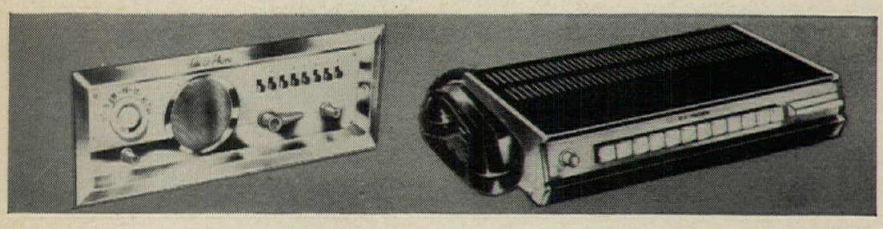
TALK-A-PHONE . . . "Has Everything. Does Everything." The accepted standard of quality and dependability in Intercommunication for over a third-of-a-century.



Intercom For The Home. Enjoy comfort, convenience and peace of mind. From any room you can • Listen-in on baby, children or sick room • Answer outside doors • Talk to anyone—upstairs or downstairs, inside and out • Enjoy radio. Distinctively styled. Beautifully finished. Easily installed.

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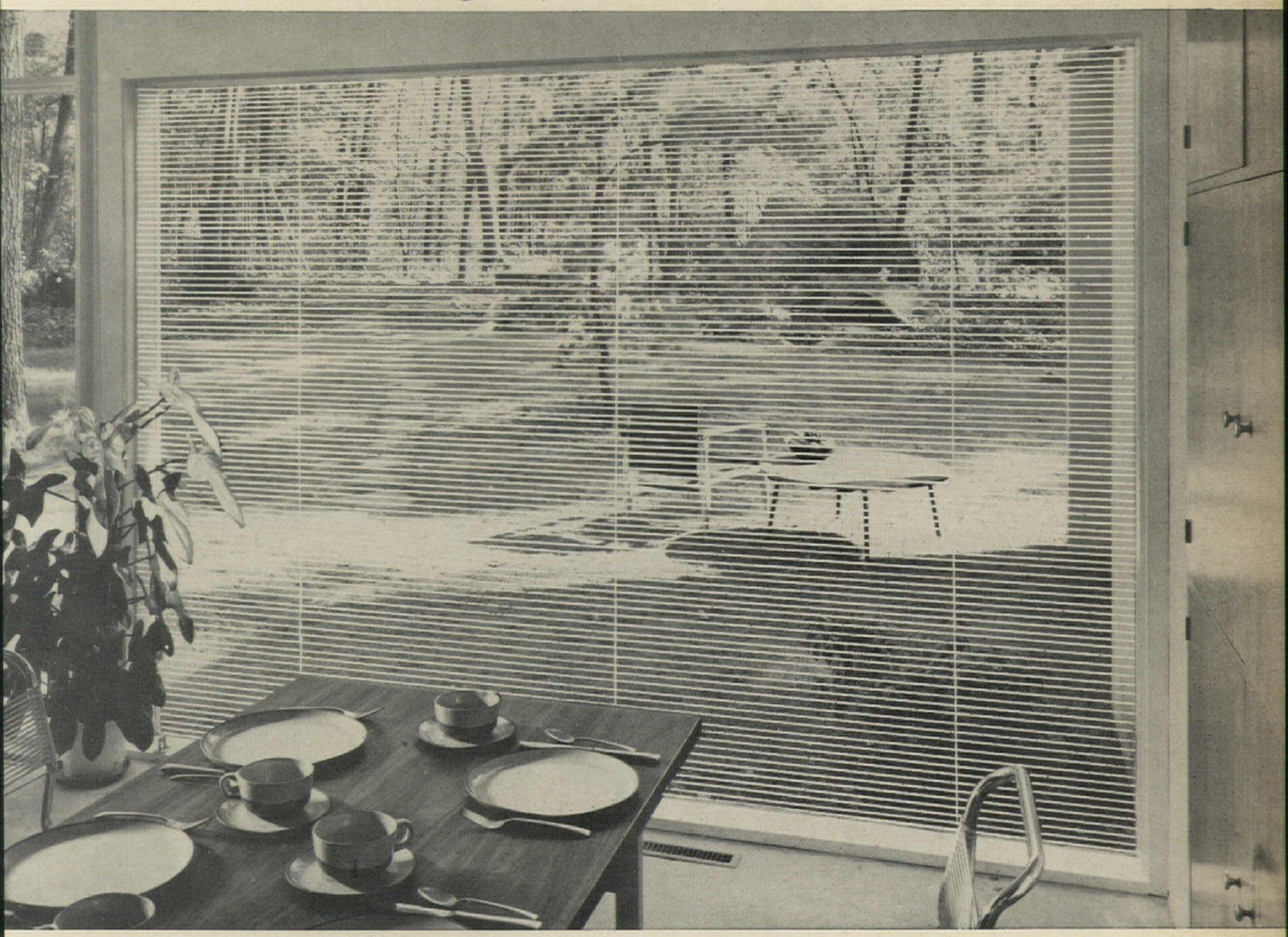
The Soft Blind is here!

The effect is soft and graceful.

New slender slats just an inch wide. New extra-slim cord and almost-invisible tape.

Look for the low metal head with the crossed Ls on the installation brackets, special new hardware, and slender matching bottom rail—symbols of design by Levolor.



LEVOLOR *Riviera*

a venetian blind of invisible beauty

Levolor Lorentzen Incorporated, 720 Monroe Street, Hoboken, New Jersey

For more data, circle 134 on inquiry card

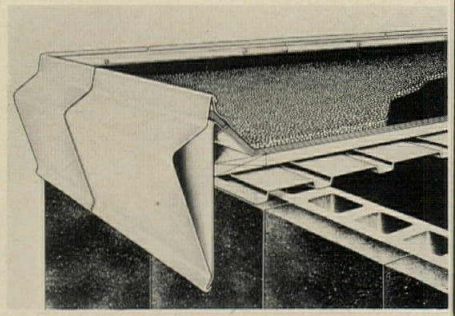
continued from page 256

SOLAR CONTROL / A new plastic film which reflects a high percentage of the sun's heat and glare back towards its source, rather than absorbing and re-radiating the energy into the room, has recently been introduced. Called *Scotchtint*, the new film is blue gray in color, is comparable in price with other solar control products applied directly to glass, and does not greatly reduce light perception within the room. Available in two densities of vapor coating, the film is a 1-mil-thick polyester sheet with an aluminum vapor coating of controlled density on one side. A water-activated adhesive allows the film to be applied like a decal to the inside of the pane. ▪ Dept. 16-2, 3M Company, St. Paul, Minn.

Circle 311 on inquiry card

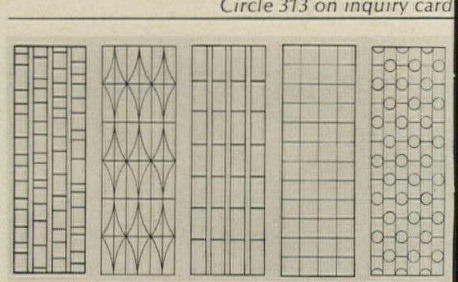
SOUND DEADENER IN TAPE FORM / *Quietape*, a newly patented sound deadener and vibration damper in an easily applied tape form, has been used to solve an acoustical problem in the Vivian Beaumont Repertory Theater at New York's Lincoln Center. Close-in aluminum sheet panels, which are raised and lowered by cable to vary stage settings were causing excessive noise whenever they were moved. Adjoining panels have Teflon tracks to minimize friction during movement. Applied in vertical rows on the backstage side of each panel, *Quietape* successfully dampened vibration and the resultant noise. The product was also applied to cable housings and gear boxes to assure quiet operation. ▪ Daubert Chemical Company, Oak Brook, Ill.

Circle 312 on inquiry card



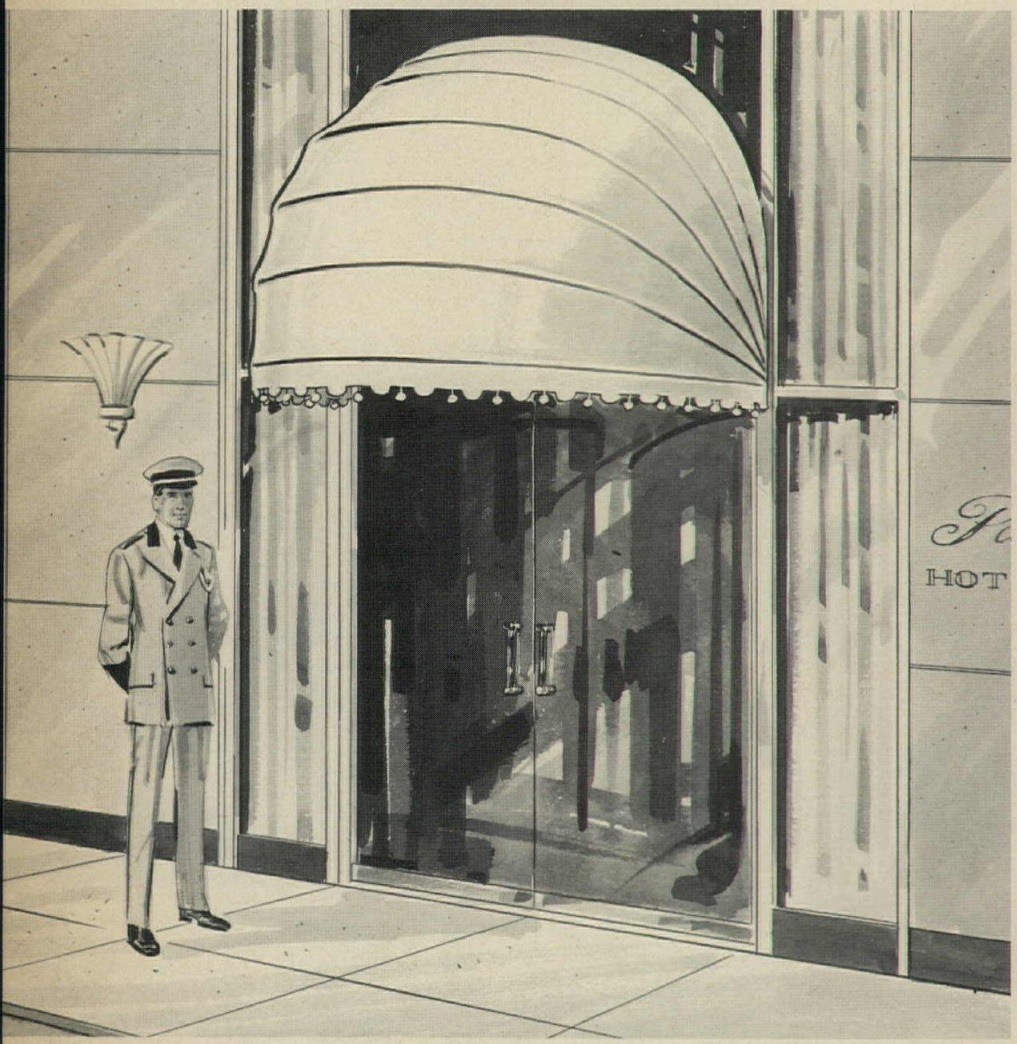
ONE-PIECE EXTRUDED FASCIA SECTION / The newly designed *H 10 Contour* extruded aluminum fascia, with a full 10-in. face, has been added to the company's fascia and water dam system to give greater depth and better visual effect. The *Contour* is available in standard 10-ft sections complete with concealed cover plates and factory-fabricated miters. In addition to mill finish, it is available in the clear anodized series, baked enamel, Duranodic, porcelain enamel, and color anodizing. The redesigning of the *Contour* fascia section does not affect the rest of the system which remains the same. ▪ W.P. Hickman Company Inc., Troy, Mich.

Circle 313 on inquiry card



TRANSLUCENT WALLS / Five new grid patterns have been added to the Kalwall series of translucent curtain wall panels to give architects greater design freedom. Increased use of sandwich-bonded glass fiber-aluminum panels to provide translucent walls in buildings is said to have prompted the introduction of the new *Custom Grid* designs which maintain good insulation. ▪ Kalwall Corporation, Manchester, N. H.

Circle 314 on inquiry card



Put your best front forward with SUNBRELLA®

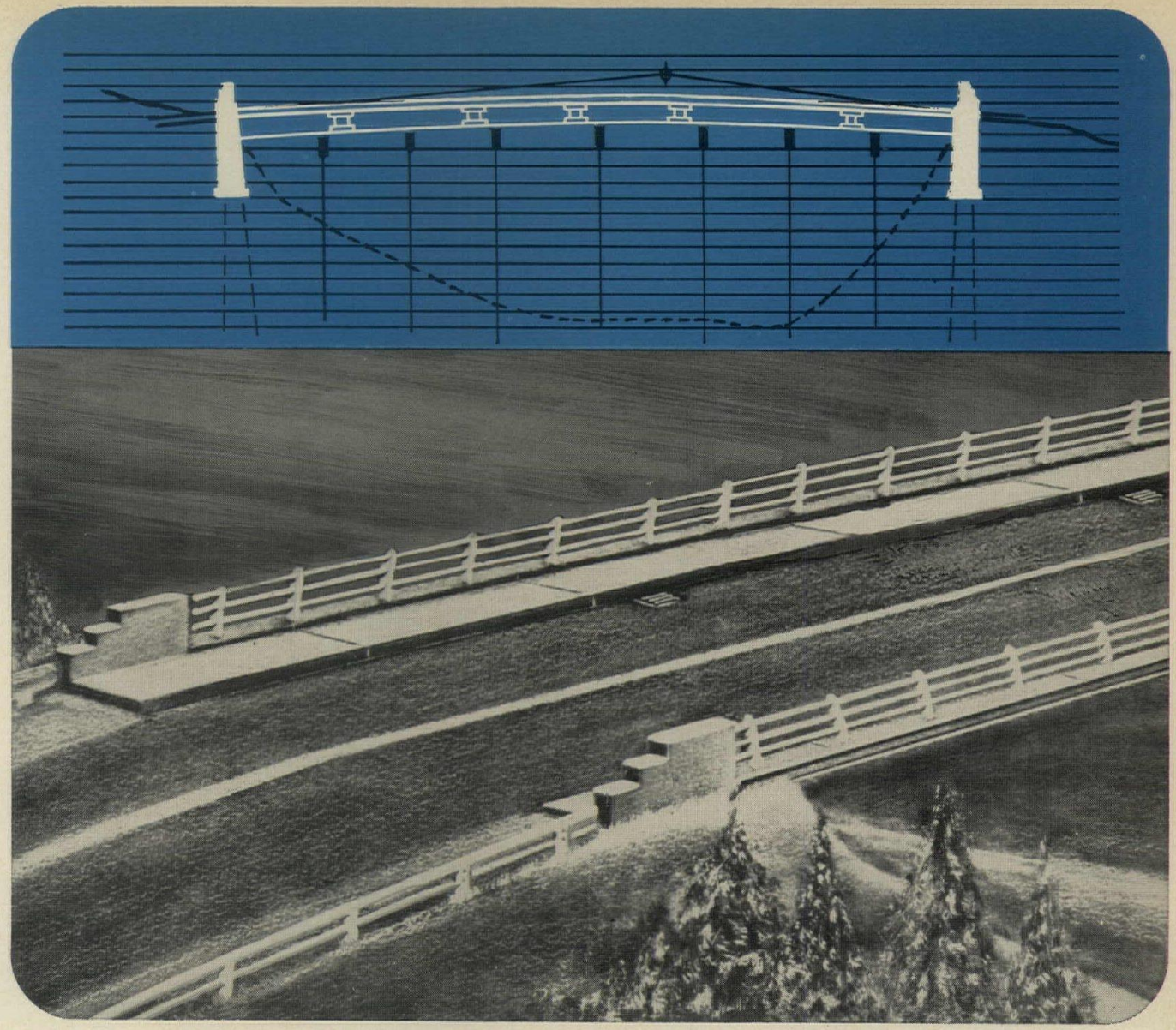
When you want an awning installation that will enhance your exterior design, specify Sunbrella 100% Acrilan® outdoor fabric. They'll "out-look" everything on the market with their soft, subtle colorings and patterns, their supple hand that drapes and tailors so well. They'll "out-perform" all the others, too. Glen Raven guarantees the fabric for 5 years from date of installation. Sunbrella awnings can be fabricated to your specifications by your local awning dealer. Write us for canvas idea booklet and fabric swatches.

Glen Raven

ACRILAN acrylic fiber by CHEMSTRAND

Glen Raven Cotton Mills, Inc., Glen Raven, North Carolina

For more data, circle 135 on inquiry card



THE FIRST HOT DIP GALVANIZED BRIDGE IN THE U. S. WILL SPAN A RIVER OF MAINTENANCE 20 YEARS WIDE

A zinc skin will provide 20 to 50 years of protection **without maintenance** for this bridge being built over Stearns Bayou near Muskegon, Michigan.

The bridge is 420 feet long with a 30 foot roadway and a 5 foot walk on each side. There are 8 spans, two at 60 feet and six at 50 feet. Design loading is H2O-S16-44. All structural members, fasteners and other steel parts are protected against corrosion after fabrication by hot dip galvanizing specified at 2.3 ounces per square foot. Structural techniques proven successful in a hot dip galvanized bridge opened near Quebec City, Canada, in 1963 assure full friction of fastener contact surfaces **plus** the corrosion resistance of an unbroken zinc coat.

The cost of galvanizing today is surprisingly close to that of a proper paint system. When maintenance costs are considered, galvanizing with its 20 to 50 year life expectancy is by far the most economical.

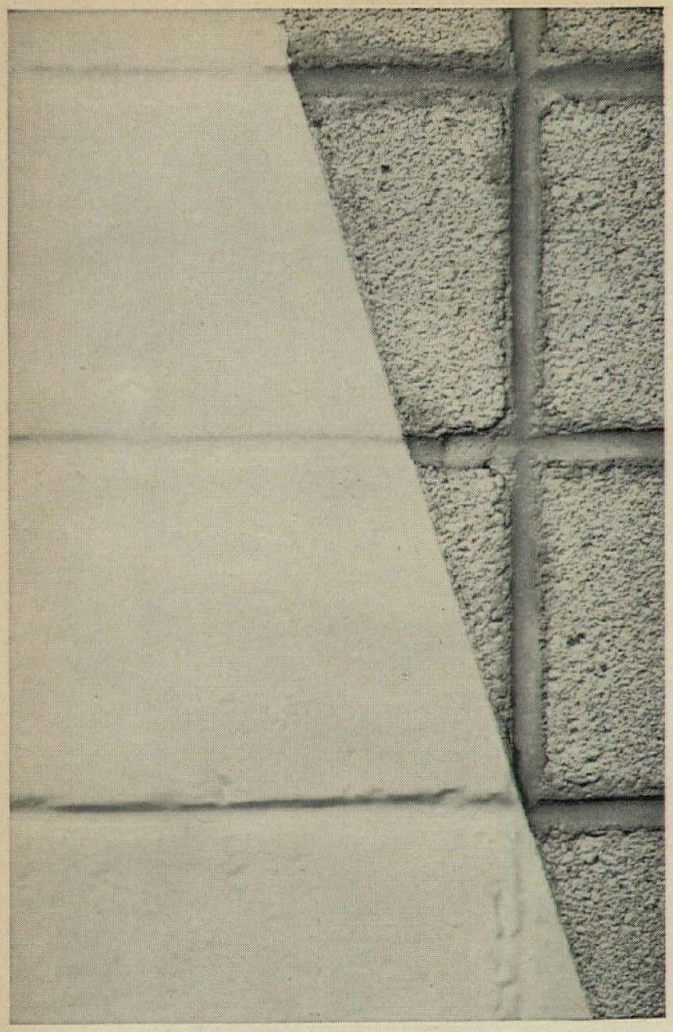
ST. JOE

ST. JOSEPH LEAD COMPANY

Producers of Zinc for American Industry

250 Park Avenue • New York, New York 10017

ZN-286



O'Brien's New *Mira-Plate*

The miracle strength epoxy that goes on like paint, looks and lasts like ceramic tile!

Here's superior protection and tile-like beauty—at a fraction of tile's cost. O'Brien's MIRA-PLATE beautifully coats everything paintable—including new or previously painted plaster, brick, concrete, wood, metal. Ideal for heavy traffic areas. Superior to paint. Defies wear, weather, chemicals, fumes, peeling, and cracking. Unique waterproofing properties defy moisture. Brush it, roll it, or spray it on—and MIRA-PLATE may be recoated or retouched at any time. Many popular colors and attractive fleck patterns. Ask your O'Brien dealer, your painting contractor, or simply send the coupon.

To: The O'Brien Corp., Dept. AR-4
South Bend 21, Indiana

Please send me complete information about MIRA-PLATE, your miracle-strength coating that goes on like paint, looks and lasts like ceramic tile.

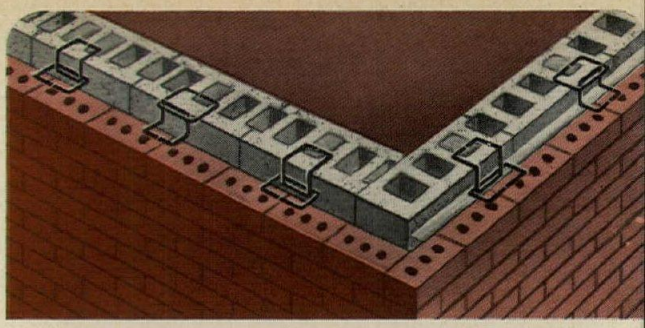
NAME_____

ADDRESS_____

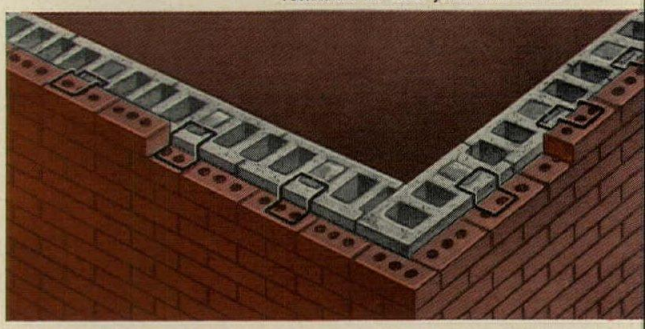
CITY_____ ZONE____ STATE_____

The O'Brien Corporation, South Bend 21, Indiana • Baltimore • Oklahoma City • San Francisco • Los Angeles

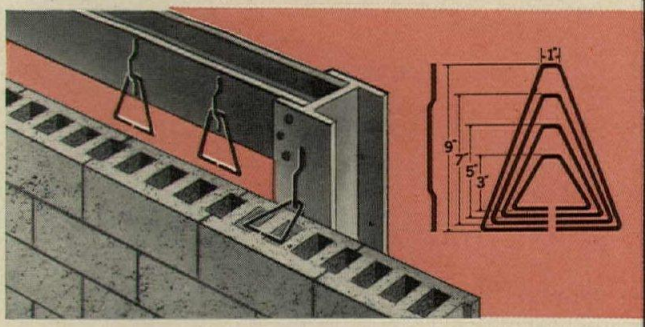
For more data, circle 136 on inquiry card



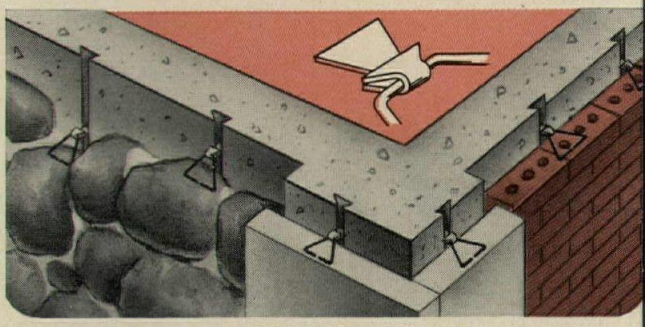
ADJUSTABLE TIES For cavity or veneer walls. For shear resistance fill collar joint with mortar.



SOLID TIES For faced masonry walls.



FLEX-O-LOK® For anchorage to steel columns or beams.



DOVETAIL FLEX-O-LOK For variable vertical anchorage to poured concrete walls and columns.

AA flexible wall anchorage reduces wall cracking

Allow walls to move independently yet remain securely tied laterally. AA flexible wall anchors increase wall strength and reduce cracking. Only AA Wire Products offers a full line of quality masonry reinforcing and wall ties designed to do your specific job best.

Send for FREE catalog!

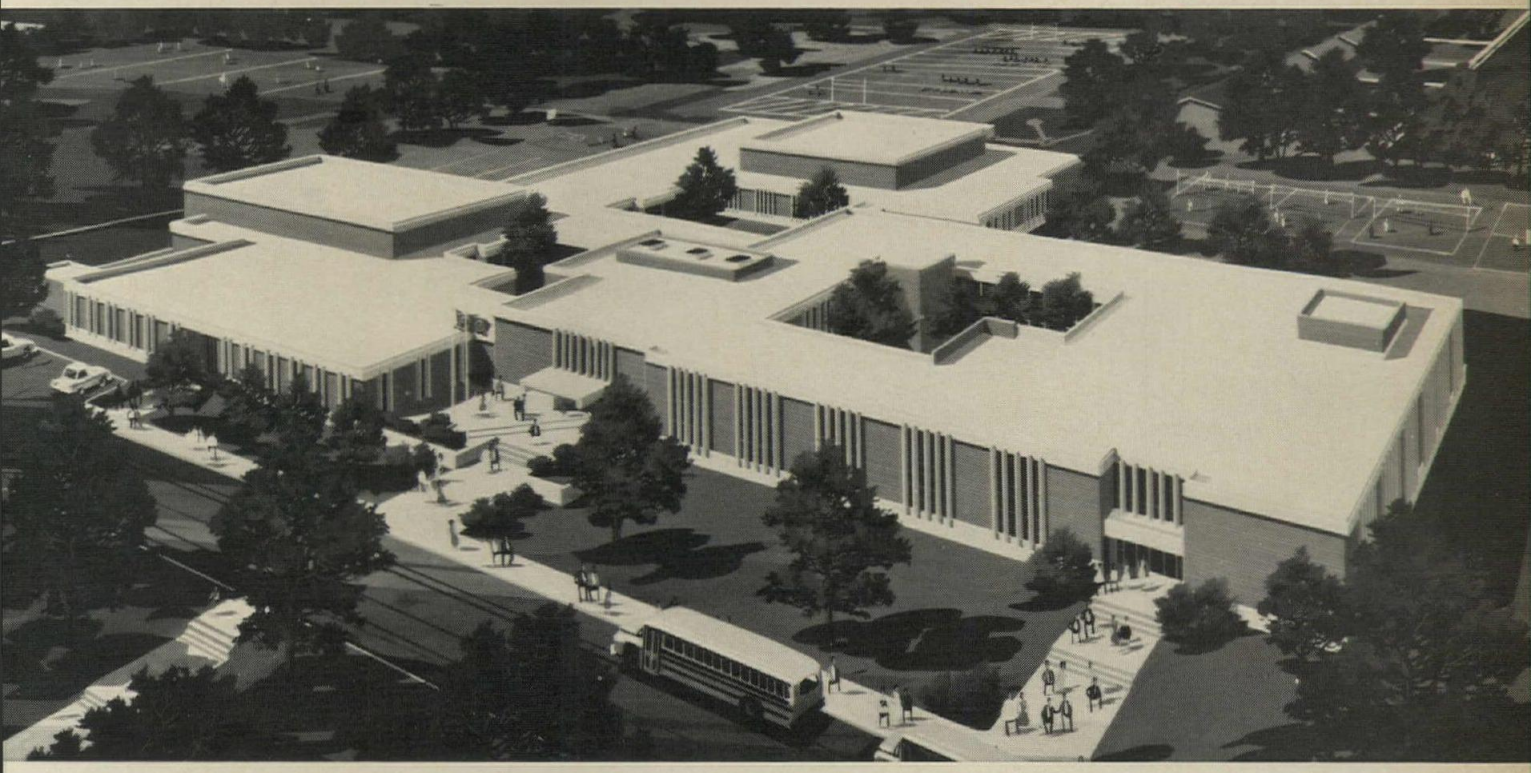
Reference:
CSI File Div. 4
A.I.A. File 3M-5F
1965 Sweets' File 4h/Aa
1964 A.I.A. BPR 4.05 A-B
1965 CE Spec. Data file S-a

AA WIRE PRODUCTS COMPANY
6100 S. New England • Chicago, 60638
Manufactured in Chicago, Dallas and Canada.

For more data, circle 137 on inquiry card

Since **HOPE'S** *1818*

WEATHERSTRIPPED
STEEL WINDOWS



JOHN ADAMS MIDDLE SCHOOL · ALEXANDRIA, VIRGINIA

Vosbeck-Vosbeck & Associates, *Architects* — M. L. Whitlow, Inc., *General Contractors*

This attractive school structure will be well guarded against the cold draughts of winter. It is one of the first to incorporate Hope's revolutionary new Weatherstripped Steel Windows. Through specially designed continuous Neoprene weatherstripping, Hope's engineers have reduced air infiltration by more than 60% (confirmed by independent laboratory tests). These windows combine the strength and rigidity found only in steel, with an air infiltration rate well within the maximum established for weatherstripped aluminum windows. Here are some of the advantages:

- All windows constructed from hot rolled solid steel sections.
- 5/8" high glazing rebates comply with glazing requirements for 1/2" insulating glass.
- Heavy ventilator section permits use of larger ventilators.
- All frame and ventilator corners mitered and solidly welded for greater strength and rigidity.
- To reduce maintenance and simplify initial glazing, windows can be inside glazed with continuous metal beads.
- Factory-finishing with Hope's Ultra-Coat available to eliminate field painting.

Hope's engineers are prepared to help you incorporate Weatherstripped Steel Windows in your building design; contact your local Hope's representative in the yellow pages, or write for Weatherstripped Steel Window publication No. 181-65.

HOPE'S WINDOWS, INC. *Jamestown, N.Y.*

HOPE'S WINDOWS ARE MADE IN AMERICA BY AMERICAN WORKMEN

Red Cedar can help turn a remodeling job into a transformation

Red cedar shingles add something special to any wall. And they look just as nice whether the surface underneath is plywood, stucco, asbestos or open air. A wall of cedar shingles can reach high without heavy support, because they don't weigh much. Yet shingles are rigid and strong—and once applied, they form a surface as resilient as rhino hide. Red cedar shingles are durable, insulative and dimensionally stable. You'll find more detailed information on Certigrade shingles (and Certi-Split handsplit shakes) in our Sweet's Catalog listing, 8d/Re. Or give us a call. Or write. **RED CEDAR SHINGLE & HANDSPLIT SHAKE BUREAU**

5510 White Building, Seattle, Wash. 98101 • (In Canada, 1477 W. Pender St., Vancouver 5, B.C.)

THE CROWNING TOUCH OF QUALITY • RED CEDAR SHINGLES & HANDSPLIT SHAKES •

Remodeled professional building, San Rafael, California
Architect: Donald J. Batchelder
Certigrade Shingles, #1 Grade, 16" Fivex with 5" to the

COMMUNITY MENTAL HEALTH
SERVICES

continued from page 236

SECTIONAL CABINETS / Over a thousand models that can be combined or modified to make individual units or groupings for schools, offices, and institutions make up a new 52-page booklet. Forty black-and-white and color photographs suggest a variety of storage, display, work surface and space division needs, which the units are designed to satisfy. A number of diagrams and tables describe the cabinets fully. ▪ Brunswick Corporation, Kalamazoo, Mich.*

Circle 409 on inquiry card

WALLPLATE SPECIFICATIONS / The complete *Medalist* stainless steel line is illustrated in a 16-page brochure, which contains descriptions of each wallplate including color composition, a composite wallplate index, and details of the company's guarantee which allows for replacement of any defective unit without cost and call-back labor cost as well. Among the products shown, is the *Sta-Kleen* wallplate which is designed without ridges to eliminate dirt collection. ▪ Slater Electric Inc., Glen Cove, N. Y.

Circle 410 on inquiry card

WHY TAKE UNNECESSARY CHANCES specifying unproven grouting materials? One mixing mistake by a mechanic can cost your client plenty in time, materials and effort. That's why farsighted architects and specifiers prefer to rely on Hydroment Joint Filler, the tight, non-shrinking and non-expanding material which eliminates mechanic errors in screening and mixing. Reason: Hydroment Joint Filler is ready to go—it's easy to apply—just add water!

No wonder architects specify it for "Joint Insurance" in quarry tile and brick paver installations in many of the leading hotels and restaurants: Hilton Hotels, Ponce De Leon, Hot Shoppes to name a few. Hydroment Joint Filler cleans up easily—looks sparkling and fresh for years. Comes in seven architecturally designed colors, natural, black and white.

catalog on request!

THE UPCO COMPANY 4805 Lexington Ave. • Cleveland, O. 44103

a subsidiary of USM **United Shoe Machinery**

For more data, circle 140 on inquiry card

SEALANTS / Comprehensive data on 21 high performance joint sealants and related compounds for the construction industry is set out in a new brochure, which includes a convenient listing of major Federal and State specifications with which each product complies. Application and other technical information on each product is given in individual sections. ▪ Presstite Division, Interchemical Corporation, St. Louis, Mo.*

Circle 411 on inquiry card

GLASS PATTERNS / The 1966 catalog presents a complete line of glass patterns for installation in industrial, commercial, school, residential and light construction. The catalog is illustrated with photos of typical installations and also includes photos of individual patterns accompanied by light distribution charts and transmission data. A special four-page insert features the company's *Profilite* channel-shaped glass, which has high load-bearing qualities making it suitable for glazing wall and roof construction in exposed positions. ▪ Mississippi Glass Company, St. Louis, Mo.*

Circle 412 on inquiry card

SIDING / Two technical bulletins on lap, panel, and grooved siding show detail drawings of joints, outside corners, inside corners, doors and windows and cover general construction, application and finishing techniques. ▪ Masonite Corporation, Chicago.*

Circle 413 on inquiry card

ROLLING DOORS / A 24-page booklet featuring service (push-up, chain, crank-operated and motor-operated), fire, and overhead doors plus counter shutters and rolling grilles gives construction features, types available, sizes and clearances, optional equipment and specifications. Information is also available on bifold doors. ▪ The Kinnear Manufacturing Company, Columbus, Ohio.*

Circle 414 on inquiry card

ENTRANCES AND STORE FRONT SYSTEMS / A 16-page catalog covers three series of *Arcadia* doors: narrow stile, wide stile, and the prestige Strestile, plus S-45 storefront and window-wall systems. There are details of 1¾-in. and 2¾-in. flush glazed storefront systems plus illustrations of entrance door hardware and locks, sash, stops, sills, and division bars. ▪ Northrop Architectural Systems, City of Industry, Calif.*

Circle 415 on inquiry card

**Additional product information in Sweet's Architectural File.*

more literature on page 288

*Trademark of Otis Elevator Company

In the Otisphere, waiting is for the birds

Birds don't have to punch time clocks. Or meet deadlines. Or keep 9 AM appointments. But people do. And more do it with a big assist from Otis than from all other makes combined.

Take our "INSTANT ELEVATORING,"* for example. This remarkable Variable Interval Programming (V.I.P.) system electronically adjusts itself to the building's business routines. V.I.P. anticipates all service demands. Automatically dispatches cars where they're needed. When they're needed.

Call an Otis man about your elevator design requirements. Ask him for complete details on this remarkable V.I.P. Otis development. See how "INSTANT ELEVATORING" can be applied exactly to your clients' needs.

Otis Elevator Company, 260—11th Ave., New York, 10001.

Otis®
ARCHITECTS' SERVICE

Electric and Hydraulic Passenger & Freight Elevators · Escalators · Moving Walks · Dumbwaiters · Elevator Modernization & Maintenance · Military Electronic Systems · **Gas & Electric Trucks by Baker Division**

Be choosy!

G.E.'s full line of new luminaires for Lucalox® and Multi-Vapor™ lamps lets you tailor the lighting to the application

What's your preference? The warm, sun-like color of Lucalox® lamps? The cool, crisp light of Multi-Vapor ™ lamps? Floodlighting, street lighting, or decorative area lighting?

Only General Electric offers the right luminaires for all these jobs —a broad, **system-engineered** line of new luminaires for Lucalox or Multi-Vapor lamps.

These new luminaires keep the modern, style-setting outside look of previous designs to give you match-up appearance. But they're **all new inside** to meet the special requirements of new lamps. Reflectors have been re-engineered to take advantage of the new light sources. New solid-state ballast concepts to provide the higher starting voltages for Lucalox lamps have been developed by Outdoor Lighting Department and field-tested in a wide variety of trial installations across the country.

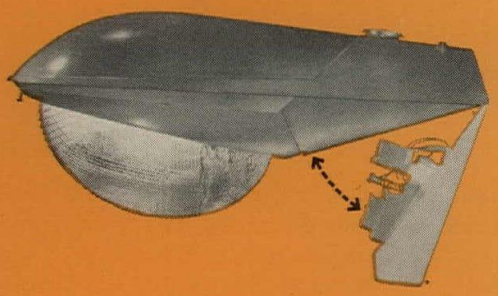
To be sure of the best, rely on the proved leadership of G.E.—the **first and only** manufacturer to design, develop, and test the entire system.

for floodlighting

New Super Powerflood® luminaires designed around the Lucalox lamp (left) to give high-efficiency flood-lighting. Also available for 400- and 1000-watt Multi-Vapor lamps (right). Choice of reflectors gives a variety of light-distribution patterns.

for street lighting

New POWR/DOOR™ luminaires protect your investment from obsolescence. Try Lucalox lamps today. Or install now for long-life Bonus Line™ mercury lamps; upgrade later to Lucalox or Multi-Vapor lamps just by changing the POWR/DOOR assembly.



for decorative area lighting

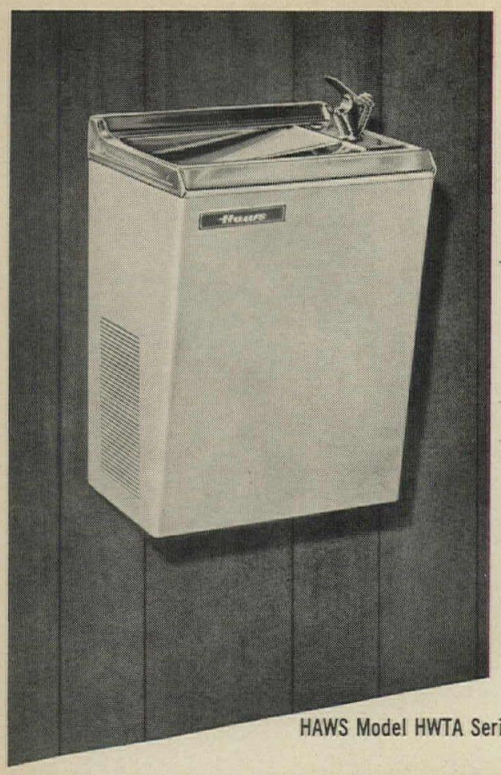
New Powerglow® family offers three sizes, ranging 100 thru 4000 watts, for Lucalox, Multi-Vapor, or mercury lamps. Their look-alike, space-age styling adds beauty to any area, from walkways to shopping centers.

For more information on General Electric's broad line of new luminaires for Lucalox and Multi-Vapor lamps, contact your G-E Representative. Or write General Electric Co., Section 460-79A, Schenectady, N. Y. 12305.

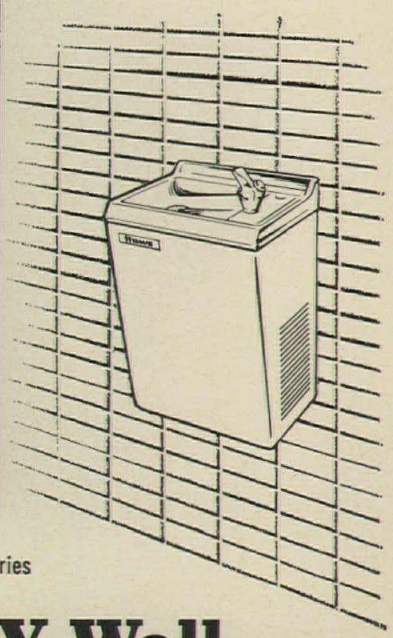
Outdoor Lighting Dept.
Hendersonville, N. C.

GENERAL ELECTRIC

For more data, circle 141 on inquiry card



HAWS Model HWTA Series

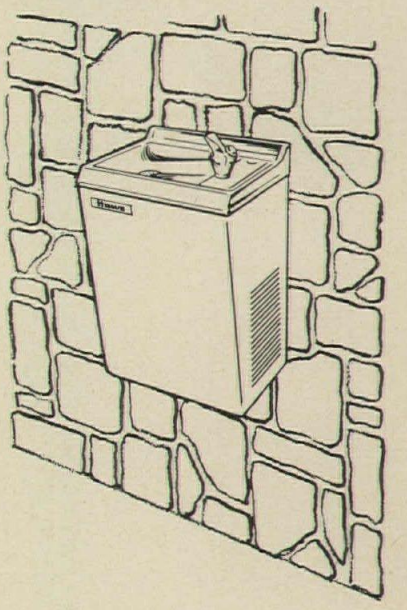


Mounts on ANY Wall...

Haws water cooler Model HWTA mounts off-the-floor on any wall—be it stone, masonry, wood panel, or concrete. The Cool Mist Grey baked enamel finish and stainless steel receptor harmonize with any interior decor.

Because it's wall-mounted, there's space beneath for cleaning equipment—no exposed fittings. And installation height may be varied for children and/or adults.

Compact Model HWTA wall-hung coolers are available in eight different models with capacities from 6 to 17 gph. Write or call today:

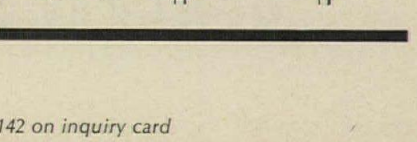


HAWS Since 1909

HAWS DRINKING FAUCET COMPANY

1441 Fourth Street • Berkeley, California 94710

For details and information on other Haws products—see your Haws catalogs on drinking fountains, emergency eye/face-wash fountains, drench showers and decontamination equipment; and dental fountain/cuspidor units.



For more data, circle 142 on inquiry card

continued from page 284

GLAZED ENCLOSURES / Dome, barrel, vault, pyramid and other types of transparent overhead structures are presented in two brochures: "Glazed Enclosures and Skylights" and "Glazed Enclosures and Greenhouses." Photos of actual installations indicate a wide range of design and application possibilities. The dome system has slim-line tubular aluminum framing, thermoformed cast acrylic panels and aluminum connection which eliminates exposed clips, lugs, and bolts. All-aluminum rigid-frame units with non-trussed interiors are designed for institutional, experimental and industrial purposes. ▪ Ickes-Braun Glasshouses, Inc., Chicago.*

Circle 416 on inquiry card

ELECTRICAL DISTRIBUTION EQUIPMENT / Prices, catalog numbers, and selection and application information make up a 168-page illustrated catalog which features safety switches, molded-case circuit breakers, low voltage power circuit breakers, load centers, meter centers, panelboards, bus ducts, motor controls, and accessories. ▪ I-T-E Circuit Breaker Company, Philadelphia.

Circle 417 on inquiry card

HEATING AND AIR CONDITIONING / A comprehensive line of commercial and residential equipment is on display in a 16-page, illustrated catalog. Gas, electric and oil furnaces are covered as well as remote and packaged air conditioning systems, heat pumps, the *Blend-Air* pre-engineered distribution system, and a range of wall and space heaters. Specifications and illustrations are included for each model in the line. ▪ The Coleman Company, Inc., Wichita, Kan.

Circle 418 on inquiry card

WASHROOM EQUIPMENT / A full line of stainless steel dispensers and receptacles including many completely new models is described in a 12-page catalog, with illustrations. ▪ D. J. Alexander Corporation, Moorestown, N. J.*

Circle 419 on inquiry card

FLAME PROTECTION / Silicone rubber foam, which protects against flame and can be applied to a variety of material ranging from newspaper and fabrics to fuel tanks and walls, is explained in a four-page brochure that gives information on properties, applications and handling. ▪ General Electric, Silicone Products Department, Waterford, N. Y.

Circle 420 on inquiry card

*Additional product information in Sweet's Architectural File.

more literature on page 296

Robertshaw

TEMPERATURE CONTROL SYSTEMS

Architects: Kenneth C. Black Associates, Incorporated, and Daniel L. Dworsky, A. I. A. and Associates; Mechanical Engineer: George Wagschal Associates, Incorporated
Mechanical Contractor: Spitzley Corporation, Detroit, Michigan; General Contractor: Spence Brothers, Saginaw, Michigan

The 14,000 seat University of Michigan Events Building

During basketball games, graduation ceremonies and other events ROBERTSHAW will be there... with a highly flexible pneumatic environmental control system.

The extreme load changes of this unusual building required a versatile temperature control system. ROBERTSHAW is supplying a pneumatic temperature control system specially tailored to the needs of the design.

Since all areas of the building will not be used simultaneously, a central control panel was designed to enable operating personnel to readily select and schedule mechanical equipment to handle specific demands. Some of the functions performed at the central control panel are:

1. Constant temperature indication and set point adjustment in key areas.
2. Manual start-stop plus target gauge indication of 16 supply fan systems and 11 exhaust fans.
3. Three stage capacity selection of main exhaust systems.
4. Day-Nite selection and read out for each of the 10 multi-zone fan systems.
5. Adjustment and read out of variable fresh air dampers for each of 10 fan systems.

For information on ROBERTSHAW service write for Bulletin SP-100.

Bill Gray—Regional Manager, Detroit. He is a veteran of the control systems business, and typical of the managers in Robertshaw offices throughout the country who direct trained personnel to handle jobs such as this University of Michigan Events Building.

Robertshaw

MR. CONTROLS

ROBERTSHAW CONTROLS COMPANY
CONTROL SYSTEMS DIVISION
Executive Offices: 1701 Byrd Ave. Richmond, Virginia 23226

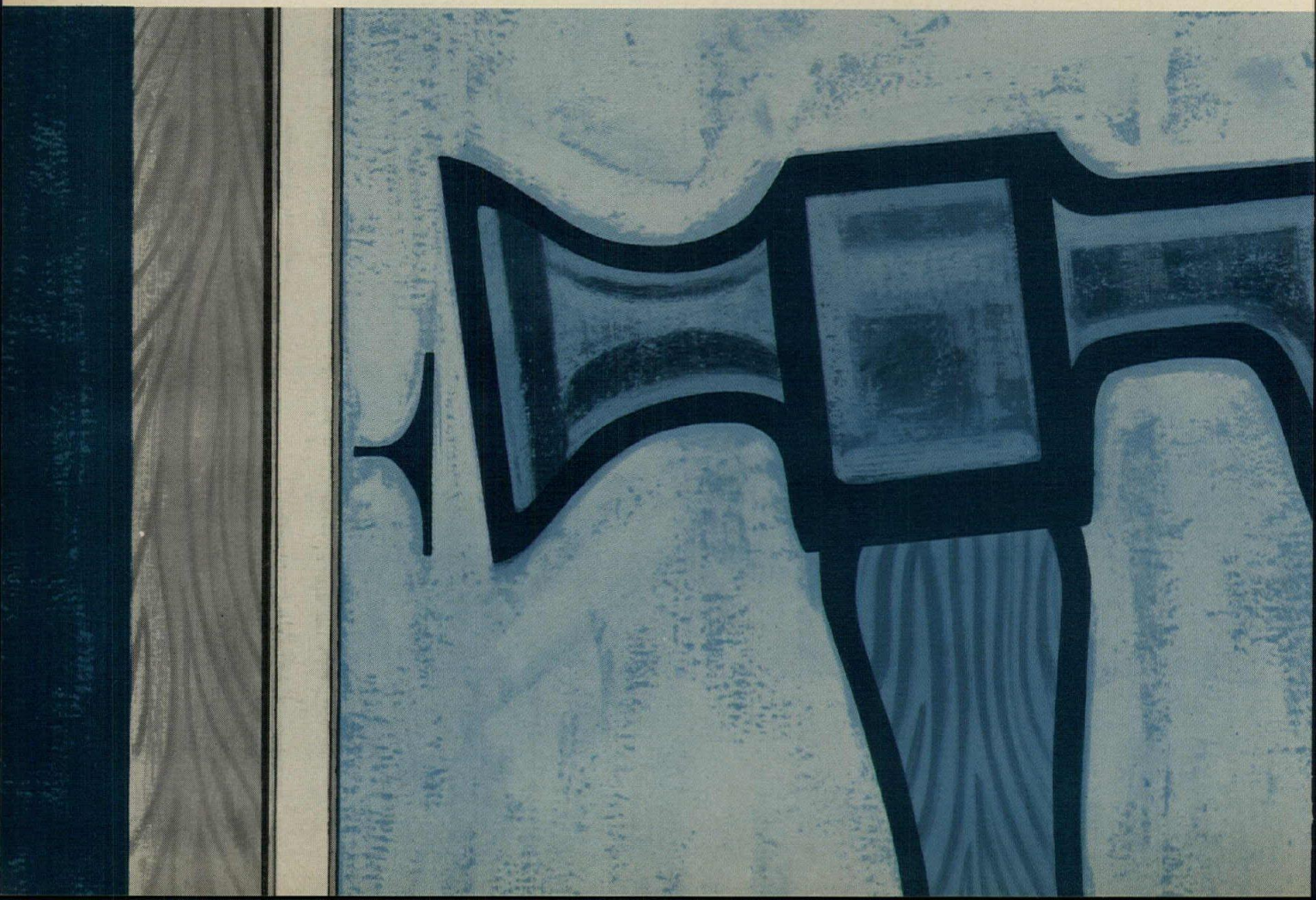
For more data, circle 143 on inquiry card

Our wallboard has better nailing qualities:

Bestwall is the original glass fiber reinforced wallboard. This unique core of gypsum and uniformly dispersed glass fiber filaments literally anchors a nail (or screw) driven through its body, pressing hard against the side of the metal, resisting flexural stresses, cracking or sagging. Let our salesmen tell you about Bestwall wallboard systems, ceilings and partitions available for every specification.

GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION

2 INDUSTRIAL BOULEVARD, PAOLI, PENNSYLVANIA



What's happening outside?

When this question crowds the mind of a school child, concentration on studies suffers.

Like what happened at Appomattox in April 1865.

Or who wrote Silas Marner.

That's why windowless schools are out.
And lots of windows are in.

They're a sight more thoughtful.

Libbey · Owens · Ford Glass Co.
Toledo, Ohio

LOF GLASS

For more data, circle 145 on inquiry card

For more data, circle 144 on inquiry card

The college contribution

is a two-way street

There are two ways to look at it.

There's the contribution the colleges make to business.

That's crucial.

Business employs about 42% of all college people. It uses their brainpower and skill in developing new products and methods. It fills management posts.

In the other direction, there's the contribution business makes to colleges.

The colleges welcome it. They need all the funds they can get. They're helping to prepare leaders for management, but the cost of education is going up.

In fact many colleges are having to turn away applicants—100,000 a year, says one estimate.

If business wants college talent, it must keep colleges in business. It can help finance their need for classrooms, facilities and especially teachers.

In this light, your aid-to-education program is an aid to your company.

SPECIAL TO CORPORATE OFFICERS—A new booklet of particular interest if your company has not yet established an aid-to-education program. Write for:

"How to Aid Education—and Yourself"
Box 36, Times Square Station
New York, N. Y. 10036

College is Business' Best Friend

COUNCIL FOR FINANCIAL AID TO EDUCATION

Published as a public service in cooperation with The Advertising Council and the Council for Financial Aid to Education.

ADVERTISING COUNCIL · PUBLIC SERVICE ·

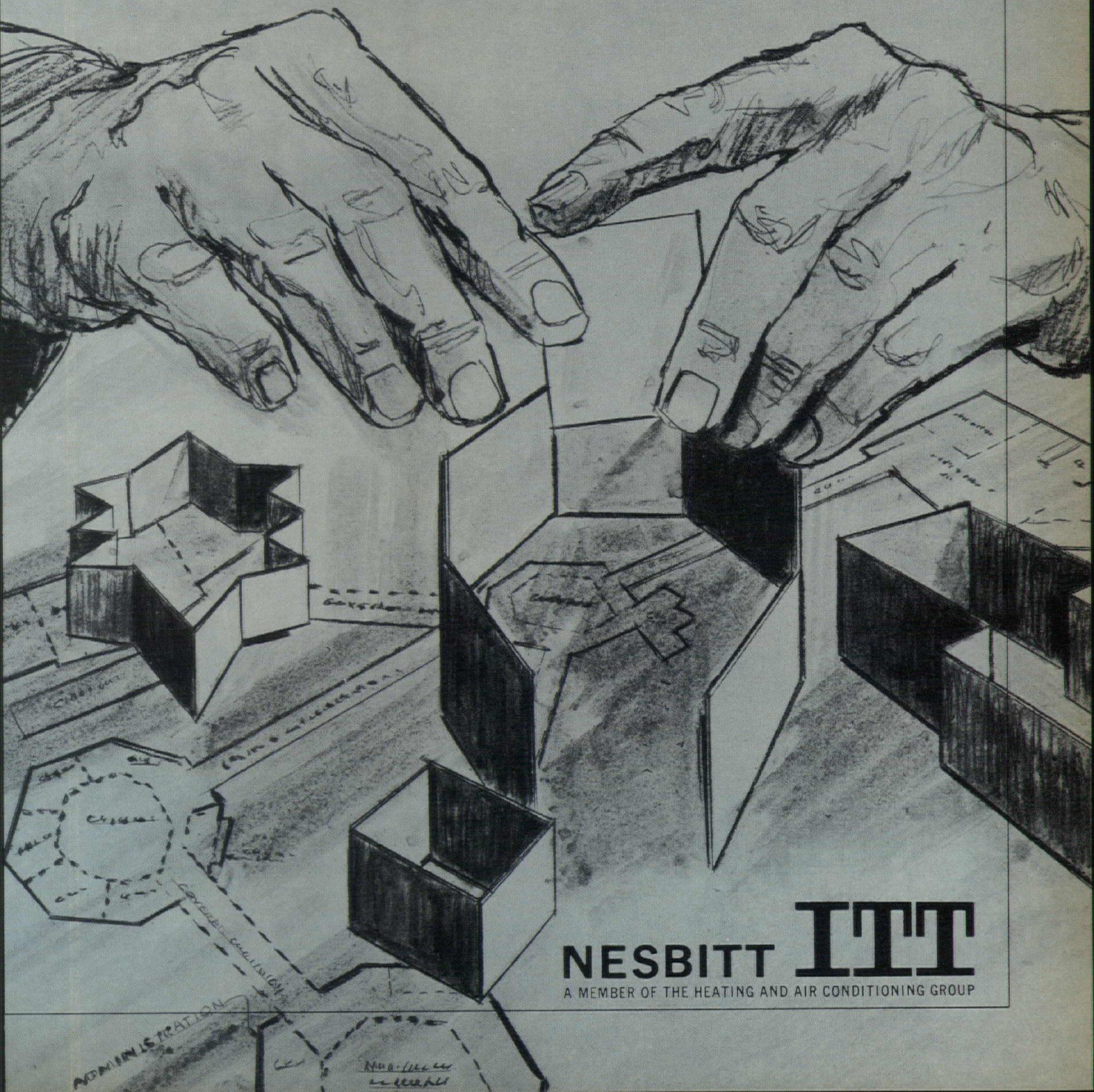
For more data, circle 147 on inquiry card

What's more, the Nesbitt line is quiet. Visually quiet...styled to work right along with your designs. Where you want the equipment visible, Nesbitt colors, textures and patterns form an integral part of the line so that each unit blends with the room, with the building, with each other.

It's no accident. The entire Nesbitt line was styled by Paul McCobb, one of America's leading contemporary designers. Now you have the freedom to organize various arrangements of Nesbitt classroom cabinets and select the units that unify all your design elements.

Whether you're creating a new building or planning a renovation, think about Nesbitt —the year-round unit system for round shapes, square shapes, any shapes.

Need more proof? A Nesbitt representative will be glad to talk to you about the versatile unit system in the next school you design. Write ITT NESBITT, a division of International Telephone and Telegraph, Philadelphia, Pa. 19136.



NESBITT ITT

A MEMBER OF THE HEATING AND AIR CONDITIONING GROUP

continued from page 288

CONTROL CENTERS / A four-page brochure shows a typical center and lists possible administrative applications for hospitals, schools, industrial and commercial buildings, hotels and apartments. Such units, valuable for signaling and protection, as well as day-to-day inter-building communication, can be designed for any grouping or configuration depending on equipment, physical room limitations or personnel. ▪ Edwards Company, Norwalk, Conn.

Circle 421 on inquiry card

FLASHINGS / A 16-page illustrated brochure, showing an expanded line of factory-made flashing products, introduces the following new items: two-piece cap flashing available in four types of receivers to fit a wide range of wall situations; interlocking through-wall flashing, with raised buttons at 4-in. intervals which promises to increase mechanical bond and eliminate movement across the wall; an improved reglet system, said to provide more positive attachment to wood forms. Information is also given—with an actual sample—of a new rolled copper flashing, laminated on both sides with dense polyethylene film. ▪ Revere Copper and Brass Incorporated, New York City.

Circle 422 on inquiry card

GLIDING DOOR AND WINDOWALLS / Descriptions and illustrations of standard wood and the new *Perma-Shield* vinyl-coated wood doors are available in an 8-page booklet.

An additional 39-page brochure which gives detailed information on Andersen Windowalls, contains sections on casements, bow, double-hung, picture, gliding (including patio wall) and basement windows. Detail drawings, specification tables and application photos are used to illustrate products. ▪ Andersen Corporation, Bayport, Minn.*

Circle 423 on inquiry card

WALL COATING / Fire-resistant, epoxy-polyester tile available in 20 colors plus white, black and clear may be used in various areas ranging from classrooms, corridors, and lobbies to laboratories, hospitals and motels. Information in a four-page brochure includes results of chemical and stain resistance tests and application instruction. ▪ Cook Paint and Varnish Company, Kansas City, Mo.

Circle 424 on inquiry card

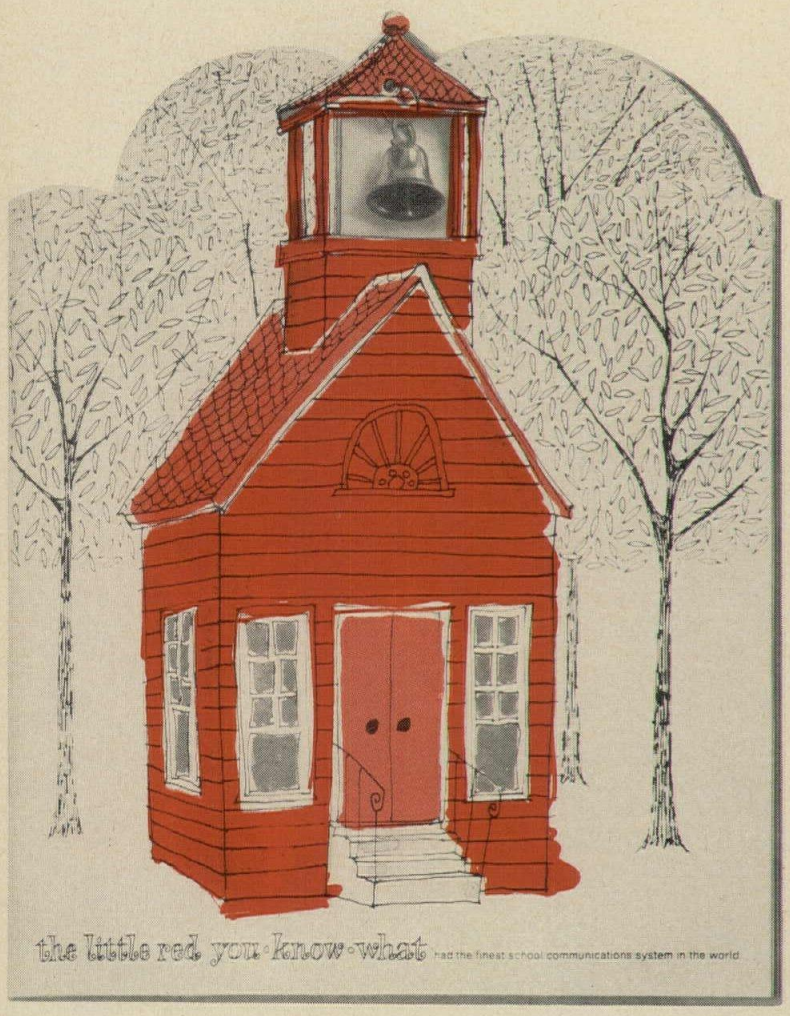
JOINT COVERS AND TRENCH FRAMES / A catalog covering aluminum and bronze expansion and aluminum seismic joint covers, as well as aluminum manhole and trench frames and covers, introduces new four-way movement expansion joints to supplement the standard line. Choice of abrasive plate or strip plate, and plain, corrugated and recessed plates offers versatility in design. Numerous diagrams and detail drawings, descriptions, installation details and specifications are included in the catalog's 36 pages. ▪ Architectural Art Mfg. Inc., Wichita, Kan.*

Circle 425 on inquiry card

STEEL PIPE FOR BUILDINGS / This new brochure outlines basic design principles, material selection and the advantages of using steel pipe for radiant panel heating systems, hot-water and steam-heating systems, snow- and ice-removal systems, fire protection systems and plumbing applications. It also indicates sources for additional information about these and other uses for steel pipe. ▪ American Iron and Steel Institute, New York City.

Circle 426 on inquiry card

**Additional product information in Sweet's Architectural File.*



We wrote the book on school communication systems. (It ain't bad)

We may not know how to educate malleable young minds. But we know our business cold—communications. Things like convertible classrooms, electronic educators, fire alarm systems, communication control centers, automatic internal telephone systems, sound systems, intercom systems and central resident call systems. Systems we back up with guaranteed service availability. The whole story is in the school house book, illustrated. Want a copy? Call your Stromberg-Carlson distributor. Or write us and we'll have him send you one.

STROMBERG-CARLSON
A Subsidiary of General Dynamics
P.O. Box 987, Dept. 136, Rochester, N.Y. 14603

Since 1894—"There is nothing finer than a Stromberg-Carlson."

For more data, circle 149 on inquiry card

6607

New Textured Wormy Chestnut Marlite

Textured Wormy Chestnut Marlite adds a beautiful new dimension to walls in any room anywhere!

Touch it. You can feel the texture. Wash it. You can't harm its beauty.

It's the newest and most exciting paneling you can specify for your building and remodeling projects. Marlite Wormy Chestnut reproduces the beautiful texture of natural Wormy Chestnut, with the Marlite soil-proof finish that stays like new for years. You can actually see and feel the texture in this unique wood-grained surface. And when you specify Marlite Wormy Chestnut you create more beautiful interiors, more satisfied clients. Get complete information from your building materials dealer, Sweet's File, or Marlite Division of Masonite Corporation, Dept. 405, Dover, Ohio.

Marlite®
plastic-finished paneling

ANOTHER QUALITY PRODUCT OF MASONITE® RESEARCH

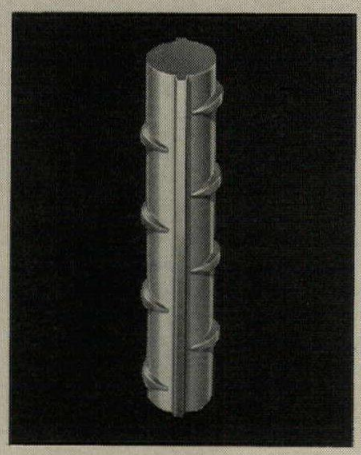
MARLITE BRANCH OFFICES AND WAREHOUSES: 1721 Marietta Blvd., N.W., Atlanta, Georgia 30318 • 57 Smith Place, Cambridge, Mass. 02138 • 4545 James Place, Melrose Park (Chicago), Illinois 60160 • 1199 Great Southwest Parkway, Grand Prairie (Dallas), Texas 75050 • 777-139th Ave., San Leandro, Cal. 94578 • 1622 Phoebe St., LaMirada (Los Angeles), Cal. 90638 • 39 Windsor Ave., Mineola, L.I. (New York) 11501 • 2440 Sixth Ave. So., Seattle, Wash. 98134

For more data, circle 150 on inquiry card

high strength steel reinforced concrete buildings are

on the rise! everywhere

■ Yes, it really is high! The 1000 Lake Shore Plaza Apartment Building, Chicago, has set a new height record for monolithic reinforced concrete construction. It towers over 600 feet from sidewalk to rooftop. ■ A-432 steel, one of the new reinforcing steels having 50% greater yield strength, made this building possible in concrete. Using high strength steel reinforcement, the designers achieved slimmer columns . . . greater usable floor space . . . the reduction of overall construction costs. Modern flat slab design also provided a record number of stories within the total height. ■ On your next building, consider the advantages of reinforced concrete construction. There is no more economical, versatile, or creative material for buildings, high or low. Ask your consulting engineer, too, about the many other benefits of using new A-432 steel in modern reinforced concrete building designs.



CONCRETE REINFORCING STEEL INSTITUTE

228 North La Salle Street • Chicago, Illinois 60601

8-65

1000 Lake Shore Plaza Apartments, Chicago, Illinois
Developer: Harold L. Perlman
Architects: Sidney H. Morris & Associates
Structural Engineers: William Schmidt & Associates

Architects and Engineers
Skidmore, Owings and Merrill
Electrical Contractor
Super-Hatfield Co-Venture
Photos by Hedrich-Blessing

Square D...whereve

SQUARE D COMPANY

For more data, circle 151 on inquiry card

electricity is distributed and controlled

New Equitable Building

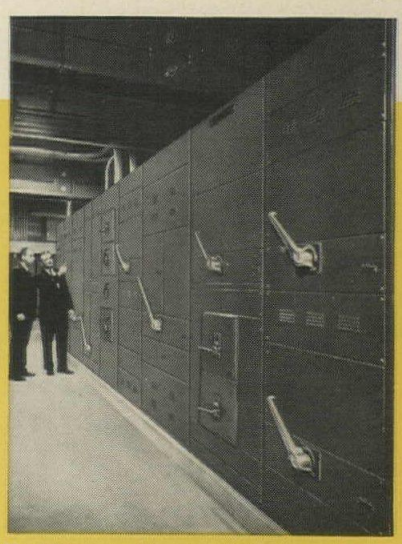
Brings New Beauty to Chicago's "Magnificent Mile"

35 stories of elegance, plus a unique 100,000 sq. ft. plaza, now replace a river-level parking lot at the juncture of the Chicago River and Michigan Avenue.

The new Equitable Building features a metal-and-glass design with unusually large windows to make the most of the spectacular view. Of special benefit to tenants is a Square D underfloor duct installation (totalling 194,000 ft.) for the most versatile electrical and telephone distribution.

Owned and operated by The Equitable Life Assurance Society of the United States, this new building is an impressive addition to Chicago's skyline.

Square D electrical distribution and control equipment is on duty throughout this beautiful and highly functional building.



Earl Towery, Structural Engineer for the architect, and Bob Colby, Field Superintendent for the electrical contractor, inspect **the Square D main service switchgear. Square D I-Line feeder duct** distributes 15,000 amps of power from this point to all other parts of the building.

This **Square D motor control center** provides remote operation of the building's ventilating and heating system. Ward Ruske, Square D Field Engineer, and Carroll Burnett, Project Engineer for Super-Hatfield, check out a **special Square D panel** that indicates visually which motors are operating. Other control centers serve other areas.

Square D I-Line feeder duct carries electricity from the lowest level to the top floor. As the duct passes through service closets on each floor, power is tapped off to feed more than 140 **Square D lighting panelboards**. Over 3,100 feet of Square D feeder duct has been used.

EXECUTIVE OFFICES • PARK RIDGE, ILLINOIS

A *Complete* LINE OF ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT

ADJUSTABLE SPEED DRIVES
BUSWAYS & WIREWAYS
CIRCUIT BREAKERS
CONTROL CENTERS
CRANE & HOIST CONTROL
DISTRIBUTION SWITCHBOARDS
ELECTRIC TRUCK CONTROL
HIGH VOLTAGE CONTROL
LAUNDRY CONTROL
LIFTING MAGNETS
LIGHTING AND POWER PANELBOARDS
LIMIT AND FOOT SWITCHES
MACHINE TOOL CONTROL
MAGNETIC BRAKES
METERING EQUIPMENT
MOTOR STARTERS
PRESS CONTROL
PRESSURE, FLOAT, & VACUUM SWITCHES
PUSH BUTTONS
RELAYS AND CONTACTORS
RESISTORS
SAFETY SWITCHES
SERVICE ENTRANCE EQUIPMENT
SOLID STATE LOGIC CONTROL
STEEL MILL CONTROL
SWITCHGEAR & UNIT SUBSTATIONS
SYNCHRONOUS MOTOR CONTROL
TERMINAL BLOCKS
TEXTILE MACHINE CONTROL
TIMERS
UNDERFLOOR DUCT
VOLTAGE TESTERS
WELDER CONTROL

For more data, circle 152 on inquiry card

Joe feels used

Which is OK with him.

He's the kind of guy who doesn't look for the easy way out.

Especially when it comes to selling Devoe paint.

Joe won't just sit back and pitch.

He'll pitch in.

Want a comprehensive paint spec for a steel mill? A school gym? Let Joe do it.

Want the full picture on epoxies? Including all the "if's" and "but's"?

Joe will give it to you straight.

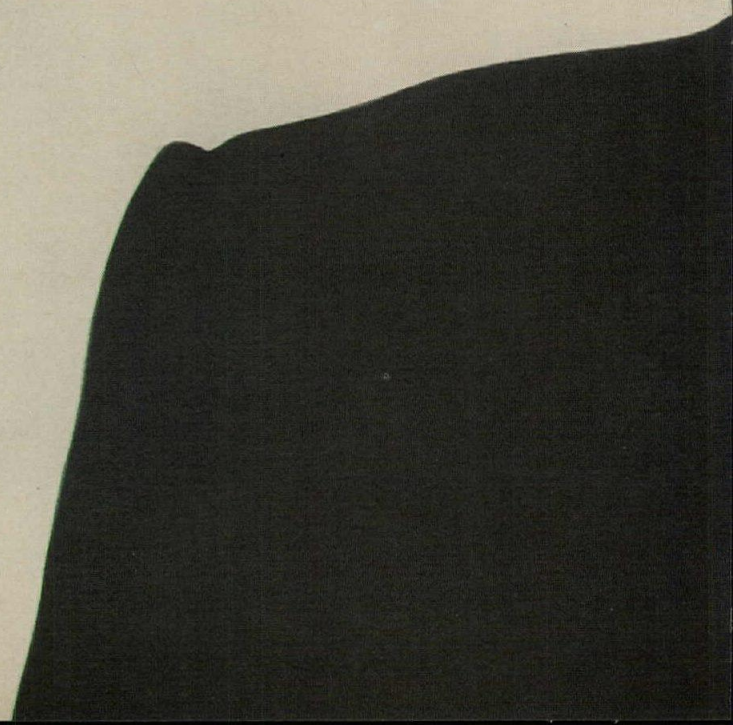
After all these years in the business, Joe is still a bit of a Boy Scout. Always doing someone a good turn.

Same goes for Gabe. And Maury. And Artie.

And every Man from Devoe.

They know which side their bread is painted on.

You can depend on the **Man from Devoe.**

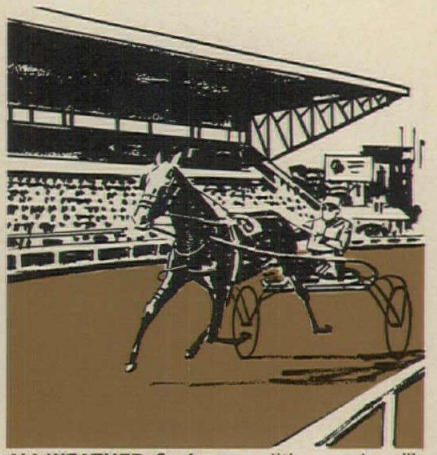


DEVOE

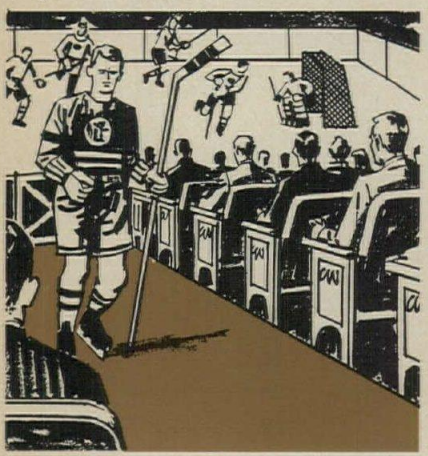
A DIVISION OF CELANESE COATINGS COMPANY

This is 3M's new Tartan® BRAND Multi-Use Surfacing...

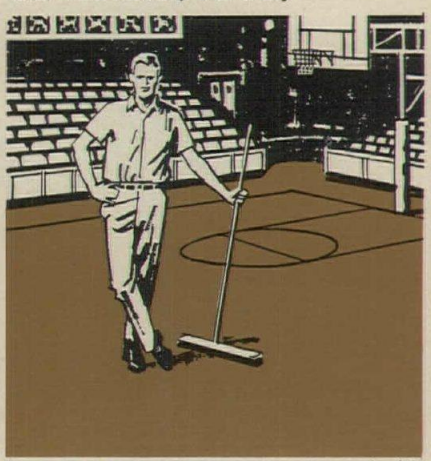
RESILIENT: Provides cushion for falls, protects against shin splints, leg fatigue and body shock. Constant under all conditions.



ALL WEATHER: Surface conditions and resilience remain constant regardless of rain, cold, heat. Non-slip wet or dry.



DURABLE: Withstands extreme wearing conditions; impervious to spikes, cleats, high heels, even heavy machines and vehicles.

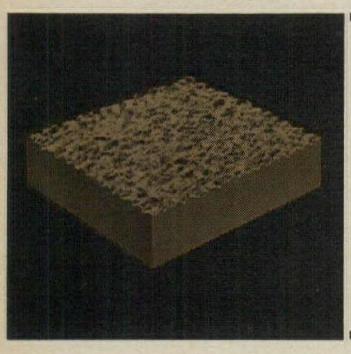


LOW MAINTENANCE: May be cleaned with broom or rinsed with hose. Never needs varnishing. Causes no dust or dirt.

An incredibly durable material. Sound-proof, resilient and non-slip underfoot. Can go indoors or outdoors; resists abrasion, chemicals, soiling and weather extremes; requires minimum maintenance; can be pre-fabricated to almost any dimension or custom-installed on the site. Available in several colors and surface textures. Refer to our catalog in Sweet's Architectural and Industrial file 36c/ME. Or write or call for information.

3M COMPANY

what do you make of it?



Recreation & Athletic Products
Minnesota Mining & Manufacturing Co.
367 Grove St., St. Paul, Minn. Tel.: 612-733-2452

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

AR-4

For more data, circle 153 on inquiry card

ON THE CALENDAR

APRIL

17-21 32nd National Planning Conference of the American Society of Planning Officials—Bellevue-Stratford Hotel, Philadelphia.

17-21 Second North American Conference on campus planning and college building design—University of Illinois, Urbana.

24-29 28th Annual Convention of the National Association of Architectural Metal Manufacturers—Mark Hopkins Hotel, San Francisco.

26-28 27th National Conference on Religious Architecture—Sheraton-Palace Hotel, San Francisco.

30 Sixth Annual Conference of the U.S. Institute for Theatre Technology, Inc.—University of Toronto, Ontario, Canada; through May 2.

MAY

4-6 Tenth Anniversary Convention, Consulting Engineers Council U.S.A.—Civic Center Assembly Hall, Tulsa, Okla.

8-12 66th Annual Meeting, American Society of Landscape Architects—Yosemite National Park, Calif.

8-14 28th World Congress for Housing and Planning, International Federation for Housing and Planning—Tokyo.

10-12 Annual Conference of the American Society for Church Architecture—Conrad Hilton Hotel, Chicago.

12-13 Third Annual National Colloquium on Information Retrieval—University of Pennsylvania, Philadelphia.

15-21 Mid-Pacific Conference on Landscape Architecture and Urban Design—Princess Kaiulani Hotel, Honolulu; tours to other islands.

21-27 Fifth International Congress of the Precast Concrete Industry—Royal Garden Hotel, Kensington, London.

OFFICE NOTES

OFFICES OPENED

Richard R. Bradshaw has opened an Oregon affiliate of his Los Angeles-based firm. **K. R. Srinivasan** is vice president of the firm, **Richard R. Bradshaw Consulting Engineers of Oregon Inc.,** 1320 S.W. 21st Ave., Portland.

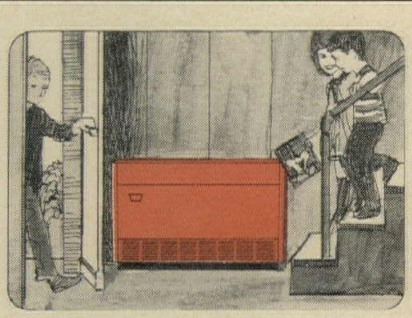
continued on page 328

Look to Chromalox®

for the right answers to electric comfort heating/cooling problems in buildings

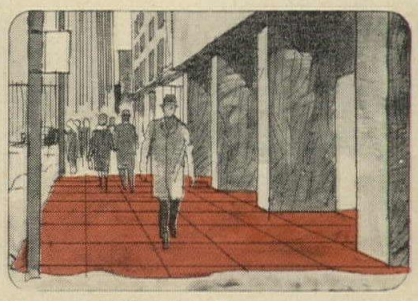
[Office Areas] Chromalox Modulaire year-round Air Conditioners are compact, through-the-wall, self contained units which provide complete comfort conditioning including electric heating, refrigeration cooling, dehumidification, ventilation and air filtering for lounges, classrooms, offices, meeting rooms, churches and similar areas needing air conditioning.

Request Bulletins F03100 and F03102



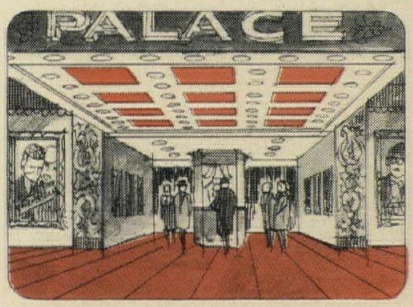
[Entranceways] Chromalox Electric Cabinet Unit Heaters are compact, blower type, high capacity heaters designed primarily for applications in entranceways, corridors, lobbies. They are available in decorator style models for floor, wall and ceiling mounting; free standing, semi-recessed and fully recessed units.

Request Bulletin F22100



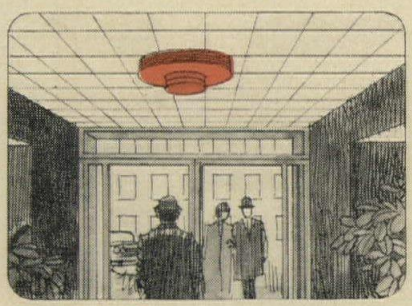
[Snow Melting] Chromalox Electric Heater Mats and MI Heating Cable are embedded in concrete or asphalt sidewalks, driveways, ramps and steps to keep surface areas free of ice and snow. They eliminate manual labor and related costly agents such as salt, cinders and chemicals which often are tracked indoors to stain rugs and floors.

Request Bulletins M60100 and PJ-102



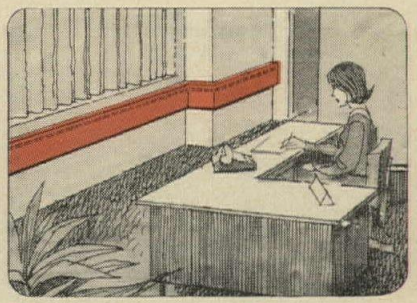
[Marquees] Chromalox Electric Infrared Marquee Heaters provide spot comfort whatever the weather outdoors. They project radiant warmth on people and help keep sidewalks free of ice and snow at building entrances. Easy to install, designed for either recess or surface mounting.

Request Bulletin F70100



[Lobbies] Chromalox Type VUH Ceiling-Mounted Electric Vertical Unit Heaters are installed in entryways and stairwells to form a warm air barrier to cold outdoor air. Optional discharge air diffusers provide a choice of five heat distribution patterns. Larger sizes up to 50 KW are ideal for high bay mounting.

Request Bulletin F15100



[Reception Areas] Chromalox Electric Sill Line and Baseboard Units are available in a wide range of models and heating capacities. Sill lines are usually mounted under windows, baseboards at floor level for continuous wall-to-wall heating in offices, reception areas, corridors and similar applications.

Request Bulletins F31100 and F50100

CHROMALOX
FIRST NAME IN ELECTRIC HEAT ®

CHROMALOX
electric
HEATING / COOLING

CLIP COUPON AND MAIL

EDWIN L. WIEGAND COMPANY
7741 Thomas Boulevard, Pittsburgh, Pa. 15208

Gentlemen: Please send me complete technical and specification information for:

- ☐ Modulaire Air Conditioning (F03100, F03102)
- ☐ Cabinet Unit Heaters (F22100)
- ☐ Sill Line—Baseboard Heaters (F31100, F50100)
- ☐ Snow Melting (M60100, PJ-102)
- ☐ Infrared Heaters (F70100)
- ☐ Unit Heaters (F15100, F14100)

NAME _____ TITLE _____

AFFILIATION _____

ADDRESS _____

CITY, STATE, ZIP CODE _____ PHONE _____

WC-81A

For more data, circle 154 on inquiry card

Want the most from electric heat? Consider Styrofoam.

That's because an installation system using Styrofoam® brand insulation board doesn't make demands on floor space the way other insulations do. The combination of properties offered by Styrofoam makes it unusually effective. So much so that you get more permanent insulation value per square inch, and get a maximum of usable floor space, too.

How else is Styrofoam good for electric heat? Once in, Styrofoam is in for good because it doesn't rot, mold, or deteriorate. It needs no vapor barrier. It's flame retardant. And is lightweight and easy to install.

Where does Styrofoam insulation go? Just about anywhere. Over walls of unit masonry or poured concrete, as form liners for conventional concrete, in foundations and slabs. And it makes an excellent base for gypsum wallboard, wood paneling or plaster.

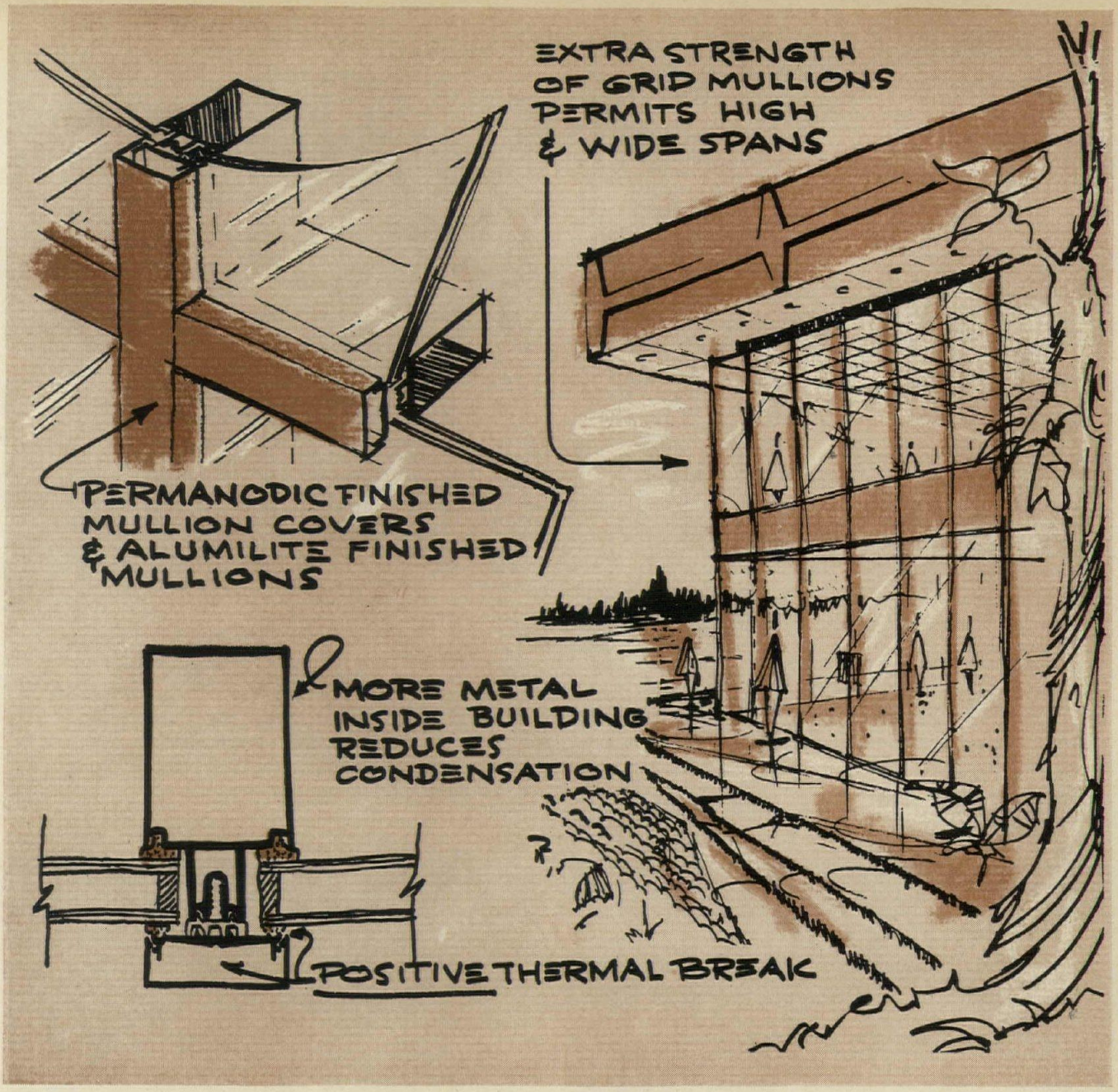
Have we almost made a sale? Then to clinch it, write us or consult Sweet's Architectural File 10a/Do. The Dow Chemical Company, Plastics Sales Department, Midland, Michigan 48640.

Styrofoam is Dow's registered trademark for expanded polystyrene produced by an exclusive manufacturing process. Accept no substitutes... look for this trademark on all Styrofoam brand insulation board.

DOW

(It's the least you can do.)

For more data, circle 155 on inquiry card



the Kawneer 1600 curtain wall system that solves condensation problems!

EXCLUSIVE THERMAL BREAK ELIMINATES METAL-TO-METAL CONTACT BETWEEN OUTSIDE AND INSIDE SURFACES!

■ You'll never hear a complaint about condensation causing damage to wall coverings, drapes, carpets, etc. There is little thermal transfer to cause condensation, discomfort, or high costs for heating or air conditioning. Also, there is more metal inside and less outside which in itself tends to minimize heat flow. ■ The Kawneer 1600 Wall System is ideal for high rise and 1-or-2 story applications with *high and wide spans* because of extra strength in the grid mullions. Available with both plate and insulating glass. ■ *Clean, crisp lines and Permanodic*, too!* Available in non-fading Permanodic hard color finishes. You can add rich color economically by combining Permanodic finished mullion covers with Alumilite finished mullions. ■ For more information, write for File No. WS-65. Address Kawneer Product Information, 1105 N. Front St., Niles, Michigan.

* Trademark of Kawneer Company, Inc.

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Kawneer

Kawneer Company, Inc., a Subsidiary of American Metal Climax, Inc.
Niles, Michigan • Richmond, California • Atlanta, Georgia • Kawneer Company Canada, Ltd., Toronto, Ontario • Kawneer de Mexico, S.A. de C. V., Mexico City, Mexico • Kawneer Company (U. K.) Ltd., London • Kawneer GmbH, Rheydt, Germany • Showa Kawneer, Tokyo, Japan

For more data, circle 156 on inquiry card

ACCENT ANY OPENING WITH SECURITY

SPECIFY . . . WILSON ROLLING GRILLES

This Phoenix installation includes one Diamond Rolling Grille over 50' in width.

Combine Flexibility and Simplicity with Protective Beauty

If you have a problem of openings where protection, light, air and decoration are all necessary, the J. G. Wilson Corporation has the practical solution with Diamond Rolling Grilles and Straight Link Grilles (alternate design).

Decorative and tasteful for the decor of any installation, the grilles are designed for strength and protection against theft and intrusion. The curtain coils on a shaft, enclosing a helical counter-balancing spring and travels in guide channels in which the ends of the curtain are retained. The coil is covered by a metal hood.

WRITE FOR COMPLIMENTARY BROCHURE

The J. G. WILSON Corporation

QUALITY PRODUCTS SINCE 1876

P. O. Box 599, NORFOLK, VA.

SERVING A GROWING AMERICA

Other Products: Standard Rolling Service Doors / Wilson Weather Doors / Underwriters' (Label) Service Doors / Midget Slat Closures / Overhead Doors / Rolling Wood Closures / Tee-M / Special Products

For more data, circle 129 on inquiry card

CENTRIFUGAL UP-BLAST

COOK TYPE R ROOF VENTILATOR

Low, compact. Blows fumes or grease-laden air high above the roof. All aluminum, including the airfoil blower wheel. Belt or direct drive, 7″ to 48″ wheel. Completely weatherproof construction. Insulated motor plate.

See our Catalog $\frac{20c}{Co}$ *in Sweet's, illustrating 24 ventilators, blowers or accessories.*

LOREN COOK COMPANY

640 N. Rocky River Drive

Berea, Ohio 44017

For more data, circle 157 on inquiry card

Color integrity's locked in,

when you specify new DU-LITE*

*DU-LITE is Du Pont's registered trademark for its fluoropolymer enamel.

At Du Pont, we define color integrity precisely: a color change of less than five National Bureau of Standards units through eight years of exposure to the elements.

That's what we lock into new DU-LITE fluoropolymer enamel. DU-LITE is available precoated on steel or aluminum. Ask your mill, coil coater, or building panel manufacturer about availability.

Put your finger on color integrity: Remember DU-LITE when you specify color enamel on prefinished metal exposed to the weather. It's your assurance from Du Pont.

E. I. du Pont de Nemours & Co. (Inc.)
Coil Coating Sales
308 E. Lancaster Ave., Wynnewood, Pennsylvania 19096

Send DU-LITE color samples and specifications.

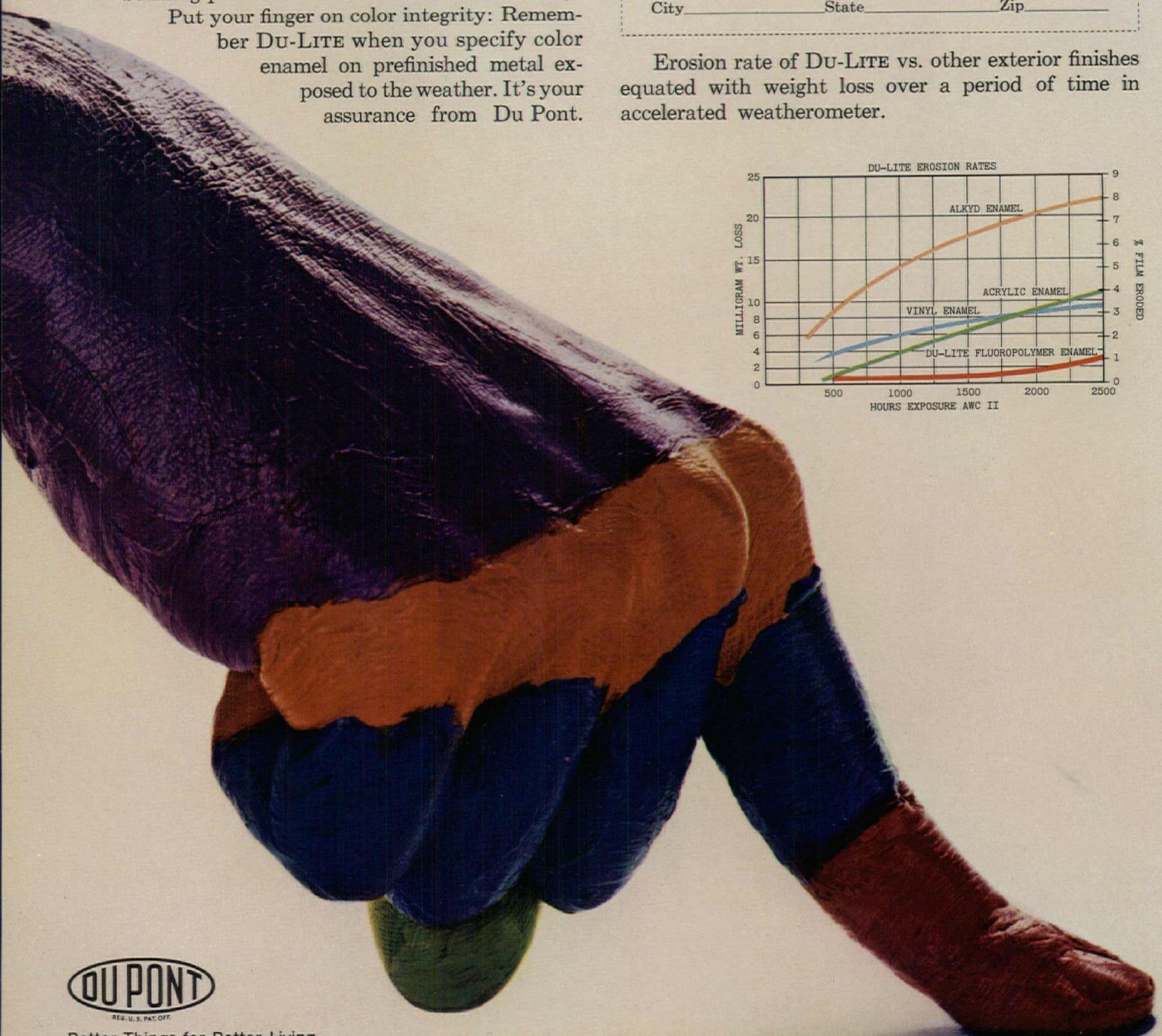
Name_____

Company_____

Address_____

City_____ State_____ Zip_____

Erosion rate of DU-LITE vs. other exterior finishes equated with weight loss over a period of time in accelerated weatherometer.



DU PONT
REG. U.S. PAT. OFF.

Better Things for Better Living
...through Chemistry

No noise, no vibration, no problems... with quiet, shakeless gas absorption air conditioning.

Highly effective gas absorption air conditioning roof mounted units are so quiet and free from annoying vibration that even top floor occupants can live or work in complete comfort.

A quick check of one of these remarkable cooling units will show you the answer. No moving parts to produce noise or vibration. Just a simple, efficient, modern mechanism that does its job silently, smoothly, economically.

Bonus features include economy . . . compact design . . . flexibility of location . . . simple installation and maintenance.

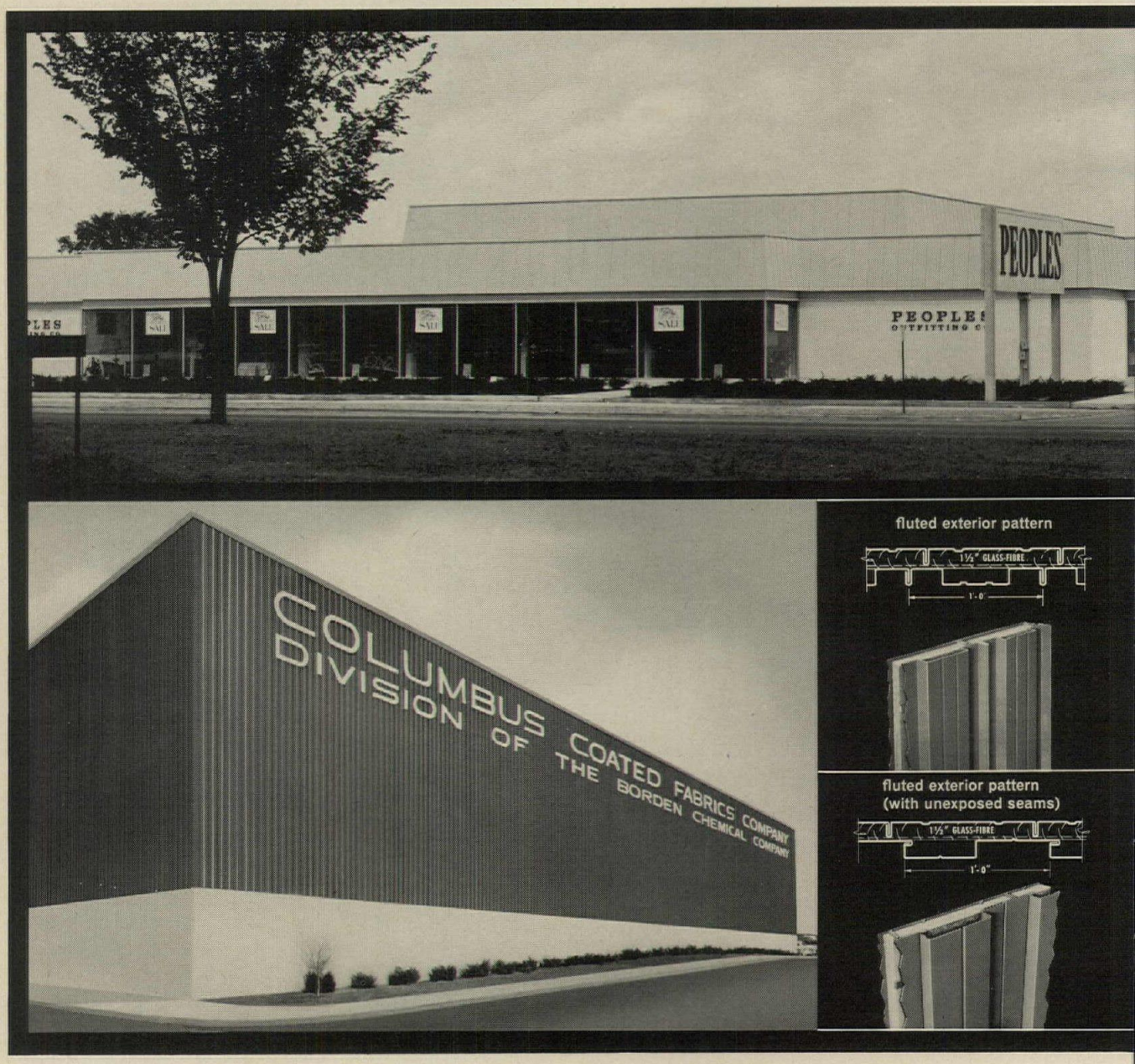
In East Ohioland, your East Ohio Gas Architectural Representative can fill in the details. Let him show you why gas air conditioning should figure in your next plans. No obligation. No cost. Just good sense. Gas makes the big difference . . . costs much less, too.

THE EAST OHIO GAS COMPANY
PART OF THE CONSOLIDATED NATURAL GAS SYSTEM

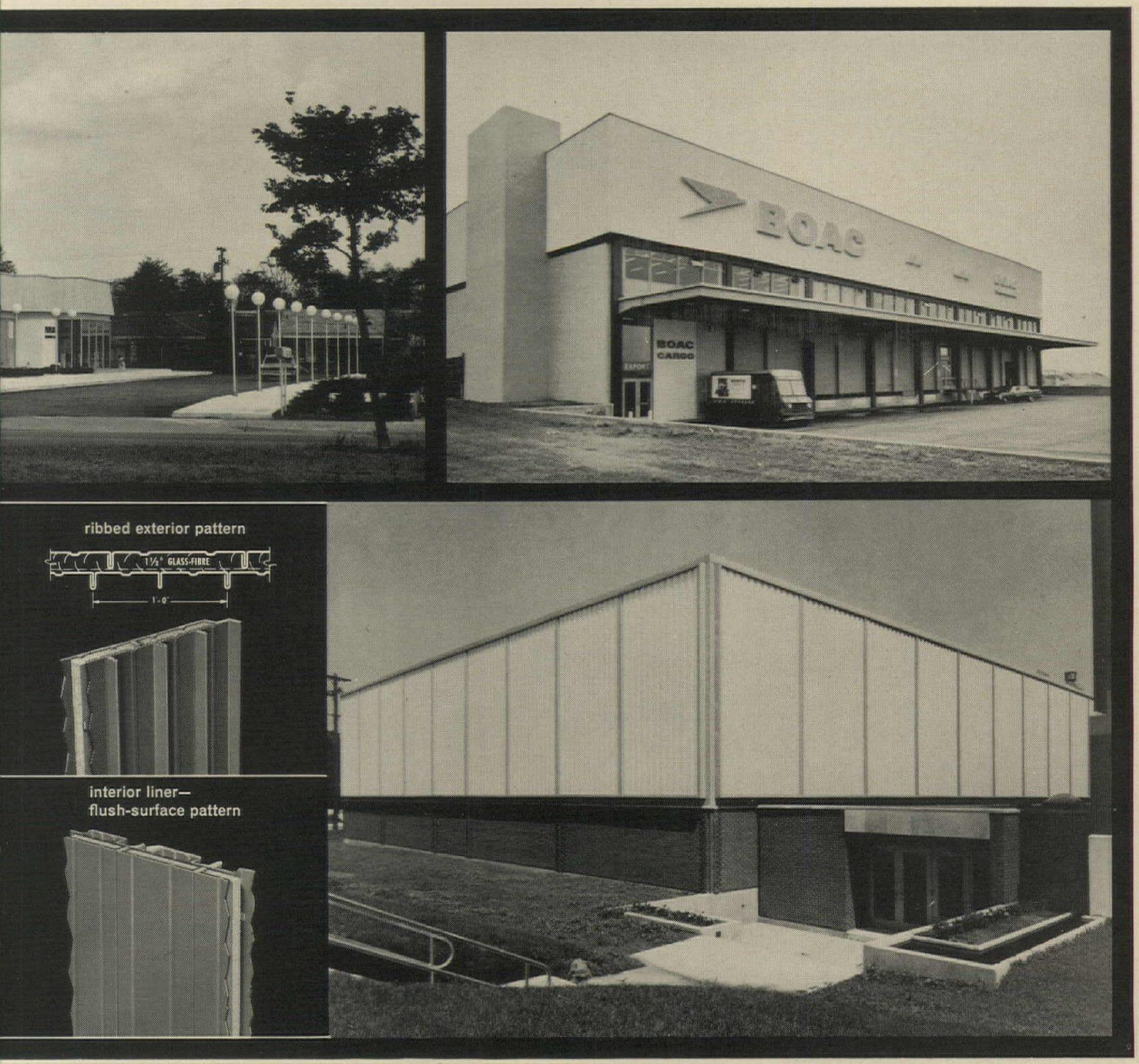
For more data, circle 164 on inquiry card

For more data, circle 165 on inquiry card

MAHON
IS IDEAS
IN BUILDING PRODUCTS



SEE HOW MAHON WEDS BEAUTY AND UTILITY
In "New Look" For Once-Plain Building Walls



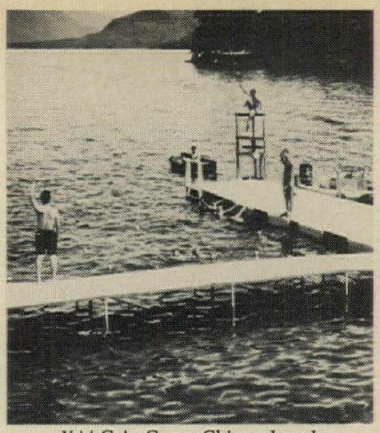
Beauty of design, smart modern colors, full insulation, fast easy erection—these are some of the features engineered into curtain wall by the Building Products Division of the R. C. Mahon Co.

Because of these features, Mahon's Building Products Division is helping change the face of America. Once ugly-duckling factories, industrial and commercial buildings are now blossoming in beauty that's efficient and eye catching, too.

For example, thermal qualities of a Mahon-built curtain wall insulated with 1½"-thick glass-fibre batts are superior to that of a conventional masonry wall with furred lath and plaster. In addition, savings on both materials and labor are substantial as is the saving in construction time.

Mahon is ideas in building products—ideas that can help you do a better job. Cash in on these time and cost saving ideas when you have a building project. Write The R. C. Mahon Co., 6565 East Eight Mile Road, Detroit, Michigan 48234.

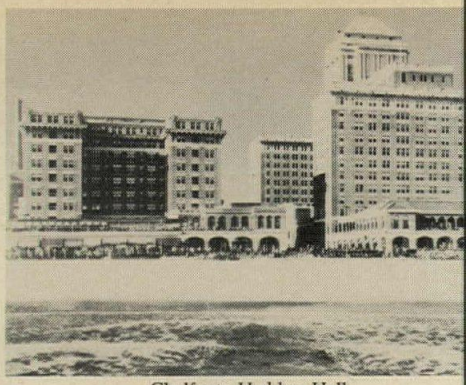
For more data, circle 166 on inquiry card



Y.M.C.A. Camp Chingachgook
Pilot Knob, New York

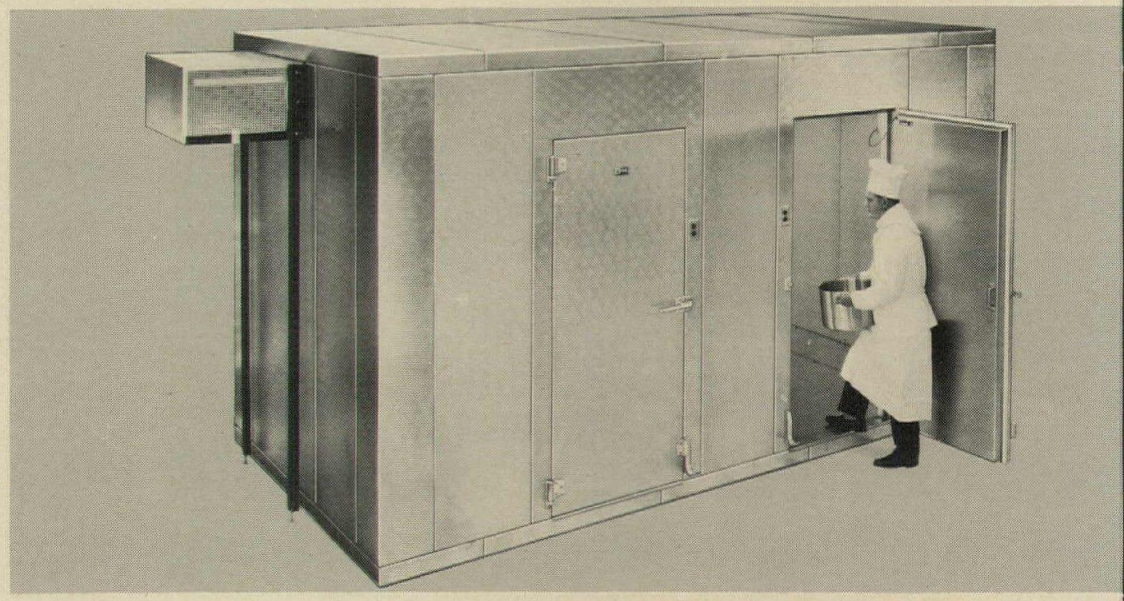
Carmel Valley Golf and Country Club
Carmel, California

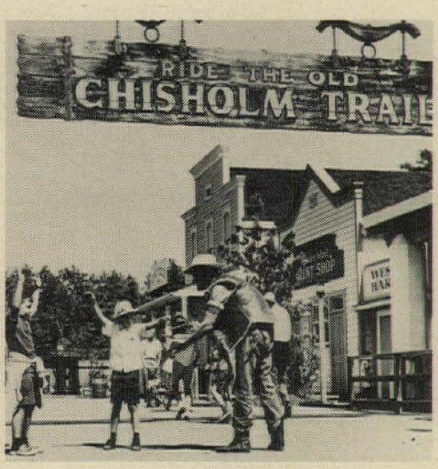
Garden State Park
Camden, New Jersey



Chalfonte-Haddon Hall
Atlantic City, New Jersey

for club, recreation and resort walk-i





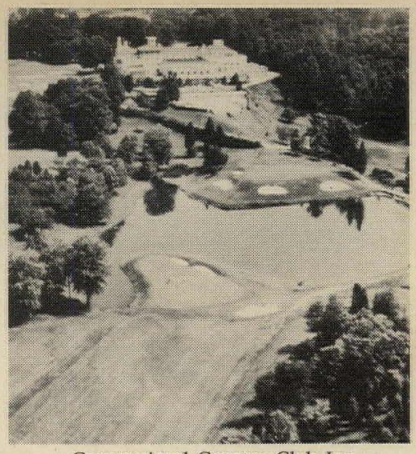
Pleasure Island
Wakefield, Massachusetts

Yankee Stadium
New York, New York

Pine Lakes International Country Clu
Myrtle Beach, South Carolina

Saratoga Race Track
Saratoga Springs, New York

Memorial Stadium
Baltimore, Maryland



Congressional Country Club, Inc.
Washington, D.C.

Girl Scouts of Rochester and Genesee Valley, Inc.
Rochester, New York

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ese clubs, resorts and recreation centers, like many other institutions and places business, are benefiting from Bally Walk-In coolers and freezers with revolution- construction techniques and design features. Bally has set a new high in re- geration efficiency.

hen you specify Bally you can be sure that your clients will get many advan- ges not found in conventional prefab Walk-Ins... never available in on-the-site uilt-ins"... and at far lower cubic foot cost than "reach-ins". There is never a ed to accept an "or equal" or a substitute. Bally Walk-Ins are available to all alers everywhere at uniform published ces. *Write for Fact File with new brochure, cification guide and sample of urethane wall.*

See Sweet's File 25a/Ba

Bally Case and Cooler, Inc., Bally, Pennsylvania

Bally

Address all correspondence to Dept. AR-4

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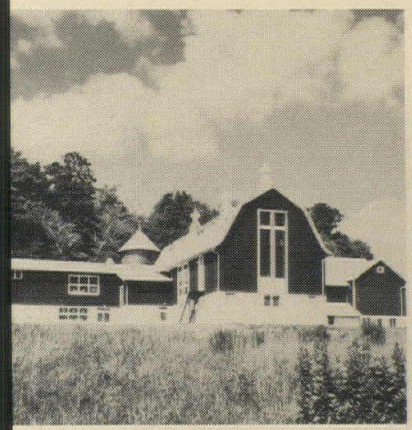
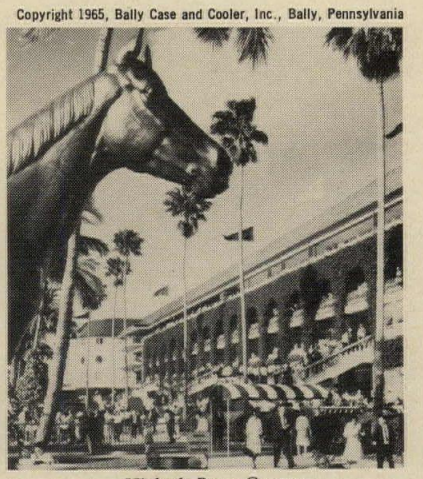


Elko Lake Camps
Parksville, New York

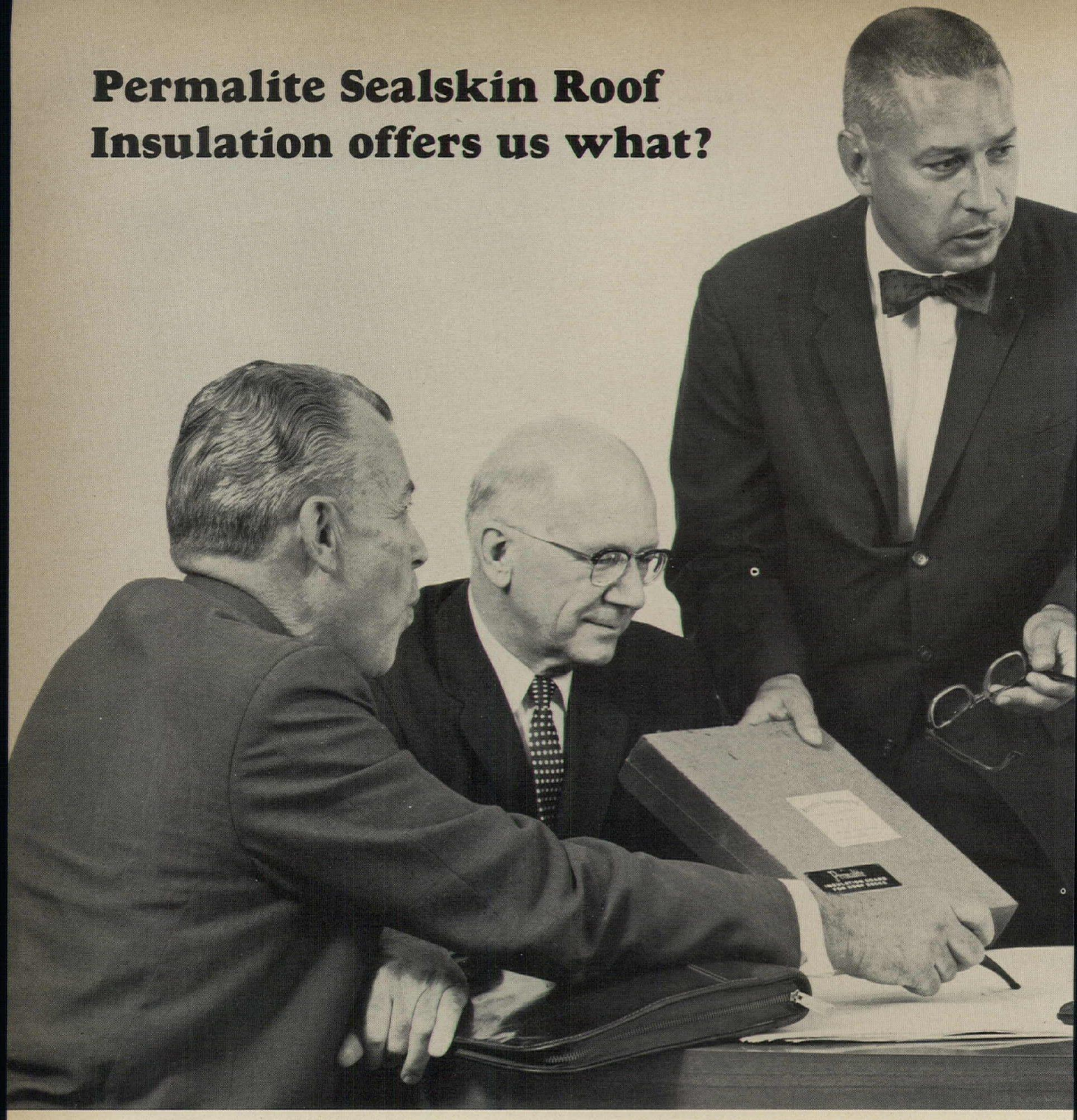
The Country Club of Florida
Delray Beach, Florida



Hialeah Race Course
Hialeah, Florida

For more data, circle 167 on inquiry card

Permalite Sealskin Roof Insulation offers us what?



The Permapak System:

Measurable savings are available in insurance, heating-cooling, and maintenance costs when the Permapak system is employed in Class 1 metal roof deck construction. Three Permalite elements are involved, all carrying U.L. and F.M. label identification, and offering single-source responsibility for delivery and performance.

1. PERMALITE SEALSKIN mineral roof insulation, with a new self-surface that prevents bitumen soak-up, and insures a uniform, skin-tight bond of board to roof membrane.
2. PERMALITE high-strength aluminum PVC vapor barrier.
3. PERMALITE cold adhesive.

Write for samples and literature.

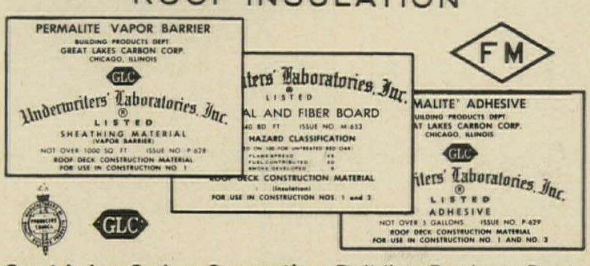
Request "THE GLC STORY," a brochure covering the many products, services and facilities of Great Lakes Carbon Corporation.

A preferred insurance position. It carries both U.L. and F.M. listings for Class 1 metal deck construction.

PHYSICAL DATA:
Permalite Rigid Insulation Board

C (Conductance Value) 1″ Nominal Thickness	0.36
Water Absorption (% by Volume)	1.5 @ 2 Hrs. Total Immersion (No Capillarity)
Vapor Permeability	25 Perms @ 73° F. and 51% Relative Humidity
Concentration Load Indentation	1/16″ @ 77 lbs.
Compression Resistance	185 PSI (50% Consolidation)
Fungus Resistance	Complete
Flame Spread	25 (Non-combustible)
Smoke Developed	5
Wt./Sq. Ft./1″ Thick	0.8 lbs. Approx.

RIGID
Permalite®
ROOF INSULATION



Great Lakes Carbon Corporation, Building Products Dept.
333 N. Michigan Avenue, Chicago, Illinois 60601

For more data, circle 168 on inquiry card

continued from page 304

The Detroit firm of **Eberle M. Smith Associates, Inc., Architects and Engineers** has established a subsidiary in Canada to be known as **Eberle M. Smith Associates Limited—Consultants,** Equity Chambers Building, 52 Chatham West, Windsor, Ontario.

NEW FIRMS, FIRM CHANGES

Marcel Beaudin, A.I.A., Walter Moulton, A.I.A., Architects is a new firm in Burlington, Vt.

Bovay Engineers, Inc. of Houston, Spokane and Baton Rouge have named **Stephen A. Bryan, Donald G. Donegan** and **William J. Sanders** associates.

George Kurosaka, Jr., P.E. has become a partner of **John K. Bright, Consulting Engineers,** Glen Falls, New York.

John E. Brown and **Harold C. Smith** have formed **Brown & Smith Structural Engineers,** 1006 Mendocino Ave., Santa Rosa, Calif.

The Los Angeles firm of **Carmichael-Kemp, A.I.A.** has appointed **Aiden F. Sheehan, A.I.A.** an associate.

Caudill Rowlett Scott, architects of Houston and New York have announced as associate partners **James M. Hughes, William F. Perry, Philip C. Williams,** and **Donald B. Wines.**

Channing Associates, architects and engineers of Miami, have promoted **Joel B. Channing,** architect, to partner in charge of architectural design.

New associates in the Portland, Ore. firm of **Cooper & Rosé & Associates, Consulting Structural Engineers** are **Samuel M. Holmes, Delmar L. McConnell, Richard B. Cason,** and **Robert F. Scherzinger.**

Cox-Liske-Associates, architects and engineers of Sacramento, Calif., have appointed **George Lionakis,** architect, and **Klyne G. Beaumont,** structural engineer, partners.

John P. Nix, structural consultant and engineer of Clayton, Mo., and his engineering staff have joined the St. Louis office of **The Engineers Collaborative.** Mr. Nix is a participating associate.

The New York City architectural firm of **Ulrich Franzen and Associates** has named **Robert L. Thorson** a senior associate and **Allan S. Anderson, Samuel E. Nylen** and **Edward A. Rosen** associates.

Richard N. McMullin, A.I.A. and **Alfred H. Miller, A.I.A.** have formed **Architects McMullin & Miller,** 3317 Ingersoll Ave., Des Moines, Iowa.

Donald M. Trotter has become an associate in the firm to be known as **Lawrence E. Matson & Assoc., A.I.A. Architects & Engineers.**

Adrian R. Noordhoek, A.I.A. and **Charles W. Scurlock, A.I.A.** announce **Noordhoek & Scurlock, A.I.A. Architects,** 1703 Portage St., Kalamazoo, Mich.

Osborn Engineering Company, Cleveland, has elected **Homer T. Borton** chairman of the board and has named Ralph E. Scott, president.

Elies Elvove has joined **Parsons, Brinckerhoff, Quade & Douglas,** engineers of New York City.

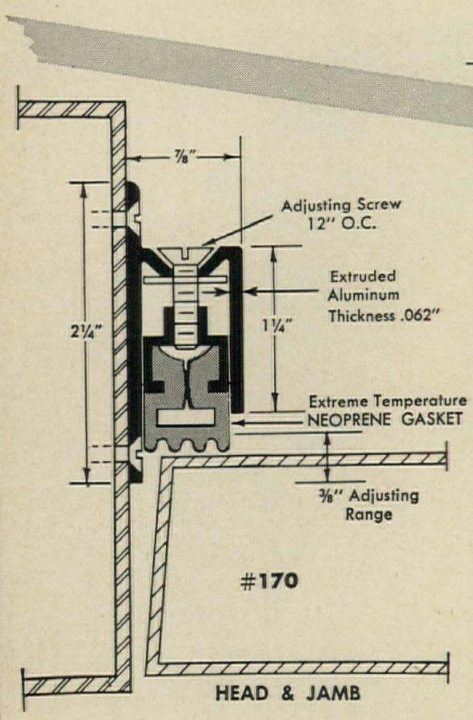
John E. Silver, P. E. and **Milton Meckler, P. E.** have formed **Silver, Meckler and Associates,** offering mechanical, electrical and chemical engineering services. Suite 506, 8201 Beverly Blvd., Los Angeles 90048.

The Spokane and Seattle architectural firm of **Walker & McGough** has made **Walter W. Foltz** and **Robert J. Nixon** partners and **Edward M. Musgrove** a senior associate.

NEW ADDRESSES

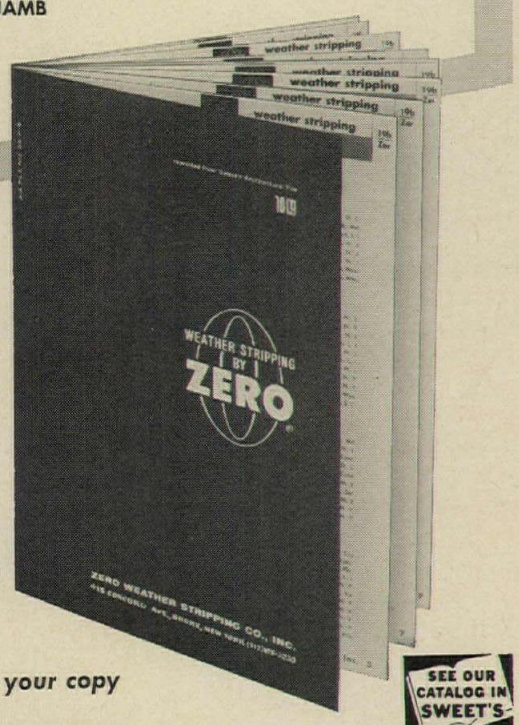
Evans and Delehanty, architects, 5 Madison Ave., New York City.

— our 42nd year



adjustable doorstop

- sound-proof
- light-proof
- weather-proof



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GOODYEAR CHEMICALS

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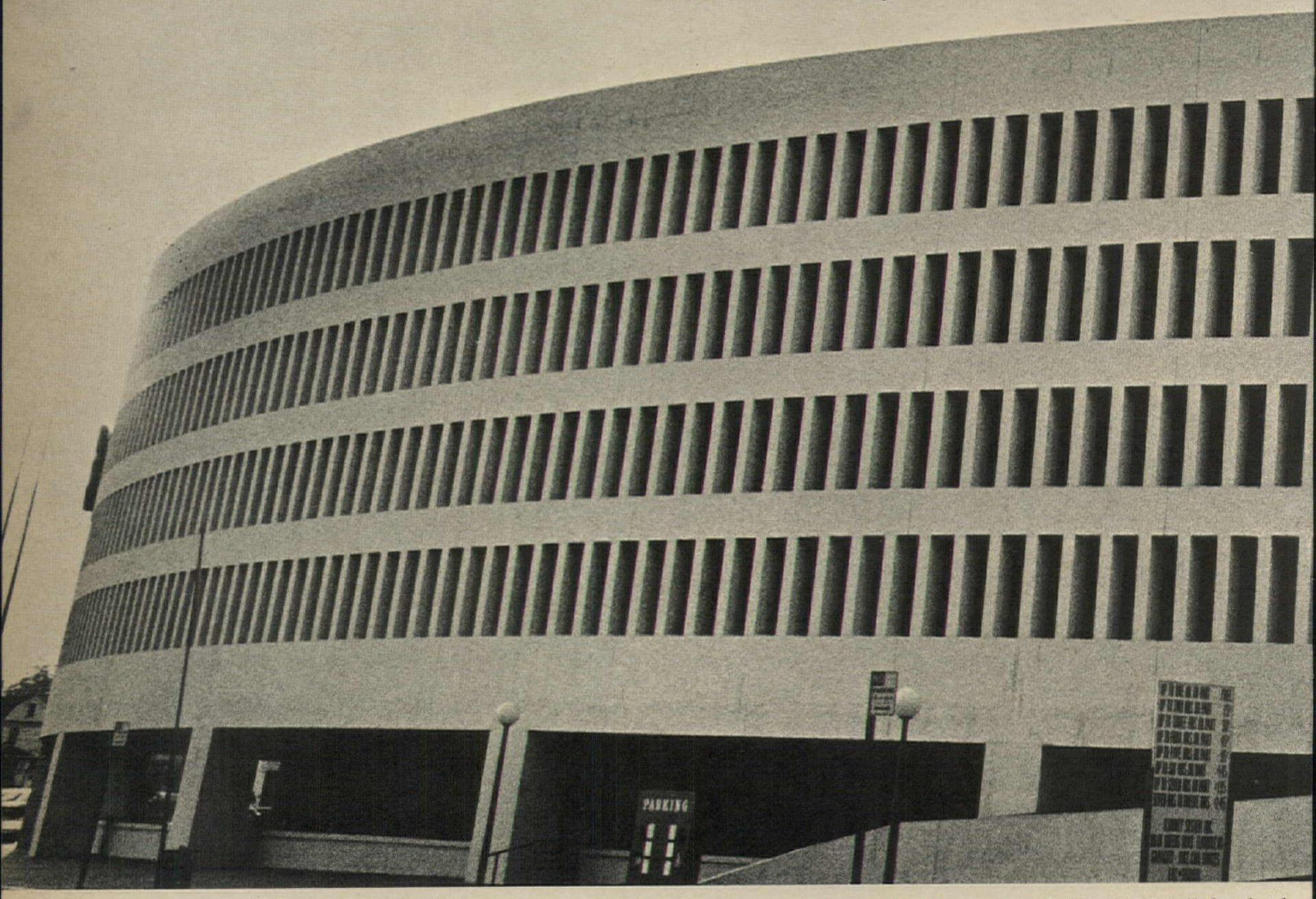
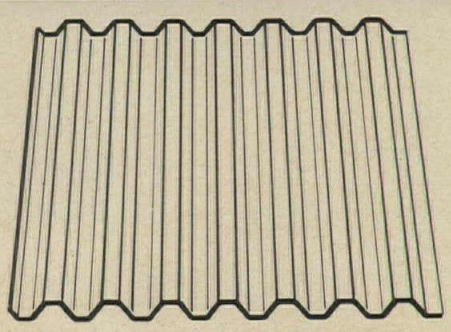
For more data, circle 176 on inquiry card

Wheeling sold Macy's 335,000 sq. ft. c for its spectacular new store in Queens

(We wish they'd tell Gimbels.)





We'd like everyone to know about Tensilform.®

Tensilform. Our permanent steel base for concrete floors and roofs that's being used in so many contemporary buildings.

Why are so many people using it? Because it helps them hustle.

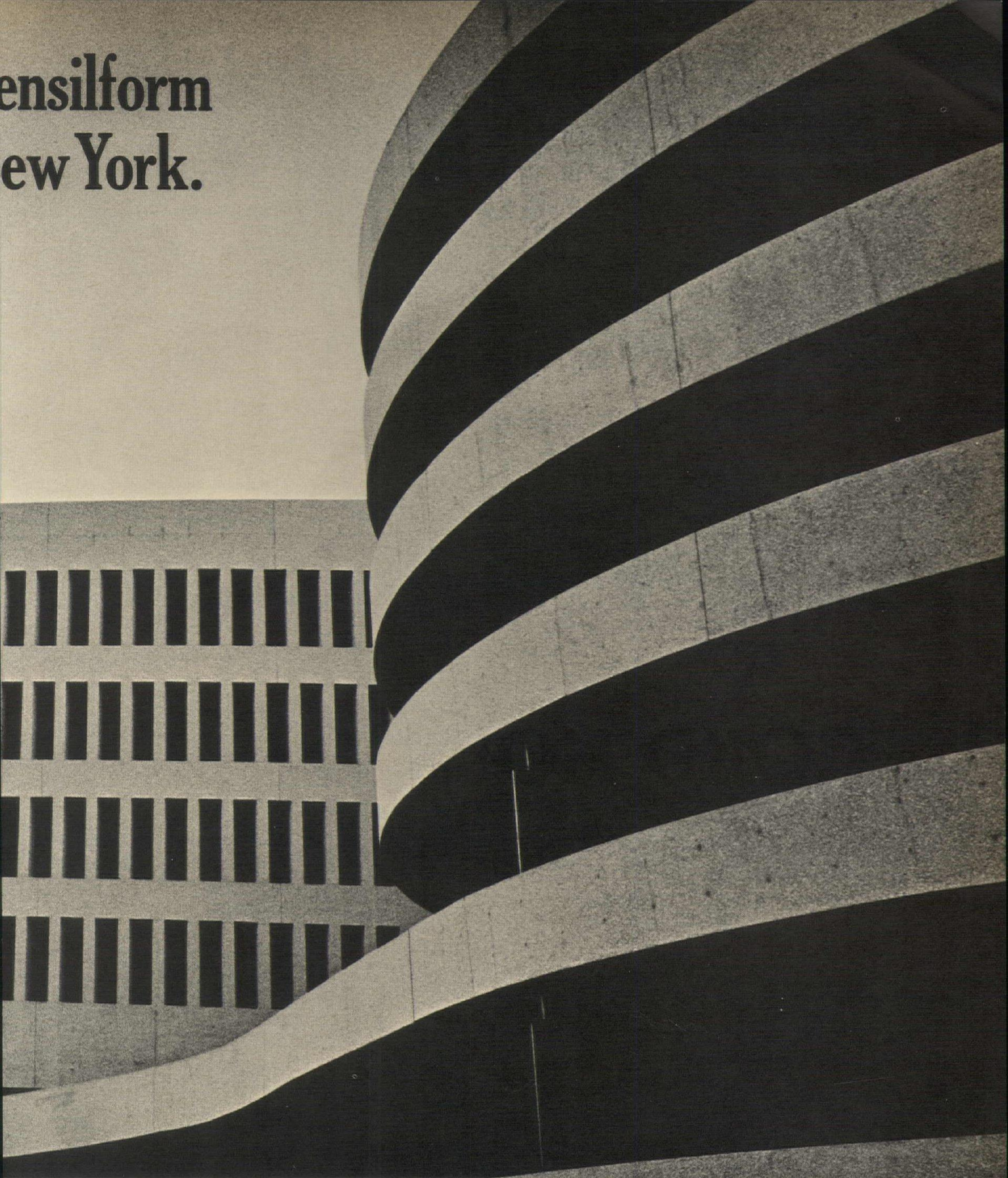
You see, unlike wood it doesn't have to be removed. And it's easier and quicker to install for both c ventional and lightweight aggreg concrete.

Other quick facts? Tensilform p vides an immediate work surface d ing installation. You walk on it wh you build with it.

And its neat fit reduces weld time and speeds construction.

Like Macy's, Wheeling has so

ensilform
ew York.



art comparative shopping guides
ich help us sell.
For example: Uncoated or galva-
zed, Tensilform is made from
heeling's own cold-rolled steel.
s quality-controlled from ingot to
tallation.
Compared to many other forms it
ves up to 20% concrete.
In its galvanized form it serves as a ceiling and its greater strength allows for lighter structural supports. Also it gives lateral stability to structural members.

On top of everything else, Wheeling will detail blueprints so Tensilform arrives on the site pre-engineered and ready to install.

And it arrives on time. (That's what all of Wheeling's hustle talk is really about.)

So come on, Macy's. We'd sure appreciate it if you'd tell Gimbels about Tensilform and where to buy it.

From Wheeling.

The steel store.

Have you looked at Wheeling lately?

Wheeling

Wheeling Corrugating Company/Wheeling Steel Corporation,
Wheeling, West Virginia

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ateljé sundahl photos

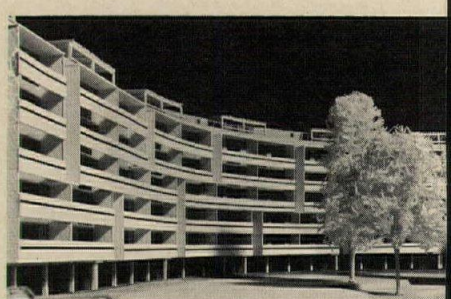
1200-unit Swedish apartment—"the worm with lumbago"

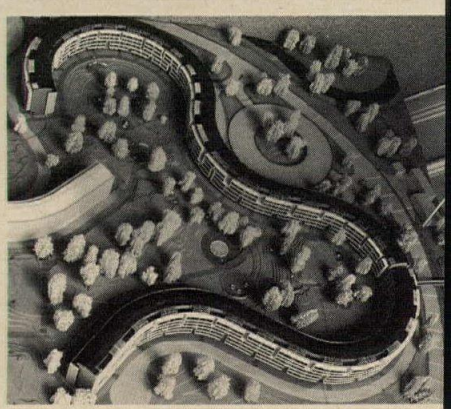
A 1,200-unit apartment, the first phase of which is now being built in Karlskrona, Sweden, snakes about its site for two reasons: to take best advantage of the terrain; and to provide an area, enclosed by the arms of the houses, which is free of traffic and cars. Parking will be provided in circular structures on the periphery of the complex. These garages will have two levels—one below ground and one on the surface. The apartments are being built for HSB, a cooperative apartment society. Architects are Curt Strehlenert and Sven Bofelt of the HSB office in Stockholm.

Now under construction is the serpentine house at the east of the site, at the right in large photograph above. Natives call the structure "the worm with lumbago." The other two apartment structures are under design.

The east building is 1,810 feet long and 41 feet wide. It has a ground floor, five stories, and a penthouse level. Each apartment has a 172-square-foot balcony facing south. The structure contains 374 units. A two-bedroom, kitchen, bath, living room apartment of about 850 square feet rents for $90 a month, while a three-bedroom apartment rents for $100.

On the ground floor of the structure are laundry rooms and a special hobby area in which residents can rent space for use as their hobby workshops. Also on the ground floor: equipment for central vacuum cleaning for halls and corridors.



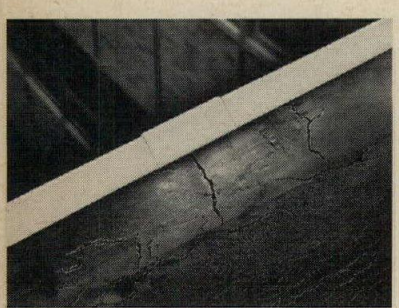


This cross section of the expansion joint shows how water leakage into the joint itself is prevented. A vinyl strip at the bottom, from one roof section to the other, moves with the roof to form a positive, continuous seal. The extruded aluminum sides and related components, being free-floating, are independent of thermal reaction between water dam and felts; this construction likewise insures that electrolytic action is negligible. Transitions at the eaves and junctions are factory fabricated to insure accurate matching of the adjacent components of the fascia and expansion joint systems.

TO STOP ROOF LEAKS

AT EAVES AND EXPANSION JOINTS

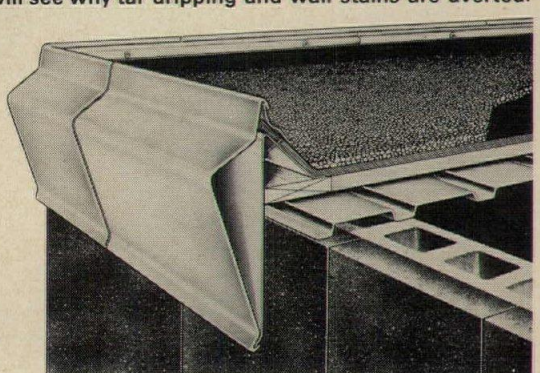
see SWEET'S 8G-Hi



This is a photo of a probable calamity for some client. It could have been prevented . . . The Hickman safeguard System stops felts from cracking because of thermal reaction, thus giving positive control of roof water at eaves (and expansion joints, if any). Please remember too, you have a selection of extruded aluminum fascia profiles in Kalcolors. Porcelain and Baked enamel (all with concealed cover plates). It is easy to combine utility and beauty.

Write for expansion joint details and additional Sweet's Pages.

ROOF LEAKS! They happen most at the eaves and expansion joints. They mean trouble for your owners —time consuming annoyances for you. To prevent roof leaks at these points, refer to the 8 pages of Hickman in Sweet's and you will understand how thermal cycling between the roofing felts and the metal water dams, the main cause of these leaks, is neutralized and cracked felts avoided; also you will see why tar dripping and wall stains are averted.



H 10 Fascia Contour

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For more data, circle 179 on inquiry ca

Hurricane wind proves

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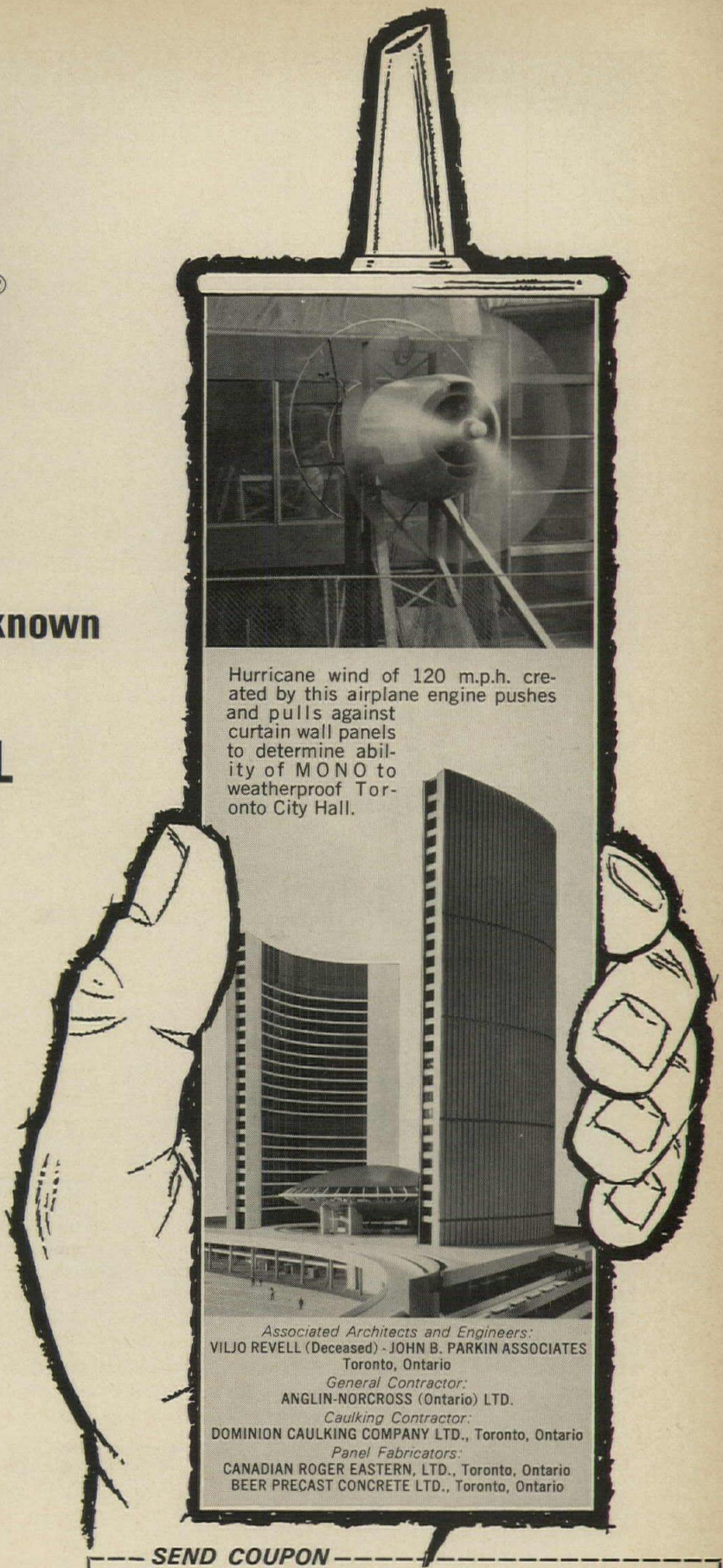
TORONTO CITY HALL



Hurricane wind of 120 m.p.h. created by this airplane engine pushes and pulls against curtain wall panels to determine ability of MONO to weatherproof Toronto City Hall.

Associated Architects and Engineers:
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"92% of sealant failures result from loss of adhesion"

TMC SURVEY

To prevent sealant failure, Mono was subjected to a torture test. Sealed curtain wall panels faced hurricane winds created by a 2000 h.p. airplane engine. Result of this "rugged shakedown": MONO was selected to seal construction joints in the precast panels, stainless steel curtain-wall head and sill joints, also all exterior joints in the metal and concrete towers. Here's why:

- *Security of performance; 20 year minimum life expectancy.*
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- *Meets government specifications: Canadian 19-GP-5; U. S. TT-S-00230.*

On your next structure, don't take chances with a sealant that lacks inherent adhesion. Specify or apply MONO for **optimum security at minimum cost.**

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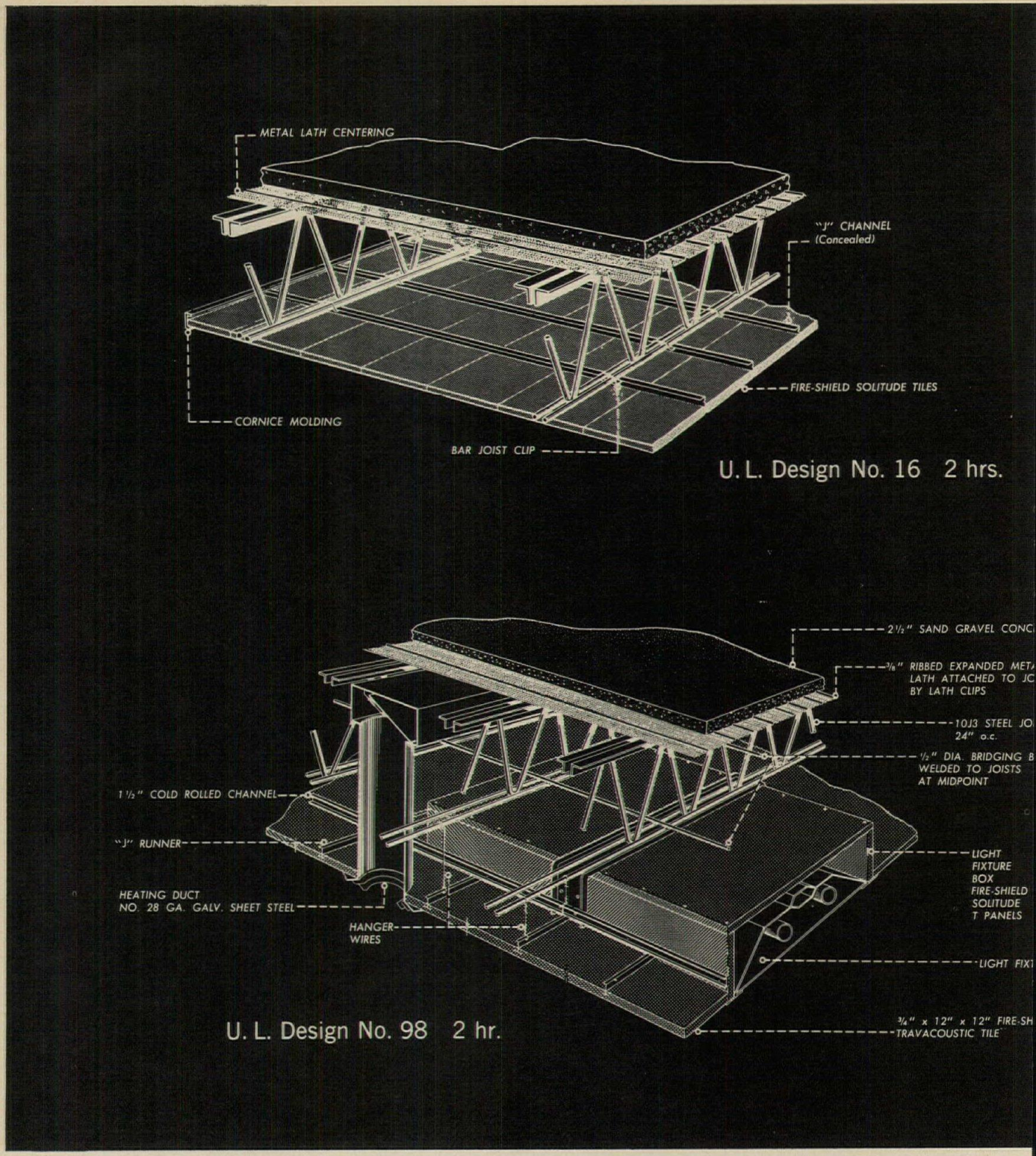
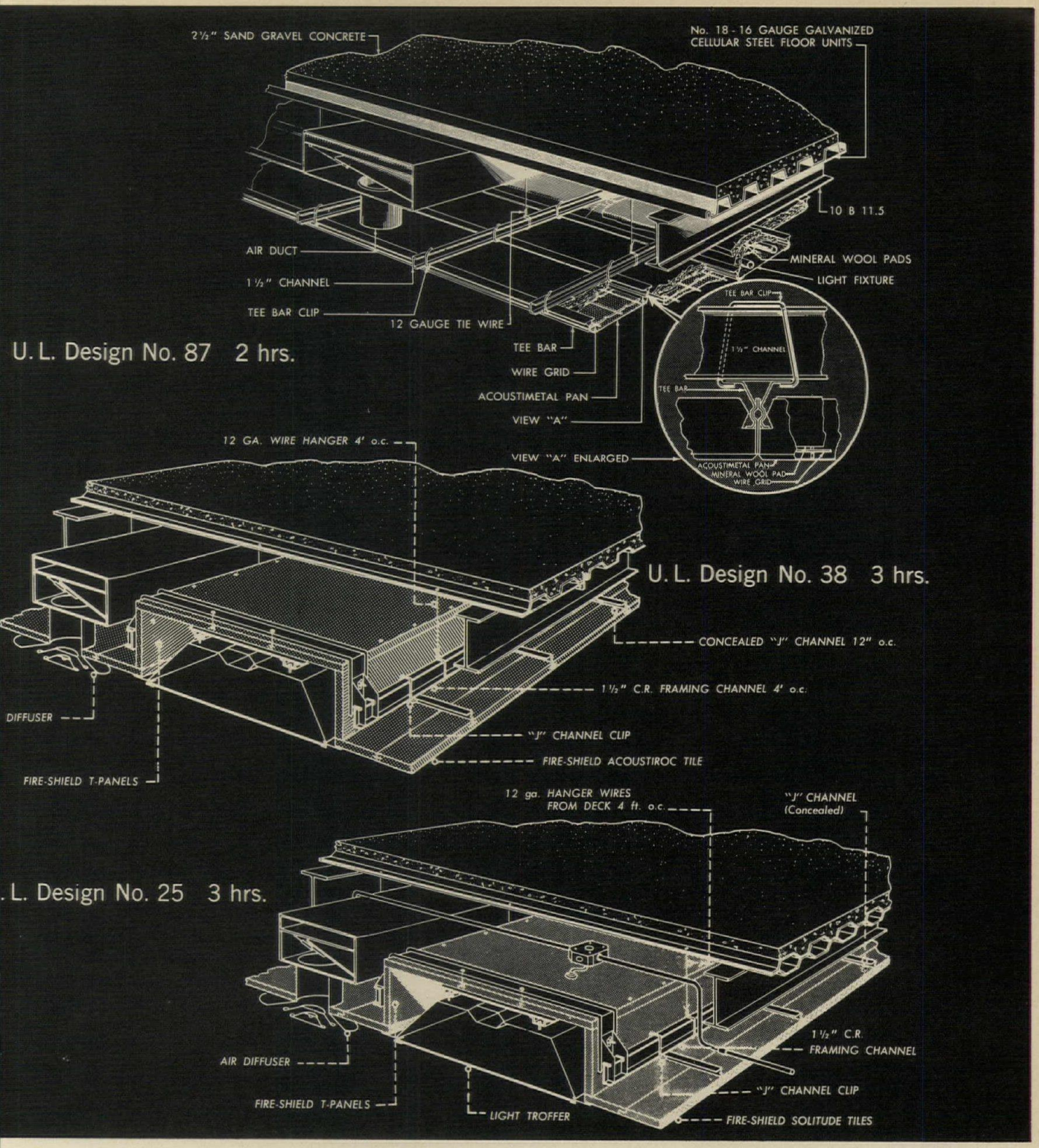


How many ways are there to build a safe



ound-conditioned environment?

ere are 27 published Gold Bond ways; 27 systems for erecting quiet, 1, 2 or 3-hour e-Rated floor or roof and ceiling constructions. Here are five examples. Gold Bond stems provide a complete selection of acoustical tiles and panels in a broad range patterns and finishes, sizes and edge details. When you are specifying Fire-Rated stems call your Gold Bond® Representative. He can save you time and money. write National Gypsum Company, Department AR-460, Buffalo, N. Y. 14225.

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ACOUSTICAL PRODUCTS

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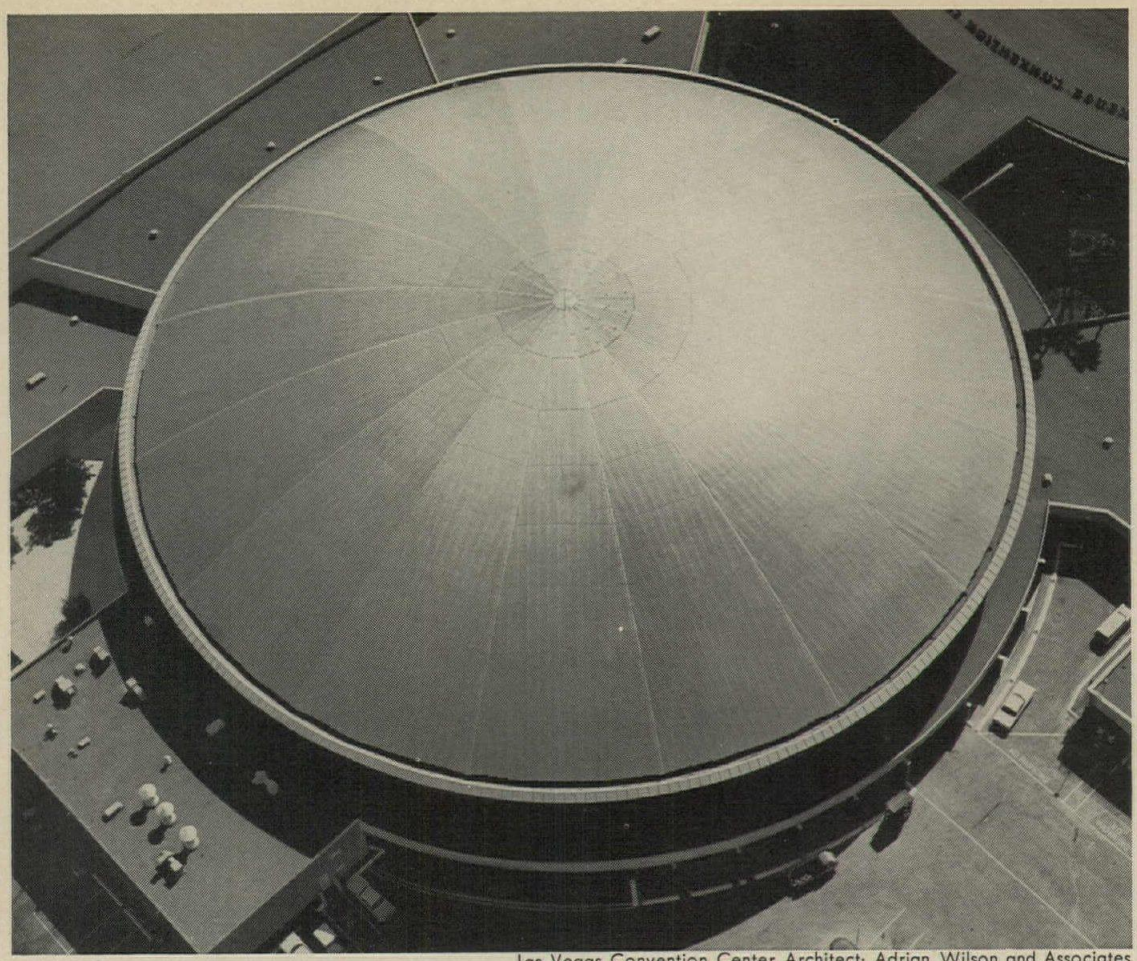

*4-Inch Rib was specified for the Las Vegas Convention Center.

Las Vegas Convention Center Architect: Adrian Wilson and Associates

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or do functional, hard-working designs. Both look better longer with highly corrosion resistant Reynolds Aluminum Roofing and Siding

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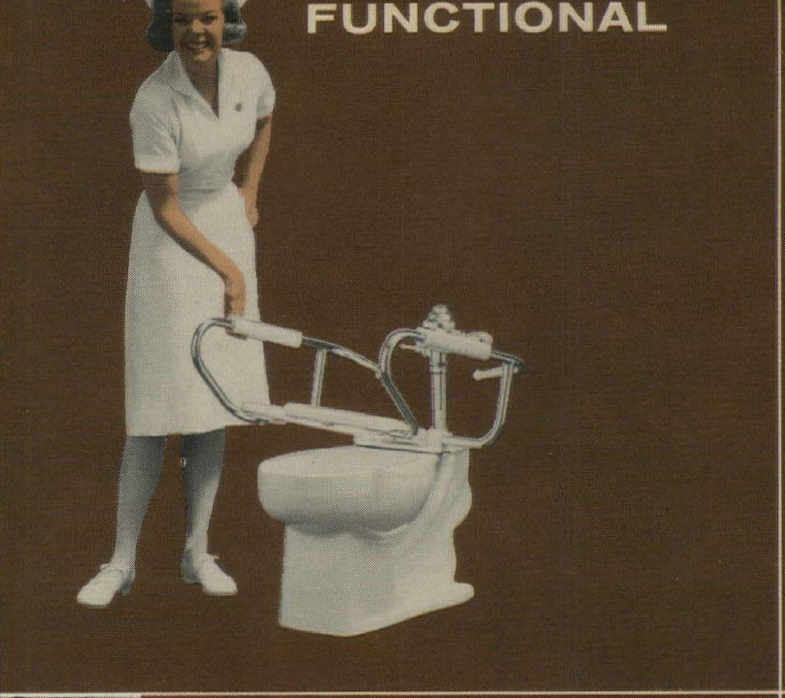

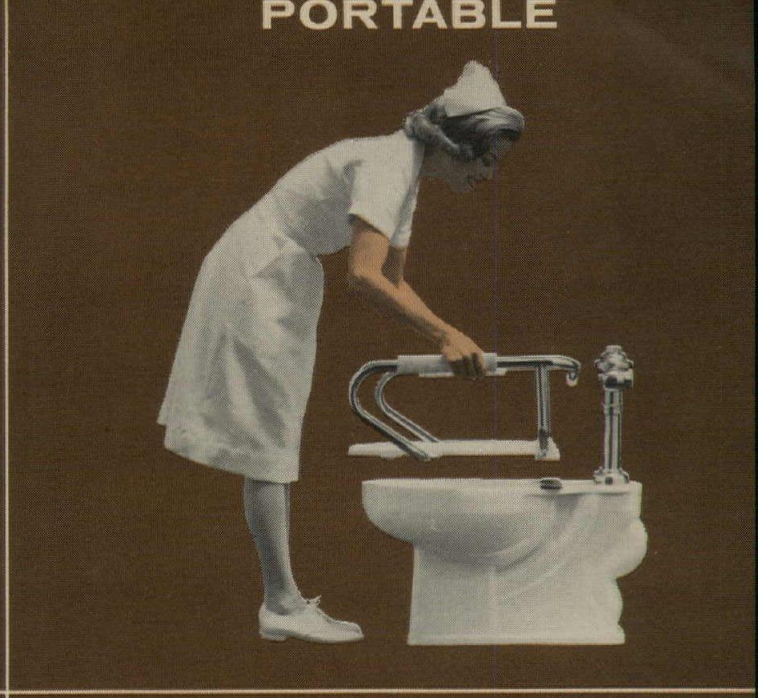

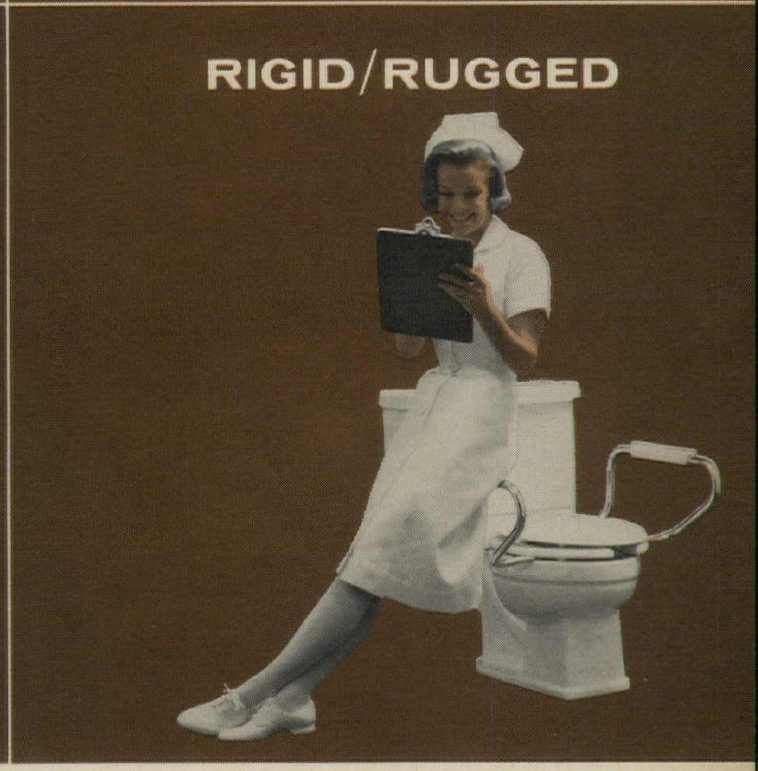

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New engineering accomplishment is the answer to self-help and safety in the bathroom for elderly, infirm, obese, post-operative or other physically handicapped persons. *Sheltering Arms* is a modern, hygienic aid that provides a firm grip for standing, sitting or rising—swings up and out of way for urinal position—becomes a handy, safe dressing stool with seat and cover down. *Sheltering Arms* installs in minutes like any toilet seat on any manufacturer's closet, can be carried easily from one bathroom to another.

Sheltering Arms needs no special wall or floor supports, eliminates the expense of special construction and maintenance, provides maximum sanitation. Extra heavy chromium-plated supporting arms and solid plastic pistol grips are rugged and rigid, factory tested to withstand extreme pressures and weight. Comes completely assembled to a hi-impact solid plastic seat (open or closed front). Models available to fit wall hung or pedestal types—either flush valve or tank.

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A four-pipe system isn't always the answer.

Why waste a penthouse view on a cooling tower?

There's a rent-paying tenant atop this new office building—because it's heated and cooled with G-E Zoneline.

At first, the F&A Development Corporation was considering a four-pipe system for the new People's Savings Bank office building in Bridgeport, Conn. "But as plans evolved," says Bennett Delle Bovi, project engineer of F&A, "it became obvious that General Electric Zoneline would do everything a four-pipe system would do—and free an extra 5% to 10% in usable, rentable floor space."

Here are some other benefits F&A found in G-E Zoneline:

NO PIPES, ductwork, valves, compressors, storage tank or boiler with G-E Zoneline. But enough added space on the roof for penthouse offices that give a net return of $15,000 a year. Overall, a gain of 5% to 10% in usable, rentable floor space.

40% SAVINGS on first cost, compared with the estimates for a four-pipe system.

CHOICE OF STYLE in exterior grillwork. A special grille was designed for the Peoples's Savings Bank to complement the building's architectural styling.

INTERIOR FLEXIBILITY was a consideration, too. Zoneline units will fit over doors (Marina Towers, Chicago) or under window seats (Century House, Lincoln, Neb.).

ROOM-BY-ROOM CONTROLS provide individual, year-round comfort. A tenant who is chilly can turn up his heat at the same time another is running his air conditioning.

For motels, dormitories, garden apartments, nursing homes and medical centers—and high-rise construction like the People's Savings Bank office building, G-E Zoneline heating/cooling systems can almost always make dramatic savings in space and first cost. Call your General Electric Zoneline Air Conditioning Sales Representative for the facts.

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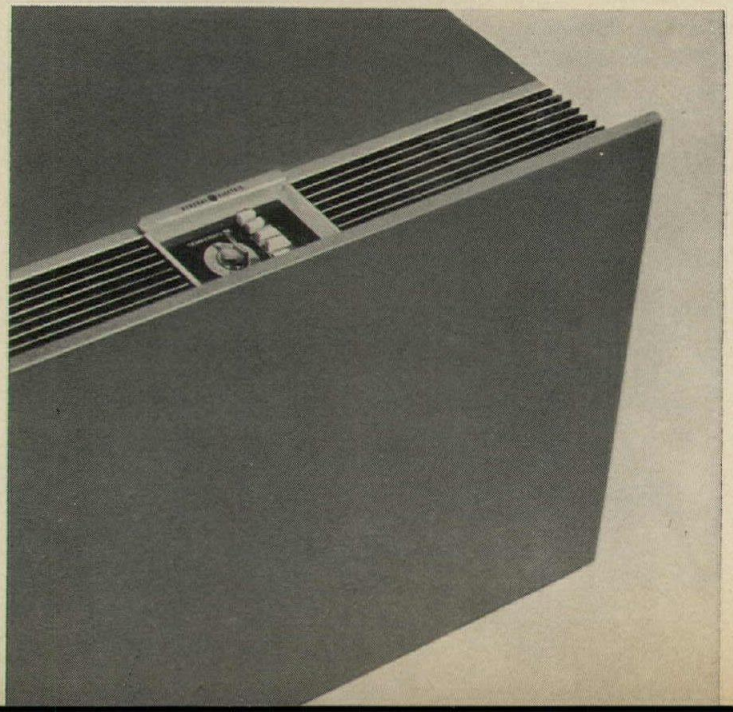
Air Conditioning Department, Appliance Park, Louisville, Kentucky



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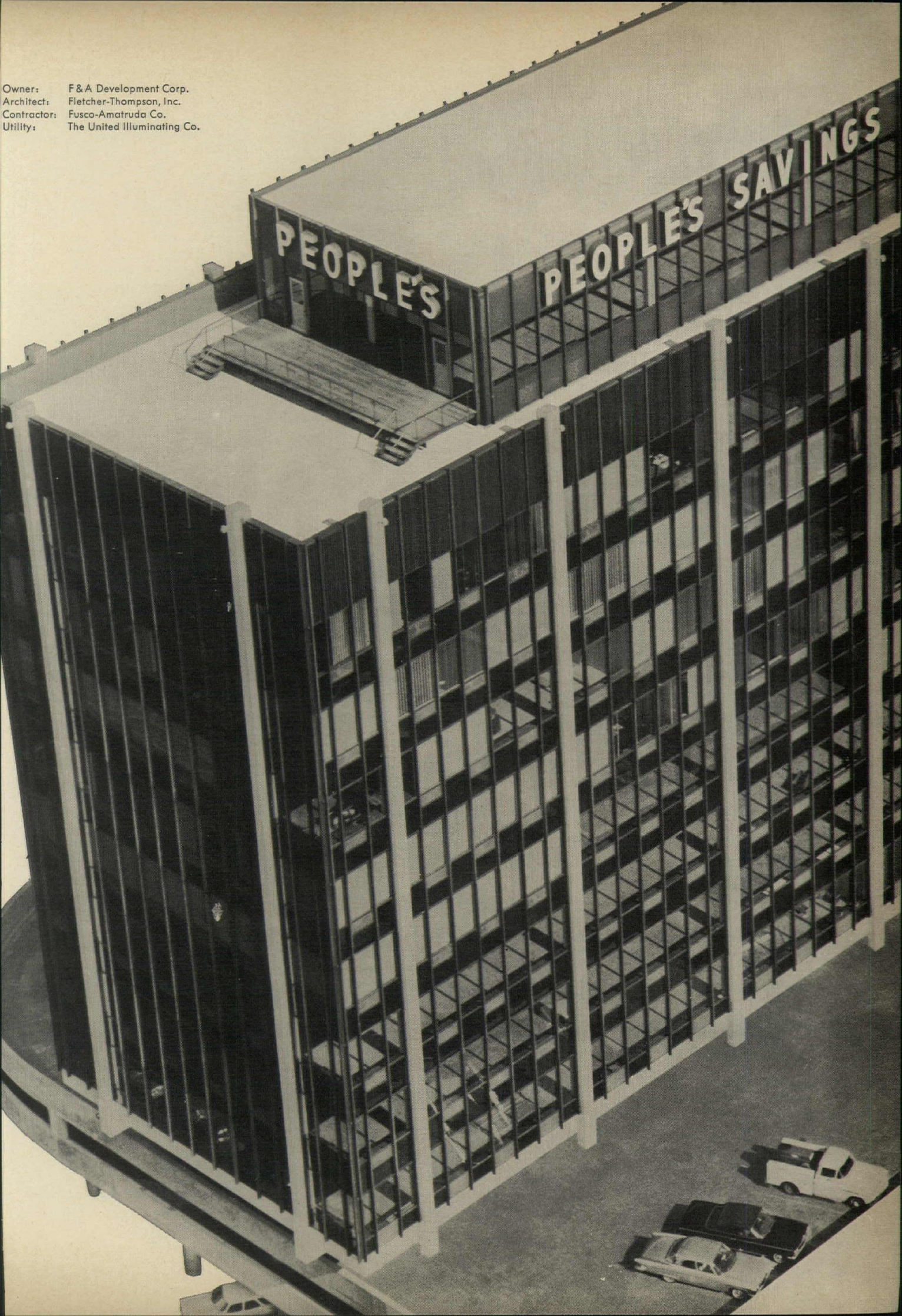
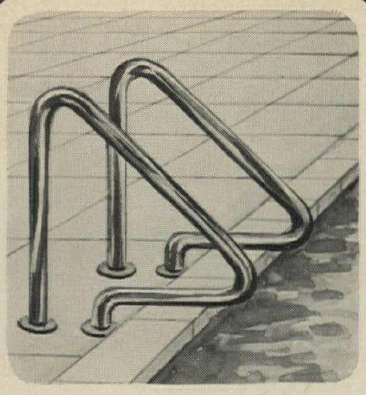
Owner: F&A Development Corp.
Architect: Fletcher-Thompson, Inc.
Contractor: Fusco-Amatruda Co.
Utility: The United Illuminating Co.





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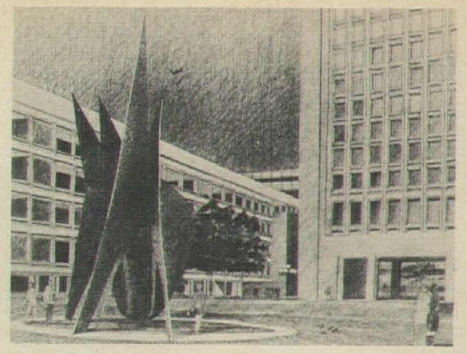

MIT plans courtyard around sculpture by Alexander Calder

A 40-foot, steel sculpture by Alexander Calder will dominate a new court to be created on the East Campus of the Massachusetts Institute of Technology. McDermott Court, a gift from Mr. and Mrs. Eugene McDermott of Dallas, will be bounded by the 20-story Cecil and Ida Green building, the Hayden Library, Walker Memorial, undergraduate dormitories, and by the projected chemistry building to be designed by I. M. Pei and Associates, who will also be responsible for the planning of the court. Dedication ceremonies for the new court are planned for May 7, 1966.

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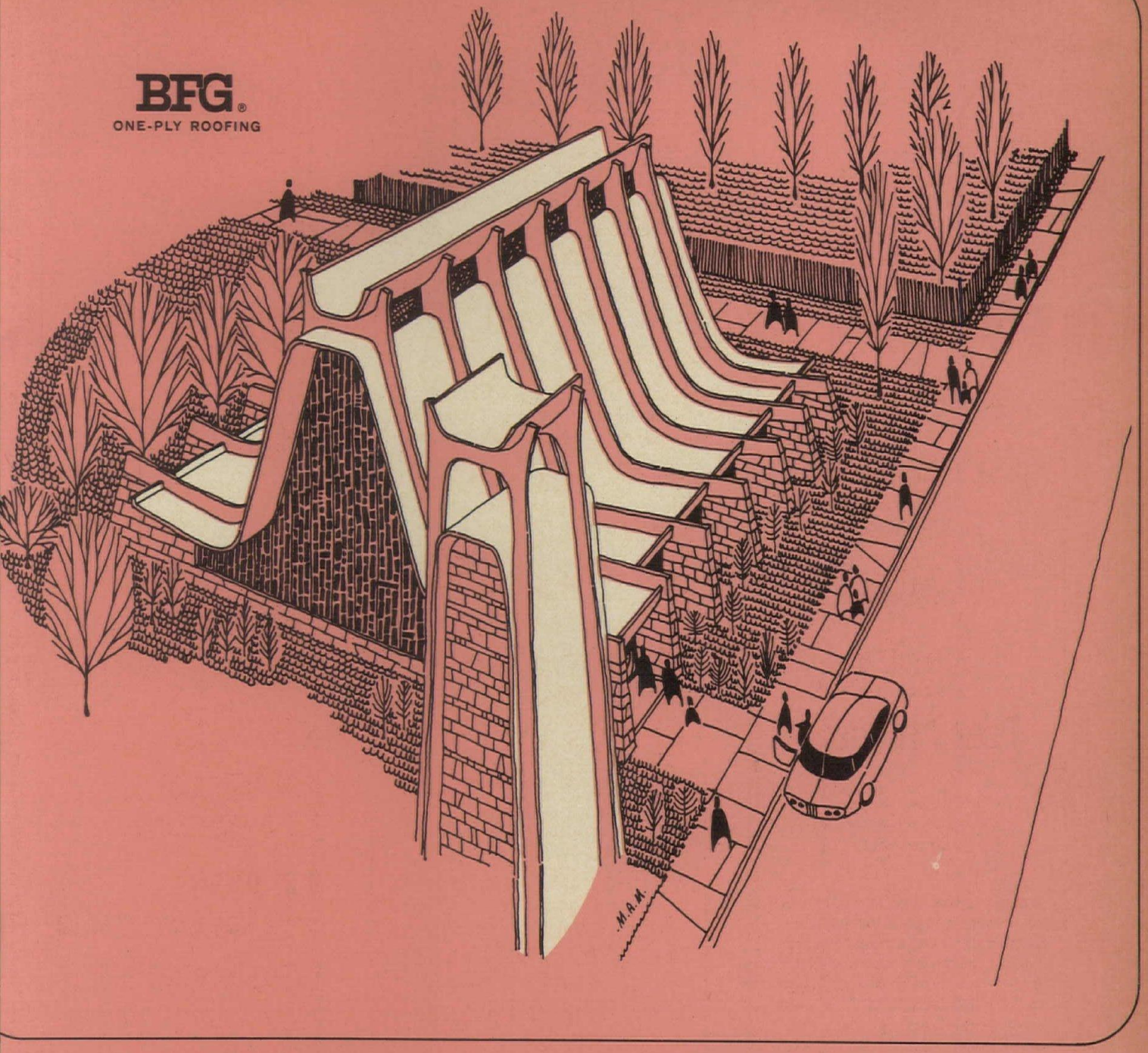

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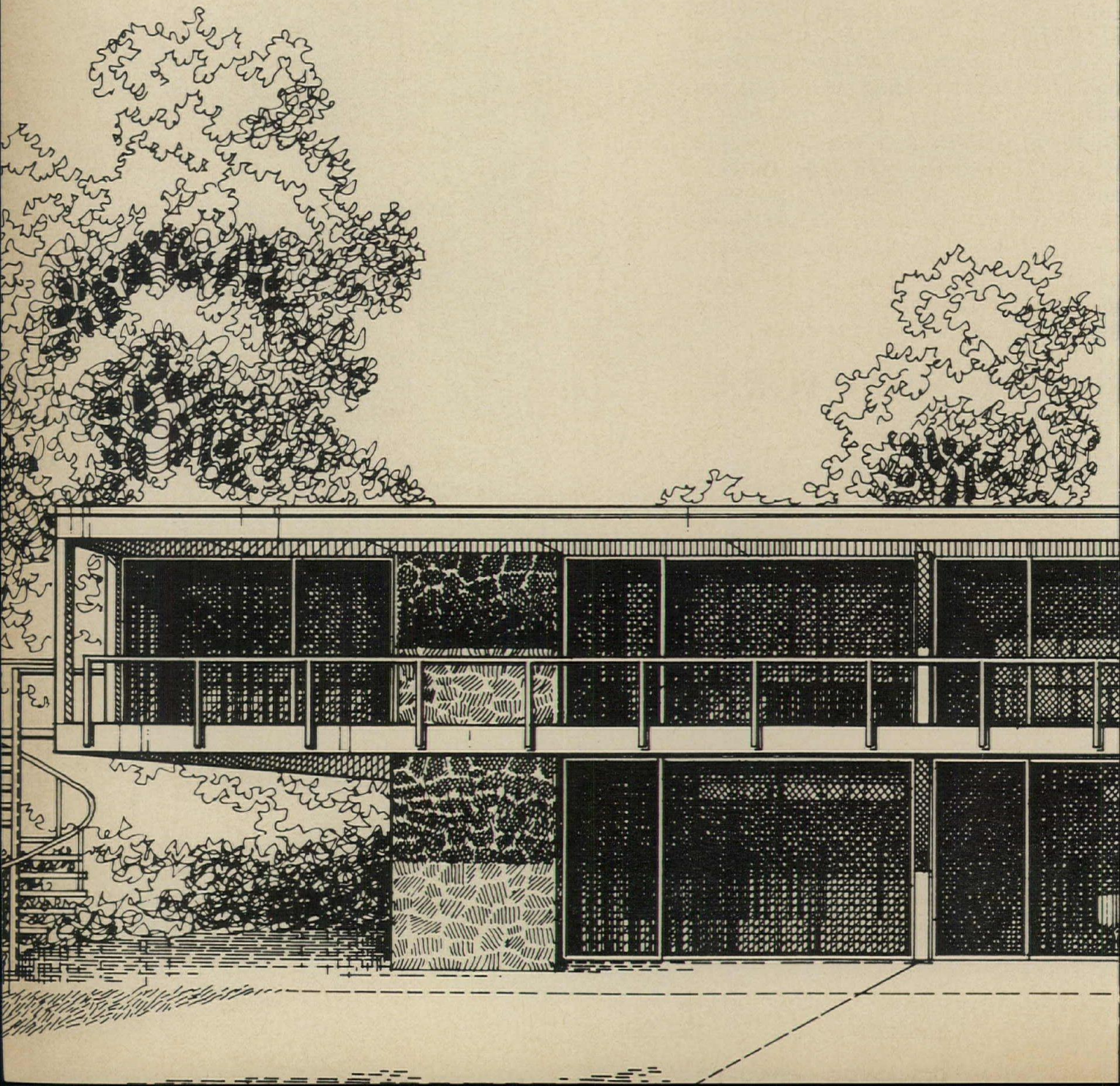

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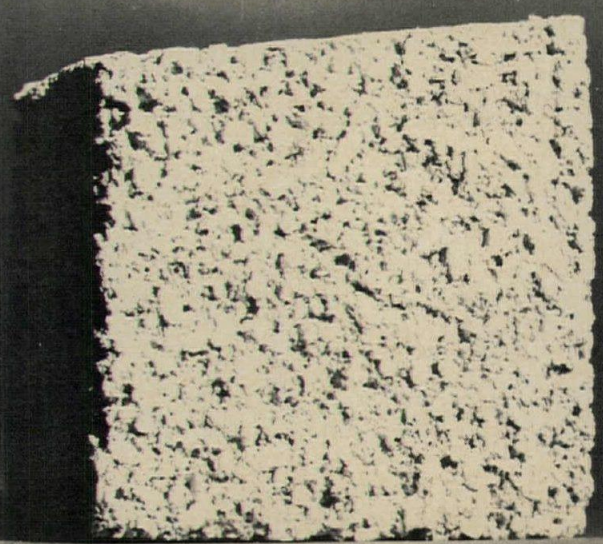

Actual size cube, cut from slope-to-drain Permalite roof deck.

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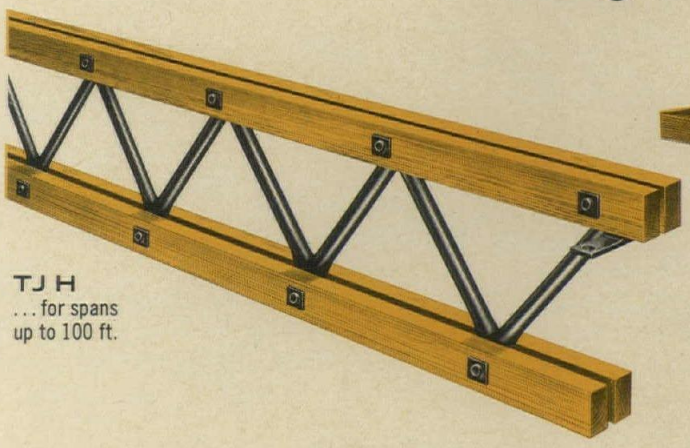

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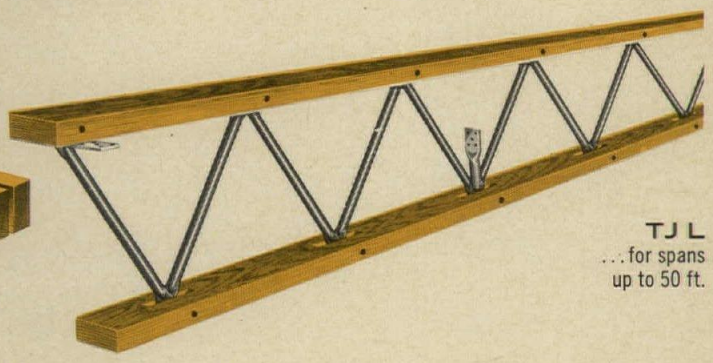

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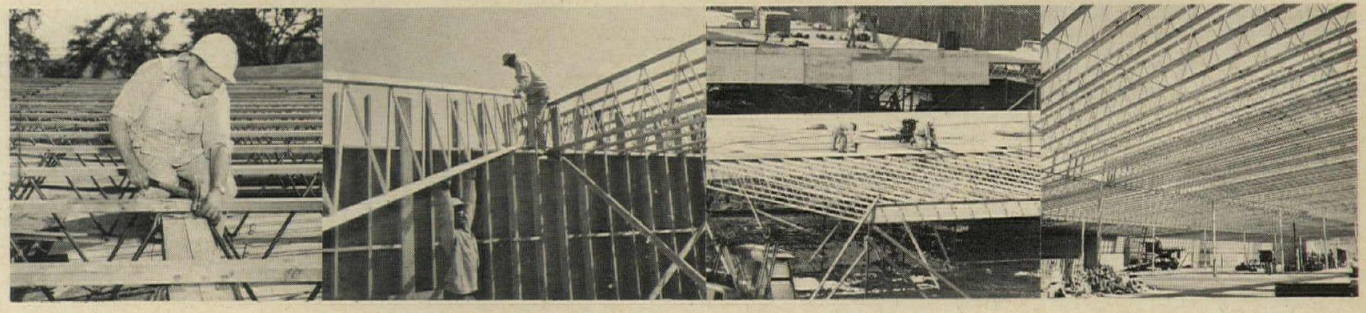

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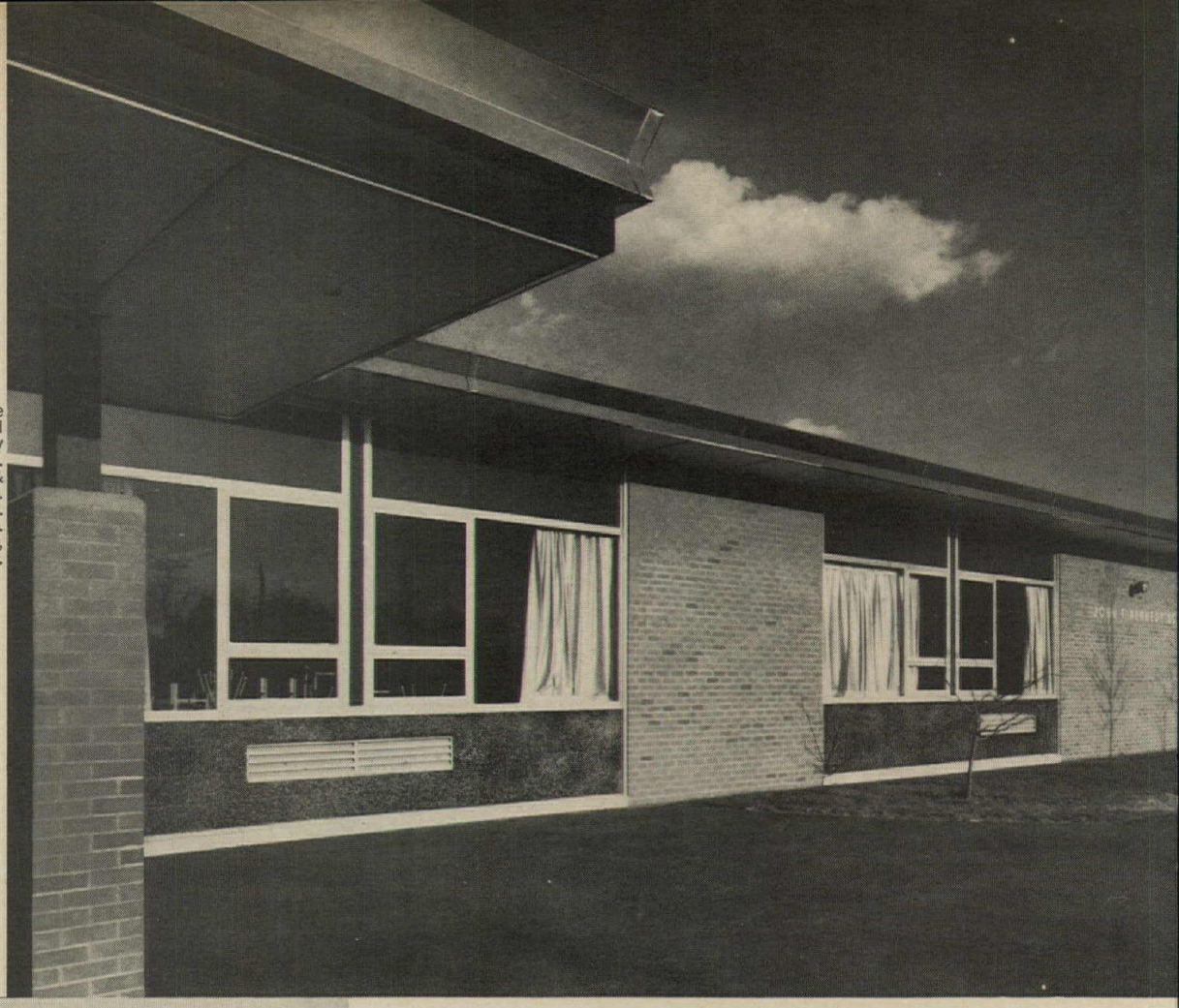
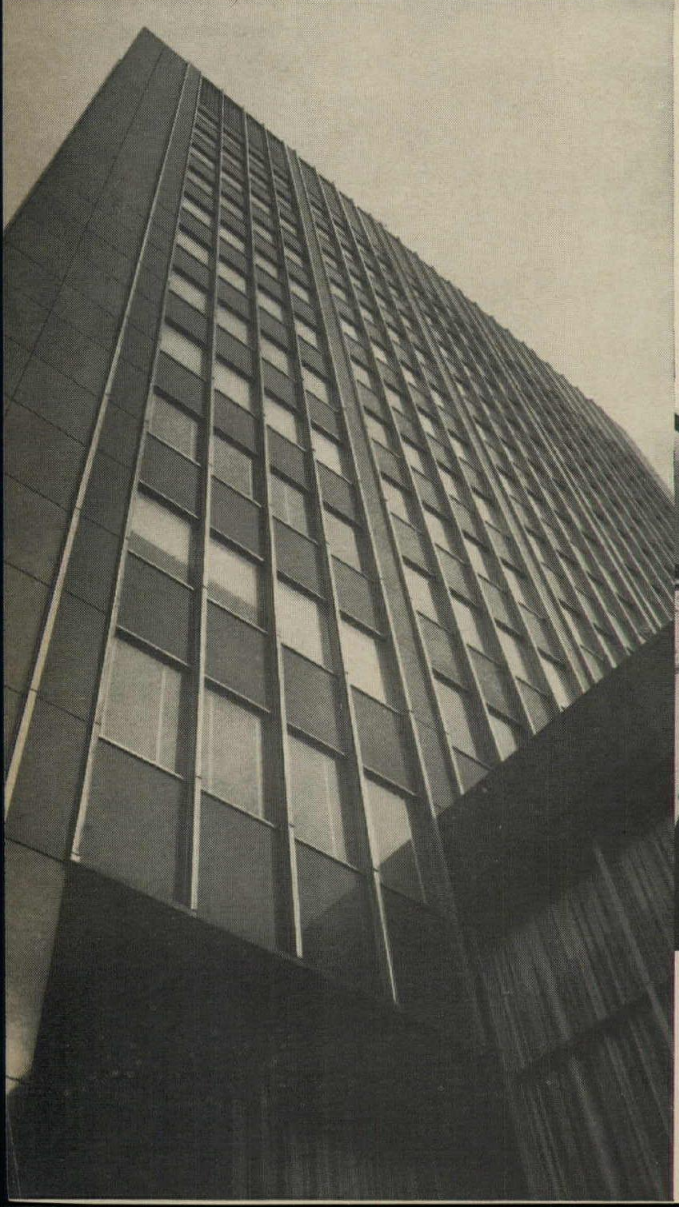


10,000 pounds of stainless were used for the facia and gravel stop of the John F. Kennedy School in Windsor, Conn. Architect: Louis Drakos & Associates, Hartford, Conn. General Contractor: A. F. Peaslee, Inc., Hartford, Conn. Fabricator: Fishman & Sons, Inc., Windsor, Conn.

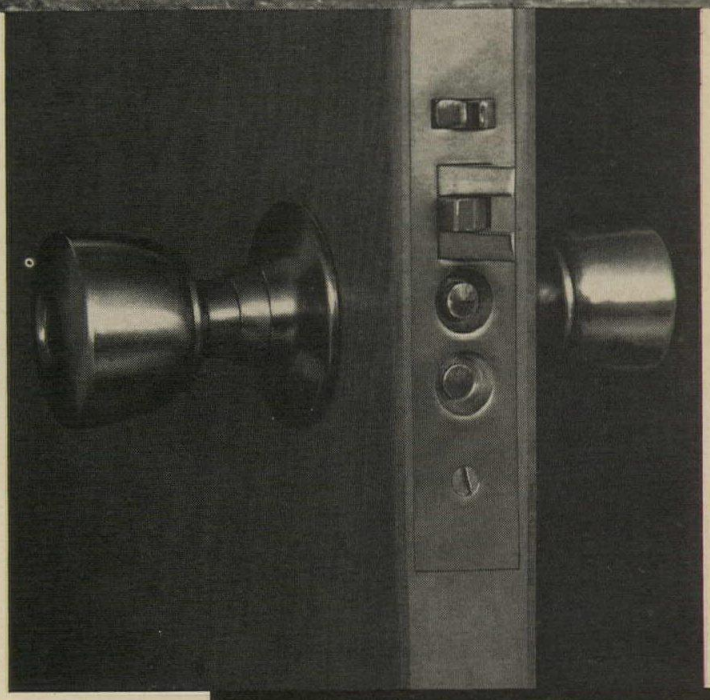


When nickel stainless steel goes to school

This staircase at the Brookings Institute Center for Advanced Studies, Washington, D.C., incorporates handrails and tubing made completely of stainless. Architects: Faulkner, Kingsbury and Stenhouse, Washington, D.C. Fabricator: Criss Brothers, Inc., Bladensburg, Md.

This 14-story student building on the campus of Stevens Institute of Technology, Hoboken, New Jersey, is planned for a life of 100 years. Exterior mullions, roof coping, louvers, flashing, lobby door frames, convector covers, railings and elevator doors are stainless. Architect: John J. McNamara, New York, N. Y. General Contractor: Walter Kidde Constructors, Inc., New York, N. Y. Metal Fabricator: Moynahan Bronze Company, Flat Rock, Mich.

Curtain walls and windows are stainless at the Elmira Free Academy in Elmira, New York. Architects: Fudge and Underhill, Elmira, N. Y. Fabricator: United Stainless Window Div. of Seagrave Corp., Woodside, L. I., N. Y.



At the Colorado State College Special Education Facility in Greeley, Colorado, stainless was used throughout the building for interior and exterior door hardware. Architect: Robert F. Linstedt, Denver, Colo. Fabricator: P. & F. Corbin, Division of Emhart Corp., New Britain, Conn.

you'll win all the honors.

Honors seem to come naturally to architects who design with stainless when they work on schools.

Kindergarten or postgrad, elementary or advanced study—school buildings have to be designed not only for beauty, but for long life, ruggedness and low maintenance. That's where stainless is in a class by itself. The toughest architectural metal available, it withstands the roughest use and abuse; in fact, it's just about student-proof.

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Study the advantages of nickel stainless steel for your next design—including curtain walls, entrances, windows, railings, hardware, flashings and other available products. And if your clients haven't graduated to stainless yet, let us supply you with more convincing information. For your copy of the "Stainless Steel Architectural Fact Sheet" and for our series of "Suggested Guide Specifications for Stainless Steel Products," write: The International Nickel Company, Inc., New York, N. Y. 10005. In Canada: The International Nickel Company of Canada, Ltd., Ontario.

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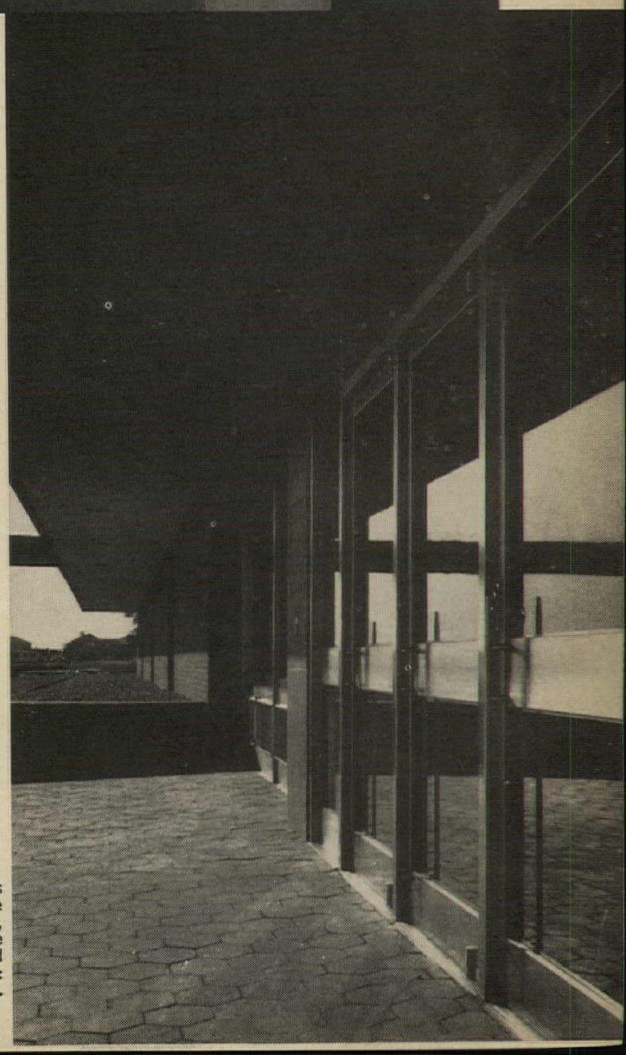
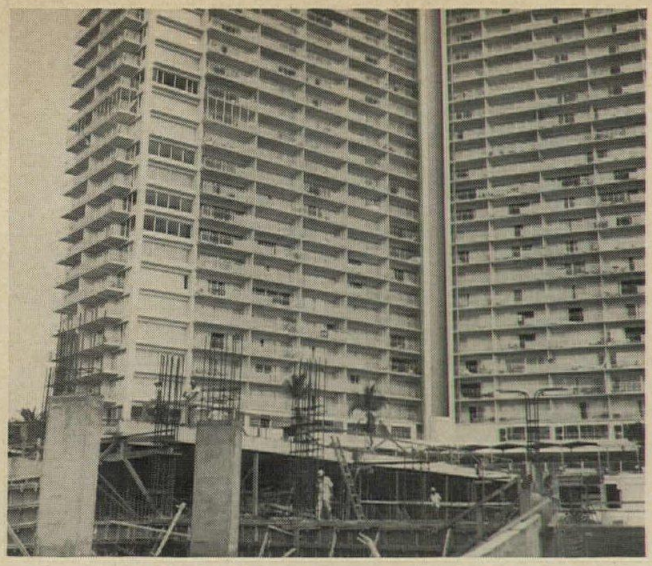


Heavy traffic doesn't faze these stainless balanced doors at the New York Maritime College Health and Education Building, Port Schuyler, Bronx, N. Y. Sidelites are also stainless. Architect: Ballard, Todd Associates, New York, N. Y. Fabricator: Schacht Associates, Bronx, N. Y.



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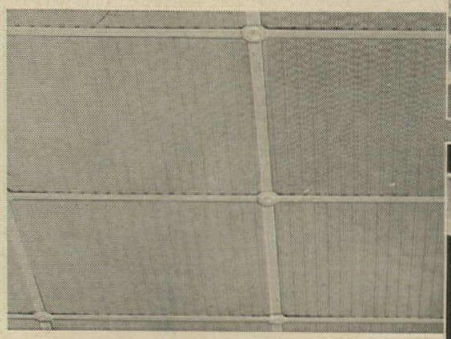

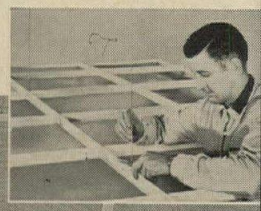

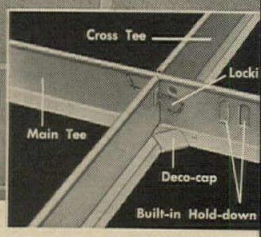

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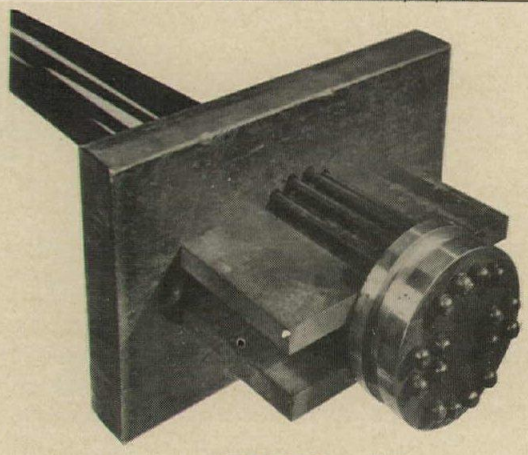

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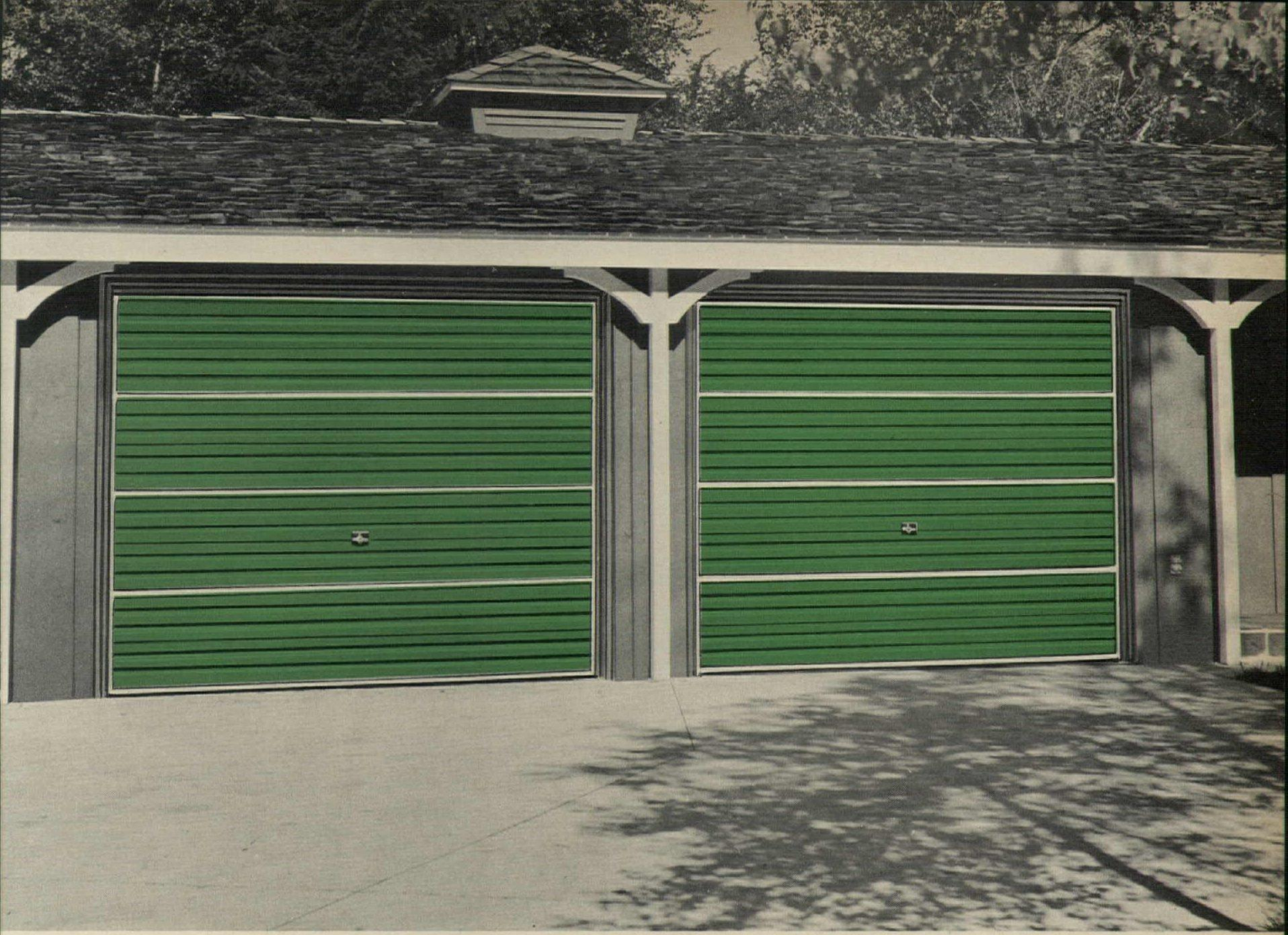

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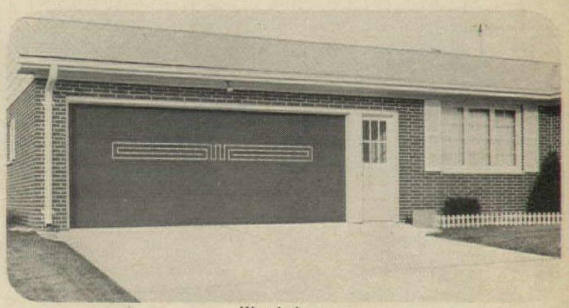
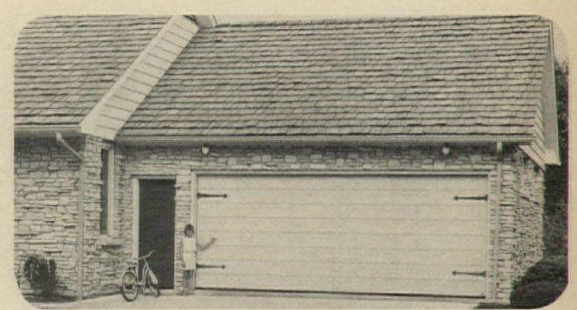
● The quality line of Fiberglass Aluminum, Wool or Steel Doors for residential and commercial applications.

Wagner Doors have had the greatest acceptance for over 60 years—and it's no wonder! No other doors so successfully fit into, blend into, or enhance the design of nearly any type building. They have all the top quality features that assure longest door life with years of trouble-free, maintenance-free service. Electric operators with push-button and radio control are available for any kind of Wagner Garage Door.

There's a type, style, size, color Wagner Door to fit exactly into the plans you create! *Write for new Bulletin AR-66C.*



Wood doors



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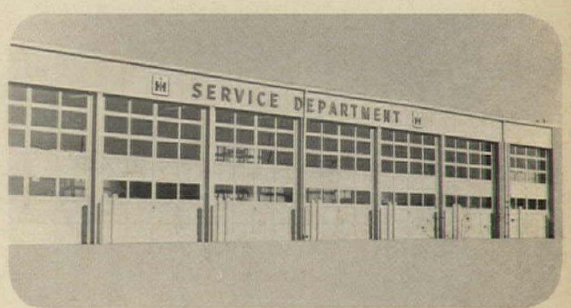

Doors for Commercial Applications

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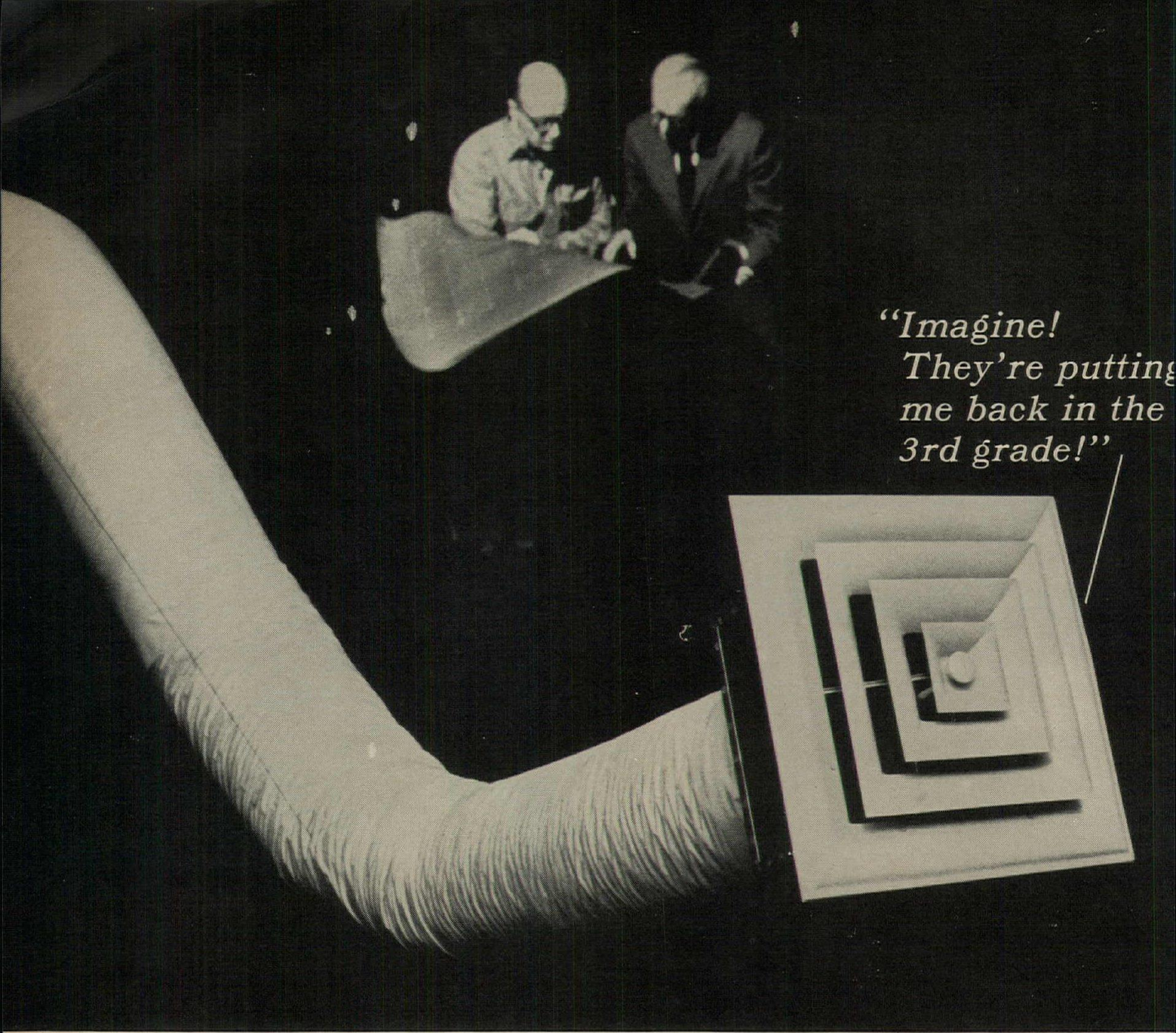


New Lennox Direct Multizone System

keeps comfort in step
with changing interior spaces

For example a modern school must be able to add, move or eliminate walls at the drop of a subject.

Why? So that today's lecture hall can become three classrooms tomorrow, if needs change. This is true in any building you design—industrial plants, office buildings, clinics—wherever space cannot be static.

What makes this possible? Movable walls, of course. But more importantly, the Lennox DMS heating-air conditioning system.

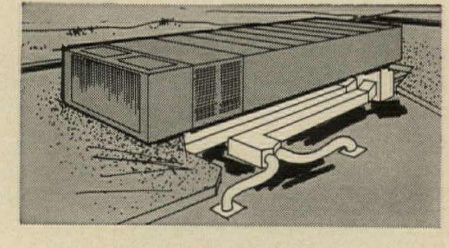
Its flexible ducts plug (or unplug) anywhere into the ceiling, and move around as the walls move!

Before Lennox DMS, it was hard for comfort to follow changing space. Heating and air conditioning were "locked" to the floor.

Lennox DMS is many ways unique. It nestles 42" low on the roof. It can heat, cool, ventilate at the same instant. It can provide, if required, 12 different air temperatures to 12 different rooms simultaneously.

The unit arrives completely assembled and wired, including controls. Just one source of responsibility!

For detailed information, write Lennox Industries Inc., 680 S. 12th Ave., Marshalltown, Iowa.



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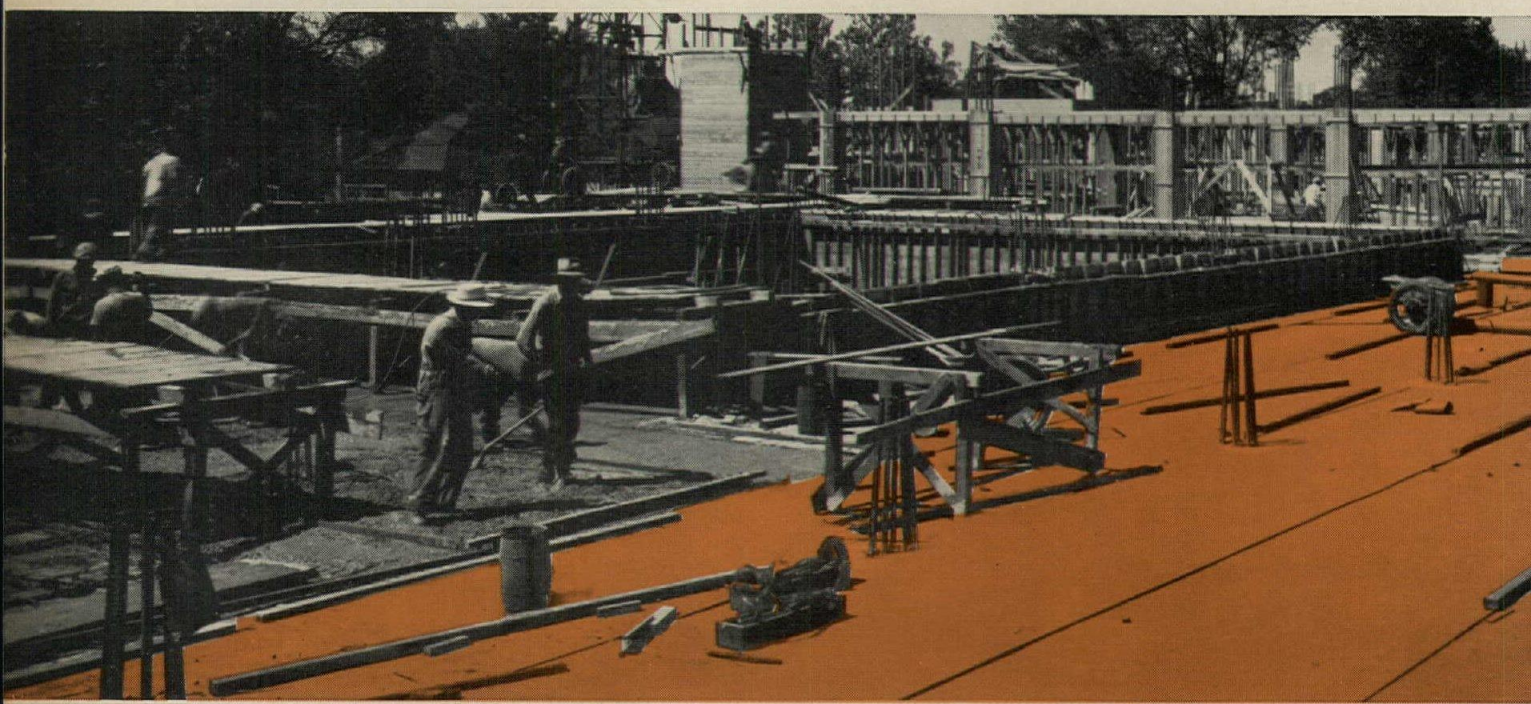

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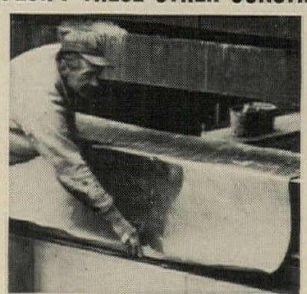
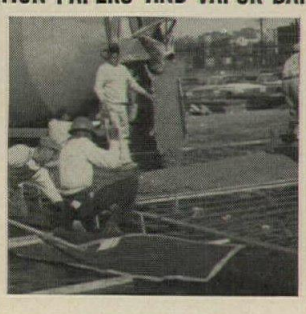


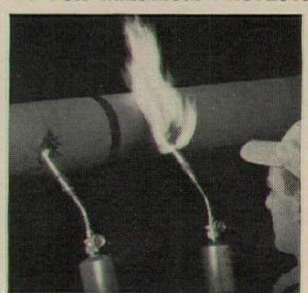
Copper Armored Sisalkraft®

For concealed flashing with pure copper at 1/5th the cost of heavy copper:
COPPER ARMORED SISALKRAFT. A combination of electro-deposit copper and reinforced Sisalkraft that provides lifelong protection against moisture penetration at vulnerable points in the structure.



Moistop®

To prevent moisture migration through concrete slabs:
MOISTOP. A six-ply barrier of reinforced Sisalkraft extrusion-coated with black polyethylene film. Moistop will not rip and tear like plain polyethylene film. Applied under concrete, Moistop helps keep floors dry.



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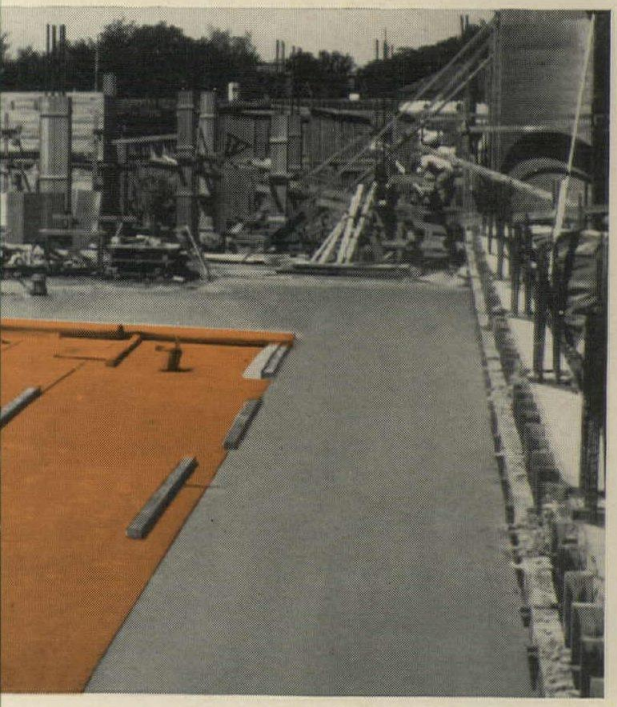
Permanent, noncombustible vapor barriers for pipe jacketing, air conditioning duct insulation and industrial insulation facing:
PYRO-KURE®. A line of flame-resistant, reinforced laminations with a U/L flame spread rating of "25 or less." Complies with National Building Code standard

Roof Deck Vapor Barriers

For Class 1 Construction: PYRO-KURE 600. More than twice the vapor resistance of vinyl. Approved by Factory Mutual.
For Other Decks: VaporStop 710. Single ply, pre-built barrier (0.28 perm) **at 20% less applied cost** and 80% less weight than 15 lb. felt.

IT PRODUCES A BETTER CURE, PROTECTS SLAB AGAINST STAIN AND DAMAGE



Sisalkraft Reinforced Paper is 5-plies strong, so it protects the surface against abrasion and soiling from traffic and debris, and reduces clean-up costs. Sisalkraft is also waterproof, prolonging the hydration process to produce a denser, more uniformly cured slab.

This assures you, and your client, that the concrete will be clean and smooth with maximum strength and durability. Curing is "automatic" because a glance at the curing paper in place quickly tells you that the curing process is going on. And, for curing in cold weather, reinforced curing paper is especially important because it helps protect against frost damage.

Make sure of Sisalkraft Curing by using this specification: "As soon as the concrete has set sufficiently hard to permit application without marring the surface, a Sisalkraft curing paper, as manufactured by the Sisalkraft Division of St. Regis Paper Company, shall be unrolled over the slab. Laps of no less than 4" shall be sealed with mastic or pressure-sensitive tape. The curing paper shall be maintained in place for the duration of the curing period or until removal is directed by the architect."

Send for Samples and Information: Bulletin on "Curing and Protection for Better Concrete," plus samples of various grades will help you specify for maximum curing efficiency. Write today: Sisalkraft, 73 Starkev Avenue, Attleboro, Massachusetts.

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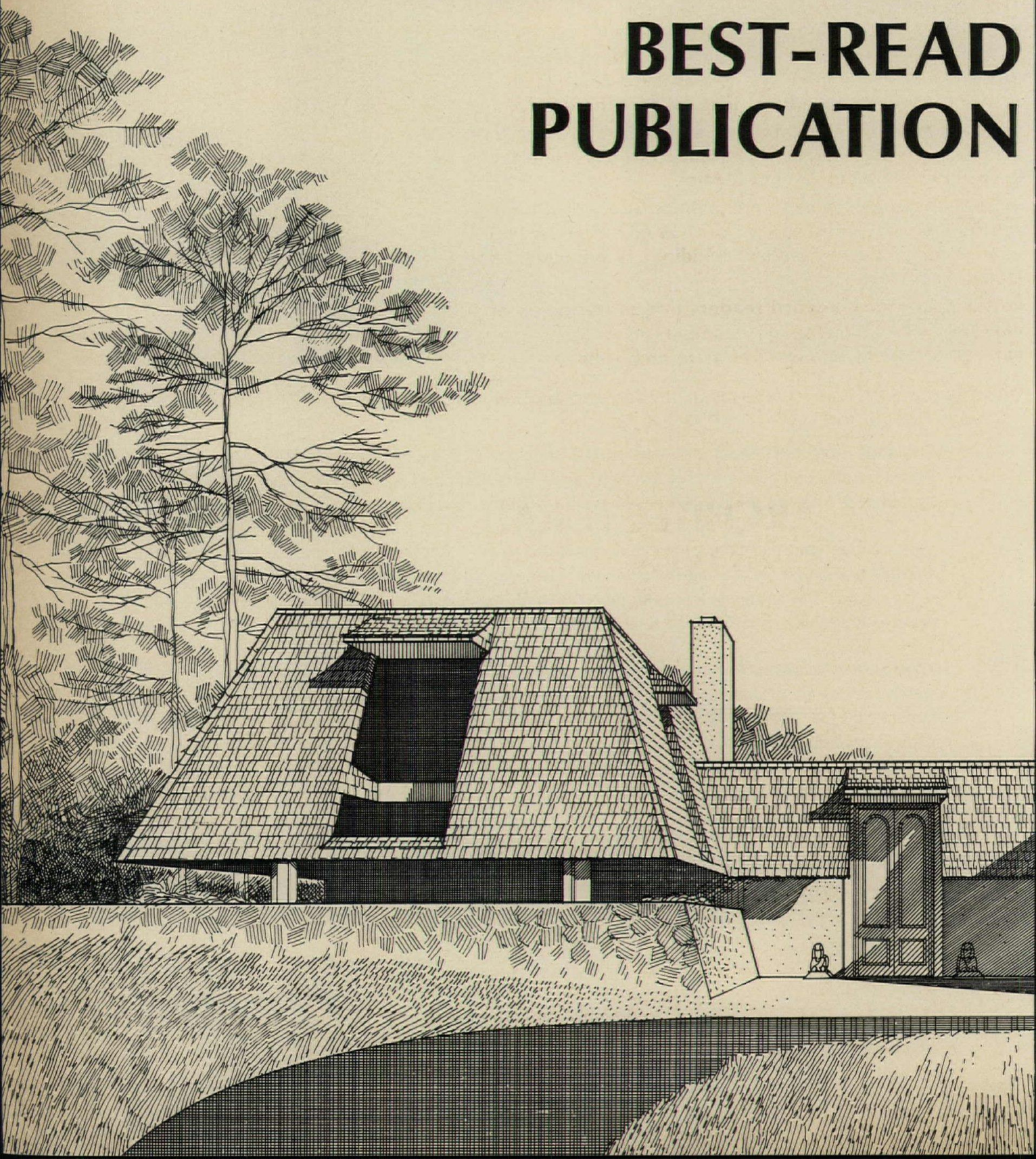

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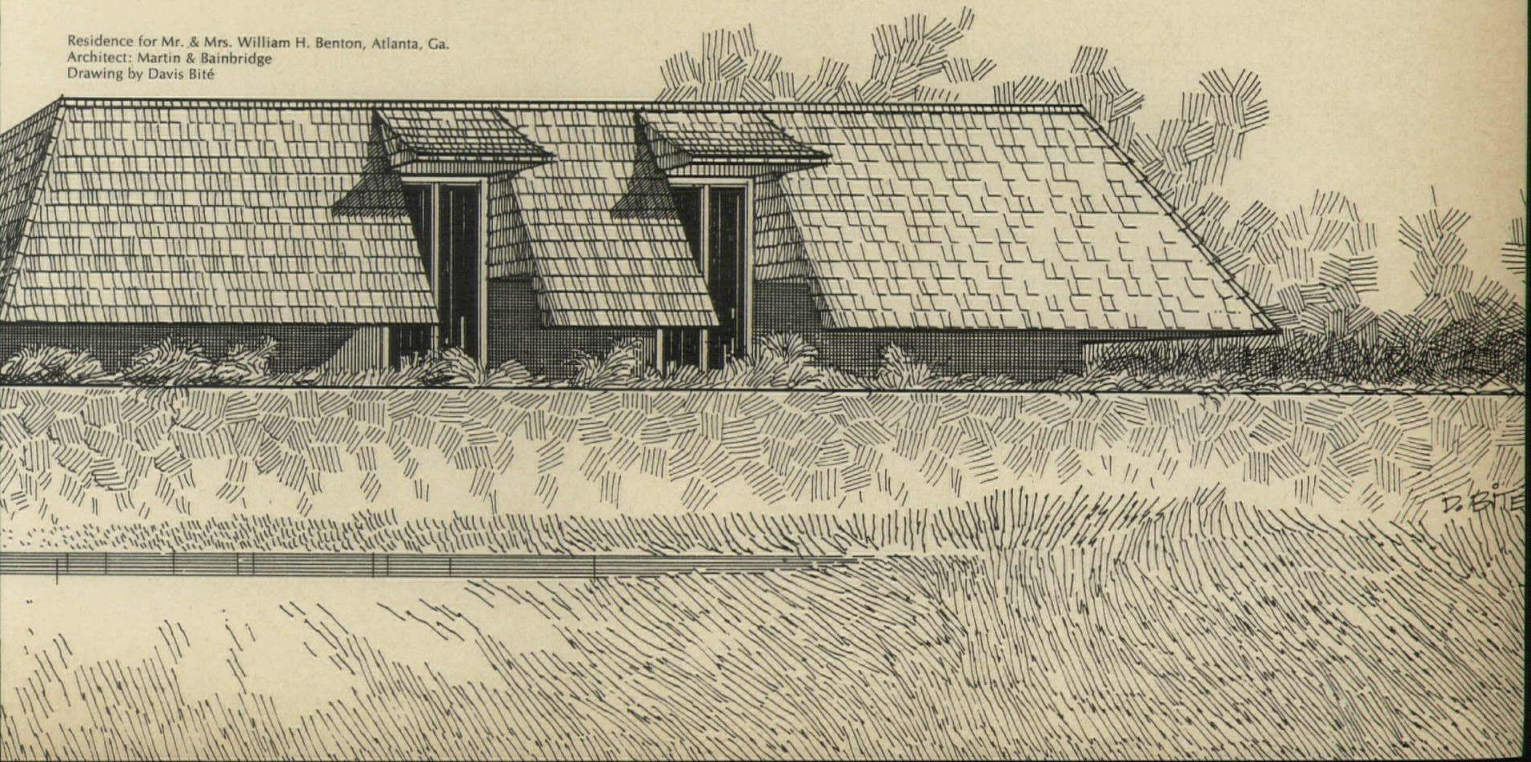

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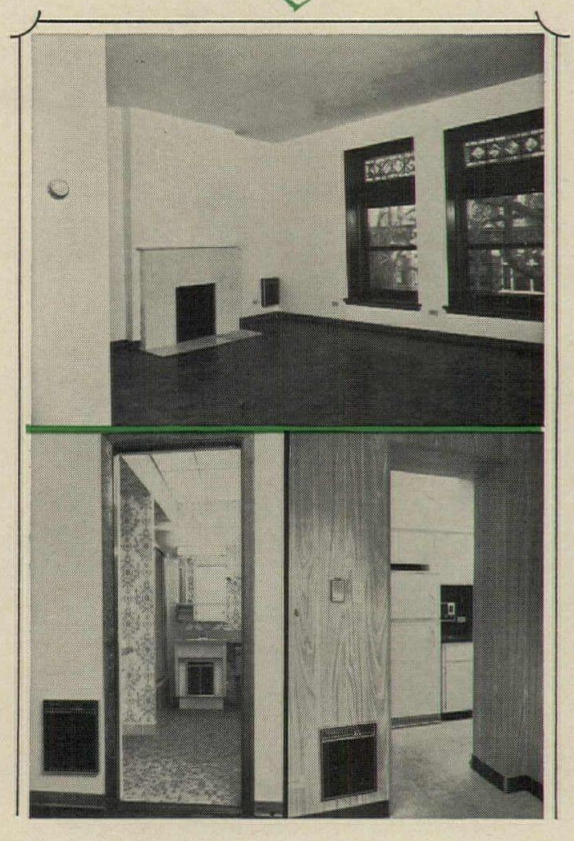

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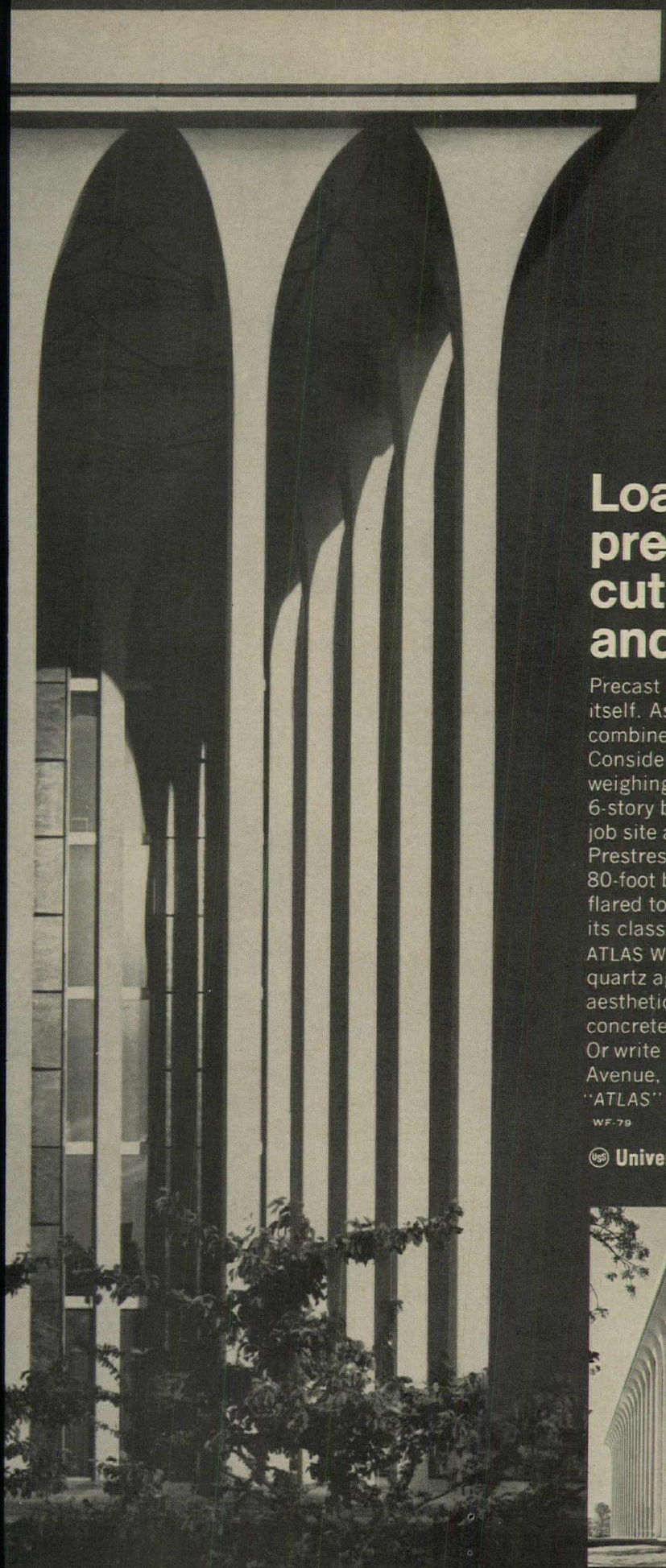

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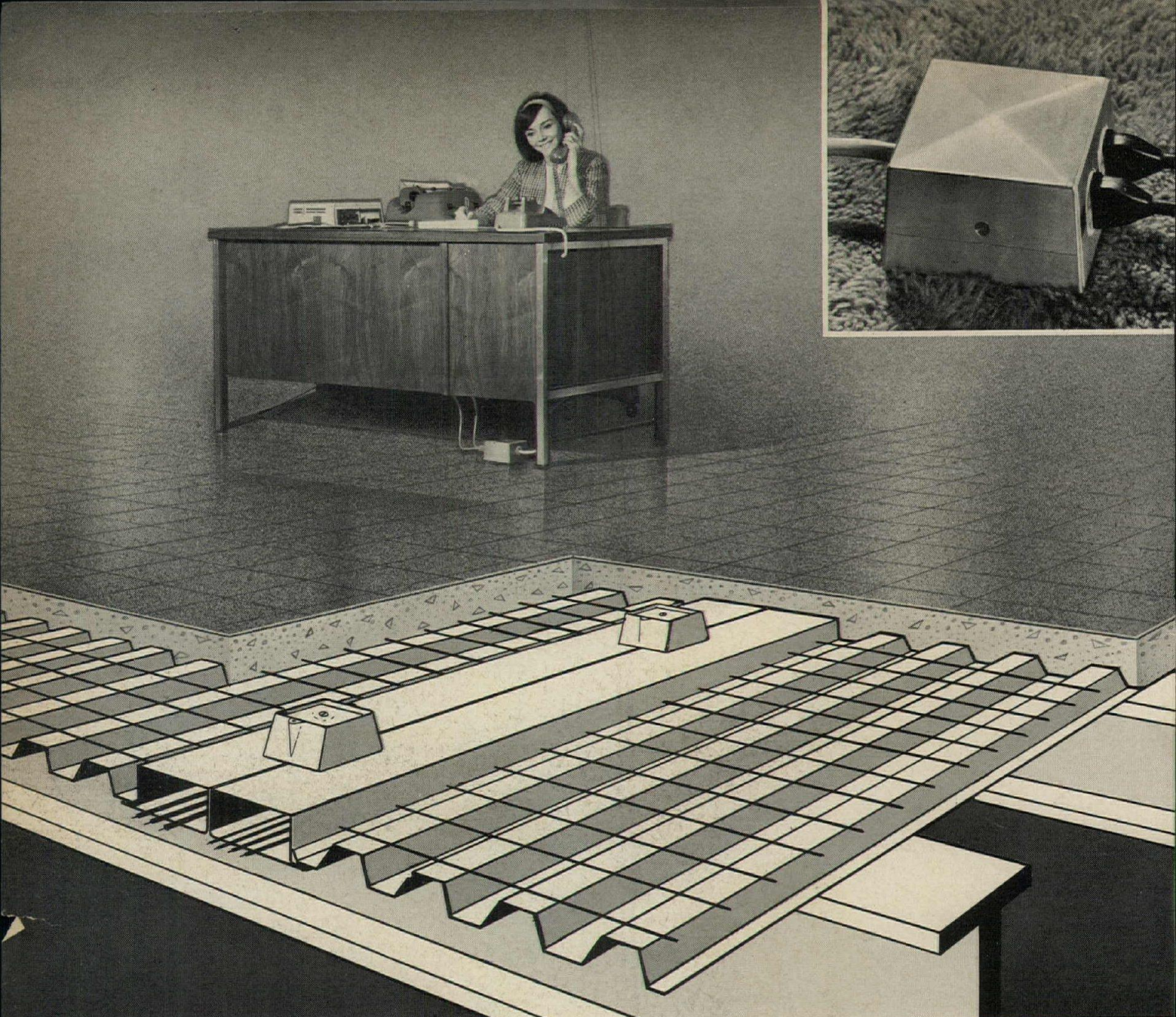

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