

THE FEDERAL RESERVE BANK OF MINNEAPOLIS BY GUNNAR BIRKERTS AND ASSOCIATES
LIBRARY AND DORMITORY BUILDINGS AT TOUGALOO COLLEGE, MISSISSIPPI
FIVE HOUSES BY ALFRED DE VIDO
THE BROOKS MEMORIAL ART GALLERY, MEMPHIS BY WALK JONES + FRANCIS MAH, INC.
BUILDING TYPES STUDY: AIRPORTS
FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

NOVEMBER 1973

11

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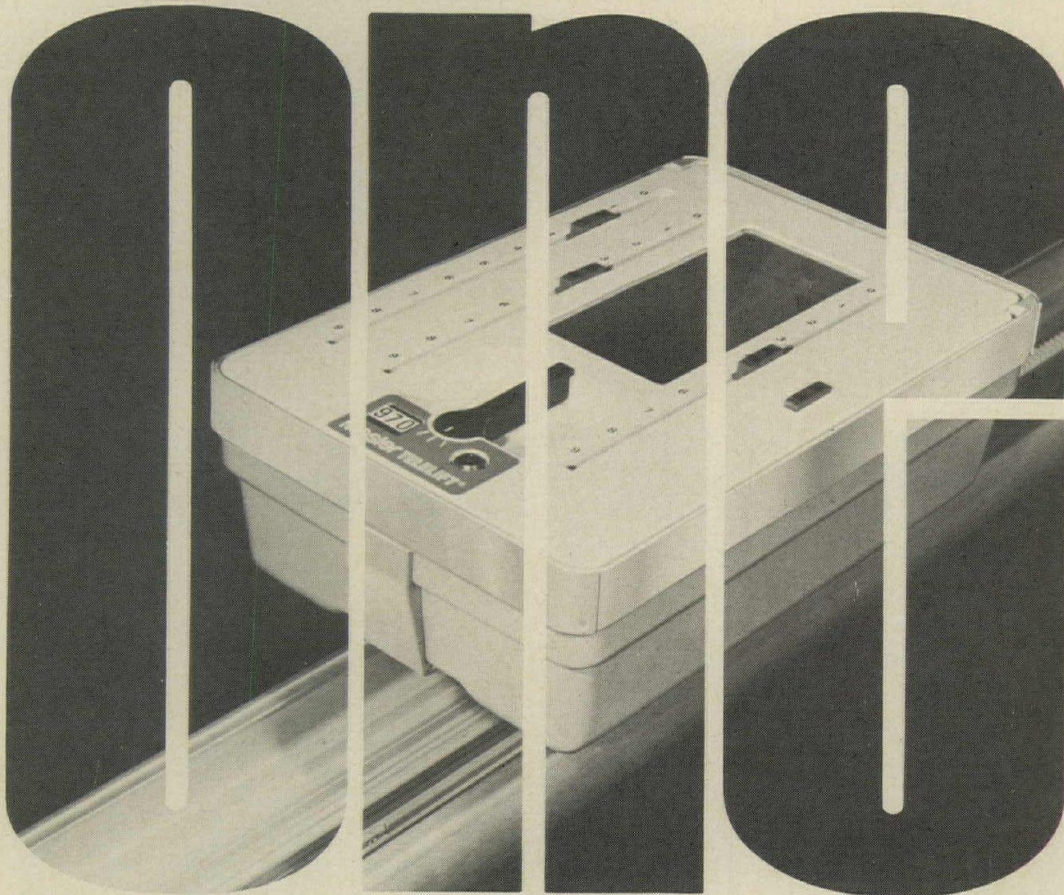


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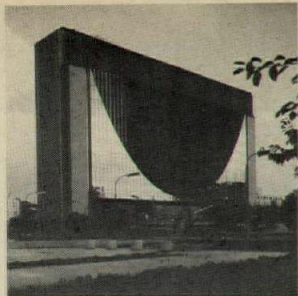
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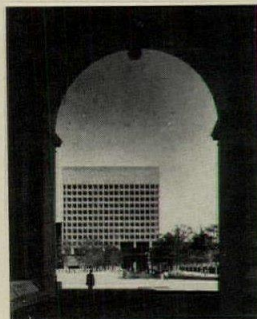
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David Hirsch

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"End of the boom," opening note in this annual review and forecast, sounds a note much less somber than might be supposed. The sprinkling of minus signs in George Christie's forecast of contract value activity is confined to commercial and residential building types. Others are not zooming, but the bottom-line total index for next year still registers a hopeful plus two per cent. Strength lies, despite shifts in Federal support programs, in the outlook for health facilities and utilities.

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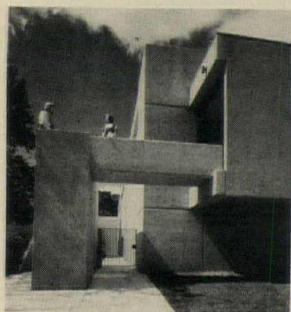
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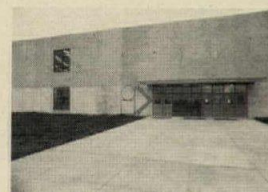
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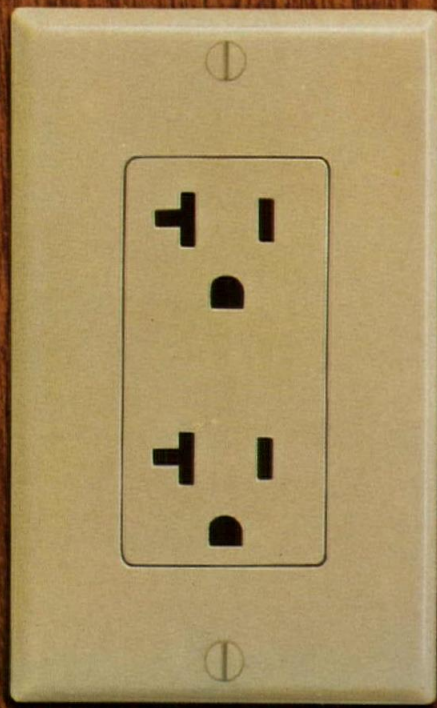
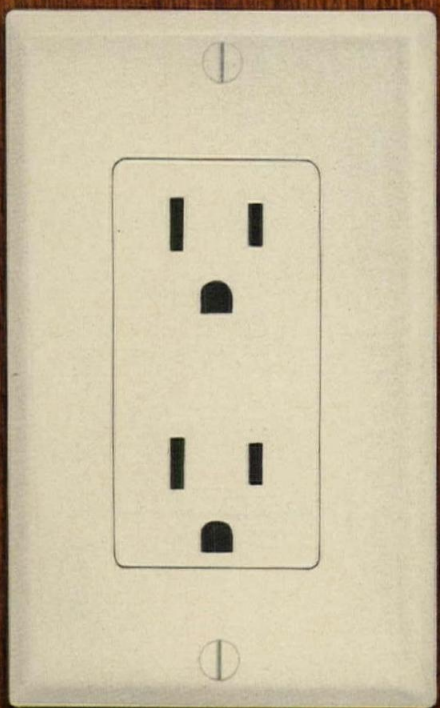
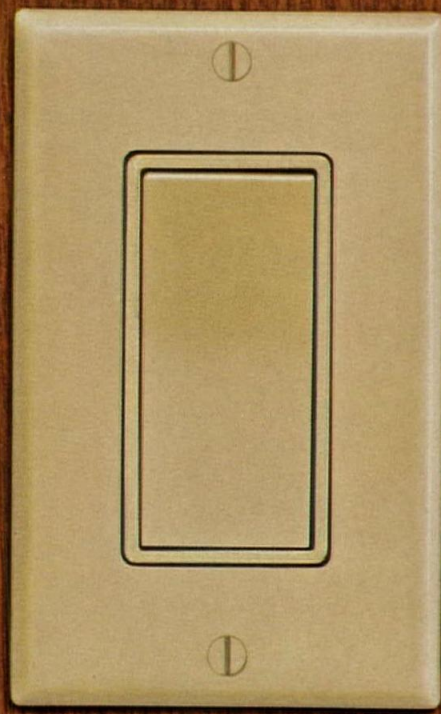
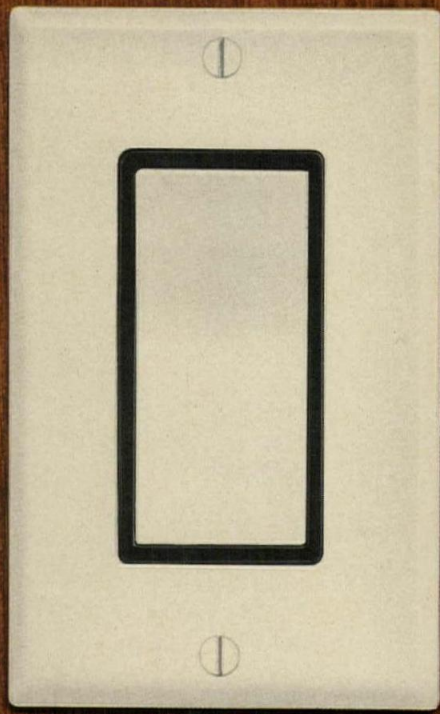
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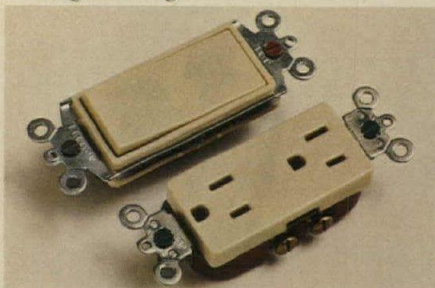
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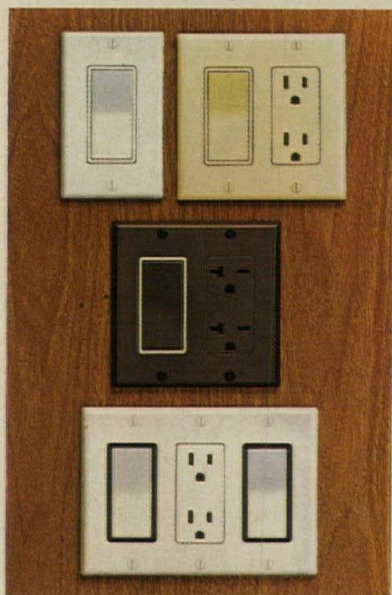
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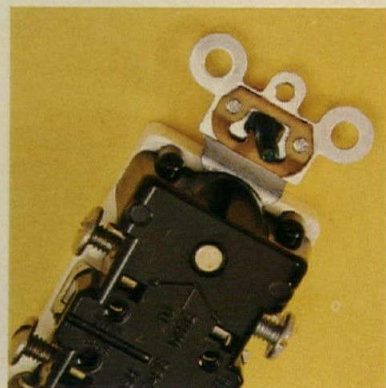
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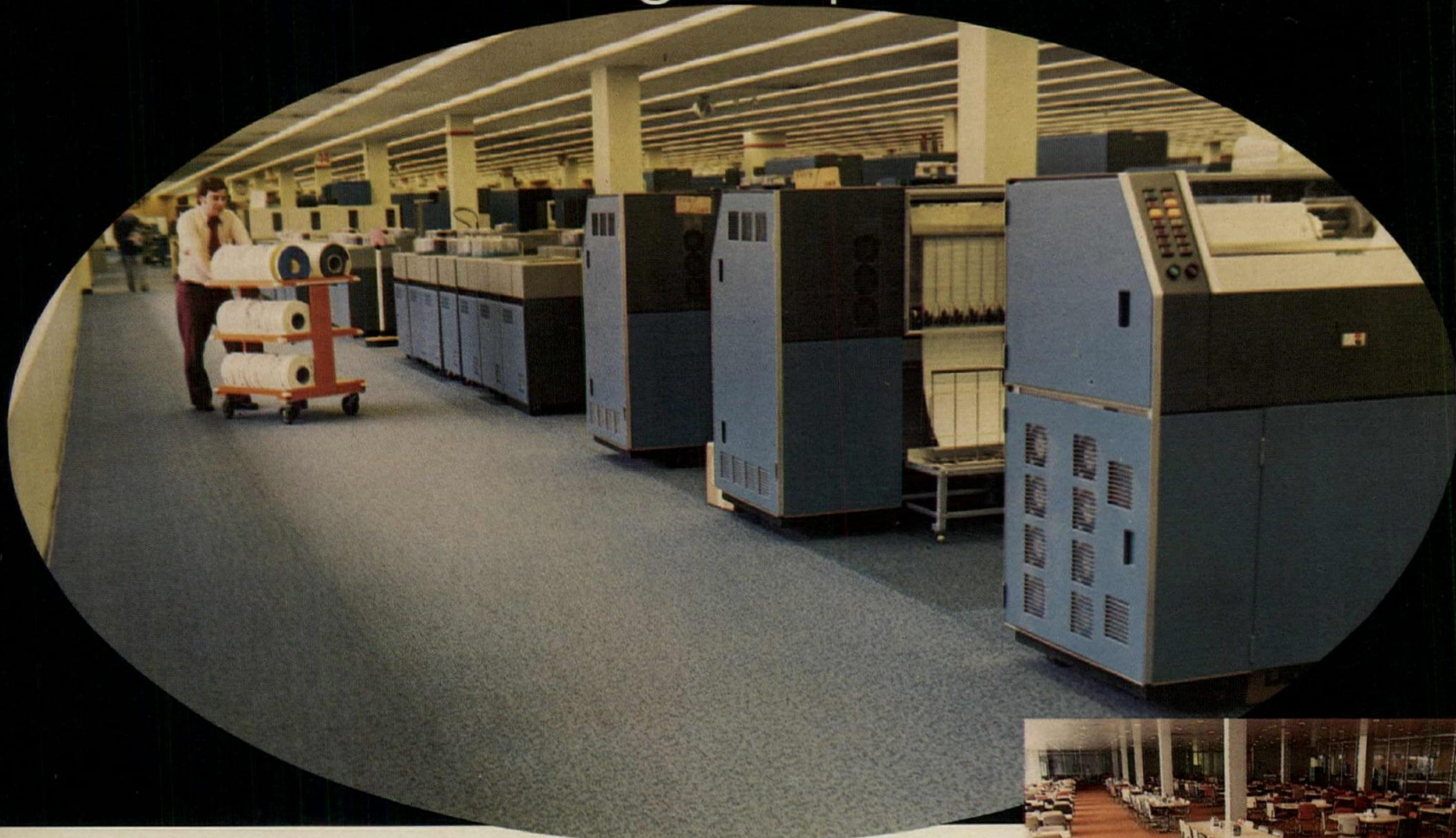
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Top — double Jute-backed carpet in below-grade computer center, 8 years later. • **Middle** — carpet in below-grade cafeteria, 8 years later. With double Jute backing, remained intact through a flood without mildew, shrinkage. • **Bottom** — double Jute backing helps resist casters 8 years.

Now does everybody see the "political contributions" mess?

In January, the then-new board of the American Institute of Architects named a Task Force on Political Contributions to develop guidelines and recommendations for the profession. That report was presented to, and acted on by, the Board at its September 19-21 meeting in Vermont (see News Reports, page 34) and thus is being presented to the profession—and by a strong public relations effort to the general public—at an exquisitely appropriate time.

Those architects and engineers (and there are more than a few and you know who you are and you sure aren't all in or anywhere near Maryland) who thought that political contributions and fee kickbacks were "a way of life," that "everybody does it so we have to," or that "there's nothing much we can do about it" were and are dead wrong and may now ponder the utter and complete disgrace of the Vice President of the United States of America and how it is going to affect you.

Unless I'm very much mistaken, that vast majority of honest politicians and legislators and lawyers and public prosecutors aren't going to stop with taking one little chip off one corner of that small visible part of the iceberg of corruption. Not all, of course, but a big chunk of that iceberg is the construction industry, and a big chunk of the construction industry problem is selection of professionals for public work.

Let's concentrate on architect and engineer selection—since that is a major concern of RECORD and its readers, and leave the rest of the mess to those who created that part of it.

There's just no doubt that architects and engineers in many cities and states around the country have been subjected to some very sophisticated forms of extortion.

You don't have to talk to many architects to find some who—with their partners—have agreed jointly how much they will each give (on an "individual basis" of course) to which political campaign—and often to both. (How in the world do you justify contributing to *both* sides on the basis of "the right to participate in the political process" and on the basis of individual conscience?)

You don't have to talk to too many architects or engineers to find that the going rate for selection in many cities is 5 per cent of fee; in others a more discreet 1 or 3 per cent; but that some architects and engineers have found themselves moved to attend enough testimonial dinners, to write enough "contribution" checks (or just plain hand over enough cash)

to kickback 10 per cent.

In those states which, like the Federal government, use professional advisory boards to submit names of qualified architects and engineers for public work, you don't have to look far for occasions on which those reports have been totally ignored in favor of firms whose professional qualifications would appear to the average practiced eye to be considerably less distinguished.

Well, there's no one who knows how long, how hard, and how far the present pursuit of corrupt politicians and the people who corrupted them (both, since it takes two to tango, being quite equally as guilty in betraying the public trust) will go on. All historic precedent indicates that most of the politicians who have taken the money will get away with it and most of the professionals who gave the money will get away with it. May their punishment be many nights worrying about whether some sharp young reporter in their city will decide to shoot for a Pulitzer prize for investigative reporting in *his* town, and may they also ponder long the fact that they not only handed over their own personal integrity, but compromised the integrity of a distinguished profession.

So what happens now? For surely it is clear that the corruption must stop. Now. Today.

It could stop, at once, completely and forever, if every architect and engineer simply refused ever again to take part in this kind of extortion.

Not everyone will. So it now becomes the responsibility of every architect, engineer, or other professional to blow the whistle long and hard at dishonest practices that he becomes aware of. It is indeed, under the newly revised ethical standards of the AIA, a professional responsibility to blow the whistle. The new "Guidelines for Members Who Wish to Make Contributions to Political Parties or To Candidates for Public Office" state clearly (again, see News Reports, page 34):

"An architect who believes that he has been denied professional work because of his refusal to contribute to a political activity or entity has a professional responsibility to report such circumstances to the Institute and such other authorities as are appropriate." The new Guidelines further state that "An architect who violates these recommendations and/or Standard 8 of the American Institute of Architects Standard of Ethical Conduct shall be (a) subject to disciplinary action by the Institute, and if appropriate, (b) reported to the public authori-

ties." In short, the whistle blown.

Let's face it: next to cleanliness and Godliness, "not telling" on your fellows is one of the first things you learn in elementary school. But let's also consider that not just individual honor, but the honor of a whole group of professions is at stake; and that people who do not honor the code of these professions must be dishonored; if necessary by a kind of self-policing that is abhorrent but necessary.

And let the penalty for this misconduct be made clear. For openers, those proven guilty in the courts should have their license to practice taken away.

What are the options today? Honesty. Design advisory boards. And (alas!) bidding

Let's assume (and I hate to have to assume it) that complete honesty—a total and complete end to kickbacks or to political contributions made "in order to secure from any individual, political party, political organization, or candidate for public office the award of professional work"—cannot be counted on, and would not be accepted by the general public in its present cynical and shamed mood.

Option c., competitive bidding, cannot now be ignored. To legislators under pressure, the low-bid concept is appealing, for it has the real advantage of clarity and simplicity.

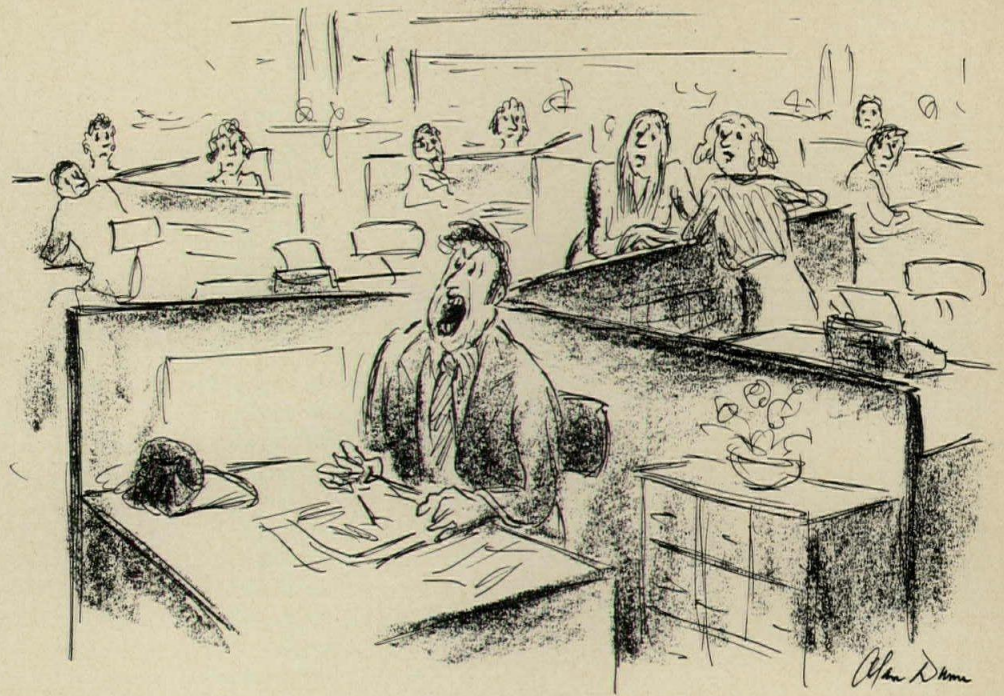
And what a shame it will be if the sloppy (or illegal) practices of a few professionals condemn all professionals who wish to do public work to function under the low-bid system!

How much work—in Washington and in state legislatures across the country; how much work by how many dedicated chapter people and legislators to get the Brooks bill and state and local versions of the Brooks bill will be wasted if the present public mood demands that professional services be granted only on the basis of the low bid. How treasured a precedent will be lost. How many good architects will suffer because a few bad ones made this necessary.

This battle is, thankfully, far from lost. The insight of the AIA board in establishing that task force early this year has made possible instant and strong response to the present moment of unhappy truth.

The AIA has already—in Washington and across the country—begun promulgating "open architect and engineer selection processes for government construction projects." The task force, headed by Philadelphia architect Ehrman B. Mitchell Jr., recommends that (to quote the AIA release): on the state level, the governor choose candidates for the selection board from lists of qualified persons submitted by professional organizations with an interest in state work. Candidates would be subject to confirmation by the state legislature. "Design firms would submit their qualifications and notification of their interest in specific projects to the board, which would then select and rank firms to be considered for each project. Negotiation with the selected firms, in order of the board's preference, would then take place until a firm was selected."

Presumably, the same sort of system could be implemented in at least our major cities—and perhaps the smaller ones.



"Quiet!"

The AIA's proposal will be tough to implement—but it looks like the best bet. . .

. . . and it's my view at least that every architect around the country ought to support it as strongly and as loudly as he can (I hesitate to suggest that he write his Congressman and Senator about it).

There are several reasons that this proposal will be tough to implement. First, it's bound to take time—especially in those places where corruption has been the worst and the legislators are least likely to be anxious to cause any major public discussion of the selection of professional consultants. Some states, as some readers will know, already use open selection procedures; they include California, Massachusetts, Kansas and Hawaii. And other states and some cities have had this proposal under consideration for some time and may be close to implementing it. Comment from practitioners and legislators in those states might well be especially useful comment on the effectiveness of this procedure (and comment on the subject would be much appreciated by RECORD, on an off-the-record basis if you wish).

There is, of course, room for really cynical cynics to criticize this process. Anybody else remember the old "Mayor's list" of architects who got work? Those suggested to the governor or mayor by the professional organizations will have to be super-impeccable. Further, they should in my view represent a true cross-section of the profession—not just ex-chapter presidents, but young practitioners. Not just conservatives (I don't mean political conservatives, I mean design conservatives) but liberals and radicals; a good mix of representatives of big firms, medium-size firms, and small firms—and, to be practical, a good mix of firms who are clearly design-first-and-always, and firms with broad management expertise (not

mutually exclusive, of course). How you get the bureaucrats and politicians to see this same mix into the selection advisory boards I cannot imagine.

Beyond this point it seems easier: If the boards are good enough, they will make the right decisions. In fact, they will be acting as client for the state or city, and will have a very special public responsibility. Then, if the political body is required to negotiate with the pre-selected firms in order of the selection boards preference, award of contracts will really be in a goldfish bowl.

This procedure removes a lot of prerogatives from government, it must be remembered—and, again, we'll have to see whether it really can be implemented.

For example, General Services Administrator Arthur Sampson strongly objects to any system of architect selection that removes the final decision from his office. His conviction: Without responsibility and authority, there can be no accountability. He has always openly accepted—indeed invited and demanded—accountability. But the accountability in some states and cities has clearly been ducked—and again, perhaps the innocent must accept a process to protect the public from the not-so-innocent.

Myself—being an eternal optimist—I think it must be made to work. The other options are just awful (bidding) or just too unrealistic. I think we all ought to work for the AIA proposal with all our energies; for if a less satisfactory method of professional selection grows out of moral mess the country is in, all we will be able to do is weep and dream of the good old days when professionals were trusted by the people whose trust they had asked for and accepted the day they were licensed and started to call themselves professionals.

—Walter F. Wagner Jr.

We asked some of our customers why they buy Game Time[®] Equipment

The
number one
answer was:

durability.

It's a fact . . . Game Time park and playground products are built to last, built to take the day in, day out punishment active kids can dish out. Check for yourself, compare other equipment in a highly used park or playground. You'll see a dramatic difference . . . a difference highlighted by our sound design concepts and our use of the best construction materials available. For example, we use large diameter galvanized steel pipe, stainless steel and zinc grip steel throughout our product line. Our Saddle Mate* animals-on-a-spring feature a special extra-strong and flexible aluminum alloy. We use heavy cast aluminum and malleable fittings for an extra safety margin, and heavy gauge sheet steel for strength. Game Time product quality and durability can pay off in years of extra service and drastically reduced equipment replacement costs.



Another important Game Time feature is greater safety. Nationwide Consumer Testing Institute, Inc., is evaluating the Game Time product line for compliance to standards which have been developed for recreational equipment for use in public parks and playgrounds. You can buy Game Time with confidence.

Remember . . . if playground and park equipment is not created for durability, and can't meet safety standards, it just can't be quality.

Get to know the Game Time sales representative in your area. He's only a phone call away and is always ready to help you in planning, product selection, and installation.

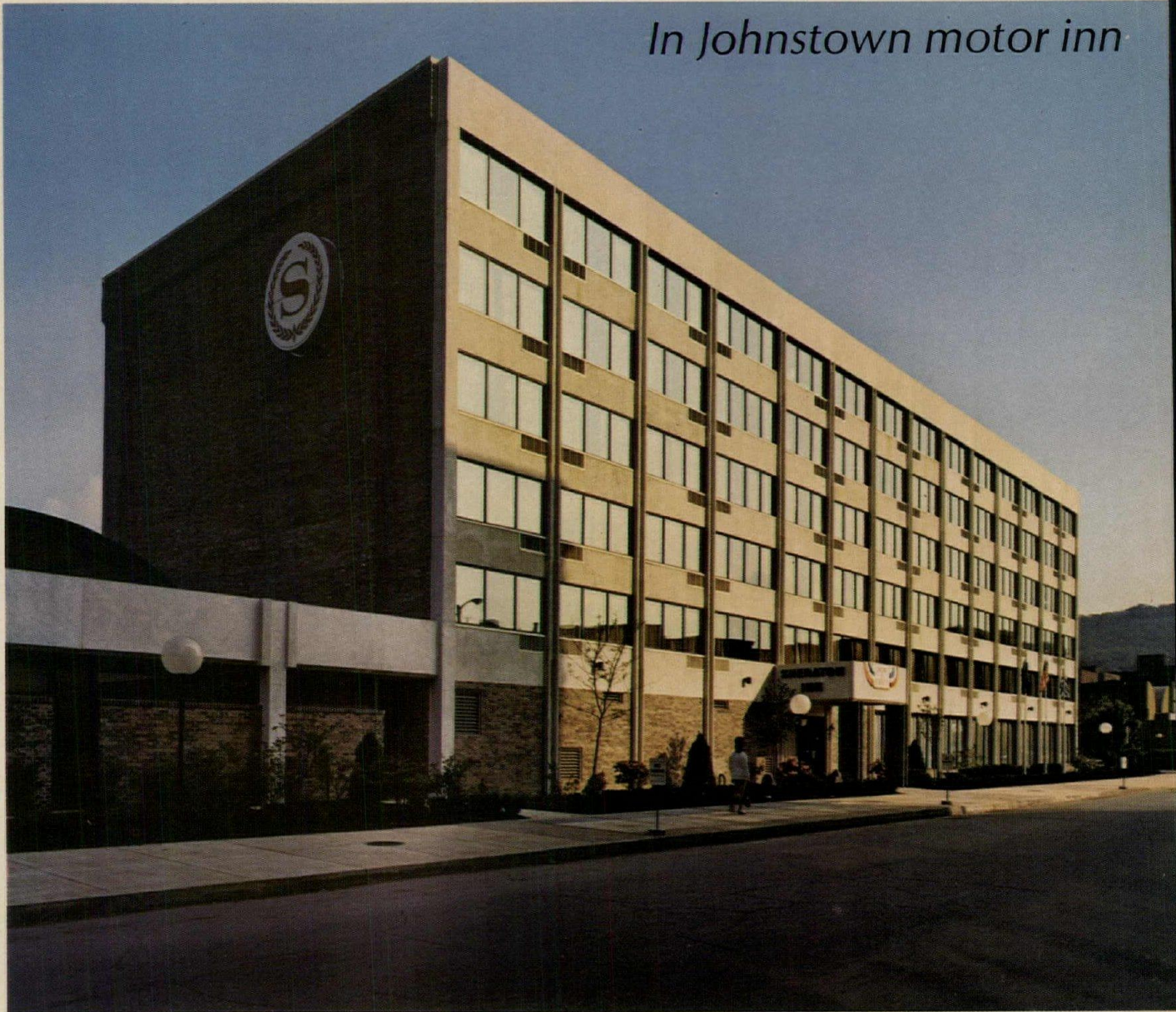
*Exclusive trademark of Game Time, Inc.

**Game
Time** by
TORO

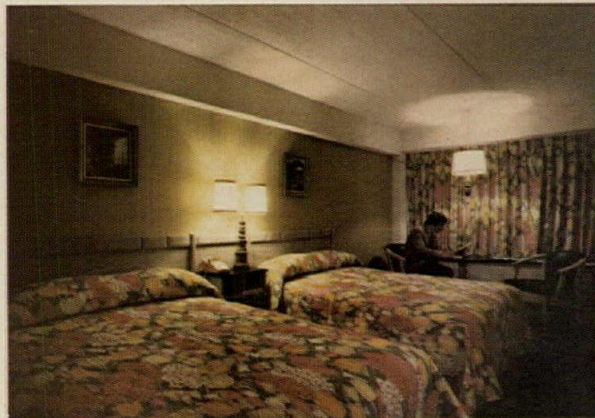
903 Anderson Road / Litchfield, Michigan 49252

For more data, circle 7 on inquiry card

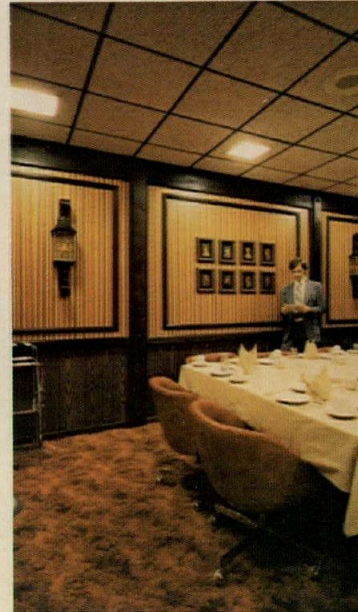
In Johnstown motor inn



Owner, developer, architect, and general contractor: Crown American Corporation; structural engineer: Norman Alterman Company; fabricator: Claster Steel Company; erector: Kent Steel Company. Sheraton Inn's framework incorporates a total of 226 tons of Bethlehem structural steel. All of the structural steel framing is ASTM A36. The six floors of the \$2-million Sheraton Inn encompass 71,086 sq ft.



The five upper floors accommodate 135 guest rooms and suites. Each upper floor contains 13 single rooms and 12 double rooms typically measuring 12 by 24 ft.



Steel framing provided economy, erection speed, and early occupancy

The Sheraton Inn which recently opened in Johnstown, Pennsylvania, is a six-floor, steel-framed motel.

Originally the inn's framework was designed for precast concrete construction. But a switch was made to steel when a comparative framing analysis indicated that steel framing was more economical . . . and would permit completion of the framework more than one month before the alternate method.

Total time from start of design to delivery of the steel was eight weeks. A further saving in time was accomplished because the general contractor was able to complete all the underground site work—curbing, sidewalk, utilities—before the steel was delivered. This preliminary effort got the job "out of the mud" and enabled the builder to proceed with steel erection quickly with less lost time due to bad weather. The steel framework was erected in only 8 weeks.

Inn features enclosed swimming pool

The six floors of the Sheraton Inn encompass 71,086 sq ft. The structure was built at a total cost of \$2 million.

The ground floor measures approximately 100 by 223 ft. It includes a registration desk and spacious lobby, administrative offices, gift shop, dining room, cocktail lounge, banquet and meeting rooms, kitchen area and a laundry. An enclosed swimming pool features a sliding, vaulted skylight roof.

Major clear span area in the first floor is over the 1,050-sq-ft pool. The enclosure measures 45 by 74 ft. The next major span is over the largest of the four meeting rooms, which measures 36 by 64 ft. This room can be evenly divided by a movable partition.

The five upper floors accommodate 135 guest rooms and suites. Each contains 13 single rooms and 12 double rooms typically measuring 12 by 24 ft. The guest floors of the inn measure 60 by 178 ft. This area is framed by 15 bents typically 12½ ft apart with three 20-ft bays in each bent. Column spacings were dictated by room layouts and the use of existing footings which were already in place when the framing was changed to steel.

Framed with 226 tons of Bethlehem steel

The inn structure rises 58 ft, 8 in. above ground and is topped by a 20-ft-high elevator penthouse. Floor to floor height for the ground floor is 12 ft; the remaining five floors have a floor to floor height of 8 ft, 8 in.

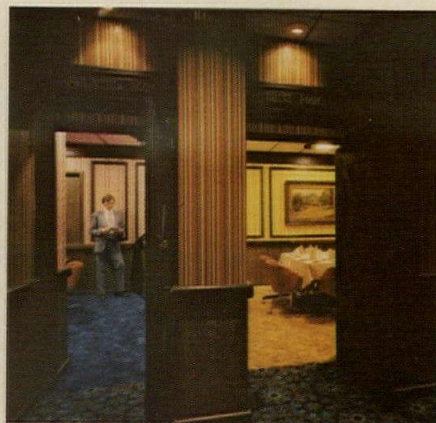
All of the steel framing is ASTM A36. Typical columns range from W10 x 54 to W8 x 17 sections. Typical girders are W8 x 28's and W8 x 17's. Wind struts are W6 x 15.5 members and pairs of 6-in. channels at the pipe chases. Spandrels are W12 x 19 sections. Floor construction is of 8-in.-deep precast, prestressed concrete planks spanning 20 ft and welded to the girders between each bent. All field connections are bolted with ASTM A325N bolts.

Whether you're thinking about a high-rise or a low-rise structure, steel gives you a lot for your dollar. Its speedy erection often means earlier occupancy. There is a Bethlehem sales engineer near you, or write: Bethlehem Steel Corporation, Bethlehem, PA 18016.

Bethlehem



Major clear span area in the first floor is over the pool. This enclosure measures 45 by 74 ft. The next major span is over the largest of the four meeting rooms, which measures 36 by 64 ft. This room can be evenly divided by a movable partition.

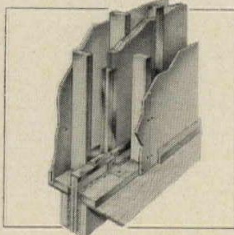


***New fire barrier wall system
obsoletes costly
“stone age” methods... fast!***



- Lighter weight assemblies add 8 to 16 sq. ft. of floor space per floor compared to bulky masonry barriers.*
- Deliver fire ratings up to 3 hours, sound ratings as high as 53 STC.

Now, USG® Cavity-type Area Separation Walls bring the same innovative thinking to townhouse fire barriers that revolutionized elevator shaft construction in America's tallest buildings. This totally new system outdates heavy, space-wasting masonry walls. Savings in materials, labor and in-place costs can be highly significant. Yet, you sacrifice nothing in superb performance. USG Cavity-type Area Separation Walls consist of steel T-studs and gypsum liner panels set in steel runners and faced both sides with SHEETROCK® W/R FIRECODE "C" Gypsum Panels. It all adds up to some substantial advantages: projects move along faster, scheduling is simplified, and tenants can take occupancy days sooner to trim your building loan costs.



USG Solid-type Area Separation Walls offer many of the cost-saving benefits built into our cavity-type walls. The major difference is in a solid wall assembly consisting of single-layer 5/8" face panels attached to 2x4 wood studs on each side of the solid fire barrier. They are fire-rated at 2 hours and sound rated at 50

STC. Get specifics on both separation wall systems from your U.S.G. Representative. Or write to us at 101 S. Wacker Drive, Chicago, Ill. 60606, Dept. AR-113.

*Based on 24' long walls

UNITED STATES GYPSUM 
BUILDING AMERICA

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Look ahead.

To shape, shadow line and color as you conceived them. To long service life and low maintenance costs. For now and for years from now. Alcoa® aluminum industrial building products.

What meets the eye

Formed aluminum industrial siding products with deep profiles for added strength (V-Beam) . . . profiles that blend texture and shadow line (Bold Rib I and II sheet and Box Beam) . . . profiles that combine function and economy (4-inch and 8-inch ribbed and corrugated sheet) . . . and special-purpose profiles (perforated corrugated and curved corrugated). Plus a roofing system that resists water leakage by eliminating through-fasteners (Snug Rib® roofing). All Alcoa industrial building products

can be finished in any of the 10 attractive colors of Alcoa Super Aluma-lure® finish, a baked-on, factory-applied, fluoropolymer enamel, rich in beauty and color integrity.

What doesn't

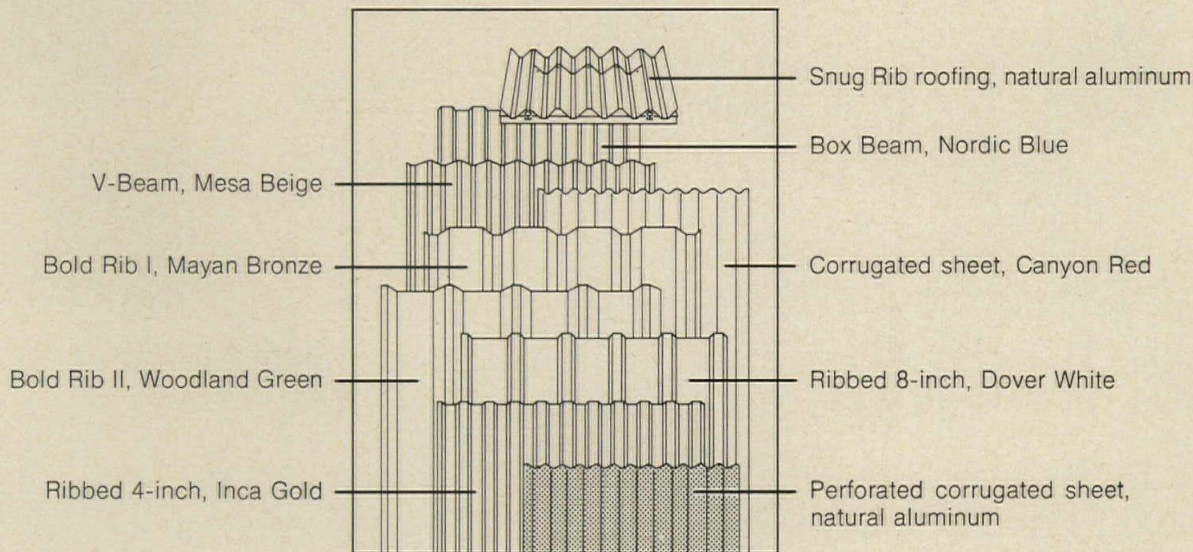
Aluminum's hidden advantages. Begin with the fact that aluminum takes care of itself *and* your budget. It resists corrosion by forming a protective film of aluminum oxide. So, unpainted aluminum is all some buildings need. However, if you want color, all the more reason to choose aluminum. It's the substrate that provides additional protection should the coating be scratched. The natural aluminum oxide film that forms, resists corrosion and discourages flaking or adhesion

loss, staining or streaking. Aluminum actually *helps* a coating last. It holds a finish beautifully.

And, the Super Aluma-lure finish is a long-lasting film that won't peel, flake or chip. Its fluoropolymer resin is tough, durable Kynar* that gives a high degree of protection from chemical attack and has a projected service life of more than 20 years, based on exposure and weathering tests.

For complete information on our commercial and industrial building products, see *Sweet's Architectural or Industrial* files. Or write Aluminum Company of America, 1130-L Alcoa Building, Pittsburgh, Pa. 15219.

*Trademark of Pennwalt Corporation

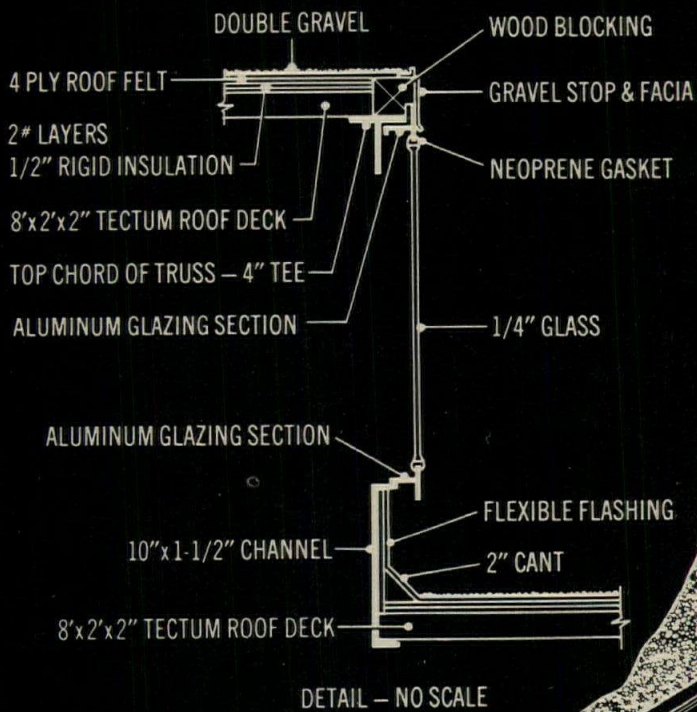


Change for the better with
Alcoa Aluminum



For more data, circle 8 on inquiry card

Tectum: decorative, insulating,



At Gund Hall, Harvard's Graduate School of Design, Tectum was used as a structural roof deck and exposed ceiling in this unique and distinctive canopy of glass and steel. Toronto architect John Andrews specified 2" thick Tectum to span the translucent roof truss enclosures and develop a thin profile for the stepped roof section. The detail shows how this section was constructed. In the open central studio space under the canopy, Tectum's sound absorption is an important factor. Its NRC is in the .50-.60 range.

SEE DETAIL ABOVE

10"x1-1/2" CHANNEL

8'x2'x2" TECTUM PLANKS

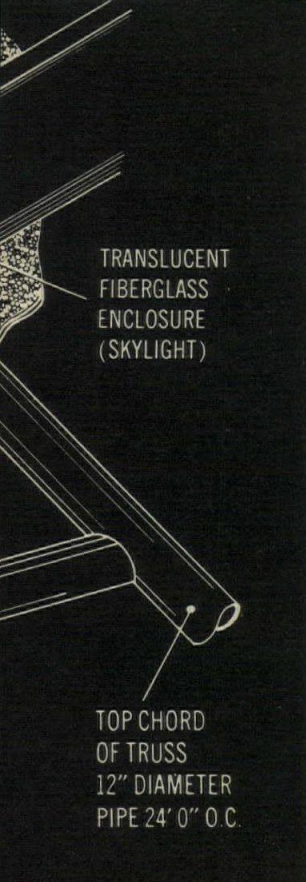
#218 BULB TEES 24" O.C.

structural, acoustical, non-combustible.



Gund Hall Graduate School of Design, Harvard University, Cambridge, Mass.
Architects: John Andrews, Edward R. Baldwin and John Simpson, Toronto.
Structural Engineers: Le Messurier Associates, Boston.
Tectum Contractor: Bay State Structural Specialties, Boston.

Texture is the thing about Tectum, but not the only thing.



There's no end to the ways you can be constructive with Tectum Roof Deck. Look at the way it was used in Gund Hall, shown at left. As a structural material, Tectum gives the roof a thin, efficient section, and demonstrates impressive insulating values as well. In the two-inch thickness, resistance to heat transmission is 3.50. With its Noise Reduction Coefficient in the .50-.60 range, it soaks up sound. And with its rugged finish, Tectum looks good exposed.

The reason Tectum is so constructive is because of the way it's put together. An exclusive inorganic binder bonds long wood fibers into a compact sheet under heat and pressure. Like wood, it's easy to cut, shape and install. Unlike wood, it's rated noncombustible and Tectum has been given an uplift rating of Class 90.

Long Span Tectum Roof Deck

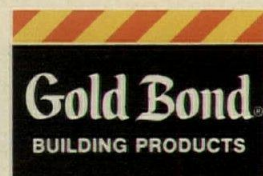
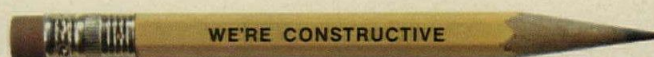
Tectum is also available in Long Span

Tectum. This adaptation allows even greater areas of the exposed Tectum surface to remain unbroken by purlins. Tongue and groove edge of Long Span Tectum is designed for galvanized 16-gauge steel channels. These channels permit spans of up to 6' for 3", 5' for 2½", and 4' for 2" thick Long Span Tectum.

Like other Tectum Roof Deck, Long Span Tectum has factory-applied asphalt felt membrane, and is applicable to flat or pitched roofs with steel, wood or concrete framing.

So, for a good-looking way to cut roofing costs, why not cut down on the number of materials you use? With Tectum, or Long Span Tectum.

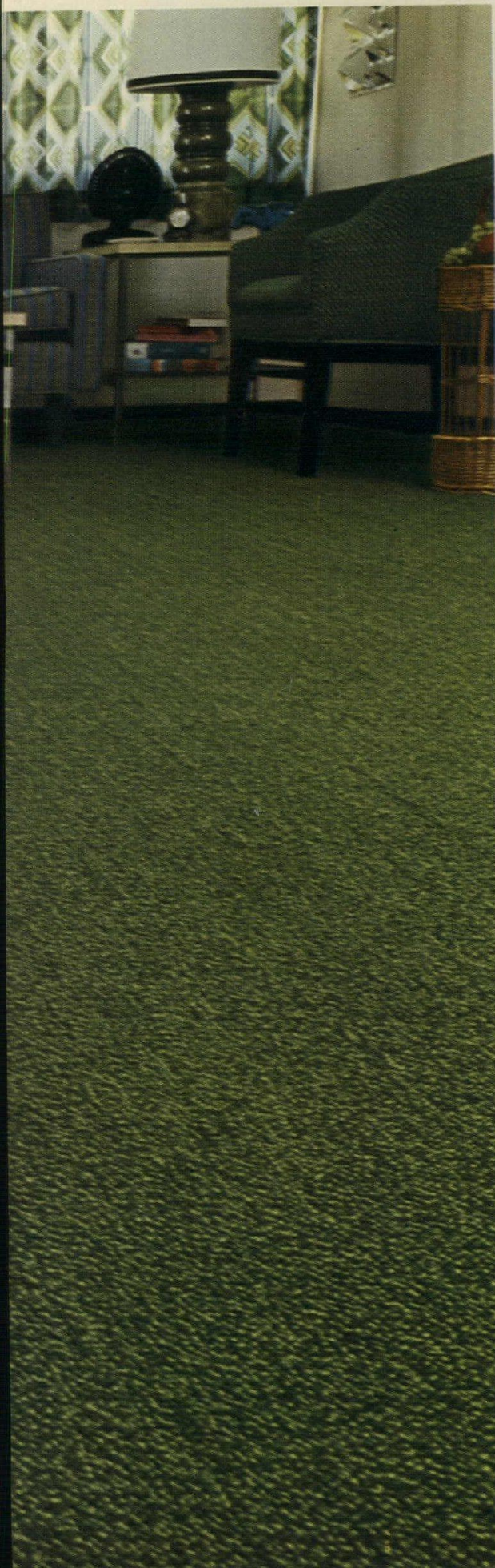
For more information, write Gold Bond Building Products, Division of National Gypsum Company, Dept. AR-113T, Buffalo, New York 14225.



Antron® makes carpet



practical in USC apartments.



When the University of Southern California at Los Angeles planned the flooring for its new 14-story, 110-unit Apartment Tower Residence, practicality was one of the important considerations.

Floors in the apartments and hallways would be subject to heavy student traffic. Trunks, color TVs, even pianos would be moved in and out regularly. At the same time, softness was desirable, as was preservation of a feeling of newness and freshness.

Cannell & Chaffin, retained by the University as interior design consultants for the new building, recommended a low-profile carpet with pile of Antron* nylon. They based their choice on the wearing qualities and soil-hiding ability of "Antron".

The unique hollow filament structure of "Antron" optically screens out most of the appearance of soil. Instead of appearing as spots, soil concentrations tend to blend in with the overall color and texture of the carpet.

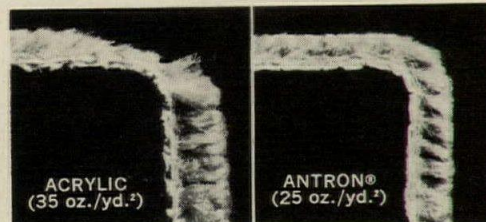
This together with the fiber's exceptional durability (see stair-edge test), and resiliency, gives carpet of "Antron" a fresh look that lasts.

Furthermore, maintenance costs are reduced by the need for fewer wet cleanings than with carpets of other fibers.

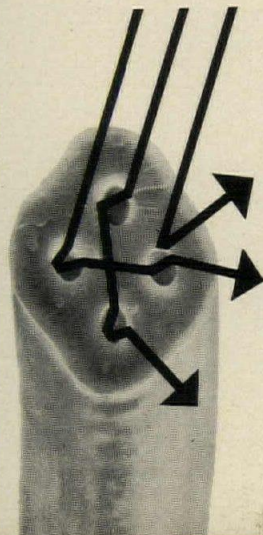
Wherever you want good-looking, tough-wearing commercial carpet, specify "Antron". It has no equal in long-term appearance retention.

For further information and a list of mill resources, write: Du Pont, Contract Specialists, Room 109AR, Centre Road Building, Wilmington, Del. 19898.

For more data, circle 10 on inquiry card



Abrasion test on simulated stair-edges shows pile wear in level-loop carpets after equal exposure.



How "Antron" hides soil. Its filament structure is unique, as shown in this magnified (650X) cross section. The four precisely-placed hollow cores scatter light like the facets of a diamond to minimize the dulling effect of soil, while helping to retain color clarity and luster.

*Du Pont registered trademark. Du Pont makes fibers, not carpets.

How to multiply your draftsmen's time.



Shortcuts from Kodak turn drafting hours into minutes—on job after job.

Routine redrawing chores take a lot of valuable board time. Kodak can show your draftsmen how to restore drawings, make revisions, and handle repetitive elements—without redrawing. You'll save hours of drafting time and save money, too.

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There are other ways that Kodak can help multiply your draftsmen's efficiency. Microfilming your drawings will make them more accessible, save filing space, provide security, and give you other benefits, too.

Get the details.

For additional information write: Eastman Kodak Company, Business Systems Markets Division, Dept. DP902, Rochester, N.Y. 14650.

Kodak products for drawing reproduction.



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Kaiser KW-500 movable wall system

A great advance in interior beauty, form and function.

Simple as a, b, c—

a—Lift hooks to 90-degree angle.

b—Twist stud into place.

c—Engage panel hooks into slotted studs.

Planners for the twin 110-story World Trade Center towers in New York and the Atlantic-Richfield Plaza in Los Angeles designated the KW-500 as the building standard for interior partitions in their projects.

So, you'll be in good company when you specify the modular KW-500 system.

Installation speed, interior space flexibility, and economy are big reasons for its wide acceptance in nearly all types of buildings throughout the country.

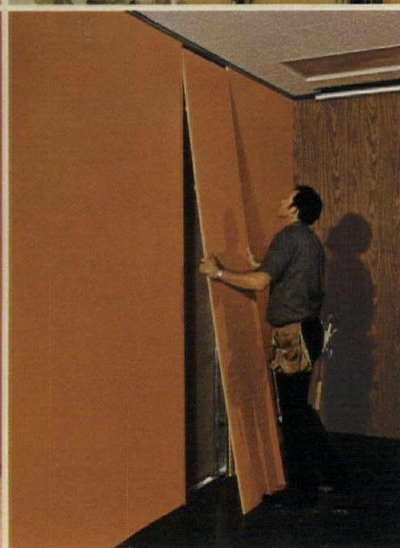
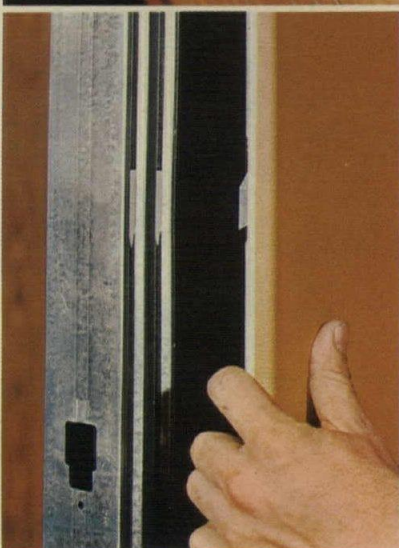
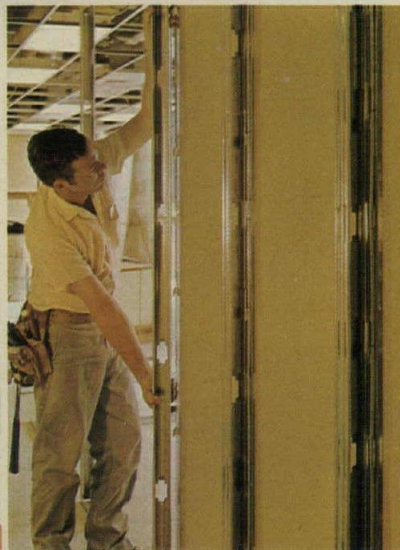
Performance? Excellent sound control—up to 46 STC. Can be rated for one-hour fire resistive construction.

Finishes? Choice of over 30 beautiful, durable, maintenance-free vinyl colors and patterns; vinyl tackboard panels; and porcelain-enamel steel chalkboard panels in a variety of colors.

Construction? Erects to bank-rail, cornice or full height partition—up to 12 feet. Panels come in 24, 30, and 48-inch widths.

Movability? As the photos show, KW-500 employs a unique "hook-on" fastening method for applying the panels to studs. It's a fastening concept requiring no screws. Each panel is quickly and individually removable. You can interchange panels. You can even demount the entire system to meet changing space needs or to suit special tenant requirements.

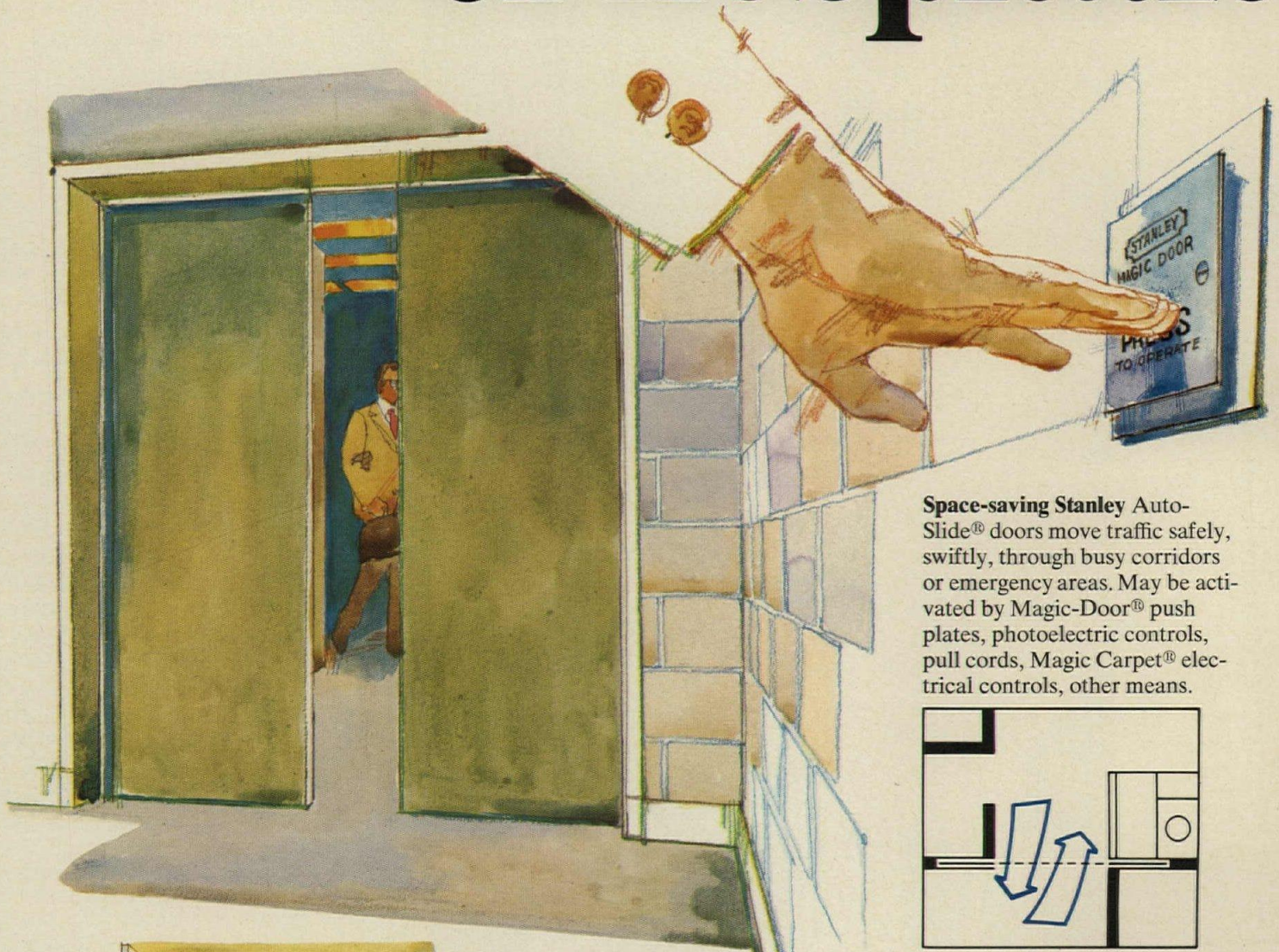
Architectural details? See the Kaiser KW-500 in Sweet's Architectural File. Or, let us hear from you. Five minute KW-500 film demonstration arranged on request. Write: Kaiser Gypsum Company, Inc., KB 1114, Kaiser Center, 300 Lakeside Dr., Oakland, California 94604.



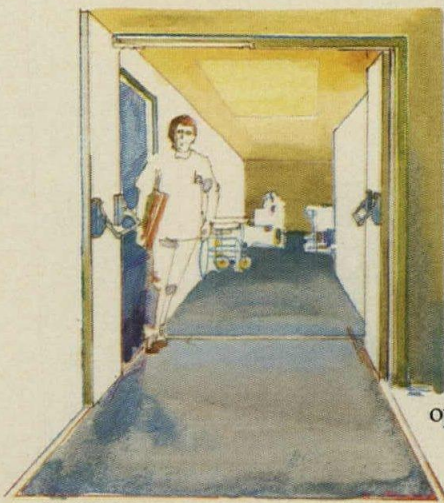
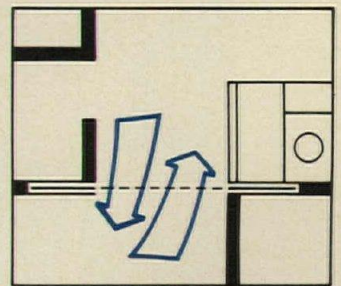
**KAISER
GYPSUM**

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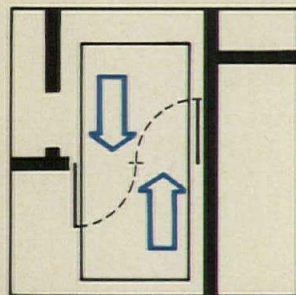
No one knows of hospitals



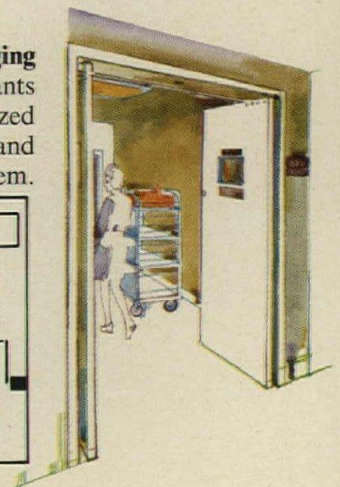
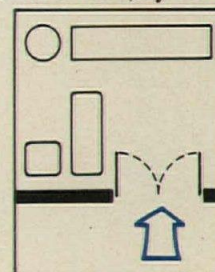
Space-saving Stanley Auto-Slide® doors move traffic safely, swiftly, through busy corridors or emergency areas. May be activated by Magic-Door® push plates, photoelectric controls, pull cords, Magic Carpet® electrical controls, other means.



Stanley's unique, new Double Egress Fire Door normally opens, closes automatically. In case of fire or smoke, it shuts automatically, can only be manually opened.

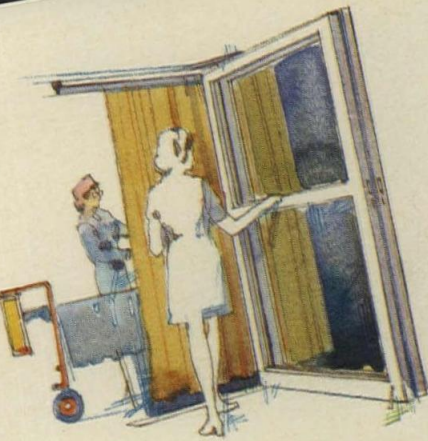


Automatic swinging doors help restrict contaminants from vital areas in a mechanized SPD (supply, processing and distribution) system.

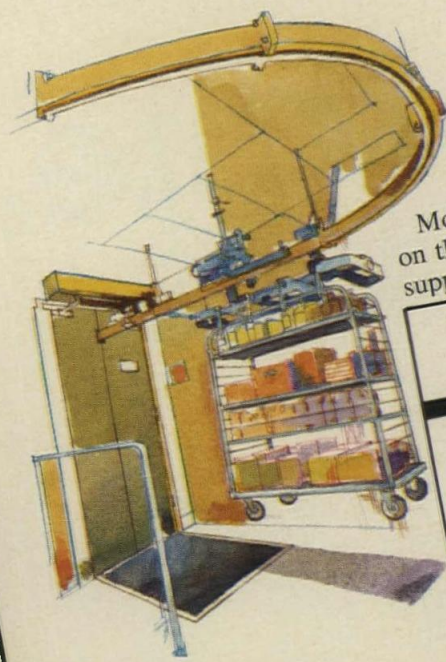
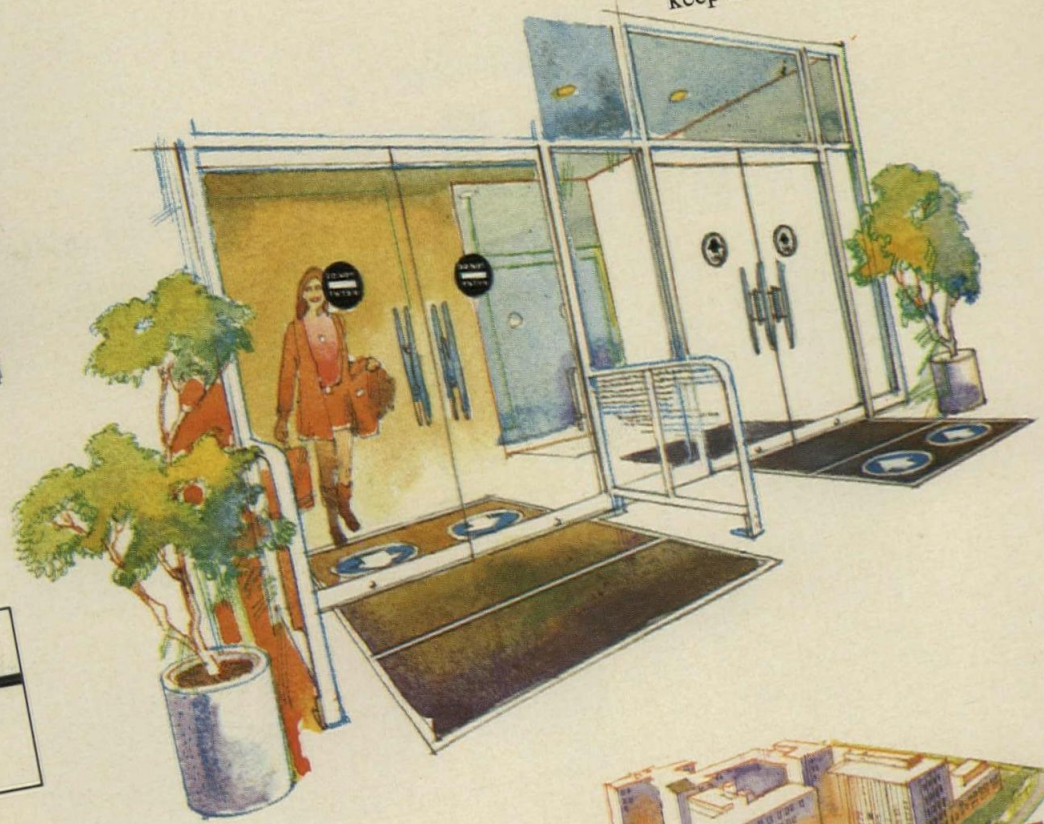
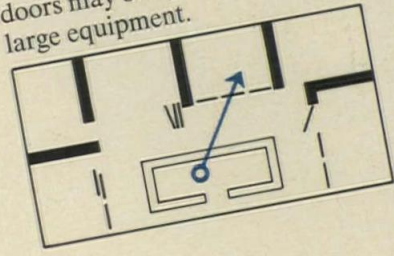


...e ins and outs ...ke Stanley.

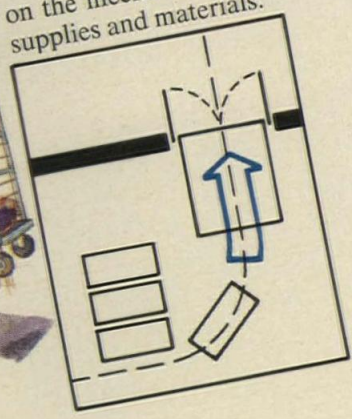
Efficient, practical, inviting — Stanley automatic entrances welcome patients, visitors, keep traffic flowing.



For intensive care and coronary care units — Stanley's versatile manual sliding door. Can also swing open. Or entire wall of doors may be opened to move large equipment.



Trouble-free Stanley doors play an integral role in Automatic Cart Transportation Systems. More and more hospitals rely on the mechanical handling of supplies and materials.



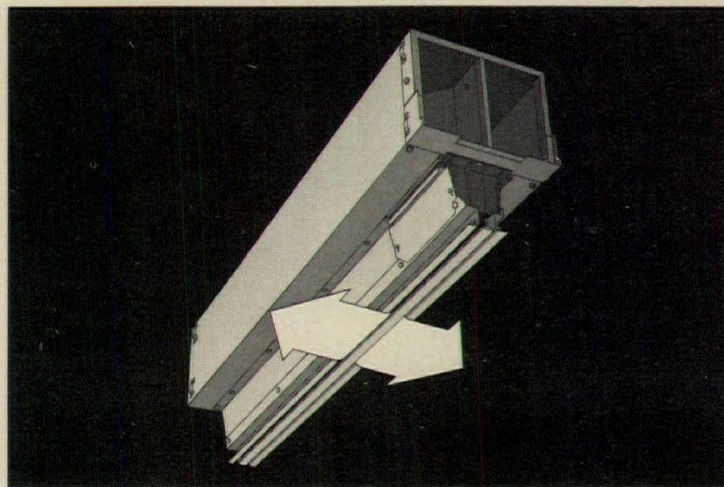
Mercy Hospital's McAuley Building, Buffalo, N.Y., has 68 automatic doors. All by the Stanley Magic-Door people, world leader in quality automated doors.

STANLEY[®]
helps you do things right

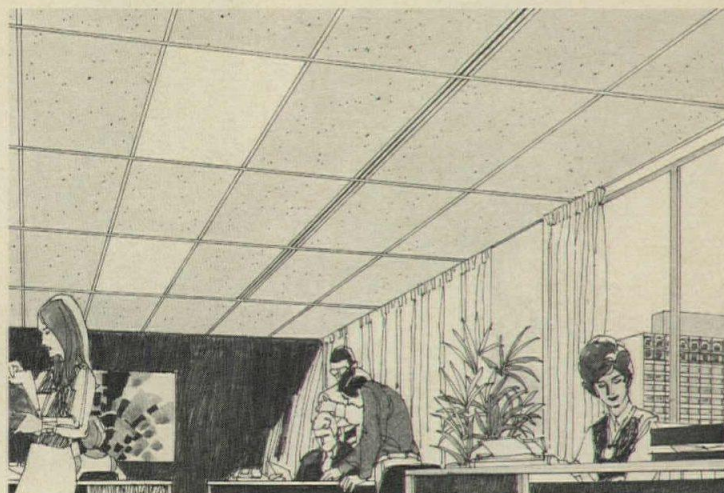
Stanley Door Operating Equipment, Division of
The Stanley Works, Farmington, Conn. 06032

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Cools, heats,



and hides.



At the same time.

Save the space under your windows with Carrier's split-plenum Moduline® System in your ceilings. The new 37AD.

It's a unique two-in-one diffuser unit for perimeter comfort. Cools out of one side (into the interior). Heats out of the other (toward the windows). And does both at once, through a mere 3"-wide outlet.

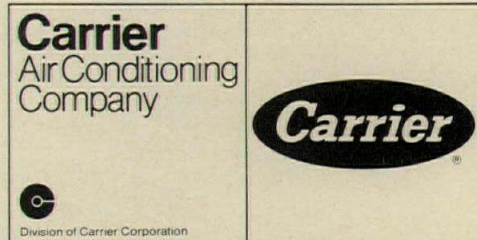
Like all Carrier Moduline Systems, the 37AD's controls are

self-contained. Without wiring. They're built right into the unit. Simply snap in or out to adjust to partition changes. Eliminates a lot of costly changes. Adds a lot of convenience.

All Moduline controls cool and heat only when needed, too. Save energy in the process.

Plan on the freedom of an all-Moduline System all over your next building with a Carrier representative. Or write us.

Carrier Air Conditioning Company,
Syracuse, N.Y. 13201.

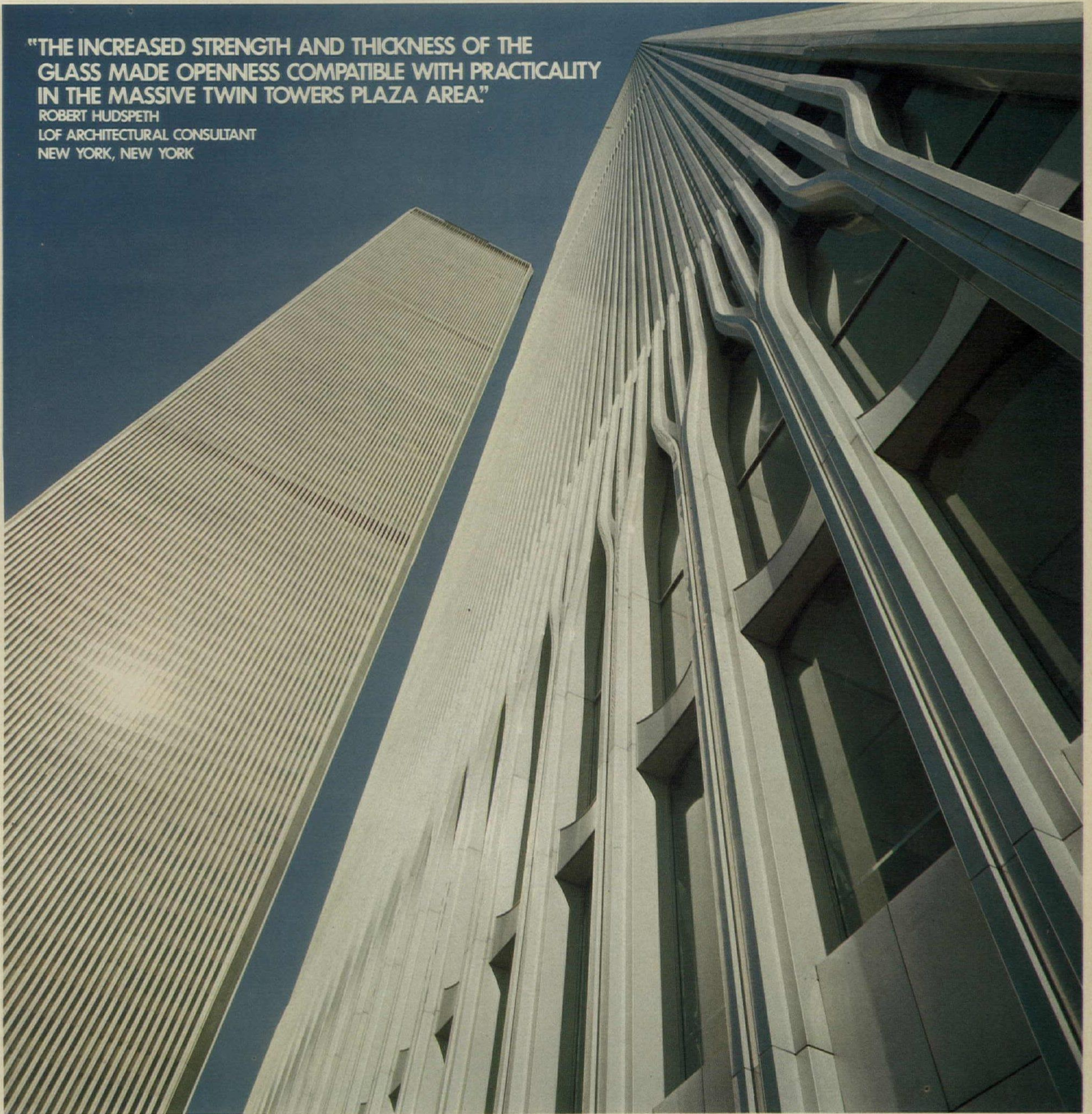


NO. 1 AIR CONDITIONING MAKER

HEAVY-DUTY GLAZING MEETS NEW CHALLENGES IN THE WORLD TRADE CENTER.

"THE INCREASED STRENGTH AND THICKNESS OF THE GLASS MADE OPENNESS COMPATIBLE WITH PRACTICALITY IN THE MASSIVE TWIN TOWERS PLAZA AREA."

ROBERT HUDSPETH
LOF ARCHITECTURAL CONSULTANT
NEW YORK, NEW YORK



LOF

FROM HEAVY-DUTY STRENGTH EM

The architects of these twin 110-story skyscrapers refused to sacrifice openness for solidity or humanity for monumentality. As a result, the World Trade Center is meaningful in its advancement of architectural technology—in fact, because of its design, whole new technologies had to be developed before construction could begin.

The large cathedral-like modules of the 70-foot-high lobbies necessitated the use of LOF Heavy-Duty glass in 7' x 18' lights. The thicknesses here at street level, from $\frac{3}{4}$ " to $\frac{5}{8}$ ", not only make such expanses possible, but reduce sound transmission and resist wind loads.

The glass in the upper floors is $\frac{1}{4}$ " bronze Tuf-flex®, a tempered glare-reducing glass that lowers air-conditioning requirements.

Total amount of glass in the buildings? A half-million square feet or 43,600 windows... a view for nearly every person who will work in the center.

All of it, we're proud to say, from LOF—with uniformity and strength that can be adapted to modern designs.

World Trade Center, New York: Built and operated by the Port Authority of New York and New Jersey

Architects: Minoru Yamasaki and Associates, and Emery Roth and Sons

General Contractor Agent: Tishman Realty and Construction Co., Inc.

Curtain Wall System: Alcoa

Glazing Contractor: Collyer-Sparks Company, Inc.

LOF



ERGES A CRYSTALLINE ELEGANCE.



LOF GLASS MEANS SPARKLING NEW DESIGN POTENTIAL.

"FOR THE MICHIGAN CONSOLIDATED
GAS COMPANY BUILDING,
HEAVY-DUTY GLAZING
ENHANCES THE VERTICAL
OPEN LOOK."
LOWELL RAGER
LOF ARCHITECTURAL REPRESENTATIVE

Heavy-duty glazing gives a feeling of spaciousness to the Michigan Consolidated Gas Company headquarters on Detroit's riverfront. The wide-open spaces of the lobby bring in vistas of the park-like Civic Center and boats on the river.

Our 1/2" Heavy-Duty glass was utilized with tension mullions in the floor to make this dramatic expanse of glass possible.

An LOF architectural representative can help you solve glazing problems in your next project to achieve the design you have in mind.

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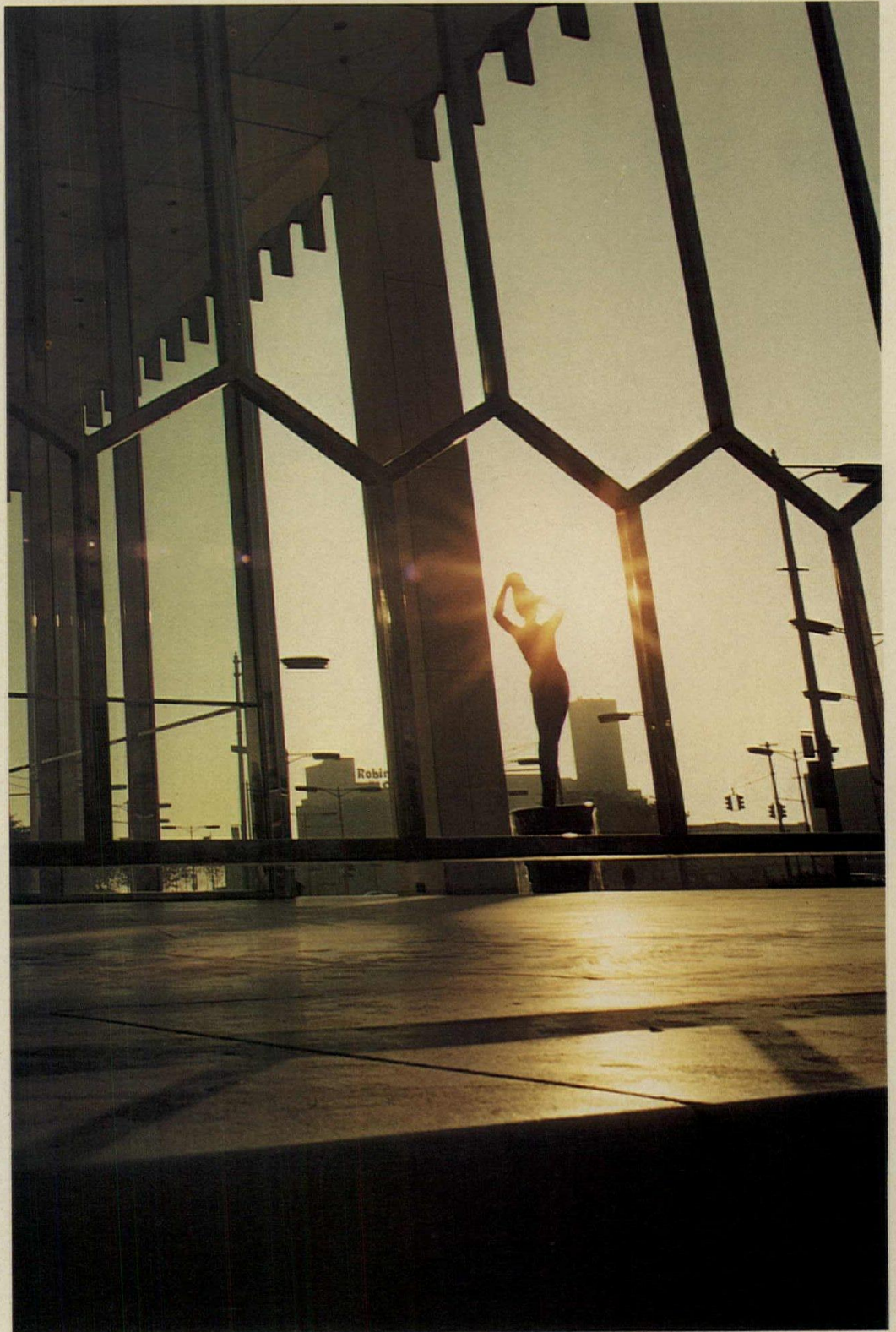
Michigan Consolidated Gas Company, Detroit, Michigan

Architect: Minoru Yamasaki

Associated Architects: Smith, Hinchman, Grylls

Glazing Contractor: Cadillac Glass Company

LOF



For more data, circle 14 on inquiry card

The F. W. Dodge construction outlook for 1974 predicts the value of contracts will surpass \$100 billion, a major milestone according to George A. Christie, vice president and chief economist, McGraw-Hill Information Systems Company. For the full report, see Architectural Business page 65.

Repercussions over alleged political kickbacks, culminating in the Vice President's resignation, continue. For example:

- Omaha, Nebraska will no longer negotiate contracts with architects and engineers, but will require competitive bidding. Mayor Edward Zorinsky also said the city will stop accepting free work from engineering firms for preliminary studies on proposed projects.
- A public commission suggested by the AIA to study methods of procuring professional design services has been established in Maryland. Named to that commission by Governor Marvin Mandel are architects John W. McLeod, Bethesda, Maryland, and Jack D. Train, Chicago. The Governor has requested that panel recommendations be submitted by December 1, in preparation for the 1974 session of the state assembly. Details on page 34.
- The NSPE is calling for national reform of campaign financing. NSPE president Robert L. Reitingier said the 70,000-person organization has for some time been seeking state enactment of legislation giving state engineering registration boards the right to adopt rules of professional conduct that would bar any kind of payment to secure engineering contracts. With only five or six states having tough registration laws enforcing design professional conduct, the NSPE has established a task force to review the whole question of political involvement in awarding engineering contracts. The task force will offer specific legislation.

An interdisciplinary coalition on National Growth Policy has been established, and is expected to stimulate interest in the AIA project to find answers to the problems of urban growth up to the year 2000. Essentially, the task force report on growth asserts that the building and rebuilding of American communities should be planned and implemented at neighborhood scale, through construction of growth units comprising from 500 to 3000 residential units. In forming the coalition with contractors, planners, engineers and homebuilders among others, the AIA hopes to carry the program into national prominence.

Congress has defeated a proposal to create a National Institute of Building Standards, which had been sought to develop building performance criteria that would ease the way for proven innovative materials and processes. Such an organization, according to the bill's supporters, could accelerate development, testing and approval of new materials and methods which would help stem rising construction costs. Representative H. R. Gross (R-Ia.) was one of the key opponents. It is doubtful the measure will be brought up again this year.

A five per cent increase in construction put in place, 1974 over 1973, is a Federal prediction expected to be published in the Commerce Department's industrial outlook, which estimates new construction next year will reach a value of \$136.4 billion compared with an estimated \$123.8 billion for this year. Housing starts next year will number almost 1.9 million units, according to Federal calculations.

Senator William Proxmire has again tried to force resumption of suspended housing programs. The Democrat from Wisconsin introduced a bill in Congress which would direct HUD and the Farmers Home Administration to carry on their present programs until alternatives are in place. Presidential veto of the measure, should it pass the Congress, would be almost certain.

The field has narrowed to three firms. one to be selected, to manage a \$5 billion construction program for the U.S. Postal Service. For details on the selection of a firm to win the \$20 million annual fee, see page 34.

January 15, 1974 is the deadline for submitting applications for urban design and planning assistance, to be offered under a program sponsored by the National Endowment for the Arts. Available to individuals and non-profit organizations, the "City Options" program will provide matching funds for proposals that concentrate on those special settings within a city that provides distinctive character and identity. For more information, write to Architecture & Environmental Arts, National Endowment for the Arts, Washington, D. C. 20506.

December 31, 1973 is the deadline for submitting entries in the AIA Library Buildings Award Program. Library buildings designed by registered architects practicing in the United States, and completed after January 1, 1973 are eligible. For more information, contact the AIA, 1735 New York Avenue N. W., Washington, D. C. 20006.

Applications will be available until December 31, 1973 for the \$10,000 Brunner Scholarship Award, sponsored by the New York Chapter, AIA. The award is open to any U.S. citizen engaged in the profession of architecture, and is for study. The award will be presented June 3, 1974. Also, a traveling fellowship of \$5,000 is open to anyone with at least 1½ years of architectural office experience, 23 to 30 years of age and a U. S. citizen. Requests for forms will be accepted after December 1. For more information on either of these grants, write: New York Chapter, American Institute of Architects, 20 West 40th Street, New York, N.Y. 10018.

AIA board acts on political contributions

The board of directors of the American Institute of Architects has ordered an immediate publicity program to tell of its recent actions relating to problems of political campaign contributions.

The Institute directors had before them a thorough report on the subject presented by the Task Force on Political Contributions and accepted the findings and recommendations, adding that an aggressive public relations program should be initiated to inform the media and the public on the policy and measures for its implementation that were adopted. The board further ordered that the initiatives the Institute has taken in Maryland to work toward a better A/E selection process should be studied for application of their benefits in other states.

(Reference here was to AIA's proposal, accepted by Maryland's Governor Marvin Mandel, that the governor appoint a public blue-ribbon panel to develop alternatives to present methods of selecting design professionals.)

The board also approved a set of recommended guidelines for members wishing to make political contributions. These dealt with Section 8 of the organization's ethical practice standards. Making minor changes, they did re-emphasize (and more specifically) the architect's right to participate in the political process by contributing to the candidate of his choice. The motives for such fund-giving are spelled out clearly.

The board added this paragraph to the standard:

"The architect has the right to participate in the political process, to contribute time and money to political campaign and to attempt to influence legislation, executive decisions and appointments. However, the architect shall not contribute, or promise to contribute, either directly or indirectly, any gift or other consideration for present, past, or future award of professional work."

One important change was made in guideline number four, dealing with Institute airing of charges by members who feel they have been denied professional work because they refused to make contributions. Stricken from the paragraph was the wording: "Upon verification, the Institute shall bring the matter to the attention of the proper civil authorities, and if appropriate, to public attention." That section now reads:

"An architect who believes

that he has been denied professional work because of his refusal to contribute to a political activity or entity has a professional responsibility to report such circumstances to the Institute and such other authorities as are appropriate."

The Task Force report endorsed is a result of almost 10 months study of the complexities and problems involved with the present political contribution system throughout the country. The board members had before them many examples of the problems the profession has faced at state and local levels. The group concluded that the award of design contracts and contingent difficulties highlighted in recent months and culminating with submission of Vice President Agnew's case to a grand jury, have been far more prevalent at state and local levels.

Federal law, the report said, cannot solve the problem *per se*. Limiting or pooling contributions of architects through an Institute mandate would surely raise constitutional questions. Working through state registration boards could have serious "enforcement and evidentiary" problems, it was decided, and many boards do not now have the power to go this route.

It was decided that AIA members should encourage their state registration boards to adopt rules and regulations prohibiting abuses of both the political process and specific procurement procedures.

Noting that the recent problems, magnified as they have been by wide publicity, give rise to arguments for competitive bidding as a solution, the report considered it "most important" that the profession be able to take the initiative and suggest an open designer selection process that will not only ensure non-political choices, but will also ensure high-quality services and products. It further mentions that implementing legislation to create a designer-selection board will be slow but indicates the desirability of coordinated efforts in this direction.

The board decided to charge its Commission on Government Affairs with providing guidelines and assistance to AIA components to establish a non-political selection process (designer-selection board) at both state and municipal levels. Next year's grassroots meetings in January were suggested as good forums for airing examples and discussing the whole problem.



Major buildings open in New York, Texas

Police from London, Tokyo, Milan, Frankfurt, Madrid, Rome, Athens and other foreign cities joined New York's finest last month in a two-day celebration marking the official opening of the new \$58 million New York City police headquarters in lower Manhattan. (Description of the building is on page 37.)

Designed by Gruzen & Partners, the 10-story building replaces a Renaissance Revival headquarters which opened in 1909. The new building's design team consisted of Peter Samton (left) and Jordan Gruzen

(center), shown with the project's landscape architect M. Paul Friedberg (right). Not shown is design team member Charles Silverman.

Highlight of the opening festivities was the traditional ribbon-cutting, presided over by then-United States Attorney General Elliot Richardson.

Also dedicated last month was the first phase of the \$700 million Dallas/Fort Worth airport, reputed to be the world's largest.

The jumbo jetport, located midway between Dallas and Fort Worth, occupies more than 27 square miles, an area larger than Manhattan. Initially, four terminal half-loop structures, with 66 passenger gates, will be in operation January 13, and are expected to serve 8 million passengers in the first year. Ultimately, more than 230 gates will be available in 13 half-loop buildings, accommodating an estimated 100,000 passengers daily by the year 2001.

The facility was planned and designed by a joint venture team of Hellmuth, Obata & Kassabaum, with Gyo Obata, principal-in-charge of design; and Brodsky, Hopf & Adler, with Richard M. Adler, principal-in-charge of administration. (See Airports, page 135).

Maryland sets up procurement study commission

The State of Maryland, hotbed of bribery and kickback charges related to design and contracting of public works and reaching as high as the Vice-President of the United States, has followed American Institute of Architects suggestions for a new commission to study methods of procuring design services.

Governor Marvin Mandel named the public body recommended by AIA, selecting two fellows of the Institute as well as leaders from the two engineering organizations—National Society of Professional Engineers and the American Consulting Engineers Council. There are 11 members in all and they are expected to submit recommendations to Mandel's office by December 1.

The naming and functioning of this group is of special significance for the AIA since its board of directors has just determined that "the initiatives" taken in Maryland in connection with the study of A/E selection processes should be studied by the Institute for appropriate application in other states.

Part of the intense interest in the Maryland situation focuses on moves in the legislature to correct conditions contributing to an atmosphere in

which political contributions to influence A/E selection apparently abound. The AIA Task Force on Political Contributions reports to the board of directors that as a result of the kickback allegations, legislation has been prepared which would require competitive bidding. Other proposals call for the state's contracts to be awarded by a designer-selection board.

As the AIA Task Force notes: "The outcome is still very uncertain. However, because a national political figure is involved, its ultimate determination will have the widest national implications."

Governor Mandel, in announcing the new advisory group, said it would review the method of awarding non-competitive contracts and submit its recommendations by December 1, so he could prepare legislation, if needed, for the general assembly which convenes in January.

Named to the commission were architects John W. McLeod and Jack D. Train. Also: Dr. Abel Wolman, PE; Harry C. Simrall, PE; Leslie C. Gates, PE; Billy T. Sumner, PE; George R. Lewis, Harry R. Hughes, Edmond R. Rovner, Robert R. Nathan; and Joseph Mur-nane.

Industry's architects meet in Washington

More than 70 architects in industry, those who work in large corporations with construction activity requiring design resources, convened at the Washington headquarters of the American Institute of Architects in September for their second annual Seminar for Architects in Industry.

As members of the Institute their expressed concerns ran to their status within the organization as well as to their standing in the professional world outside. They appear to be much encouraged that the Institute has created a new Committee of Architects in Industry to become operative next year; it will function separately from the older Committee on Architecture for Commerce and Industry which, it was felt by many of these industry practitioners, had diluted their representation in Institute affairs.

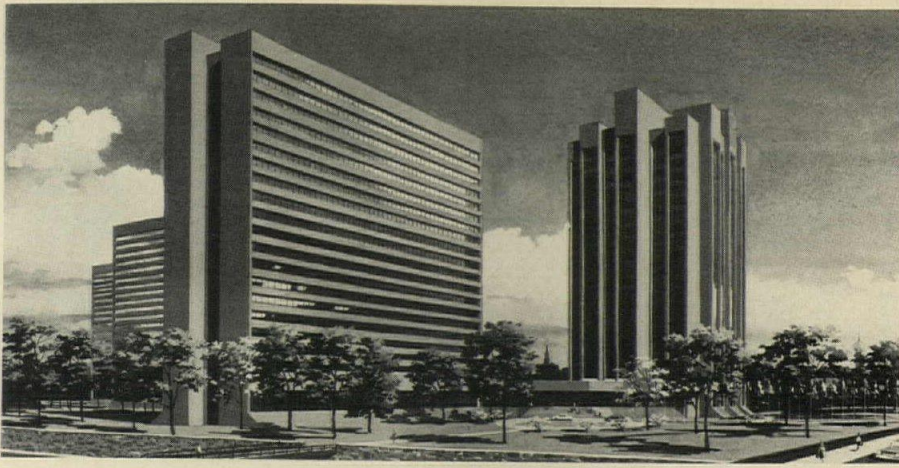
If the delegates needed any further assurance that they were now becoming full members of the AIA team, they received it from Institute president S. Scott Ferebee, Jr., who addressed their annual dinner. He noted that the situation was changing rapidly, with the first step being establishment two years ago of a new fellowship category, Achievement in Government and Industry. Then the seminars began, and now AIA's 1974 program and budget calls for the new Committee of Architects in Industry separate from the CACI.

The demands by clients for better management and control of their projects, Ferebee feels, is the principal pressure leading to change and experimentation with the practice.

He urged the architects in industry to give their fellow AIA members their invaluable insights into the owner's concerns and possible solutions for them.

Ferebee has proposed to AIA directors that they establish a blue ribbon task force, on a par with the Institute's National Policy Task Force, to study and propose creative new approaches to practicing architecture; ideas that "will deal head on with the client and public pressures that are upon us." He proposes that it have client representation as well as assure it will come up with "meaningful results."

Finally, Ferebee called for support in combating moves to legislate forced competitive bidding in opposition to concepts outlined in the Brooks Bill. The profession needs help in defeating proposals that will change the present law.



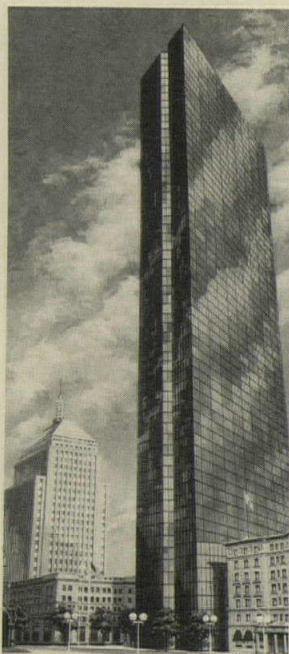
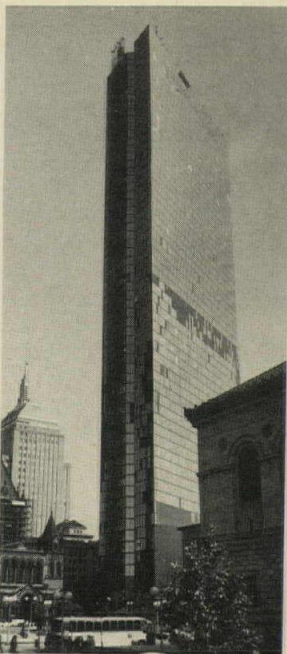
International trade center for Moscow designed in U.S.

The U.S.S.R. Chamber of Commerce and Industry, with the participation of the Moscow City Council, and Occidental Petroleum Corporation have formally signed an agreement concerning construction of a \$110 million International Trade Center in the central part of Moscow. It will have office space for 400 foreign firms, living quarters for their employees, a first-class hotel of 600 rooms, an exhibit hall, theater-concert hall and facilities for business conferences, as well as for the news media.

Design and supervision of the 1,700,000-sq ft complex will be handled by Occidental Petroleum Corporation and Bechtel-Garrett Company, a joint venture company formed by Occidental's wholly-owned subsidiary, Garrett Research & Development Company and the Bechtel Corporation. Ground will be broken in spring 1974.

The buildings will be designed for reinforced concrete with exterior of stone and recessed windows framed in bronze aluminum. A mall will be the linking element of the Center and will provide an enclosed, climate-controlled street with access to all buildings, restaurants, stores, etc. There will also be covered parking. The site is along the Moscow River adjacent to a Soviet-built exhibition hall.

John Hancock Tower windows will be reglazed



A solution to problems involving the windows of John Hancock Tower in Boston has been recommended by the architects, I. M. Pei & Partners, and accepted by the company, subject to the outcome of tests involving this proposed action.

The solution calls for reglazing the 10,300 windows in the tower with 1/2-in. thick reflective tempered glass, which is a high-strength monolithic glass of a different type from the insulating glass units originally used. Henry N. Cobb, principal architect of the tower, said the replacement glass will provide maximum safety and comfort and will not alter the appearance of the building.

To date, more than 3,500 insulating glass units have been removed and temporarily replaced with plywood. Occupancy is planned for next September.

American Gas Association announces design tool for conserving energy

Engineers and architects are designing energy conserving systems for new buildings utilizing a computer program now available on a nationwide basis.

ECUBE (Energy Conservation Using Better Engineering), is an integrated series of energy analysis computer programs providing an efficient tool to energy decision-makers during the early stages of building construction planning. It enables selection of the best possible energy system for each re-

quired use in a commercial or industrial installation.

The ECUBE program sponsored by the American Gas Association provides three essential sets of basic statistics—energy requirements; equipment selection and energy consumption; and economic comparison among systems.

F. Donald Hart, president of The American Gas Association, stated that "Just as ECUBE enables the architect and engineers to study the effects of

different design treatments on energy use in the early planning stages so too can properly trained utility people assist plant managers and building owners in realistic evaluation of proposed conservation measures. The potential for reduced energy consumption during the life cycle of a large building, approximately 50 years, is estimated as high as 50 per cent."

The ECUBE program is offered by Control Data Corporation.

States reacting to growth crisis

Land use policy, zoning, and growth control may soon be a prime function of state governments in many U.S. states. So said participants in a recent "managed growth" conference sponsored by the Urban Research Corporation in Chicago.

The states are reacting to a growth crisis that, according to American pollster George Gallup, has more than one-third of the inhabitants of the nation's largest cities saying that they are dissatisfied with the quality of life.

Fred Bosselman, partner, Ross, Hardies, O'Keefe, Babcock and Parsons said that Hawaii, Vermont, California, and Florida have all been taking measures to control growth, stop land speculation, and monitor all land development.

Bosselman said Vermont is working hard to implement a state-controlled permit system to control most major development, and stop land speculators: "The state is now in the middle of outlining the various factors that will be considered by environmental commissions in implementing their growth management plans," said Bosselman. In the years to come the state may go even further to a "Map Plan" based on controversial state zoning.

Bosselman claimed that former growth champ Florida has also embarked on a plan to "winnow out major development decisions and get the state involved, leaving only small developments to local authority."

John W. Abbott, executive secretary and editor of *California Tomorrow* said that California too is considering the state-controlled approach to land use planning.

According to Robert Cahn, environmental editor for *The Christian Science Monitor* and former member of the President's Council on Environmental Quality, the states are operating without much Federal guidance in developing their managed growth programs. "Since (Patrick) Monyhian left there has been no urban expert on the White House staff" said Cahn. "There's very little evidence that anything is happening in Washington on the development of a national growth policy."

Others at the conference said that, despite the lack of Federal encouragement state legislatures in many parts of the U.S. were "grabbing back their land-use prerogative" in a logical democratic reaction to land abuses.

David Stahl, executive vice president of the Urban Land Institute and former deputy mayor of Chicago commented that it was time to seek out better land use policies. He also cautioned that managed growth could result in little more than the artificial escalation of housing costs; "we should ask ourselves if the no-growth trend may really be part of a suburban effort to keep the people in the central city in the city." He said it was time for all to decide on objectives. "Good developers will meet public objectives if they can find out what these objectives are," he said.

Fee structure under study in Britain

British architects, who charge their clients on the basis of a mandatory fixed-scale ranging between six and 10 per cent of the cost of a new building, may be forced to compete with each other on price in the future. This follows a decision from Secretary of State for trade and industry, Peter Walker, to refer their scale fees for consideration by Britain's Monopolies Commission.

The Commission, whose function is purely advisory, has to determine first whether architects' fees are covered by Britain's anti-monopoly legislation and then whether the system of scale-fees operates against the public interest. If it does so decide, then Walker has the power to order the scale to be abandoned or modified.

Postal Service to select "master contractor"

The U.S. Postal Service is expected to name the winner of its contract for managing its \$5 billion building activities soon.

From a list of 13 applicants for consideration for the "master contractor" contract, USPS reportedly has narrowed the choice to one among three—Bechtel Corporation, San Francisco; Catalytic, Incorporated, Philadelphia; and Ralph M. Parsons, Los Angeles. The annual fee will be around \$20 million.

The master contractor will have the responsibility for supplementing the headquarters and regional postal service staff in carrying on the huge construction undertaking.

Associated with Bechtel on the original list of proposers were Giffels Associates; Skidmore, Owings & Merrill; Dalton, Dalton, Little & Newport. Appearing with Parsons were Lester B. Knight, Chicago; Heery & Heery Atlanta; and the Office of Max O. Urbahn.

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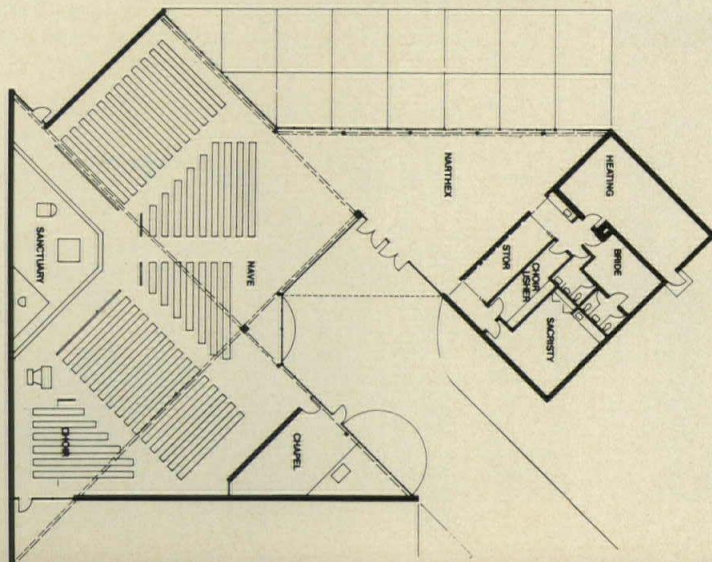
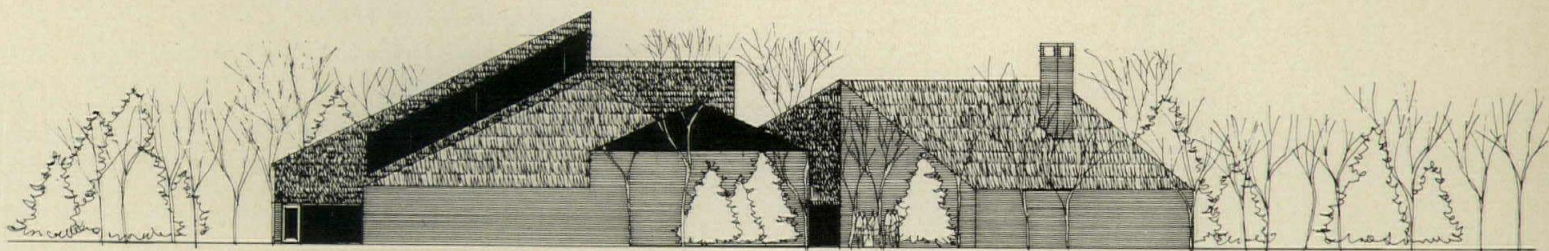
For more about "Better than wool" write, Custom Carpet Division/Monsanto/1114 Ave. of the Americas/New York, N.Y. 10036



For more data, circle 21 on inquiry card

New York City opens police headquarters

The complex needs of one of the world's largest police forces are now housed in this latest shape on the lower Manhattan skyline—the new \$58 million New York City police headquarters designed and master planned by Gruzen & Partners. Linked to the Municipal Building (spired building at right) by M. Paul Friedberg's expansive and inviting plaza, the complex consists of a 10-story office cube atop a cruciform assemblage of one- to five-story structures housing specialized functions. A five-level public parking garage beneath the building is meant to keep traffic around the area—New York's Civic Center—to a minimum. The headquarters has a reinforced concrete frame with red-brown brick facing. Huge cantilevered steel and concrete trusses support the tower and emphasize the demarcation between the office floors and the lower specialized spaces.



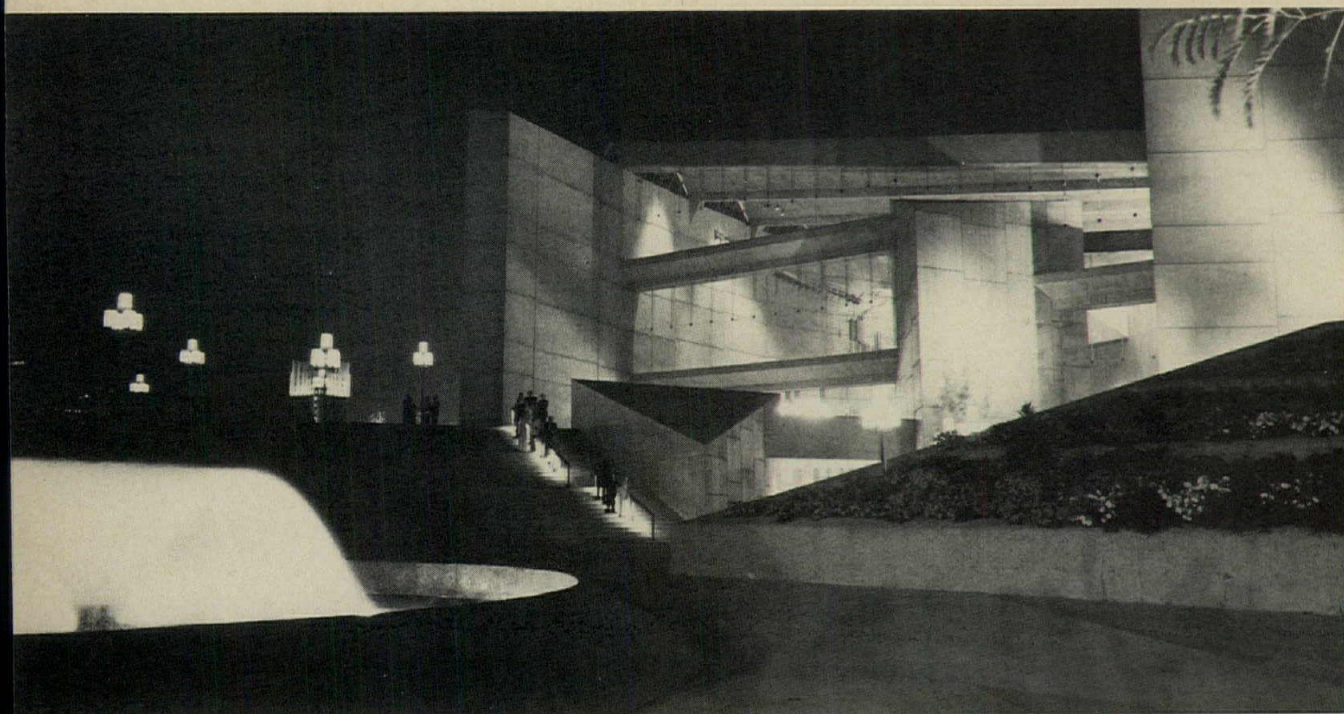
Small church melds with its wooded site

In deference to a stand of trees on its predominantly open site, this church in Aurora, Ohio will draw attention to the woods from the moment one enters the parking lot side shown above. This blank wall is broken only by a diagonal entry court whose glass walls afford views of the narthex, nave and outdoors on the other side of the building. Designed by Richard Fleischman Architects, Our

Lady of Perpetual Help church is scheduled for completion in the spring of next year. With fixed seating for 400, the 10,000-sq ft church will be roofed in wooded shakes which are carried onto vertical walls in some places. A sand-molded textured brick will be used for most walls, exposed on the inside where wood beams and decks will also be expressed. The budget is \$382,000.

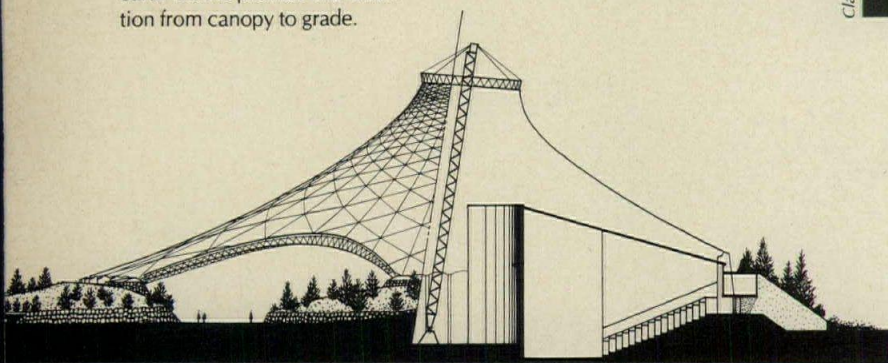
Performing arts hall opened in Ohio

The Edwin J. Thomas Arts Hall at the University of Akron opened last month with immediate kudos for its masterful acoustics. The 280,000-sq ft, \$13.9 million hall, the design of Caudill, Rowlett, Scott and Dalton, Van Dijk, Johnson and Partners, is four elements—stage house, two massive towers, and a giant concrete envelope that shields the theater from outside noise—connected by glass-enclosed lobbies. The architects designed into the hall a system of plazas, ramps and elevators for easy access by the elderly and handicapped, and continental seating in the orchestra, grand tier and flying balcony can accommodate up to 3000 persons. A most unique feature is the 44-ton movable ceiling.



U.S. pavilion designed for Expo '74

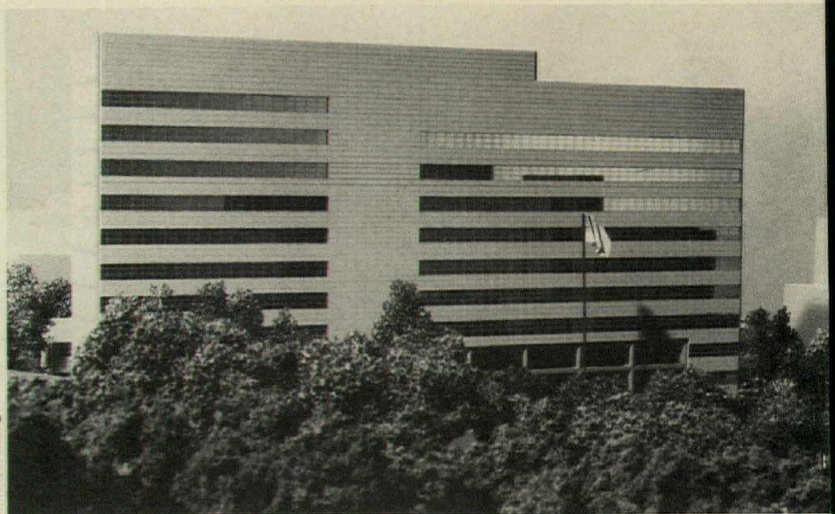
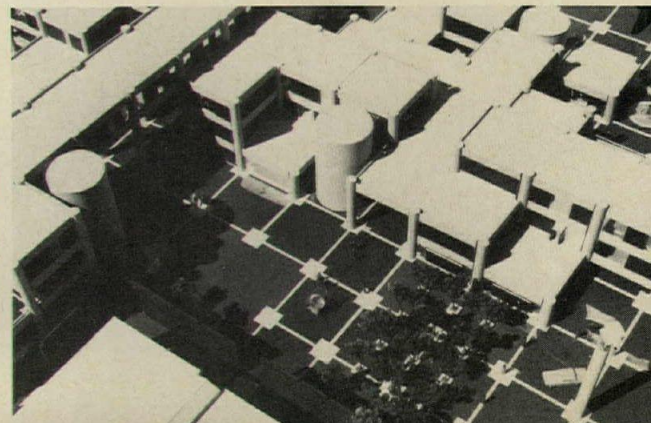
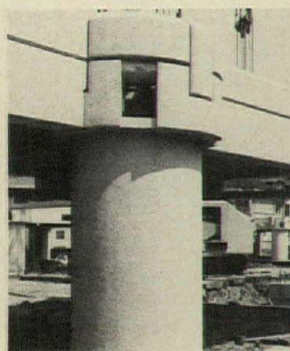
Development of a statement embodying conservation of materials, energy, cost and time was the main goal in designing this United States pavilion for the 1974 exposition in Spokane, Washington. Architects Naramore Bain Brady & Johanson have designed a translucent canopy that will span an area of 320 by 280 ft, suspended from a network of cables extending from an off-center mast 152 ft high. The canopy is anchored to a series of pylons and piers, and earth berms provide the transition from canopy to grade.



Structural system aids growth of arts center

A center for the creative, musical and performing arts is under construction in Detroit, being built in several stages as logistics and funds permit. The first stage is approximately 120,000 sq ft. Intentional interaction of all the disciplines to be studied here is accomplished in part by a grade-level pedestrian plaza, which like other spaces, will

allow the students to view the work in many departments. To meet growth needs, architect William Kessler and structural engineer Robert Darvas designed a pre-cast concrete structural system similar to the one developed by Darvas for the building on page 112. Functional requirements induced selection of a 32-ft square bay.



Clarke/Golding

U.S. embassy in Tokyo

Construction will begin this March on a 12-story U.S. embassy office building in Tokyo, designed by Gruen Associates. Sited on a hillside, the structure is placed against a backdrop of well-grown specimen trees. The enclosure of the \$12 million building is a thin curtain wall of glass and precast concrete with a modular abstract grid that cor-

responds to the office modules inside. According to Cesar Pelli, the designer, there is no structural expression, except on the ends of the building where the round columns and rectangular beams are exposed as if the building had been sliced in half. The structure is also exposed in the entrance colonnade shown here, lower right.



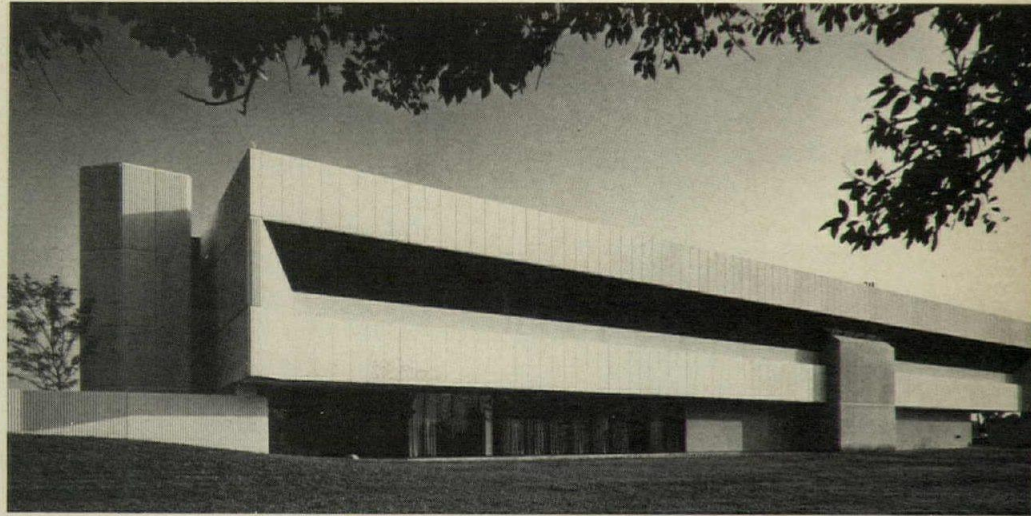
Garden offices begun in Los Angeles

Groundbreaking was held in September for a low-rise garden office building, part of the 420-acre commercial and residential development known as Universal City. The office building shown is the design of Skidmore, Owings & Merrill, San Francisco and includes in its five stories 190,000 sq ft with 16,000 sq ft of gardens. The structure steps back along much of the exterior, combining with upper-level terracing and landscaped public and private gardens to create an environment of recreation and work spaces. Landscape architects: Eckbo, Austin, Dean & Williams.

1973 Prestressed Concrete Institute Award winners

Excellence in design using precast and prestressed concrete was recognized recently by a jury of architects and engineers who named 17 winners—four of which are shown—in this year's Prestressed Concrete Institute Awards Program. Equivalent top awards were granted the winning entries for their esthetic expression, function and economy. Shown top is the United Airlines regional reservation center, Dearborn, Michigan. Designed by Rossetti Associates, it is a two-story, 35,000-sq ft building for telephone and computer terminal equipment. Exterior walls consist of precast concrete panels, light beige in color, with smooth and fluted surfaces. Middle left is the Hancock Place garage, Boston, Massachusetts. It was designed by I. M. Pei & Partners and Nichols, Norton and Zaldastani, architect and engineer as co-principals in design. At middle right is an Operation Breakthrough high- and mid-rise apartment complex in Macon, Georgia. Keyes, Lethbridge & Condon associated with Sulton & Campbell on the project which was framed entirely with precast wall and floor panels—all exterior and interior walls are precast loadbearing elements. The structure is designed on an alternate path method. At the bottom is the Old Miramar Road overcrossing in San Diego, California, the design of the engineer, architect and owner, California Division of Highways. Its low profile employs end spans of 65 ft and a central span of 430 ft. The other winners are: Atlanta Steam Heat Generating Plant by Lockwood Greene Engineers; Christian

Science Church Center, Boston, by I. M. Pei & Partners and Araldo Cossutta; Dallas/Fort Worth Airport (see story on page 34) by Hellmuth, Obata & Kassabaum and Brodsky, Hopf & Adler; Law Building, Greeley, Colorado, by Larry E. Steel; Mount Royal College, Calgary, Alberta, Canada, by Stevenson, Raines, Barrett, Hutton, Seton and Partners; Convention and Cultural Center, Norfolk, Virginia, by Williams and Tazewell & Associates; Syd Solomon residence, Sarasota, Florida, by Gene Leedy; Bear River Bridge, Digby, Nova Scotia, Canada, by



A. D. Margison Associates; Kern River Bridge, Kern County, California, by California Division of Highways; B. A. Martin Bridge, Brookings, Oregon, by Oregon State Highway Division; Papillion overpass, Sarpy County, Nebraska, by State of Nebraska, Department of Roads; Priest Point Park Bridge, Olympia, Washington, by Arvid Grant and Associates; and Fred G. Redmon Bridges, Yakima County, Washington, by The Ken R. White Company.



"3443 tons of GE cooling help the hold tolerances that would

Joseph H. Gauss, Vice President and General Manager



In Greenville, South Carolina, there's a factory that makes gas turbines large enough to generate electricity for a city of 60,000 people.

There, rotor assemblies weighing as much as 26 tons are machined to a tolerance



of $\pm .0005$ (that's about one quarter of the thickness of the piece

of paper in this book.)

The plant makes these rotor assemblies, and the rest of the turbine, in three shifts a day, five days a week, throughout the year.

And even though Greenville has an average summer temperature of 79° with a normal daily high of 89° , the plant has never had to shut down because of heat.

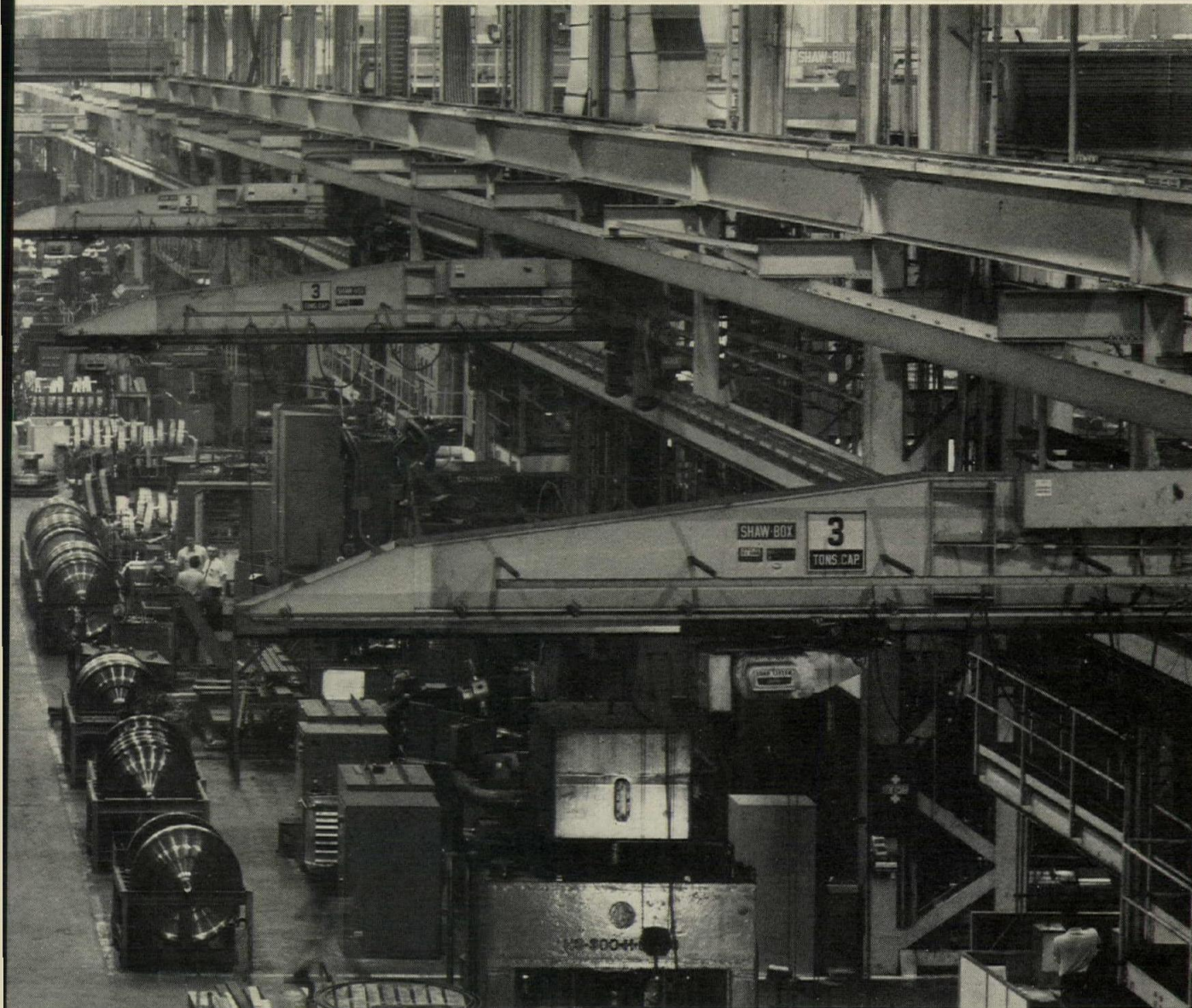
Nor has hot weather ever ruined a 26 ton rotor assembly.

General Electric central air conditioning helps to maintain quality control and to make this plant a clean, comfortable place to work.

John Funke, manager of Greenville plant facilities, has his own private morale booster: the General Electric

world's largest Gas Turbine factory make a watchmaker jealous."

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Service Contract that was bought with the installation.

The contract lets John budget his maintenance costs (resulting from normal usage) to the penny. With the contract, John knows that one predictable check will take care of anything that will have to be repaired or replaced for the life of

the contract.

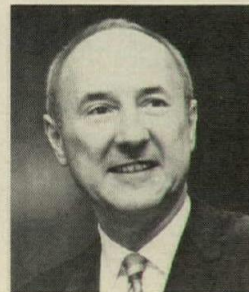
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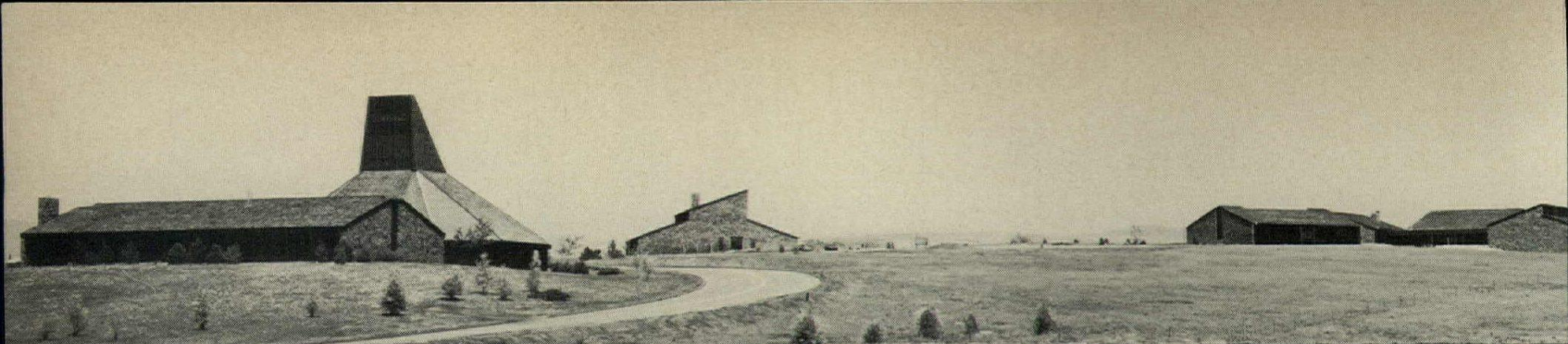
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Joseph H. Gauss

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Nazarene Bible College, Colorado Springs, Colo. Certi-Split No. 1 Handsplit/Resawn shakes, 24" x 3/4" to 1 1/4". Architects: Keyes & Hestrup, Chicago. Associate Architect: John Ten Eyck, Colorado Springs. Builder: Goodwin/Bevers.

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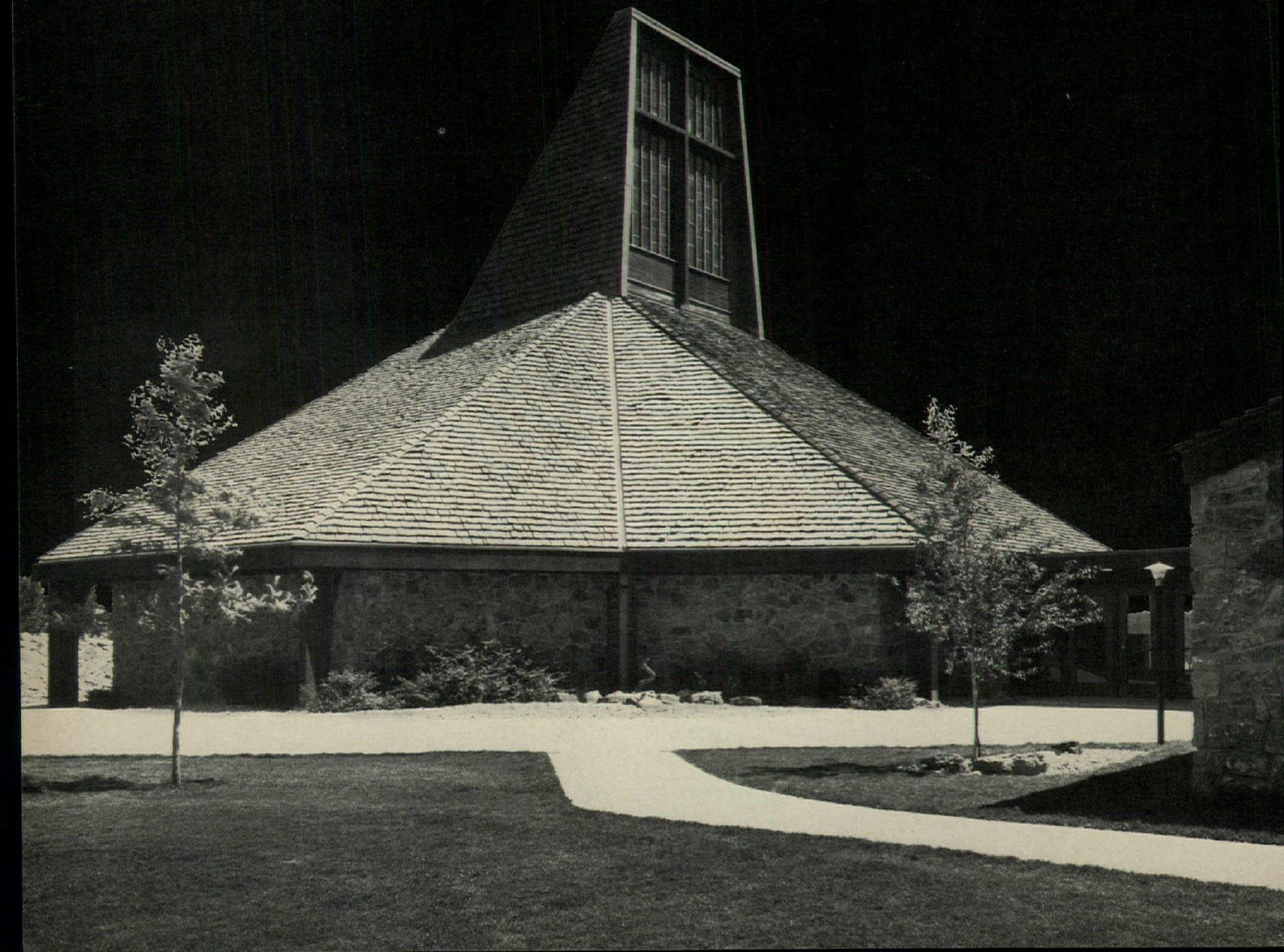
For details and our specification guide on Certi-Split shakes and Certigrade shingles, write us at 5510 White Building, Seattle, WA 98101. In Canada, write 1055 W. Hastings Street, Vancouver 1, B.C.



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New Perspecta

PERSPECTA 13-14: *The Yale Architectural Journal*, edited by Robert Coombs; distributed by George Wittenborn & Co., New York, 1972, paperback, 371 pages, illus., \$25.00.

From its first appearance in 1952 *Perspecta* has dedicated itself to a liberal critique of its times, even if doing so has necessitated the over-elaboration of issues of only passing significance. However, like the bidding in a game of poker, the *Perspecta* stakes have risen higher over the years, the ante being upped with each successive editor. The big league, to which this current double number is a worthy successor, was dramatically initiated by Robert Stern with his bulky *Perspecta 9-10* of 1965, a highly charged double issue largely dedicated to establishing the New Haven-Philadelphia axis as the lifeline of American architectural culture and to celebrating the predestined eminence of architects such as Moore, Venturi, Giurgola and Kahn.

Since Stern, editors and their attendant designers have vied with each other to produce bigger, slicker and more stimulating numbers. After *Perspecta 9-10* (the last issue, incidentally, to carry a recognizable architectural image on its cover) came Peter Debretteville's silver mylar "Plug it in Rameses" *Perspecta 11* of 1967, an issue which, apart from its zappy content, played manneristically with light-weight type against large areas of white. This piece of affluent editing naturally took some matching. Stuart Wrede's understandable response was the modest black tautness of his elegant but nonetheless strictly edited *Perspecta 12*. Robert Coombs' followup has been to return us, in a prevailing mood of nostalgia, to the streamlined, dispensable white-space of the late 60's. Deco in aura, tangerine in color, Coombs' *Perspecta 13-14*, designed by Erick Muller, presents a vinyl cover that glistens with all the colors of the spectrum as it flexes nervously in the hand.

By now we are far removed from the simple polemical intent of the avant-garde magazines of the inter-war era and equally from that cultural subconscious that clearly gave shape to the first seven issues of *Perspecta*. For *Perspecta* has now become a big production, possessed of an editorial tradition that is nothing if not pluralist in its feelings for topicality.

In retrospect, then, the first decade of *Perspecta* affords substance for comparison, for within that span a discernible set of themes and opinions appears to have prevailed. A very general review of the subject matter of *Perspecta* numbers 1 to 7 would have to reveal something of the following: First and foremost, there would be that misplaced anxiety, as expressed by Henry Hope Reed, with regard to the capacity of the Modern Movement to realize the monumental. This imperialist line would be nurtured from time to time throughout the decade, particularly through Vincent Scully's preoccupation with the pre-eminence of form. His essay of 1953 on the formal values of Michelangelo's fortifications surely helped establish the historicist tone of the period.

Thus *Perspecta* rapidly shifted the center

of its critical approval from Buckminster Fuller and the Institute of Design in Chicago to the East Coast trinity of Johnson, Rudolph, and Kahn. En route, there emerged the re-discovery of the vernacular. By the early 60's, local genres were being regarded as inexhaustible formal stockpiles. Paul Rudolph and the late Sibyl Moholy-Nagy made the running in this area, closely followed by the pre-Columbian "space-time" speculations of George Kubler. The British, first invited at this time as visiting critics to Yale, innocently indulged in a brief honeymoon of transatlantic debate, an exchange that soon foundered on the rocks of chauvinism. Opening this dialogue (significantly enough in the same issue as George Kubler on Macchu Picchu and Charles Moore on Hadrian's Villa) came James Stirling in *Perspecta 6* of 1960 with his own rather eclectic notions of vernacular. Stirling was followed in *Perspecta 7* by Colin St. John Wilson, who, while acclaiming Aalto's dormitory at MIT, roundly denounced what he already characterized as the hysterical edge of post-Miesian monumentality. Saarinen was the obvious target, while others, closer to home, no doubt felt themselves implicated in the attack. Among the doyens of the East Coast, only Louis Kahn was explicitly excepted from Wilson's critique.

With *Perspecta 8*, however, the content was projected away from the issue of monumentality and the partisan historicism of Yale to the cultural frontiers of Europe—to Spain, with George Collins' anti-historicist appraisal of Gaudi, and to Finland, with a documentation of the recent work of Aalto and the younger generation of Finnish architects. These pieces, together with the Rowe-Slutzky enquiry into the role played by transparency in Modern architecture and painting (a discourse extended in the current issue of *Perspecta*), rendered a tone that was decidedly more intellectual. *Perspecta 8* established an alternative editorial posture destined to exercise its influence over the journal, along with the polemic of East Coast cultural supremacy. This outward orientation (which was notably absent from *Perspecta 9-10*) quietly re-emerged with the content and structure of *Perspecta 12*. Wrede consciously introduced a new concern for the value of broadly-based documentation and discourse, and this policy is largely extended in the Coombs' *Perspecta 13-14*.

The latest *Perspecta* may in part be read as a last look at the balmy days of Transatlantica before its jet-age eclipse. The first half, subtitled "Paradise Lost", reads like the itinerary of a Translux memory bank, hastily compiled on the threshold of a cosmic disaster. It could easily have been assembled, allowing for some brilliant moments of clairvoyance, by the passengers of the first class (culture) deck on the last crossing of the Mauretania. Thus Dennis Sharp wistfully recalls that misty 1920's *Jugendstil* suburb of his beloved Park Meerwijk, while Robert Vickery celebrates the heroic tradition of Hilversum in the later 20's as represented in the life and work of Johannes Duiker. From here, depending on our inclination, we may wander, courtesy of Judith Applegate, through Paul Nelson's art deco sets for *What a*

continued on page 45

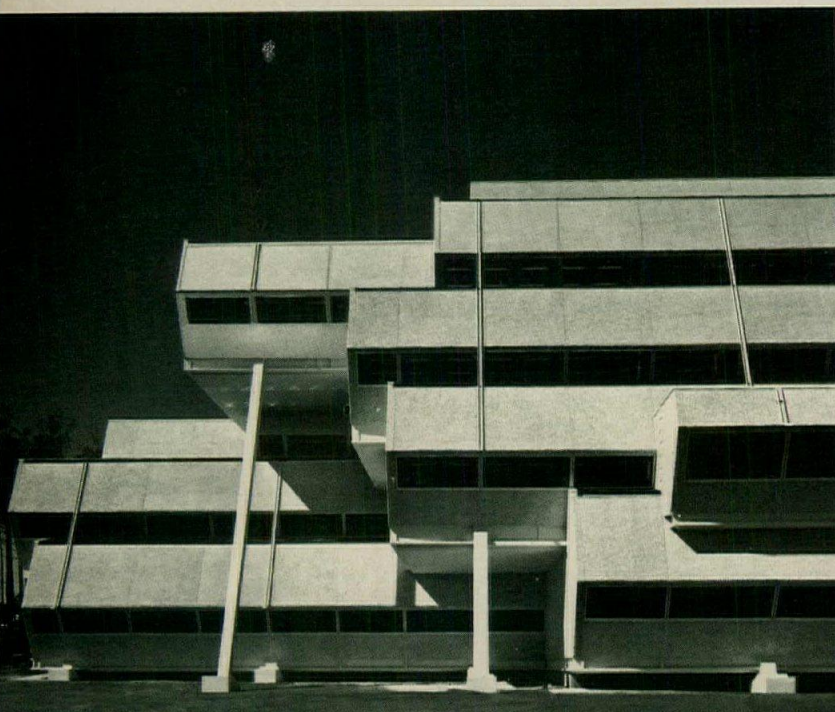
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Widow, which are described in part of her excellent essay on the work of Nelson. Alternatively we may turn to that last moment of the Hindenburg before it blew itself to pieces in 1937, affording a traumatic coda to Thomas Doremus's evocative piece, "Picture a Penthouse Way Up in the Sky." From Zeppelins to Zephyrs is but a step as we wander through this compendium of the 30's. What ever happened to that streamlined pioneer diesel-electric, that Burlington Zephyr of 1934? Although Neil Aptaker's otherwise excellent documentation fails to inform us about its final fate, it is hardly difficult to guess. The same no doubt as that which befell the even more famous 20th Century Limited: namely, premature demise and destruction in the name of an oil lobby and the utopian promise of the automobile. This last was first elaborated and sold on a national scale in the Bel Geddes General Motors Pavilion, erected for the 1939 Worlds Fair, and in particular, by the "paradise projected" in its Futurama exhibit, which conveyed 25,000 people a day over a vast montage of the American landscape as it was then deemed to appear 20 years hence, irrigated by multi-lane networks that epitomized the glorious future. This brilliantly displayed piece of stargazing, however, was a good deal more accurate than Bel Geddes' romantic notions about the multi-level street of future, as it is here documented by Robert Coombs. Little did he see that the highway would destroy the street as traditionally understood.

Despite the extraordinary quality of its invaluable documentation, *Perspecta 13-14* has the decided air of being the last touch of 20th century nostalgia before the Flood. There is a certain ominous foreboding in the density of its memories; a final stocktaking before the apocalypse. How else can one interpret the tone of Joseph Rykwert's homage to Eileen Gray's elegant, *maison en bord de mer* of 1926, or Judith Wolin's gloss on Mikail Bartsch's functionalist planetarium of the same date? Both these texts have the quality of being definitively "last words" and one seriously wonders whether either of these respective authors will ever turn again to the subject of the pioneer 20th century? Only Peter Eisenman's analysis of Giuseppe Terragni's *Casa Giuliani Frigerio* of 1940 seems to offer any serious implications for the future, mainly because of its method, which is analytical and formal rather than historical and socio-cultural.

By degrees we are prepared in "Paradise Lost" for the issues formulated at the beginning of the second half of *Perspecta 13-14*, under the title "Utopia and Anti-Utopia," a section primarily oriented towards the future rather than the past. In my opinion, such questions, particularly as they are formulated in Jacques Ehrmann's essay "Live in Utopia," constitute the most challenging issues that *Perspecta* has raised in all of its 20-year history. Through an analysis of selected texts drawn from LeCorbusier and Frank Lloyd Wright, Ehrmann mounts a Heideggerian attack on the philosophical basis of Modern architecture, with its idealistic propensity for conflating the "beautiful" and the "good," and with its perennial projection

of the past into the future.

A number of the other contributors to this utopian section end up affording inadvertent evidence in support of the Ehrmann thesis, most particularly Anthony Vidler's essay "The New Industrial World," devoted to the evolution of urban utopia in 19th century France, and Manfredi Nicoletti's "The End of Utopia," a highly stimulating, but politically immature appraisal of the demise of Utopia as the prime motivating principle of modern architecture. The historical substance of Vidler's text (the utopian writings of Fourier, Considerant, Proudhon, Zola and Blum, and the projected socialist order of Garnier's *Cité Industrielle*) affords adequate testimony to the essential pathos of utopian visualization. Nicoletti complements this text by isolating, with equally

convincing evidence, the precise moment at which this same utopian tradition failed as the *raison d'être* of the Modern Movement, a failure which has yet to be assimilated or overcome. Nicoletti writes: "The end of CIAM (1959) inserted the utopia of the 20's in its historical frame and unveiled the complexity of the present. For such complexity, simplistic formulas, magic keys and quick slogans of utopian extraction were inadequate tools. The future had to be conquered not through prophecy but within a continuous search. . . ." Yet while Nicoletti is acutely conscious that the golden Utopian hope of the 20's was deprived of its spontaneous energy and conviction by the volatile forces of vast socio-technical transformations, and while he remains vaguely

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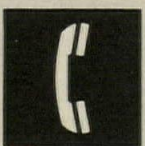
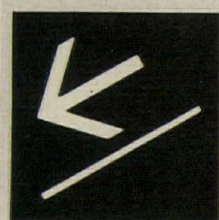
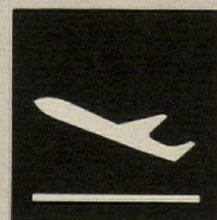


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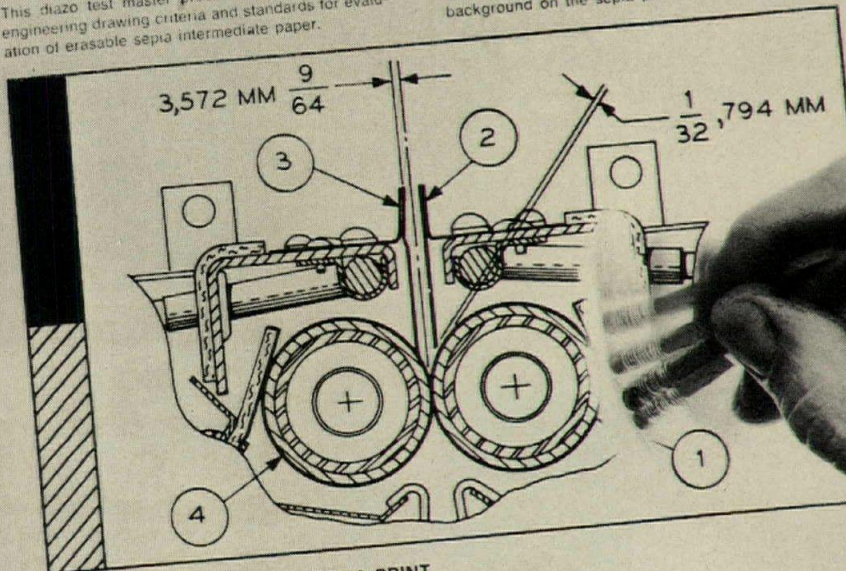
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aware of the essential virulence of our present "Utopian" consumerism, he nonetheless still aspires, unlike Ehrmann, to the potential redemptive function of utopia—to the light that failed and must be rekindled. For Ehrmann, utopia is not an aspirational choice, but an inevitability. At a primary level, it is integrated into the processes of thought as a manifestation of "being;" at a secondary level, it is inseparable from the act of planning in the processes of architecture. At the primary level, Ehrmann challenges the conceptual elision embedded in the Cartesian dictum, "I think, therefore I am," with the demonstration that the use of the conjunction "therefore" neatly overlooks the essential disjunction of the time. He writes: "One can only say: 'I think therefore I have been'—and think of oneself as a beginning, or: 'I think, therefore I will be'—and think of oneself as an end." Later, Ehrmann argues, "If 'I' is able to say: 'I think therefore I will be,' he ought as well to realize that 'I' will never be what he thinks, since between these moments time has elapsed, if only that which is necessary to utter the words which designate it."

Ehrmann goes on to show, at the secondary level, that the linked processes of planning and realization are but a direct sequential extension of this paradox, engendering a whole cycle of translations over time, between the initial conception and the occupation of a built form. Thus the plan is but a translation of the conception, and the realization is but a translation of the plan, just as the occupation is but a further translation of the realization. Through this process, that prime impulse of the Modern Movement in architecture—namely the worldly redemption of man through a return, by design, to his essential "nature"—is projected into a state of perpetual suspension. By the same token, that over-all utopian project of the Enlightenment, or for that matter of the Renaissance, the inauguration of an "eternal present," whereby form and content, esthetics and ethics, are restored to their original unity is forever to be postponed by this sequence of translation which perpetually transpose the initial terms of reference.

Ehrmann's reasoning appears to lead eventually to a neo-existentialist conclusion wherein the utopian is reduced to the inevitable precondition of thought and where building (note the exclusion of the term "architecture") may only be understood through the act of building itself. This restores to the German word "bauen" its archaic meaning, "to build" and "to be." With this, the nexus of meaning shifts from the Humanist "what" to the Existentialist "how," a shift whose import is far from clear in a complex industrialized society where man has little enough opportunity "to house himself," let alone "to dwell" in the full Heideggerian sense of that term. And while it may be true, as Ehrmann concludes, that "the reorganization of science, displacing the boundaries of knowledge, deprives this discipline [Humanist architecture] of the meaning it might have had in the modern era," it does not necessarily follow that some post-Renaissance, post-Enlightenment meaning may be easily imparted to the act of building. The reign of inno-

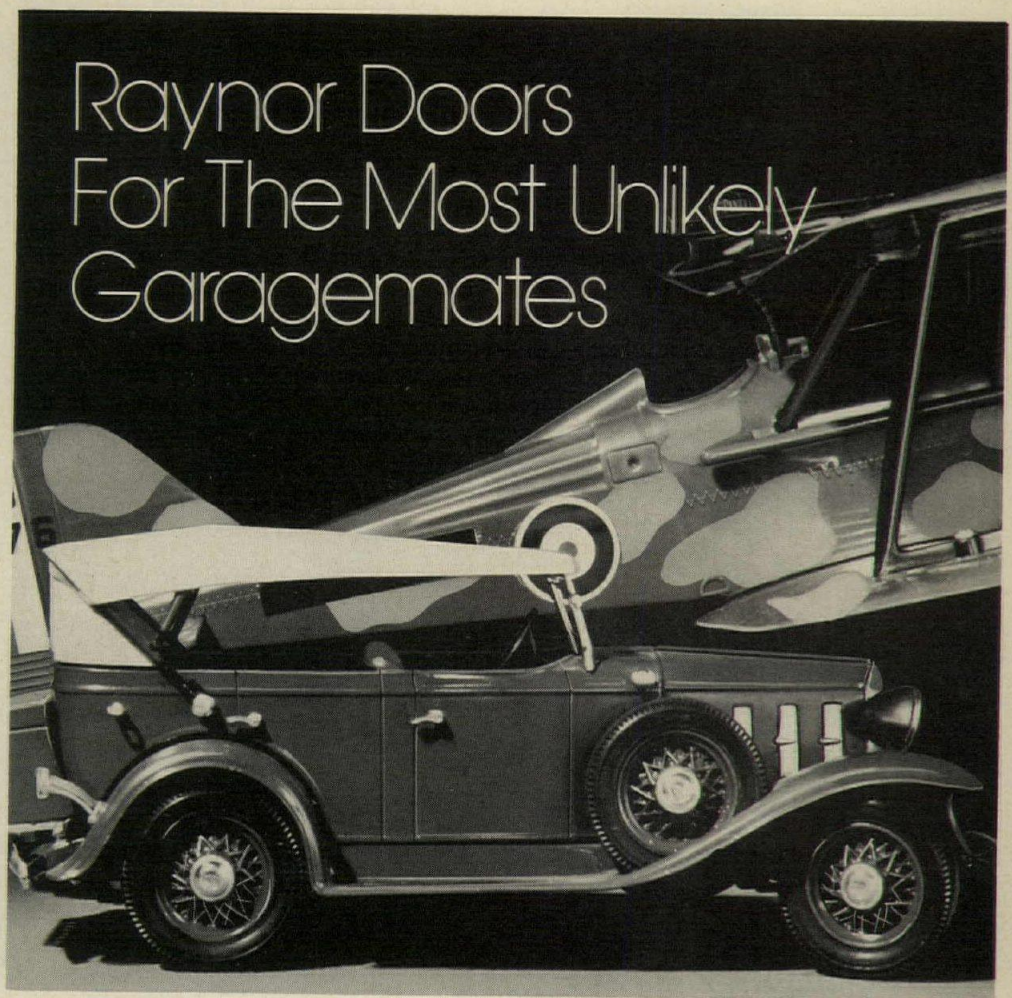
cence is hardly so easily restored.

To replace the Humanist rhetoric of architecture, as distinct from construction, with a rhetoric of building integral to the act of construction, and to embrace within this last term everything that man makes, as Ehrmann suggests we do, is a proposition that does nothing but return us in one stroke to the Russian constructivist polemic of the early 20's. Paradoxically enough, such a position was forcibly eclipsed within a Stalinist Soviet Union at that very moment when CIAM was about to be born. The ironies of history aside, what is this, after all, but a program to restore the lost unity of ethics and esthetics? What is this, if not Gorky's ethics becoming the esthetics of the future? Properly enough, Ehrmann pleads the cause of semiology, as the human science par-

excellence, and the one field by which we may begin to "understand the conditions of the possibility of building." Yet, given the demise of Soviet constructivism and the repressive climate of our own times, would it not be more sanguine to pose another question first? Namely, under which political conditions may the signs of the "life world" release the full possibility of human expression in order to move from Heidegger's preoccupation with "being," as archaically ordained, to a concern for our present totality as "being-in-the-world?"

—Kenneth Frampton

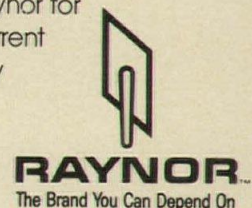
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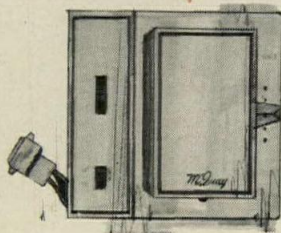
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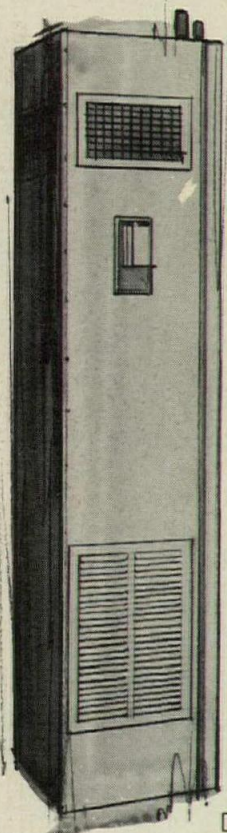
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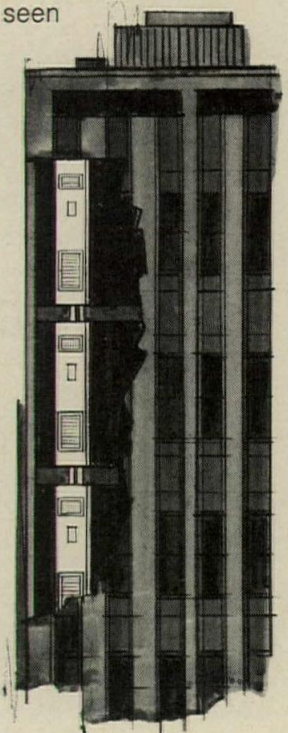


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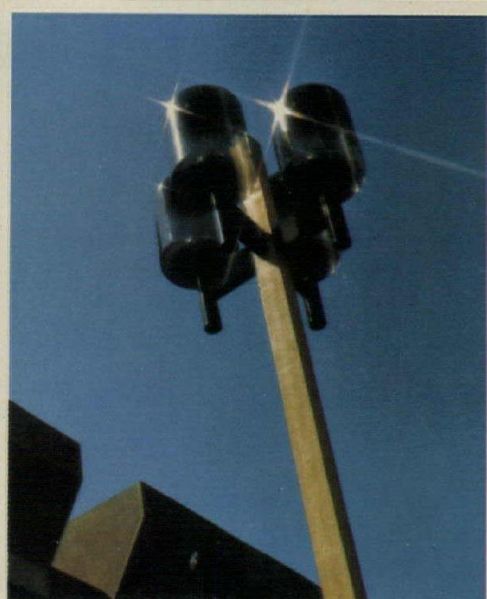
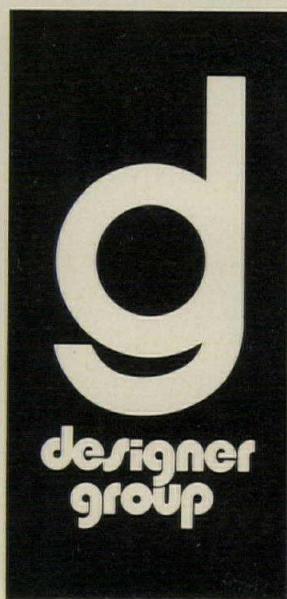
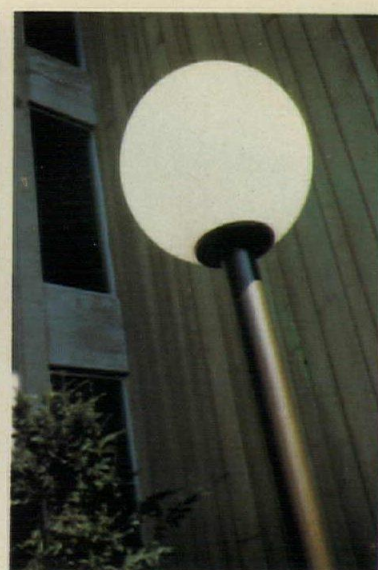
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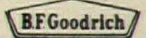
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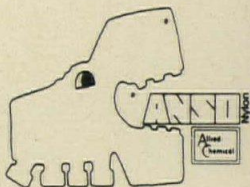
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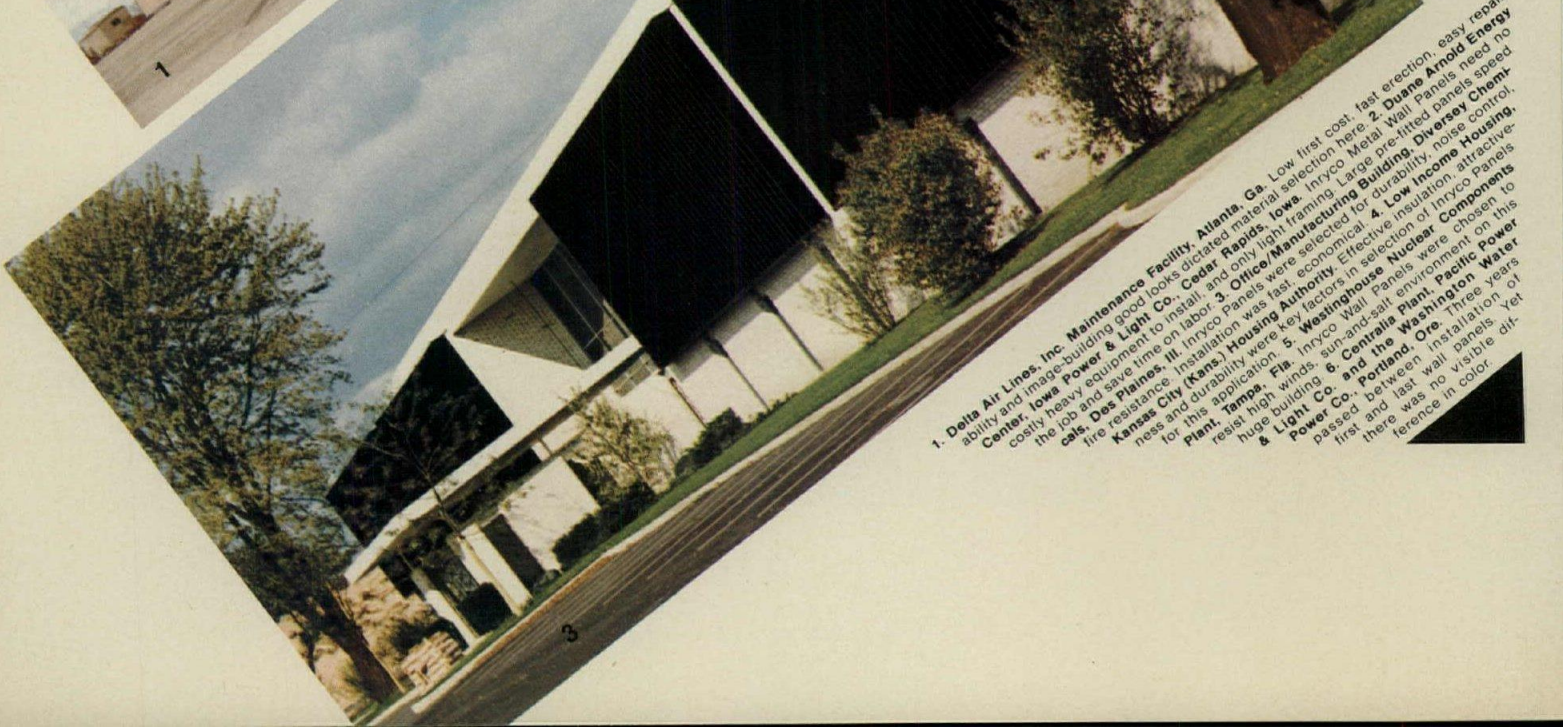


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1. Delta Air Lines, Inc. Maintenance Facility, Atlanta, Ga. Low first cost, fast erection, easy repairability and image-building good looks dictated material selection here.
2. Duane Arnold Energy Center, Iowa Power & Light Co., Cedar Rapids, Iowa. Inryco Metal Wall Panels need no costly heavy equipment to install, and only light framing. Large pre-fitted panels speed the job and save time on labor.
3. Office/Manufacturing Building, Diversy Chemicals, Des Plaines, Ill. Inryco Panels were selected for durability, noise control, fire resistance.
4. Low Income Housing, Kansas City (Kans.) Housing Authority. Large pre-fitted panels were chosen for this application.
5. Westinghouse Nuclear Components Plant, Tampa, Fla. Inryco Wall Panels were selected for their ability to resist high winds, sun-and-rain environment on this huge building.
6. Centralia Plant, Pacific Power & Light Co., Portland, Ore. Effective insulation between installation of panels and last wall panels passed. Three years later there was no visible difference in color.



5

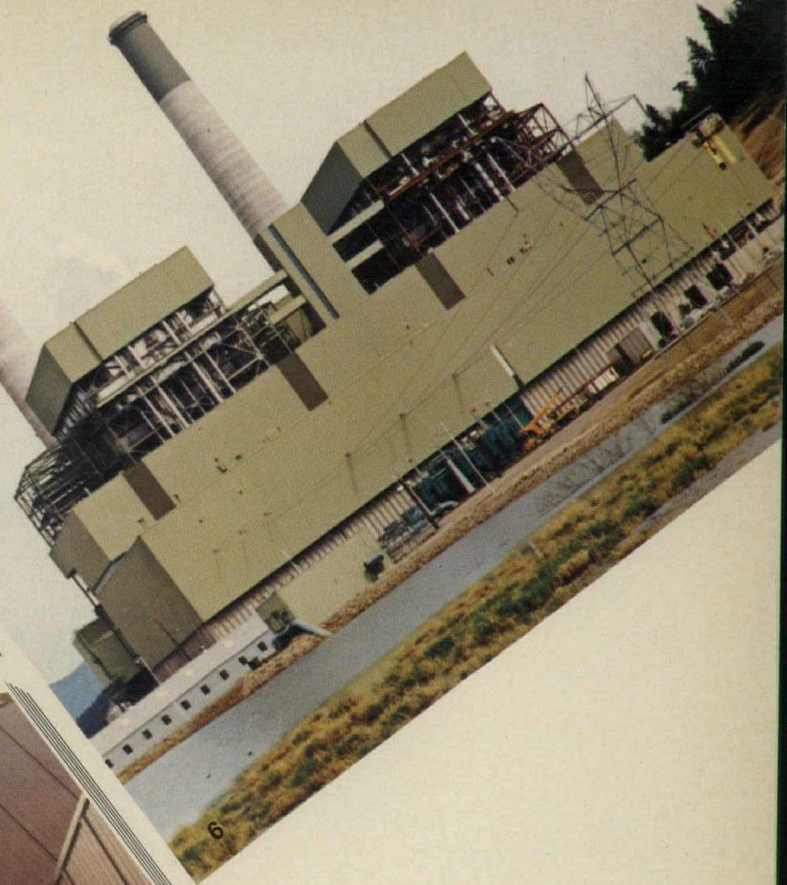
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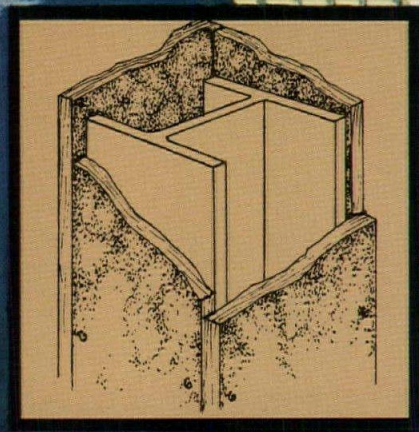
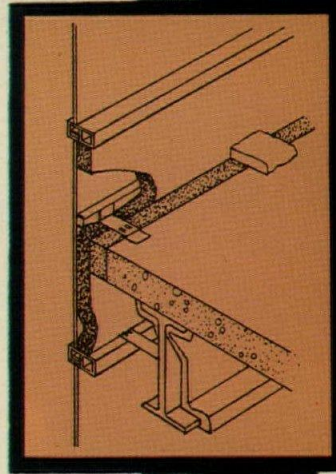
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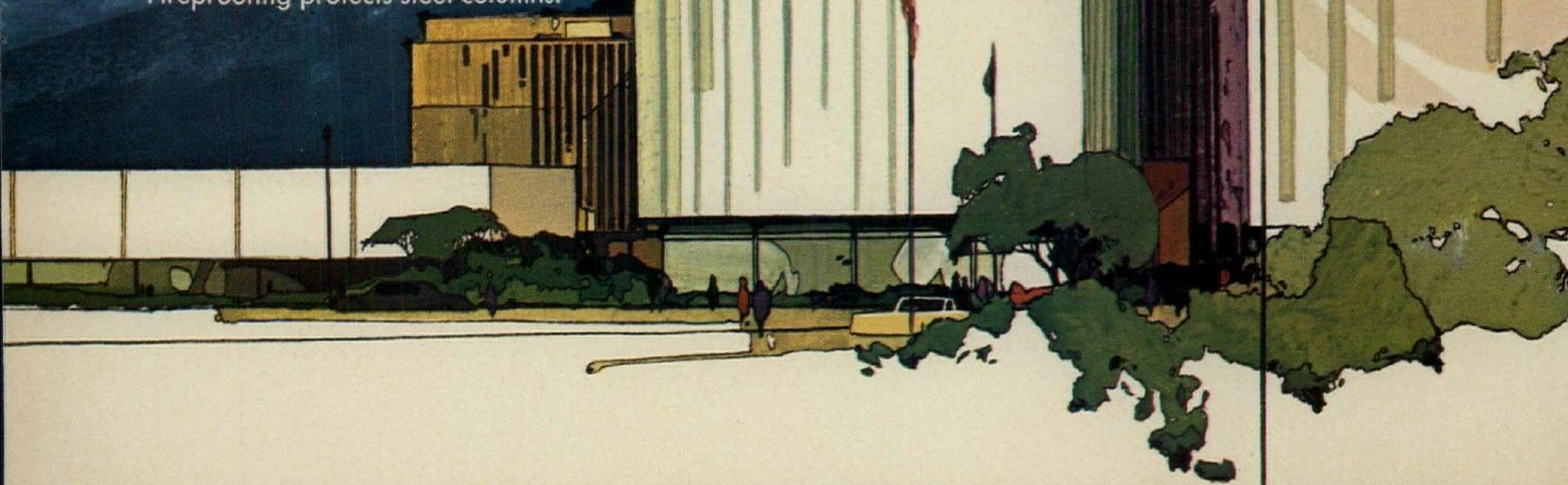
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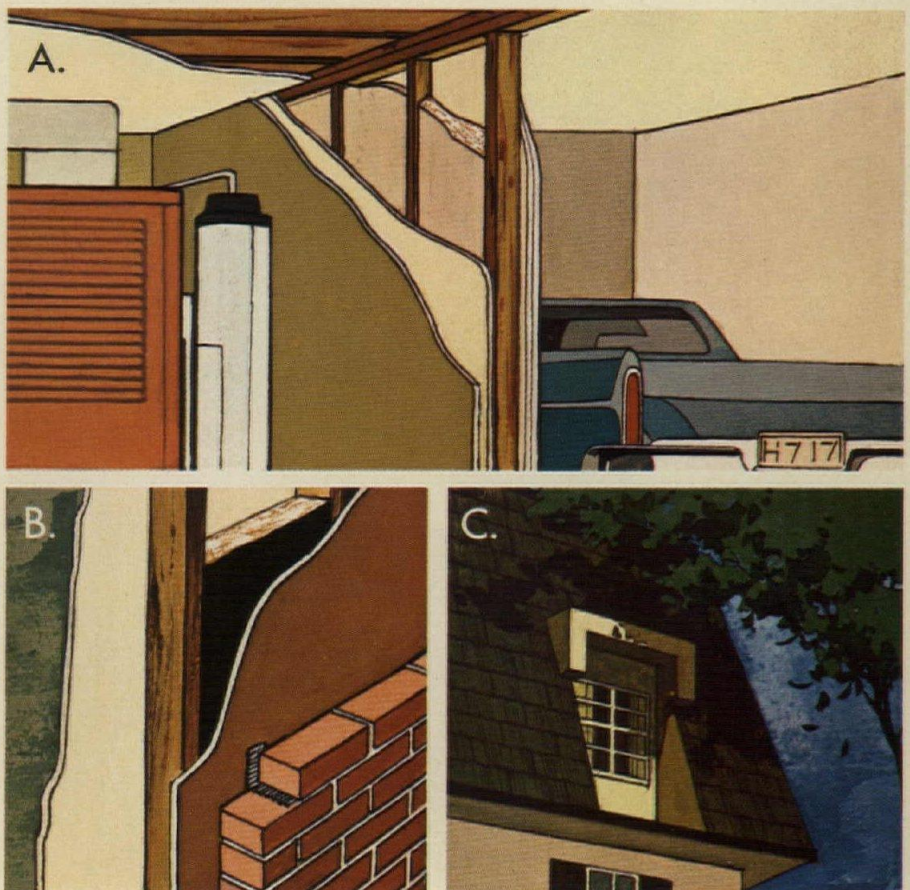
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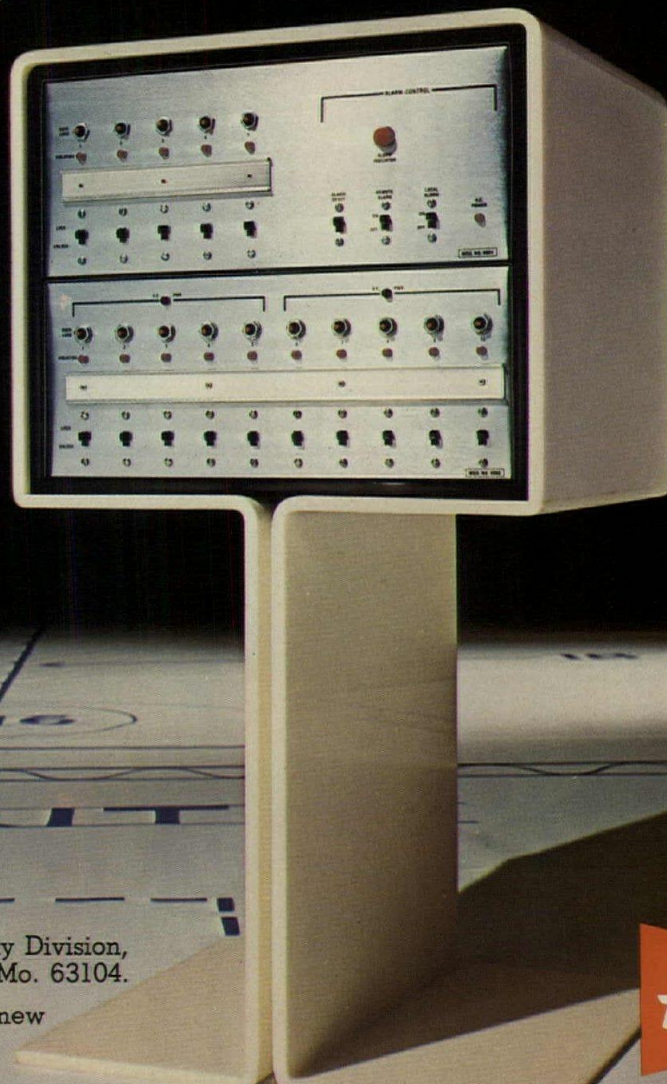
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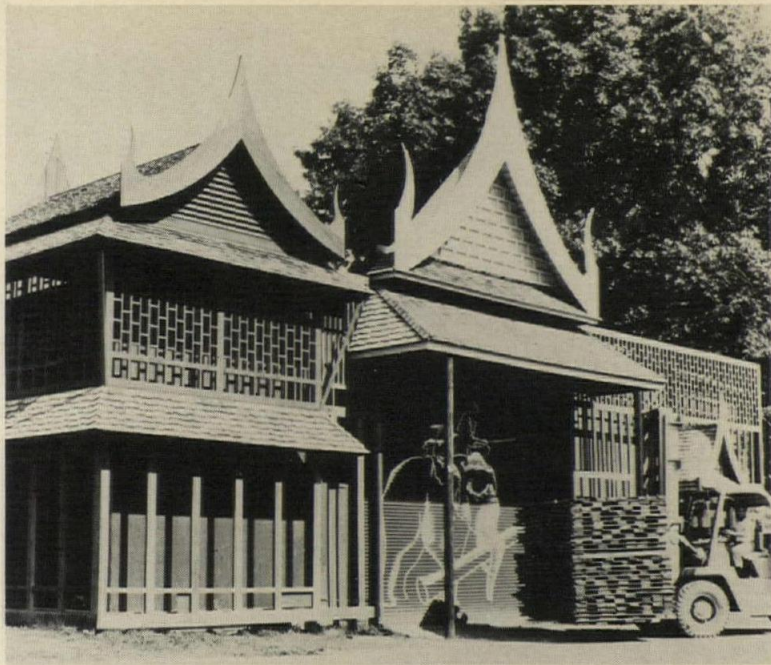
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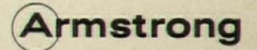
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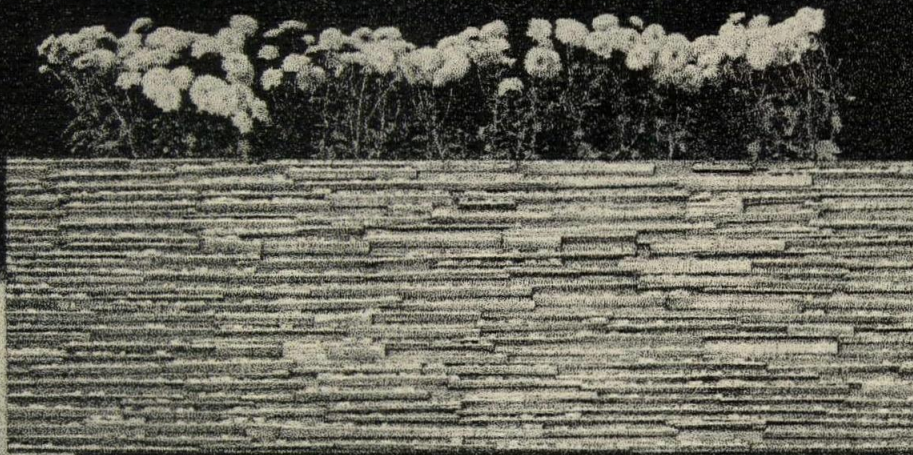
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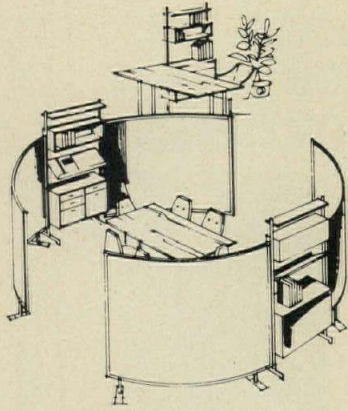
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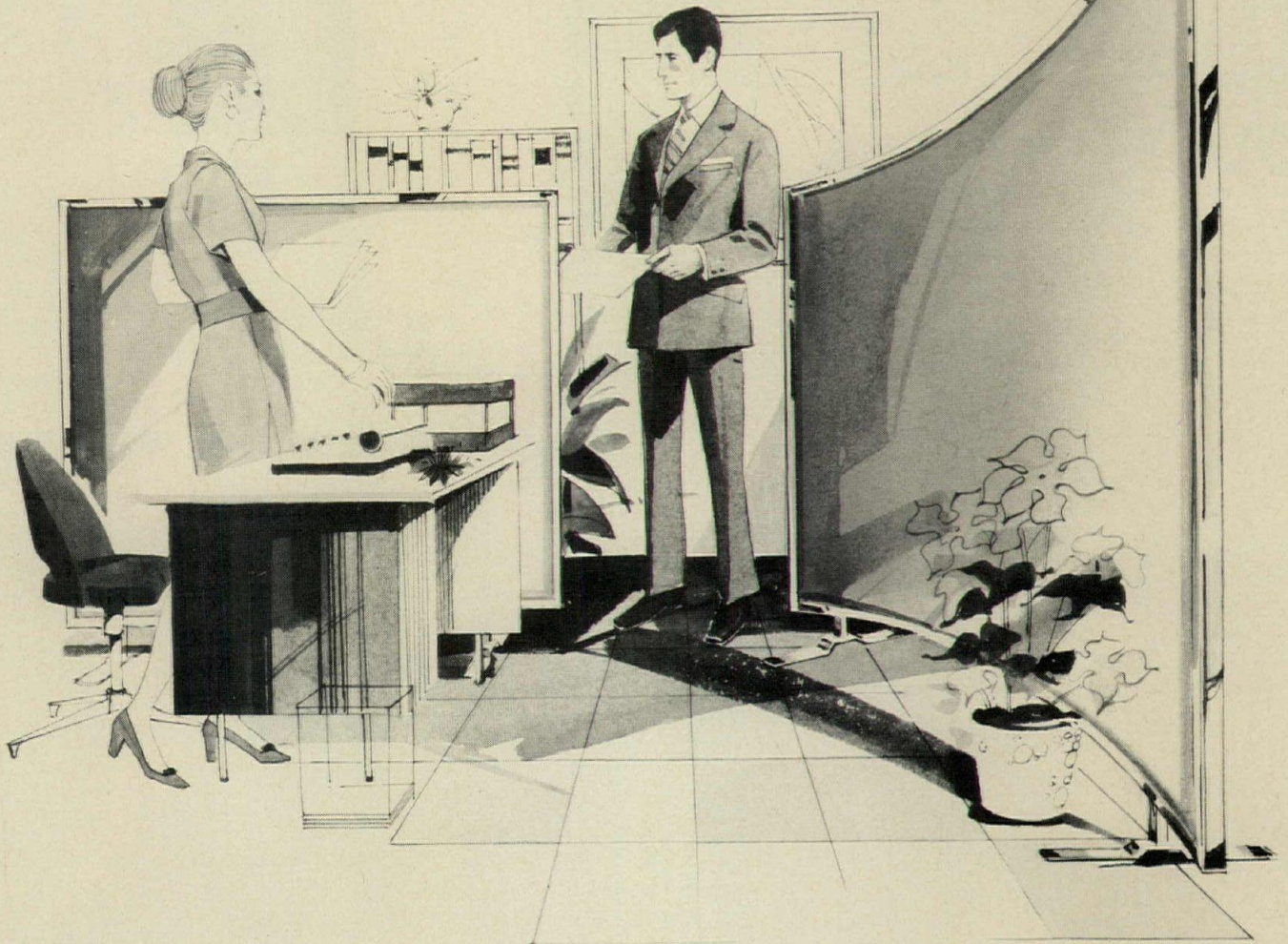
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**BERLIN STEEL
WAS IN BUSINESS
SEVENTY THREE
YEARS BEFORE
THEY SPECIFIED
JOIST GIRDERS
FOR THE FIRST
TIME. ELEVEN DAYS
LATER, THEY DID
IT AGAIN.**

Joist Girders. The advantages they had over I-beams were more than enough for Berlin Steel to specify them for the Sage-Allen Department Store they were building in West Hartford, Connecticut. So much



Joist girders have a simple span design. Which explains why ponding calculations are easier. And why design time is shortened.

more, that eleven days later they specified them again. Only this time for National Plastics and Plating Supply Co. in Plymouth, Connecticut.

Where did Berlin Steel learn about those advantages? From meeting with Vulcraft. The people who knew as



Joist girders need fewer foundations and columns. Which means less work for you and larger bay areas for your clients.

much about joist girders as Berlin did about steel fabricating.

And the first thing the Vulcraft engineers did was show Berlin Steel

why joist girders are easier to specify and erect. By explaining that the simple span design of joist girders make ponding calculations easy. And shorten design time.

By telling them about the larger bay areas possible with joist girders. And by talking about the fewer foundations and columns needed with joist girders than with I-beams.

Then came the subject of the advantages joist girders offer after they're erected.

And to explain that topic Vulcraft talked about the modified Warren truss configuration used in joist girders. And that it gave joist girders a high strength to weight ratio.

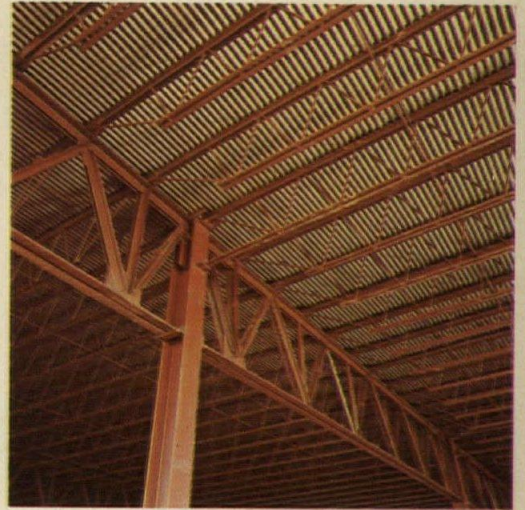


Joist girders have a modified Warren truss configuration using hot rolled double angle sections for top and bottom chords and single and double angle sections for web members. What that means is a high strength to weight ratio.

They mentioned further, that bar joist erection was faster. Because top chord panel points show joist location, eliminating a lot of measuring.

Finally, the matter of ducts, pipes and conduits came up. And Vulcraft explained how these things go right through a joist girder. Something no one can say about an I-beam.

What it all added up to for Berlin Steel was a change. A change from I-beams to another roof-framing system. A roof-framing system that was more economical and easier to erect



Joist girders have top chord panel points that show joist location. Which makes a lot of measuring unnecessary.

for anything over 10,000 square feet.

It wasn't surprising to Vulcraft, though. Because architects and engineers all over the country are discovering the advantages joist girders have over I-beams.



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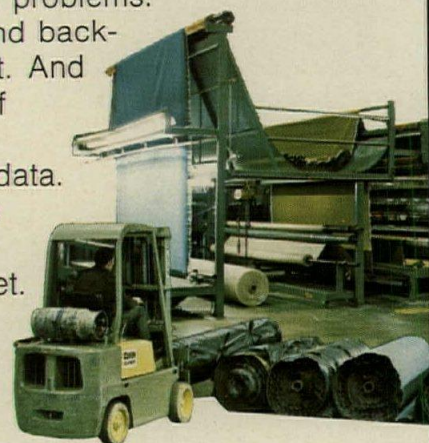
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F. W. Dodge construction outlook: 1974

No recession, but . . .

1. *a slowdown from current boom*
2. *declining interest rates*
3. *a nearly balanced budget*

End of the boom

By any measure except one, 1973 will go down in the record books as a big year for the construction business. Most of the dollar values for the year as a whole are coming out as high as or higher than for record 1972. The one shortcoming: the boom of the early 1970's is indeed over.

What, besides the unrelenting passage of time, has brought the construction boom of the early 1970's to its eventual end?

From the second week of January, the construction industry began working under an accumulation of handicaps that eventually sapped its vitality. First came the President's suspension of housing subsidy programs. Meanwhile, Federal spending for public works was being tightly restrained by impoundment and veto. And by summer the money markets were in chaos—for the third time in less than a decade.

Even so, it took time for these events to reverse the strongly upward thrust of construction contracting. The negative effect of the January housing subsidy freeze, for example, was blunted by the existence of a backlog of a couple of hundred thousand units previously approved but not yet started. Money market conditions had their lag, too. Housing starts dropped off a bit, but nowhere in proportion to what was happening to the supply of mortgage money. Through early fall, lending was being sustained by earlier commitments; the money squeeze of mid-1973 was taking its toll on commitments for later lending. So with subsidy work due to run out, and mortgage money vanishing, the housing market faces its most difficult months in what's left of 1973.

Outside the residential field, construction in 1973 was going in a variety of directions at once. Anything closely related to housing (like shopping centers or sewer and water facilities) was still riding the coattails of the residential boom. The typical one-year lag will keep these housing-derived needs strong through all of 1973 and into 1974. Construction related to industrial expansion (factories, warehouses, etc.) has been 1973's most outstanding performer. However, the clouded economic outlook for 1974 raises some doubts for the future

In 1974 total construction contract value will reach—and pass—a major milestone as more than \$100 billion of new construction work is started. It wasn't so many Dodge/Sweet's Outlooks ago (ten, to be exact) that the contract construction market was only half that size.

Adding in the work that doesn't originate through the normal contracting route (work done by full-time crews of industrial firms, utilities, and local governments for self-use; small jobs such as additions and alterations on single family homes; etc.) will bring the grand total of next year's construction put in place to a new high of \$140 billion or more.

On the surface this sounds like more of a cause for celebration than it really is. The other side of the story—the part that takes away much of the satisfaction from this achievement—is construction's old problem of inflation.

As the Dodge Index settles into the mid-180's next year (i.e., a level more than 80 per cent higher than the value of construction in base year 1967), the index of construction cost will be in the mid-150's. This means, simply, that after adjustment for inflation, the real growth of the construction market, in terms of building materials assembled on the job site, has amounted to a bit less than 20 per cent since 1967. That works out to a ratio of roughly three dollars of increase in cost for every one dollar of increase in real output over the past six years.

That's hardly a noteworthy achievement. Nor is it a sign of improvement that in the past few years the rest of the economy has become nearly as inflation-prone as the construction sector.

Yet there has been change. Largely as a result of the Construction Industry Stabilization Committee's efforts, wage pressures have been reduced in the building trades. But while this source of inflation was being suppressed, materials prices (mainly the uncontrolled forest products) shot up. The result: since 1971 materials prices have been rising faster than construction labor costs—the opposite of the traditional pattern in the industry.

For the near future, inflation in construction should be less than it has been for quite some time. That's because lumber prices are on the way down, most other material prices are limited by Phase 4 controls, and bargaining between contractors and the building trades will remain under the supervision of CISC. This suggests something like 5 per cent inflation in construction next year compared with the string of 6½ to 7½ per cent increases that were the experience of the past several years. Still not good, but improving, anyway.

Controls, however, are no long-run substitute for competition and productivity. And it is only through progress in these two areas that we'll see a lasting change in the construction industry's built-in propensity for inflation.

of this building market. And finally, construction that depends heavily on Federal program money (highways, other public works) was not up to potential because billions of appropriated dollars remained impounded.

Toward the close of 1973, the deck was quite heavily stacked against short-run improvement in construction contracting. Monetary restraint, budget austerity, business slowdown, redirection of housing subsidies, impounded appropriations . . . they all add up to a hostile environment for construction during

the next year or so. Considering how construction markets have flourished over the past couple of years when conditions were unusually favorable, the deterioration of these environmental factors strongly suggests that the potential for further expansion of total construction demand in the short run is, at best, limited.

Setting the boundaries around 1974 construction markets requires some assumptions about the critical areas of the business outlook, monetary policy, and the Federal budget.

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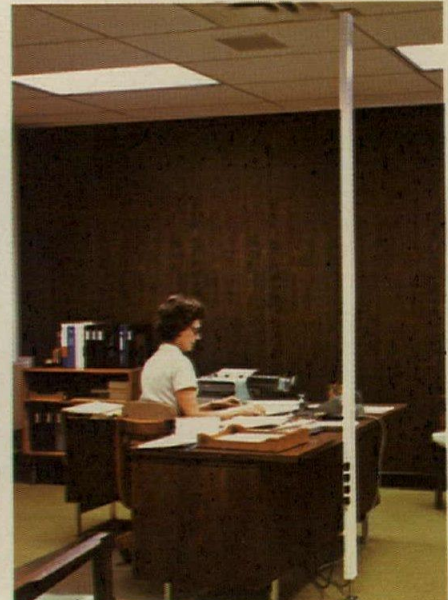
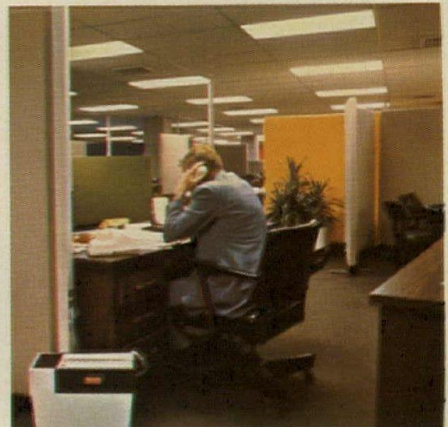
who has to keep a lot of tenants happy.

Says the executive director of a Pennsylvania office complex: "Every week, somebody wants to change his office around. I don't know what we'd do without Tele-Power Poles."

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Three hard questions need answers. How close to recession will 1974 bring the economy? Will monetary policy be more concerned with restraining inflation or with supporting the economy? And who—Congress or the President—will have the last word on government spending?

The threat of recession in 1974 has been overemphasized to the point that it is obscuring the real issues. Certain facts are quite obvious at this stage of the business cycle. Among them: Expansion during late 1972 and early 1973 became excessive. Most of the slack has disappeared from the economy. That being the case, it is unrealistic to expect (and undesirable to try) to sustain 7-8 per cent expansion much longer. Clearly, some adjustments are due.

So where does this leave us? On the borderline. If we have a recession next year (and the possibility can't be ruled out entirely) it would most likely be a very mild one—a recession that would barely qualify according to the technical definition of two consecutive quarters without "real" growth. In the much more likely event that we *don't* have a recession in 1974, we'll nevertheless come uncomfortably close to one by next spring. What matters most is that we are in for a substantial slowdown from the way things have been in 1973. And to aggravate the situation, business activity will be slowing noticeably, but inflation won't. That sets up a dilemma for monetary and fiscal policy.

In contrast to the monetary and budgetary excesses of 1972, we are now approaching 1974 with appropriately tight control over the Federal budget and the money supply—appropriate because both of today's main economic problems (overheating boom and worsening inflation) clearly require monetary and budgetary restraint. The optimum economic strategy for 1974 won't be nearly so straightforward. As business activity turns soft but inflation persists, we'll be right back in the same policy conflict as in 1969-70. The bitter experience of 1970's recession-cum-inflation that resulted from excessive reliance on tight money is the best argument for a more enlightened monetary strategy this time around. We shall hope for the best: a blend of Phase 4 controls to limit inflation and monetary ease to help the economy through its sluggish months.

Something of a parallel situation exists in Federal budgetary management. While current circumstances warrant maximum restraint, it doesn't follow that the same degree of restraint will be right for next year as well. (The stimulus of a small deficit could actually be welcome next year.) Nevertheless, the President seems determined to run a tight 1974 budget on his own terms. Welcoming the Congress back from summer recess with the challenge to work together "in a spirit of cooperation and compromise," he proceeded to serve notice that he was prepared to veto any legislation that would cut military spending or raise the cost of domestic programs. Thus the battle lines were drawn for another test of strength. Congress—equally aware of the inflationary pressures of a large deficit—is likely to settle

for something close to the Administration's \$269 billion ceiling if it can have more to say about setting priorities within that ceiling.

Our key assumptions about the factors influencing the environment for construction in 1974 can be summarized this way:

1. No recession, but significant slowdown from current boom conditions to another spell of "stagflation."
2. Relaxation of present monetary tightness before the close of 1973, with declining interest rates throughout 1974.
3. Over-all budgetary balance (or close to it) next year; little change from present austerity where social programs are concerned.

National construction outlook

Now it remains to be seen how these circumstances are most likely to affect future contracting for housing (which will decline further, then go up again), nonresidential buildings (which will soon level off), and nonbuilding construction (which has the best potential for gain in 1974).

Housing

Now that the housing cycle has clearly entered its downward phase, the obvious questions become: How far down will the rate of homebuilding sink before turning upward again? When will the next upturn occur?

Four hurdles stand in the way of an early recovery of homebuilding: mortgage availability, localized overbuilding, construction cost, and housing subsidies. None of these—except possibly the last—looks formidable.

Mortgage Availability: In the past two credit crunches, as mortgage money became increasingly scarce, the rate of housing starts fell drastically. This time around we can expect something better. At mid-1973, the thrift institutions were in better shape to withstand the drain of a brief period of very high interest rates. For one thing, the extraordinary volume of savings in 1971 and 1972 left them with a great deal more liquidity than in either of the two earlier crunches. What's more, through the support of the Federal Home Loan Bank and Fannie Mae, they can expect to maintain a reasonable degree of liquidity while honoring some \$15 billion of outstanding commitments. Further, the combination of higher rates paid on deposits by the thrift institutions and the depressed state of the stock market helped to slow the process of disintermediation during the summer of 1973. And if these aren't enough to get by the balance of 1973 without disaster, the Administration has recently proposed granting additional authority to the Federal Home Loan Banks and the Government National Mortgage Association to "moderate the tight mortgage situation." It suggests, then, a period of some financial discomfort, but something short of crisis for the mortgage lending industry. And depending upon when the Federal Reserve decides to relax its mid-1973 tightness, we can look ahead to improving mortgage availability through 1974.

Mortgage rates aren't apt to rise as high

over the next several months as the tightness of the market would seem to justify. State usury laws will set an artificial upper limit, and the squeeze will take other forms: points, equity participation, etc. By the same token, next year's easing won't bring mortgage rates down very far, either. Inflation, more than money supply and demand relationships, is the underlying problem and it sets a high lower limit on the range in which the price of money can fluctuate.

Overbuilding: It would be hard to make much of a case for overbuilding . . . except on a local basis. The great surge of housing starts since 1971 hasn't yet begun to push up vacancy rates significantly. That's partly because of the backlog of housing demand carried forward from the low building years of the late 1960's, partly because current household formation is rising rapidly, and partly because a large block of the million or more new apartments started during the most recent twelve months aren't yet ready for occupancy . . . and therefore technically aren't vacant.

The national vacancy rate will undoubtedly rise over the next six months to a year as projects now in progress reach completion. But with the rate currently under six per cent—a low rate by past standards, and showing remarkable stability despite the record volume of building—an increase of a percentage point or so would be only a minor deterrent to further building.

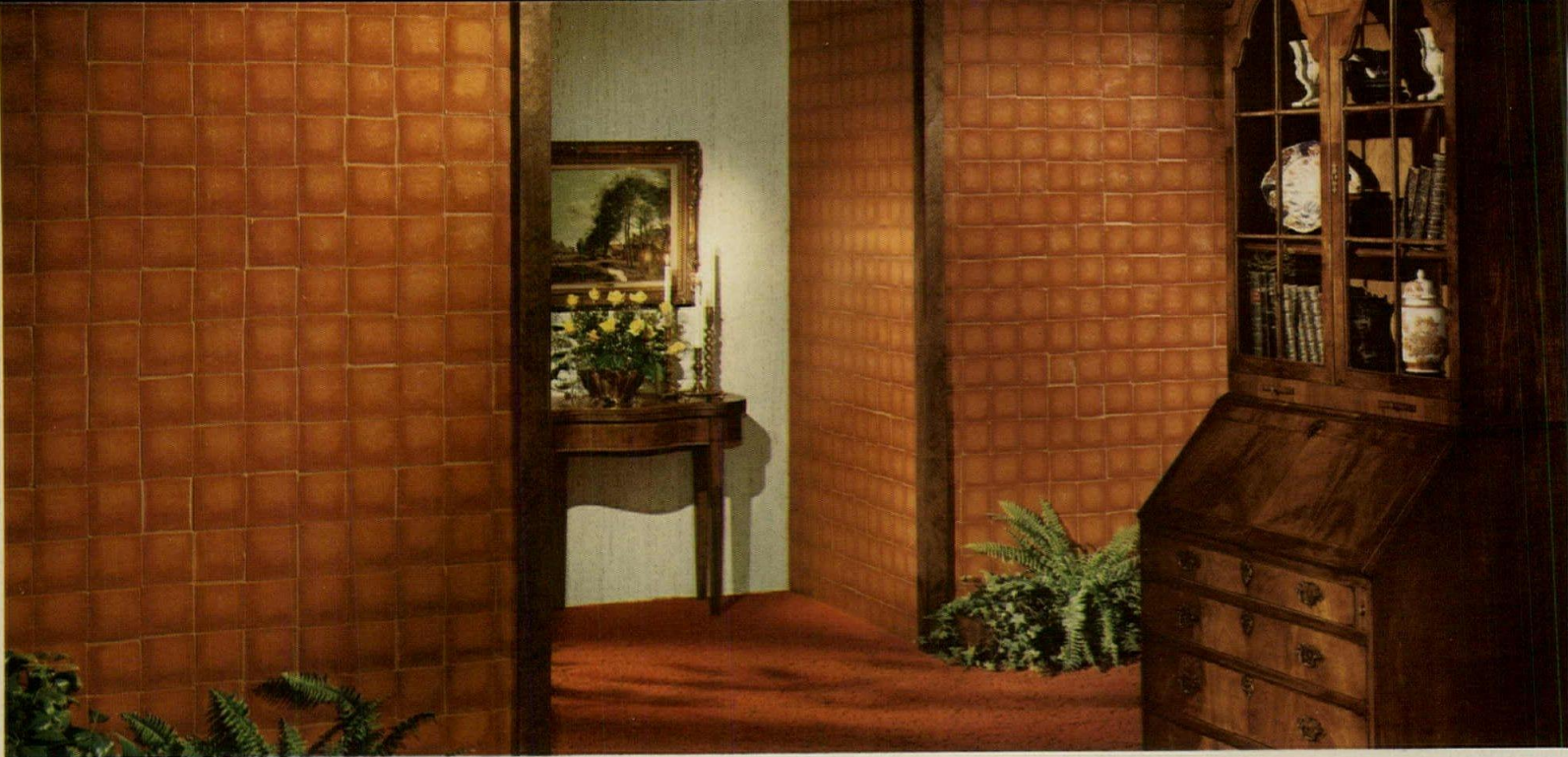
Regional vacancy rate comparisons show that although rental building has become excessive in the South and West over the past year, it has been inadequate, if anything, in the Northeast where the rate is very low, and in the Midwest where vacancies have actually declined since mid-1972.

Construction Costs: Homebuyers have been getting a double dose of inflation lately—paying an inflated price for housing and then financing it at an inflated interest rate.

Due mainly to the severe run-up in lumber and plywood prices, single-family housing built in 1973 cost 10 per cent more per square foot to build than 1972's comparable house. That's \$2,500 added to the price of an "average" \$25,000 house (excluding land) just since last year. One result: mobile homes increased their penetration of the shelter market to more than one-third of combined one-family and mobile home volume in the first six months of 1973.

With forest products prices coming back to reality again, homebuilders should be able to do a better job of holding prices down in 1974 . . . and just maybe sell a few more homes that way.

Subsidized Housing: Since the President's January moratorium on housing subsidies, starts under the various government programs to assist the production of housing for low- and moderate-income families have diminished to their lowest level since the mid-1960's. This year's subsidized starts, less than half the peak



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volume reached during 1971 and 1972, were mainly leftover work—projects that were approved but not yet started at the time new approvals were frozen. With this work “in the pipeline” running out, there is bound to be a sizable gap in subsidized housing starts before HUD’s proposed new approach to housing the needy can be set in motion.

The alternatives from which a new housing policy will be derived over the months ahead are:

1. Revival of existing subsidy programs but with better administration at the local level.
2. Emphasis on the “revenue sharing” approach by which Federal housing funds are allocated to state and local governments for use however these local groups consider most appropriate.
3. Switch to the “welfare” concept by which housing allowances (cash or credits) are paid directly to families qualifying for assistance.

Recently we learned some of the details of the Administration’s new housing policy recommendations. They involve all three alternatives, plus expanded support of the residential mortgage market. Next year’s authorization for new subsidized housing would be limited to about 150,000 units as the housing allowance system is phased in. The object: to maximize the use of existing structures in meeting the national commitment to raise housing standards among the poor. Congress has shown some interest in the housing allowance approach, but as an addition to and not as a replacement for rent and interest supplements.

It will be quite some time (not in 1973, anyway) before the executive and legislative branches iron out differences and settle on a new national housing strategy. In the meantime, we face a period of low production of subsidized units at the same time that credit market conditions will be inhibiting privately-financed building.

▪ **Outlook:** Of the several factors acting on the housing cycle, the negative influences of credit scarcity and subsidy review will dominate the near future. Then, as these problems are resolved, the positive force of the underlying demand for housing will make itself felt in a second-half recovery.

The end of the declining phase of the cycle should be reached during the first quarter of 1974 when the annual rate of housing starts to level off at about 1.7 million units. Easier credit conditions will spark a spring rise of privately-financed housing, which will later be augmented by a revival of subsidized units, bringing the rate of starts above 1.9 million by the final quarter.

At 1,825,000 for the year (1,075,000 one- and two-family homes and 750,000 apartments) 1974’s number of dwelling units will be about 13 per cent lower than this year’s volume. But inflation will limit the decline in residential contract value to eight per cent for a total of \$43.0 billion.

Nonresidential building

Not at all surprising, 1973’s booming economy has provided the incentive for strong gains in

business-related construction. Industrial building, always the most sensitive to the business cycle, was in its third year of advance—and accelerating. Commercial building, also in an extended upswing, was drawing most of its strength from stores and shopping centers, although the previously slow office building market was also showing improvements in 1973.

Through August, contracts for these business-related construction categories (which represent roughly half the total of nonresidential building value) had piled up a 30 per cent lead over the amount for the first eight months of 1972.

Institutional building, on the other hand, was in difficulty in 1973. By summer, a plague of problems—some temporary, some basic—turned the year’s strong start sour. Lacking enrollment growth, educational institutions are being severely squeezed by inflation. The doubtful future for Federal funds in support of construction of hospitals and other health facilities also has undercut the potential growth of this market. And around mid-year both schools and hospitals began to show their customary sensitivity to high interest rates. Borrowing costs were the immediate barrier to institutional building, but when rates began to decline next year, the more fundamental problems of enrollments and Federal aid will still be there.

Municipal governments converted their Federal Revenue Sharing allotments into buildings in a big way in 1973. Public administration buildings were the year’s second fastest growing category, topped only by the sizzling pace of industrial construction.

On balance, 1973 has been a year of strong gains in nonresidential building, but gains that were closely identified with the booming economy. The clock is running out on that boom, and next year’s slowdown implies something of a shakeout in the market for nonresidential building contracting.

Business construction

If we were to consider only the sharpness of the rise in contracting for *manufacturing facilities* since the last recession, the odds would heavily favor a downturn before much longer. Since its critical low in 1971, industrial building has risen by close to 75 per cent (15 per cent in 1972, and more than 50 per cent on top of that in 1973). That’s a considerably faster rate of rebound than during the first two years following either of the last two recessions, and in this notoriously cyclical building market, it’s something hard to ignore.

There are, however, some other circumstances which make industrial construction contracting look less vulnerable to instant collapse. One is the severity of its decline during the 1970-71 recession. From peak to trough (first quarter of 1970 to first quarter of 1971) the seasonally-adjusted annual rate of industrial building fell by 60 per cent—from \$5.5 billion all the way to \$2.2 billion. Despite the rapidity of the recovery of industrial construction through 1972 and 1973, the rate of

contracting at mid-1973 was back only about where it was just before the 1970 collapse—\$5.7 billion. But that current rate of building, to be comparable to the pre-recession level, has to be reduced by three years of severe inflation. In real terms, industrial building contracting in 1973 was still some 20 per cent short of the level attained a short while prior to its decline.

Another way to show this is through what has been happening to industrial capacity in relation to output. In our basic industries, output has grown by 16 per cent since its pre-recession peak, while capacity has been expanded by only 12 per cent over the same three and a half years. This disparity puts current utilization of facilities in these industries at 94 per cent—the highest rate in more than a quarter of a century.

Two things will be happening in 1974 to alter these relationships. As the expected slowdown materializes, industrial production will flatten out; as the new capacity contracted for in the past year or more reaches completion, available capacity will increase. And as a result of these opposing movements, the percentage of capacity in use will almost certainly decline next year from its present peak.

If next year’s economic problems turn out as expected—a 1967-type slowdown rather than a 1970-type recession—we might use 1967’s experience as a guide. There are similarities to the present. Just prior to the 1967 “mini-recession,” industrial capacity utilization was similarly above 90 per cent. And contracting for industrial building was also at an all-time high (for then), having risen steeply in the years prior to 1967. When the slowdown came, capacity utilization dropped several points (to 87 per cent) but industrial building did not decline. It continued to increase, though at a slower pace.

No two situations ever yield identical results, but if we suffer no worse than a mild slowdown through 1974 with the expectation of a pickup in 1975, conditions in most industries are presently tight enough to warrant further (but slower) growth in industrial construction contracting next year.

▪ **Outlook:** Manufacturing building contract value will be up four per cent to \$4.8 billion in 1974.

Stores

Neither the same reasoning nor the same conclusion applies in the case of commercial building. If the rationale we’ve offered in prior forecasts of *stores and shopping centers* (that their growth is mainly a lagging function of the residential cycle) has any validity, then this major portion of the commercial building market will bear some careful watching during the quarters ahead.

This much is history: during 1968, 1969 and 1970, both residential building and store contracting were showing essentially flat trends. The housing boom began in 1970’s third quarter, and two quarters later stores and shopping centers began to move up. Both markets have followed very similar rising trends

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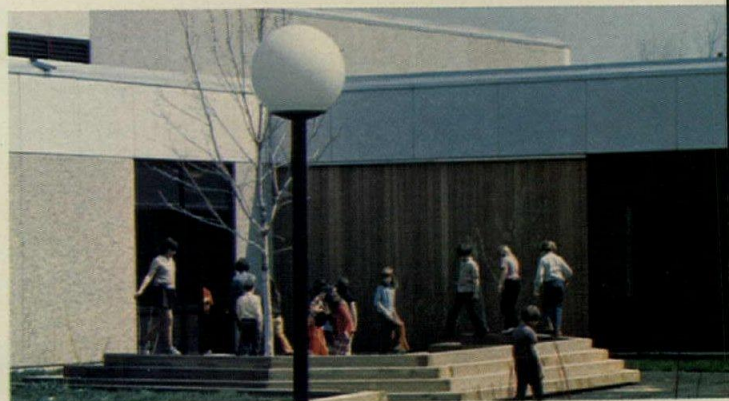
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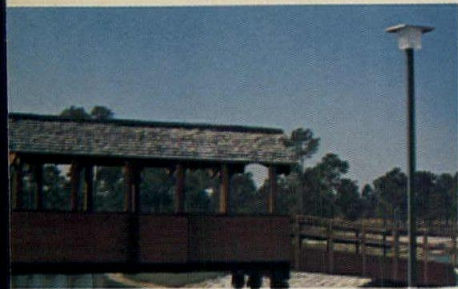
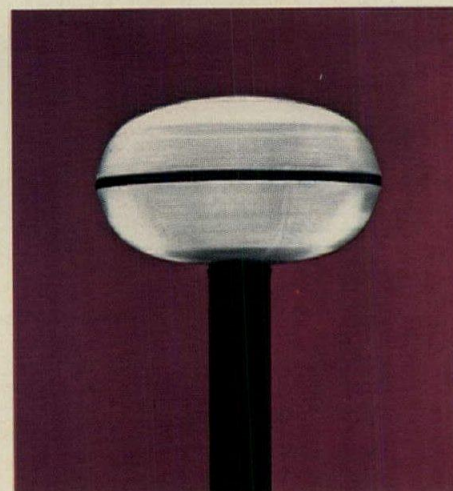
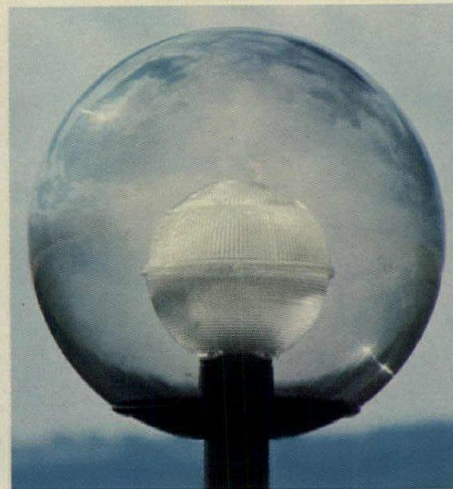
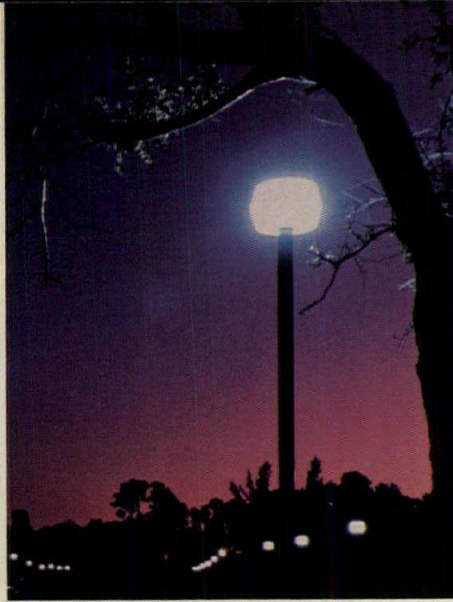
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until the second quarter of 1973 when housing reached the end of its boom and turned down. If the same two-quarter lag holds, we could expect a weakening of store contracting around the final quarter of 1974.

That kind of precision isn't to be expected. A primary cause of housing's downturn was the tightening of mortgage money. And since developers of shopping centers aren't confined to the limited source that homebuilders and homeowners are for their financing, there's reason to expect that the store boom may continue more than two quarters beyond the housing downturn.

■ **Outlook:** At some point in 1974, odds favor a downturn in contracting for stores and shopping centers. And what this suggests is a modest decline of about four per cent next year to \$6.9 billion with most of the weakness showing up in the second half.

Offices

It took less time than anyone might reasonably have expected for the *office building* market to regain the peak reached during the boom of 1969, but it's there again. Getting back to that high level in so short a time involved a bit of geographical realignment of the office building market. The shift has been away from the Northeast, which the '69 boom endowed with more than ample space for the present, and to the South and West.

■ **Outlook:** The demonstrated resiliency of the office building market justifies a forecast of a small gain next year to \$6.0 billion as the after-effects of the previous boom recede further into the past.

Institutional building

Contracting for both educational and hospital construction sagged noticeably around mid-1973 as tightening credit forced the postponement of some projects. So far the pattern is strikingly similar to what happened in the 1969-70 money squeeze. If the rest of that pattern holds, institutional building could show a temporary spurt in 1974 as more favorable borrowing terms encourage the resumption of delayed 1973 work.

However, for reasons apart from credit availability, school and hospital construction markets will remain under handicaps for a while.

Educational institutions are making the adjustment from a growing enrollment universe to a static one.

For public schools, this implies simply a diminished need for new facilities, but for private schools, where enrollment is an important source of income, the problem is more one of survival. With inflation pushing their operating costs up faster than tuition income, most schools are looking for ways to cut back rather than expand.

In *health care*, where the number of patients continues to increase as relentlessly as ever, one important source of construction money—Federal aid through the Hill-Burton program—is drying up. In recent years, the \$200 million available annually on a 4:1

matching basis through this medium has stimulated roughly a billion dollars of hospital and health facility construction. Its elimination is bound to retard the growth trend of hospital construction for a time.

National estimates, 1974

construction contract value (million of dollars)	1973 pre-liminary*	1974 forecast	per cent change
nonresidential buildings			
office buildings	\$ 5,900	\$ 6,000	+ 2%
stores and other commercial	7,200	6,900	- 4
manufacturing	4,600	4,800	+ 4
educational	4,900	5,000	+ 2
hospital and health	3,400	3,800	+ 2
other nonresidential buildings	5,400	5,500	+12
TOTAL	\$31,400	\$ 32,000	+ 2%
residential buildings			
one- and two-family homes	\$29,000	\$ 27,500	- 5%
apartments	15,000	13,000	-13
nonhousekeeping	2,500	2,500	—
TOTAL	\$46,500	\$ 43,000	- 8%
TOTAL BUILDINGS	\$77,900	\$75,000	- 4%
nonbuilding construction			
highways & bridges	\$ 8,600	\$ 9,000	+ 5%
utilities	4,000	5,000	+25
sewer & water supply	4,800	5,500	+15
other nonbuilding construction	3,400	6,500	**
TOTAL	\$20,800	\$ 26,000	+25%
TOTAL CONSTRUCTION	\$98,700	\$101,000	+ 2%
Dodge index (1967=100)	179	183	
physical volume of floor area (millions of square feet)			
nonresidential buildings			
office buildings	205	205	—%
stores & other commercial	525	485	- 8
manufacturing	285	280	- 2
educational	150	145	- 3
hospital & health	80	85	+ 6
other nonresidential buildings	190	190	—
TOTAL	1,435	1,390	- 3%
residential buildings			
1- and two-family homes	1,640	1,425	-13%
apartments	895	750	-16
nonhousekeeping	105	100	- 5
TOTAL	2,640	2,275	-14%
TOTAL BUILDINGS	4,075%	3,665	-10%

* Eight months actual; four months estimated ** includes trans-Alaska pipeline

■ **Outlook:** The trend of educational building contract value stopped growing as long ago as 1968, and after holding steady for almost three years, has been declining since 1971. With credit restraint pushing some 1973 work into 1974, that decline is likely to be interrupted temporarily. Next year's second half could be weak, but the year as a whole will be close to the current \$5 billion total.

Contracting for hospital and other health facilities will recover from two year's decline with a 12 per cent gain to \$3.8 billion in 1974, and then settle into a slower rate of growth.

Public buildings

As recently as a couple of years ago, contracting for public buildings—municipal buildings, courthouses, libraries, etc.—barely topped a billion dollars annually. In 1973 the total of such work will exceed \$2 billion. One major difference: revenue sharing.

Analysis of the uses of those Federal funds that are being made available to states and communities on a formula basis shows that roughly 40 per cent goes for capital outlays with police and fire stations a heavy favorite. And apparently some of it represents a net addition to what was previously being raised through local taxes, rather than just a dollar-for-dollar substitution of Federal for local funds.

Another source of additional public building is the Postal Service. Now a quasi-public agency and outside the purview of the Federal budget, this agency is now moving ahead with its long-delayed building program.

■ **Outlook:** Because part of 1973's revenue sharing money included a retroactive adjustment, next year's disbursement will be about 30 per cent lower. This reduction, and the likelihood that 1973's burst of construction has removed some of the urgency from community building demand, argue for a decline of about five per cent to \$1.9 billion in public building contracts next year.

Nonresidential building summary: With the economy moving from boom to slowdown, and with credit changing from tightness to moderate ease, nonresidential building markets are bound to react. Business-related construction, especially industrial building, will lose much of its current thrust. Institutional construction, currently inhibited by high borrowing costs, will recover somewhat. Public building, not as responsive to economic conditions, is expected to show a moderately slower pace next year as the initial impact of revenue sharing wears off.

■ **Outlook:** As these changes occur, their net effect on total nonresidential building contract value will be positive, but only slightly so. After 1973's 16 per cent expansion, the potential for further gain next year is only some two per cent, bringing total nonresidential building value to \$32.0 billion.

Prepared October 1973 by the Economics Department
McGraw-Hill Information Systems Company
George A. Christie, vice president and chief economist

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Dodge estimating guide for air-frame structures

The air-frame structure has been used to convert swimming pools, tennis courts and athletic fields from seasonal to year-round use. Although the air-frame structure has certain aerodynamic characteristics, a vinyl clad catenary cable system reinforced with a bias belted harness reduces the stress on the fabric to a minimal 6 p.s.i. and allows the structure to maintain its shape even in 80 m.p.h. winds. Interior pressure is maintained by a 7½ to 10 hp motor and blower with a 1,500,000 Btu/hr burner capable of operating on either natural gas or propane with a fail-safe unit that activates automatically to compensate for a pressure drop.

The following is a sampling of costs for air-frame structures (including anchoring devices but not floors or foundations) taken from the *Dodge Building Cost Calculator and Valuation Guide*:

SIZE	TYPE	COST/SF	COST/CF
60 x 120	Nylon	4.22	.15
100 x 200	"	2.83	.07
120 x 160	"	2.69	.07
120 x 200	"	2.30	.06
120 x 250	"	2.30	.06
120 x 300	"	2.25	.06

Additives & adjustment (in Cost/SF)		
Installation	.20-.50	(depending on field conditions)
Lighting	.50	
Heating	.40	
Air Conditioning	.60	

—John H. Farley senior editor
Dodge Building Cost Services

INDEXES: November 1973

1941=100.00 (except as noted)

Metropolitan area	Cost differential	Current Indexes				% change last 12 months
		non-res.	residential	masonry	steel	
U.S. Average	8.1	437.7	411.0	428.3	418.1	+12.04
Atlanta	7.5	551.4	519.8	539.5	527.7	+ 9.61
Baltimore	8.1	483.5	454.6	471.4	458.1	+13.28
Birmingham	7.3	407.2	378.7	392.9	388.5	+12.43
Boston	8.8	443.4	419.0	437.2	426.4	+11.19
Buffalo	8.7	476.5	447.5	468.6	455.1	+10.73
Chicago	8.4	515.7	490.3	497.2	491.0	+14.64
Cincinnati	8.5	468.4	440.7	455.3	444.3	+12.77
Cleveland	8.7	468.6	440.9	457.7	447.3	+ 7.82
Columbus, Ohio	7.9	451.7	424.1	439.4	430.4	+ 9.82
Dallas	7.5	440.3	426.3	429.7	421.4	+13.07
Denver	7.9	466.0	438.4	458.0	443.4	+11.15
Detroit	9.5	506.0	482.5	509.4	489.8	+15.86
Houston	7.0	395.9	371.8	385.3	378.9	+ 7.32
Indianapolis	7.5	396.4	372.2	387.2	379.0	+ 9.17
Kansas City	7.9	411.0	388.3	401.6	391.3	+10.77
Los Angeles	8.4	515.3	471.0	500.2	489.3	+18.97
Louisville	7.4	435.6	409.1	425.1	416.0	+11.89
Memphis	7.7	432.2	406.2	415.4	409.7	+17.15
Miami	7.7	452.5	431.1	438.7	429.8	+10.21
Milwaukee	7.9	477.9	448.7	467.9	454.2	+ 8.75
Minneapolis	8.5	461.1	433.8	452.9	442.7	+10.63
Newark	8.4	418.8	393.2	411.2	403.3	+10.11
New Orleans	7.3	425.9	402.0	419.6	409.9	+13.94
New York	10.0	496.4	461.6	484.3	471.8	+14.88
Philadelphia	9.0	490.4	467.2	485.8	472.6	+15.82
Phoenix (1947 = 100)	7.7	250.2	234.9	242.1	238.0	+12.51
Pittsburgh	8.5	429.0	403.6	423.9	410.9	+11.79
St. Louis	8.4	449.9	424.6	442.5	432.4	+10.54
San Antonio (1960 = 100)	6.9	159.8	150.0	154.5	151.4	+ 6.50
San Diego (1960 = 100)	8.0	180.0	169.0	176.0	172.4	+17.96
San Francisco	9.2	646.3	590.8	639.9	620.6	+12.84
Seattle	8.4	435.3	389.6	430.4	414.4	+14.44
Washington, D.C.	7.5	405.6	380.8	393.4	384.9	+ 8.79

Cost differentials compare current local costs, not indexes.

Tables compiled by Dodge Building Cost Services, McGraw-Hill Information Systems Company

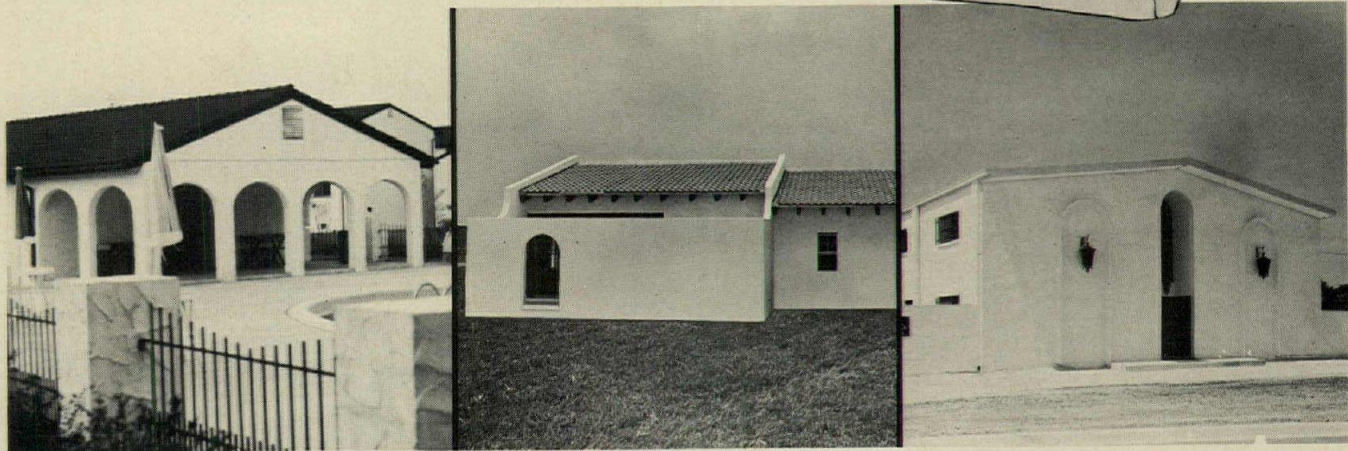
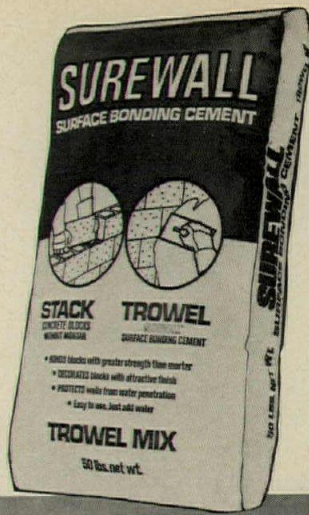
HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL NON-RESIDENTIAL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972 (Quarterly)				1973 (Quarterly)			
										1st	2nd	3rd	4th	1st	2nd	3rd	4th
Atlanta	306.7	313.7	321.5	329.8	335.7	353.1	384.0	422.4	459.2	472.5	473.7	496.1	497.7	516.4	518.0	543.8	
Baltimore	275.5	280.6	285.7	280.9	295.8	308.7	322.8	348.8	381.7	388.1	389.3	418.8	420.4	441.8	443.6	474.5	
Birmingham	256.3	260.9	265.9	270.7	274.7	284.3	303.4	309.3	331.6	340.4	341.6	356.7	358.3	371.7	373.2	401.1	
Boston	244.1	252.1	257.8	262.0	265.7	277.1	295.0	328.6	362.0	377.3	378.5	392.8	394.4	414.0	415.6	436.8	
Chicago	301.0	306.6	311.7	320.4	328.4	339.5	356.1	386.1	418.8	422.8	424.0	442.7	444.3	465.3	466.9	507.6	
Cincinnati	263.9	269.5	274.0	278.3	288.2	302.6	325.8	348.5	386.1	399.9	401.1	400.1	410.7	430.4	432.0	461.4	
Cleveland	275.8	283.0	292.3	300.7	303.7	331.5	358.3	380.1	415.6	415.2	416.4	427.7	429.3	436.7	438.3	461.2	
Dallas	253.0	256.4	260.8	266.9	270.4	281.7	308.6	327.1	357.9	364.9	366.1	385.0	386.6	407.3	408.9	435.4	
Denver	282.5	287.3	294.0	297.5	305.1	312.5	339.0	368.1	392.9	398.3	399.5	413.8	415.4	429.5	431.1	460.0	
Detroit	272.2	277.7	284.7	296.9	301.2	316.4	352.9	377.4	409.7	416.9	418.1	431.5	433.1	463.4	465.0	500.0	
Kansas City	247.8	250.5	256.4	261.0	264.3	278.0	295.5	315.3	344.7	348.7	349.9	365.4	367.0	387.7	389.3	404.8	
Los Angeles	282.5	288.2	297.1	302.7	310.1	320.1	344.1	361.9	400.9	407.8	409.0	422.9	424.5	453.3	454.9	503.2	
Miami	269.3	274.4	277.5	284.0	286.1	305.3	329.3	353.2	384.7	391.5	392.7	404.8	406.4	419.0	420.6	446.2	
Minneapolis	275.3	282.4	285.0	289.4	300.2	309.4	331.2	361.1	417.1	401.7	402.9	411.3	412.9	430.6	432.2	455.1	
New Orleans	284.3	240.9	256.3	259.8	267.6	274.2	297.5	318.9	341.8	350.9	352.1	368.1	369.7	382.1	383.7	419.5	
New York	282.3	289.4	297.1	304.0	313.6	321.4	344.5	366.0	395.6	406.5	407.7	421.5	423.1	453.5	455.1	484.3	
Philadelphia	271.2	275.2	280.8	286.6	293.7	301.7	321.0	346.5	374.9	394.2	395.4	417.9	419.5	459.3	460.9	484.1	
Pittsburgh	258.2	263.8	267.0	271.1	275.0	293.8	311.0	327.2	362.1	364.5	365.7	378.7	380.3	406.3	407.9	423.4	
St. Louis	263.4	272.1	280.9	288.3	293.2	304.4	324.7	344.4	375.5	385.5	386.7	400.9	402.5	427.8	429.4	443.2	
San Francisco	352.4	365.4	368.6	386.0	390.8	402.9	441.1	465.1	512.3	535.3	536.5	559.4	561.0	606.4	608.0	631.3	
Seattle	260.6	266.6	268.9	275.0	283.5	292.2	317.8	341.8	358.4	363.0	364.5	369.9	371.5	388.4	390.0	423.4	

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.

Specified for economy and beauty, built with strength. SUREWALL[®], the only white mortarless Surface Bonding Cement....



in Virginia.

CA Construction Associates of Tidewater, Ltd. (Newport News), general contractor, and McPhatter & Son, plastering contractor, chose SUREWALL as a water resistant stucco finish coat for the large Cordoba Apartment complex in Hampton.

Results: SUREWALL is superior to regular stucco in resistance to cracking. No further waterproofing agents required. Job time cut by elimination of usual brown coat on block areas. Cost factor, good! They'll use SUREWALL again. Soon.

You can specify SUREWALL with confidence because SUREWALL has major code approvals: Southern Building Code Congress, South Florida Building Code, North Carolina Building Code, BOCA 72-72.

in Florida.

Despard Constructors (Winter Haven) approved SUREWALL's performance on other jobs. So they chose it for their own new office building — inside and out.

Dave Despard says: SUREWALL is even easier to work with than anticipated. What he likes most is that he has more control over the job. His own people do it all. He also appreciates the many different, attractive SUREWALL finishes. Despard Constructors continue to use SUREWALL. Now, on townhouses. SUREWALL is versatile. And, SUREWALL is pure white. Looks good. Even without paint. (For color, use one coat — not two — of regular masonry paint.)

in Texas.

Mike Butler Construction Co. (San Antonio), plastering and masonry contractor, used SUREWALL for the Olmos Equipment Co. plant. Only 46 construction days to complete the 5,000 sq. ft. building — despite three ice and two snow storms. SUREWALL was used to bond the concrete blocks. And inside the office areas on dry wall. Butler, and Olmos, like SUREWALL's performance. Homes, apartments, offices, farm and industrial buildings, theatres, bank vaults, sea walls. All built with SUREWALL. Independent tests prove the superiority of SUREWALL concrete block bonding. Complete data is available.

SUREWALL[®] is a registered trademark of W. R. Bonsal Company, Lilesville, N. C. and Best Concrete Products Company, College Park, Georgia.

See SWEET'S 4.9/Bo

BONSAL COMPANY P.O. Box 38, Lilesville, N. C. 28091 Phone: 704/848-4141

Other plants: 483 Bonsal Rd., Conley, Ga. 30027, 404/361-0900 — 1775 N.E. 205th Terrace, Miami, Fl. 33126, 305/651-4500 — 5455 N. 59th St., Tampa, Fl. 33610, 813/621-2427. — Box 395, Flomaton, Al. 36441, 205/296-4252. SUREWALL[®] is also available from Barrett Industries, Inc., 6889 Evans Rd. East, San Antonio, Tx. 78218 and Post Distributing Company, Stanton & Empire Sts., Wilkes Barre, Pa. 18702.

For more data, circle 55 on inquiry card

Onan announces
**the first automatic
 transfer switch with
 plug-in solid-state
 control modules.**



It's one more reason to switch with Onan — the world's largest producer of standby power systems and the automatic transfer switches to make 'em work right.

New plug-in, solid-state control modules mean greater design potential for the consulting engineer.

Instant service in the field.

And the ultimate in silent, dependable operation.

Every one of these unique new Power Sentry™ automatic transfer switches is designed as an integral part of a complete Onan standby power system that includes engine. Generator. Controls. Transfer switch. And a nationally advertised 5-year warranty.

Features? More than 15,000 combinations of standard accessory groups to meet all of your design requirements.

You'll also like the improved operational safety features, plus such benefits as our coast-to-coast parts and service network, and simplified purchasing (one spec, one purchase order).

Call your Onan distributor (in the Yellow Pages under Generators — Electric) for full details. Or write to:
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 1400 - 73rd Ave. N.E., Minneapolis,
 Minn. 55432

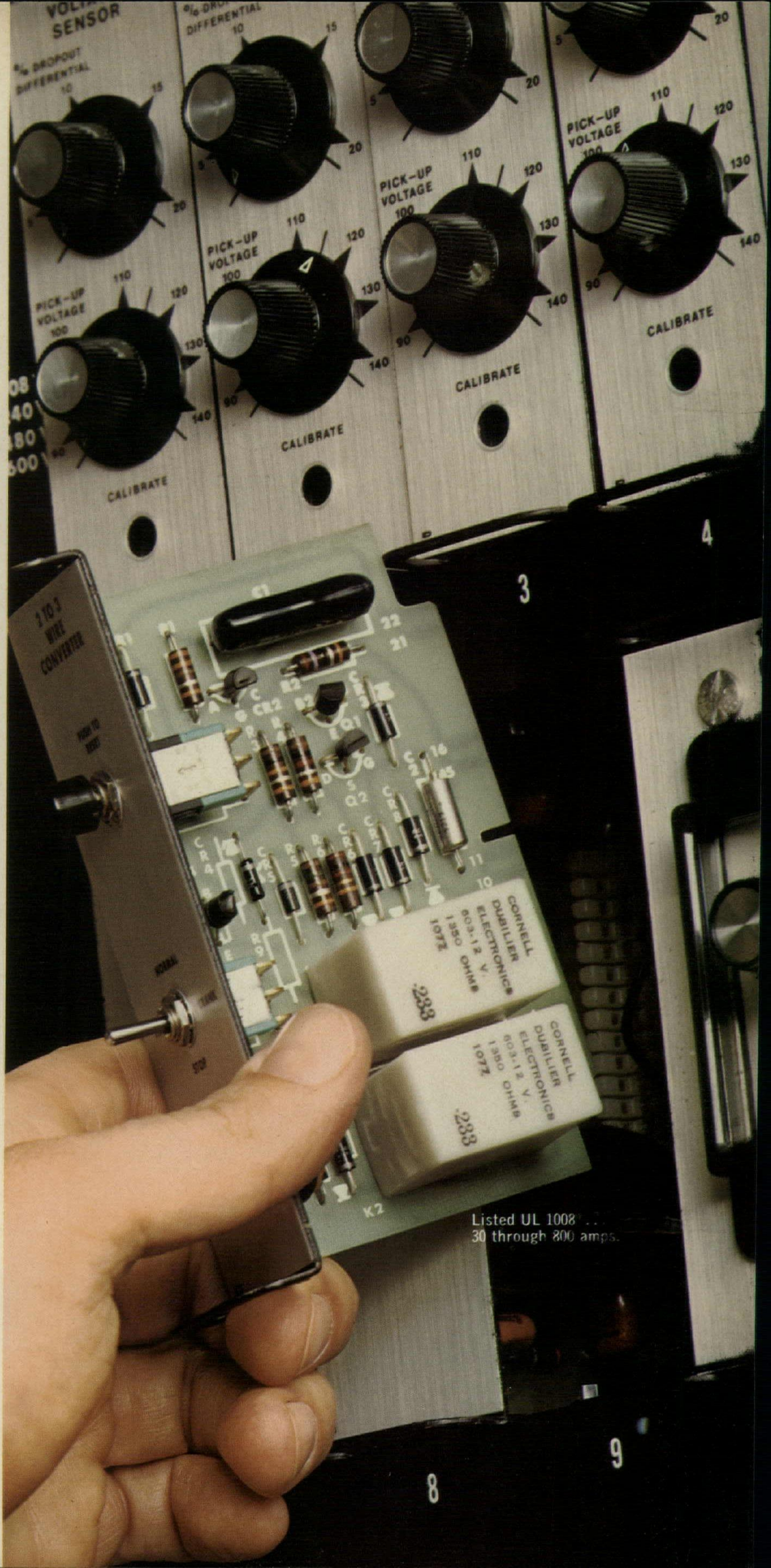
* Models LTCU, LTDU, LTEU, LTSU . . .
 30 through 800 amps.



Onan®

Power on demand
 for the **Good** things in life.

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Listed UL 1008 . . .
 30 through 800 amps.

2' X 2' REVEAL EDGE, TEXTURE-TONE

12' X 12" TEXTURE-TONE TILE



Celotex: ceilings that

They say you can't please everybody. We don't accept that at Celotex. Especially when it comes to ceiling products.

We try to please the architect with a range of patterns and textures in a variety of ceiling products that give his imagination free rein.

We have surface textures that make tile joint lines almost invisible, and reveal edge lay-in panels that create a distinctive total ceiling design.

We have acoustical ceiling products with noise reduction coefficients to .90;

ceilings with U.L. time-rated assemblies of 1, 2 and 3 hours.

Naturally, being able to specify acoustical ceilings that function so effectively and offer beauty pleases the architect. And, the owner and tenant are pleased too. Good acoustical control and a ceiling that comple-

12" X 12" TEXTURE TONE TILE



work. Beautifully.

ments the architect's design makes for satisfied occupants.

Which brings us right back to where we started.

Trying to please everybody with a line of ceiling products so complete and so well designed that they fulfill nearly every requirement.

You can get information on Celotex ceiling products from Sweet's Architectural and Industrial Files or from your Celotex representative. Or write The Celotex Corporation, Tampa, Florida 33622.

While it's true that we're

trying to please everybody, we'll start by pleasing you.

CelotexTM

BUILDING PRODUCTS

The Celotex Corporation, Tampa, Florida 33622

a **Jim Walter** company

ARCHITECTURAL RECORD November 1973 77

For more data, circle 57 on inquiry card

The subdued approach to Reflective Glass

With the increasing use of reflective glass for outstanding solar control and lower operating costs, more and more buildings are sticking out in harsh, metallic glare.

Now, Shatterproof Glass Corporation has developed a refined, subdued Reflective Glass that still offers the benefits of the harsh reflective glasses.

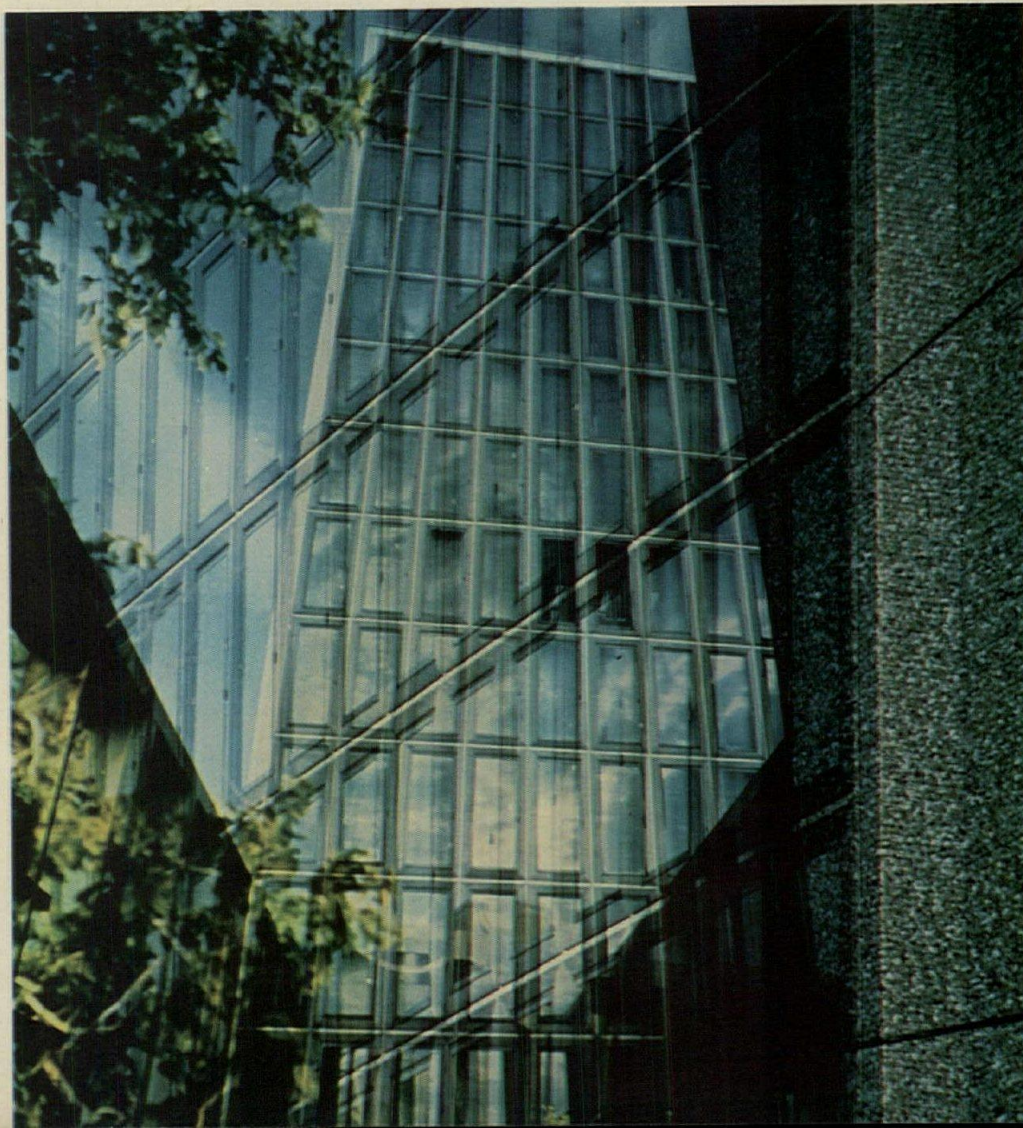
... Manufactured in three configurations—Insulating, Laminated and Monolithic—for complete versatility.

Depending on the type specified, it can also provide thermal control, sound control, security and safety benefits. Available in subdued tones of bronze, gold, gray and chrome ... in the largest quality sizes in the industry.

To learn more, write for our Reflective Brochure, Shatterproof Glass Corporation, Dept. 101A, 4815 Cabot Avenue, Detroit, Michigan 48210. Phone: 313/582-6200.

For more data, circle 58 on inquiry card

Shatterproof
GLASS CORPORATION *Architectural Division*





Anso[®] nylon's five year guarantee. It means the McCarran Airport carpet won't wear out its welcome.

Visitors mean a lot to Las Vegas. So the McCarran Airport people decided to roll out the welcome mat—"Jupiter Flamegard" carpeting by Commercial Carpet Corporation.

They picked this level loop carpet for its ability to stay new-looking through heavy traffic and countless cleanings. Features that are characteristic of ANSO nylon, and backed up by Guarantesth—the guarantee with teeth. That's Allied Chemical's assurance that the carpet will not wear more than 10% in five years, or we'll replace it, installation included.

Allied can make this promise because we test every carpet made of ANSO nylon ten different ways to be sure

it will stand up to day-in, day-out wear and tear.

ANSO is the second-generation soil-hiding nylon with the solid cross-section that means liquid stains cannot get into the fiber.

So look for the label with the fierce little animal who symbolizes our Guarantesth. And get the carpet with the five year wear guarantee.

For your free copy of our Contract Carpet Manual, write to: Allied Chemical Corporation, Fibers Division, Contact Dept. AR, One Times Square, New York, New York 10036. Telephone: (212) 736-7000.



McCarran Airport, 30,000 yards, Jupiter Flamegard, Commercial Carpet Corporation.



**Guarantesth.
The guarantee with teeth.**

For more data, circle 59 on inquiry card



We helped Denver cure its drinking problem.

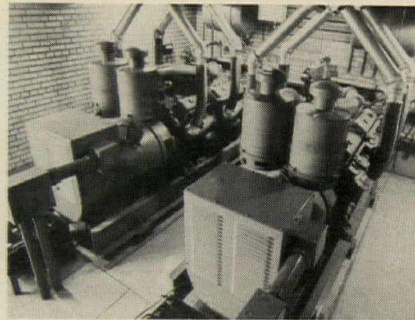
Denver is a man-made jewel. Implanted neatly into the uncut beauty of the Rockies, it embellishes one of nature's great settings.

As beautiful as Denver's setting is, though, it places the city one mountain away from its water supply. Millions of gallons of fresh water flow daily down the western slopes of the Rockies. But on the eastern side, the Denver side, the air is dry and the water scarce.

In the 1920's, however, this situation was eased. At the cost of 15 million dollars, two tunnels were augered straight through the Continental Divide. One tunnel brought the railroad. The other brought water.

Today, the Moffat Filter Plant supplies the people of Denver with 170 million gallons of water a day. Obviously, the continuous operation of this plant is vital to the city. This is why its power source is so carefully pro-

tected. Protected by two Detroit Diesel Generator Sets.



In 1962, the Detroit Diesel Allison Distributor in Denver furnished these twin 16V-71 300 KW standby generators. Detroit Diesels were chosen for three good reasons: 1. These engines have proven their reliability in countless hours of the toughest kind of work. 2. They are basically simple engines; easy and inexpensive to maintain. 3. And most important, the Detroit Diesel Allison Distributor had the know-how to handle the entire job from start to finish.

In the 11 years since they've been in use, these engines have been called upon several times during power

outages in the Denver area. In each case the big 16V's have kicked over right on cue. Without a minute's interruption to Denver's water supply.

Without actually knowing it, the people of Denver depend heavily on these Detroit Diesel engines. And, if part of your job is finding and specifying power that people depend on, then you should find out more about Detroit Diesel Powered Electric Sets.

Just check with your nearest Detroit Diesel Allison Distributor. He'll work with you in every way possible. Actually custom building the exact set for your job. Any job.

To find out more, just clip this coupon and we'll send you the latest catalog on Detroit Diesel Powered Electric Sets.



Detroit Diesel Allison
Division of General Motors
P.O. Box 81, Birmingham, Mich. 48012

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COMPANY _____

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GD01-AR-11-AC

Detroit Diesel Powered Electric Sets

Now you're talking power.

For more data, circle 60 on inquiry card

Fast Service, Less Breakage with automatic kitchen door operators

The new generation of Norton[®] automatic door operators gives you one more important benefit. They're Quiet.

That's right . . . quiet.

We've incorporated a new hydraulic pump in our operators. It's more powerful and it dramatically reduces the discernible noise level. It completely eliminates objectionable noise, making it ideal for the hushed atmosphere so important to the better restaurant.

We've also been able to provide improved door control. Since the operator is more powerful, it opens all sized doors smoother, more effectively.

And, of course, you have faster service in and out of your kitchen. You serve more meals during the

rush hour. And you reduce the possibility of a waitress being caught in a manual door and dropping a tray. All tangible benefits with automatic kitchen doors.

And with Norton automatic operators, you get the dependability of the Norton electro-hydraulic power operation and the smart interior-design styling.

For more information ask your Norton Dealer, your Norton Representative or contact Eaton Corporation, Lock and Hardware Division, Norton Marketing Department, Box 25288, Charlotte, N.C. 28212.

Norton Automatic Operator Systems

Series 2000
Transom Mounted Operators for
new or existing doors.

Series 4000
Completely Concealed Operators
to fit into aluminum door transoms
(4" x 5" minimum).

Series 5000 & 9000
Sliding Door Operators (5000),
Sliding Door Operators as a
complete package with door and
frame (9000).

All control methods and schemes.

EAT•N Security Products
& Systems

1204

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Bally has a new edition of its Working Data Catalog ready for you.



It's the world's most comprehensive reference on Walk-In Coolers/Freezers and Refrigerated Buildings. Has 182 pages of detailed technical information for everyone involved with design and specifications. Includes more than 400 photos, drawings and charts. Provides weight and size data, refrigeration and electrical capacities, details about floors and doors. Use your letterhead to send for your free copy today.
Bally Case & Cooler, Inc., Bally, Pa. 19503



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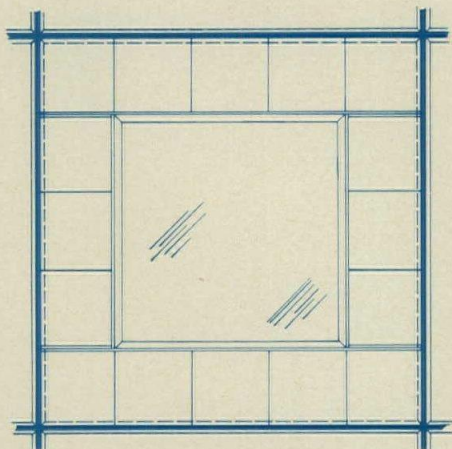
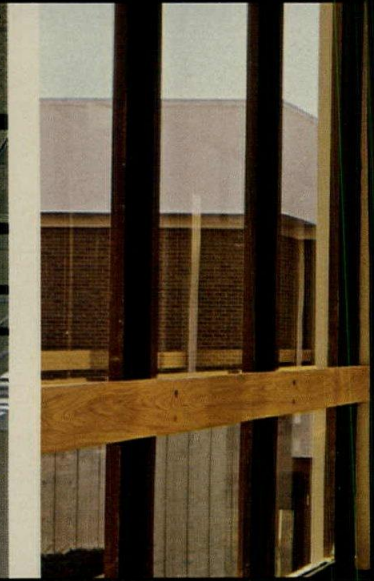
Behind these beautiful ceilings and



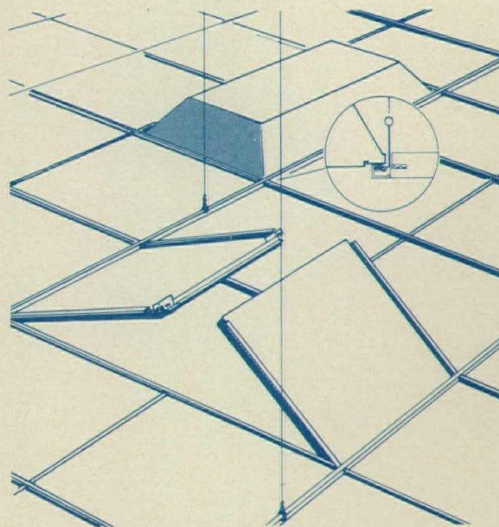
Medco Jewelers, Oklahoma City, Oklahoma, 13,000 Sq. Ft. of Tab-Lock



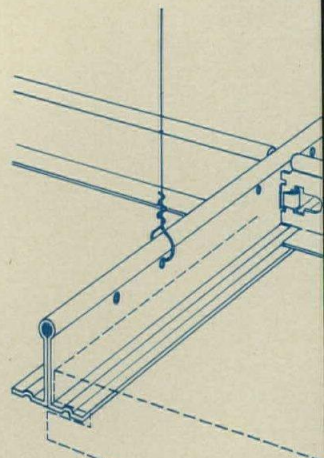
Ohio Bell Telephone, Columbus, Ohio, 200,000 Sq. Ft. Gemini+Plus in addition to ESP partition



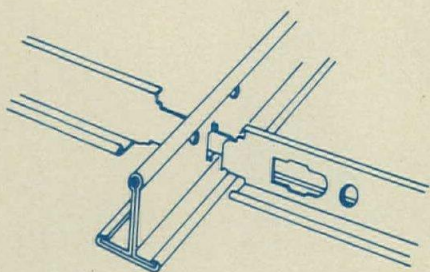
(a) Gemini+Plus, 5X5 module



(b) TAB-LOCK 281, showing simplicity of assembly

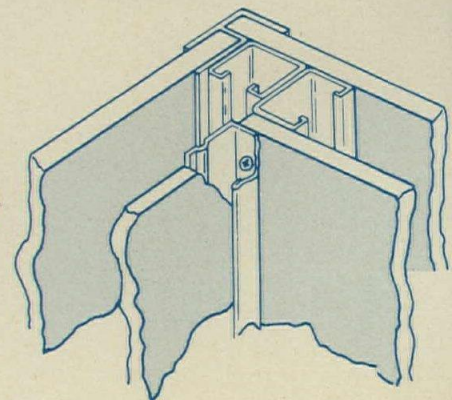


(d) TAB-LOCK 281, beams suspend by wire directly from structure above



(c) TAB-LOCK, End tabs are secured locking tees in tension.

(f) E/S/P Demountable Wall System, inside/outside corner post assembly



Every one of them has either an E/S/P Demountable Wall System, or a Tab-Lock acoustical grid suspension system as its backbone.

And that means two things: Complete design freedom, and the strength to support it.

For walls there's beautiful engineering.



Lehigh County Community College, Schencksville, Pennsylvania, 200,000 Sq. Ft. of TAB-LOCK

Lincoln Kohoa Elementary School, Nebraska, 20,000 Sq. Ft. of TAB-LOCK

E/S/P Demountable Wall Systems, for instance, are adaptable to practically any non load bearing vertical requirement, whether ceiling height or free standing, and will take any standard wall panels—gypsum boards, wood paneling, vinyl or metal laminates from $\frac{3}{8}$ " to $\frac{5}{8}$ ". And E/S/P systems are fully compatible with all standard borrowed lites, door frames, electrical circuitry. Best of all, they install easily, and can be dismantled and reassembled. With E/S/P, building interiors stay functionally flexible for decades. Beautiful.

Tab-Lock grid suspension systems combine the styling to complement any design with the tensile strength of steel. Any known panel, tile, or ceiling component can be matched to one of these:

Tab-Lock 281—The first true grid in a concealed ceiling.

Tab-Lock—Sturdy, reliable, the classic exposed grid design.

Gemini+Plus—Combines exposed runners, concealed elements for 3-D effect.

Tab-Lock Firesafe—UL listed for fire resistive ceilings.

What's more, they're economical, install easily, are structurally stable without tiles. Beautiful.

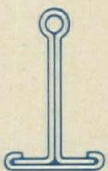
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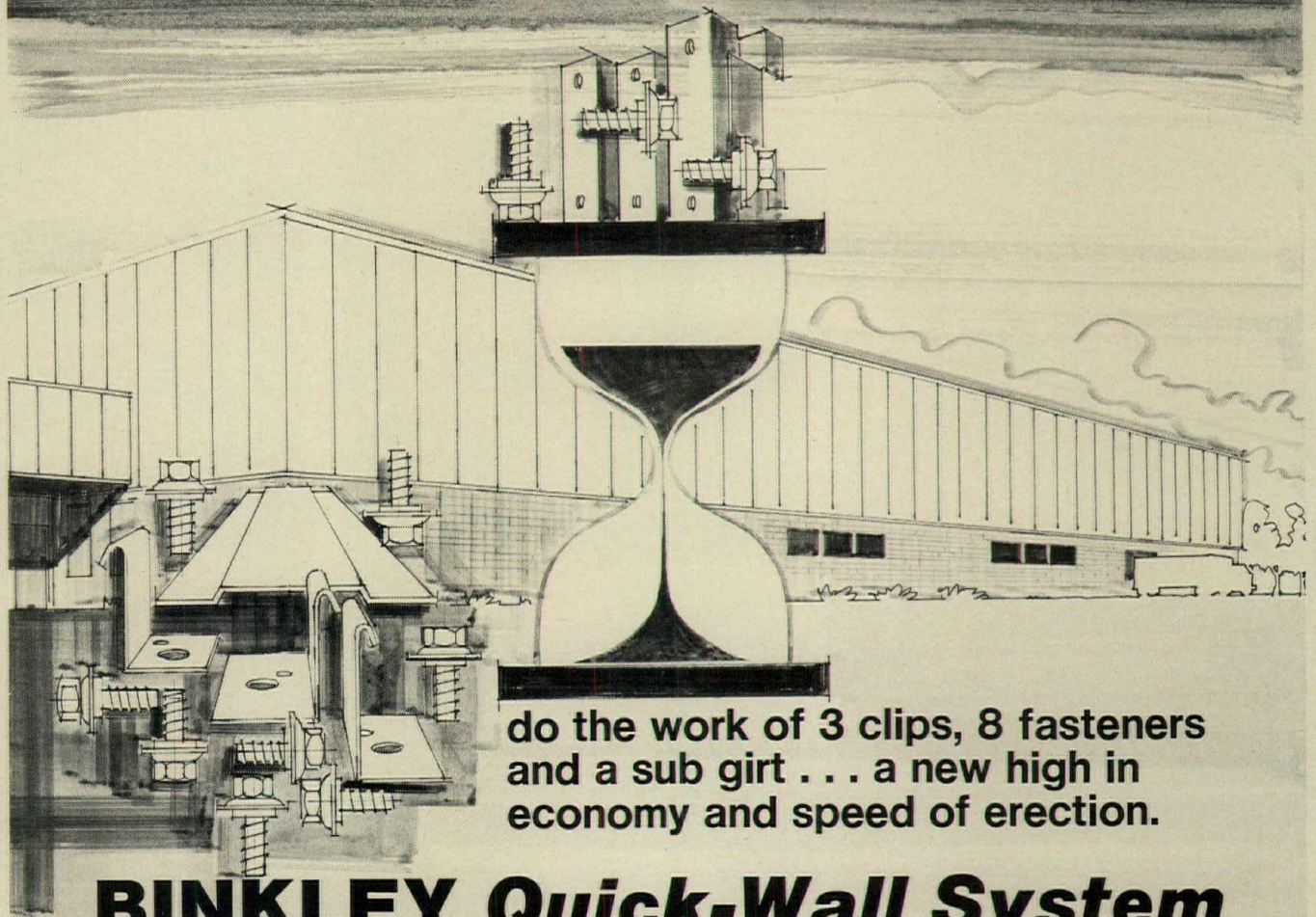
(e) TAB-LOCK FIRESAFE



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Metal Products Division
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3 BINKLEY Xpediter clips and 3 fasteners



**do the work of 3 clips, 8 fasteners
and a sub girt . . . a new high in
economy and speed of erection.**

BINKLEY Quick-Wall System

Fully insulated, high-strength metal walls—ONLY 2-1/2" THIN—go up in a fraction of the time required for erection of conventional metal walls.

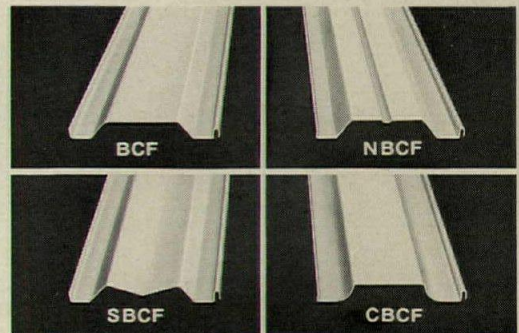
Binkley's new Xpediter Clip at each fastening point holds both liner and face panel. This Quick-Wall System completely eliminates sub girts and takes advantage of the greater U Value of 1" thick light-density insulation.

Fewer Materials. Fewer Pounds. Fewer Fasteners. Fewer Headaches . . . Greater Speed. Greater Ease. Greater Economy.

Full range of coatings and weathering steel available.

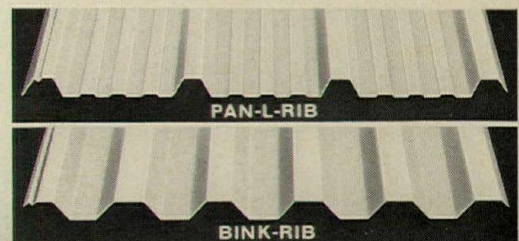
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You can choose from various panel designs in Binkley's BCF series.

To utilize the Quick-Wall System for Pan-L-Rib and Bink-Rib Panels, contact your Binkley sales representative.



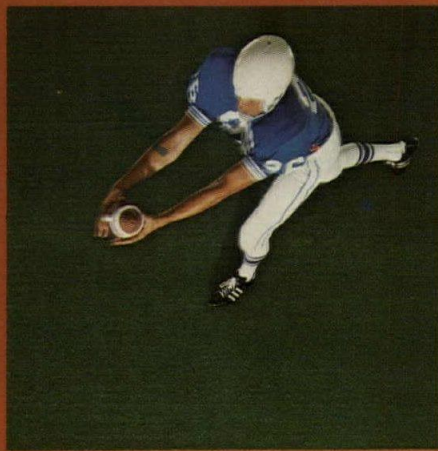
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Whatever the sport, Robbins has the surface.



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Got a question about athletic surfaces? Get the answer from the world's leader: Robbins.

- The world's finest hardwood flooring . . . Lock-Tite is endorsed by the U. S. Handball Association.
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Find out about synthetic and wood athletic surfaces today from Robbins. Our staff of specialists is always ready to assist you in planning new or replacement facilities.

If it's athletic surfaces, Robbins has it! We'll show you what we mean—with Robbins, there's a choice.

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A Division of E. L. Bruce Co., Inc.

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Knoll International

745 Fifth Avenue, New York 10022



Andrew Ivar Morrison and Bruce R. Hannah design for Knoll

Their multiple seating system is a trim solution to the problems of all public space requirements, offering the economical use and easy maintenance of polished aluminum and a unique upholstery method.



Knoll International operates in 31 countries.

For more data, circle 66 on inquiry card



Want to save on electrical installations?



NECA study reveals opinions of design professionals.

The National Electrical Contractors Association (NECA) recently completed a study to find out how electrical contractors can help maintain high performance on projects requiring complex electrical system installations. On a question involving project planning, most participants agreed: the professional electrical contractor should have a role as a preconstruction consultant.

Reasons? The electrical contractor is an important member of the building team. And his specialized knowledge, applied early in the project, can be very valuable in assuring overall coordination of the electrical job. Skilled at project scheduling and expediting electrical work, his knowledge of product applications, code requirements, and his installation expertise can help

avoid costly potential problems and delays later in the project.

That's why many construction industry professionals involve electrical subcontractors in preconstruction planning: to make sure the job gets done—efficiently, economically, accurately, profitably. For more information on how you can benefit from the study, mail this coupon today.



National Electrical
Contractors Association, Inc.
Dept. B-11, 7315 Wisconsin Ave.
Washington, D.C. 20014

If electricity makes it possible, electrical contractors make it practical.

Please send a free copy of the NECA Preconstruction Conference Handbook, explaining how I can save time, headaches and money through preconstruction planning.

Name _____ Title _____

Firm _____

Address _____

City _____ State _____ Zip _____

TEST PROVES: NO NYLON FIBER HIDES SOIL BETTER THAN ENKALURE II.

AND NO ONE KNOWS IT BETTER THAN RAYTHEON.

Almost two years ago, when Raytheon was renovating one of its Rhode Island office buildings, they were looking for carpeting to absorb sound, reduce maintenance costs, hide soil and stand up to traffic.

After considering all available carpet, they selected Enkalure® II in "Bold" by Jorges. So well did it meet all their goals, that Raytheon has just installed more of this same carpet in another office building, and they plan to rely on Enkalure II for future installations.

It's not surprising, because the fact is, that when the Nationwide Consumer Testing Institute compared carpets made of the leading nylon soil-hiding fibers by placing them on one of the most heavily traffic'd airports in the country, the test results proved that Enkalure II is every bit as good as the best-known soil-hiding nylon.

That's because, unlike conventional nylon fibers, Enkalure II

bulked continuous filament nylon has no deep grooves to trap and hold dirt. And its special multilobal construction actually bounces light off the fiber. So the color looks clean, even if the carpet is dirty.

One more test of interest: each prototype carpet is tested by Nationwide to make sure it meets our specifications. So we can guarantee your Enkalure II carpet will wear no more than an average of 10% in 5 years when certified by Nationwide and the mill and properly installed and maintained—or we'll replace it.

So if your floor takes a lot of traffic and a lot of dirt, these tests and the Raytheon experience are some very good reasons you should specify carpet of Enkalure II.

For specific information and a 14-page report of the airport test results, contact American Enka (Dept. AR), 530 Fifth Avenue, New York, New York 10036. Or Call (212) 661-6600.

For more data, circle 67 on inquiry card

**ENKALURE II.
NO NYLON HIDES
SOIL BETTER.
ENKA**

ENKALURE IS A REG. T.M. FOR A SOIL-HIDING, MULTILOBAL NYLON FIBER MANUFACTURED BY AMERICAN ENKA CO., ENKA, N.C., A PART OF ALZORNO INC. ENKALURE IS LICENSED FOR USE IN CARPET MANUFACTURED ACCORDING TO QUALITY SPECIFICATIONS SET BY ENKA.





Your design doesn't

Look at it this way: upside down.

Consider the ceiling as the main focal element.

Let it be the mirror of your total design.

Let it reflect, create, capture a mood.

Let it soar.

Or roar.

Or whisper subtleties.

Let it be whatever your ideas want it to be . . .

with Luminous Ceilings systems. Total decorative lighting systems designed to be designed. By you alone . . . or with our specialized design assistance.

Flexibility is the key. What it unlocks is up to you.

Luminous Ceilings. Bringing your ideas to light.

Litecraft/Luminous Ceilings Company, P.O. Box 22601, Tampa, Florida 33622



Leaf-Lite Ceiling in Muntz Metal John Hancock Building, Chicago.

stop at the ceiling.

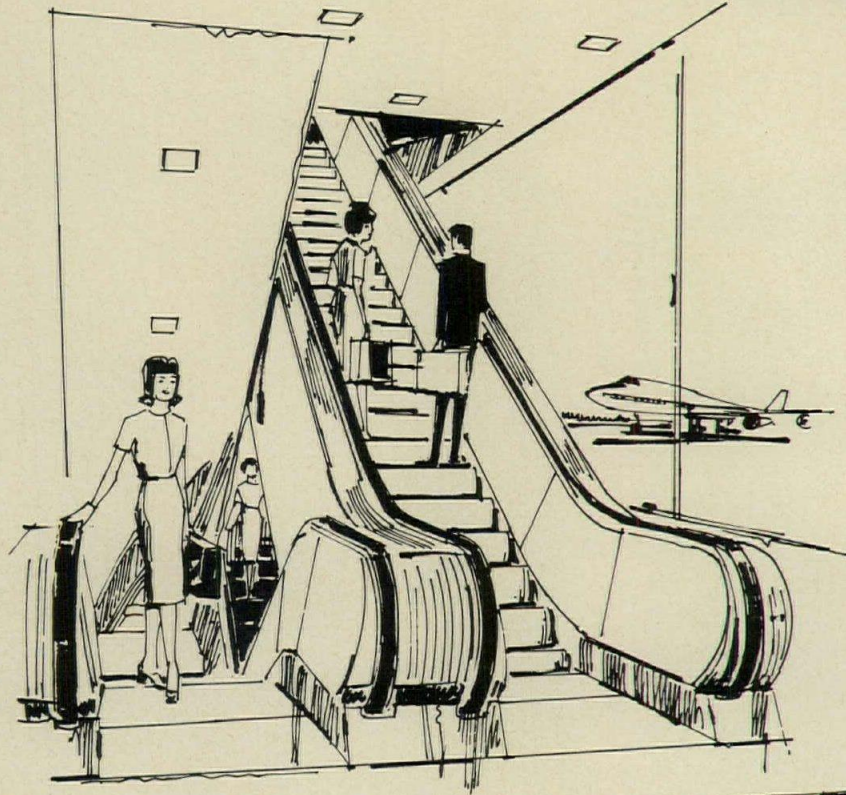
 **Luminous
Ceilings**

Bringing your ideas to light

a **JIM WALTER** company

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montgomery moves people at Dallas/Fort Worth Airport



When designing a huge new international airport complex, such as Dallas/Fort Worth, one must consider the special demands the anticipated high volume of passenger traffic will make on transportation between the floor levels. Presently under construction at the new Dallas/Fort Worth Airport are 48 Montgomery escalators and 26 Montgomery elevators, both passenger and freight. This overall vertical transportation system by Montgomery will keep passenger and freight traffic moving with speed, efficiency and dependability. Montgomery's "PM" maintenance program will insure continuing good operation for years to come.

Montgomery elevator and escalator systems can help you move people efficiently, too. Contact us at our general office or look for one of our 170 offices in the Yellow Pages. You'll find we're not very far from anywhere in North America.

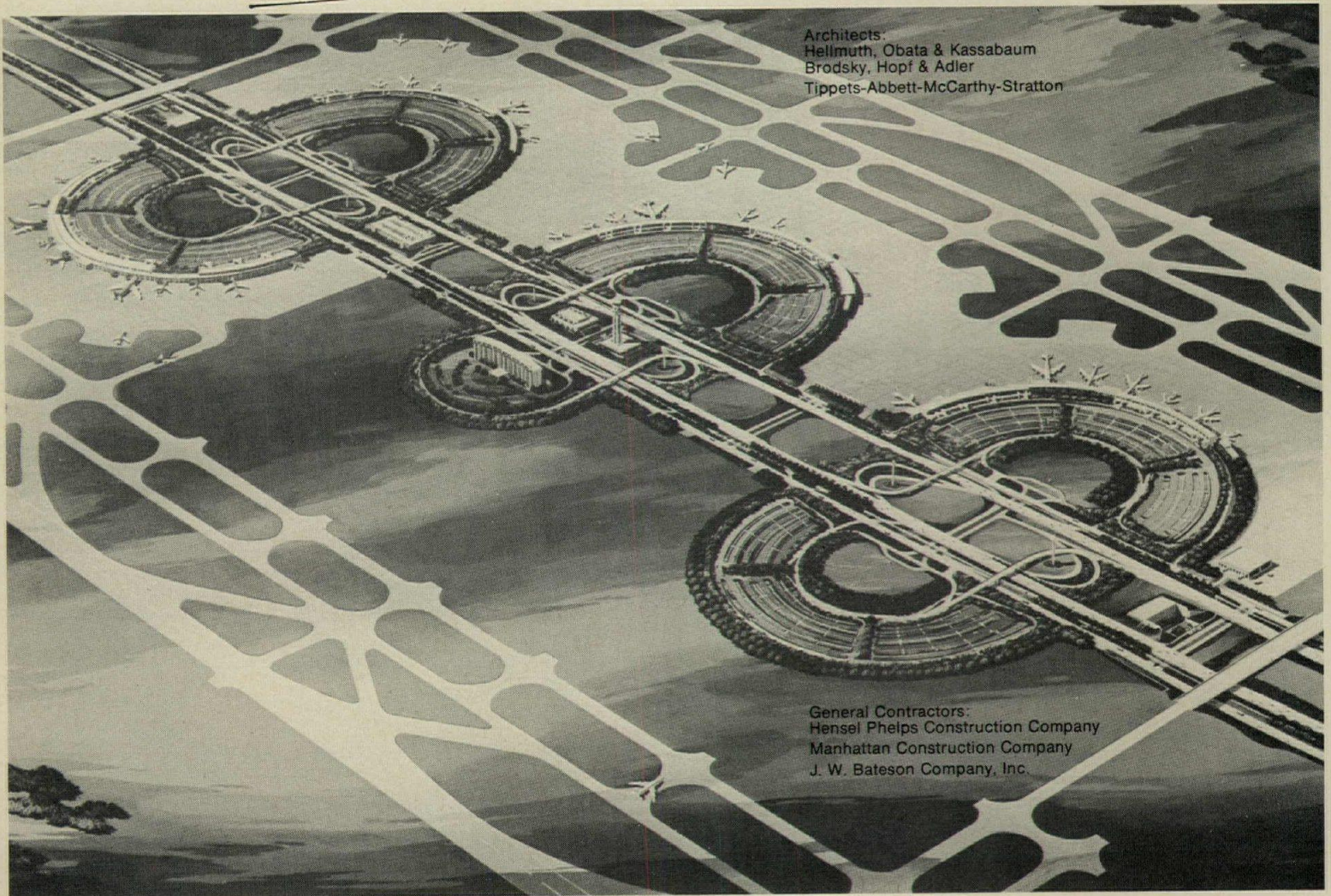
montgomery[®] ELEVATORS/ESCALATORS POWER WALKS & RAMPS

Montgomery Elevator Company, Moline, Illinois 61265
Montgomery Elevator Co. Limited, Toronto, Ontario
Offices in Principal cities of North America

montgomery moves people

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General Contractors:
Hensel Phelps Construction Company
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ABOVE ALL

CONWED[®]
CEILING
FOR
ENDURING
BEAUTY



Rock Face^{T.M.} Ceilings...handsome, but tough.

Rock Face panels are one of the interesting recent ceiling developments from Conwed. These panels are handsome enough for an executive suite, yet tough enough to go into a school and take the impact of a thrown basketball or improperly handled projection screen. Against the hazards that typically confront ceilings — rough handling in installation, frequent and sometimes careless maintenance, heavy traffic — Rock Face panels are practically indestructible.

It may be that Rock Face panels and tile are relevant to something you're working on now. Or maybe you need something quite different. It doesn't matter. The Conwed line is large and versatile and we're a company that doesn't stand still. If you haven't looked through our line lately take a look at the Conwed pages in Sweet's.

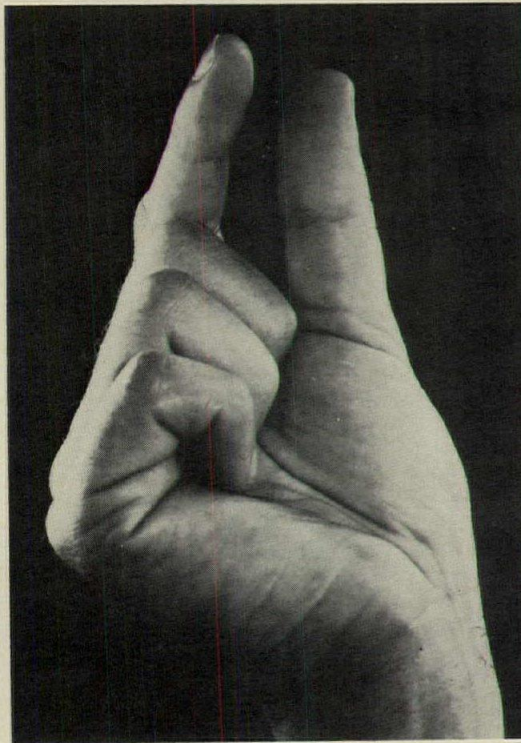
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Conwed
CORPORATION

332 Minnesota Street
Saint Paul, Minnesota 55101

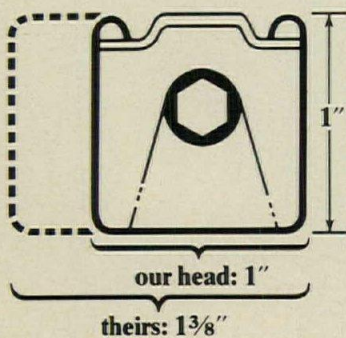
When we started to design the Mark II Blind we were just this far from a breakthrough.



We set out to design the slimmest, smoothest working narrow-slat blind possible. And now we've done it. We attacked the cumbersome headrail

problem, and designed out $\frac{3}{8}$ ", giving us a trim 1"x1". No other blind has a slimmer head than that!

Why go to all this trouble for a headrail?



Because we know the architect or designer would like to see us disappear. So our 1" head and bottom rails aesthetically blend into the blind. Open or fully closed, the Mark II rails are virtually unseen. And a full range of decorator colors

provides total flexibility of design coordination. The reason you can't do without us is function, of course. The Mark II has been engineered for

maximum glare reduction and heat gain control. We made internal improvements too, like the crash-proof lock that snubs the cords without tearing them. And the smooth tilt-action that's responsive to the lightest touch. And the spring-tempered slats that won't bow or sag.

Now that we've completed the Mark II, we know we were right! We were on top of a breakthrough!

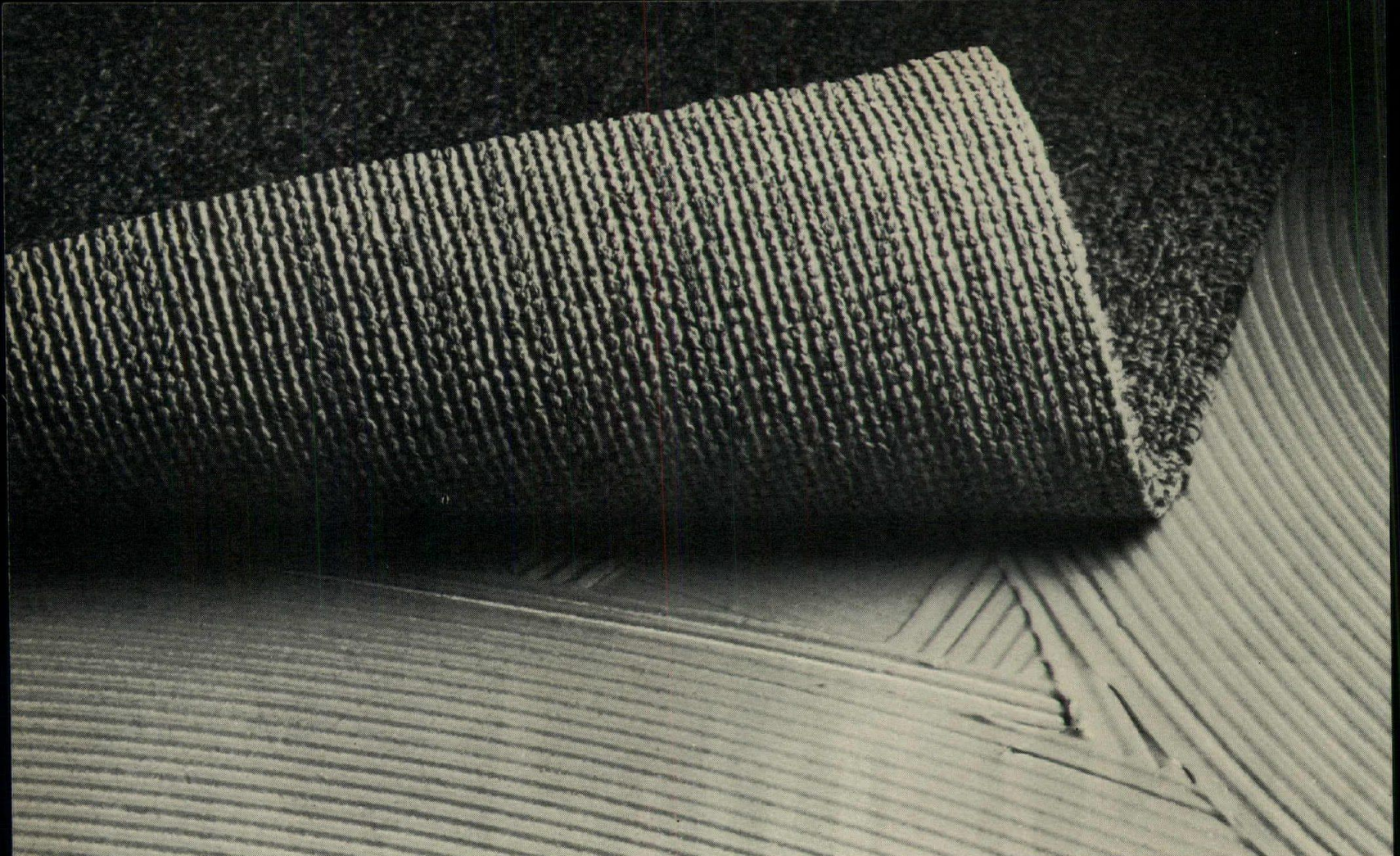
Venette Mark II Blind

For complete details, specifications and color selection, write Alcan Building Products, 4519 Mahoning Avenue, N.W., Warren, Ohio 44483

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This is carpet with no secondary backing—just one, tough unitary backing of “Typar” that acts like a common bond between carpet pile and floor.

When properly glued down, there's little danger of

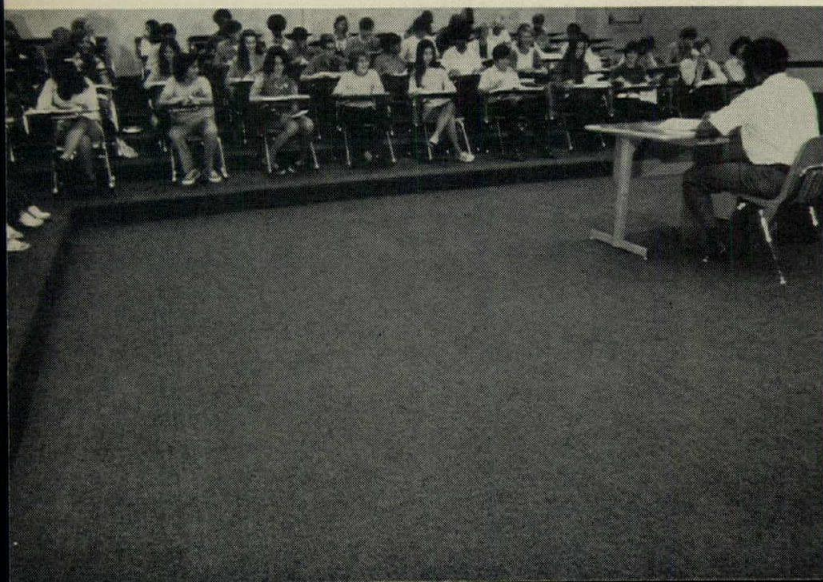
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“Typar” won't fray or ravel at the edge. Seams stay tight and virtually invisible. No matter how you twist it, “Typar” keeps its shape. Patterns can be repeated in the longest corridors.

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Carpet of Antron® nylon with unitary back of “Typar” installed in Tabb High School, York County, Va.

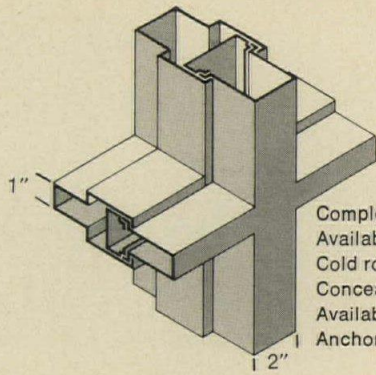


*Du Pont registered trademark.
Du Pont makes carpet backing, not carpet.



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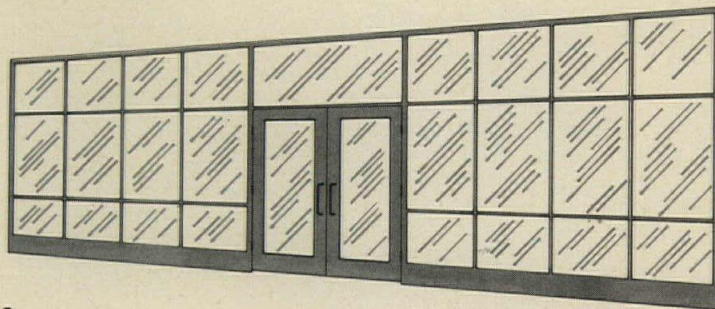
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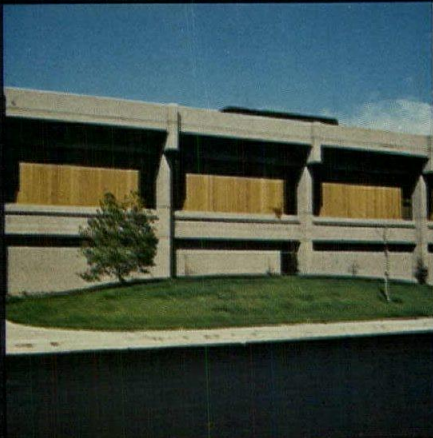


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For more data, circle 76 on inquiry card

Owner: Phipps Land Co.
Architect: Toombs, Amisano & Wells
Stopray #2016 glazed by PPG, Atlanta

For more data, circle 39 on inquiry card



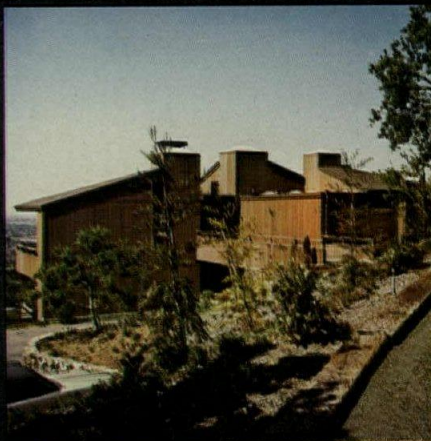
Ruf-Sawn redwood plywood combined with architectural concrete

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Traverta ceiling tile provides fire safety and noise control

For more data, circle 45 on inquiry card



Inverted Batten Ruf-Sawn redwood plywood on custom residence

For more data, circle 38 on inquiry card



Redwood lumber for commercial decks, patios and stairways

For more data, circle 41 on inquiry card



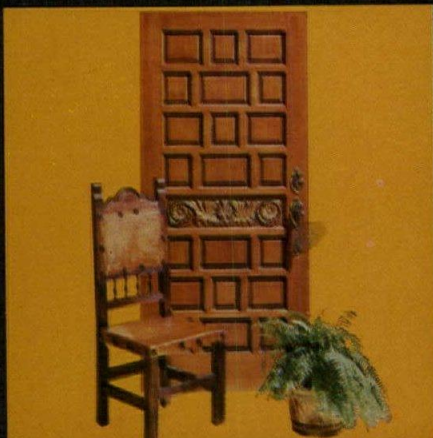
Recessed edge, non-directional fissured Pyrotect ceiling

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Redwood lumber siding lends lasting warmth to office buildings

For more data, circle 37 on inquiry card



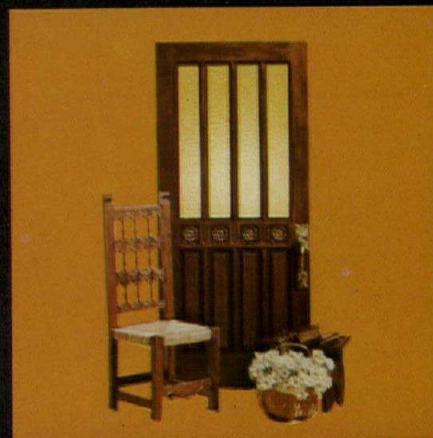
Castillo pattern entrance door from the International series

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Ruf-Sawn 316 was the answer for low-income housing project

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Innsbruck pattern entrance door from the International series

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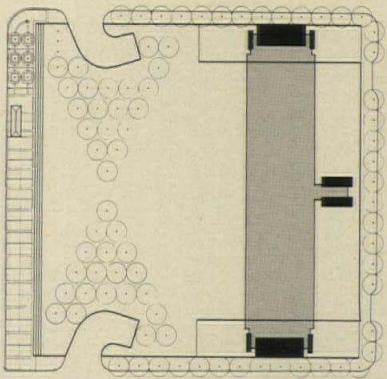
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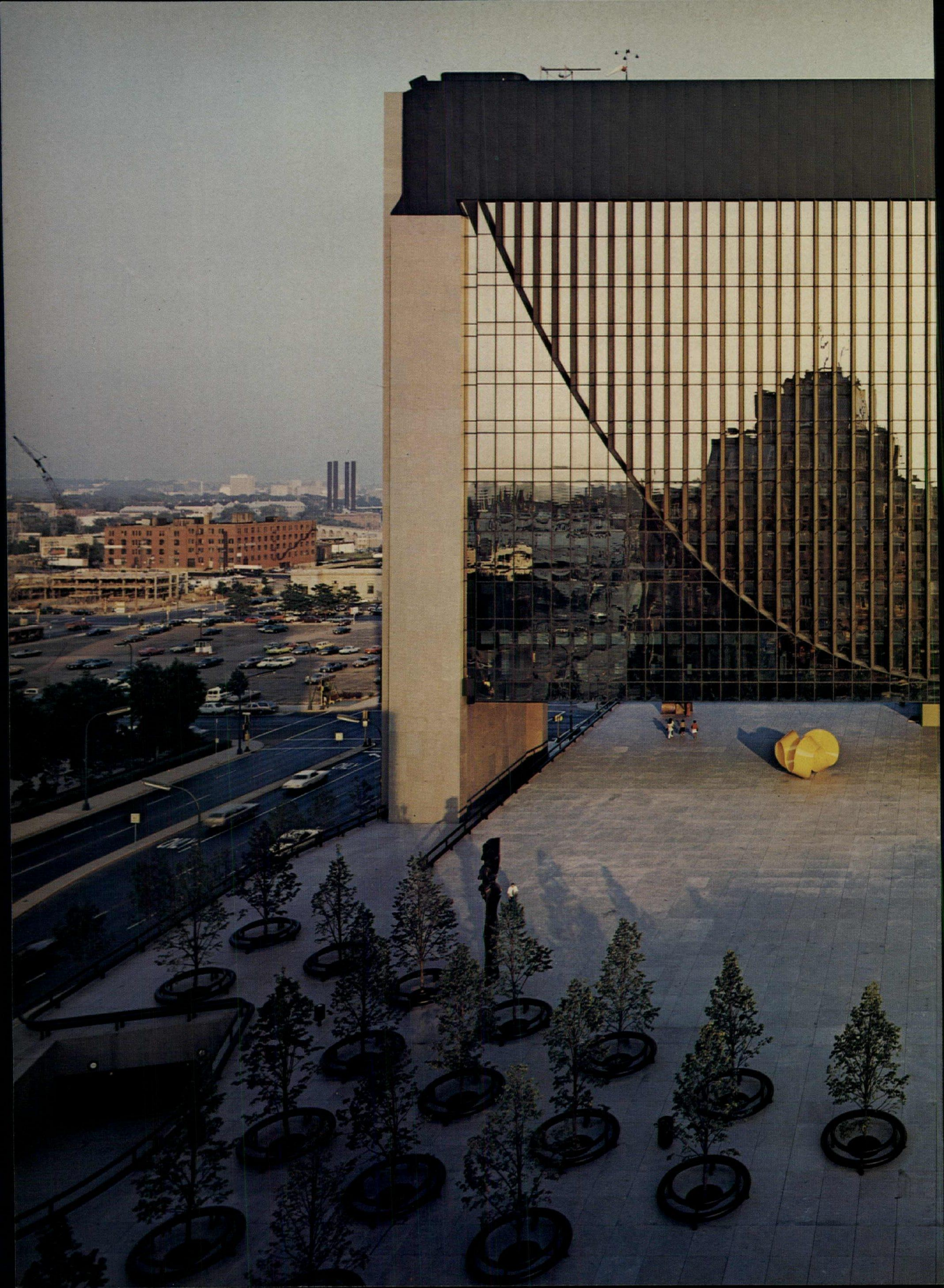
The Federal Reserve Bank of Minneapolis and dormitory and library buildings for Tougaloo College, Tougaloo, Mississippi

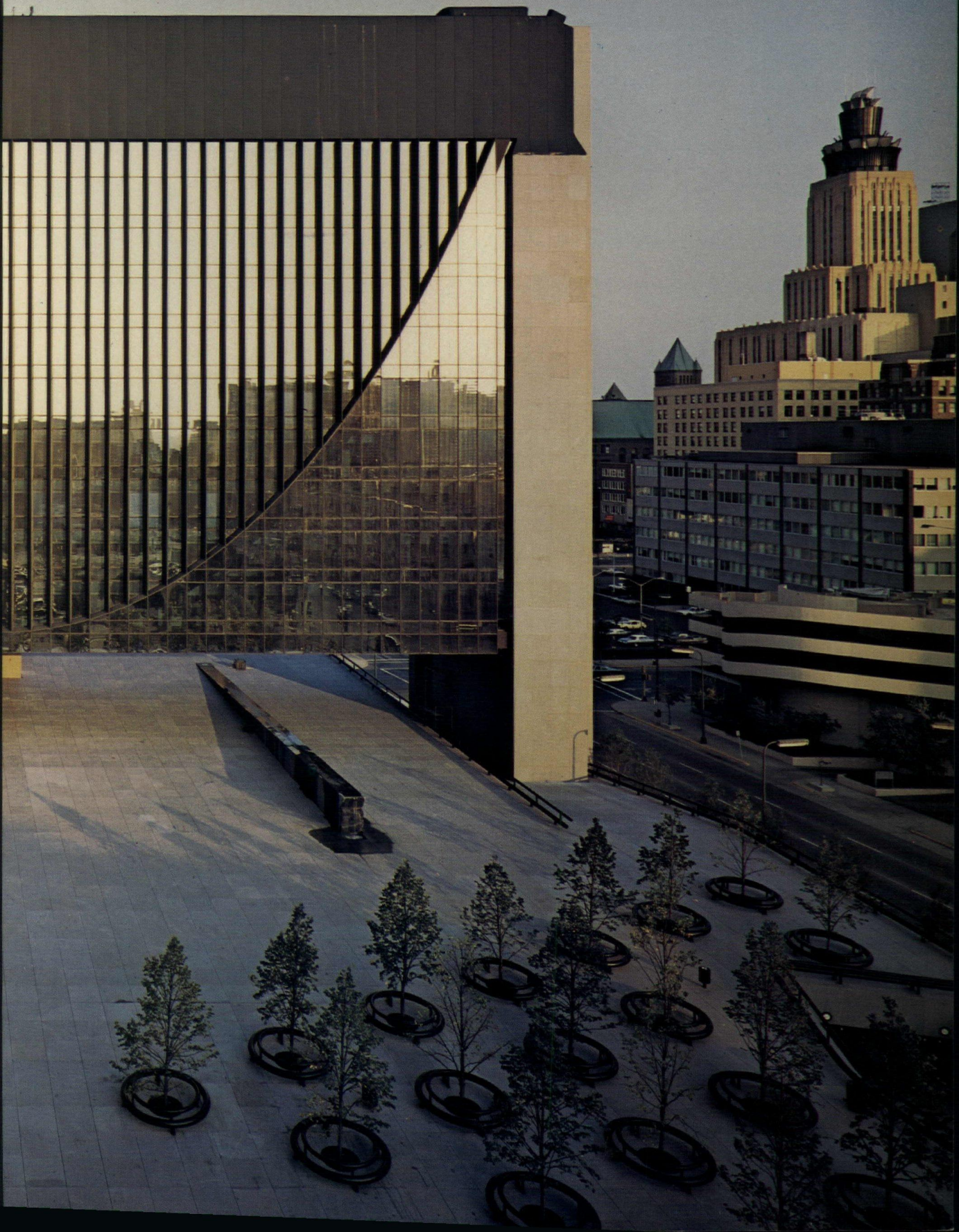
Four recently completed buildings by Gunnar Birkerts and Associates reflect that firm's abiding interest in clear and powerful architectural shapes and with innovative structural techniques. The buildings are memorable in themselves, and thus they are first presented separately. But they also have, in the architects' minds, implications far beyond themselves in the realm of large-scale planning, and doubtless they will raise other questions in many people's minds. Some of these matters are discussed more fully at the end of this article.



Photos below and overleaf courtesy of The Federal Reserve Bank of Minneapolis







The Federal Reserve Bank of Minneapolis

The new Federal Reserve Bank of Minneapolis is by just about any standards an impressive realization of impressive aims, even if some of those aims are discredited or discounted or misunderstood by some architects. But there it is—big, bold and real, the product of the enthusiasm and imagination of the client, the architects and the engineers. As such it is a building to be reckoned with.

The architects have taken a complicated program and rendered it in clear and unforgettable terms. Security operations which require protected facilities (about 60 per cent of the total square footage) are below the ground underneath a sloping plaza. Clerical and administrative operations are housed in an office block suspended from two great concrete towers. The catenary members which support the office floors are echoed in the curtain wall. Below the curve the glass stands forward; above it stands behind. For clean and strong architectural gesture, the likes of this solution have not been seen very often in recent years. Ask anybody in Minneapolis about the Federal Reserve building; if they draw a blank, then describe a catenary with your hand and they'll know what you mean. That fact in itself represents an achievement of sorts.

The architects' design commanded an unusual performance by the structural engineers. Most knew that it was possible to build an office building with a column-free span of 275 feet, but until now no one had actually done it, and few would quibble over the reported price tag of \$47 a square foot. In concept the structure is simple (RECORD, October 1971, pages 106-109). Two catenaries, one on either side of the building and 60 feet apart, support the major facades. These are rigid frames which in turn support the concrete slab floors. The tendency of the supporting towers at either end to topple inwards is checked by two 28-foot-deep trusses at the top of the building; the space in between them contains the mechanical equipment. One result of all these labors is a set of eminently flexible work spaces. Another result is the creation of a 2.5 acre public plaza sloping gently upward to a height of 20 feet above the entrance level of the building (photo, page 105).

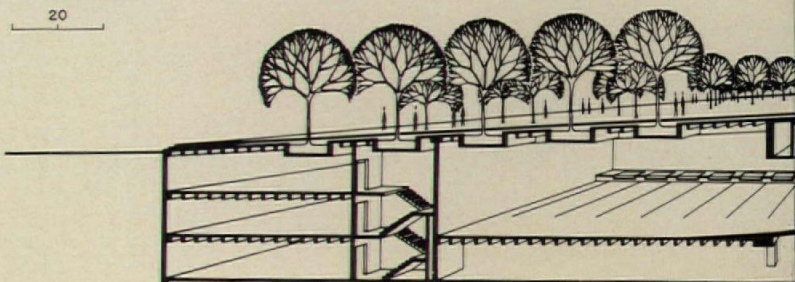
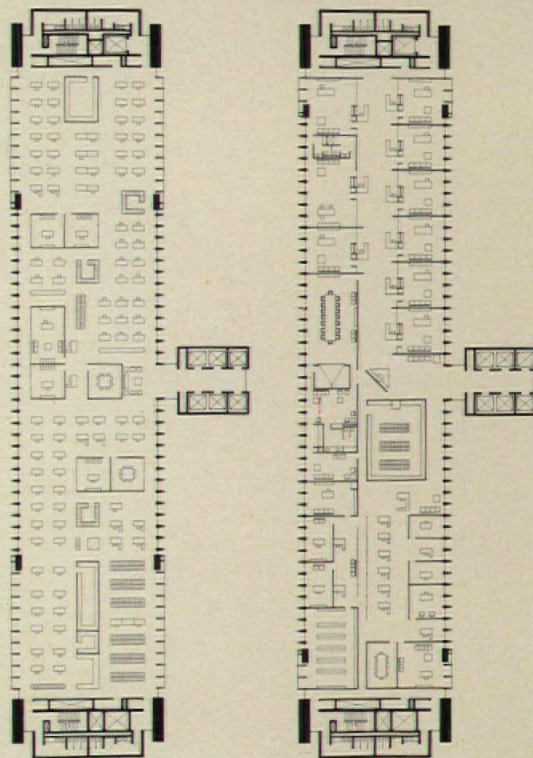
The original Federal Reserve Bank of Minneapolis, like many of the other banks in the system, was built in the early 20's and was a windowless, forbidding structure. Its architect, Cass Gilbert, described it as "a strongbox for the currency of the Northwest." The president of the Bank today echoes Gilbert's concern for security, but he also adds a new twist: "The responsibility of the Bank to serve the financial community and the public requires openness and accessibility." This without question is an admirable intention, resulting in offices with a view, and a plaza for the general public.

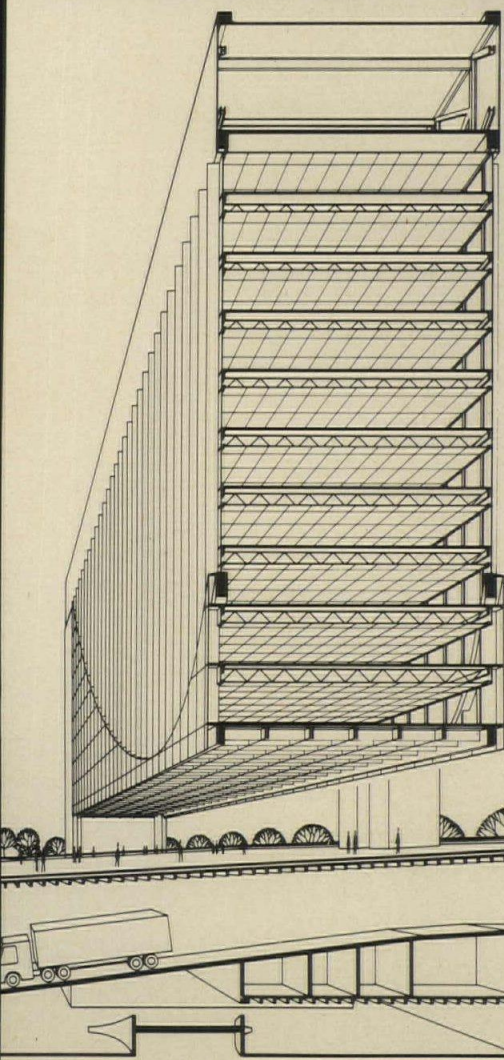
Admirable, too, are the intentions behind the unabashedly glamorous form of the bank and the unusual structural system. Some of the manifestations and the perhaps larger significance of all this good will are described on pages 114-116.

FEDERAL RESERVE BANK OF MINNEAPOLIS. Architects: *Gunnar Birkerts and Associates*—project director: *Charles Fleckenstein*; director of production: *Vytautas Usas*; director of field administration: *Gunars Ejups*; interiors: *Barbara J. Bos*. Engineers: *Skilling, Helle, Christiansen, Robertson* (structural); *Shannon & Wilson, Inc.* (foundation); *Jaros, Baum & Bolles* (mechanical/electrical). Consultants: *Cerami and Associates, Inc.* (mechanical/electrical); *Geiger & Hamme, Inc.* (acoustical); *McKee-Berger-Mansueto, Inc.* (cost); *Arthur W. Dana & Associates* (food operations); *Hubert Wilke, Inc.* (audio-visual). Landscape architects: *Charles Wood & Associates, Inc.* General contractor: *Knutson Construction Company*. Plaza Sculpture: *Charles Perry, Dmitri Hadzi, and Paul Granlund*.



Balthazar Korab photos





Typical floors of the above-ground portion of the bank are organized in an open plan, with certain areas where privacy is desired screened off by movable partitions, one of which can be seen in the photograph above right. The executive offices have fixed walls (photo above). The lobby of the building is shown at right.



Tougaloo College Dormitories

Tougaloo is a small, private and predominantly black liberal arts college in Mississippi. In the mid 60's, cresting the wave of the civil rights movement, an aggressive new board of trustees set out to expand the college's enrollment, to redefine its traditional educational philosophy in terms of current social thought, and to commission a new academic, financial and physical master plan. In 1965 the Cummins Engine Foundation provided funds for this latter endeavor, and Gunnar Birkerts and Associates were charged with the task of swiftly providing a flexible over-all plan and developing building prototypes to implement it. (RECORD, October 1968, pages 129-133.)

"One of the basic goals," Birkerts has said, "was to preserve and foster the century-old image of Tougaloo as a place where a young person could receive the best possible liberal education. This image had to be projected into a new physical one." The projection, Birkerts added, was to take place through a "simplicity and honesty in materials and forms."

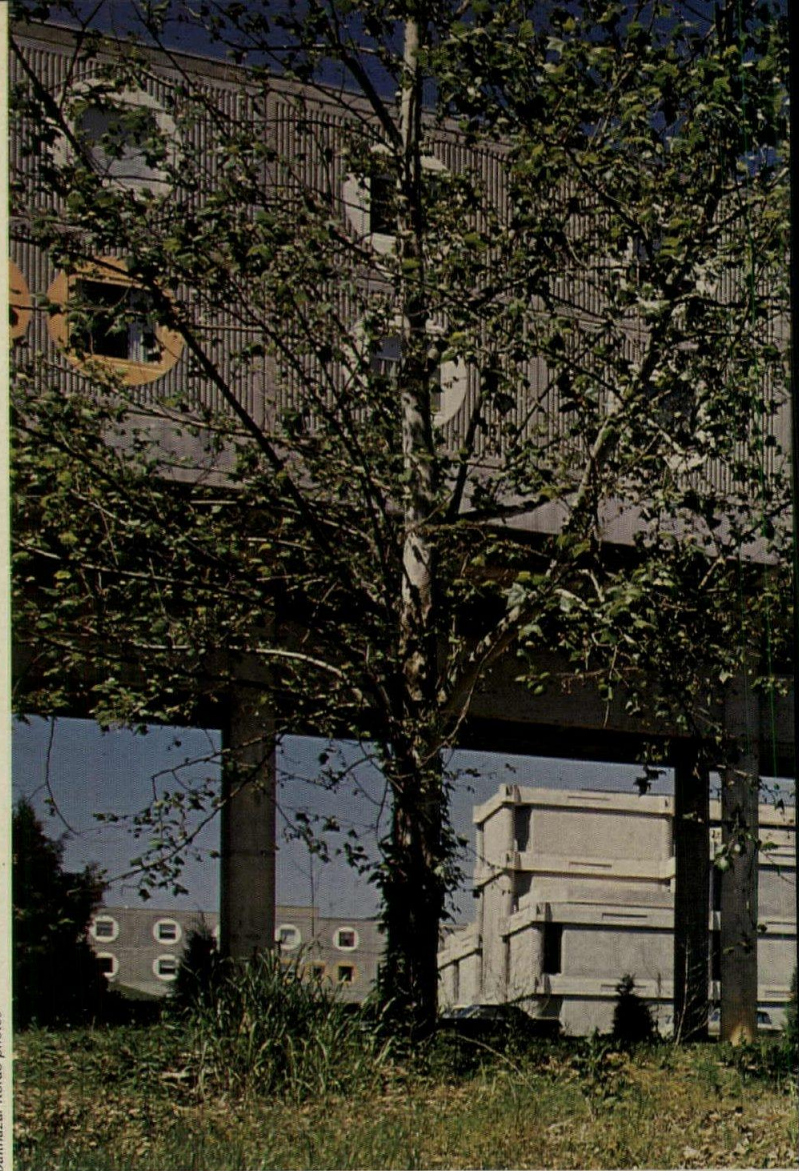
The first real building assignment—referred to as the "mini-plan"—was for two dormitory buildings and a library. These three structures have now been placed among the older buildings (many of them badly deteriorated) to relieve the most pressing shortages. The dormitories are designed to satisfy the student's need for privacy, and therefore to contrast with the intensive social and intellectual communion which the master plan ultimately envisions.

One practical problem which confronted the architects and engineers was the soil condition in the Tougaloo area. Known as Yazoo clay, the soil has an upper and therefore weathered stratum which contracts or expands as it becomes dry or wet; the lower stratum maintains a relatively constant moisture and is relatively stable. The erratic movement of the upper layer was regarded as the principal cause of deterioration in the existing buildings, which were built on conventional footings. So it was seen fit to keep all the floors of the new buildings above the ground and to support them on deep foundations of drilled and belled concrete caissons.

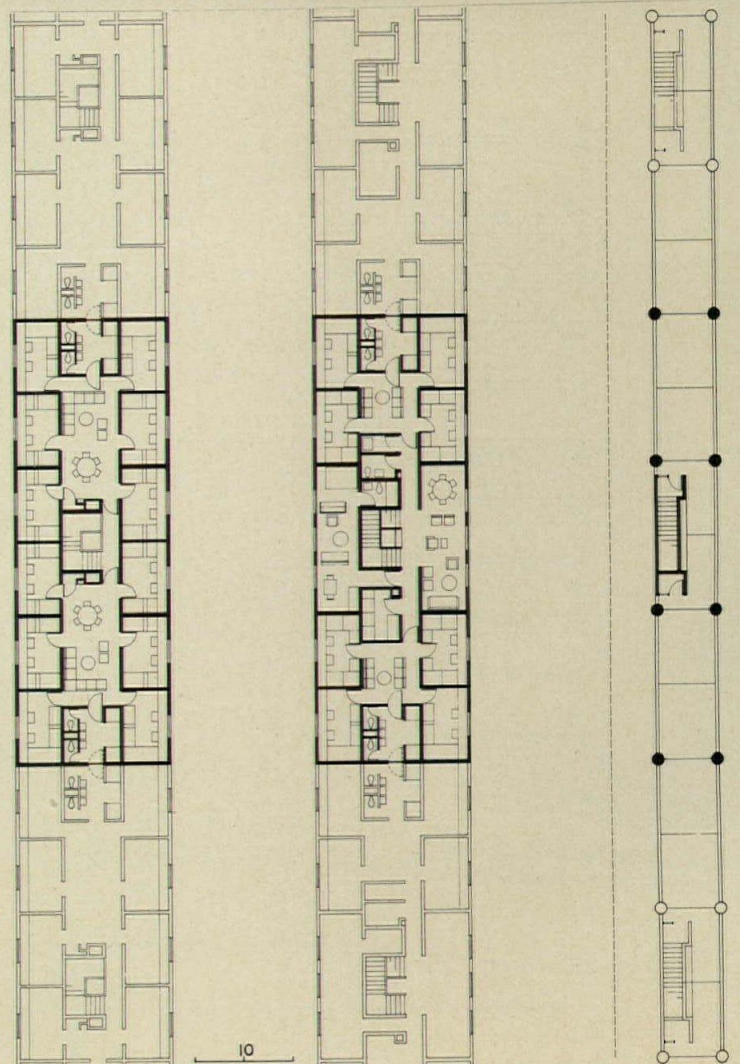
The basic dormitory module consists of three 30-foot by 12-foot 2-inch bays; the over-all building configurations are linear. Two parallel rows of monolithic concrete columns in each building are tied together at grade with monolithic grade beams. Just underneath the first dormitory level a series of pre-cast concrete beams spans between columns, perpendicular to the long axis. These beams are cantilevered at each end and support longitudinal edge beams; another set of longitudinal beams spans between the columns themselves. Thus a grid is produced to support the two-story dormitory above. The floor is a system of 5-inch solid concrete panels.

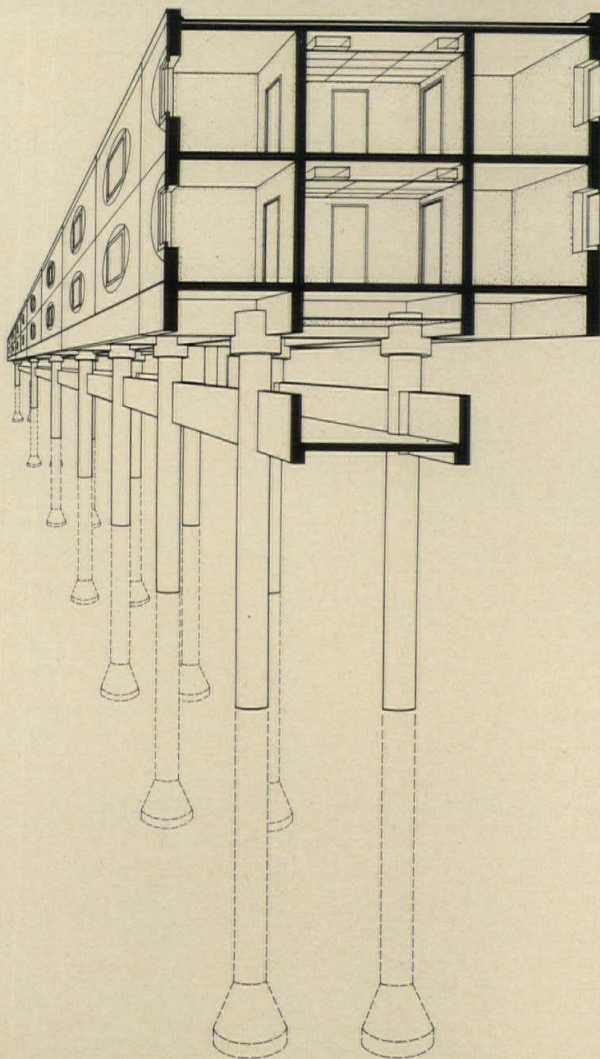
The interiors are organized on the house principle. Groups of student rooms are arranged near a common lounge on each floor. At the center of each module is a stairwell leading to an open walkway slung beneath the first level. This connects to other dormitory modules and to the ground. The same basic structural system which produced the dormitories was used, with variations, for the library. This is the third building in Birkert's "mini-plan" for Tougaloo College, and it is shown on the following pages.

TOUGALOO COLLEGE DORMITORIES, Tougaloo, Mississippi. Architects: Gunnar Birkerts and Associates—project director: Charles Fleckenstein; director of production: Vytautas Usas; director of field administration: Gunars Ejups. Engineers: Robert M. Darvas & Associates (structural); Hoyem Associates, Inc. (mechanical/electrical). General contractor: Industrialized Building Systems Corporation.

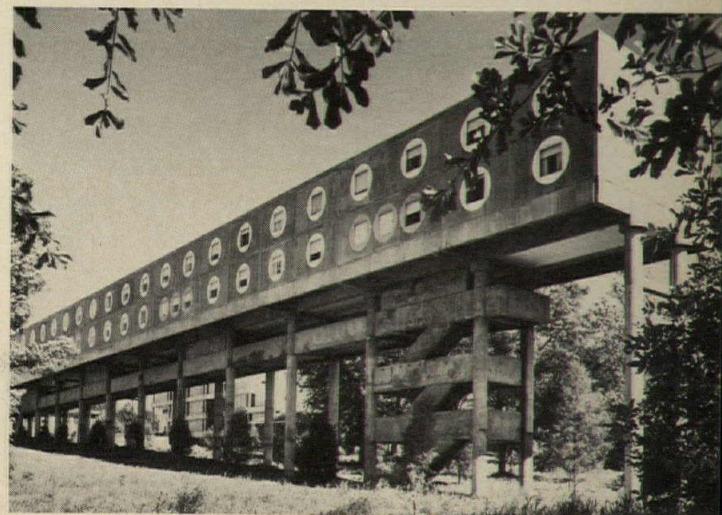
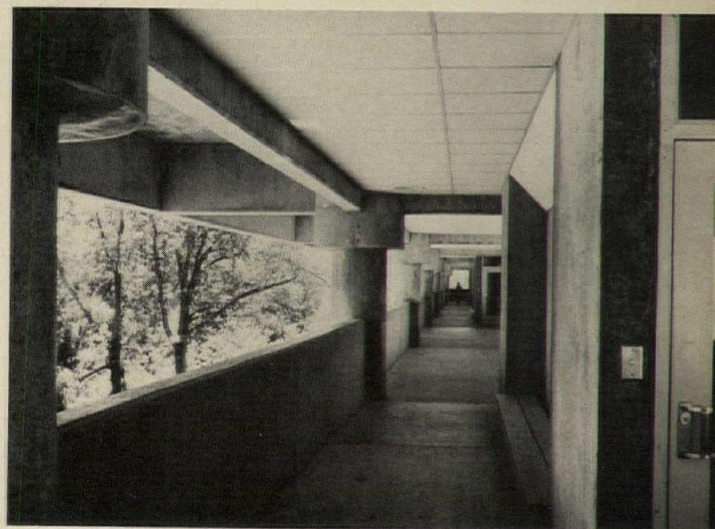


Balthazar Korab photos





The photograph above shows one of the dormitory buildings with the library in the background and an earlier college building to the far right. The plans on the left show (from left to right) the second level, the first, and the pedestrian passageway. The passageway is also shown in the photograph on the right. The structural system is shown on the left.



Tougaloo College Library

After several unsuccessful attempts to negotiate contracts for mass-produced precast components fabricated near Tougaloo and delivered to the site, the architects were put in contact with the Winston A. Burnett Construction Company, a firm which was then negotiating with a German building equipment supplier, Waldschmidt Systems of Hamburg, for a franchise for an industrialized construction plant. The Waldschmidt system, like many European mass production systems, is able to produce one-piece exterior and interior wall and floor elements, cast with all door, window and mechanical openings included. The Burnett Company needed an actual construction project to secure the franchise, and so an agreement was reached between it and Tougaloo College for a portable plant to be set up on the campus.

Thus in the spring of 1969 Gunnar Birkerts and Associates began final revisions on the dormitories and library, implementing the Waldschmidt techniques. Construction was to begin in the spring of 1970, but was delayed because of late shipping of equipment, difficulties in adapting it to local electrical supplies, and a longer setup time than had been expected (some of the equipment was involved in a dock strike).

The library embodies certain features that were not in the system used for the dormitories, because it required longer spans and much heavier floor loads. Here the system has a square bay, 30 feet by 30 feet. It is adaptable to a number of varying architectural requirements (section perspective, opposite), and it allows a free flow of mechanical systems through the entire structure. The system uses prestressed beams on all four sides of each bay; these rest in recessed seats in cylindrical precast column capitals. The capitals are doughnut-shaped, with hollow cores slightly smaller than the diameter of the columns. This design made it possible to tie together the reinforcing in the columns and beams, to fill the cores with grout, and thus to make the structure continuous.

The precast prestressed hollow-core floor planks are placed in checkerboard fashion; that is, they span in different directions in alternate bays. The result of this arrangement is that the beams on all four sides of most bays receive more or less equal loading. The beams themselves have an 8-foot by 15-inch opening mid-depth at mid-span; these openings allow mechanical equipment to pass from one bay to the next, and some of them can be seen in the interior photograph above, where they are used as registers.

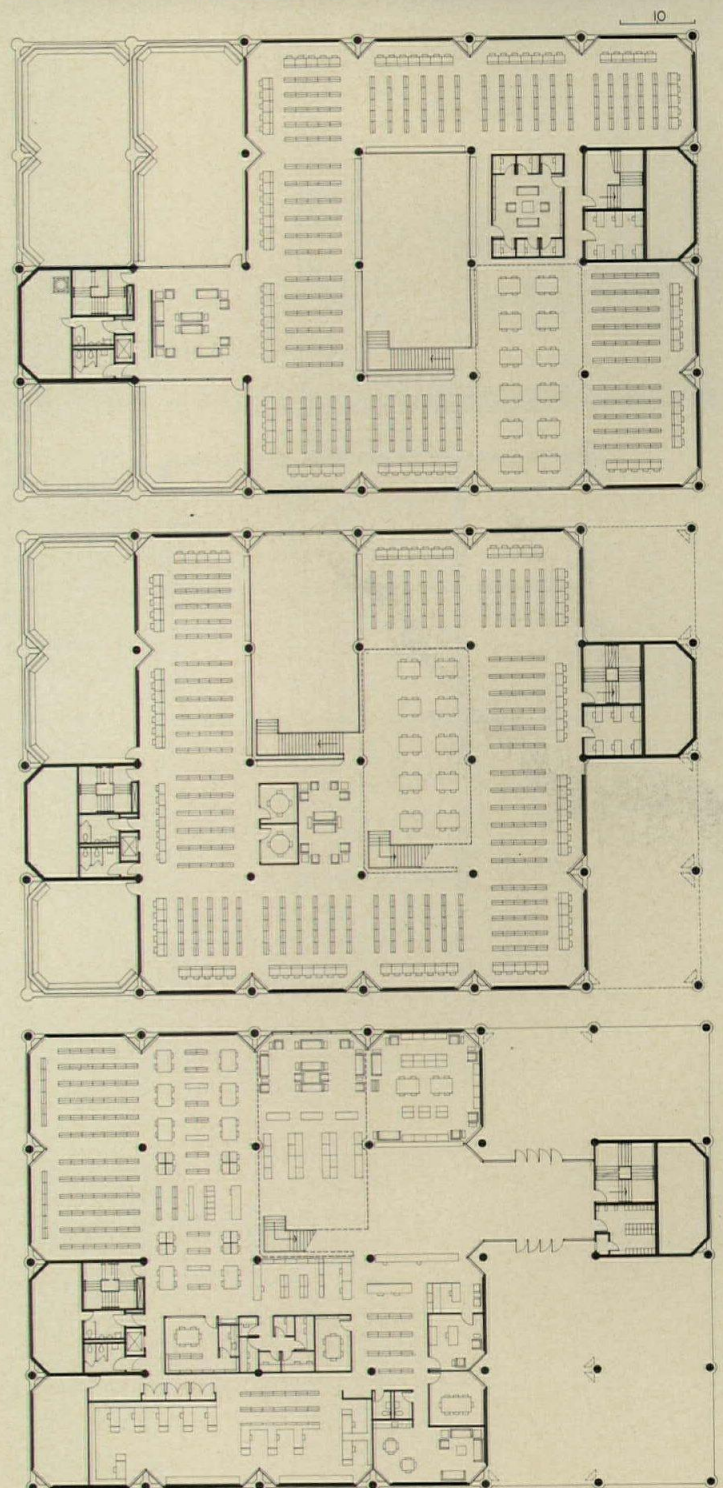
The structural system allows interesting juxtapositions of one- and two-story bays, both inside and out. Inside on the main floor one ascends a stair through one two-story space and arrives at another on the second floor. From there one progresses to the third floor by means of another stair; here there is still another two-story space with a double-height window, which can be seen on the opposite page.

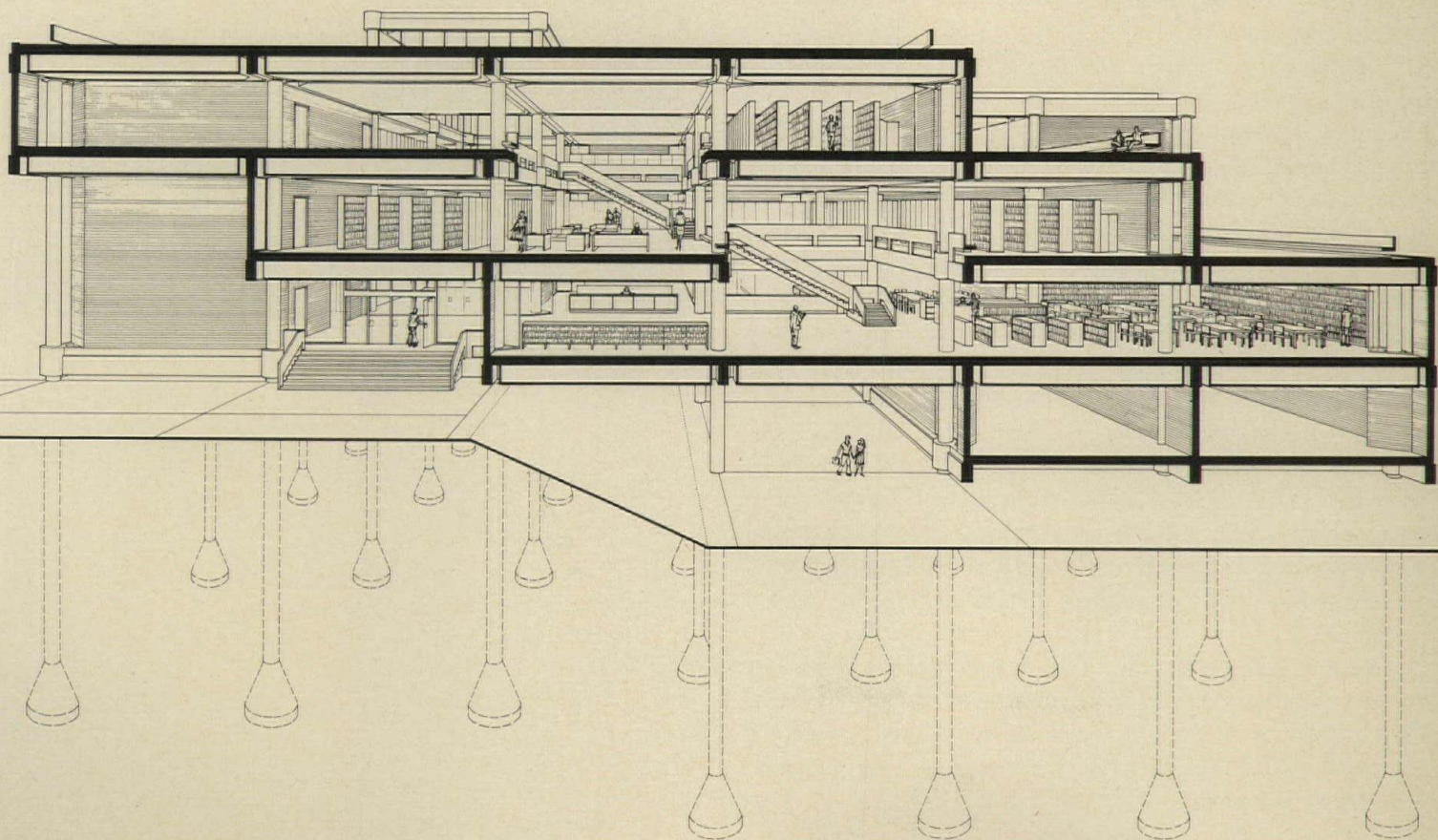
The library is the prototype building for the academic matrix in the over-all master plan for Tougaloo, just as the dormitory buildings are the prototypical residential facilities. All were finally dedicated in May of this year. Eventually the library will be exclusively for study and research; for the time being it also doubles as a place for public assembly.

TOUGALOO COLLEGE LIBRARY, Tougaloo, Mississippi. Architects: Gunnar Birkerts and Associates—project director: Charles Fleckenstein; director of production: Vytautas Usas; director of field supervision: Gunars Ejups. Engineers: Robert M. Darvas & Associates (structural); Hoyem Associates, Inc. (mechanical/electrical). General contractor: Frazier-Morton Construction Company.



Ballhazar Korab photos





What happened to Tougaloo?

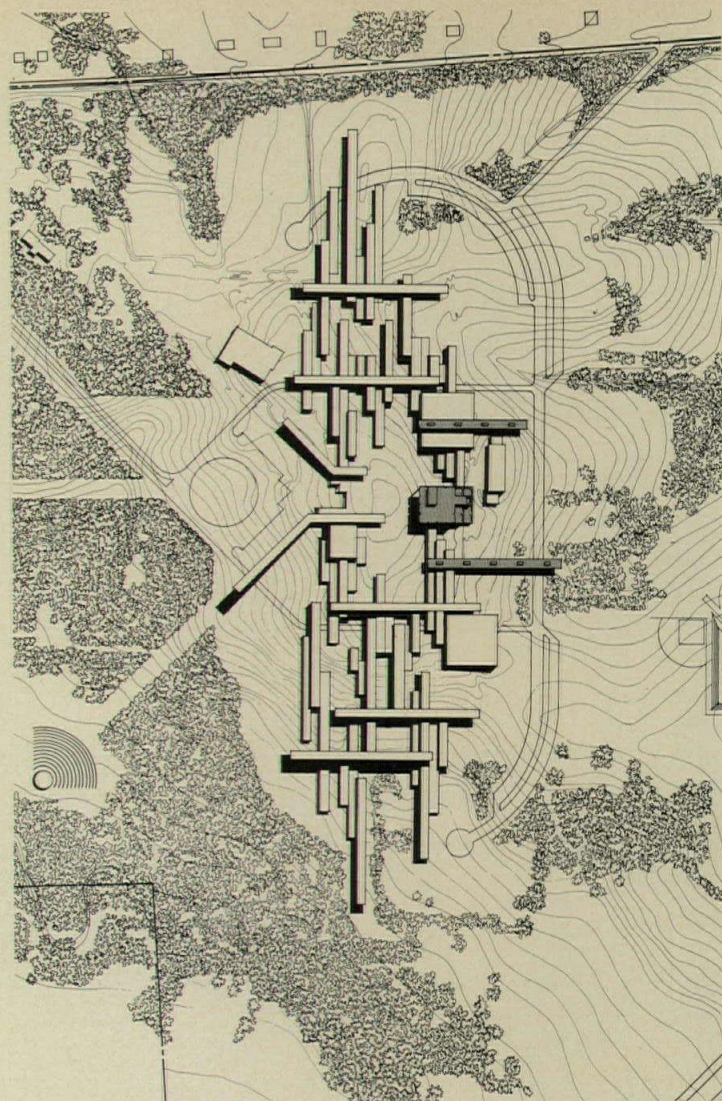
The dormitories and library dedicated last May at Tougaloo College are the first buildings to be realized from the master plan (1) commissioned in 1965—and it seems that they may well be the last. What happened? The original intentions were certainly splendid enough. The dream, as one of Tougaloo's backers put it, was "to provide an institution that will in one generation make up for the cultural and educational lag caused by the deprivation of some citizens of their inherent rights over the past several hundred years." "Our little band," he added, "has the opportunity to vitally affect a course of education in this country."

The architects, while naturally being urged to keep an eye on the practicalities, were implicitly commissioned to produce a plan that would be bold and visionary. "Be as practical as our dreams will permit," Birkerts was advised. The advice, putting practicality subservient to dreams, turned out to be fraught with peril. For what happened to Tougaloo was that its supporters, its architects and its officials were cresting a wave of social enthusiasm that broke. The hoped-for private and Federal funding did not come through, and enrollment in black colleges fell far short of mid-60's predictions. At Tougaloo, delays in occupying the three buildings that actually have been built caused some potential students to be lost to nearby Jackson State (whose tuition is, incidentally, \$600 less a year). The enrollment at Tougaloo is declining.

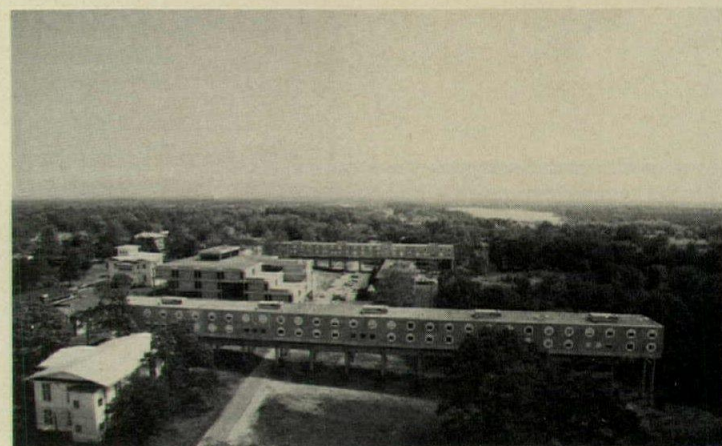
The failure of a visionary plan to be implemented whole hog causes that portion of it which is completed to be looked on with some asperity. Under present circumstances a simpler expedient might have seemed more desirable than Birkerts' technologically sophisticated dormitories soaring across the campus (2). Some cheaper expedient, too, would have meant that Tougaloo's unexpectedly limited funds could have been used more to educate students and less to house them. "We will be paying for these buildings a long time," one Tougaloo official is reported to have said. And Birkerts has observed, rightly, that he would approach the problem in an altogether different way today.

But the chain of events affecting Tougaloo's fate were not predicted in 1965, and to Americans startled almost daily by some new development this failure to predict accurately can come as no surprise. True, the original aims turned out, in retrospect, to seem overly ambitious. It is also true that some of them now seem patronizing or presumptuous. Birkerts, earlier on, said that he was trying to design for the student an environment that would "break down old living habits and build intellectual and creative ones, thus enabling him to make the transition from a simple rural cultural pattern to a highly conscious, responsible, urban way of life." Most blacks today argue that insofar as the old living habits nurtured special cultural traditions they needed to be emphasized rather than broken down. They also resent the wholesale implication that these habits were neither intellectual nor creative, and that a simple rural culture was neither conscious nor responsible. They might well ask, too, why it was foreordained that all blacks were headed for the city.

Such lapses, though, are occasional rather than pervasive. While regretting them from the disarrayed vantage point of 1973, it is only fair to mourn as well the demise of the sweeping optimism and idealism by which the master plan for Tougaloo was at first engendered.



1. Tougaloo College, site plan



2. Tougaloo College, aerial view

From campus planning to city planning

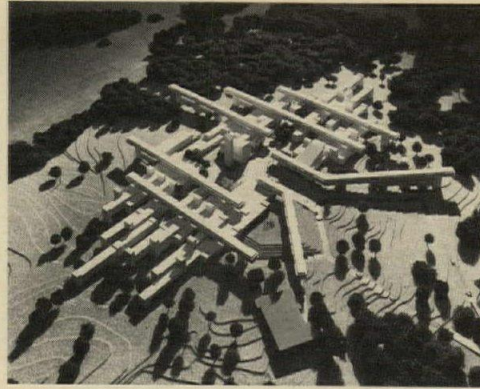
Leading the black student in Mississippi to an urban way of life implies that the campus itself be urban in character. As such the master plan for Tougaloo is an interesting manifestation of a notion that has concerned Birkerts for a number of years: the "layered" city. Birkerts maintains that many modern cities are unsuccessful because they are "zoned." The central business district forms one zone; the cultural center, the medical center, the shopping centers and the residential areas form other more or less discrete zones. Their location demands a great deal of transportation of goods and people from one place to another, creating some of the major problems which cities now face. Birkerts proposes as an alternative a system in which the various zones are integrated in horizontal layers. The master plan for Tougaloo College (3) has three layers. The bottom one has a traffic loop and scattered parking lots which fit under the buildings; thus goods and people can be delivered (or deliver themselves) to buildings from below. The next layer is the academic matrix. The planning principle here is a kind of finger system; by the addition of units to the fingers future space requirements can be accommodated. Above the academic matrix are the dormitories, connected to the middle layer by stairs and walkways and, by being superimposed, they are more integrated than if they were spread out into separate zones.

Birkerts likens this arrangement to that of medieval cities, where activities were interlocked in close proximity to each other. The comparison is apt, for in principle there is not much that is new in Birkerts' basic idea. Even some modern urban areas—notably Manhattan—are "layered," with many of the services underground, stores and shops and sidewalks at ground level and offices and apartments above. Birkerts proposes to extend such existing arrangements further by putting *all* transportation and services underground, reserving the ground for pedestrian traffic, recreation and commercial activities; residential and office space would, again, be above. The master plan for Tougaloo is a clear and coherent illustration of the idea. Its virtues are that just about everything comes within close proximity to everything else, and, since the plan is conceived almost as an organism, it is capable of organic growth. The plan, says Birkerts, is "something like a baby—complete at birth, but capable of growing and capable of developing."

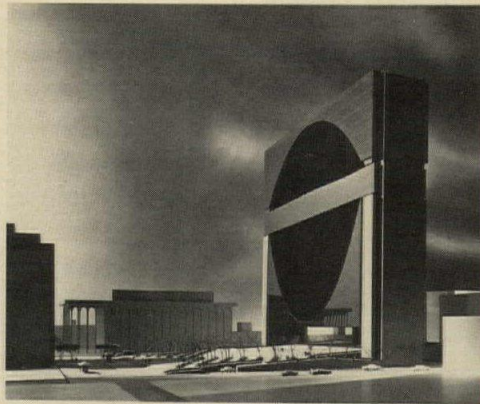
The Federal Reserve Bank of Minneapolis, too, can be seen as one part of a "layered" city. It is capable of expansion upward (4) or outward across an entire city (5). At the bank, service and pedestrian and office activities are neatly segregated, and ground-level space is left virtually unencumbered. But stringing out a whole series of such buildings in a city could surely not be done without some difficulty. For whereas the "layered" city system is coherent, organic and capable of organic growth, it is hard to see how it could be imposed on an existing city without major political, social and economic readjustments. It seems problematical, too, whether or not the specter of giant buildings leaping across freeways would inspire awe, or simply strike terror into the hearts of the citizens of Detroit, which is the subject of the experiment shown in the adjacent photograph.

Looking in the gift horse's mouth

The excitement generated by the picture of a building hanging above a highway brings us straight to the major disappointment of the Federal Reserve Bank of Minneapolis: it is dramatically



3. Tougaloo College, model



4. Federal Reserve Bank, model of ultimate phase



5. Project for a "layered" city

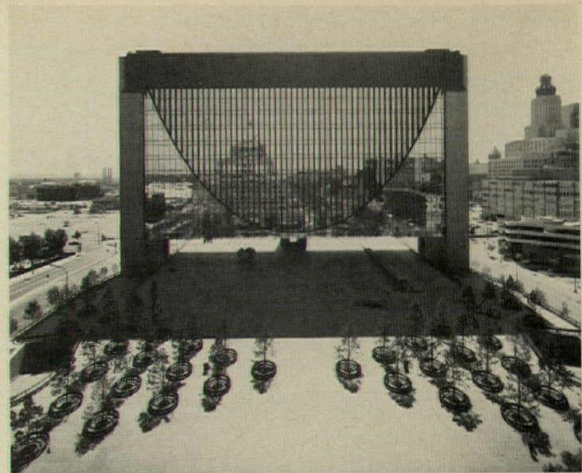
spanning something that does not seem particularly to need spanning. The architects, of course, assert that the security area below, with its complicated arrangement of vaults and service ramps, made a conventional column system difficult to use, if not impossible. They also assert that hanging the office portion of the bank above the ground allows them to give virtually all of the site to the people. This act is consonant with the bank officials' desire to make a gesture of openness to the city.

With such good intentions, realized within several sets of real constrictions, it is not unfair to ask this question: just what, in fact, has been given? A plaza, of course, and a very big one. It is equipped with a fountain, seats, planting, sculpture, electrical and TV outlets and provisions for a temporary stage—all there to induce several kinds of use. But one suspects that these uses will have to be programmed rather than improvised—that is, infrequent rather than frequent. Since the plaza slopes gently upward to a point high above the street on one side, it does not invite a spontaneous flow of pedestrian traffic across it. Since the entrance to the building is on the street below the plaza, not even the people who must go into the bank will cross it automatically. Since it is not protected by surrounding buildings (6), people who do use it are likely to find it uncomfortable on those frequent occasions in Minneapolis when the mercury dips below zero. One bank employee even quibbled that it was uncomfortable in the summer when he tried to eat his lunch there: the black steel benches were too hot to sit on, and when he sat down on the granite his boiled egg rolled away from him. "He can always find another seat in the shade," Birkerts commented. *Qu'ils mangent de la brioche?*

If the plaza is indeed uncomfortable or unfriendly, then there are bound to be reasons for it more serious and more instructive than the capricious escape of a boiled egg. For one thing, all of the elements seem either very large (the building and the surface of the plaza itself) or very small (the benches, sculptures, trees and people). There is nothing to mediate between the largeness and smallness, to soften the blow of building's dramatic facade while maintaining its excitement. In this respect the plaza is in strong contrast, for instance, to the plaza at Rockefeller Center in New York, where a series of trees, sculptures, flagpoles and smaller buildings carry the eye step by step upward to the RCA building, itself stepped up in a series of vertical slabs seen dramatically from their thin sides.

For another thing, almost all of the elements in the plaza of the bank of Minneapolis are abstract. The benches there (7)—and indeed those of Tougaloo (8)—provide examples. Can sedentary happiness be found on a bench made out of steel tubing that looks like two big inner tubes? Or from one made of precast concrete that looks like a part lifted from some giant piece of machinery? More generally, can the human imagination find comfort in an environment devoid of human connotations—in a facade that expresses a phenomenon of physics (the catenary) more than the human activities of being enclosed (by a wall) or looking out (through a window)?

Gunnar Birkerts deserves great credit for his ability to see human needs in terms of large-scale planning and of monumental architectural forms. We will need those talents once we find ways for implementing large-scale plans, and once we can achieve some general agreement about what deserves monuments. For now (one falls prey to the spirit of the times) the questions of what is possible and what, in that limited framework, is human seem more urgent.—*Gerald Allen*



6. Federal Reserve Bank, plaza facade

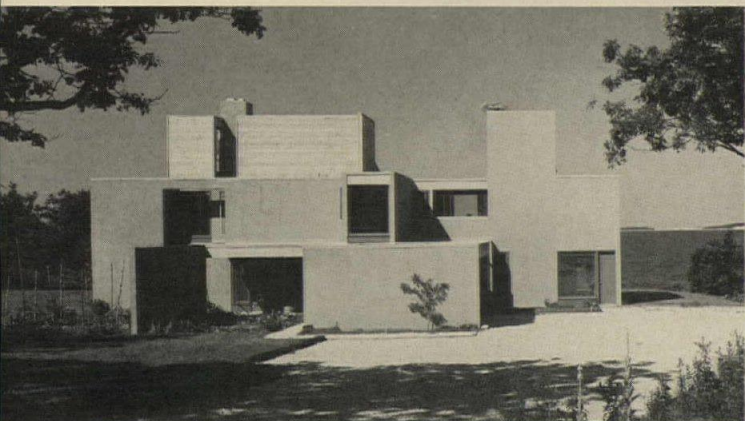
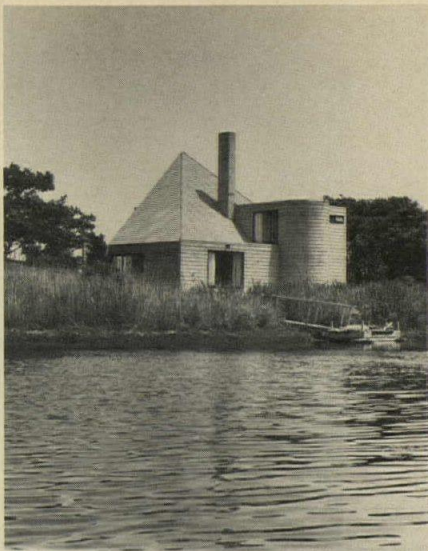


7. Plaza, Federal Reserve Bank



8. Detail of Library, Tougaloo College

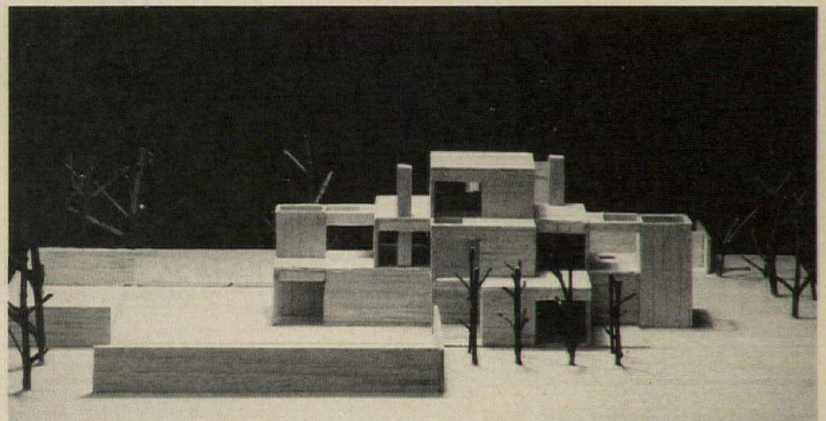
5 Houses by Alfred De Vido



Al De Vido's practice, in partnership with John McFadyen, is not limited to houses but he manages to do six to eight houses a year and he retains a special affection for residential design. His clients do not usually come from the ranks of the plutocracy, so the budgets with which he normally works range between \$40,000 and \$75,000. He not only meets those budgets but, as the houses in this section testify, he provides a lot of house for the money. He welcomes and actively encourages client participation in both programming and design, crediting his clients with a measure of responsibility for the success of their houses.

De Vido relies, more heavily than many architects, on the model as a design tool. The chipboard and balsa wood models in his office bear scars from wounds received during recutting and regluing as their designer restudied an intersection or adjusted a window opening. The complexity of elevation and massing that characterizes many De Vido houses grows directly from this reliance on working models. His drawings are very orderly but crowded with information. Two sheets usually suffice.

At a glance, the finished houses bear only a faint family resemblance as he does not mine a single stylistic vein. But on closer examination, certain common features begin to appear. Each of the houses is decisively ordered. Each is asymmetrically massed in a profusion of small projections and angles that produce a busy and happily indigestible character. Finish materials are selected on the basis of cost and appropriateness. Daylight is insistently but thoughtfully introduced from a variety of sources—some unexpected. In matters of detailing, De Vido is direct and uncomplicated. Square-edge trim covers most seams and therefore the requirement for really exquisite and expensive craftsmanship is minimal. And, like their detailing, the appeal of these houses is direct and personal. They are not fancy. They are imaginative, liveable, informal and pleasantly free of pretention.—*B. F. Gordon*





Norman McGrath photos

1 The site for this engaging house is a sandy spit of land surrounded on three sides by water. The amount of buildable land area was minimal and this pointed to a two-story solution. So did the need to zone the house into quiet and noisier areas.

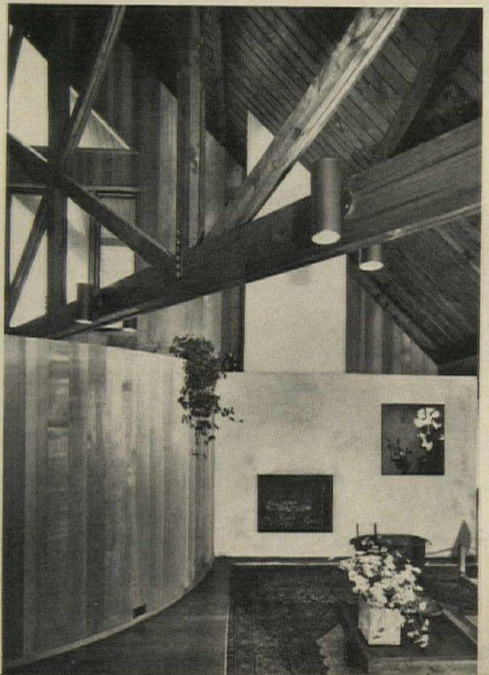
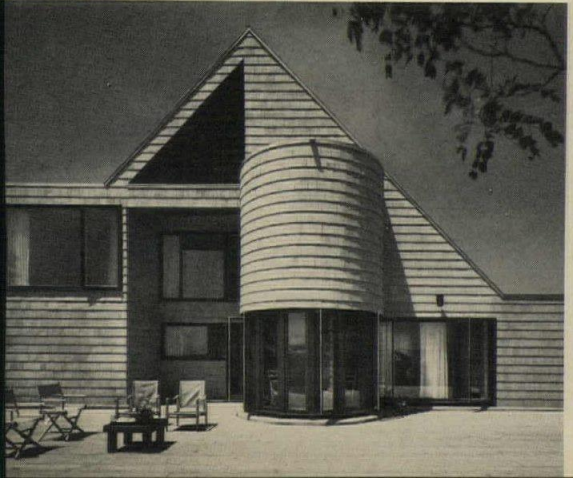
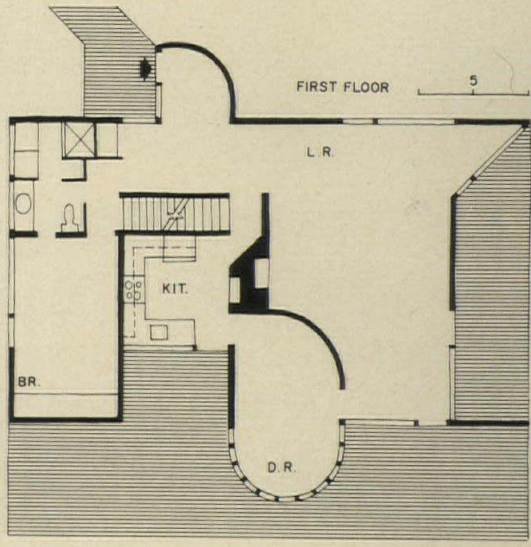
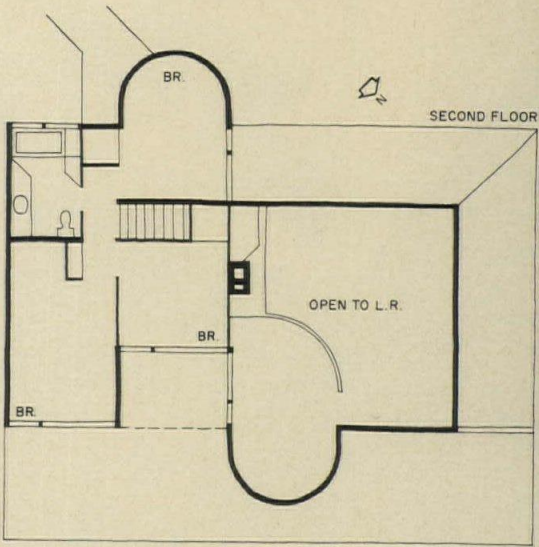
De Vido gathered several strong geometric forms—rectangles, triangles and semicircular drums—into a strong and coherent composition. He unified the whole design by cladding all exterior walls and visible roof surfaces in wood shingle (an old Eastern Long Island tradition) and by keeping the vocabulary of details to the minimum required.

Inside, some of this complexity is nonetheless revealed in the elaborate framing of the roof's pyramidal section (photos right) and in the gently irregular shape of the living room. The remainder of the plan

is simply organized and shaped: parents' spaces are all downstairs, children's upstairs in a 3-bedroom and bath cluster. A deck, on the water side, offers views in three directions. A second and smaller deck, on the east side, provides a more private retreat sequestered from the prevailing wind.

This captivating house, fitted so carefully to its site, recently won a Merit Award for residential design in a competition jointly sponsored by the AIA and the Red Cedar Shingle & Handsplit Shake Bureau. The jury described the house in part as "clearly detailed in forms that are becoming a contemporary vernacular." We agree completely.

PRIVATE RESIDENCE, Long Island, New York. Architect: *Alfred De Vido*. Structural engineer: *Robert Silman*. Contractor: *Edward Williams*





Ezra Stoller © ESTO photos

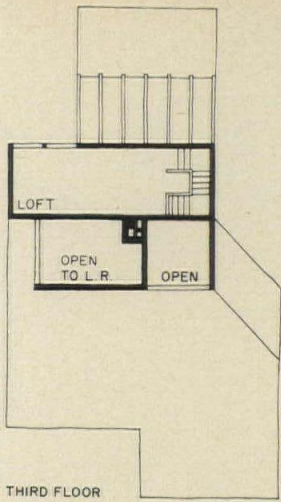
2 The Bross residence, in East Hampton, is a compact solution to the problem of providing living spaces for a family of four on a one-acre site. The plan reveals a house tightly organized around a brick core which serves physically and spiritually as the center of the house. By turning the tall chimney breast off axis, De Vido underscored its symbolic importance and also eased the flow of space from entrance to living/dining area. This large central space is oriented toward a generous deck seen in the photo upper right.

The interior spaces strongly reflect the steeply pitched roofs and the vertical organization of space. Bedrooms, reached by a central, three run stair, are clustered on the second floor. The master bedroom overlooks the living room through a port fitted with a sliding door (see photo upper right). Above, on the uppermost level, is a small loft, open

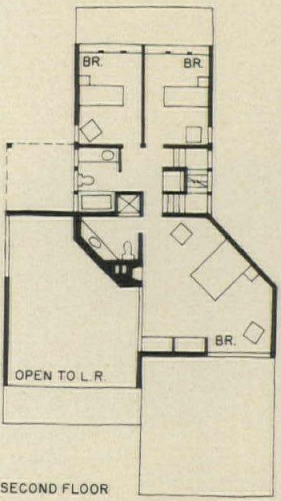
to the stair, usable as a study, a studio or a small guest bedroom, depending on particular need.

The strong forms of this house and their graceful interplay give the Bross residence a compelling spatial character. As in several of the other houses in this group, the use of a single cladding material—cedar shingle (here stained dark)—serves to unify a complication of planes and projections. And overhead light sources, in the forms of skylight and clerestory, flood the interiors with natural light, giving them an especially welcome warmth and color enrichment at all seasons of the year.

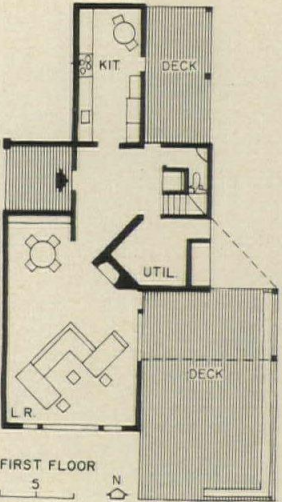
BROSS RESIDENCE, East Hampton, New York. Architect: *Alfred De Vido*. Contractor: *Walter King*.



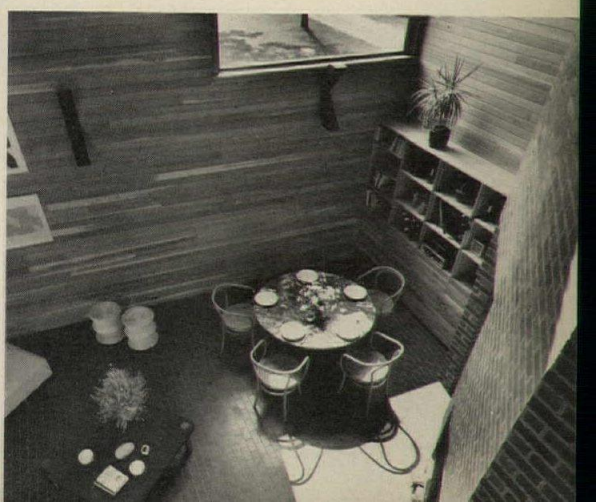
THIRD FLOOR



SECOND FLOOR



FIRST FLOOR



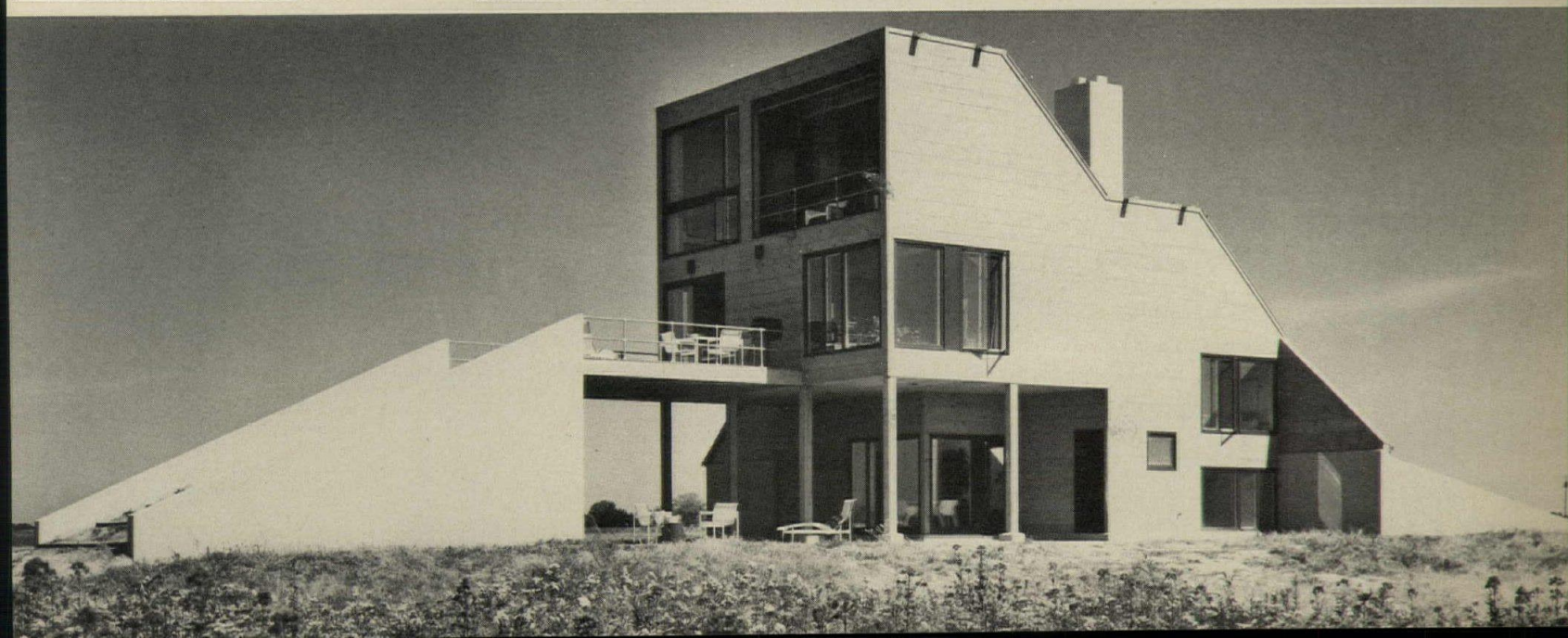
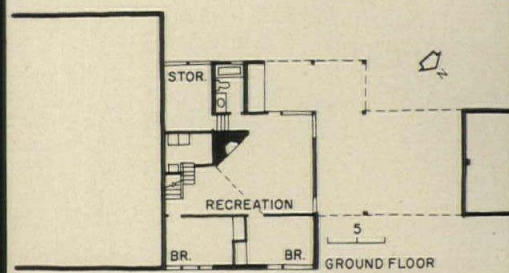
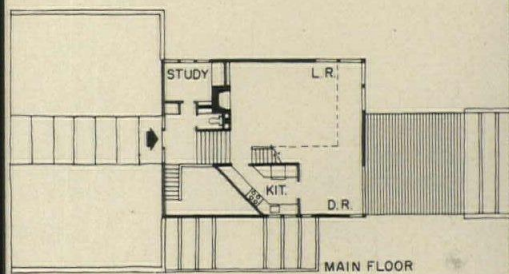
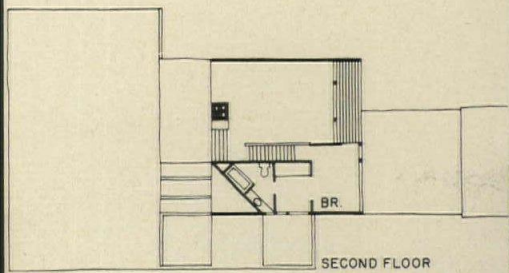
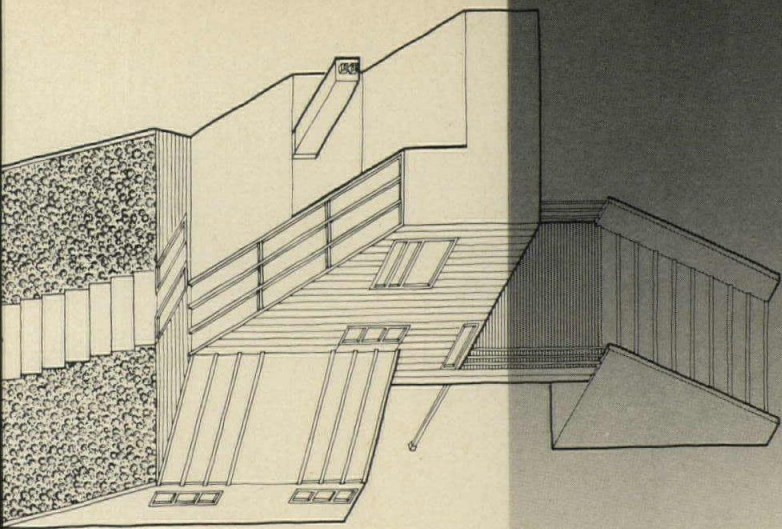


Maris-Semel photos

3 This house in Bridgehampton, Long Island, for a family of four, rises in a striking series of sloped forms with complex faceting and rather intricate internal spaces. Earth berms, at front and rear, ease the transition between the level site and the three-story structure. On the lower level, children's bedrooms are grouped around a recreational space. The middle level contains the main living spaces while the master bedroom and bath occupy the top level. The upper two levels, connected by a stair and a vertical shaft of space, provide welcome views of the ocean to the north. It is a house with outdoor spaces on two levels and views from the upper levels in every direction. The principal exterior finish materials are stucco and gray-stained cedar boards. Inside, the finishes include plaster board, light wood trim, and clay tile used selectively in the kitchen.

Like the others in this group, this house draws its strength from the forcefulness of its forms and the skill with which the major spaces have been shaped. The succession of low-ceilinged spaces leading to the double-height living room (overleaf) is a vigorous spatial composition, sculptured at the top by inclined forms. The sense of openness and the easy flow of spaces extends almost effortlessly through sliding glass doors to the view beyond. It is a personal house, to be sure, and a house that is idiosyncratic, but nowhere does the design look unresolved or the planning timid—a tribute both to the architect and the owner.

PRIVATE RESIDENCE in Bridgehampton, New York. Architect: *Alfred De Vido*. Interior designer: *Juan Mir*. Contractor: *Peter Wazlo, Inc.*







Like the exteriors, the interiors are conceived and executed without undue restraint. Colors get their full value and many design elements are treated as opportunities for architectural sculpture. Several of the photographs (left and above) indicate the effects of natural light introduced deep into interior spaces from unexpected sources overhead.



Ezra Stoller © ESTO photos

4 The owners of this house required the usual living quarters plus an apartment for visiting married children, a study and a studio. In addition, they specifically requested a house in which masonry was to be the dominant structural material. Their site fronted Peconic Bay to the west and afforded the owners unobstructed views of water and distant shoreline.

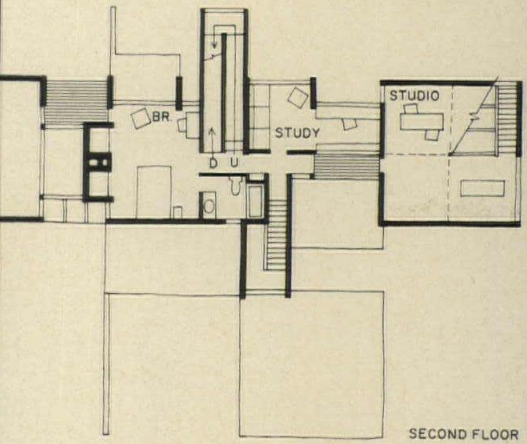
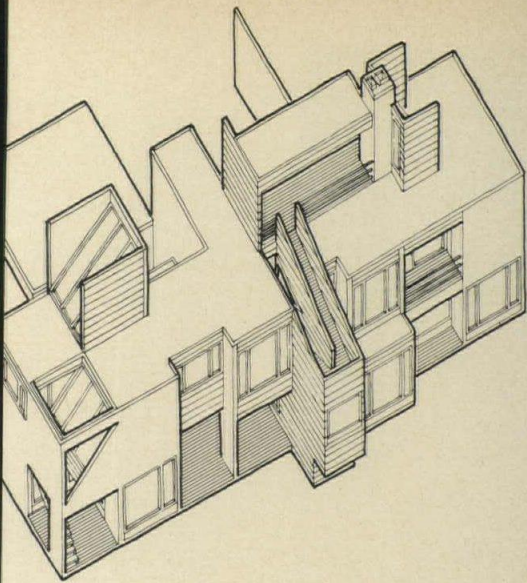
De Vido strung the plan out perpendicular to the western view and recessed the glazing line to shield windows from sun and glare. Living room, dining and kitchen areas and guest apartment occupy the first floor while the upper floor is reserved for the master bedroom, study and studio. The floors are linked by a stair as well as a long ramp that continues all the way to the roof (see isometric, opposite page).

The primary problem, says De Vido, came in trying to combine

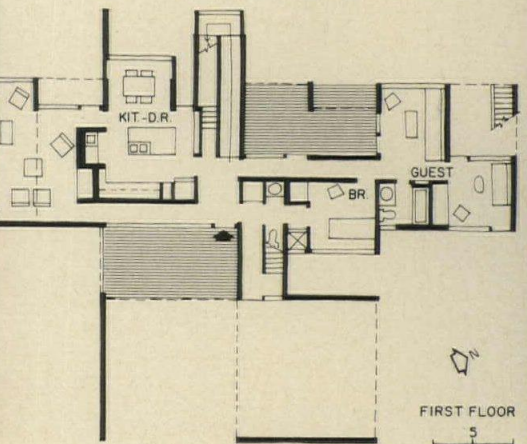
the concrete block with wood and glass in a way that was visually coherent. As finally designed, the block encloses space on three sides and is set at right angles to the view on the fourth. Light wood panels serve as infill. This design decision led to the cubical volumes which give the house its characteristic massing.

The interplay of materials carries through to the interiors which are simply but functionally expressed. Although internal spaces are closely defined by walls and partitions there is more than sufficient flow of space, upward as well as outward, to excite the eye and stimulate the senses.

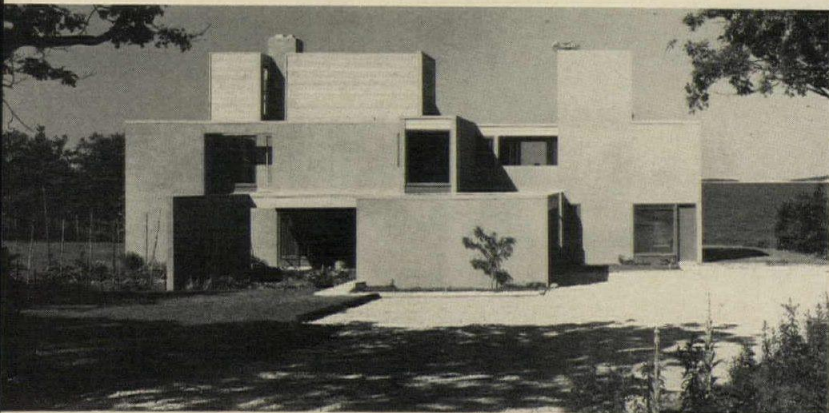
 PRIVATE RESIDENCE, Long Island, New York. Architect: *Alfred De Vido*. Contractor: *Walter King*.

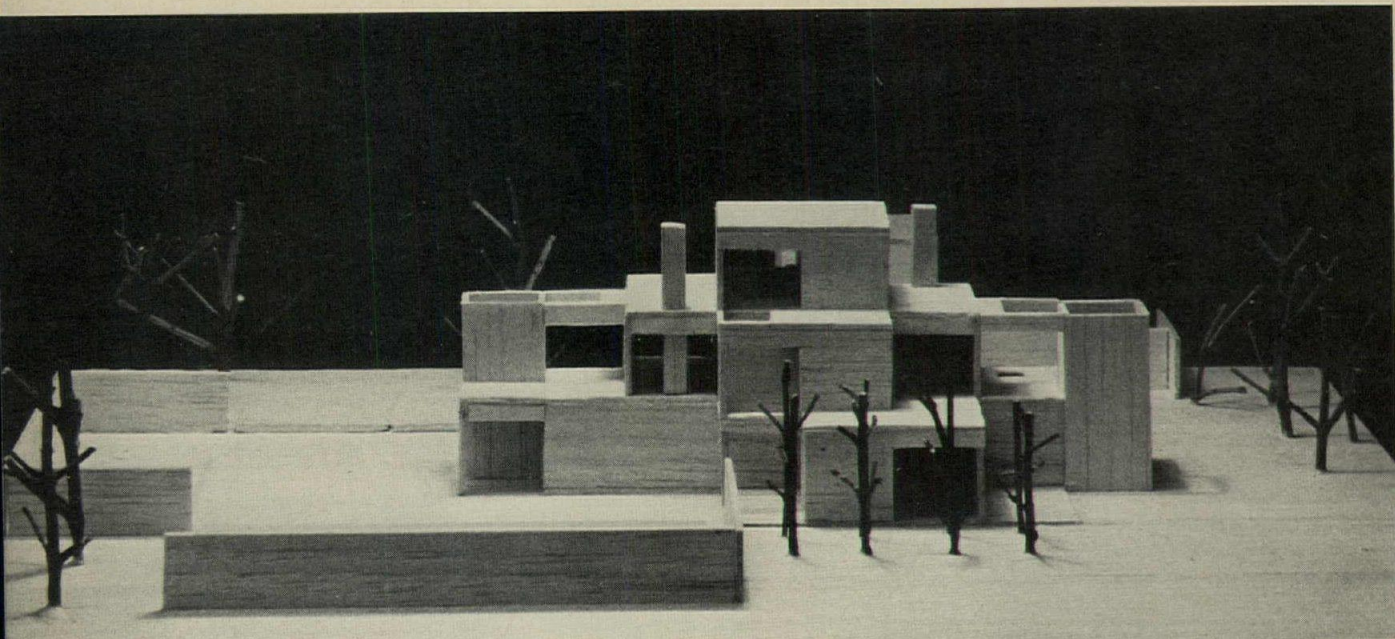


SECOND FLOOR

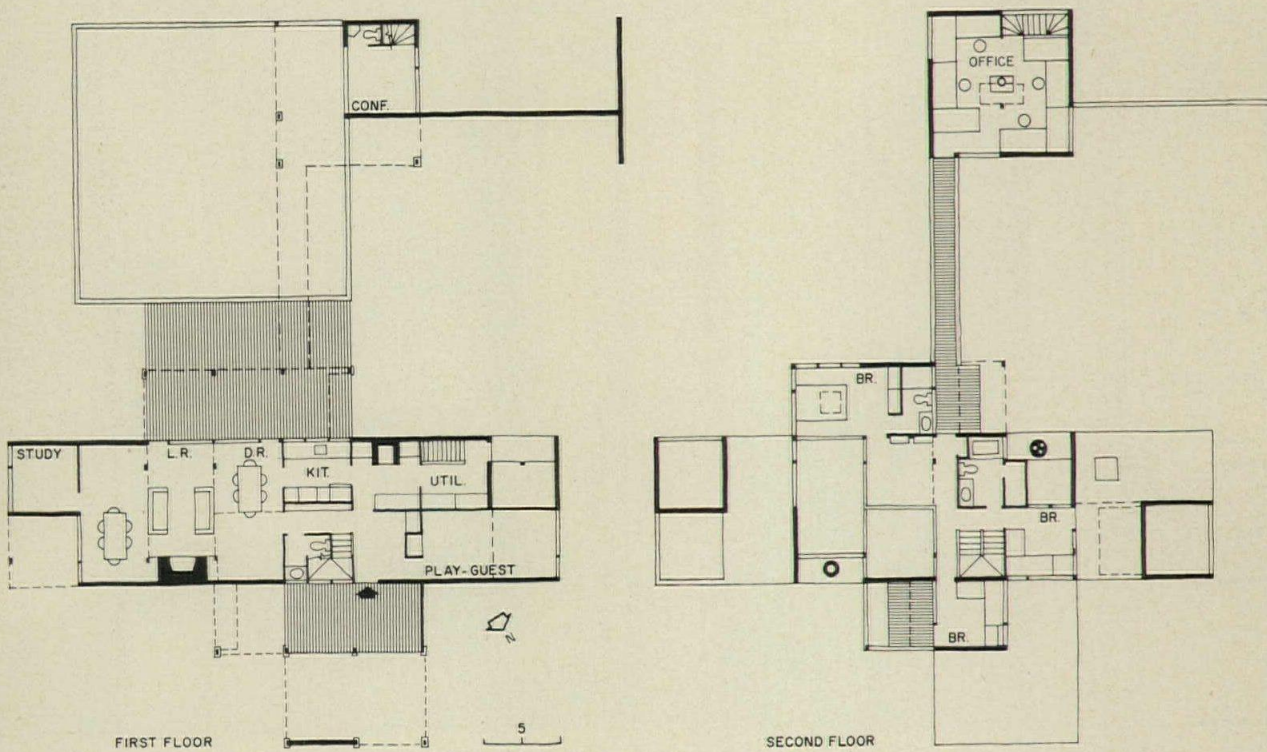


FIRST FLOOR



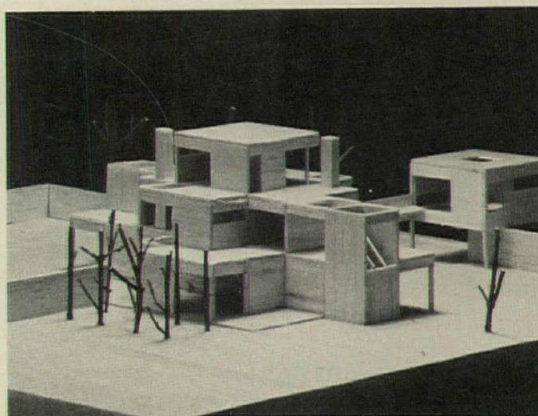


Igor Bakht photos



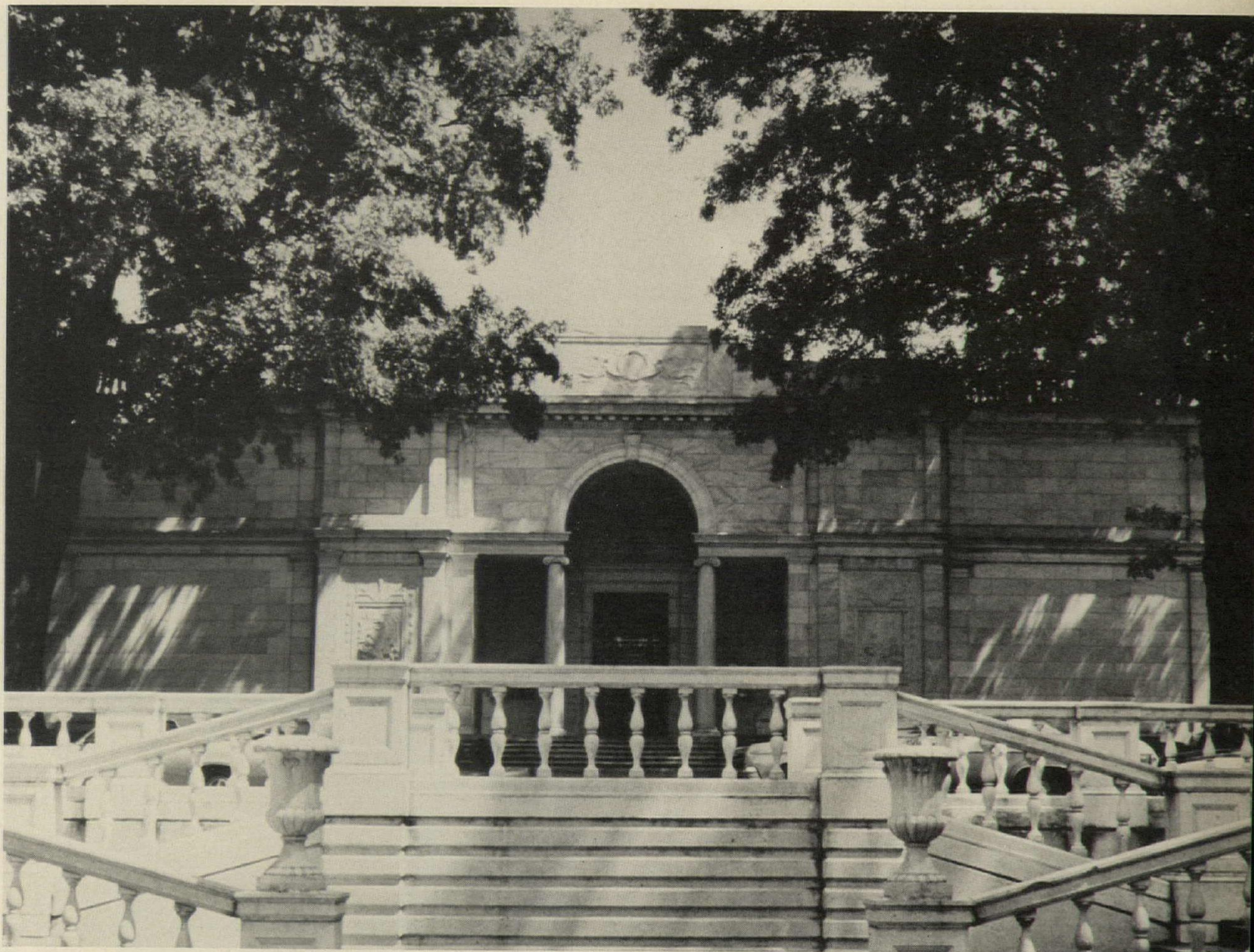
5 For his own house in East Hampton, De Vido is planning a series of flat roofed, interlocking wood cubes, somewhat reminiscent of the house in Eastern Long Island (pages 126-27). Here, however, the plan is disciplined by a 9-foot-square module that operates both vertically and horizontally. The house will be built in a light post and girt framework, clad in wood siding and finished with a built-up roof. Large open areas, glazed and unglazed, will orient to the surrounding landscape and to systems of exterior walls that reach out from the house to define a series of interrelated outdoor spaces. The site is flat so these will not be retaining walls.

A small office (see plan), with a separate entrance reached by a stair from the parking space below, will be connected to the house by a wood bridge at the second level.



A major expansion of this building is a study in planning and continuity

THE BROOKS MEMORIAL ART GALLERY



The Brooks Gallery has been a source of civic pride in Memphis since its dedication in 1916. Designed by James Gamble Rogers and modeled on the garden pavilion of the Villa Capriola, it has an irreplaceable grace, and a healthy scale for the surrounding area of large well-kept houses. When Mrs. Samuel Brooks donated the \$100,000 construction cost in 1912, "art" was looked on as a rather elitist matter—but times change. The number of visitors and donors (including Samuel Kress) grew. In 1955 the building was expanded directly to the rear, but the addition was too small at the time of the dedication. At such a juncture, the solution has often been new construction of such overwhelming scale that preservation seems irrelevant. Architects Walk Jones and Francis Mah's housing for the new spaces, as seen at right, might well have produced that result. But . . .



Otto Baitz photos

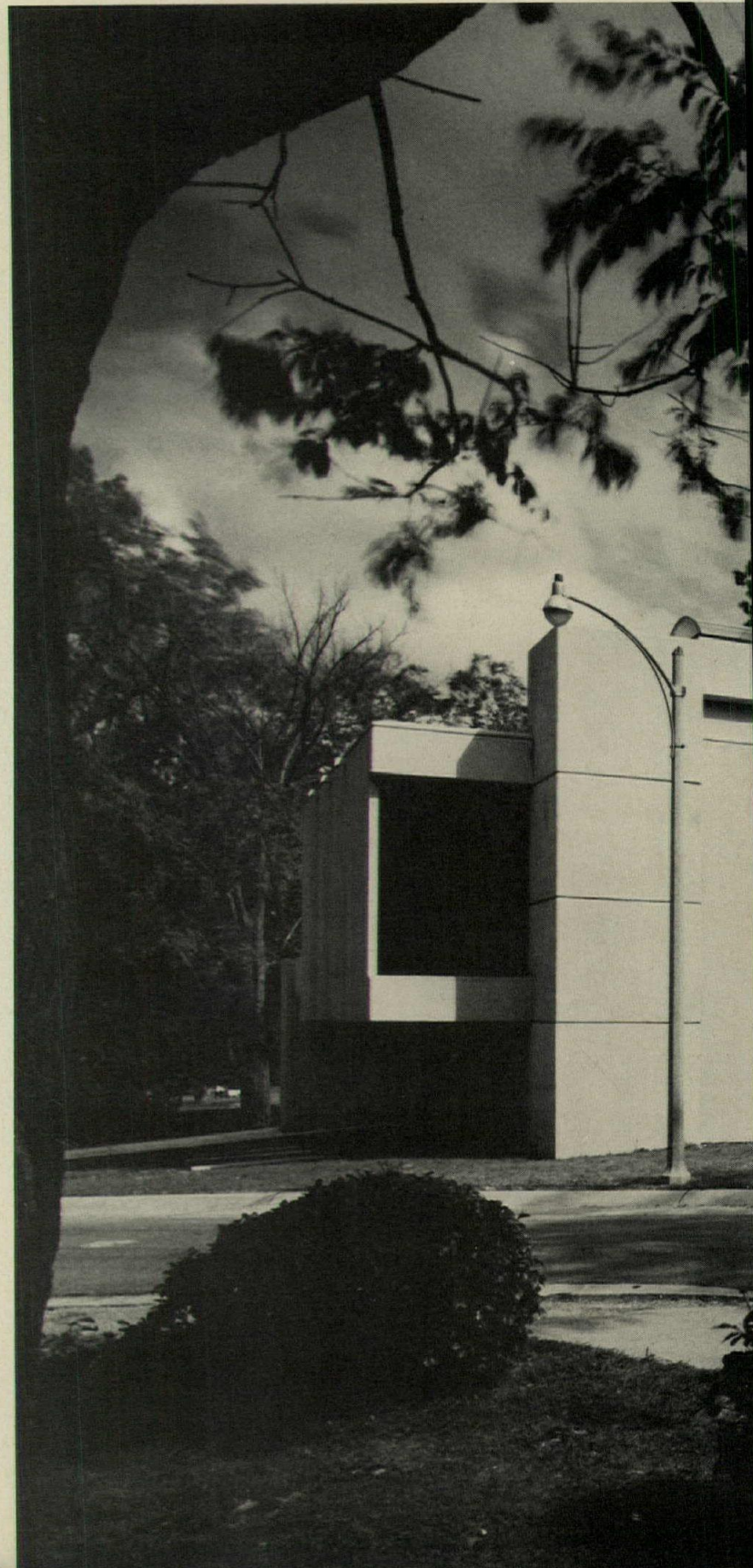
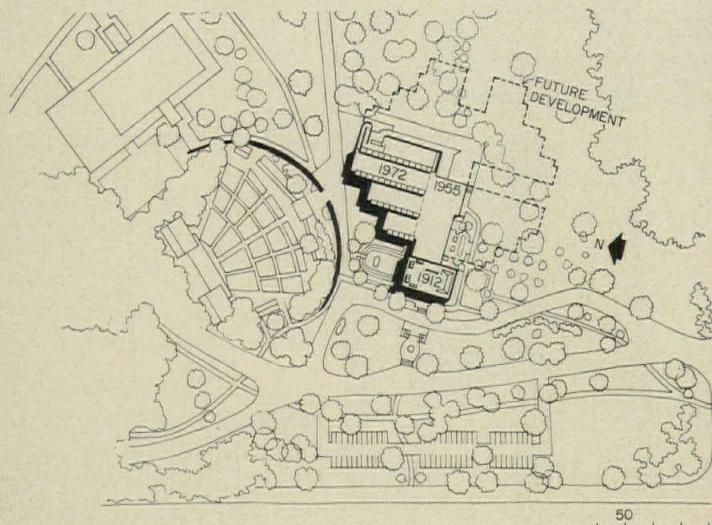
From the exterior, the new presence is revealed subtly—in deference to context

Not all the planning of the new museum space involved massing problems. As the present design began, the expansion program was way behind schedule. There were the usual budget deficits that delays produce. Lacking was a set program on the nature of exhibits or the manner in which they were to be seen. Another serious problem was the fact that long-range expansion locations had never been considered despite on-going donations and steadily increasing public interest.

The shortness of schedule and budget were tackled by use of a prefabricated concrete construction system developed for low-cost housing (more on this later), but the scale of structural members had to be greatly increased. Large flexible areas were the only way to accommodate the indefinite exhibition program, and height was required for the appropriate spatial character. The operating economies of centralized facilities (versus the alternate of branch museums) produced an eventual 100,000-square-foot long-range expansion program—all on this site. This addition represents only a quarter of that area (see plan below), but plans for another increment are already under way.

The architects always intended that theirs would be a background building to both the original small scale gallery and surrounding Overton Park. Given the volume of required space and the large-scale construction system, controlling visual impact was not easy.

There were two basic massing decisions made: the new first floor level was depressed a full story below the original, and only half of the actual height is revealed from the front approach. The visual bulk is further broken into segments stepping back on a 45 degree sight-line from the older entrance facade. With such effort at sublimating its presence, it is remarkable that this background building can stand on its own design merits, as can be seen by moving around it (photo right). The architects describe their facades as an abstraction of the Rogers exterior. The new concrete wall finish resembles the older limestone facing. Still the wall panelization and opening scale are as much a direct outcome of the construction method and interior considerations as they are deference to the earlier building.



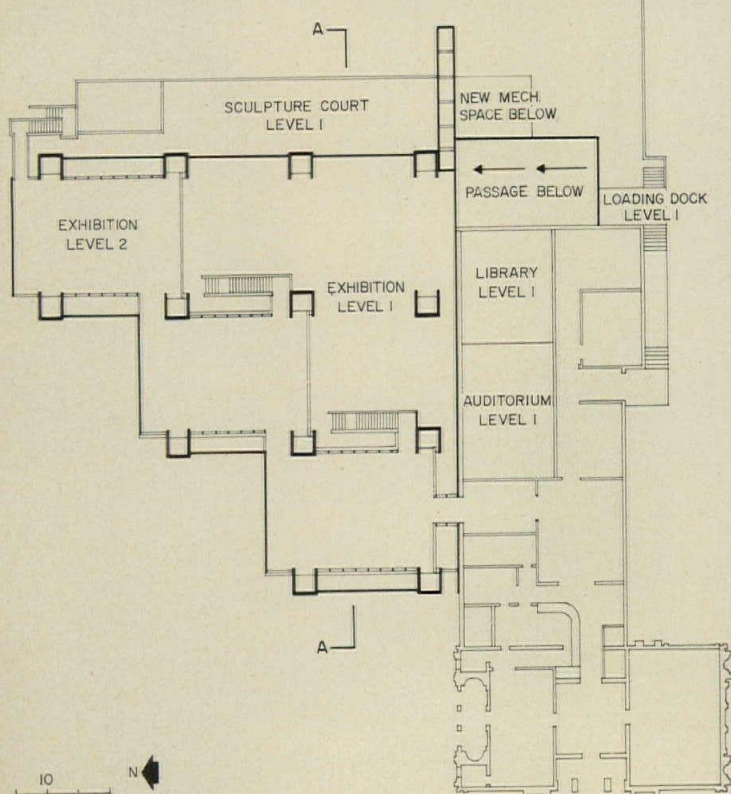
A ground slope was utilized to conceal the visible height from the front approach. The full extent of the new building is seen in stages. Passing around the original gallery the viewer first sees the most forward of three segments successively set back to reduce visual bulk (photo, near right). Farther around the new building, the slope begins to reveal the true massing (below), and finally the full height is seen from the rear (far right) where a berm conceals the sculpture court and a bridge spans between exit and stairs.

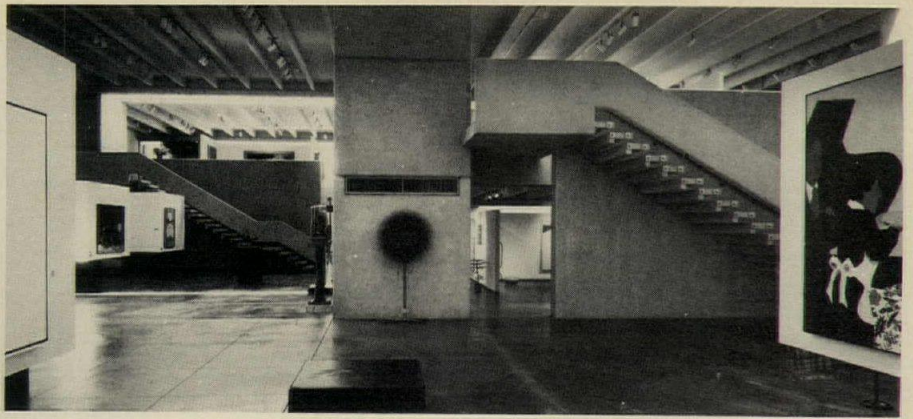
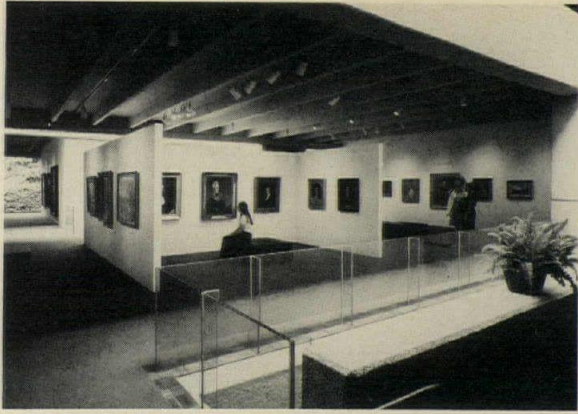


Inside, the space explodes in planned dramatic contrast to the old

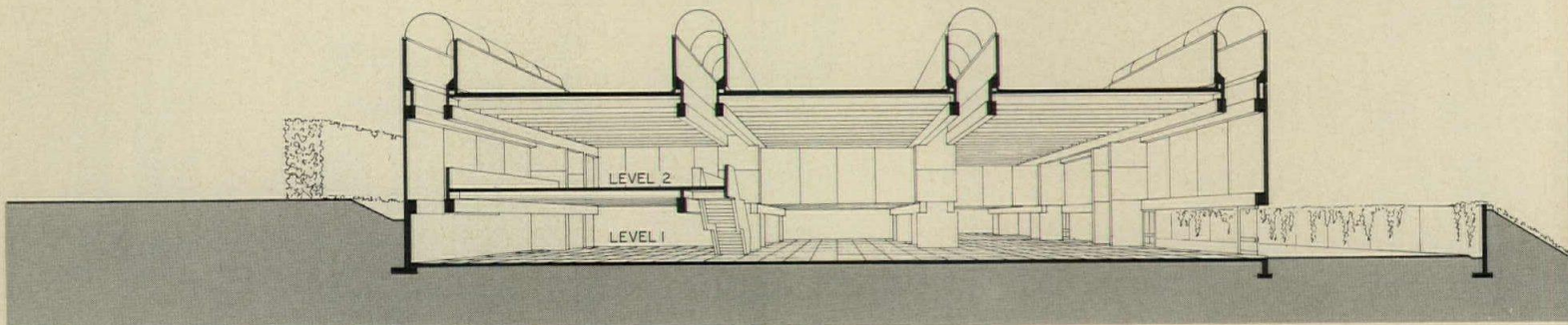
The addition is entered at a second part-floor seemingly suspended by separation from the walls (photo opposite, top left). The other two views show the relation of the second floor to the first. A full orientation to the double height space is gained before descending the stairs. To accommodate the indefinite program, floor areas were kept as open as possible, but certain divisions were inevitable. Because of loading dock location, more temporary exhibits are housed on the first level, where direct access to trucks is available.

Francis Mah explains the firm's design concerns this way: While the space was to be open, it was not to be amorphous and the finished building shows strong visual direction. There are controlled views of the park outside, and the exterior sculpture court is related to the interior by the long horizontal glazing at the first level. A continuous circulation flow, without backtracking, and a visitor's understanding of location without signs, are successful planning results. Lighting was a primary concern, and the architects' preference was to maximize natural sources. The high skylights deflect direct sun to protect the exhibitions. In an open floor plan, an inherent lack of necessary wall space exists, and hanging plywood cubes were designed to be built locally at a third of the original display system budget. Museum director Jack Whitlock is highly pleased with the new building. He can now organize the artwork presently stored (by a weeding-out process of rotating exhibits), accept traveling shows, and bring professional as well as community-related programs to life. He now plans to carpet the first level which will weaken the visual contrast with the upper (carpeted) level, but allow a more comfortable relation between art and viewers.





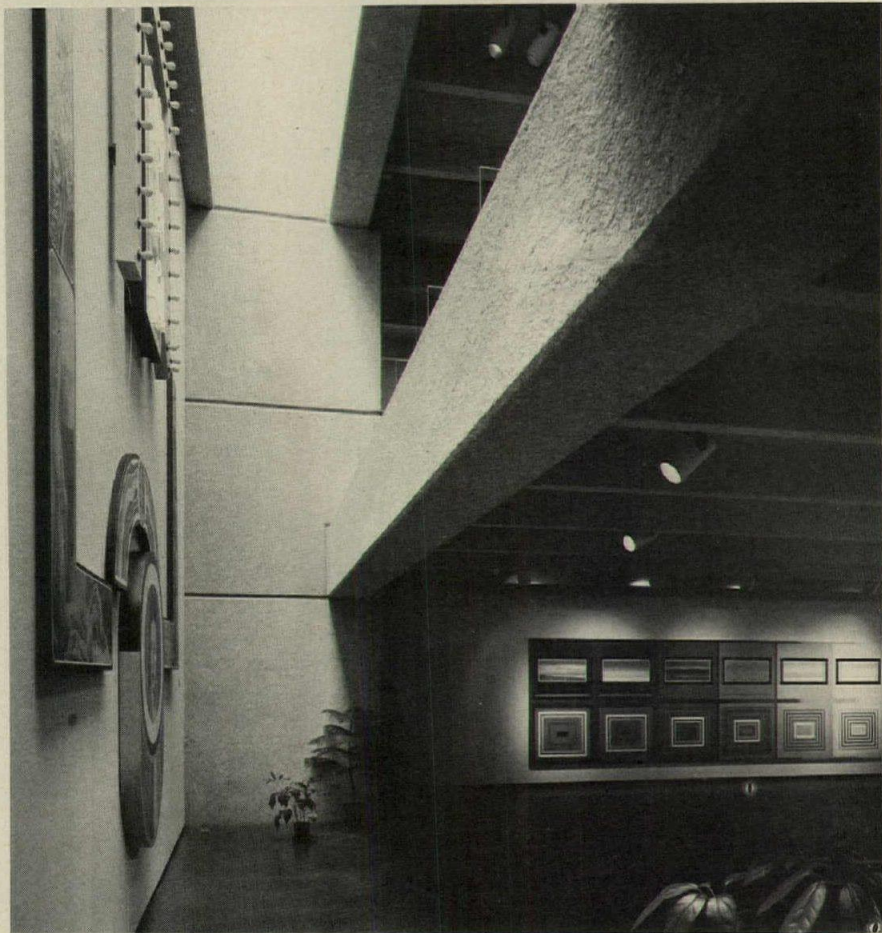
Necessity produced an economy of means turned to a strong asset



SECTION A-A

The Mah-Le Messurier Construction System used here was originally developed for the architects' local housing authority work, and possessed proven cost and time-saving advantages for taller buildings (RECORD, April 1971, pages 139-44). It relies on simple precast concrete members consisting of large U-shaped support cores (see plan page 132), beams, and double tees with concrete panel infill walls. The straightforward expression can be seen in the photos. The spans and, consequently, the scale of members had to be increased from previous applications. Manufacturing and handling of the new sizes (plus the lack of inherent system efficiency only gained by greater heights) produced structural costs in the neighborhood of standard poured concrete construction (\$238,000), but the erection time was only eight weeks. The over-all construction cost was held close to \$30 per square foot (well under the original budget). This is particularly surprising when the special detailing is considered. The stair treads (photo preceding page) are individually cantilevered from the adjacent wall by tension-rod supports capped with the visible special fittings. Separations between the walls and second floor have railings of laminated glass to facilitate views to the floor below. The confines of the structural system were employed to produce spaces of great visual interest within the rectangular grid of massive support cores. These carry mechanical risers, break up the otherwise open space, and provide a diagonal orientation to the course of travel.

THE BROOKS MEMORIAL ART GALLERY ADDITION, Memphis, Tennessee. Owner: *City of Memphis*. Architects: *Walk Jones + Francis Mah, Inc.*—Francis Mah, principal-in-charge of design. Engineers: *Le Messurier Associates, Inc.*, (structural); *Henry C. Donnelly*, (mechanical). General contractor: *Harmon Construction Company, Inc.*



AIRPORTS

"For me, aviation has value only to the extent that it contributes to the quality of the human life it serves."

—Charles A. Lindbergh July 1972

Architects who regard airports as opportunity are correct in that surmise, but often they are unaware of its full implications. There has never been a field where the basic skills of architecture have been more necessary or have met more negative constraints.

Anyone who travels by air must have encountered the consequences of those constraints: bleak and confusing terminals; exhausting delays on ticket lines; more exhausting hikes on foot with heavy luggage, traversing unconscionable distances mandated by the convenience and configuration of machines; demands upon the traveler's time and person, serving no purpose but the proprietary images of airlines; shrinkage and withering of the quality of life, subservient to the economics of machines and to the monstrous conditions they create. But here and there has been a fragmentary victory by architects on behalf of people—so logical and so expensive, on the Draconian scale of dollars per enplaned passenger, that airlines boggle at the landing fees.

Lip service to reform has been paid by our bureaucracies. "Ecology" has crept into the lexicon of political aspirants. "Environmental impact" has gained buzzword status among those who wield the power of regulation without the wisdom that must qualify legislation. There is now a requirement that aspirant architects must predict the effects of airports on the life and joy of every blade of grass and every bird and insect (but not on every passenger) within the sphere of influence of still-undetermined designs. The definitions of acceptable "environmental impact studies" are such that an architect who hopes to qualify merely to make a presentation, preamble to commission, must spend as much as half a million dollars with no assurance that he will get the job, nor that his fee will cover that expense even if he does.

Some architects do get airport work, however. Sometimes, nowadays, that is when their troubles begin. Airlines, in pursuit of bigger and more profitable loads have spent the treasure of good years on giant vehicles in the incredible assumption that flying on schedule for a subsidized profit is both a necessary attribute and a passionate goal of mankind.

Mankind, meanwhile, has found itself priced out of flying for business on unlimited expense accounts. While the airlines were buying giant vehicles and feeling economic pangs, other fields of endeavor were suffering equal pangs from other causes. Diminished expense accounts, as well as the second thoughts of individual touring enterprise, began to slow the rate of growth in air travel.

But the airlines—not the travelers—are the essential client of architects in this arena. So the airports are for airlines, not for travelers. Architects, whatever their social consciences, must either deal with the goals of clients or pass the work along to those who will.—*William B. Foxhall*

AIRPORT TERMINAL PLANNING FOR THE 1980'S

by Arnold W. Thompson, president, Arnold Thompson Associates Inc., a subsidiary of Lester B. Knight and Associates, Inc.

In the mid 1960's a discussion of airport terminals would invariably lead to the question, "Is it big enough?" The new terminals at Dallas/Fort Worth, Newark, and Kansas City reflect that consideration. Recently, however, terminal development in the United States has been largely stymied and the contemporary question seems to be: "Do we need it all?"

Much has been written about the turbulent 60's with the aviation industry, perhaps symbolic of technology, sharing the concerns of society in general. The rise of consumerism, a devastating airline recession, and an awakening to our responsibility to the environment have all had their effects. Airplanes have become larger as we expected during this period, but the SST has been delayed. Airline traffic growth has virtually stalled at many cities, although at others congestion increases seemingly unabated. Noise remains a problem but now seems to be solvable.

One element affecting terminal planning has remained constant—the passenger. Passengers still want to use the terminal easily, without confusion and with a sense of dignity.

The questions most frequently asked today about the planning of terminals for the 1980's are: 1) What technology is emerging to alter terminal planning? 2) Can the solution be economically justified and funded? 3) Will future travel and social changes affect design?

Technology will deal with size and numbers—and sometimes people

Four major categories of technological development will affect planning for the 1980's: 1) aircraft characteristics, 2) passenger processing procedures, 3) baggage handling, 4) intra-airport transportation.

1) *Airplanes.* In the early 70's the Boeing 727 and DC-9 were the most significant. The DC-10 and Lockheed 1011 appear to have this role during the next ten years. The Boeing 747 is not so far as much a factor domestically as had been anticipated, except as it emerges as a charter airplane. It is, perhaps, ahead of its time in a role more economically filled by the DC-10. The SST will arrive, but its impact on terminal design is so far minimal. For the 1980's we can anticipate larger capacity, more efficient aircraft, perhaps up to 1000 passengers, in response to airport capacity limitations. Some consolidation of airline schedules will continue but not to the extent that gate requirements will be greatly reduced. Possibly an airplane specifically designed for cargo operations will emerge—but until it does "belly" cargo containers will continue to be a ground handling problem. Much publicity has been given to the development of an efficient 100-passenger STOL (short takeoff and landing) airplane. If successful, this might divert some activity away from some larger airports, but its direct effect on terminal planning would be negligible.

In short, the major airplane factor will be

the number of passengers arriving or departing at the same time.

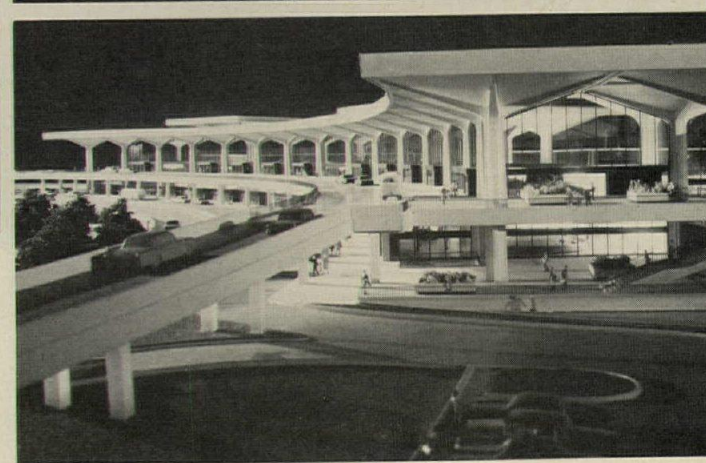
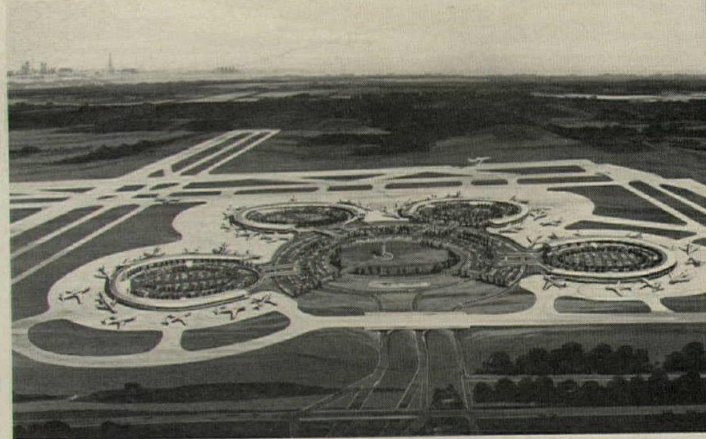
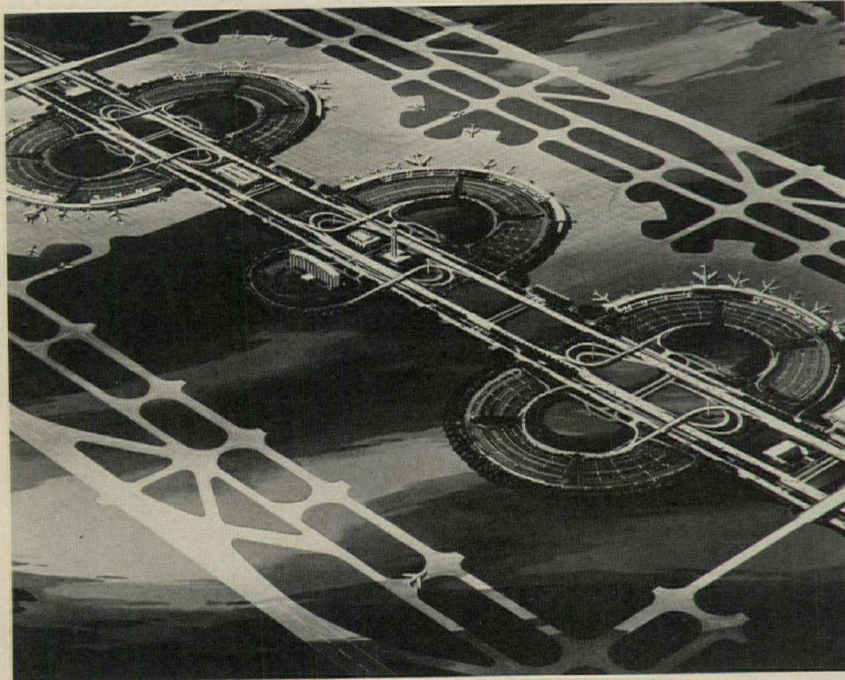
2) *Passenger processing.* Procedures for ticketing, holding, screening and otherwise handling people have been a dominant factor in shaping terminals. In the 1950's an experiment in lifting tickets at the aircraft gate led to gate waiting rooms. All major terminals from that time reflect that idea, and for a time it appeared that the ticket lobby was obsolete. The "drive to gate" concepts at Dallas/Ft. Worth and Kansas City reflect this principal. There seems to be a reversal of this design trend brought about by soaring operating and security costs. Consolidation of gate waiting rooms for efficiency in manning and sharing of space between gate areas seems to be appropriate for the 1980's.

Security has also emerged as a major consideration. Government authorities predict security will unfortunately continue to be a problem for many years ahead. Single-point control of passengers is, when practical, the ideal solution. Another consideration in the plan is to allow "secure" passengers to transfer between airplanes without having to leave and reenter secured areas. This is not unlike the physical arrangement for "in-transit" international passengers at an intermediate stop.

3) *Baggage handling.* As every passenger has experienced, this is a major airline problem. Unfortunately, security requirements have created larger quantities of checked baggage and added to the processing time. More

HOK/BHA

Kivett & Myers



Dallas/Fort Worth Airport (above), Kansas City (above right) and Newark (right) are the latest in the drive-to-your-gate airports referred to in text above.

automated conveyor systems are making it possible to permit check-in remote from the terminal itself. The result of the Sea-Tac system and the Docutel operation at Dallas/Ft. Worth will be carefully studied.

Inbound baggage does not lend itself to individual delivery. As a result baggage claim areas will continue to be consolidated although they may be rerouted from the terminal depending on the configuration of the road system, vehicular parking areas, and the presence of ground transportation.

For the planners, mechanical distribution allows more flexibility in the location of terminal elements. Provisions for equipment tunnels through the terminal and interline transfer systems must be considered.

4) *Intra airport transportation.* Systems for moving people will be the planners' breakthrough of the 1980's for larger terminals. A large terminal is defined as having more than 20 aircraft gates, unusual transfer characteristics, or excessive walking distances due to configuration. These systems have been slow to emerge, probably because research money has not been available to what had been a small market in the past.

The moving sidewalks of Love Field in the 1950's, the mobile lounge at Dallas in the 1960's, the terminal at Houston in the mid-60's, the Westinghouse shuttle system at Tampa in 1972, the underground transit loop at Sea-Tac and the Airtrans at Dallas/Ft. Worth are current answers, and other systems are on

the way. When such systems are standardized with "off the shelf" hardware components the cost will stabilize and the system will become economically practical. Major terminals will be planned with these systems integrated into the design.

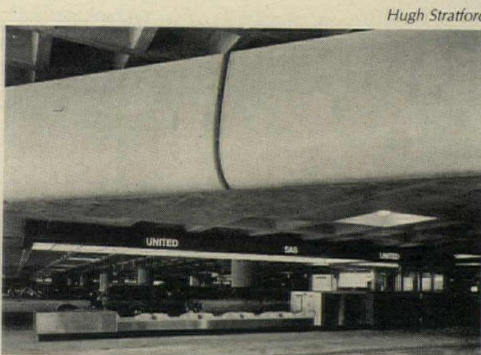
A stringent economy affects construction budgets

With inflation, the airline recession and the financial woes of large cities, it has become imperative that terminal development be financially sound. During the 1960's these problems had not yet emerged. A basis for evaluating terminal cost has subsequently been developed among airlines and referred to as "cost per enplaned passenger." With this procedure, annual terminal costs (which include construction cost plus maintenance and operation, escalation and other necessary related cost items, less Federal participation) can be compared across the country and new facilities compared with the cost of existing ones. Recently one of the airlines utilizing this procedure expressed concern that its cost on moving into a new terminal will increase from less than \$1 per enplaned passenger to over \$4 per enplaned passenger. This procedure has its limitations since the basis used for comparison is initial cost rather than costs averaged over the period of the bonds. Nevertheless this procedure has evolved and can be used as a guide to establish a realistic budget. It should be used with background perspective, however.

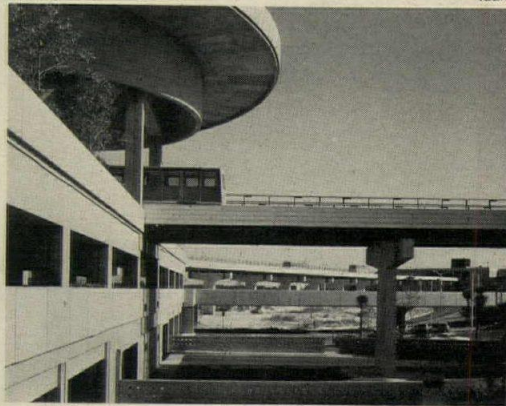
Tackling problems of social and environmental impact

Airport noise is the most publicized airport environmental problem. While this has delayed new airports it is not a significant factor in terminal building design. The impounding of water runoff and the removal of fuel and solvents do represent important considerations as does air pollution. Surprisingly, studies show that heavy concentrations of fuel combustion pollutants are caused by ground vehicles rather than airplanes. Remote auto parking areas and adequate provisions to control traffic at the baggage claim curbside are successful solutions.

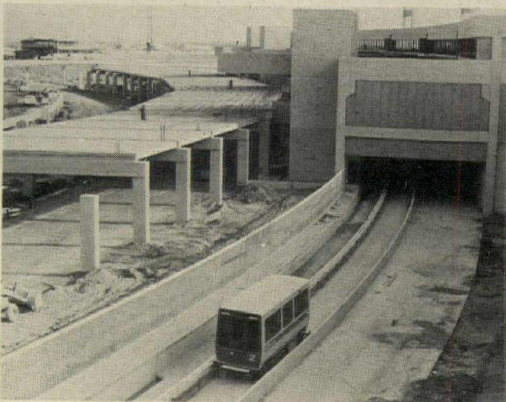
A major change has taken place in the character of air travel—the growth of low-cost group travel by charter. This phenomenon is increasing and will affect every city that has an air-carrier type airport (i.e. one served by scheduled airlines rather than exclusively general aviation or utility flights). Unfortunately, few terminals have the surplus space to accommodate the surge of travelers and their friends. While many of the charters are handled by the scheduled carriers, little provision was made in their planning for such operations for economic reasons. The terminal of the 1980's must take this into account by having sufficient surge space of a public nature located preferably at the extremities of the building. This location is least disruptive to the normal functions of the terminal and crowd control planning needs to be considered.



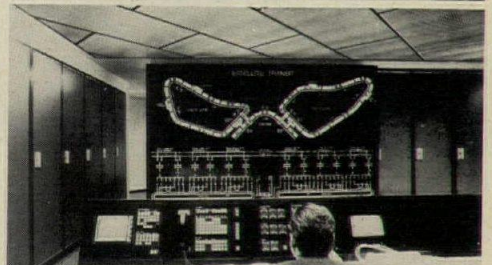
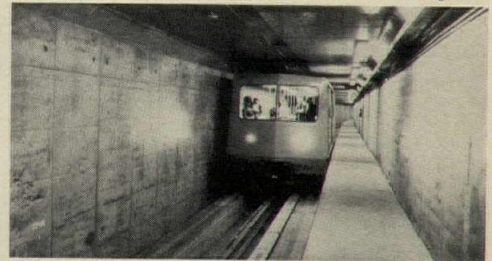
Hugh Stratford



Idaka



Westinghouse



American Airlines

Automatic transit and baggage handling systems are shown in these photos. Baggage pickup station at Sea-Tac is above. Sea-Tac transit system and control center are at top right. Tampa's satellite shuttle is top center and the Airtrans system at D/FW is at bottom center. A mobile lounge at Dulles International Airport is shown at bottom.

Charlotte plans for growth toward thriving 1980's

A new terminal is currently being planned for Douglas Airport in Charlotte, North Carolina. This community is one of those in the southeastern part of the United States showing spectacular growth and is potentially a major city of the 1980's. Aviation has good public support, the city is financially solvent, well managed and the airport has potential runway capacity through the year 2000. Runway capacity is the limiting factor to most existing airports. A few pertinent facts demonstrate the planning problem.

Aircraft gates: 16 at the existing terminal, 22 wide-body gates by 1980 and 40 by 1990. A planners guide to terminal size is gauged by gates, as it is the key to its geometry. If the wide-body gates were converted to conventional gates the numbers would be 26 and 48—a large terminal by anyone's measure.

Transfer activity: surveys reveal that over 30 per cent of the passengers at Charlotte transfer compared to an average at many airports of 10 per cent. There are strong indications that the percentage may increase substantially due to changes in airlines routings. Aircraft gate requirements will be further increased by this type of activity.

Vehicular activity: During the 20-year forecast period, the average annual daily traffic (AADT) will rise to 19,000 vehicles, a 500 per cent increase. The number of vehicles will not be affected by the rise of transfers except as

schedule service improves over the years.

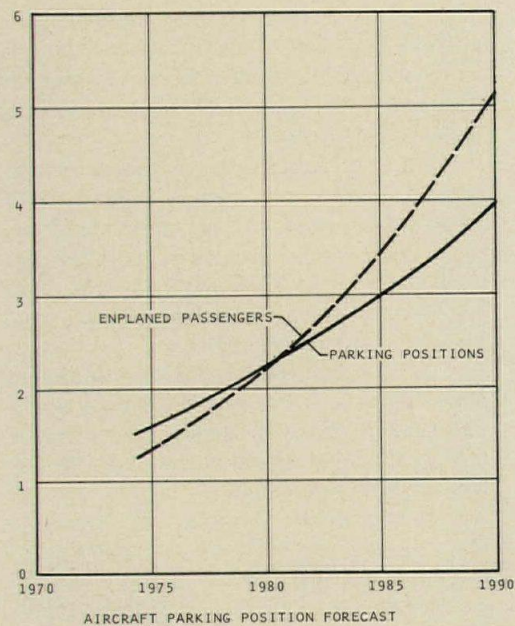
A new terminal is currently planned for occupancy by 1980. Various configurations have been studied such as; 1) a frontal gate and concourse scheme, 2) a satellite boarding area system, 3) a transporter concept and 4) a conventional unit terminal scheme. These ideas were evaluated by the city with the assistance of the airlines. Subsequently, the airlines' ideas evolved into their schemes A/L-1 A/L-3 (see sketches).

It was determined that the airlines' schemes tied up too much of the site. Subsequently, the consultants developed schemes 2A and 2B which place the terminal unit in a more central position on the site. Redevelopment for 60 or more wide body jets has been allowed.

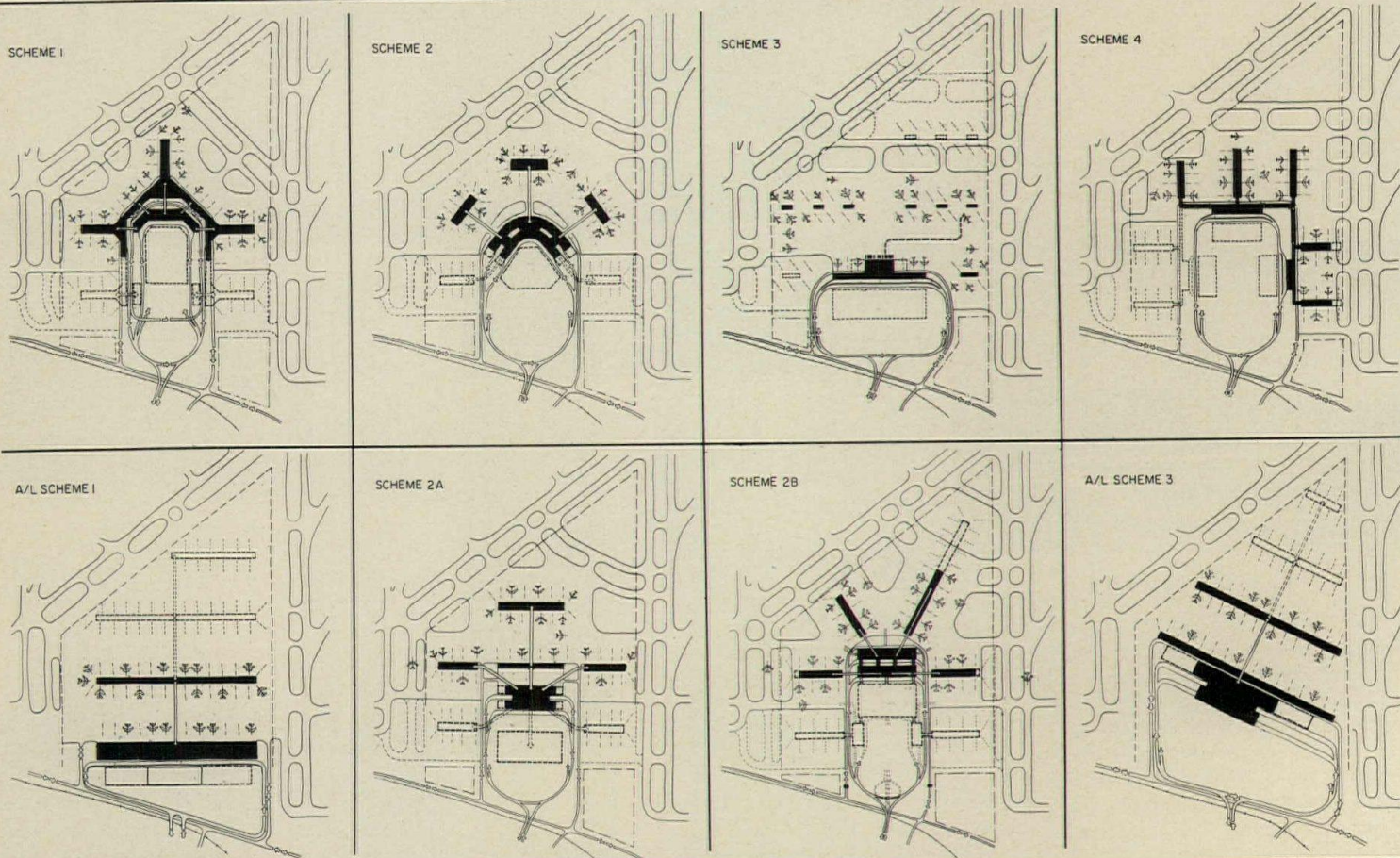
These schemes provide for a transportation system to take advantage of the interior of the site with various options available on the type of device to be used. Virtually the entire second level of the terminal is secured so that transfer passengers can move between gate units with ease.

Parking is provided on the site with provision, when economically justified, for close-in parking structures. Consideration is being given to remote, on-grade parking as well, with a people-mover evaluated against the cost of the close-in structures.

Access routes will be provided from two locations, and a tunnel connecting a cargo site on the south side of the airport is under study.



These concepts are being refined at the present time to permit funding in 1974 and construction by 1976. Indications are that the \$40,000,000 program can be developed at an amortized cost of somewhat above \$1 per enplaned passenger. With the explosive growth possible at Charlotte, the program must be kept flexible as long as practical. But the concept must be put to the test to meet the challenge of the 80's.



CROWDED EUROPEANS TEST U.S. AIRPORT THEORY AND METHOD



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The design of airports in Europe is complex in all the expected ways having to do with regional political considerations, the bureaucratic structure of client authorities, the international character of many relatively short flights and the various ground rules for local association that enable U.S. architects to participate in the work at all.

Robert Brodsky touched on some of these matters in his July RECORD article about general European practice, with special reference to development work other than airports. His New York-based firm, Brodsky, Hopf & Adler, has also made a considerable export specialty of the long-term U.S. airport experience of Richard Adler, who has had increasing roles in this arena since his early involvement in the design of New York's John F. Kennedy Airport (then Idlewild) while on the staff of the Port of the New York Authority. That experience extends through his joint-venture role (with HOK, TAMS and others) in design of the Dallas/Fort Worth Airport (RECORD, August 1970), recently dedicated. The international work of Brodsky, Hopf & Adler in the airport field currently includes a commission for intra-airport transport development for Munich Airport, design proposals for Athens, Turkey, Colombia and Lisbon, master plans for Indonesia and Guatemala, an airport and trade center design for Nicaragua, and others.

Brodsky and Adler concur in the observation that the European airport client, despite similar complexities, is different in important ways from comparable U.S. clients. In Europe, the authority tends to be monolithic in its capacity to make decisions and usually has longer periods of tenure in which to exercise a consistent point of view. Further, the European tendency to consolidate shared ground services for multiple airlines relieves the design problem from at least one element of complexity that prevails in U.S. practice.

The development of plans for a new airport in Munich is an example of some of the factors previously mentioned. The existing airport at Munich, an international focal port for tourists and commercial travel, has reached a saturation point of almost continuous peak, with surges of summer students and winter skiers. Photos at left attest to this situation. Since expansion of facilities has been carried out to the limit on the existing site, the city set up an airport authority to develop a new airport. A new site of about 5,930 acres some 12 miles from the city was acquired.

The Munich authority sponsored an international competition among six invited design firms or consortia, winnowed from among more than 100 prospective candidates. Kivett & Myers, collaborating with the Munich engineering firm of Kurt Becker and Associates, was a principal U.S. architectural firm among the six consortia. Other U.S. firms, each in combination with two or more European firms, included TAMS, Peate, Marrwick & Mitchell,

and the Golemon & Rolfe/Pierce & Pierce team who had been the principals at Houston Airport (RECORD, August 1968). Although none of the six submissions was entirely acceptable to the international jury, the Becker/K&M entry, reflecting some of the direct "car-to-gate" principles designed into D/FW, Kansas City and other U.S. terminals, (RECORD, October 1972) was acknowledged to have made substantial contributions to the design objectives for Munich. Hanan Kivett was then retained as consultant to the Munich Airport Authority for three months during 1972 while an all-German consortium sought to refine input from various competition submissions in developing an acceptable master plan. That plan, as ultimately developed, says Hanan Kivett, retained about 80 per cent of the ideas and configurations of the Becker/K&M submission as shown in plans, next page.

Brodsky, Hopf & Adler were later retained to work on traffic and scheduling studies while at the same time, a Berlin firm, Gerkan, Marg and Partners, were coordinating the output of BHA and other studies into functional planning and space programming in what is called Phase II design concept development.

Richard Adler describes the intent at this time as a search for methods and definite conclusions as to how the master plan can be implemented. There is much hard work and data acquisition involved in getting to a sound footing for the definite steps now to be taken. The BHA commission involves a full response, in terms of systems configuration, to their analysis of data and computerized simulations of airport operation, determining how the Munich Airport will in fact work and what impact the study findings will have on design elements of the master plan.

For example, the current objectives of Phase II of planning include 38 gates. These are arrayed along a double set of terminals oriented to a central spine of access roadway reminiscent of the concept at Dallas/Fort Worth (see plan next page and RECORD, August 1968). In probing this drive-to-gate concept in the Munich situation, it becomes apparent that there are a number of factors considerably different from those at Dallas/Fort Worth. The traffic conditions at Munich are different on the airside, in that flights tend to be of shorter duration and more predominantly international. Also, there are definite plans for a mass transit subway from the city penetrating into the airport at a position not yet definitely decided.

The German firm is currently interviewing airlines and other airport users in an effort to establish some of the space allocation criteria. BHA is probing into what the traffic will actually be as to characteristics, movement and disposition. The volumes and traffic patterns of people, vehicles and goods moving through the airport will affect the design and the provisions incorporated for people-movers or other

arrangements for counteracting congestion.

The two firms, U.S. and German, meet regularly to exchange data as to traffic volumes and the spaces available for setting up patterns. When the BHA input gives the German firm a definite stipulation as to how traffic and space will relate, the next step is to test the proposed design solutions. The German firm is meticulous about receiving the assurance of BHA that proposed internal transit devices will indeed work in the spaces to be provided, and no submission is made to the airport authority until there is a concurrence of view.

There are several salient points. The circumstances of the drive-to-the-gate user are one problem. The user arrives at what has been called, in reference to early design proposals for the new Paris Airport, a string of pearls. This concept, a series of ovoid terminal complexes, was developed as long ago as about 1952. Adler reminds us that the string of pearls falls apart if there is not a substantial string in it. The string at Munich, then, becomes the internal transit system.

The development of a realistic approach to such a transit system relies on authentic flight schedule data, which the airport authority did not have readily at hand. Their suggestions as to flight schedules were largely theoretical and did not contain data giving numbers of passengers classified as to destination or ground movement or probability of early or late arrival or departure. It is necessary to plot such factors of variation in order to simulate and observe the probable impact of real commerce on the airport facilities.

So the first question BHA had to ask was: What are the actual characteristics of your printed schedule today, and what has really happened in the traffic conditions it reflects in terms of individual movements of planes and people? While the question had never been analyzed by the Munich authority, BHA pointed out to them that a definite answer to it was the only valid basis for the kind of projection that was necessary. Further, the basic

traffic data are to be supplemented by other data about the characteristics and habits of the community and the regions the airport serves. The first step in gathering the necessary data was a review of the records of the existing control tower in Munich. There, it was discovered, the most minute records had been kept regarding aircraft arrivals, types, loading destinations and passengers, and all information affecting the movement of people. These data were then related to the existing printed schedules, and the actuality of deviation became apparent, although the detailed labor of computerized analysis was monumentally complex.

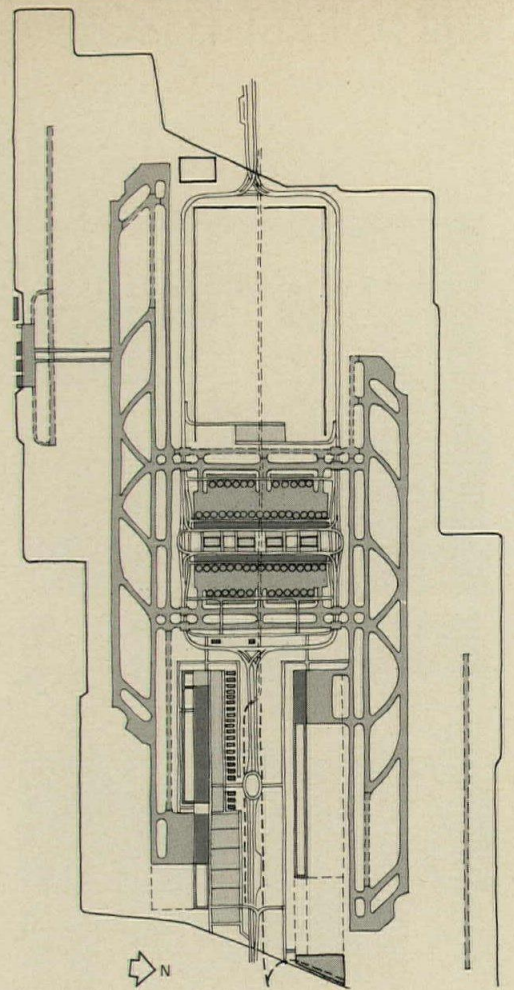
Programming the data and projecting the results into a realistic future were specialties BHA brought to bear on the job. By methods of simulation and analysis, the answers to surprisingly specific questions are attainable. For example, when will an airline introduce a new kind of airplane? Logically, they will introduce a new airplane at a peak period since the purpose is to absorb surges of profitable traffic. Having developed the first rough cut of initial and projected flight schedules, the movement of people and the peaks wherein new aircraft might be introduced are beginning to be established.

The next step will be to suggest to the airport authority the operational methods that might best accommodate the emerging patterns of future traffic. These patterns will relate not only to schedule proposals but to actual assignment of internal traffic controls. When these data and proposals have been related to the work of the German firm, the U.S. firm will then be ready to make physical proposals of the transit systems for the airport—the string—so that both transit and building design can proceed concurrently at a pace now projected for early 1974.

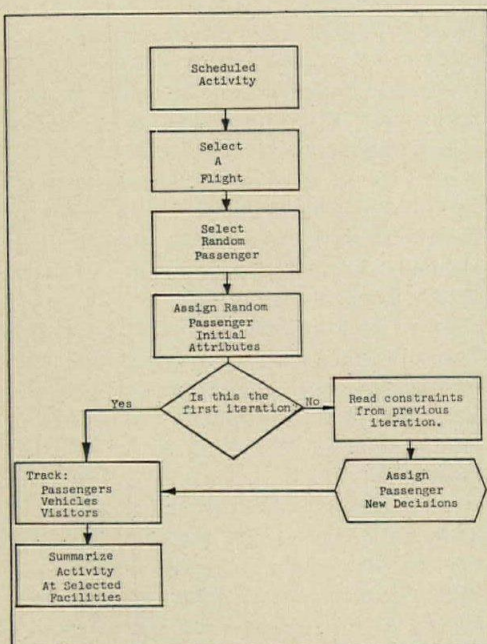
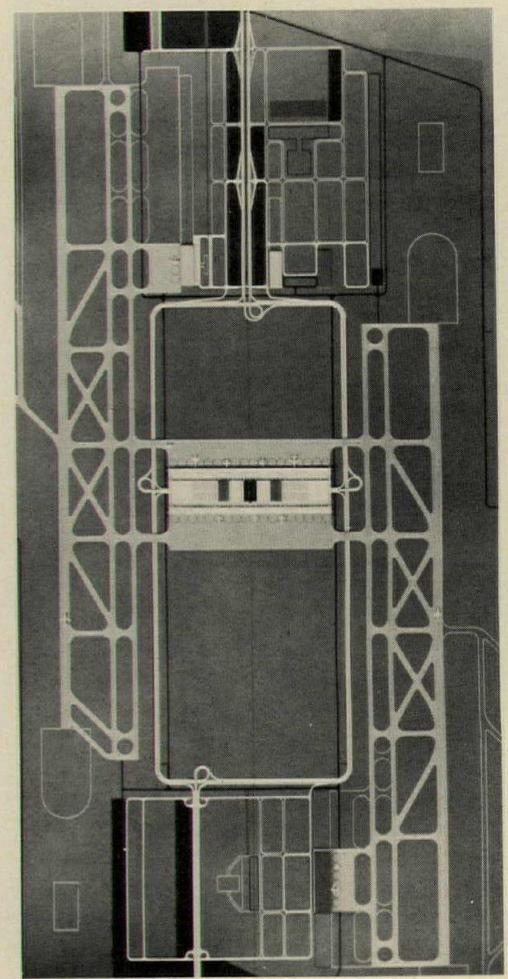
The simulation task extends beyond the periphery of the Munich Airport in that the data describe origins and destinations of all aircraft on an international basis. The study, then, must extend to projected characteristics of all these destination ports—and they range from London, to Scandinavia, to Moscow and beyond. The information is then translated into growth rates projected for each of the destination ports and the consequent impact on the Munich Airport.

Another factor affecting growth patterns and schedules is the probable change in airplane characteristics not only as to size, but also to speed, since both passenger loading and times of arrivals and departures will be affected. Not only is a given flight time shortened by higher speeds, but the optimum departure time, that is the required lead time for a desired arrival time at destination, will shift with these changes. It then becomes an operational and financial decision as to the inducements in ticket cost that might be applied to evening out the loading of the overall airport traffic. The computer is again enlisted to sort out the optimum controls by pointing out conflicts and peaks that may require one kind of attention or another.

"As architects," says Richard Adler, "we cannot walk away from our responsibility to probe and respect the realities of growth and change."



Current master plan for Munich Airport as of December 1972 is shown above. Model photo of the Becker/Kivett & Myers competition submission is below.



Demonstration of the Brodsky, Hopf & Adler approach to computer simulation of airport traffic projections.

PHILADELPHIA PHASES INTO A GROWTH PATTERN

In Philadelphia the growth of airport facilities is neither as dynamic nor as urgent, as it is in some other cities. One reason is that, although the city itself is commercially dynamic, its position on the seaboard between New York and Washington is such that many international air travelers tend to book their passages through one of the other cities. The airlines themselves have tended to encourage that tendency, perhaps because there is no airline with Philadelphia as a home base. For the domestic inter-city traveler, it turns out that the distances from Philadelphia to other coastal cities is so short that ground commuter travel is often as convenient as air travel. Nevertheless, the very role of Philadelphia as the nation's fourth-largest city, with far flung commercial interests, has generated a strong growth potential in spite of the inhibitions mentioned. The existing airport, long cramped in minimum facilities, developed a condition of crowding and chronic crisis that overrode the inhibitions cited even though they were compounded by a series of administration changes. The stop-and-go labors of Vincent G. Kling & Partners, on stream since 1967 for implementation of a master plan, finally reached a node of decision. In July 1972, the Philadelphia Art Commission approved plans and model of a \$150 million construction that will eventually virtually rebuild Philadelphia International Airport. Dan Peter Kopple, Kling's partner-in-charge of the airport project, describes the planning and development process (see RECORD, August 1968) in the following extract of his full report.

General background of the planning process

A new Philadelphia International Airport system is being developed on the 2,500-acre site of the present airport (located about nine miles southwest of the City of Philadelphia) and linked to the City and region by an extensive highway and rail network. The three major requirements demanding a new facility are:

1) A forecast of 27,000,000 annual passengers by 1995. (7 million passengers passed through the present terminal during 1972.)

2) A forecast of 22,000 passenger parking spaces by 1995. (5,000 passenger parking spaces currently available.)

3) Expanded gate positions and apron spaces to accommodate the 2nd generation of subsonic jumbo jet airplanes introduced in the 1970's, as well as future airplanes scheduled for service later.

The phased design, documentation, and construction of 16 separate bid packages are underway, in successive degrees of completion, for permanent improvements to increase the capacities of the terminal, the airfield and the roadway systems. The total facility—an integrated transportation system—is proposed to meet the Delaware Valley's air transportation demands through 1995.

Planning for Philadelphia International

Airport (PHL) started with the development of interim facilities to make the existing structure, built in 1953, suitable for the needs of the early seventies. Interim work, defined as Phase I, was to allow service to continue at normal levels while Phase II, so-called "permanent construction," was being built.

Phase II has been designed as an infrastructure sufficiently flexible to provide ground-to-air interface until the air space, airfield and highway systems of the present site are saturated.

The first stage of interim improvements, called Stage I-A, was completed in early 1970. It increased the number of gates from 25 to 39. Each gate includes a new loading lounge, constructed on the second level, flanking the existing fingers and connected to the aircraft by enclosed loading devices.

To facilitate rapid execution without curtailing airport operations, the Stage I-A construction utilized light steel framing, metal panel walls and a system of heating, ventilating and air conditioning units deployed on a modular basis.

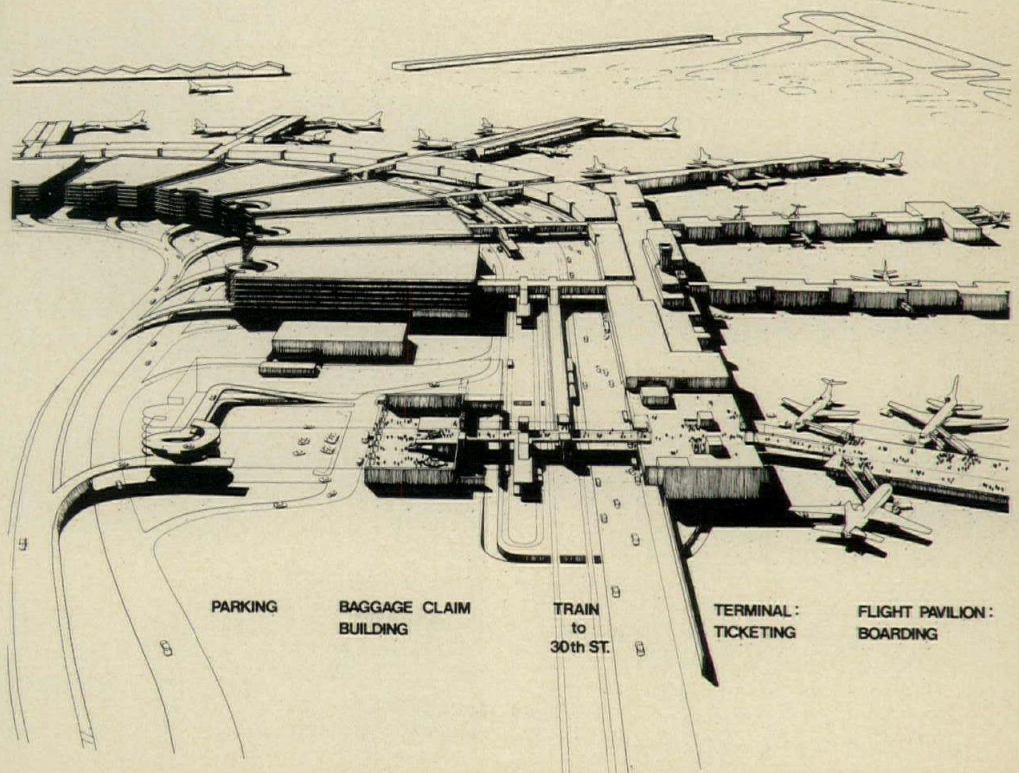
Stages I-B and I-C, which improved the existing ticketing and baggage facilities in the body of the old terminal building, were completed in early 1973.

Phase II-A, the first step of the second phase, now being implemented, is based on a system of circulation patterns and related buildings. The master plan (see sketches below

and next page) envisions a continuum of eight unit terminals spanning a transportation corridor containing all forms of ground transportation in segregated rights-of-way. The terminal area is serviced by three multi-lane, limited access, integrated roadways linking the airport with Interstate I-95 and a proposed Cobbs Creek interchange, prime elements of the regional highway network. Each airport roadway will carry a segregated flow of traffic: enplaning and deplaning passengers using the garages will enter and leave on the garage roadway; deplaning passengers leaving the airport by taxi, bus and automobile will claim their baggage and depart by the deplaning road; outbound flight passengers arriving in roadway vehicles will arrive on the enplaning roadway and enter directly into the terminal. A mass transit line is being developed between Center City Philadelphia and the airport. Existing rights-of-way and trackage will be utilized, and the mass system will have stations between each pair of units in the eight-unit terminal development.

The terminal system is a series of bridges

Each terminal unit is an elevated passenger bridge connecting aircraft positions to separate grade level structures for check-in, baggage claim, mass transit access and garages. One structure, adjacent to the garage, will be reserved for deplaning passengers exclusively, with baggage claim and rental car functions.



The second structure will provide ticketing and baggage check-in for enplaning passengers at grade, with concessions and waiting spaces at the upper level. An intra-terminal people-movement system will ultimately be provided, accessible from the passenger bridges, to connect the elements within the continuum of terminals at the airport.

Flight pavilions are a linear continuation of the passenger bridges which will accommodate passengers' and visitors' waiting spaces tailored to each airline's needs. Enclosed loading bridges will connect these spaces to the aircraft at each gate.

The master plan has been developed to include parking for approximately 22,000 cars, in eight garages. Vertical circulation cores in the garages are a part of the terminal pedestrian system, and lead directly to the passenger bridge which is the spine of the transportation level. No garages are included in the first phase of permanent expansion; however, structured parking will be provided as the demand increases sufficiently to insure their economic feasibility. It is hoped that two of the garages will be developed by the completion of the II-A package now under construction.

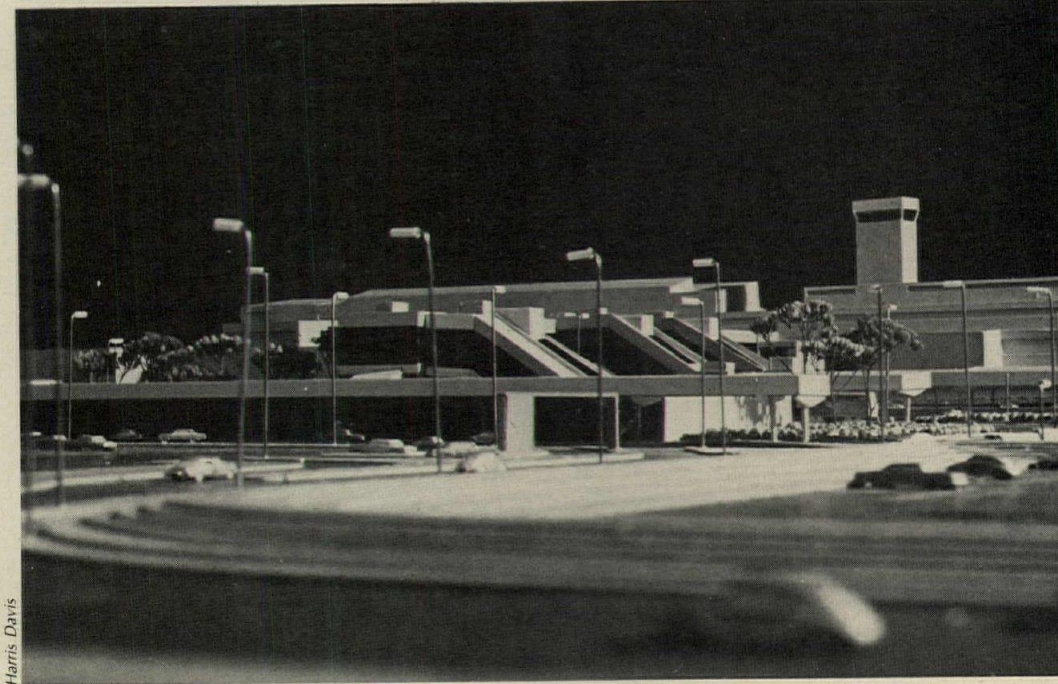
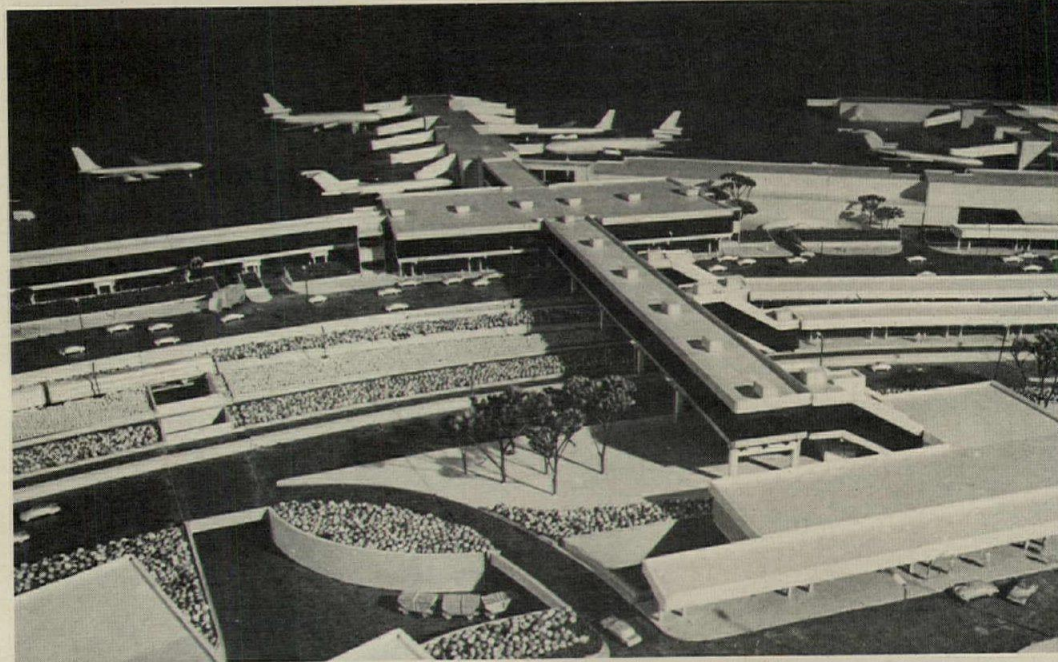
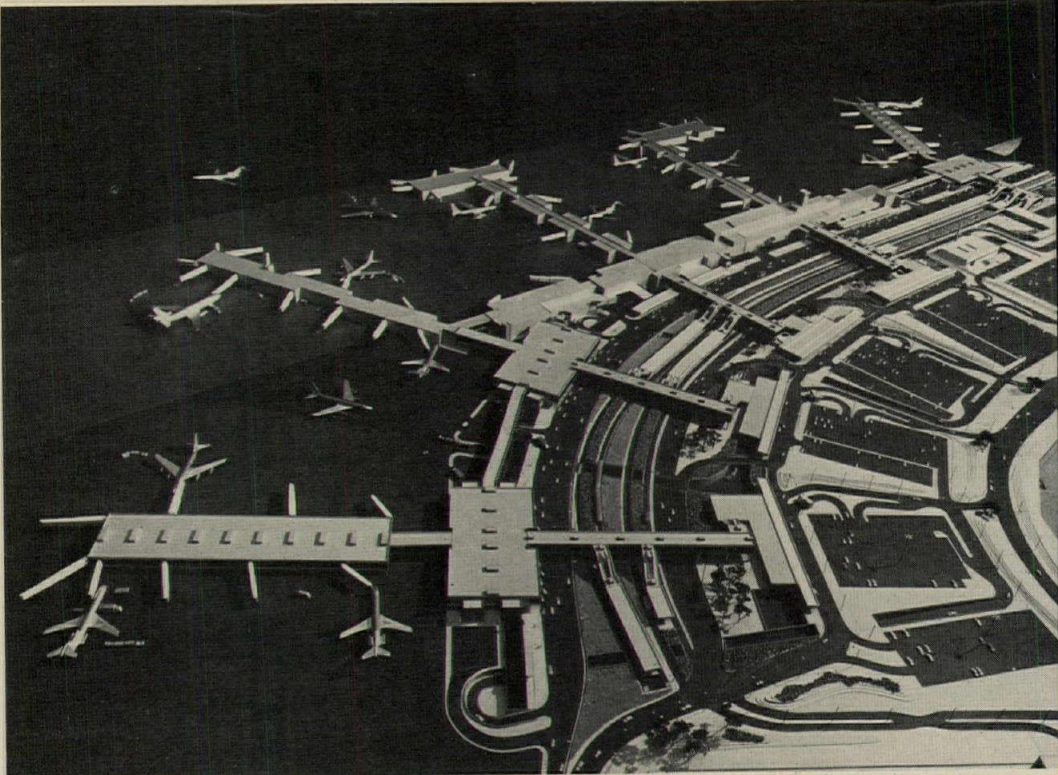
The entire complex will be built in five construction stages. The construction of the first stage (Stage II-A), started in the spring of 1972, will cost approximately \$120,000,000. Stage II-A will include one terminal unit west of the existing structures and one to the east, plus modification to the existing terminal to change its functional patterns to be consistent with the new facilities to be provided.

All building elements of the complex will have a precast structural system of columns, girders and tees, organized to accept units of a modular mechanical heating, ventilating and air conditioning system. The precast structural elements will be the structure, finished exterior surface and interior surface of the building.

The airport is owned and operated by the City of Philadelphia, and much of the credit for putting through a viable plan for growth goes to Harry Belinger, Director of Commerce; William T. Burns, Deputy Director of Aviation; Gordon Jacobson, Division of Aviation, Director of Planning and Engineering; and to Ed Foster, the city's project manager of passenger terminals areas. Development of the plan had a similar multiple backup in the Office of Vincent G. Kling & Partners. In addition to Dan Peter Kopple, partner-in-charge, was Richard J. Sheward, lead staff architect, who was the coordinating architect for five task group leaders who, in turn, gave special attention to various segments of the work. These group leaders were: David Doelp, John Di Ilio, Peter Simoncelli, Donald Snyder and Mark Spitzer. The Kling team working on the airport project has varied in number from 8 to 35 people.

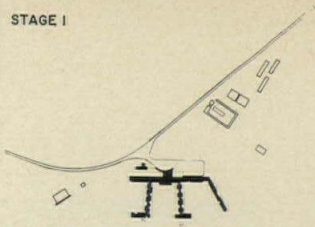
PHILADELPHIA INTERNATIONAL AIRPORT. Architects: Vincent G. Kling & Partners—partner-in-charge: Dan Peter Kopple. Engineers: Urban Engineers, Inc. (structural and civil); United Engineers & Constructors, Inc. (mechanical/electrical). Consultants: Arnold Thompson Associates, Inc., (airport master plan); Peter Muller-Munk Associates, Inc., (graphics); Meridian Engineering, Inc./MCM (construction management).

Harris Davis

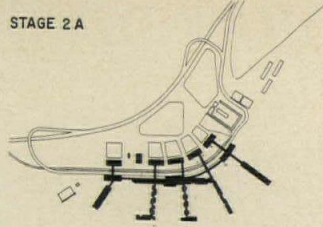


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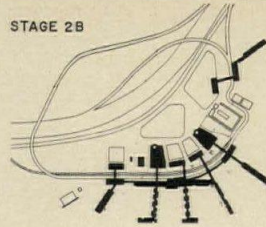
STAGE 1



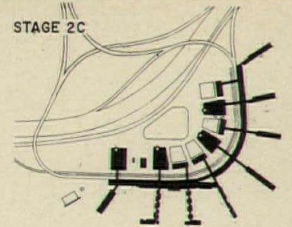
STAGE 2A



STAGE 2B



STAGE 2C

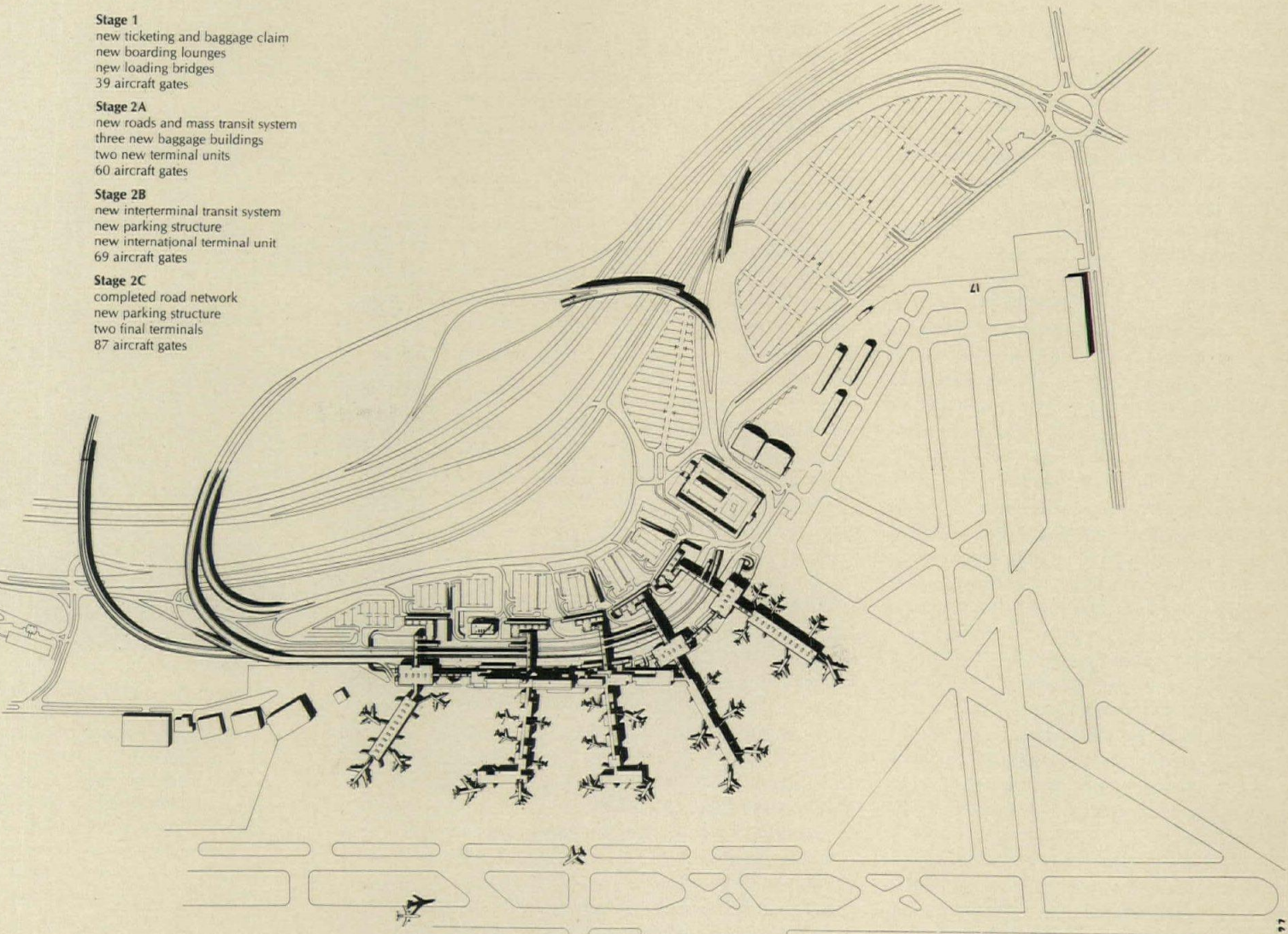


Stage 1
 new ticketing and baggage claim
 new boarding lounges
 new loading bridges
 39 aircraft gates

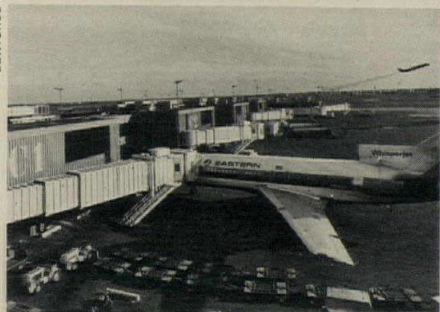
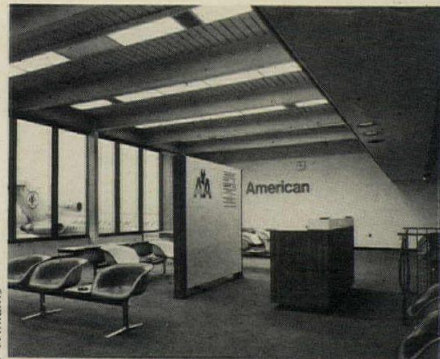
Stage 2A
 new roads and mass transit system
 three new baggage buildings
 two new terminal units
 60 aircraft gates

Stage 2B
 new interterminal transit system
 new parking structure
 new international terminal unit
 69 aircraft gates

Stage 2C
 completed road network
 new parking structure
 two final terminals
 87 aircraft gates



Tom Crane



Lawrence S. Williams

SEA-TAC, A GIANT THAT CARES FOR PEOPLE

Seattle-Tacoma International Airport is nearing completion of a \$175-million expansion program that began (at substantially lower projected costs) in 1966. At that time, the annual passenger load was 2.8 million, stretching the capability of the 25-year old existing facilities. Growth projections showed a probable traffic of more than 13 million passengers by 1980. Although recent slowing of the growth rate seems to modify that figure, there is no doubt that a continuing rise in airplane traffic nationally will prevail over the long term.

The facilities at Sea-Tac are such that travelers with an option are likely to favor this airport. It is the most highly automated large facility among the giants finished in this decade, and it went through its development phases in the more opulent years of the late 1960's. Both the Port of Seattle and user airlines were willing to invest in development of an automated people-mover system and baggage handling system, thus opening the options of the plan.

The over-all plan, regional in scope, is the result of a cooperative effort among a long list of participants and consultants, whose efforts were focused through the joint planning capabilities of The Richardson Associates, architects and engineers, and the planning staff of the Port of Seattle. The plan strives for maximum use of the existing site, which has the advantages of convenient location to both Seattle and Tacoma and a long history of port ownership. Although the site is constrained by surrounding development, including highway connections, topography and limited acreage, it has sufficient potential to warrant intensive development.

Basically the current phase of expansion provides an extension and redevelopment of the existing terminal plus two remote satellite gate facilities and a 4,300-car garage close within the chevron shape of the main terminal. A new cargo area is also being developed. All of these facilities are inter-connected by automated transit systems and an integrated baggage handling system. The result is an airport with somewhat more capacity than actual current use requires, but one that will remain economically operable for at least the full period of current projections.

Some extra space now may save money later

There have been some critical observations of the extent to which the facility exceeds current requirements and of the increased cost resulting from inflation and "over-mechanization" with the combined effect of increasing landing fees at a time when airlines were facing financial problems of their own. In spite of the slow down in traffic and the decline especially in military traffic, there is now an upturn from the plateau of 4.5 million passengers that prevailed from 1968 through 1971. Some of the airlines, United for example, registered a 12 per cent gain in the first quarter of 1972. That

and the concurrent experience of the airport in general support the projected growth rate of about 10 per cent, so that the airport should reach near-capacity about 1981. By that time, it is hoped that the port will have proved itself and alleviated the unhappy second thoughts of airlines that almost immediately followed their optimistic surge of initial investment in the giant parking garage and automated people movers. The existence of these facilities will perhaps bear out the judgment of that investment, and the landing fees, now high by national standards, will in all likelihood remain more stable than those of less advanced airport designs.

In this regard, the architect makes the following observation: "The airlines make the basic projections and based on these they determine their space needs. This, in effect, becomes the program and therefore if the demand figures are not realized then overbuilding results. I might note that this is not a calamity but generally results in the building of a facility that is more than sufficient for the traveling public during its first years and not subject to additional construction immediately following the completion of the project; a situation which often is the case when initial projections are realized or surpassed. One other clarification; on the basis of square foot costs and quality of facilities provided, the Sea-Tac project costs look very attractive when compared to other airports built during the same period."

The ultimate in traditional design approaches

In contrast to the drive-to-your-gate concepts emerging in some of the newer airports, the development at Sea-Tac follows a more traditional approach in that the Port authorities and architects considered the convenience of the passengers worthy of investment. That is, if the facility spends money and design logic on costly garage space reasonably close to the terminal and then makes it possible for passengers to travel a well-coordinated people mover while their baggage is handled and transported automatically, this may indeed increase the landing fees temporarily but it is perhaps a more durable solution than some of those which attempt to circumvent such expenditures by other configurations. The systems at Sea-Tac will result in a maximum walking distance between ground vehicle and plane of about 600 feet—and that is from any airplane to any ground vehicle whether at curbside or parked in the huge garage. The consequences in the long-term adaptability to changes in both terminal tenancy and air travel modes seems a substantial plus.

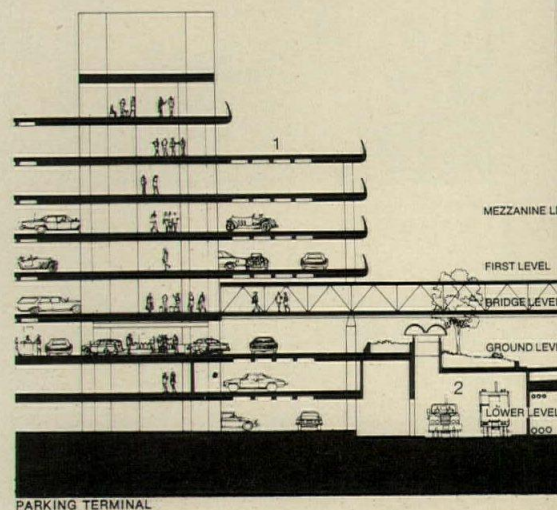
The following specifics of the design are extracted from a report prepared for a May 1972 Airport Forum by E. K. McCagg, assistant project architect.

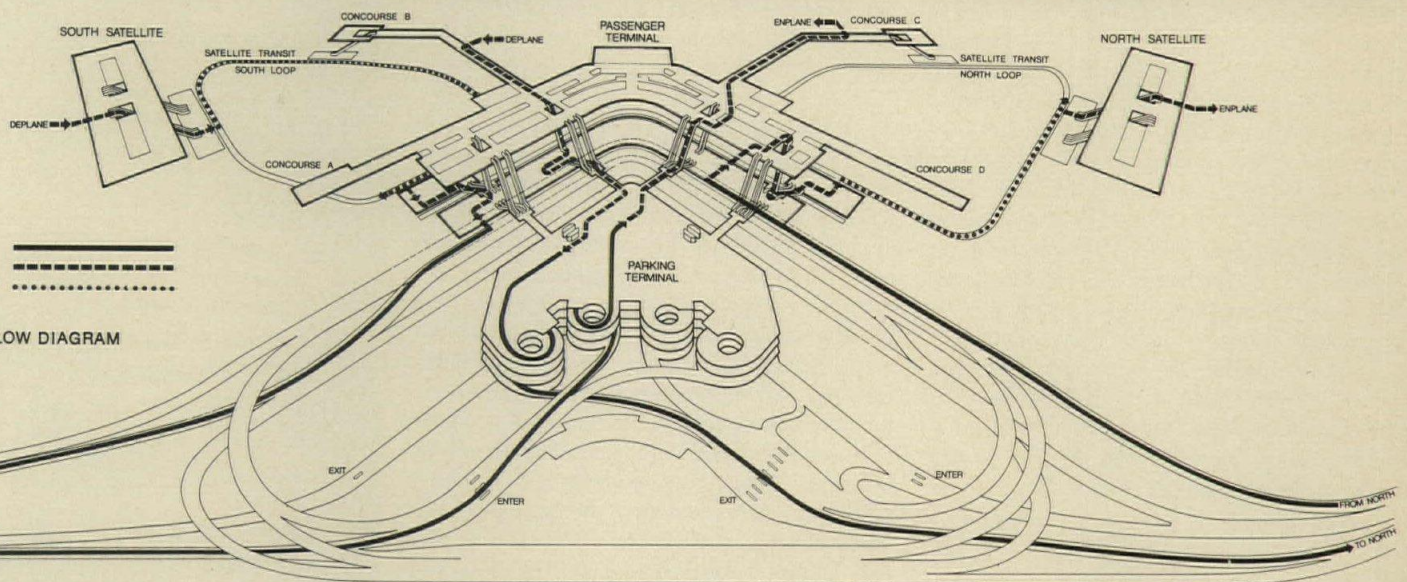
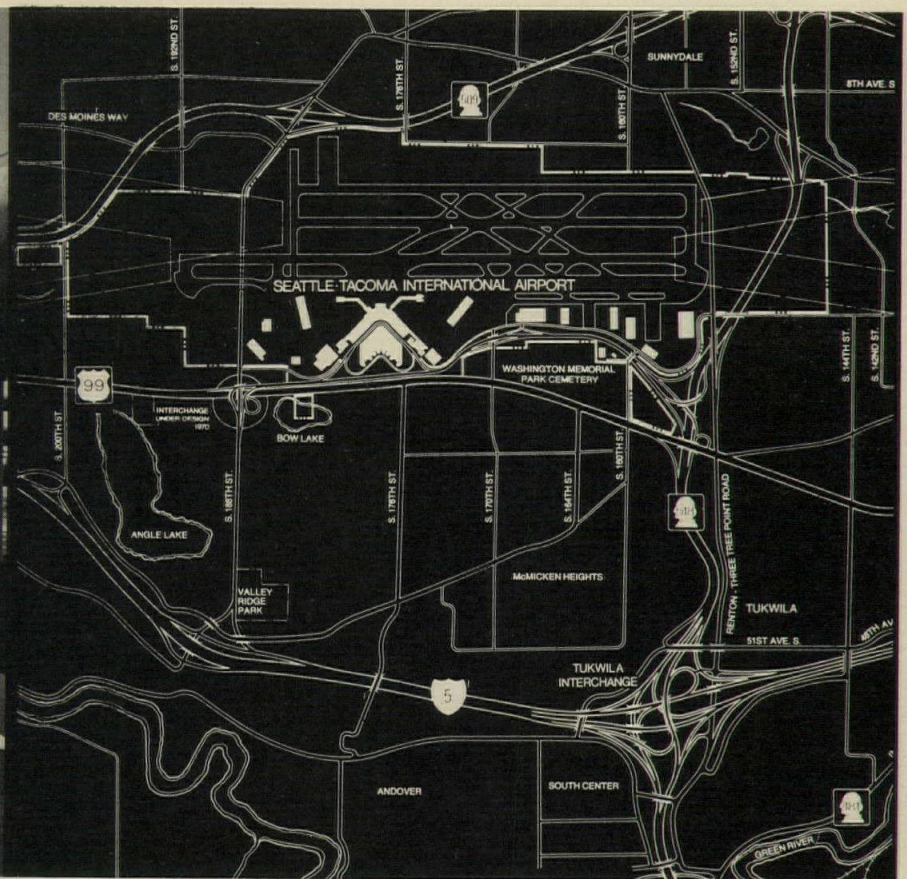
The completed main terminal without satellites provides 37 gates, their distances from

Hugh N. Stratford photos

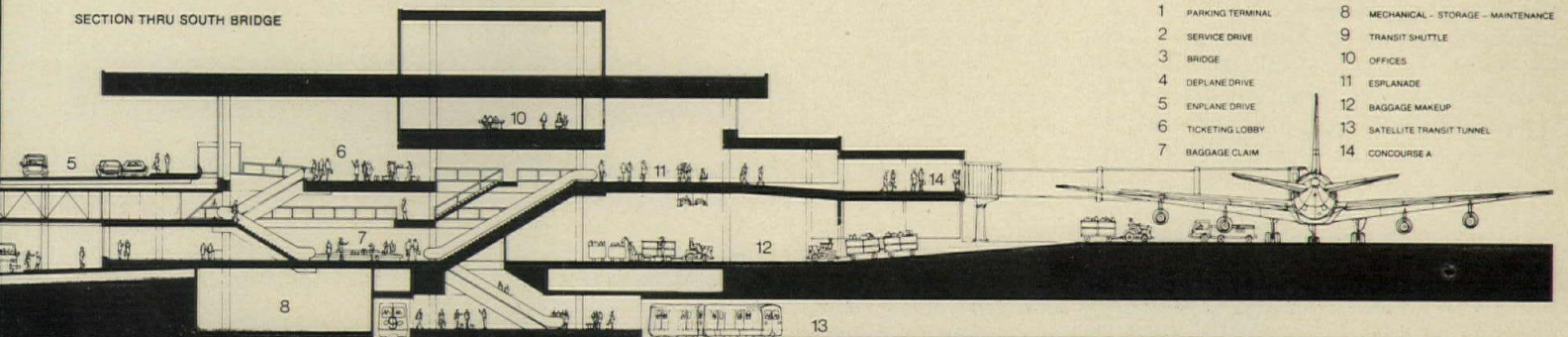


Automobile traffic areas, which include the parking terminal, are constructed with lightly sand-blasted concrete. The passenger terminal by contrast is constructed with steel framing and is enclosed with an aluminum and glass curtain wall that faithfully represents the internal flexibility and openness of arrangement of the terminal. Short bridges connect the enplane drive and the terminal at each entry to the building and allow the remainder of the curtain wall to run free of the drive.





SECTION THRU SOUTH BRIDGE



PASSENGER TERMINAL

- 1 PARKING TERMINAL
- 2 SERVICE DRIVE
- 3 BRIDGE
- 4 DEPLANE DRIVE
- 5 ENPLANE DRIVE
- 6 TICKETING LOBBY
- 7 BAGGAGE CLAIM
- 8 MECHANICAL - STORAGE - MAINTENANCE
- 9 TRANSIT SHUTTLE
- 10 OFFICES
- 11 ESPLANADE
- 12 BAGGAGE MAKEUP
- 13 SATELLITE TRANSIT TUNNEL
- 14 CONCOURSE A

the terminal entrance varying from 215 to 570 feet for enplaning passengers, and from 265 to 620 feet for deplaning passengers. The key circulation systems which radiate from the central passenger terminal include underground transit lines to the satellite passenger terminals, baggage conveyor lines serving enplaning and deplaning passengers, service driveways, separate driveways for arriving and departing passengers, and pedestrian bridges connecting the passenger and parking terminals. All these are interlaced at various levels of the terminal, to coordinate their functions with passenger traffic and airline requirements.

An automatic baggage system is almost ready to work

On approaching the terminal area, car drivers are directed to the terminal curbs to drop-off passengers, or (after shakedown of the baggage system about the end of this year) to the automobile baggage check-in (ABC) where they may check their baggage at airline curbs in the parking terminal, or directly to parking stalls. Terminal curbs, check-in points and parking terminal are all identified in sections according to the nearest airline ticketing location, thereby reducing pedestrian walking distances. Rental car users may also avail themselves of the auto-bag-check before returning to the drive system. Those who drive directly to the parking terminal are guided by automatically operated signs on the entering spiral ramps to the available parking areas closest to the airline with which they are concerned.

Approach to the ticket counters for those who are dropped at the terminal curb is through automatic doors into the ticketing lobby. ABC pedestrians climb one flight of stairs, or take nearby elevators in the parking terminal, and walk for a short distance along a mezzanine to the glass-enclosed bridge leading to the passenger terminal. Pedestrians who have parked their cars walk to the nearest elevator core and ride to the fourth floor lobby of the parking terminal which opens onto the pedestrian bridge. The bridge user, on crossing to the passenger terminal, ascends by escalator to the ticketing area.

Once ticketed, the passenger is directed across the esplanade to the concourses or to the escalators which lead down to the satellite transit system. The esplanade will also provide access to toilets, lounges and a variety of concessions.

An automatic transit system shortens walking distances

The passenger can walk to nearby plane positions in the concourses, or takes the escalators down to the satellite transit system for access to the more remote gates. In the latter case, he boards transit vehicles for a short ride to either the north or south satellite where he is directed up escalators into an independent terminal building, which is ringed with gate lobbies and is served by a core containing additional services and concessions. The far ends of concourses B and C are also reached by use of the satellite transit system.

At the ABC islands and at the ticketing counters, check-in devices of the baggage con-

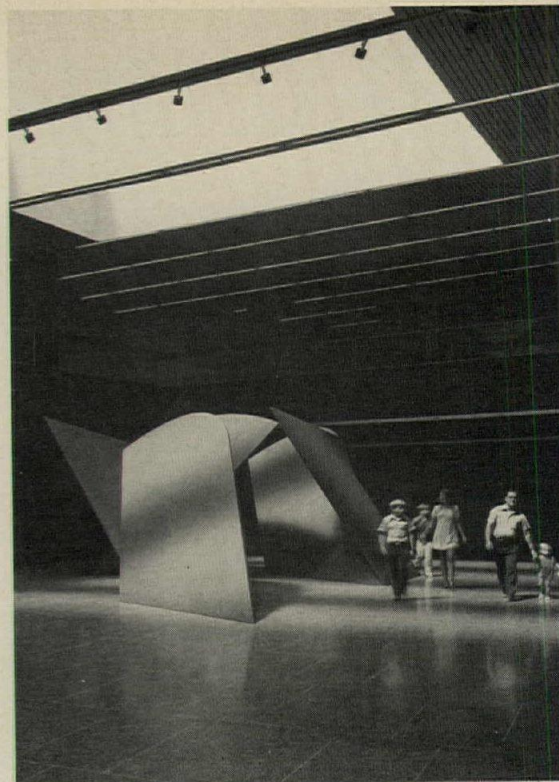
veyor system are installed that receive baggage to be conveyed automatically to appropriate baggage make-up areas from which the baggage is carried by cart to the planes.

The arriving domestic passenger from the close-in plane positions walks to the terminal where he will be directed down an escalator to the baggage claim lobby. From the satellites he returns via the satellite transit system to a terminal station before going up one escalator to the baggage claim lobby. The international arrival is guided into the international corridor, down escalators and into the arrivals hall where he will be processed through Immigration, Public Health and Customs inspections. He is offered the opportunity to recheck his bags after customs inspection before stepping into a spacious greeters' lobby and prior to boarding the transit system. On his arrival at the central terminal he may then claim his bags in the baggage claim lobby. After claiming his bags, the passenger is able to step out to the terminal curb to be picked up, or he may take an escalator up to the pedestrian bridges which cross into the parking terminal. After exiting through the spiral ramp system and toll plaza, drivers who are leaving the parking garage can pick up passengers at the terminal curb, or they may drive directly out to the freeway system.

The passenger terminal separates its two principal passenger functions by floors. The first level serves the ticketing and baggage-check-in functions. These are positioned along the east side of the first level between the enplane drive and the concourses. This level also contains passenger lounges, restaurants and concessions. Additional public spaces and terminal offices occupy the mezzanine level which is located above the first level airline ticket counters and offices.

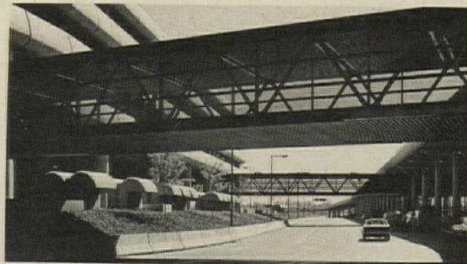
The ground level is adjacent to the deplane drive and houses the baggage claim area and baggage handling areas. The baggage make-up rooms at this level receive incoming baggage by conveyor from the first level ticket counters. From here it is dispatched directly to planes or to the satellites. Baggage from the automobile baggage check-in stations in the parking terminal is also conveyed to this level and is handled similarly. The entire terminal complex will be served by baggage carrier vehicles which circulate between these baggage rooms and connect with each of the terminal buildings. Deplaning passengers pick up their baggage at claim devices in the baggage claim lobby at ground level. The claim devices are fed directly by conveyor from the adjacent baggage handling rooms.

SEA-TAC INTERNATIONAL AIRPORT, Seattle, Washington. Owner: Port of Seattle. Architects and engineers: The Richardson Associates; project architect: Allen D. Moses; assistant project architect: Edward K. McCagg. Engineer consultants: Victor O. Gray & Co., Andersen, Bjornstad & Kane (structural); Dames & Moore (foundation); Miskimen/Associates (mechanical); Beverly A. Travis & Associates (electrical). Consultants: Paul Veneklasen & Associates; Robin M. Towne & Associates (acoustical); Talley & Associates; Sasaki, Walker & Associates, Inc. (landscape); The Environmental Analysis Group (programming and automation studies). General contractors: Morrison-Knudsen Company, Inc., (passenger terminal); Peter Kiewit Sons' Company (parking).

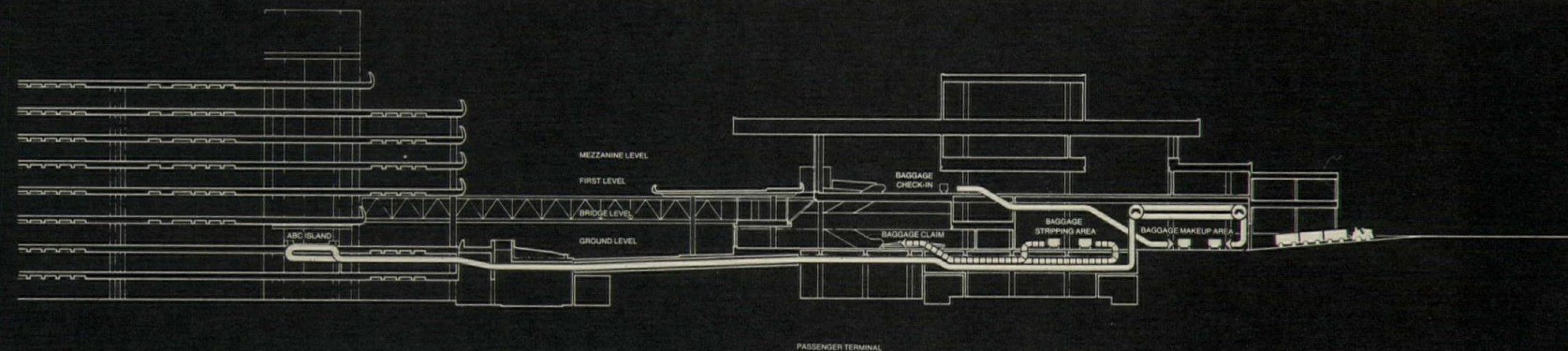
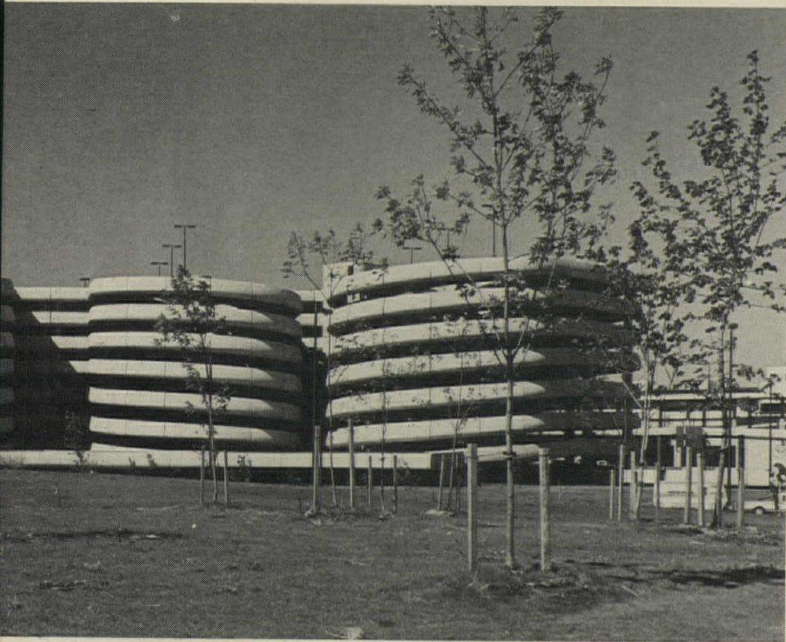


Plaza sculpture by Robert Maki



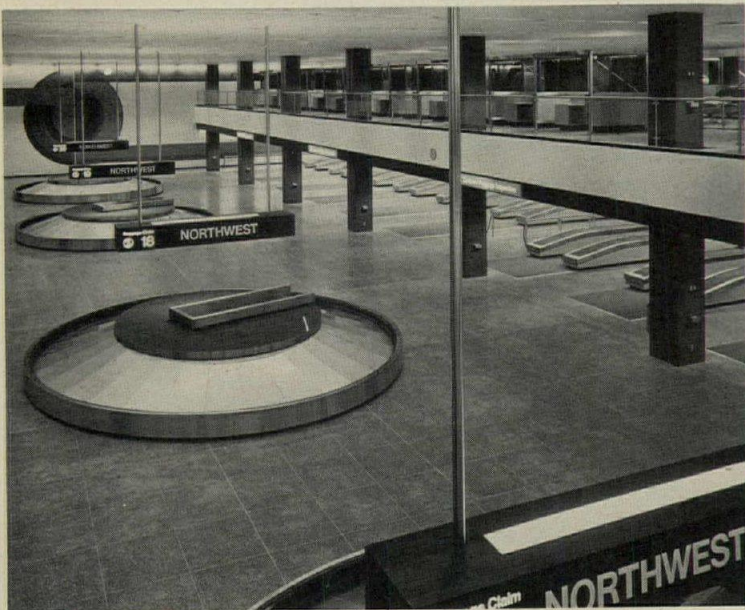
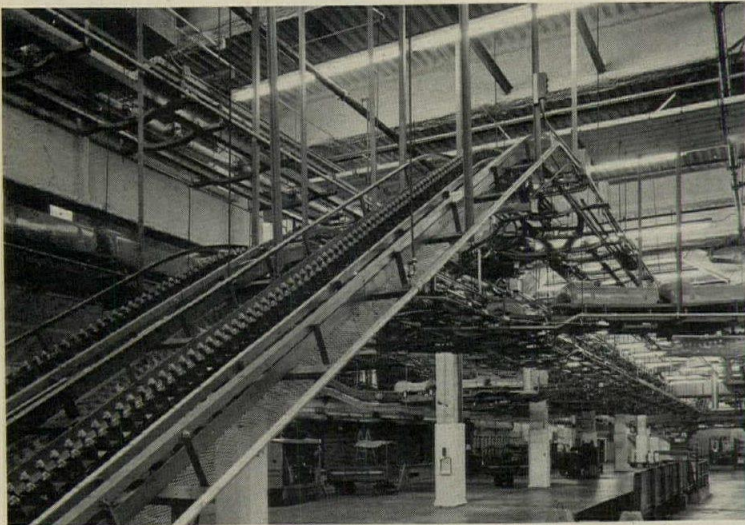
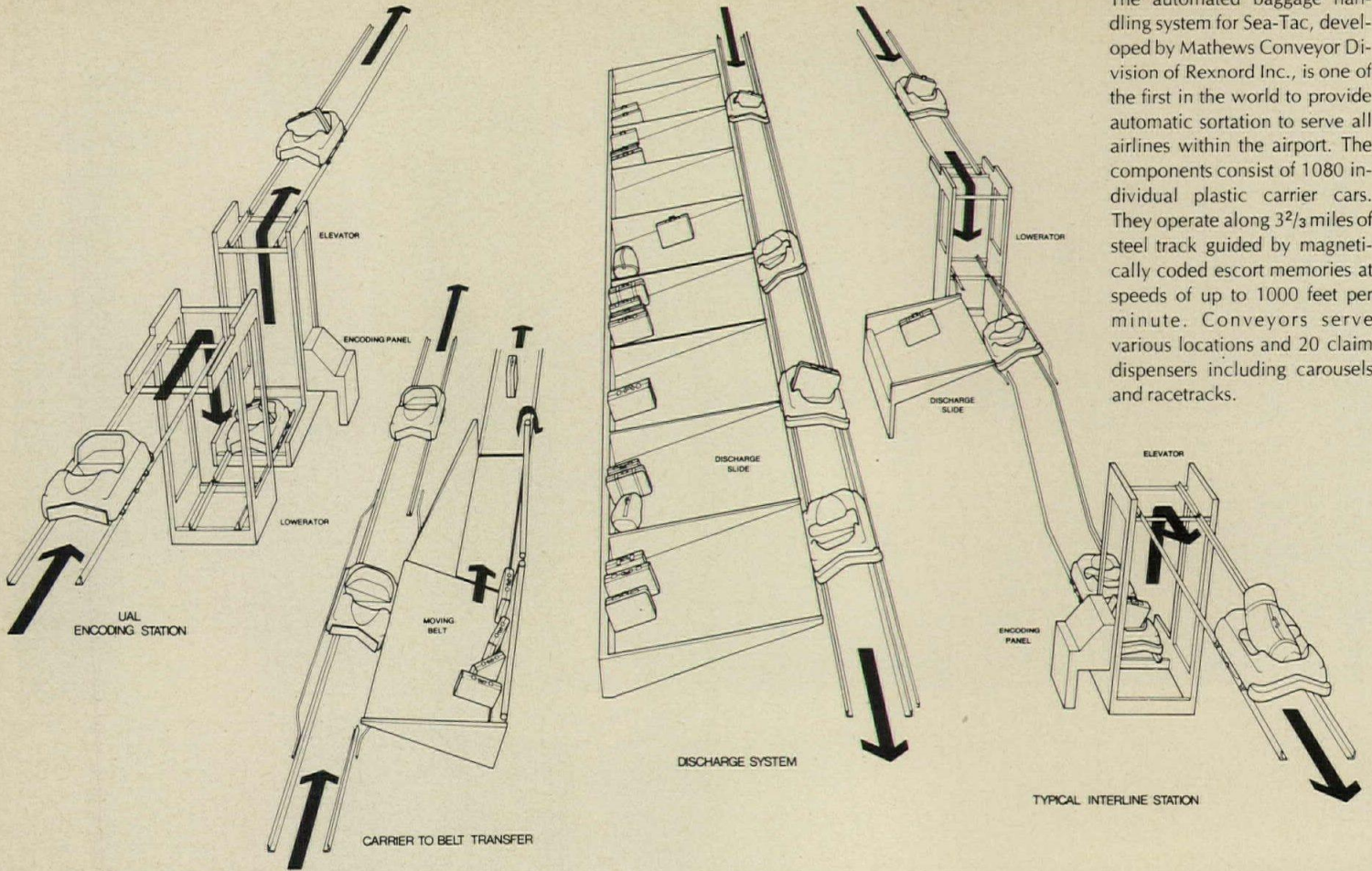


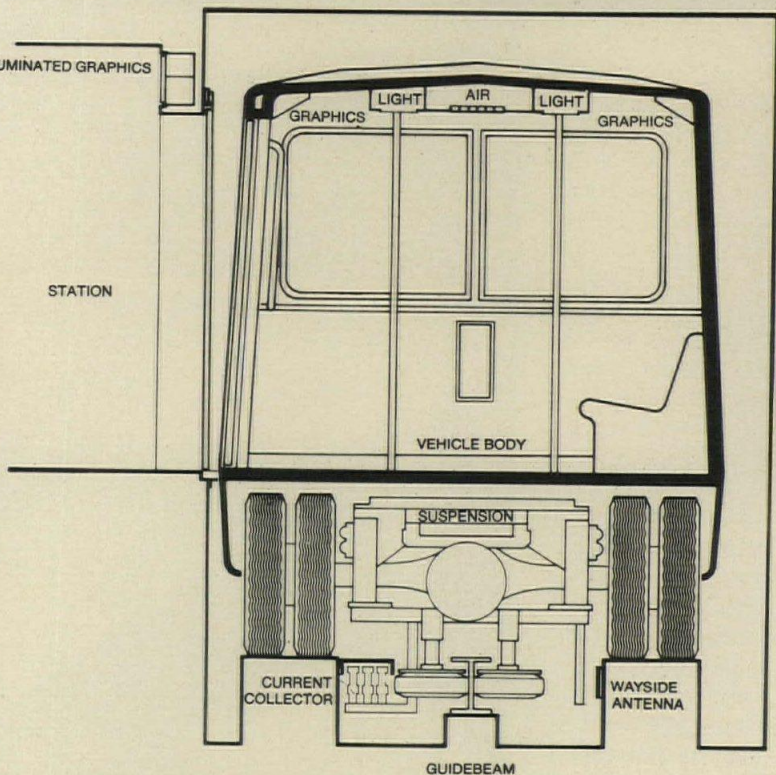
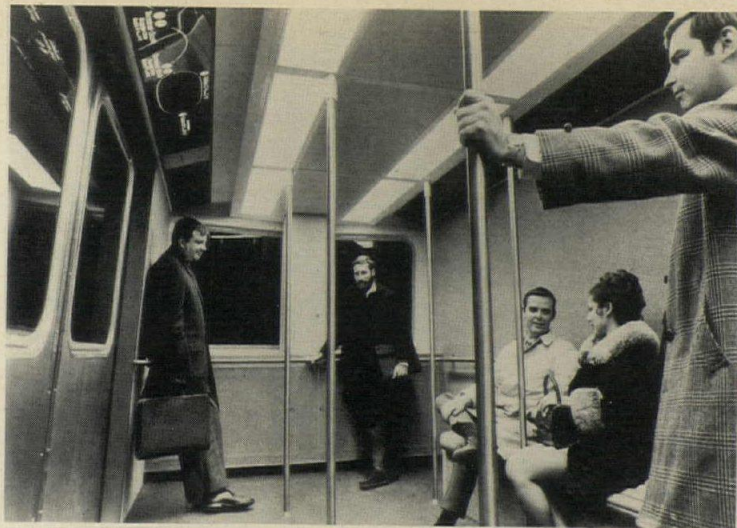
The floors in public spaces are terrazzo in the circulation areas and carpet in waiting areas. Walls and partitions display a variety of finishes, predominantly plastic laminate veneers in public spaces and columns are to be finished in black granite. Ceilings in public circulation spaces are perforated metal channels with integrated lighting systems. Offices on the first and mezzanine levels are floored in vinyl tile, with acoustic panel ceilings. The bridge connecting the passenger and parking terminals is finished to match the passenger terminal itself, entering the terminal between its ground and first levels.



Baggage handling system

The automated baggage handling system for Sea-Tac, developed by Mathews Conveyor Division of Rexnord Inc., is one of the first in the world to provide automatic sortation to serve all airlines within the airport. The components consist of 1080 individual plastic carrier cars. They operate along 3 2/3 miles of steel track guided by magnetically coded escort memories at speeds of up to 1000 feet per minute. Conveyors serve various locations and 20 claim dispensers including carousels and racetracks.

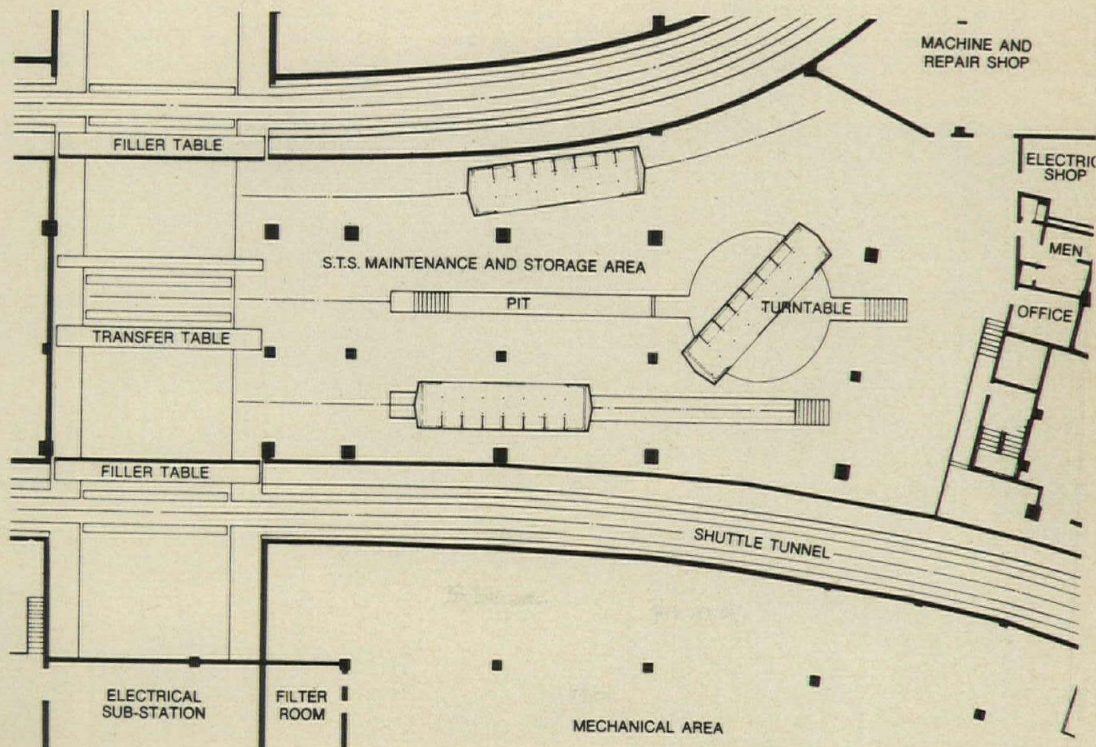




Satellite transit system

A computer simulation study of passenger and personnel movement through the airport provided the basis for specifying the passenger-carrying capacity of the underground transit system. The simulation revealed that considerable peaking could be expected. The transit performance criteria set forth that the transit system must be capable of moving a peak crowd within a five minute period. The initial phase implementation will have a capacity of 400 passengers on each loop in five minutes.

The satellite transportation system was submitted to bid as a performance specification which had been developed from the engineering studies and five proposals were received. The Westinghouse Electric Corporation's proposal was accepted on the basis of its competitive price quotation, its responsiveness to the performance specifications and its completeness.



YOU CAN STILL ENJOY FLYING IN HAWAII

An airport that has stood the test of time despite substantial increase in traffic since its first-phase completion in 1966 is the Kahului Airport terminal serving the Hawaiian island of Maui. It was designed by Vladimir Ossipoff & Associates precisely to absorb a 20 to 30 per cent annual increase in traffic then prevailing at the aging building it replaces. Perhaps the Hawaiian pace has something to do with the pleasant durability of this facility. More likely, however, it is the open spaciousness of the original design and the fact that the terminal building serves only two inter-island airlines. In any case, it has handled the increases so far over its initial 350,000 passengers per year.

The state of Hawaii had established a budget that allowed a building of less than 40,000 square feet based on an estimated cost of \$20 per square foot. The program developed by the architects on this premise called for a simple block form having two curbside exposures that separate the flow of vehicles and pedestrians arriving and departing. All primary functions of checking in, boarding and baggage claim take place in this space, but the baggage claim area, placed conveniently near curbside, is separated from the gate area by a 50-ft diameter circular central court. A conveyor tunnel carries baggage from the gates to the baggage carousels. There is additional baggage assembly and pickup space at curbside, and, of course, baggage sorting and dispatching space near gates at the apron level. A restaurant on the second floor level provides a view of airport traffic and the mountain background beyond. At Maui, there is a ratio of three well-wishers to each passenger and the single open lobby space with planted court provides a pleasant space for the kind of mingling that tends to be more frantic in other climes.

Although warm temperatures and low rainfall might make an open building tenable, the trade wind velocity averaging about 18 knots was a factor in screening measures adopted. The solid end of the building was

turned toward the prevailing wind so that the automobile approach sides were sheltered and comfortable without being enclosed. On the aircraft side, the building is glazed as a shield against blast and noise.

A lightweight steel framing system was used in the form of five-foot-deep carrying trusses supporting three-foot-deep open web beams spanning 56 feet. The structures, resembling a space frame, uses prefabricated members. This permitted off-site assembly in Honolulu and shipment by sea to the site for simplified erection.

The exterior surfaces are composed of precast concrete fascia, welded onto the steel roof structure, built-up roofs with mineral cap sheet, copper flashings, concrete columns, pre-cast concrete wall panels (waffled on the interior side), stainless steel doors, and window frames and fixed glazing held in rubber gaskets supported on painted tubular steel mullions.

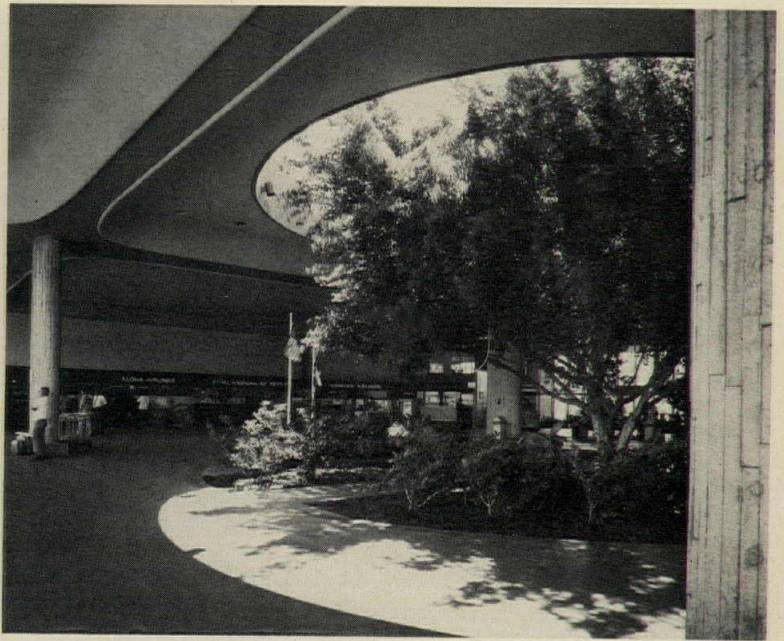
The ceiling of the structure is entirely wet plastered. The coffered form results from the five-foot-high main trusses (single and double) and the three-foot-high open web trusses. Coffered areas are acoustical plaster, integrally colored on the interior and cement plaster with color on the overhangs. The flat portions (below the main trusses) are painted plaster.

Floors are integrally colored concrete. A local wood (koa) is used for paneling. Counter tops are travertine, counter faces are tapa cloth design protected with fiberglass resins, telephone booths are bamboo lined.

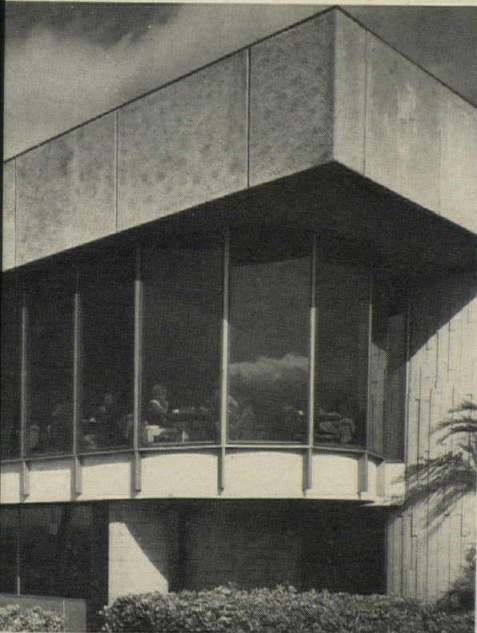
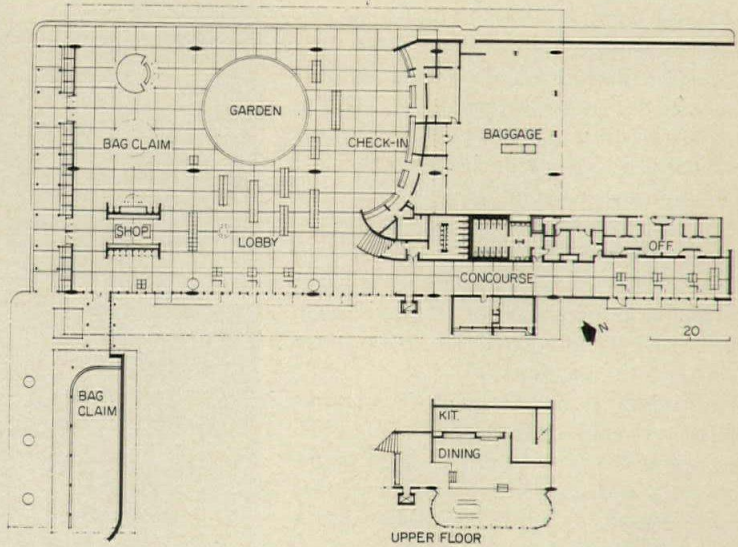
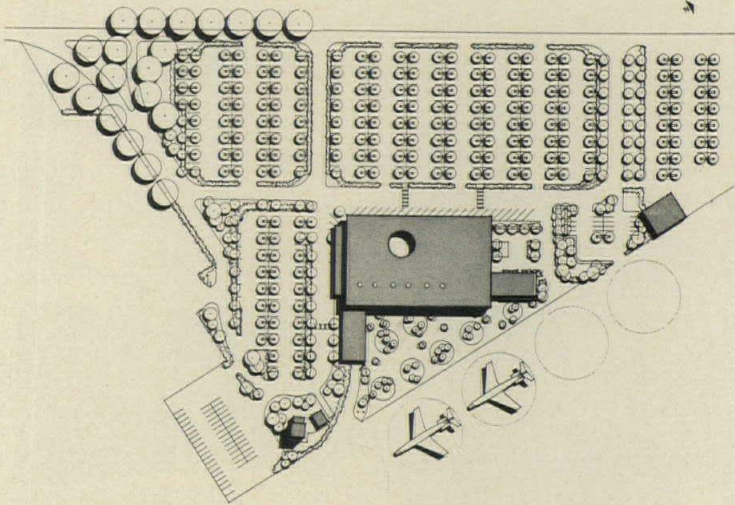
It is not possible to make direct comparison between this low cost, open structured airport facility and those of the giant intercontinental terminals, but it is nice to know that somewhere the traveler is invited to enjoy.

KAHULUI AIRPORT TERMINAL, Maui, Hawaii. Architects: Vladimir Ossipoff and Associates; Sidney E. Snyder, Jr., designer. Engineers: Shimazu, Shimabukuro & Fukuda (structural); Bennett & Drane (electrical). Landscape: George S. Walters.

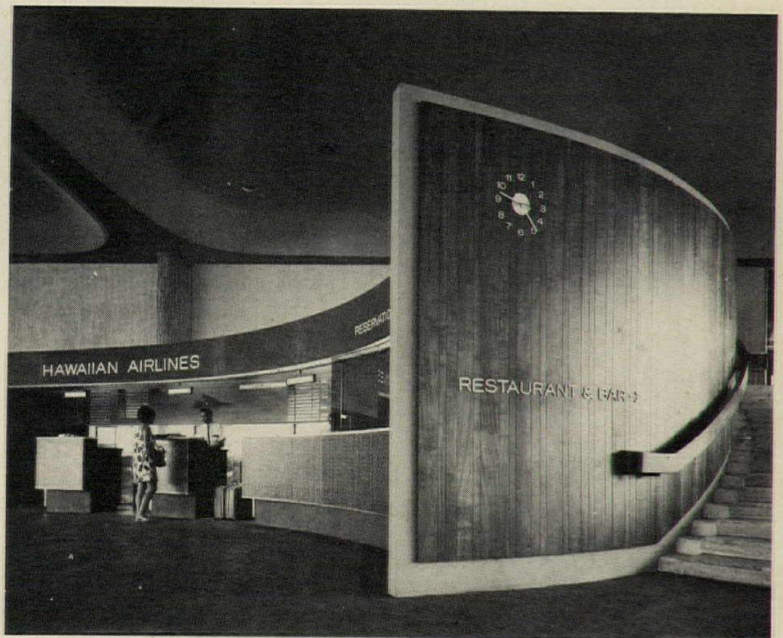




Wenkam/Salbosa photos



The combination of low-cost preformed systems and mild climate resulted in this low profile building designed and landscaped to reflect its south sea island location. There is not much exotic about concrete and glass, but the architect's sense of form and scale is fitting to this tourist airport.



A PERSIAN AIRPORT JUST FOR FUN

Kish is an island in the Persian Gulf approximately 8 by 15 kilometers in size. Until very recently the island was undeveloped except for two small villages with a resident population of a few hundred persons who subsisted on fishing the surrounding waters.

Because of its location within sight of the Iranian mainland, its agreeable climate and the Persian Gulf, which is excellent for water sports, the Iranian Government commissioned architects Rader Mileto Associates to prepare a master plan for the development of Kish as a tourist and recreational center including this small airport. The complete master plan projects an ultimate development over a ten-year period to include five hotels, approximately 2000 residential units (divided into individual villas and condominium apartments), recreational facilities, commercial and shopping facilities, administrative elements, schools, marinas, an 18-hole golf course and the infrastructure to support this development.

His Imperial Majesty, the Shah of Iran, encouraged the development plans by commissioning the same architects to design a small palace for the Royal Family on Kish Island, the construction of which was completed last year.

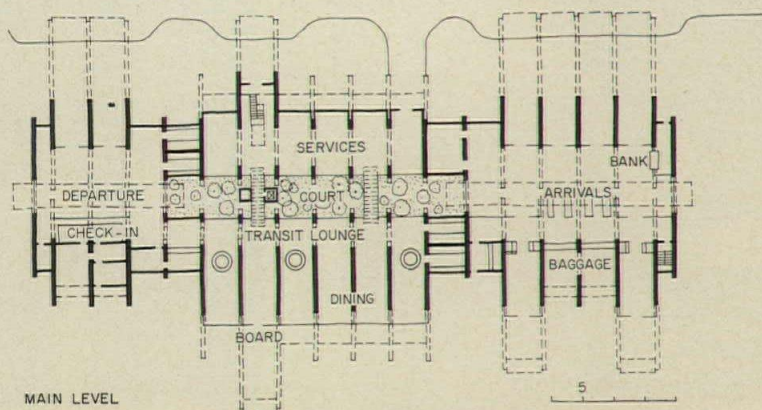
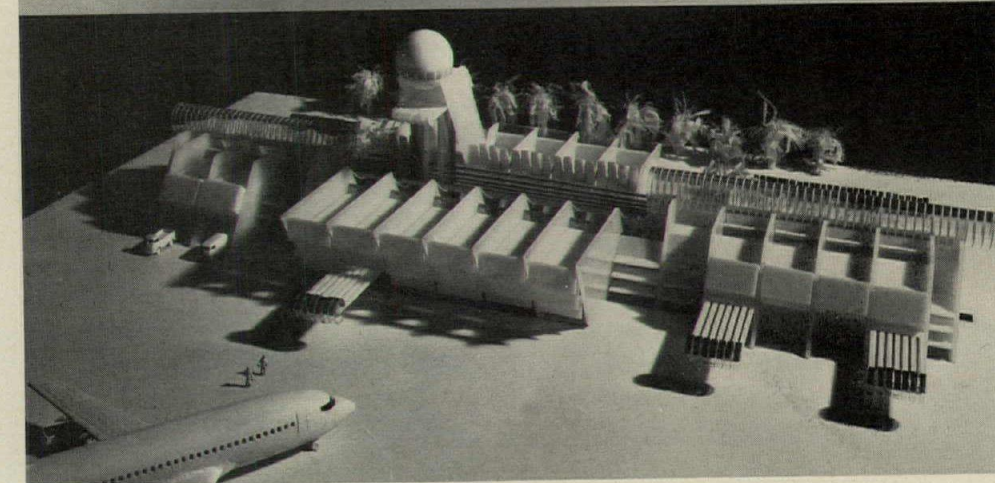
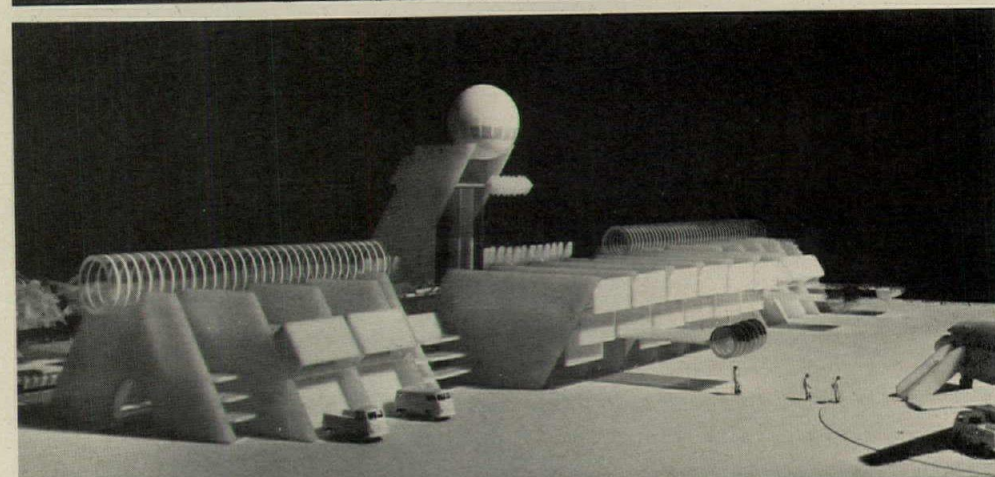
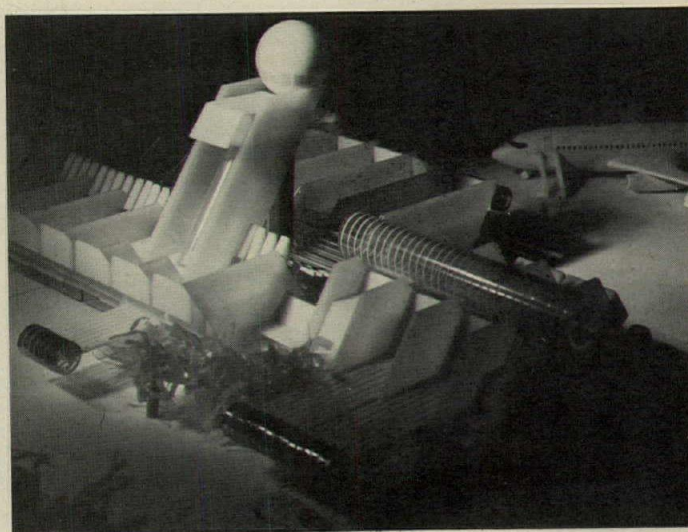
Under design development this year, the first construction phase will consist of a new airport terminal, a 200-room hotel, and the first of the housing and administrative facilities.

The airport will be served by a single runway and taxiway, which should serve the traffic needs for the foreseeable future. Vehicular access to the terminal is accomplished through a short road connecting to the main loop road which serves the entire island.

The terminal building consists of three units respectively: ticketing and check-in; transit lounge and services; and arrivals. A partial upper floor will contain offices. The project may be phased with only the center section being built initially. The total enclosed area of the project consists of 2300 square meters on the ground floor and 800 sq mts on the upper floor. The control tower is enclosed in a geodesic dome.

The basic design language of the project is expressed in strongly articulated pairs of raw concrete fins leaning inward for the outside units (check-in and arrivals) and leaning outward for the center section (the transit lounge area). The outward leaning fins of the center section define an inner court partially covered by the cable structure supporting louvers. The concrete will be covered with a thin coating of rough sprayed cement. All glazing will be with dark anodized aluminum sash. All public spaces will be carpeted throughout. This design language is consistent in principle with those initially established for His Majesty's palace and for other structures being planned within the scope of the master development plan—in terms of form, finish and material.

AIR TERMINAL, KISH ISLAND, Persian Gulf, Iran.
Architects: Rader Mileto Associates



Over-budget school gets rebid systems—adding some new twists

Though mechanical performance specifications were oriented toward roof-top multizone equipment, a central plant was chosen on the basis of the owner's life-cycle cost criteria. But multizone bidders raised questions as to what these really were.

by Robert E. Fischer, senior editor, and
F. J. Walsh, consulting mechanical and
electrical engineer

The 350,000-square foot Chantilly (Virginia) High School was conventionally designed and bid. When bids came in too high, the recently-arrived assistant superintendent for educational facilities planning and construction for Fairfax County, Ed Stephan, thought the time had come when the county should try the systems approach route. (Fairfax County lies southwest of Washington, D.C., covers an area of 425 square miles, and has a population of around one-half million people.)

Stephan had been looking into the possibilities of initiating a systems program earlier when he had a similar job with Rochester, New York school administration. The Reston, Virginia architectural firm of Jansons Roberts Taylor Associates had been urging the county to "go systems" for an elementary school they had been commissioned to do, but size of the project was considered too small for a first attempt. But Ed Stephan convinced the county administration that Chantilly should, with whatever redesign this entailed, be rebid using the systems approach. Following the Chantilly High School experience, Fairfax County has recently taken bids on two elementary schools by performance specifications, and is about to take design-build (fixed-price) bids for several more elementary schools.

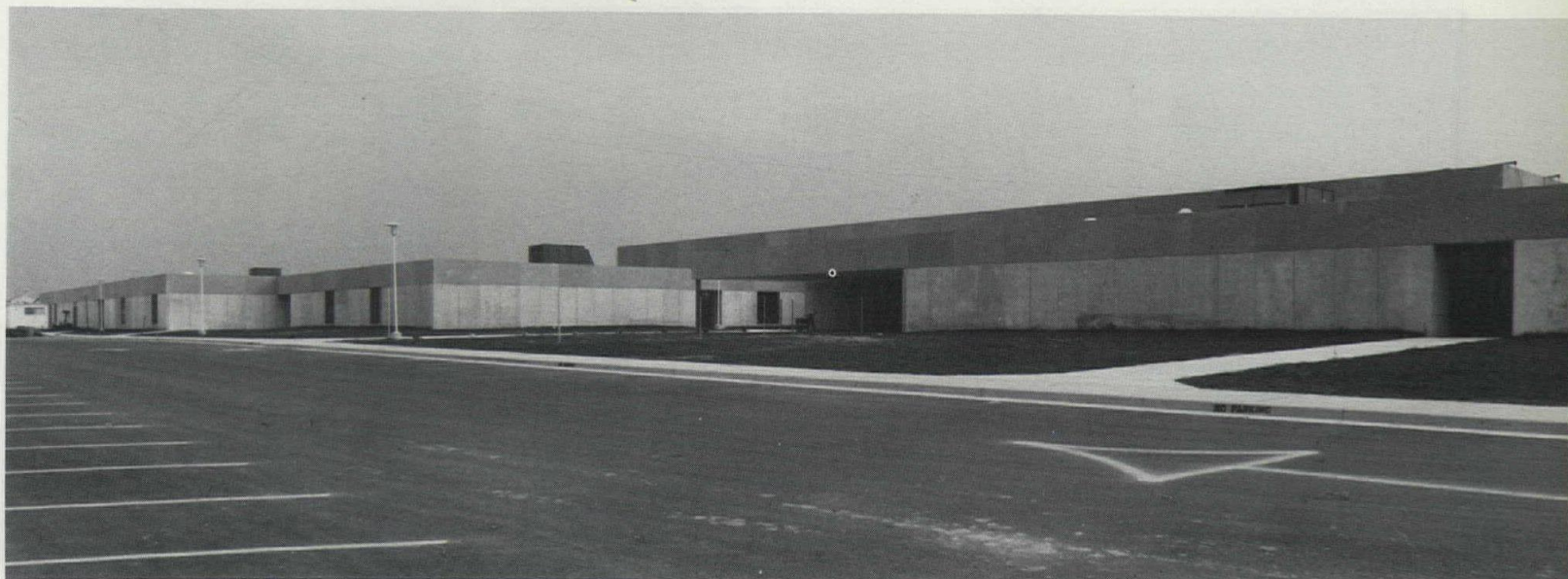
After the county had decided to go systems for Chantilly, it set up the Fairfax County School Systems Project (FCSSP), and appointed Jansons Roberts Taylor as coordinating archi-

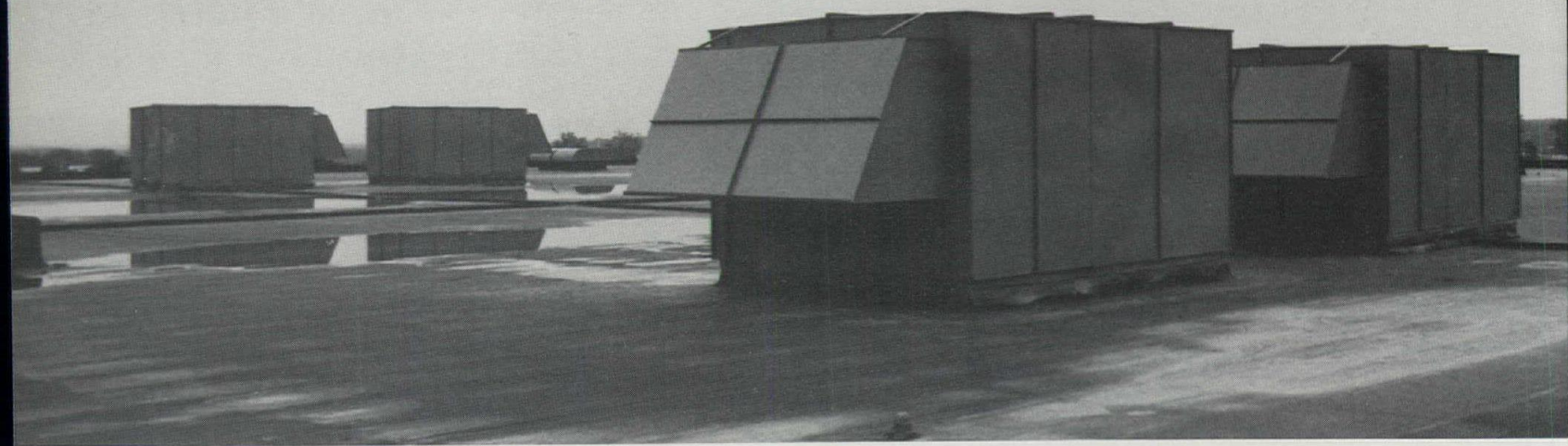
itects. Their basic responsibility was to prepare the performance specifications; also to assist the client in evaluating bids.

McKee-Berger-Mansueto, Inc. was brought in as construction managers to work out the bidding packages, and to schedule and coordinate both systems and non-systems construction. They also put together life-cycle cost figures for the client on the in-system air-conditioning bids, and examined some of the systems from a value-analysis standpoint.

The architects for the original design—Beery, Rio & Associates of Annandale, Virginia—and their consultants, were retained as project architects for the redesign. The school was not changed in size—remaining at 350,000 square feet—but the outline was altered. External stair towers that gave visual interest to the facade were brought inside the building, and other associated changes were made to reduce the number of wings and thus simplify the perimeter. It was apparent, says JRTA, the coordinating architects, that such features as this, and the absence of a consistent module for interfacing systems made the original schools too expensive for the county's budget—\$24 per square foot versus \$20. The change to a 5-ft. module meant slight adjustments in room sizes for conformance.

The basis for evaluating the hvac bids was not made clear in the performance specifications
As has been the case with most systems school





projects, single- or multi-building, the Chantilly performance specifications for the hvac system—the most complicated of them all—were the weakest in terms of establishing equitable bidding—establishing the same ground rules for all bidders, technically and costwise. Any mechanical system bidder had to be very much on top of the project to have knowledge of what direction the evaluation was taking. The performance specifications merely stated that “In designating the lowest and best bid, the annual operating and maintenance cost of the system will be considered. The effect of additional building construction required and/or the internal area of the building required for the system will also be evaluated.” No penalties were indicated for machine-room space.

A reading of the hvac performance specifications makes it clear that they were predicated upon self-contained, roof-top hvac equipment, even though it was stated that either central or roof-top, self-contained equipment would be considered in awarding the contract. Further, from the time the performance specifications were issued, the bidders had only 30 days in which to get their proposals into shape.

The award, however, went to a firm bidding a central-station system, and the award was made on the basis of a life-cycle (20-year) analysis, rather than on the lowest first cost, which was a roof-top multizone system. The difference in base bids was about \$300,000,

but MBM adjustments for electrical, plumbing, roof walkways, and deductions for longer maintenance options reduced the difference to about \$145,000. Before the central-station bidder made the decision to go ahead with a proposal, however, he obtained assurance from the client that each proposal would be evaluated on a life-cycle basis.

The firm with the low base bid (self-contained roof-top) says that it was not aware of the actual basis for evaluation until the meeting of the school board when the awards were announced. This firm questioned the results, and it urged the school board to have its consultants reevaluate the results—which was done, and the conclusions remained the same.

Systems projects have been following a pattern that now has become a familiar one

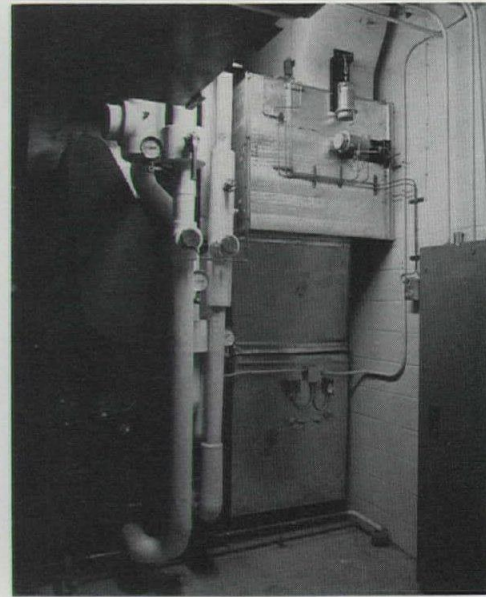
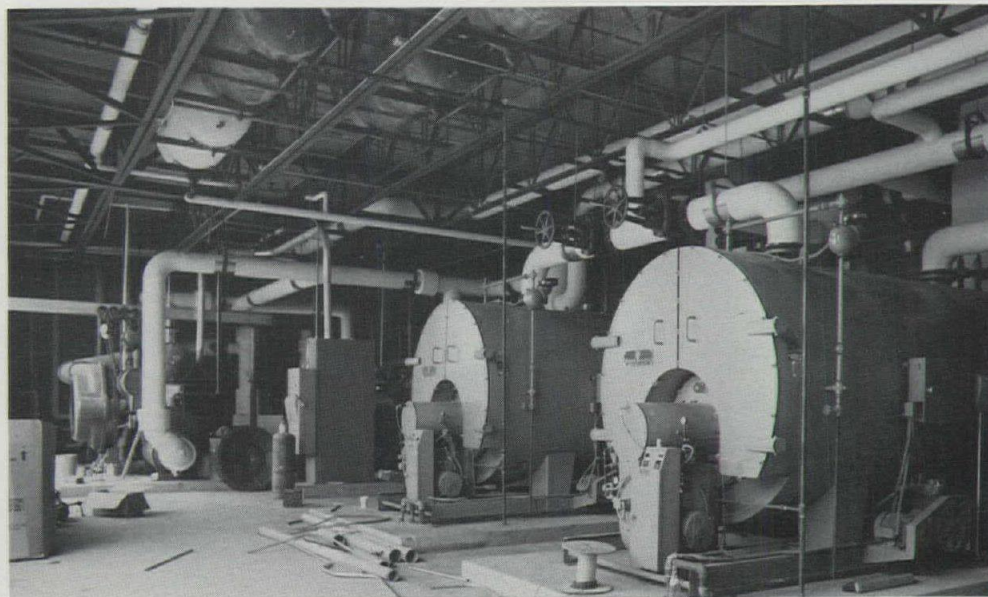
As noted earlier, the impetus to go systems came from Ed Stephan, the Fairfax County assistant superintendent; execution in terms of performance specifications and over-all evaluation of bid responses to these specifications was assigned to Jansons Roberts Taylor Associates.

The Educational Facilities Laboratories of The Ford Foundation has shown interest in what Ed Stephan has been doing in Fairfax County in several ways. It has acknowledged the life-cycle costing of the Chantilly hvac system in its recent publication, “The Economy of Energy Conservation in Educational Facilities.”

Further, it has given him grants for: 1) an energy conservation study for existing schools, which is nearing completion; and 2) a study of the design-build approach to schools (of which the schools mentioned earlier are a part).

In preparation for its role as coordinating architect for the FCSS Program, Jansons Roberts Taylor Associates studied several of the major systems school projects—principally Toronto’s Study of Educational Facilities (SEF) and Florida’s Schoolhouse Systems Project (SSP). They visited schools in these programs and talked to their staff. One of the SSP staff, architect James Y. Bruce, became a consultant to Jansons Roberts Taylor Associates. And prior to embarking on Chantilly and the FCSS Program, JRTA had added mechanical engineering capability in the person of James Cox, most recently with the Marriott Corporation, and also electrical engineering. With minor differences and modifications, the performance specifications for Chantilly High School are patterned after the progenitors—SCSD, SEF and SSP. For that matter, almost all of the single-systems project schools have been done this way, using almost exactly the same type of “hardware.” Thus many architects who have done these schools now say that, “the ‘hardware’ is here,” and, thus, “what matters the most now is the process—fast tracking, CPM, etc.”

Small and single-building systems projects are at a disadvantage in that their resources are





limited for doing fresh investigations into the technical areas that affect their clients. The best talent and expertise thus are not tapped for investigations and reviews that could lead to better performance specifications, particularly in the mechanical area. Part of the difficulty with the mechanical performance specifications stems from the fact that the criteria that do exist—derived from the major systems projects—have not involved as much review and critiquing as would be desirable by the body of design professionals, by mechanical contractors, and by technical representatives of manufacturers. When these specifications are too broad—as in the Chantilly case—then many of the engineering evaluations as to how well certain hvac approaches meet the requirements of the building project go by default to the bidder.

The defense of broad specifications is that they leave more opportunity for innovative solutions. But, in fact, they cannot because the innovative bidder cannot gamble when the risks are so high.

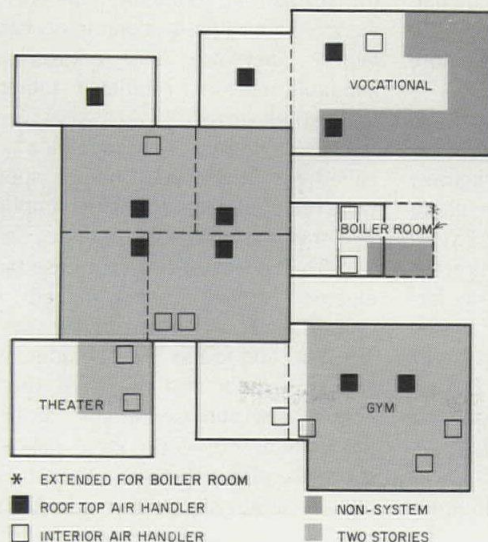
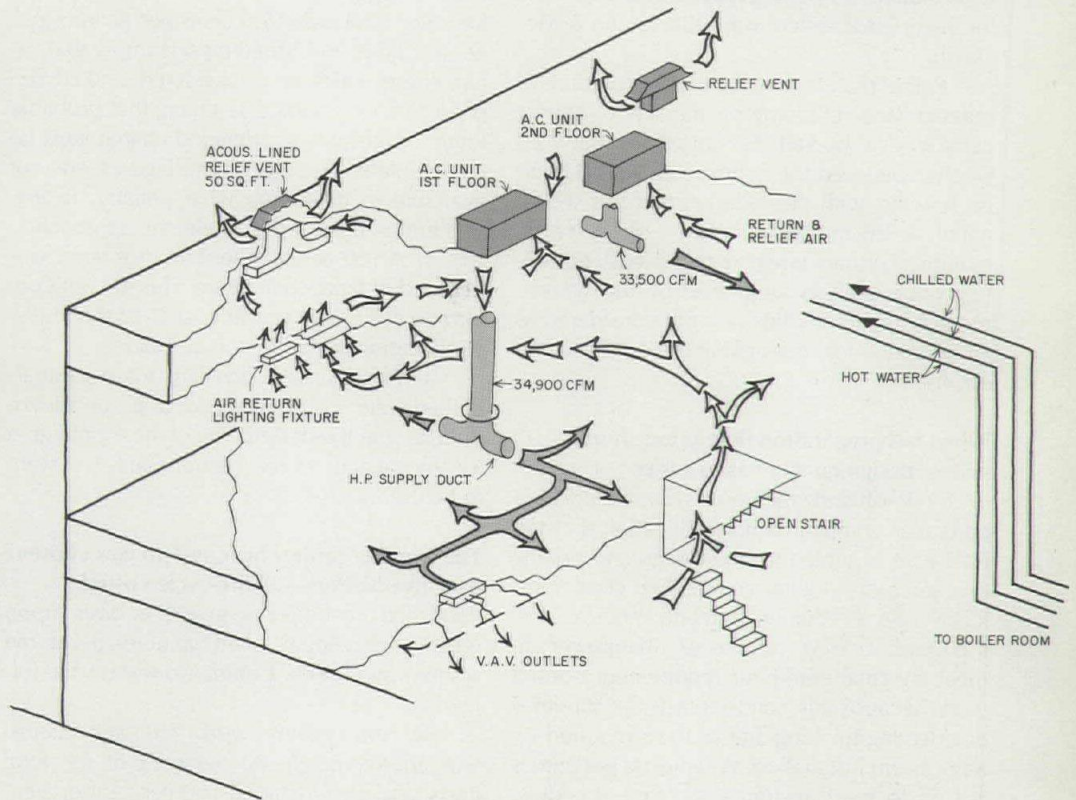
Rooftop multizone or central station? It depends largely upon building size

There is no question that rooftop multizone systems have high performance capability; and, for most single-story buildings, will have lower first cost than a system using a central chilled hot-water plant and multiple air handlers.

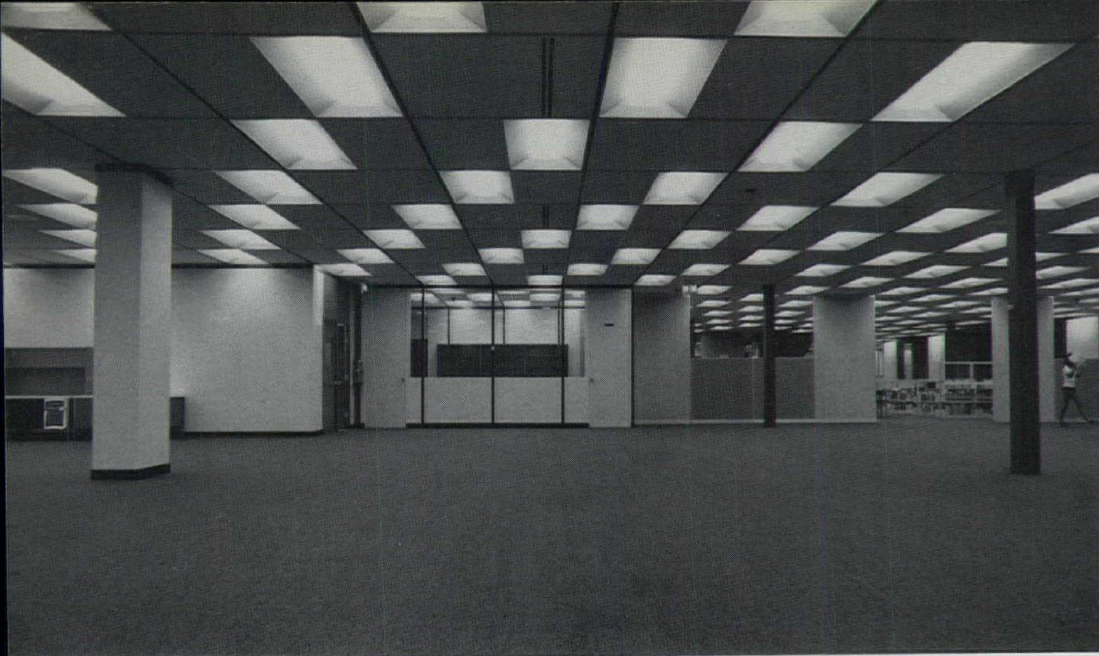
On larger schools, particularly multi-story ones, the use of central chilled/hot-water plants and one of the central-station high-pressure air systems must be considered a viable alternative. On many school projects designed conventionally, consulting engineers have proved that such systems are justified based upon their own engineering economy studies (now popularly called life-cycle costing). Admittedly many central systems are more complex in design, operation and control than unitary systems; and, further, there are many design variations possible.

Unfortunately, while school system projects to date, including Chantilly, have permitted such systems to be bid, for the most part, only limited investigations have been made into their design implications in terms of space requirements, physical coordination with structure, and hvac-system control. Though limited in a number of ways, mainly in that they are too broad, the SEF specifications have

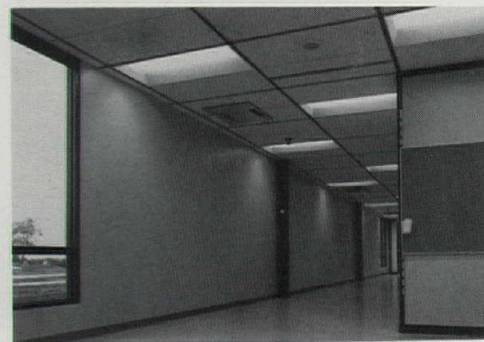
Two centrifugal chillers totaling 1000 tons (across page, bottom) serve rooftop and interior air handlers (above and across page). These chillers and the two boilers also serve non-system hvac units. Other systems bid using unitary direct-expansion equipment totaled approximately 1400 tons.



Typical air flow for academic spaces is shown above. Because the school is near the flight patterns of jets, acoustical considerations were important. Fire protection subdivision was not required, permitting large open-plan spaces. The fire-protection system included ionization-type smoke detectors. Supply air ducts in the return-air ceiling plenums did not have to be insulated. All exhaust fans and ducts were out-of-system. The non-system floor space, including the boiler room, approximated 32,000 square feet. Approximately 210 variable-air-volume units, and 20 reheat coils were provided for zoning.



Air-outlet placement in the lighting-ceiling is shown at left. One of the 15 overhead heaters used at entrances in the two-story section is shown below. Perimeter of second floor and of single-story section have air loop serving ceiling outlets.



been the best so far.

The hvac system for the conventionally-designed Chantilly High School was double-duct air distribution with hot and chilled water from a central plant, similar in design to the one used by the successful systems bidder. Consulting mechanical engineers for the original system were Kluckhuhn & McDavid.

Rather than to take the usual procedure of redesign and rebidding on the school after it came in over-budget, Fairfax administrator Ed Stephan believed the better route would be to go systems, with the redesign that this would entail—even though it meant a delay of six months. Further, while detailed cost consulting/value analysis were used on the systems project, apparently this was not considered as an approach for redesigning the original project, itself.

When bid preparation time is too short, system design quality has to suffer

With one-off systems projects, hvac bidders in particular complain with justification that too little time is allotted for the design and pricing of a job bid in tightly competitive conditions. It is always less than what reality requires. Furthermore, adding additional manpower to meet the total man-hour requirement doesn't work because this can't replace the top-level engineering thinking and analysis required on any custom installation. When extra pressure is put on to meet an unrealistic time schedule, conceptual thinking has to suffer somewhat, and design optimization is not possible at all. The more complex the system, the more difficult it is to overcome these factors.

They were minimized in the central-station systems bid for the Chantilly project because of the experience of consulting engineer Goodwin H. Taylor in central system plants and variable-air-volume systems. Taylor worked with the winning bidding contractor, bringing to bear his knowledge of diversity factors and engineering economy. For professional and business reasons, Goodwin Taylor established a subsidiary firm, Systems Design, Inc., to handle Chantilly and future possible design projects for contractors bidding systems.

Some of the sections of the Chantilly specification that are of interest include:

1) The specification on temperature controls contemplated only multizone systems, except in large single-zone areas such as the gymnasium and theater.

2) For energy-cost estimation, electricity cost was given as 1 cent per kwhr with no demand charge; No. 4 oil was 14.1 cents per gallon; No. 5 oil was 15.0 cents per gallon; gas, not available. Published reports imply that future energy costs were considered, and Ed Stephan has been quoted as saying that probable future imposition of a demand charge must be contemplated for electricity. Figures are not available to determine what penalty, if any, was imposed upon the all-electric approach.

3) A 100 per cent performance bond was required of hvac contractors. This did not conform to customary practice, and led to the disqualification of two important bidders.

4) Approximate diversity for a central-chilled-water plant was added as an addendum, as was the designation of the exact figure for the capacity of the central plant, if it were to be used.

The winning central hvac system was chosen over five bidders—all life-cycle costed

Published cost figures give the basis upon which the central plant/variable-air-volume system was chosen. Comparisons show the following:

1) Non-systems work (all subsystems) was approximately 60 per cent of the total costs, and also included 100 per cent of electric feeder and branch-circuit wiring. These were bid after systems contractors had been selected. Therefore, cost adjustment figures available represent estimated, rather than actual figures.

2) Long-term maintenance contracts called for in the performance specifications were not contracted for, which implies that the owner is not really sold on life-cycle costing.

3) The lowest first-cost base bid was all-electric rooftop, self-contained multizone units. The second lowest bidder was the same. The third and fourth lowest bidders were again similar, except that the third used oil-fired heating. The fifth lowest base bidder proposed the system shown on these pages, and described earlier. The sixth lowest bidder had central-station fan units in penthouses, and a variable-air-volume air distribution system.

This was combined with a central hot-water plant and rooftop air-condensing units matched to the coils in the fan units. Cooling units ranged up to 140 tons in size.

The two bidders who could not get a performance bond (expected by them up to the last minute) were: 1) an all-electric rooftop bid, and 2) a bid that would have been second lowest. This was all-electric and included central station air handlers on the roof matched to air-cooled condensing units up to 70 tons, combined with variable-air-volume systems. Also included were perimeter electric heat and electric unit heaters in the ceiling for night use.

Another question in this project, as with others, is who is responsible for what?

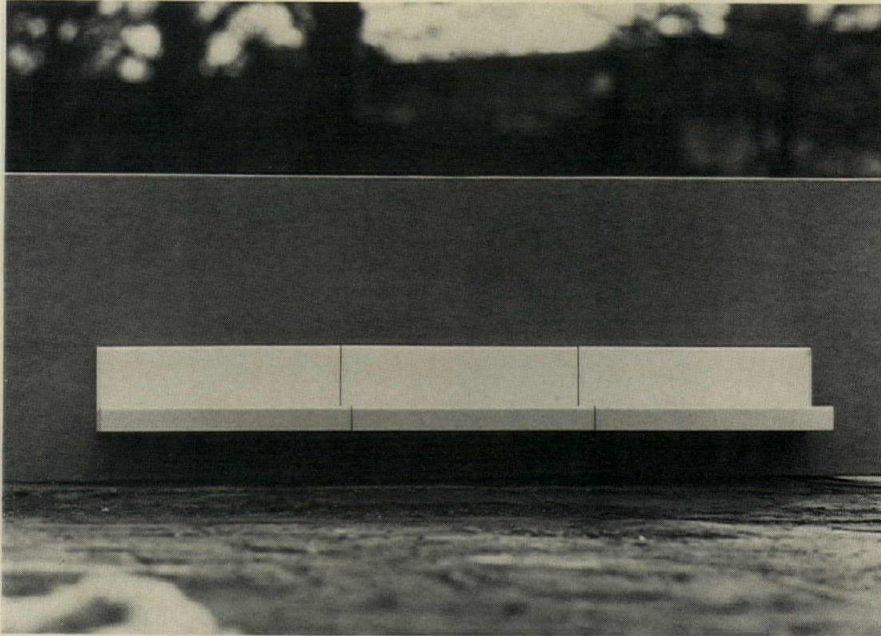
There seems to have been a fair amount of dissatisfaction among the losing bidders with the looseness of the bidding procedures, and with the lack of adequate design and evaluation criteria.

With regard to the engineering design professionals, and other consultants, no coherent picture unfolds as to any real agreement upon the division of responsibilities. The performance specifications call for the hvac contractor to be completely responsible for performance of the hvac system based upon the criteria given therein. These criteria give the basis for design—e.g. space cooling loads, zoning, air quantities, etc. The engineer's stamp on criteria documents implies responsibility only for correctness of this data. The hvac design drawings for the non-systems work were, as usual, both signed and stamped by the project architect's consulting engineer.

In the case of the system hvac design, no commitment was required of the contractor's engineer on design responsibility. The picture was further confused by the fact that the project architect's consulting mechanical engineer, working under an informal contractual arrangement, was required to intensively review the contractor's final design submittal plans, shop drawings, etc.

Thus, this project appears to continue this "gray area" of who is responsible for what when the bidder is a manufacturer or a manufacturer working with a contractor, notwithstanding the fact that a registered architect or engineer may have been retained by the manufacturer.

For more information, circle items on Readers Service Inquiry Card, pages 247-248.

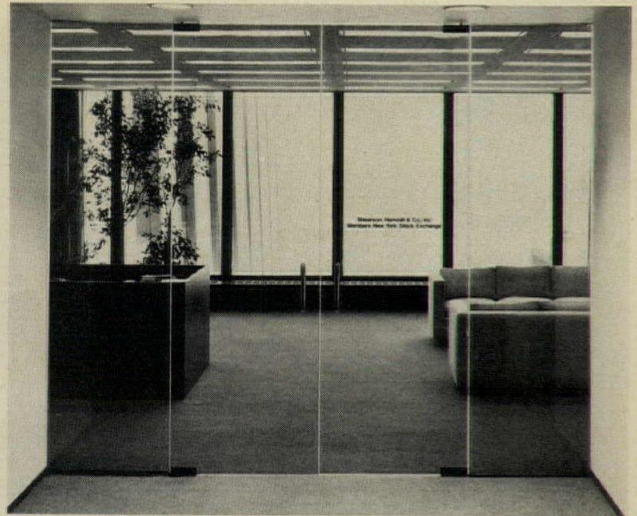


Hanging fiberglass bench for use singly or grouped

Providing comfortable seating in a minimum amount of space, these modules are made of maintenance-free fiberglass, hung from existing structures by metal supports that are concealed. The basic unit, available

in colors and textures, measures 22 in. wide by 4 ft long by 16 in. high. The company recommends the units for use in transit stations. ■ Reinforced Plastic Industries, Inc., Marlette, Mich.

Circle 300 on inquiry card

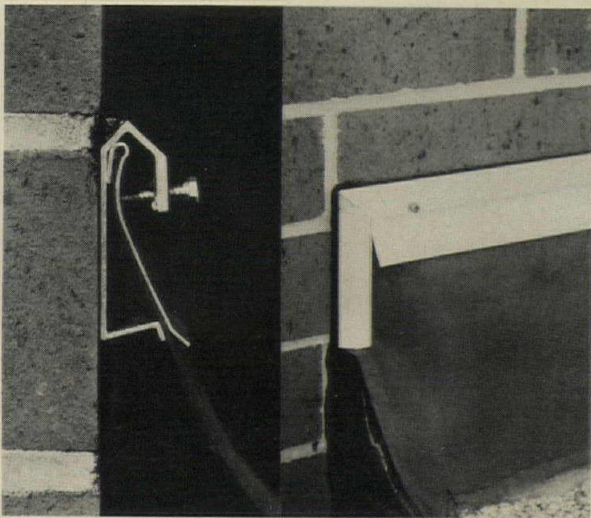


All-glass entrances for exterior-interior use

Maximum expanses of glass with minimum visual obstruction are permitted with this all-glass entrance with no metal frame members. The entrances can be used for both interior

and exterior applications involving long runs of uninterrupted tempered safety glass. ■ Virginia Glass Products Corp., Martinsville, Va.

Circle 303 on inquiry card

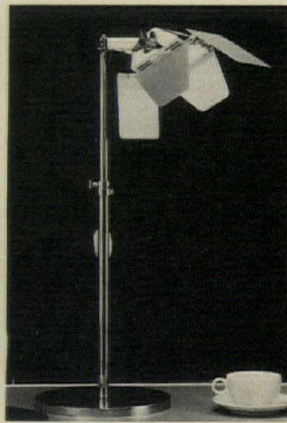


Extruded aluminum reglet flashing assembly

The company states this aluminum extruded reglet flashing, for use with either elastomeric membrane or with galvanized cant, keeps installation costs low because of simple design. Application of this system on existing roofs does not require

removal of existing flashing, according to the company. Other roofing products offered include a snap-on coping cover which eliminates all exposed fasteners. ■ Miscellaneous Mfg. Corp., Tucker, Ga.

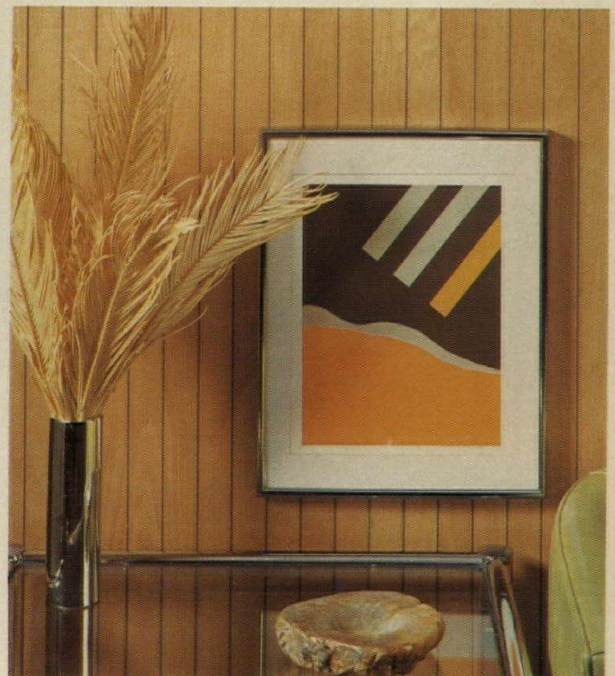
Circle 301 on inquiry card



A light adaptation

Inspired by theatrical lighting, these wall, table, ceiling and track lights are available in chrome and four vivid colors. The "barndoors" adjust to control the tungsten halogen bulb light that is said to be twice the light of normal bulbs. ■ Berkeley Colortran, Inc., Burbank, Cal.

Circle 302 on inquiry card



Prefinished plywood paneling in new collection

From the company's *Weldwood* collection of prefinished plywood paneling, this light hickory surfacing features 2-in. planks and slender 1/8-in. grooves. Another hickory paneling offers 4-in. on center planking, with even scoring to

complement the light close-grained veneer. A teak paneling from the company comes with 2-in. planks, while another version comes in 4-in. planks. ■ U.S. Plywood, New York City.

*Circle 304 on inquiry card
More products on page 165*

Ozite's® carpet of Herculon® took a ribbing from Open Pit®...



but had the last laugh.

Ozite's "Hobnail" carpet with pile of HERCULON* olefin fiber can laugh off most anything. Including a batch of juicy spareribs, topped with rich, tangy Open Pit® barbecue sauce.

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For detailed information on HERCULON, see Sweet's **S** Light Construction, Architectural and Interior Design files. Or, write Fibers Merchandising, Dept. 322, Hercules Incorporated, Wilmington, Delaware 19899 for a free 24-page booklet.

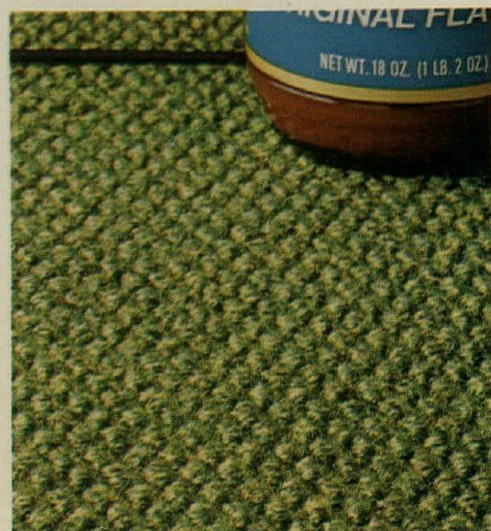


*Hercules registered trademark.

Specify carpet of stain resistant Herculon®

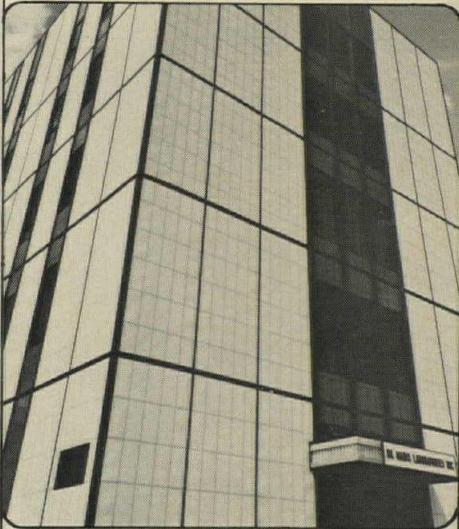
†OPEN PIT® is a registered trademark of General Foods Corporation.

For more data, circle 77 on inquiry card



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The primary element is a "sandwich" panel, formed by reinforced translucent fiberglass sheets that are permanently bonded to both sides of a grid core of interlocked, structural aluminum I-beams. The fiberglass sheets are uniform in thickness and have a special weather-resistant, low-maintenance surface.

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For more information, circle item numbers on
Readers Service Inquiry Card, pages 247-248.

CUSTOM LIGHTING / The company has introduced a 16-page, full-color supplement that features hand-crafted solid brass designs in pool table and game table lighting and 28 additional styles of decorative indoor and outdoor lighting. ■ Georgian Art Lighting Designs, Inc., Lawrenceville, Ga.

Circle 400 on inquiry card

WATER SYSTEMS / A revised water system dealer catalog presents the firm's line along with accessories, selection data, parts information. ■ Goulds Pumps, Inc., Seneca Falls, N.Y.

Circle 401 on inquiry card

FIRE-RESISTIVE ASSEMBLIES / The Steel Joist Institute has published a technical digest to meet designer needs in finding fire-resistive steel joist assemblies. This capsule review is said to give guidance in the changes which can be made to published design listings without decreasing the fire endurance. Copies of the booklet are available for \$1 each. ■ Steel Joist Institute, Arlington, Va.

Circle 402 on inquiry card

OPEN OFFICE PLANNING / A 32-page booklet describes the general benefits of open office planning and provides background on early approaches to this type of office system. A section on acoustical considerations in the office plan is included, together with charts showing proper positioning and distances. ■ InterRoyal Corp., New York, N.Y.

Circle 403 on inquiry card

OVERHEAD CHAIN BROCHURE / An 8-page brochure describing the components and application of overhead chain conveyors describes capacity ranges for light to heavy duty applications. In all three classifications, components are manufactured to industry specifications. ■ Rapistan Inc., Grand Rapids, Mich.

Circle 404 on inquiry card

TABLE BROCHURE / A catalog, featuring conference, pedestal and office tables includes an extensive selection of round, rectangular and boat shapes. The tops are finished in textured, laminated plastic with a variety of wood-grained patterns or solid colors. Frames are offered in single- or double-pedestal styles, some with folding legs or wood-grain panels that match the top. ■ Virco Mfg. Corp., Los Angeles, Cal.

Circle 405 on inquiry card

AIR SUPPLY SYSTEMS / The company describes its air supply systems in a 28-page color brochure on central vacuum systems, high vacuum pumps, oil-free air compressors, compressed air dryers and components and accessories for hospitals and laboratories. Included are detailed illustrations and charts which list vacuum pump horsepower, compressor horsepower, capacity, dimensions, motor horsepower, pump speed, shipping weight, and other specifications. The brochure gives recommendations on usage and size requirements. ■ Chemetron Corp., Chicago, Ill.

Circle 406 on inquiry card

ROOFTOP AIR CONDITIONER / Complete literature for the company's factory-assembled, modular package combination heating and cooling rooftop units now provides complete specifications for the various models which provide from two to 18 tons cooling and 160,000-360,000 Btu heating, recommended for residential, professional building or light commercial applications. ■ Dunham-Bush Residential and Unitary Products, Harrisonburg, Va.

Circle 407 on inquiry card

REFRACTORY CONSTRUCTION / An eight-page brochure describing refractory construction projects describes and illustrates installation in aluminum, cement and lime, iron and steel, mining and ore processing, and petroleum and petrochemical industries. ■ Bigelow-Liptak Corp., Southfield, Mich.

Circle 408 on inquiry card

SEWAGE TREATMENT / The company's packaged sewage treatment process for marine and domestic wastes is described in applications including lavatories, laundries, showers, galleys and kitchens. ■ International Waste Controls, Inc., Elmsford, N.Y.

Circle 409 on inquiry card

NOISE-CONTROL / Bulletin briefly describes and illustrates with photos, diagrams and performance data: (1) medical and life-science systems (2) architectural noise-control systems (3) engineered acoustic structures. All materials mentioned are accompanied by a reference to a detailed piece of technical literature, obtainable by bulletin number. ■ Industrial Acoustics Co., Bronx, N.Y.

Circle 410 on inquiry card

BUILDING SYSTEMS / A construction report file contains capsule photo reports of several recently completed projects. Included are a prototype precast concrete housing system for HUD's OPERATION BREAKTHROUGH, a school, a health facility, a utility company's service building, an engineering center and a furniture store. ■ Atlas Minerals & Chemicals Div., ESB Inc., Mertztown, Pa.

Circle 411 on inquiry card

DOCK SHELTER / Complete product descriptions, specifications and typical installation sketches, plus insight into the company's background and capabilities are included in the catalog covering a line of truck and rail dock shelters. The company offers a variety of rail dock shelters and other specialized products, such as rolling units, car-to-car rail shelters, sliding dock curtains and traffic doors. ■ Frommelt Industries, Inc., Dubuque, Iowa.

Circle 412 on inquiry card

METAL LOUVERS / A 24-page catalog covering a complete line of metal louvers for industrial, commercial and institutional buildings shows fixed louvers, operating louvers, mechanical equipment enclosures and sun control louvers. The catalog includes dimension drawings, complete with details, specifications, free area tables and performance data curves. ■ Elwin G. Smith Div., Cyclops Corp., Pittsburgh, Pa.

Circle 413 on inquiry card

DRAPERY HARDWARE / The catalog is said to contain an extensive line of drapery and curtain hardware, fixtures, and decorative accessories for home, office, store or auditorium. ■ OB/Masco Drapery Hardware Co., Compton, Cal.

Circle 414 on inquiry card

AUTOMATIC SPRINKLER / A two-page technical data sheet that describes the operation, tests and specifications of a fully approved automatic on-off sprinkler contains cut-away drawings designed to detail components of the sprinkler and show parts such as piston, pilot valve assembly, and yoke and deflector assembly. Tests leading to FM and UL approval are summarized, including operation tests for temperature, calibration, vibration, corrosion, pressure, leakage and water distribution. ■ Grinnell Fire Protection Systems Co., Inc., Providence, R.I.

Circle 415 on inquiry card

More literature on page 177

For more data, circle 78 on inquiry card

Kydex™ wallcovering: tough enough for hockey rinks... tough enough for you



Kydex wallcovering, the latest material used to face hockey rink dasher boards, can now be used to give truly rugged protection to your walls.

Available in pleasing decorator colors, Kydex gives walls exceptionally high resistance to scuffs, dents, gouges and the effects of most commonly used chemicals. Easy to install and easy to clean, rugged Kydex in the standard wallcovering thickness of .028" meets the requirements for a Class I interior finish under most building codes. Write for a brochure and the names of suppliers near you.

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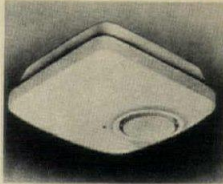


Kydex Sheet
For Class I interior finish, bond .028" KYDEX permanently to non-combustible substrate with contact cement or mastic adhesive. Flame spread and smoke ratings of .028" and thicker panels depend upon thickness, adhesion and substrate. UL ratings available. Colors may not be outdoor stable. Avoid exposure to heat. For handling and application information, consult Rohm and Haas bulletins.



continued from page 161

COMBUSTION DETECTOR / This self-contained unit is said to detect products of combustion, offering an early warning. The unit can power up to 11 additional detector units and can also serve as a corridor automatic fire detection system and door closer. Measuring approximately 6¾ in. square by 2¾ in. deep, the unit is designed for surface mounting. ■ Pytronics, Cedar Knolls, N.J.



Circle 305 on inquiry card

CONCRETE SLAB SYSTEM / The company has acquired the U.S. and Canadian rights to the French *Davum* semi-precast slab and joist systems for fire-resistant floor and roof construction. In the system, a thin portion of a concrete slab is precast in a factory, reinforced by a protruding light steel truss and steel mesh. It is then trucked to the site and erected, the slab being completed by another pour of concrete over the factory portion. ■ Bowsteel Corp., Linden, N.J.



Circle 306 on inquiry card

AUTOMATIC PLANTER / The planter connects to the mains in any building and provides a regulated water and food supply for low-light sub-tropical plants, according to the company. The model shown—largest of the fiberglass models—measures 2 ft by 4½ ft by 18 in. ■ Highbeam Design, Inc., Bearsville, N.Y.



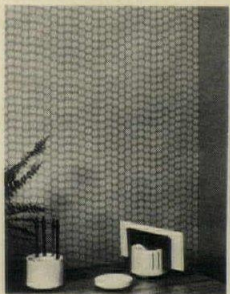
Circle 307 on inquiry card

WALK-IN FUME HOOD / This fiberglass fume hood features an interior of chemical resistant molded fiberglass reinforced polyester and exterior of vinyl-clad steel. It is available in 47-, 59-, and 80-in. widths, and has colored removable access panels to provide ready means for inspection, maintenance and adjustment of hood components. ■ Labconco Corp., Kansas City, Mo.

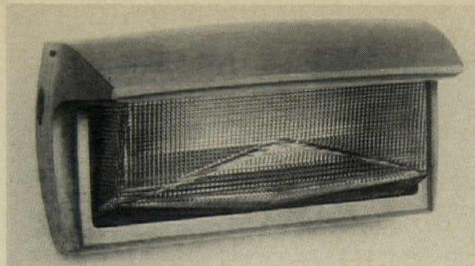


Circle 308 on inquiry card

WALLCOVERINGS / Two patterns have been introduced in the company's *Genon* contract collection, with bactericidal additive to inhibit microbiological growth. All patterns are said to pass and/or exceed all government specifications including fire resistance. Shown is a large-scale dot pattern in vinyl, available in 22 tone-on-tone colors. ■ General Tire & Rubber Co., New York City.



Circle 309 on inquiry card



CAST ALUMINUM LUMINAIRE / This wall-mounted unit designed for high intensity outdoor lighting is offered in 100-, 175-, or 250-watt versions and may be mounted directly on the circuit box or bolted to the wall. Available with or without a cast aluminum protective guard. A light sensitive photoelectric cell is offered to automatically turn the light on and off. ■ Lightron Corp., Jericho, N.Y.

Circle 310 on inquiry card



FIRE RETARDANT SHAKES / The UL-classified fire cedar shakes shown on this roof were pressure treated with *Non-Com* exterior fire retardant chemicals, which are said to make the shakes self-extinguishing when the flame source is removed. The treatment does not affect the natural weathering characteristics of the cedar. ■ J. H. Baxter & Co., San Mateo, Cal.

Circle 311 on inquiry card

more products on page 167

Detex security equipment gives you peace of mind, piece by piece.

Right now, one Detex Exit Control Lock may be all the security you need. As new security problems arise, you can combine Detex equipment, unit by unit, into a complete security network.

Or if you've already started to build a sophisticated system, we can interface with existing equipment to back up weak spots.

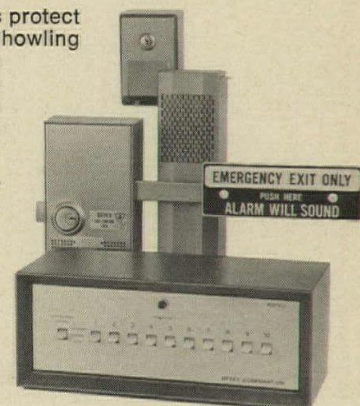
Detex Exit Control Locks and Exit Alarms protect unlocked exit doors, bringing pilferage to a howling halt. DENTCO coded-card entry systems keep restricted doors locked to unauthorized individuals. Detex Remote Indicating Panels keep an eye on every security point from a central location.

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We started with the human body. Comfort first—a unique seat recess, dual-density foam cushioning, and soft, resilient arms. Then solidity and durability from unitized, dual-shell construction. Beauty takes care of itself, in clean, functional lines that won't date when architectural styles change. The Body Chair: an integrated collection of executive, guest, clerical, and secretarial chairs. All in colors and upholsteries to fit any decor. Ask your GF branch or dealer for our new 16-page catalog. Or write to us. GF Business Equipment, Inc., Youngstown, Ohio 44501.



For more data, circle 81 on inquiry card

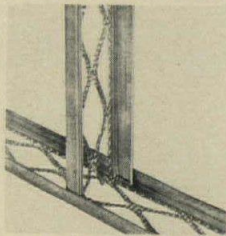
continued from page 165

CARPET CUSHION / This latex foam cushion is intended for commercial and contract applications, and consists of three models, including an extra firm density cushion for heavy traffic areas. The product conforms to non-flammability requirements of ASTM. Reinforced with woven polyester backing. ■ Allen Industries, Inc., Dayton, Ohio.



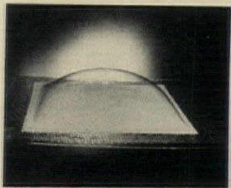
Circle 312 on inquiry card

STEEL STUD SYSTEM / The company claims this steel stud and track—using less steel—is 25 per cent lighter in weight, yet is as strong or stronger in wind load testing than conventional 25 gauge steel studs available today. Available accessories include a stud starting clip and a plastic grommet which snaps into any of the positions that carry plumbing and wiring service connections through the wall. ■ Casings Inc.-Eastern, West Middlesex, Pa.



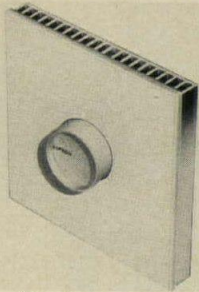
Circle 313 on inquiry card

SKYLIGHT / The product is constructed with dead air space between the dome and the diffuser panel, acting as an excellent insulation, according to the company. The material also has a high impact strength as well as UV stability that resists color change for the life of the skylight. The product is said to lend itself to use with any type of roof. ■ Kennedy and Son, Inc., Orlando, Fla.

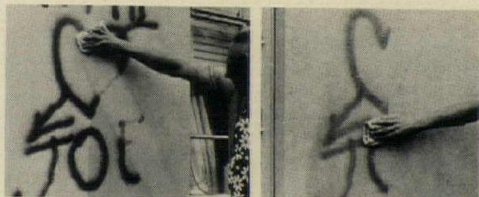


Circle 314 on inquiry card

ROTARY DIMMER / This incandescent rotary dimmer line ranges from 600- to 2000-watt capacity, and features tamper-proof recessed knob. Voltage compensation prevents flickering. All models are said to fit into single gang electrical wall boxes and are fully gangable. Soft beige color faceplate. ■ Lutron Electronics Co., Inc., Coopersburg, Pa.



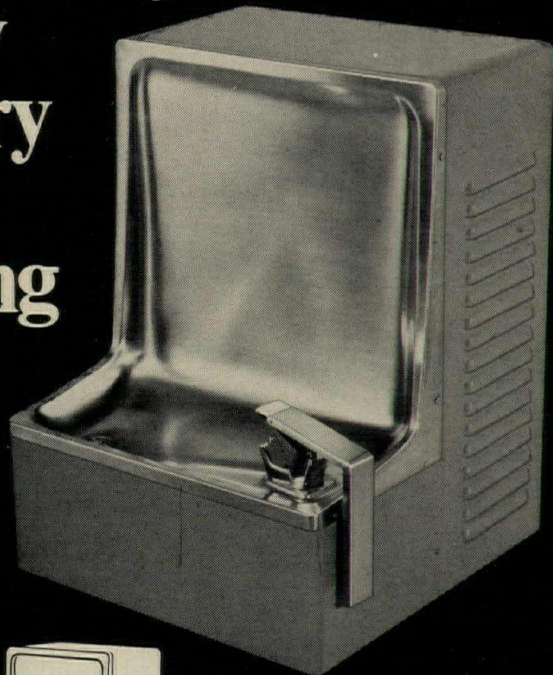
Circle 315 on inquiry card



ANTI-GRAFFITI COATING / A protective coating for walls and other surfaces is said to make graffiti hard to apply and easy to remove. The clear, water-based solution forms a tough protective film over masonry, metal, wood, painted surfaces, marble, brick and other surfaces. Protection of exterior surfaces is said to last for six months. ■ H. B. Fuller Co., St. Paul, Minn.

Circle 316 on inquiry card
more products on page 175

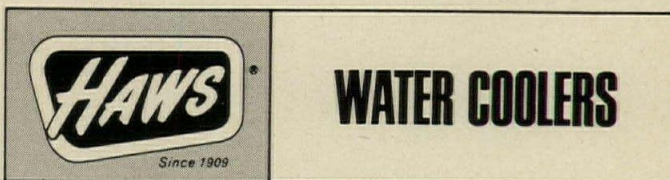
A necessary facility for every public building



Haws HWC-6 water cooler is designed for persons in wheelchairs. It extends out from the wall and is mounted at a convenient height from the floor so that a person can easily wheel up to it. A compound-action bubbler valve actuates the cooler from a push on the side or top, making it easy to operate by handicapped persons.

Model HWC-6 helps you comply with public law 90-480 which states that buildings constructed, leased, or financed by the federal government must provide facilities suitable for use by the physically handicapped.

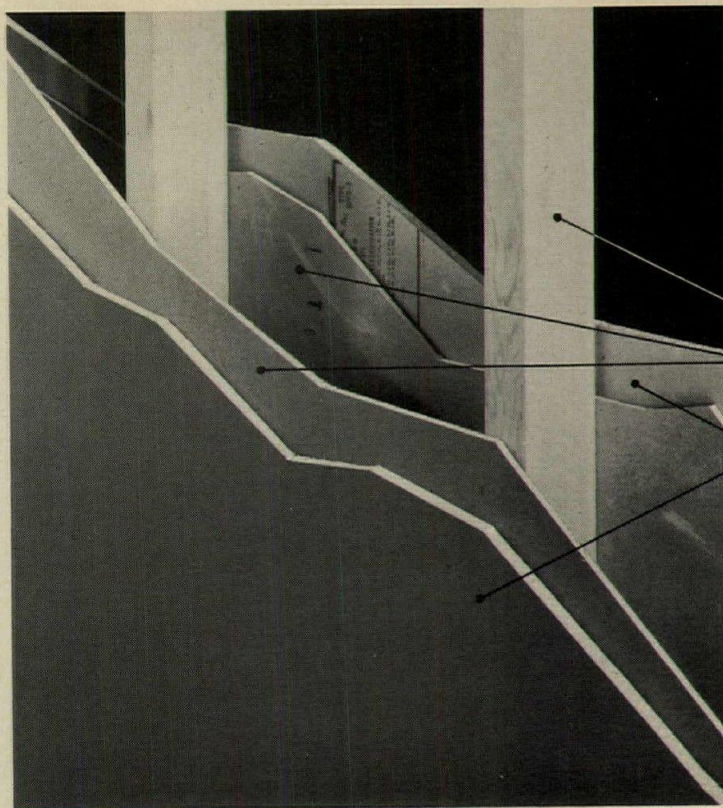
Available in stainless steel at extra cost. Dual height water cooler fountains also available. Write for detailed information. Haws Drinking Faucet Co., 4th & Page Sts., Berkeley, Ca. 94710.



For more data, circle 82 on inquiry card

It's Georgia-Pacific's gypsum sound control system. It gives you a one-hour fire rating (Test UL No. U312). An STC of 45. It reduces wall thickness by $\frac{3}{4}$ ". *And it costs \$36 per thousand sq. ft. of wall area less than a $\frac{1}{2}$ " wood fiber sound control system.

Just apply $\frac{1}{4}$ " incombustible gypsum sound deadening board over a wood framing system (2" x 4" studs, 16" O.C.). Then apply $\frac{1}{2}$ " G-P Firestop® gypsumboard or Firestop® Eternawall™ vinyl surfaced gypsumboard to the sound deadening board. And that's it! Call your G-P representative today.



2" x 4" studs, 16" O.C.

$\frac{1}{4}$ " incombustible gypsum sound deadening board

$\frac{1}{2}$ " Firestop gypsumboard.

This sound control system costs \$36 less* than a wood fiber system.

Georgia-Pacific

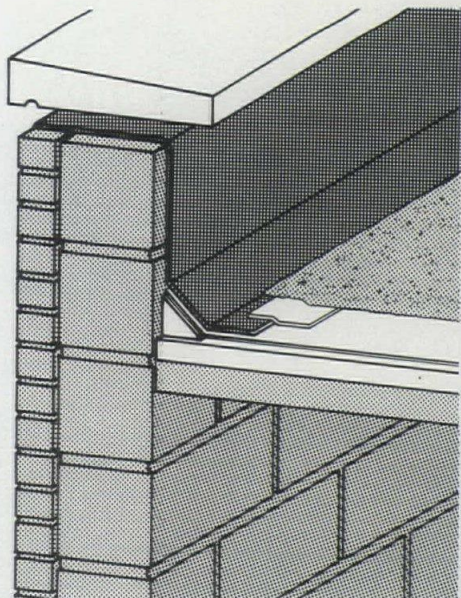
The Growth Company

Gypsum Division, Portland, Oregon 97204



For more data, circle 83 on inquiry card

continued from page 167



Flexseal. The name tells you why this vinyl flashing is so good.

We didn't name our vinyl flashing by tossing a coin.

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Flex. The ability to expand and contract to compensate for roof movement.

Seal. The ability to maintain watertightness over the years that a building settles. Without cracking, splitting or drying out.

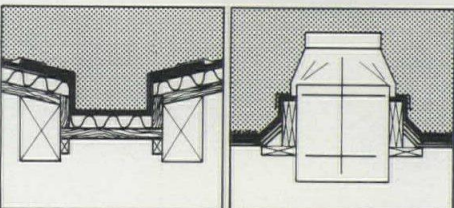
Flexseal. A vinyl flashing that over the last ten years has meant fewer call backs for roofers. Less maintenance. And increased life.

And Flexseal vinyl flashing is just one of several vinyl products from B.F. Goodrich for moisture and thermal protection.

BFG also makes vinyl expansion joint covers, in sheet and extruded form. Waterstops and membrane waterproofing. Through-wall flashing. Masonry control joints.

They're all modern, job-proven products that live up to the promise of their name.

For a free 24-page booklet on all the Flexseal vinyl systems, write the B.F. Goodrich General Products Company, Dept. 0445, Akron, Ohio, 44318.



For more data, circle 85 on inquiry card

◆ For more data, circle 84 on inquiry card

VINYL STEEL CONCRETE / The manufacturer states that this vinyl-steel concrete will adhere to wood, concrete, brick, steel, aluminum, fiberglass, even glass—and is 100 per cent waterproof. It is said to have four times the strength of ordinary concrete, and is highly resistive to chemicals. Suitable for all plant environments. ■ Okun Co., Inc., Jamaica, N.Y.



Circle 317 on inquiry card

STACKING OVERHEAD DOOR / Because of the patented stacking feature, the door is said to eliminate the need for overhead track. Working on hinged bi-fold sections and riding on nylon tire ball bearings, the door is made of aluminum and offered in many styles and sizes for standard openings. *Verti-Pak* can be operated manually or it can be motorized. ■ Bernardi Bros., Inc., Harrisburg, Pa.



Circle 318 on inquiry card

INDOOR-OUTDOOR BENCH / Either freestanding or floor-mounted, this bench has two aluminum stanchions which support five interchangeable Iroko or white oak slats, treated for weather resistance. ■ JG Furniture Co., Inc., Quakertown, Pa.



Circle 319 on inquiry card

PUSHBUTTON LOCK / The combination lock is said to replace keys in dead bolt and spring latch door lock models. Combinations are changeable in 30 seconds, and thousands of combinations are possible according to the company. ■ Simplex Security Systems, Inc., Collinsville, Conn.



Circle 320 on inquiry card

CONDIMENT TABLE-RECEPTACLE / The design provides space for both the preparation-consumption of self-service food and its disposal into an optional litter receptacle with removable top and hidden poly bag. Available in standing height, two widths and a variety of glossy or matte colors. ■ Arcon Furniture, Los Angeles, Cal.



Circle 321 on inquiry card

PRESSURE-SENSITIVE TILE / A pressure-sensitive asbestos felt sheet system for installation of ceramic tile is said to eliminate the need for mastic, thin-set mortar or epoxy adhesive. The 4-ft sq sheets may be used with glazed tile and can be applied over plywood, concrete, existing tile and other sound floors. Pre-grouted tile sheets may be used. ■ American Olean Tile Co., Lansdale, Pa.



Circle 322 on inquiry card

Thinking about a waste collection system?

Thinking about a pneumatic waste collection system?

Think about:

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designers of

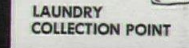
Pneumatic Transport & Waste Collection Systems for handling soiled linen or trash (or both).

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Space saving TRANS-VAC Systems utilize idle wall and ceiling space for placement of chutes and conveyor pipes. Piping may also go above or below ground, over roof tops, along outside walls and into basement area. Separate collector hoppers located in laundry room and trash collection area automatically deposit loads of transported material on signal from central control panel.

TRANS-VAC Systems offer completely integrated systems for Pneumatic Transport, Shredding, and Waste Disposal — all fully automatic. Each system individually engineered and backed by 47 years experience in pneumatic conveying and waste disposal technology.

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Congregation Beth El, New London, Conn.; Architect: Paul Rudolph, FAIA, New York, N.Y.; Roofer: H. R. Hillery Company, Groton, Conn.

THE ARCHITECT, METALS AND IMAGINATION

Many critics regard Paul Rudolph as one of the logical heirs to the late Frank Lloyd Wright's professional mantle, and his major projects have clearly influenced the whole range and dynamics of contemporary architecture. As Sibyl Moholy-Nagy once wrote, he has "great courage, comprehensiveness of talent, profound faith in the integrity of the architect's mission."

In conceptual felicity and strength of execution, Congregation Beth El is a notable example of Mr. Rudolph's recent work, and we are indeed gratified that in selecting a metal to sheathe and roof this distinguished building, he chose Follansbee Terne.

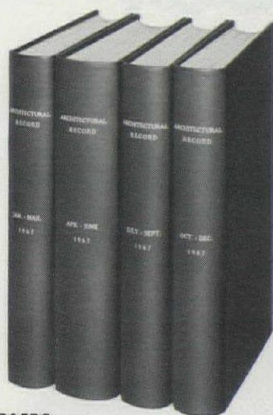
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PROTECTIVE COATINGS / The brochure contains photographs and descriptions of six educational facilities, including grade and high schools, university buildings and adult continuing education centers. The brochure features coatings, ranging from primers to finish systems for steel and masonry which were utilized throughout the projects. ■ Tnemec, North Kansas City, Mo.

Circle 416 on inquiry card

ROOF VENTILATOR / A bulletin describes a unit that combines powered ventilation with smoke and heat venting. Its construction, providing for fused damper opening and continuous operation at elevated temperatures, serves for both normal and emergency ventilation. Designed especially to comply with FIA recommendations for smoke and heat ventilation. ■ Aerovent Inc., Piqua, Ohio.

Circle 417 on inquiry card

TRANSMISSION POLES / The company is offering their new brochure describing transmission and distribution poles made of spun, prestressed, hollow concrete, including dimensional data, weights and bending moments. Also included in this brochure are descriptions of substation and service poles, and spun prestressed piling specified for use as pole foundations in unstable soils. ■ Centrecon, Inc., Everett, Wash.

Circle 418 on inquiry card

DOOR HEATER / A specification sheet documenting the company's door entry heater includes features, specifications, dimensional data and a unit selection chart. ■ Weather-Rite, Inc., St. Paul, Minn.

Circle 419 on inquiry card

PLYWOOD SYSTEMS / Plywood floors for home and factory are described in an updated brochure. Subflooring, underlayment, combined subfloor/underlayment and a glued floor system, including one with a one-hour fire rating, are illustrated in the booklet that also contains data on heavy duty floors for forklift trucks. A table of allowable clear spans is included. ■ American Plywood Association, Tacoma, Wash.

Circle 420 on inquiry card

DUCT CATALOG / The company's high- and low-velocity ATC dual- and single-duct catalog is available describing features, specifications, performance, sound ratings and dimensions in detail. Units are available in sizes ranging from 75 to 5600 CFM capacities. ■ Carnes, Verona, Wis.

Circle 421 on inquiry card

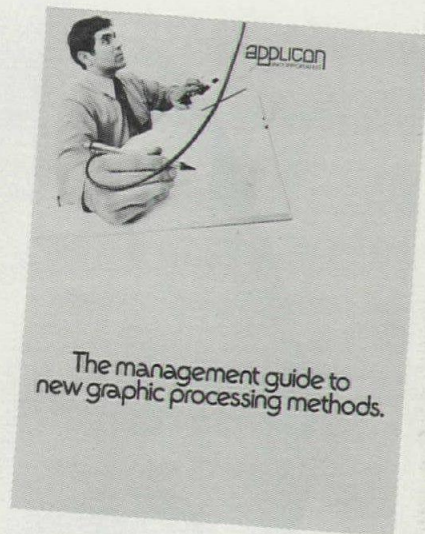
CYLINDER CASTING / Improper procedures employed in the casting of concrete cylinders will produce low and erratic compressive strength results. Approved concrete cylinder casting procedures—including selection of molds; correct sample taking; and filling, handling, and curing of cylinders—are outlined in this publication according to the company. ■ Master Builders, Cleveland, Ohio.

Circle 422 on inquiry card

FUEL-SAVING CONVERSIONS / A six-page brochure that describes the methodology of converting fuel systems to meet changing fuel availabilities in the midst of the energy crisis explains the procedure for converting industrial or large commercial boilers to efficiently burn multiple fuels, often with an increase in boiler capacity. ■ Midwesco Energy Systems, Chicago, Ill.

Circle 423 on inquiry card

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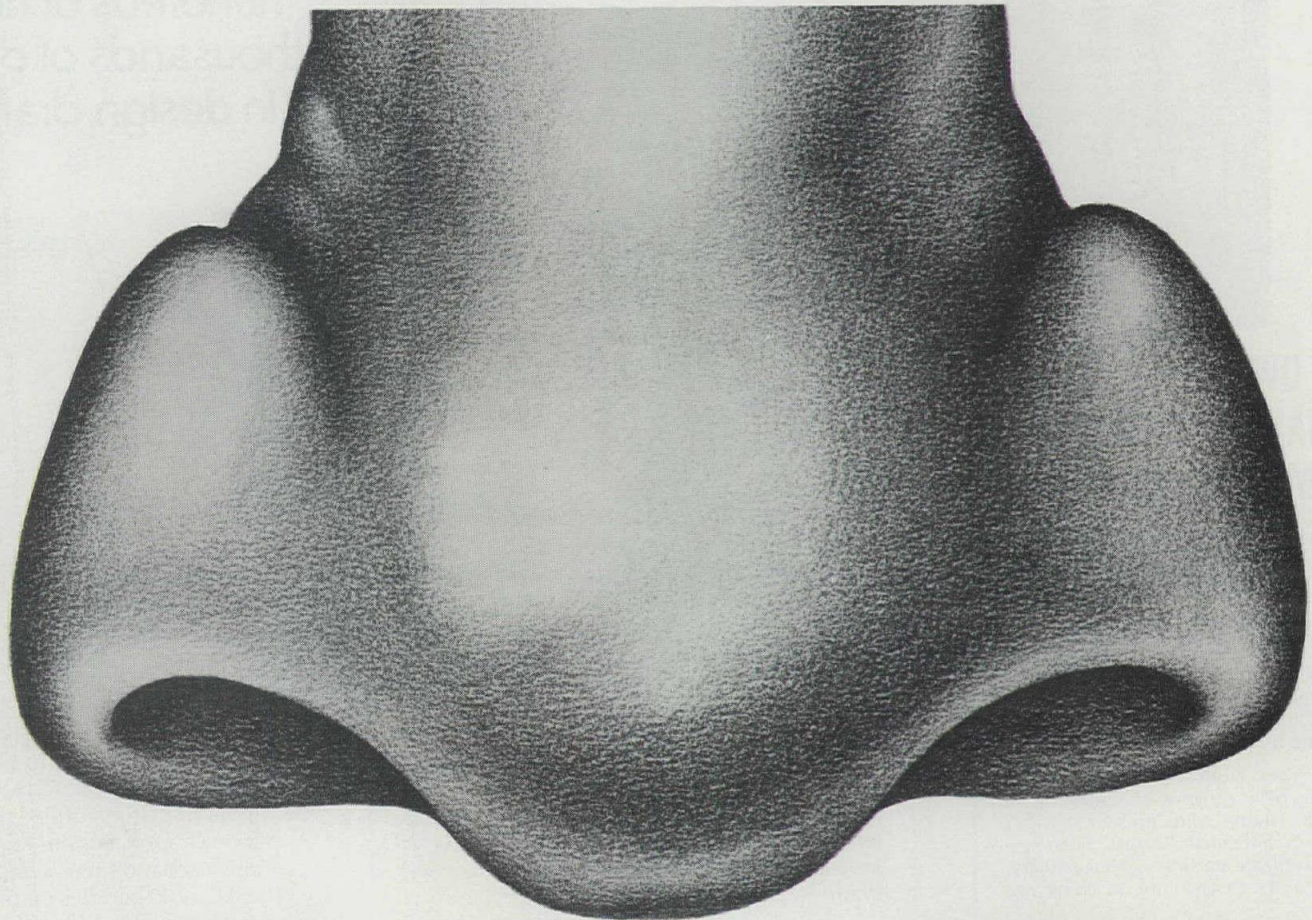
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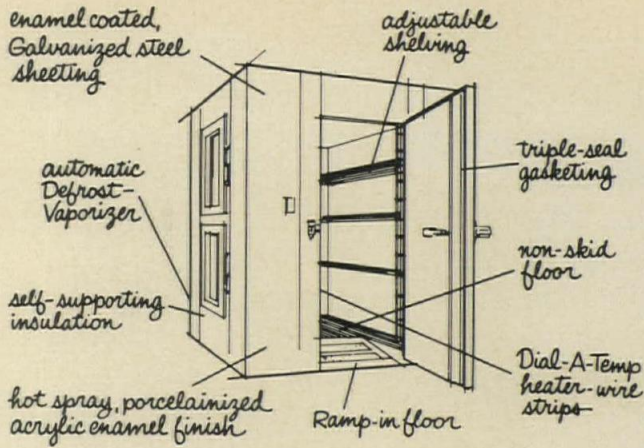
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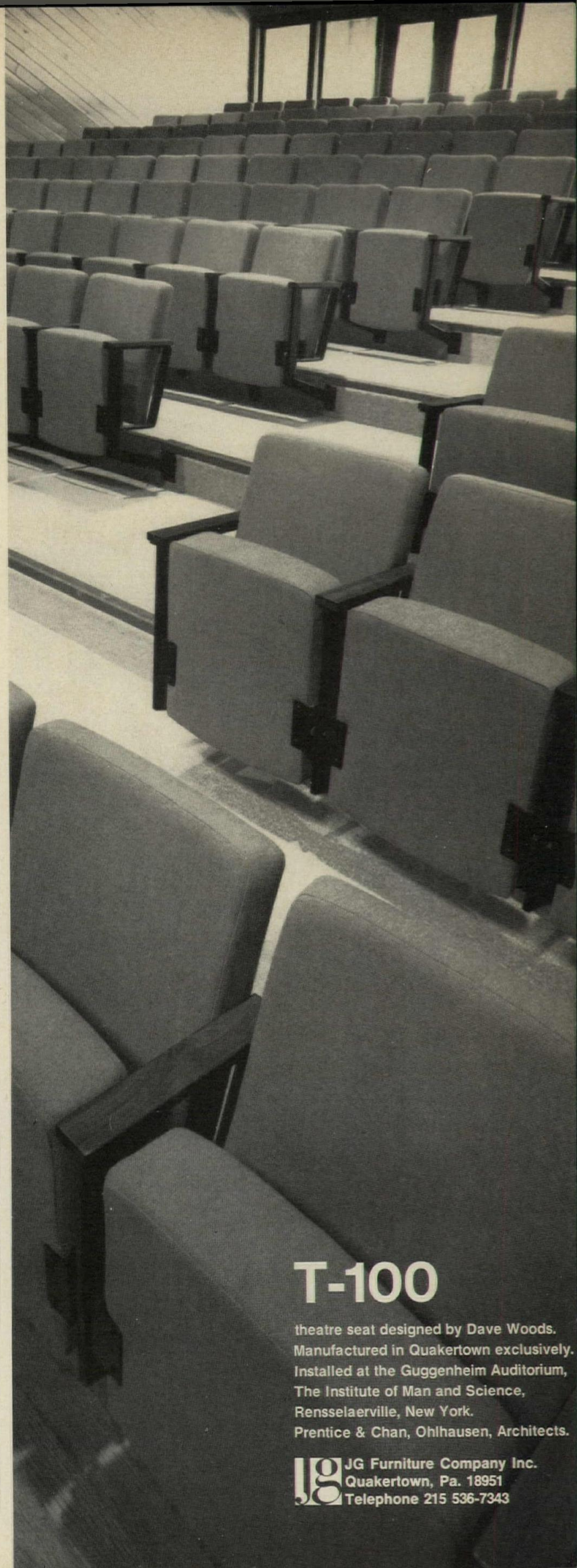
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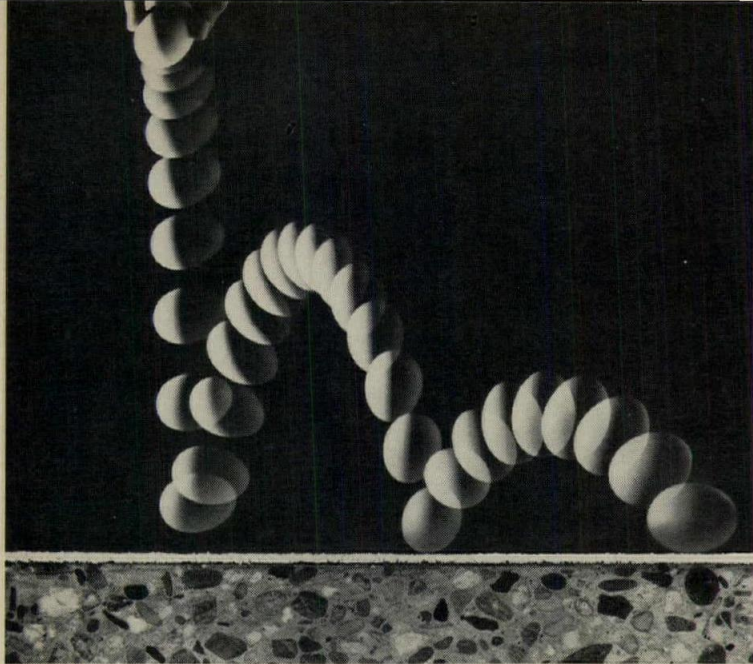
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*Pneumacel is the generic term for pneumatic cellular polymeric cushioning material.

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Pneumacel is the first cushion to combine maximum carpet protection and maximum luxury.

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At the same time, according to consumer panels, it gives carpeting a most luxurious underfoot feel.

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Right now, an increasing number of long-span, open-type parking garages conceived in exposed steel are on the drawing boards — and many have already been constructed. For very good reasons.

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Steel parking structures have low fire risk! A recent extensive survey showed that losses resulting from fire in open-type parking garages were insignificant. Realizing this, many cities are permitting code deviations in allowable heights and areas of unprotected steel parking structures. Also, a recent fire test conducted in an actual parking garage in Scranton, Pa., showed no



damage to bare steel structured members exposed to the fire. Naturally, with little or no fireproofing necessary, construction costs can be cut considerably.

Just how much can you save? Perhaps as much as \$1 per square foot! *Steel goes up faster!* Erection of structures with steel can be faster than other systems. Recently, in Detroit, a three-level, open-deck parking struc-

ture with a total supported frame area of 156,800 sq. ft. was finished in just five and a half months. So, you can lower costs by lessening the time it takes to build!

Steel is more economical! Faster construction also means that you can generate cash flow much sooner. With this factor and all others considered, steel framing often turns out to be the most economical system. And with the benefit of more usable space, it is proving to be the most practical and desirable system, too.

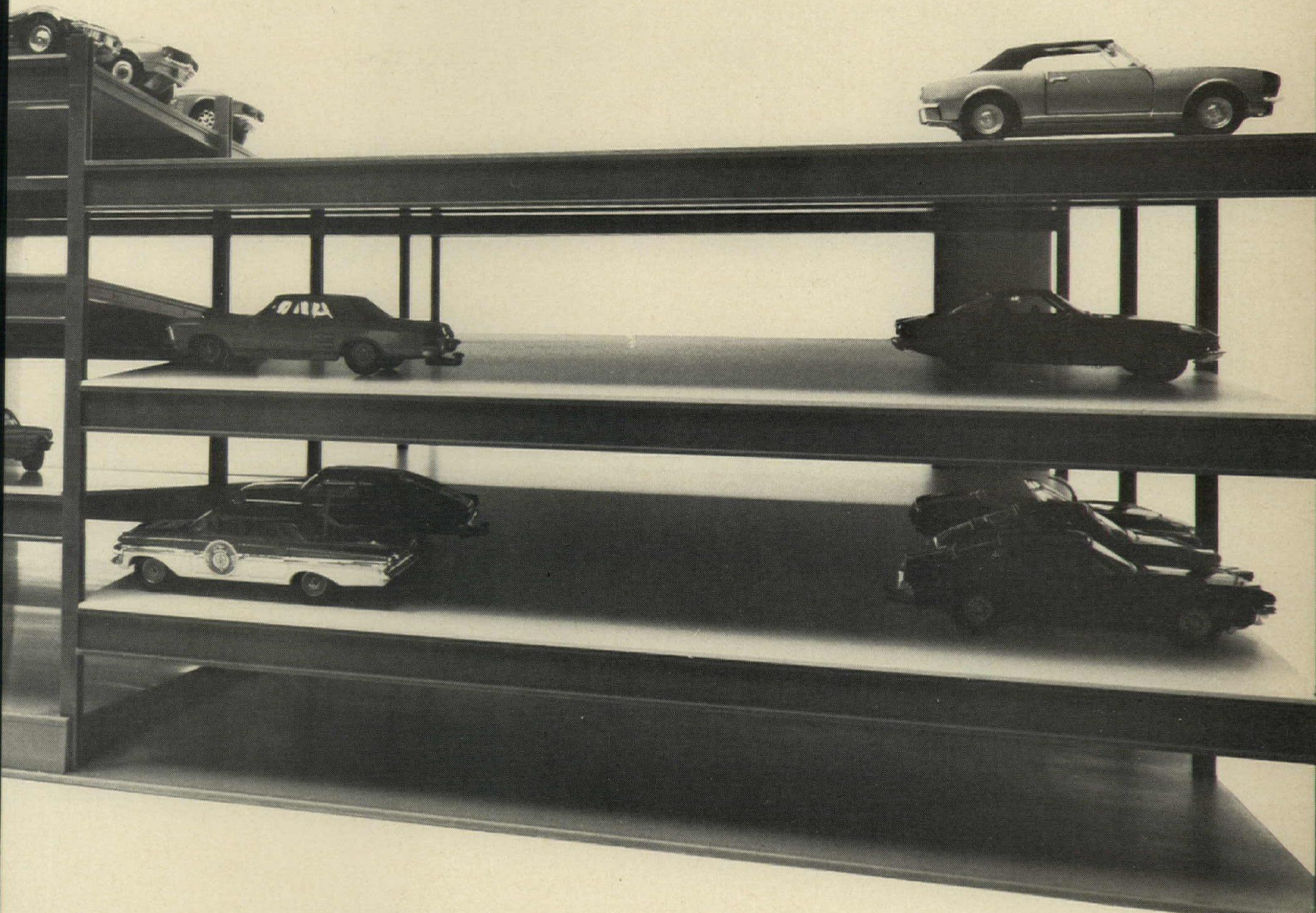
Consider erecting your next parking garage with exposed steel...and

take advantage of the wide open spaces!

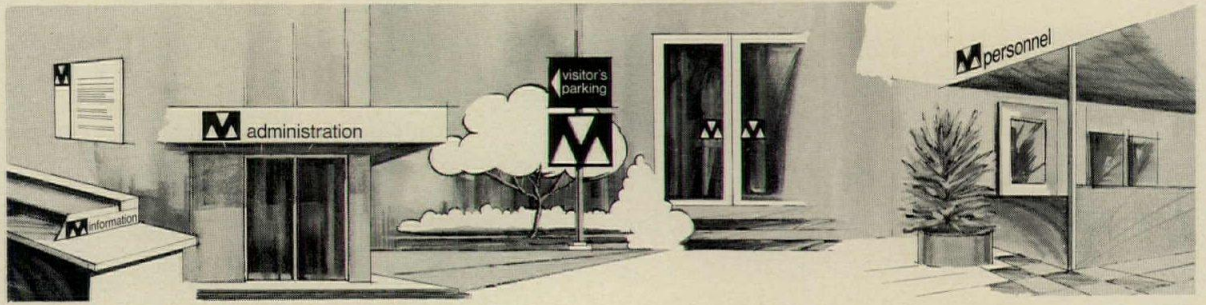
For a copy of our Brochure "Technical Report on Steel-Framed Parking Structures" (ADUSS 27-5264-01) and to find out how we can help you program your next garage, call our nearest sales office and ask for a USS Construction Marketing Representative. Or write to U.S. Steel, Box 86, Pittsburgh, Pa. 15230.



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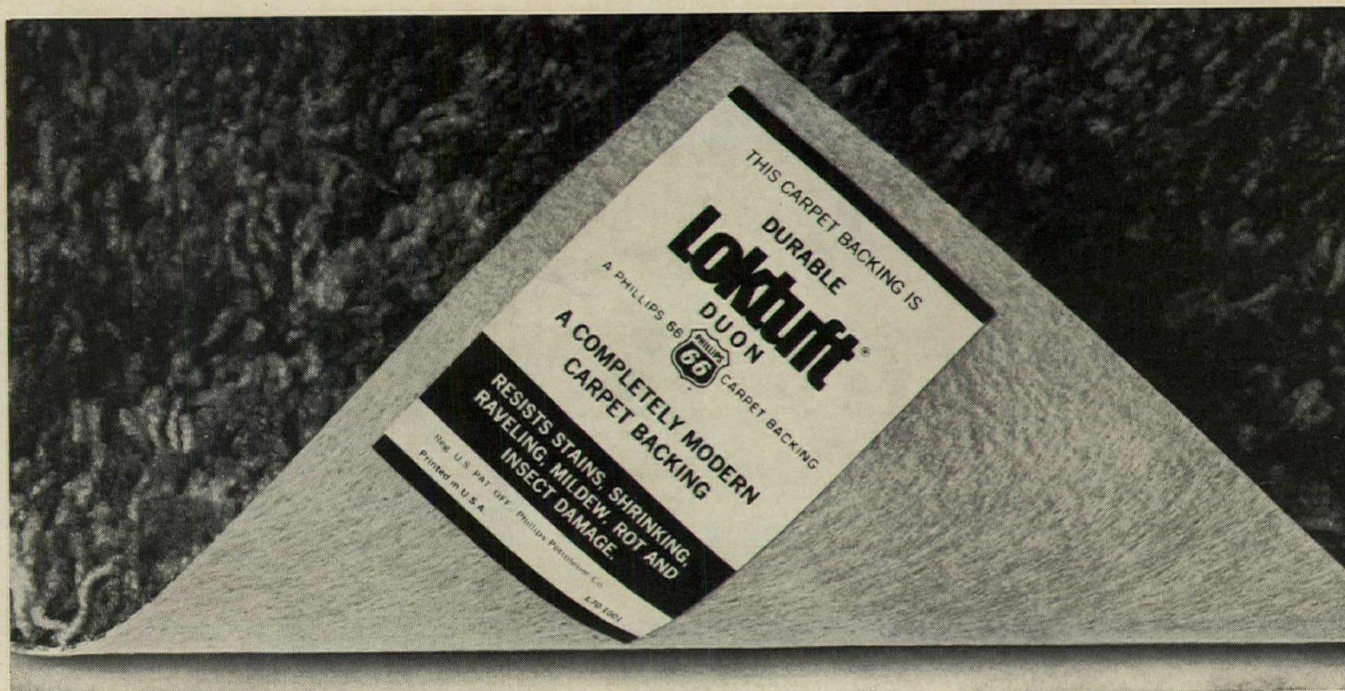
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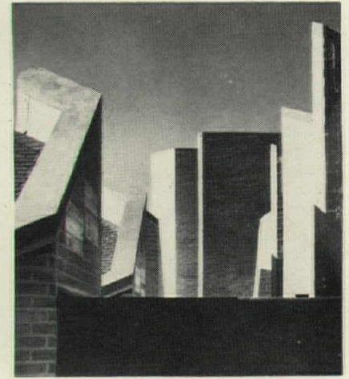
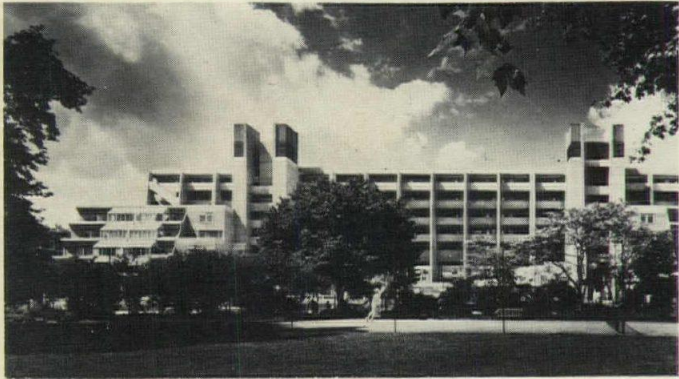
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It has a reputation for superb photo-journalism, for fine detailed drawings and for a positive and creative approach to criticism of significant buildings and the problems of the built environment. Sometimes most of a complete issue is devoted to an interesting complex of buildings or to a single subject. These special issues can become standard works of reference. Years afterwards architects and planners ask us for back numbers on specific subjects. Almost every

month interior design is featured and the current art scene is reviewed. The Review has a long history of encouragement to architectural and planning innovation and is continually searching for new talent. Awards are not usually given to publications in the UK but recently the Italian government's Gold Medal was awarded to The Architectural Review for outstanding international services to the better design of the human environment. The editorial

director in 1971 won the annual Royal Gold Medal of the RIBA (previous holders included Buckminster Fuller, Le Corbusier, Lewis Mumford, Mies van der Rohe, Walter Gropius) and the retiring editor recently won the Royal Society of Arts Bicentenary medal. Recent editorial excellence is, apparently, being maintained as current sales of the Review are higher than ever before in its 76-year history.



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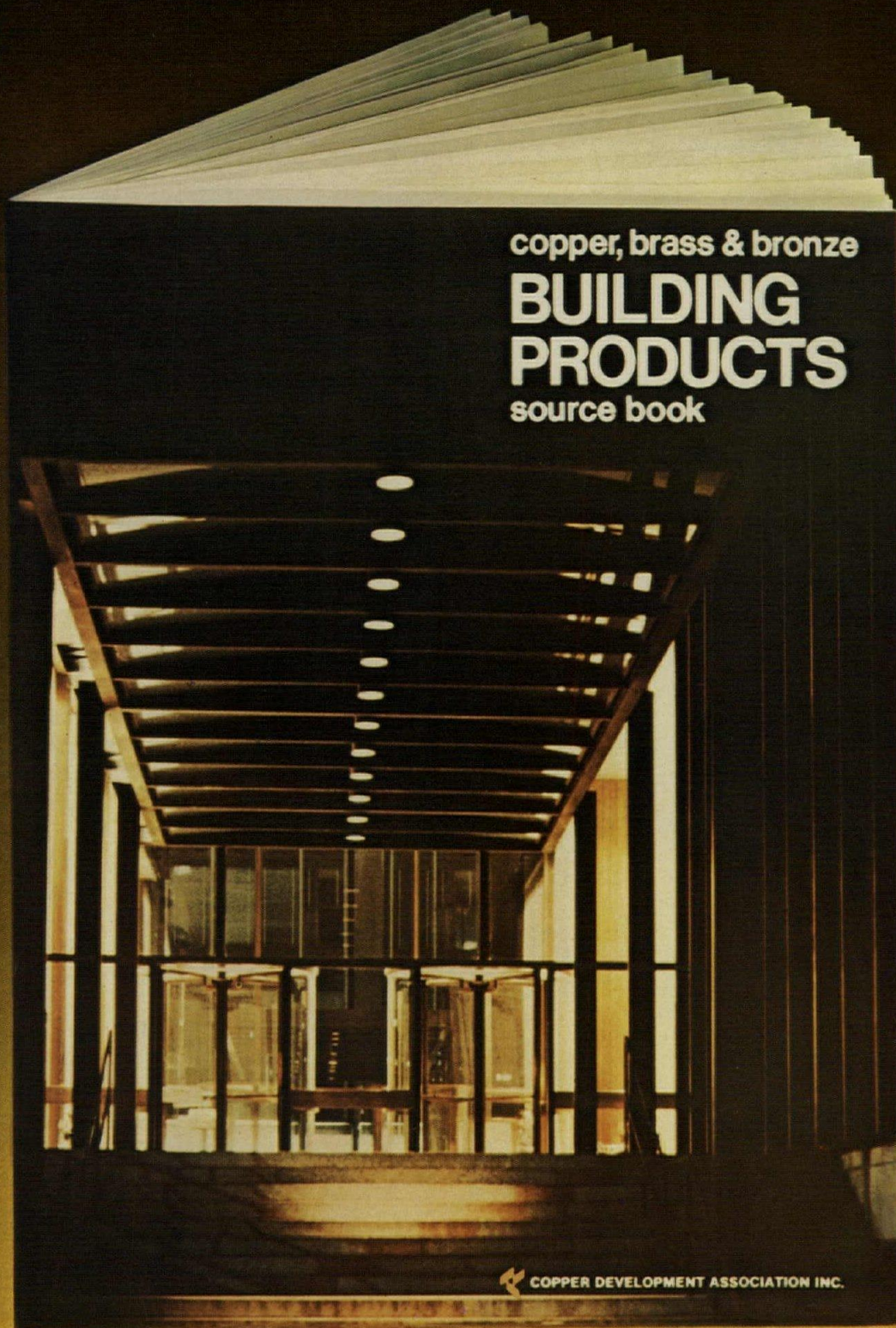


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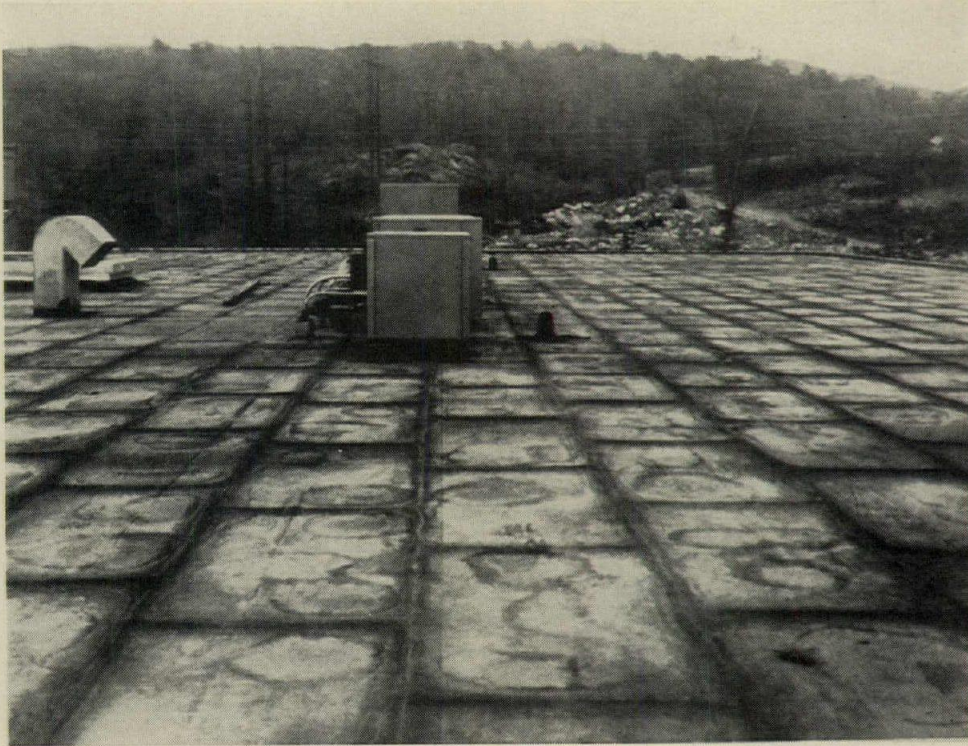
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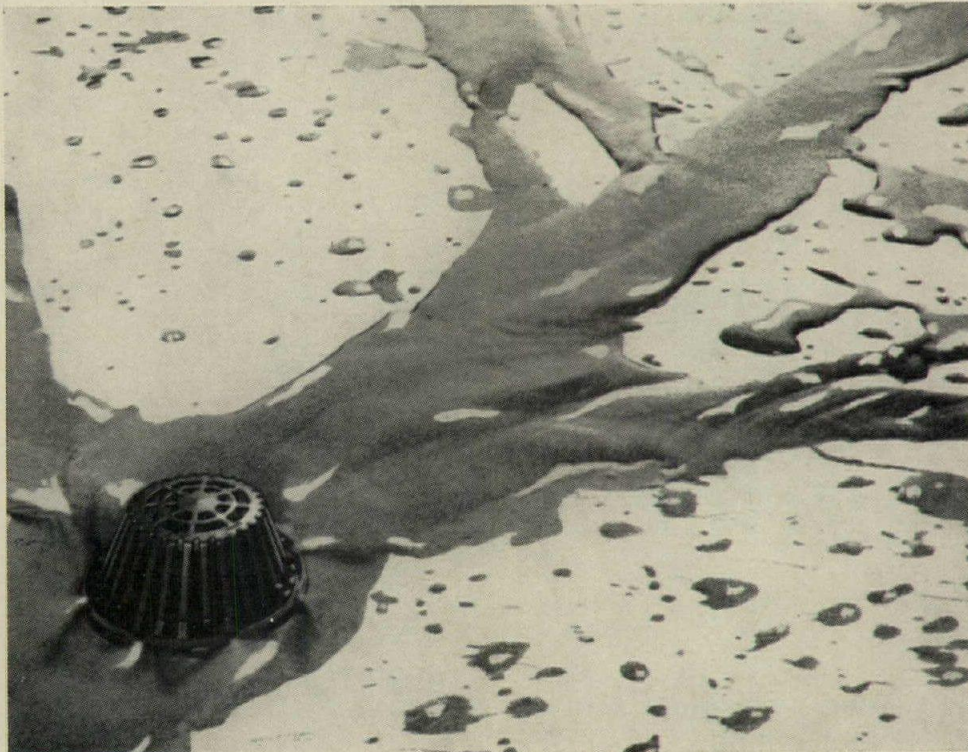
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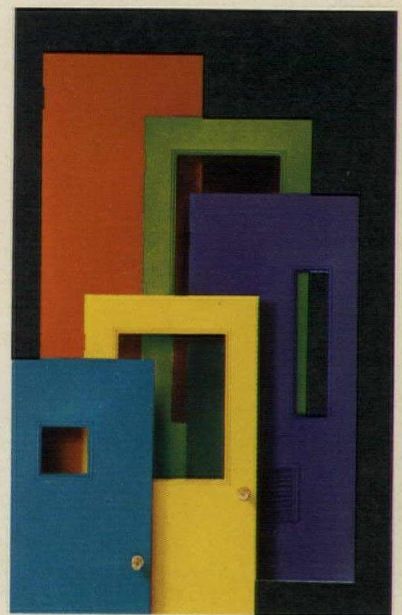
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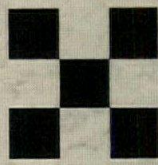
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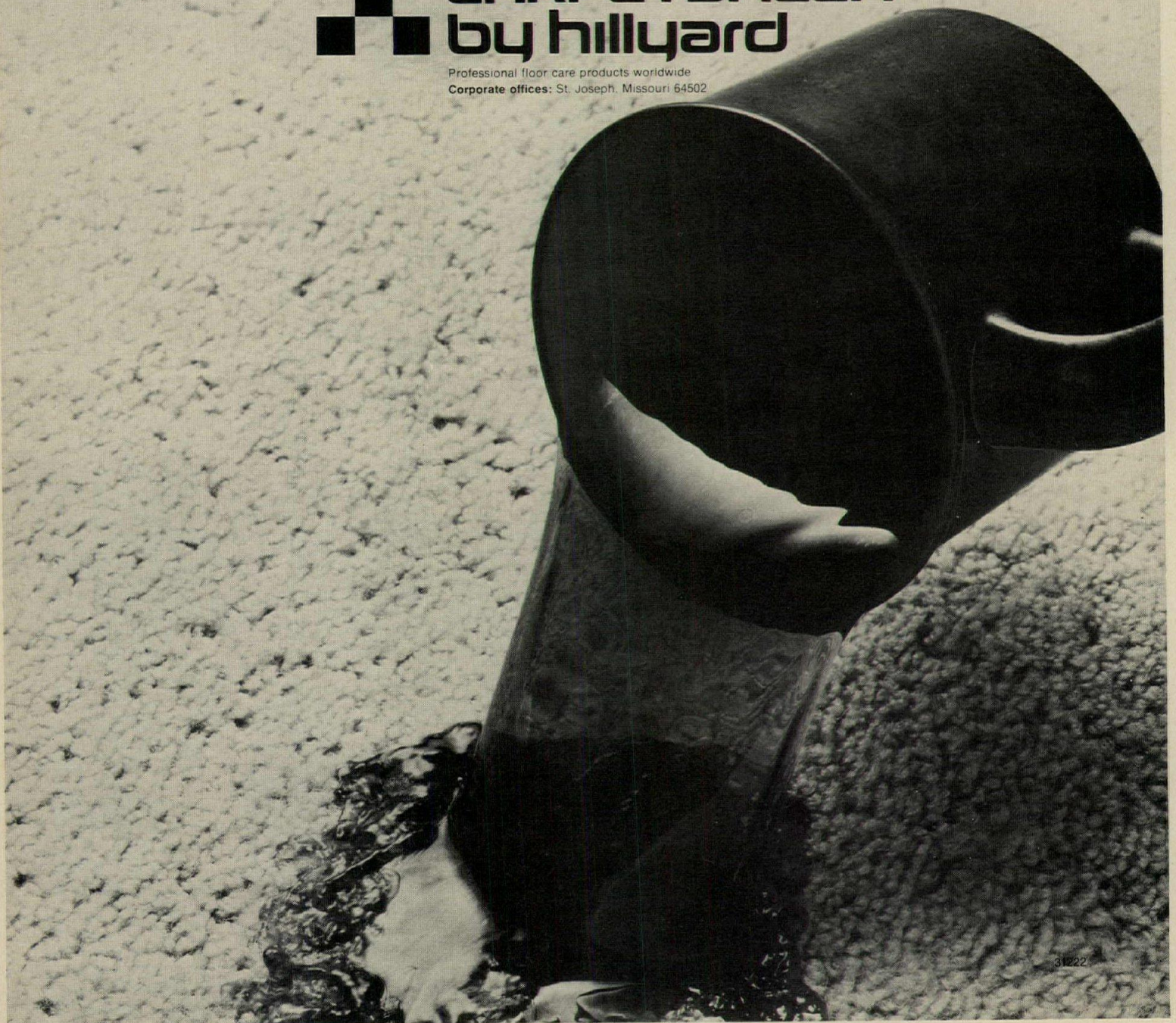
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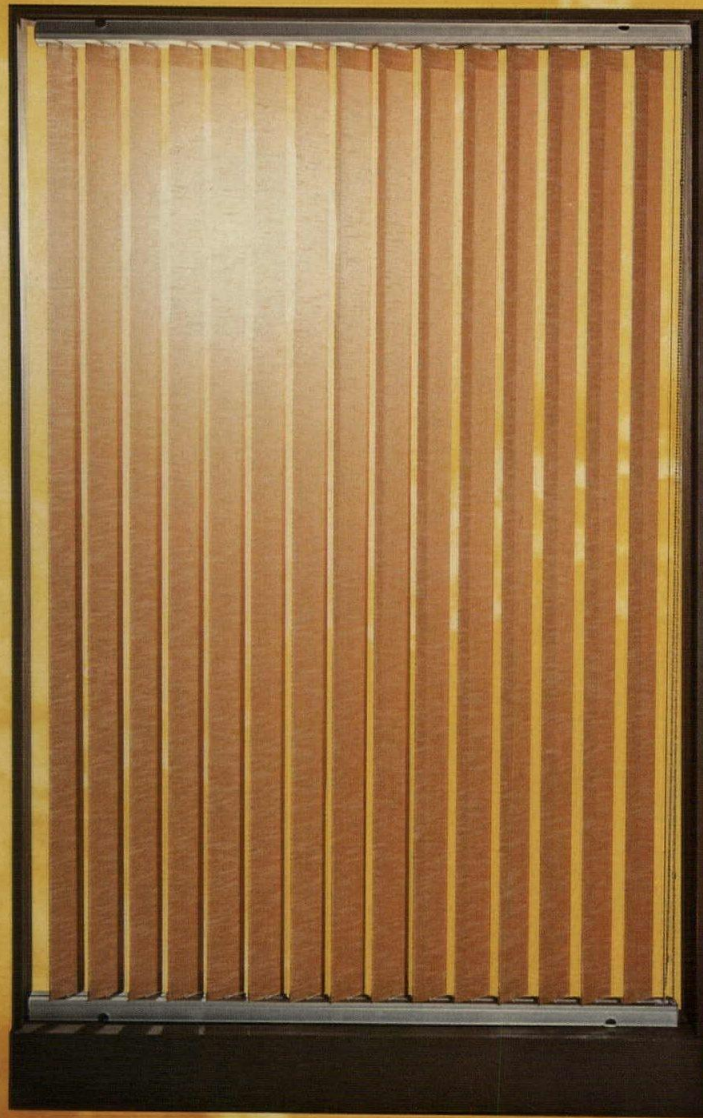
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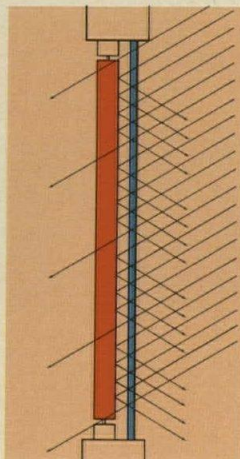


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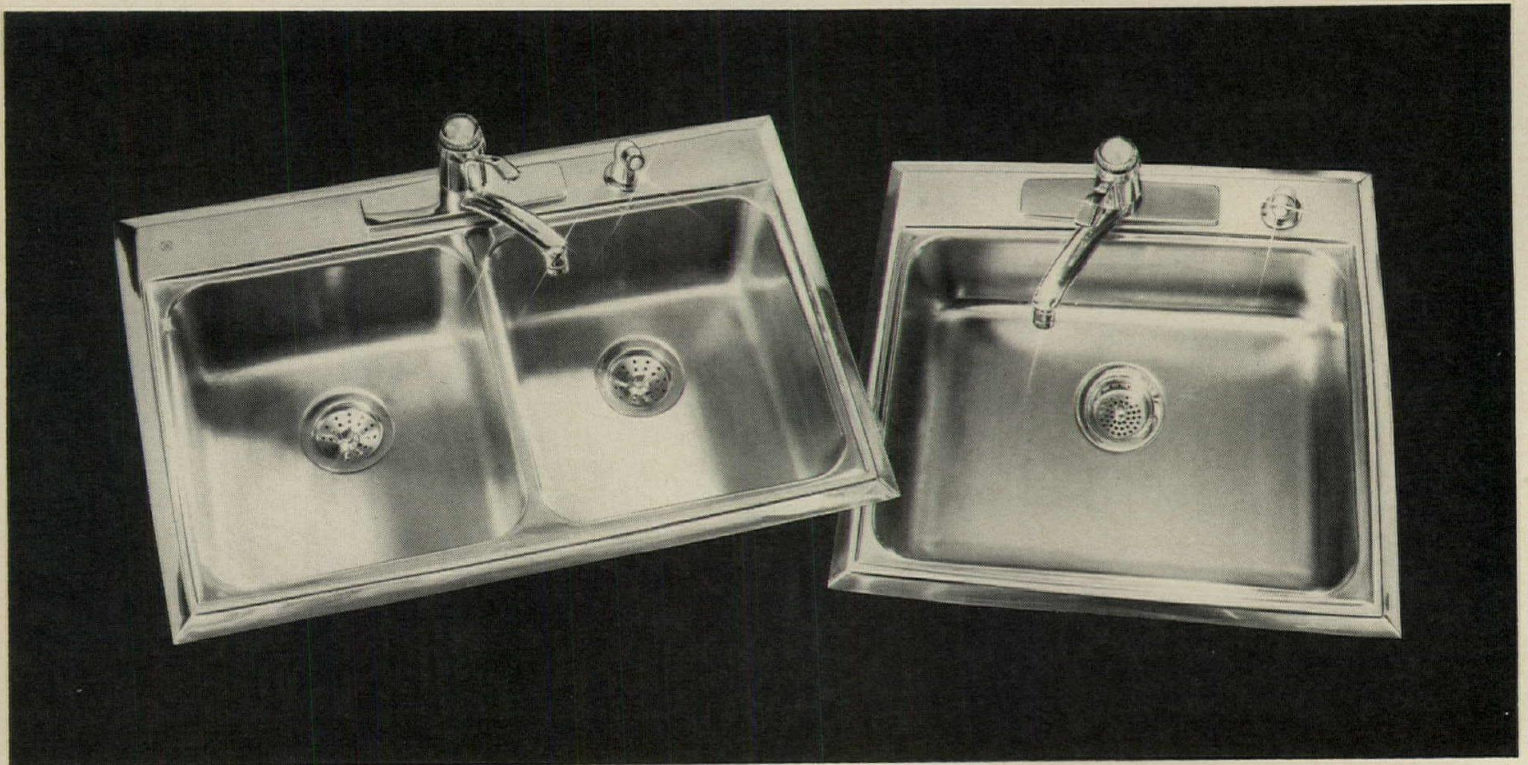
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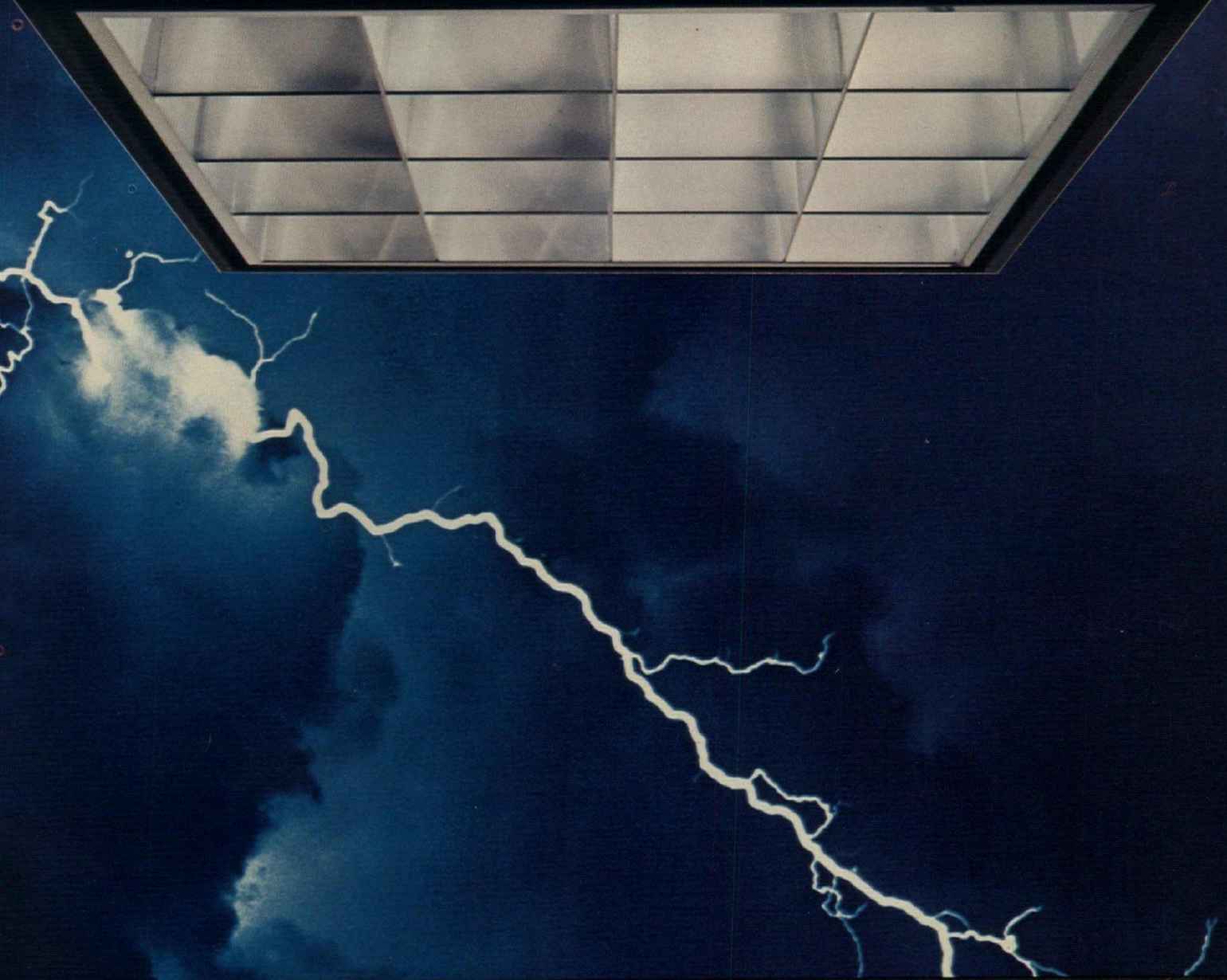
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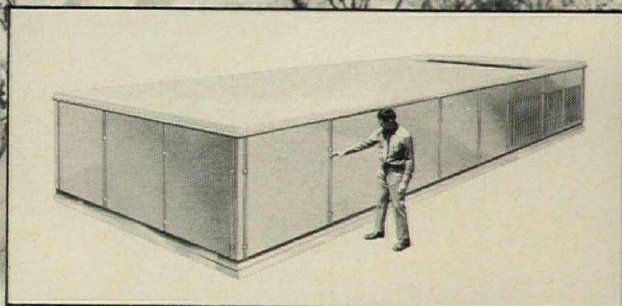
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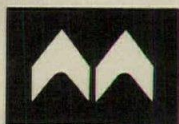
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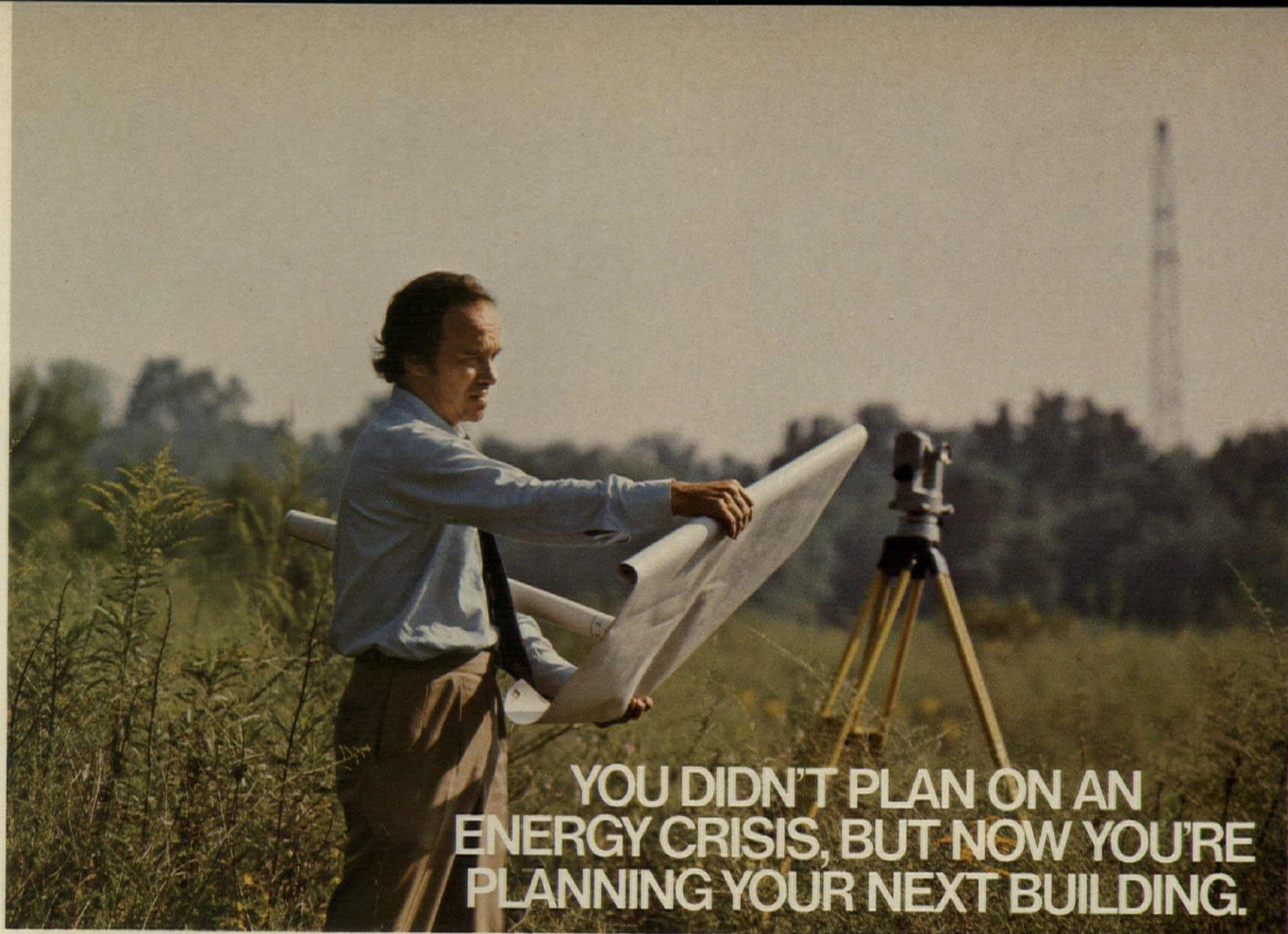


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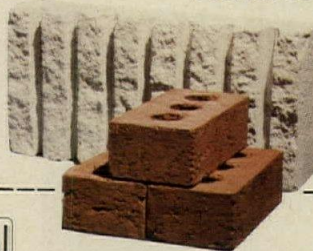
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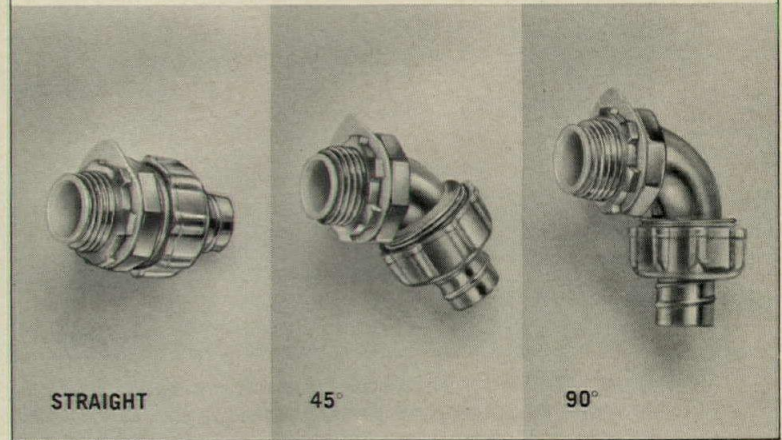
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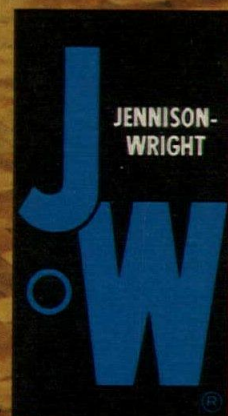
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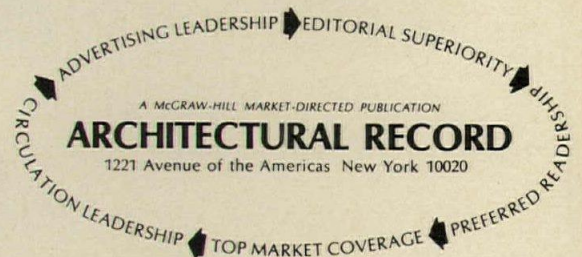
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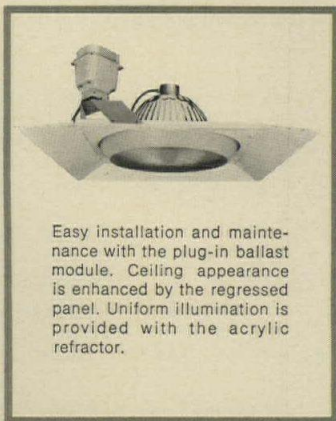


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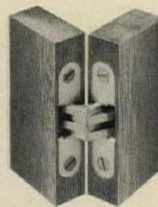


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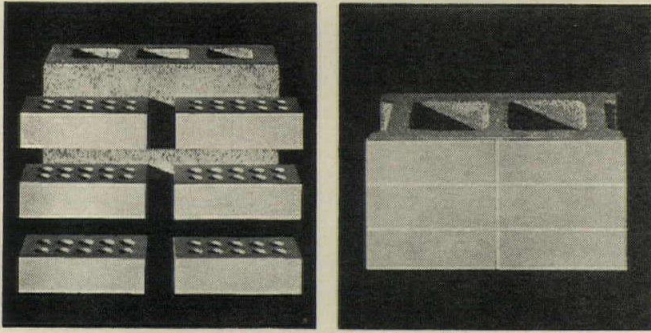


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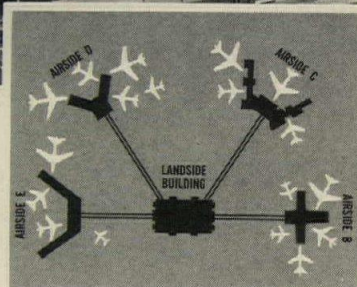
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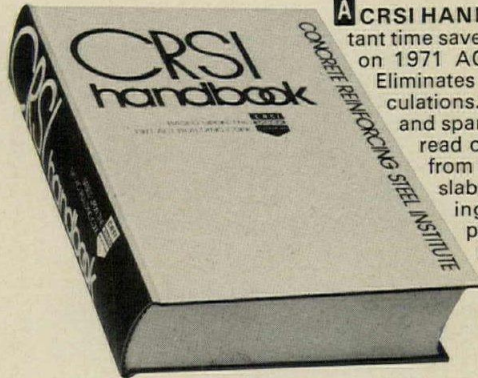
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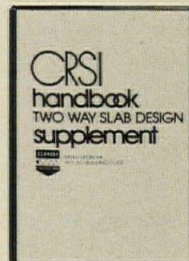
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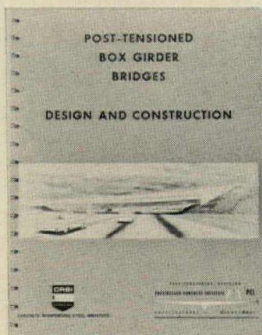
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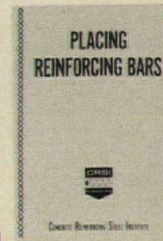


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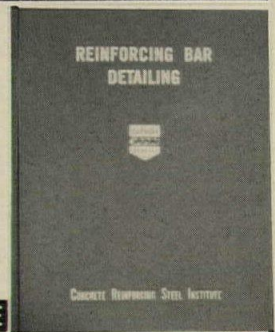


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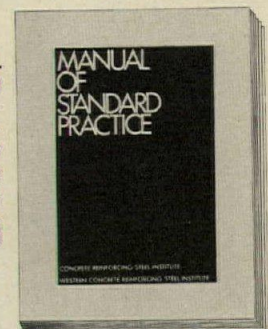
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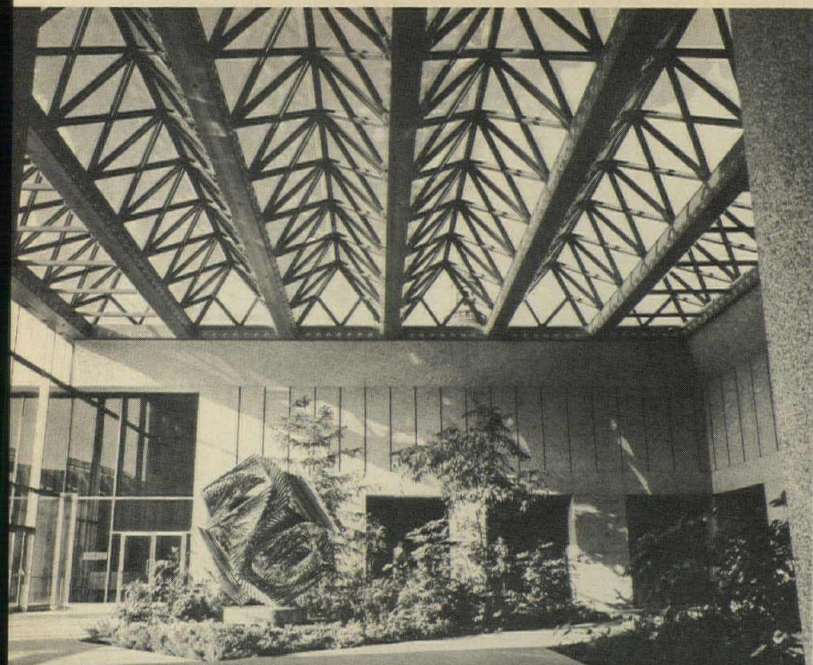
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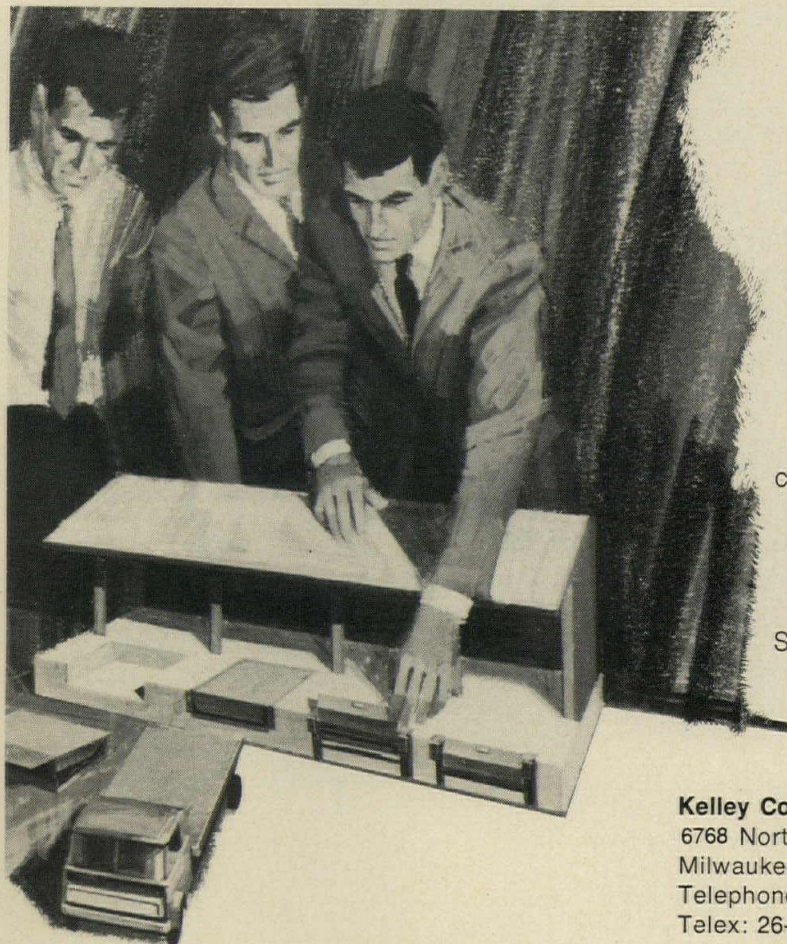


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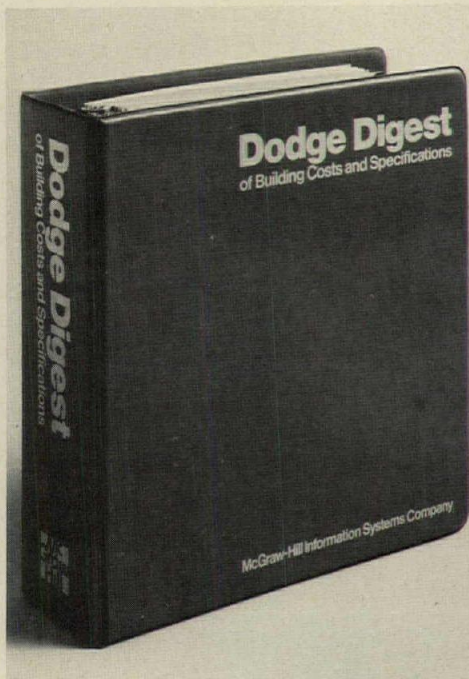
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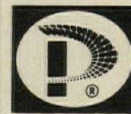
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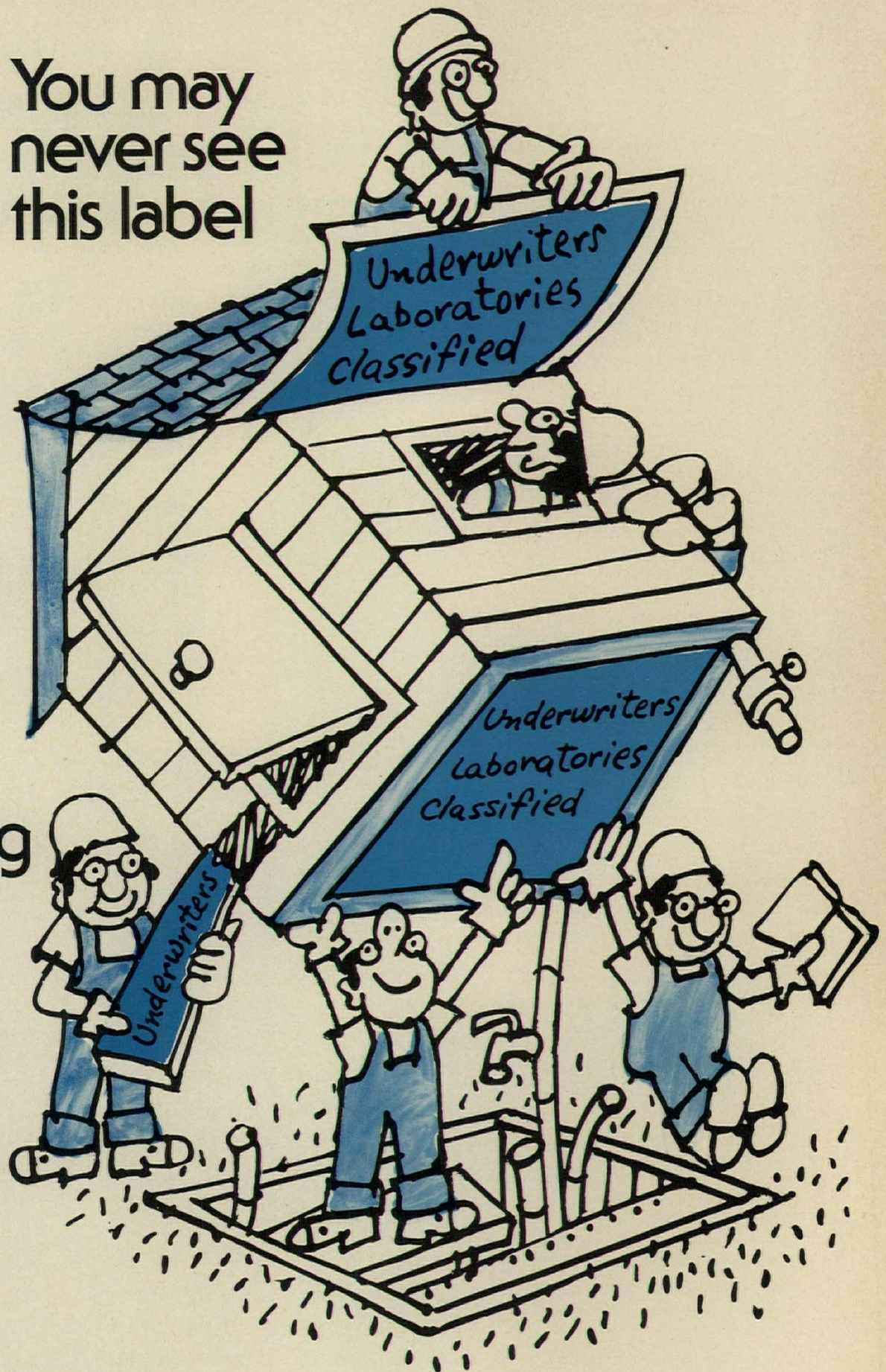
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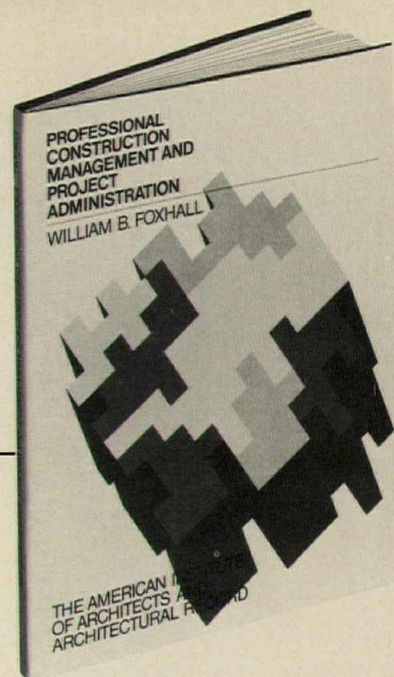
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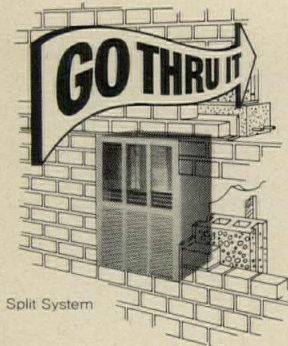
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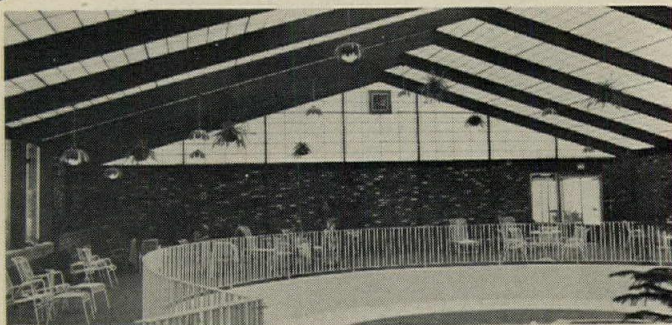
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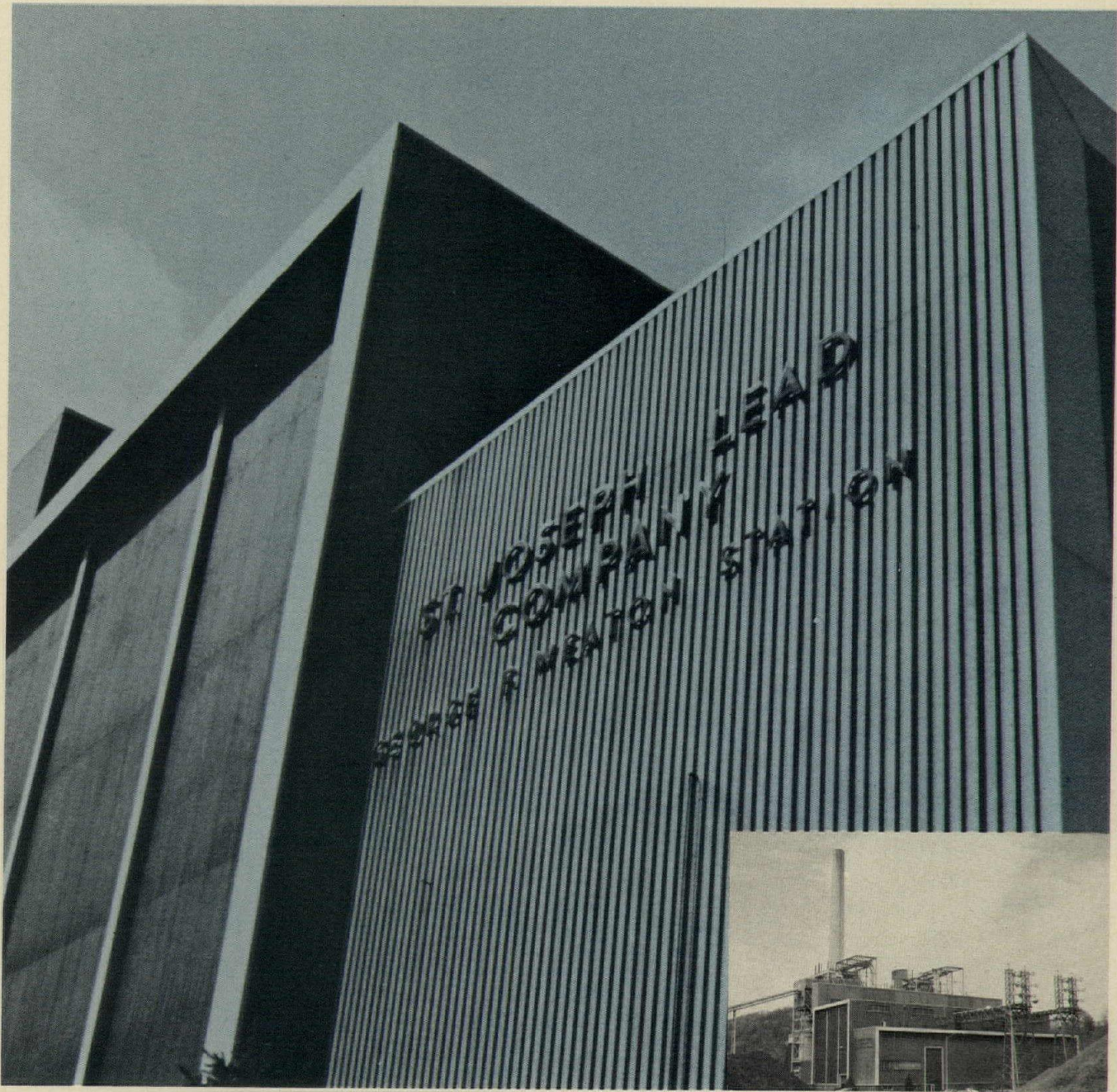
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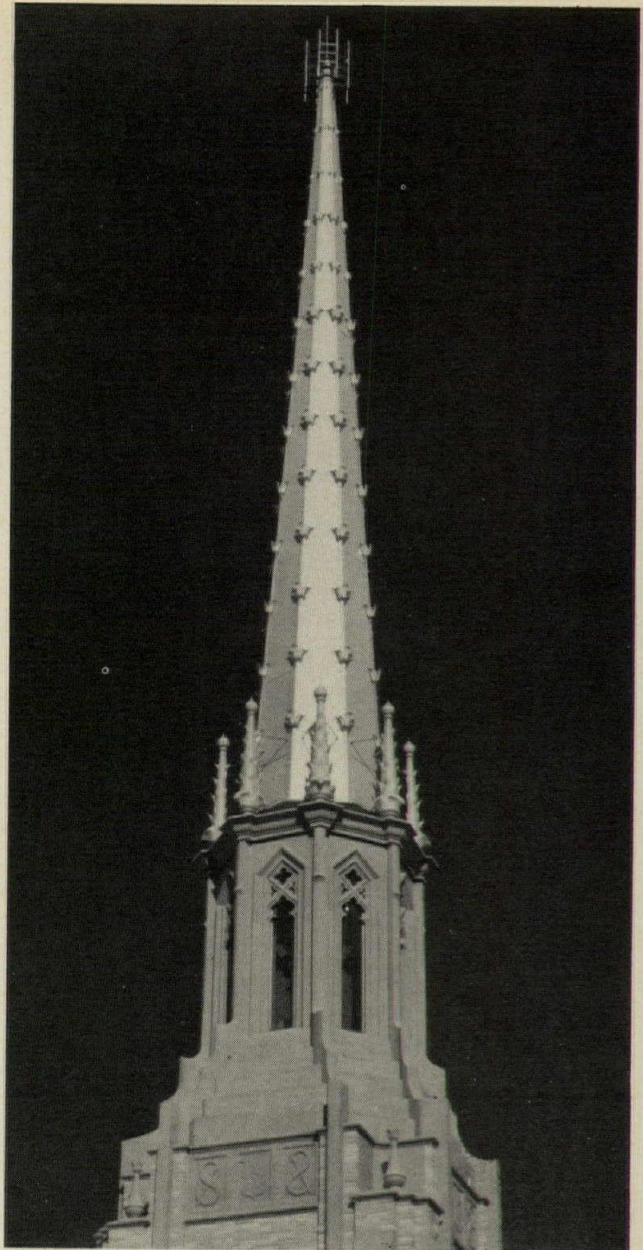
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Architect or Registerable graduate wanted for established architectural firm in small western mountain city. Seeking someone strong in design and client relations for eventual full partnership. Experience in institutional and commercial projects important. Reply to P-3986. Architectural Record.

Architect—Director—New York Architectural Firm—providing Arch/Engr/Interior Design services seeks qualified registered architect (10 years exp.) to direct established branch office in Washington, D.C. Applicant must be interested in all aspects of the profession including business development. Our employees know of this advertisement. Reply to P-3965. Architectural Record.

Supervisory Architect: Wanted to manage a diverse program of research in architecture and habitability. Must have a master's degree in architecture with a background in psychology, computer science, and statistics, and have experience in practice, research, writing, and management. Must be U.S. Citizen. Starting salary \$19,700. Equal opportunity employer. Submit resume to: U.S. Army Construction Engineering Research Laboratory. Attn: CER1-SPA, Box 4005, Champaign, IL 61820.

Architects (R.A.) Architectural Lead Draftsmen. If you have been involved in architectural planning of educational, institutional and industrial facilities for more than 5 years and feel that you have not received the recognition you deserve, then you will want to investigate this ad Today. Comprehensive hospitalization, life and disability insurance, vacation, sick leave and profit sharing plan all company paid. Credit Union privileges. Send resume or contact: Personnel Director, Buchart Associates, 611 West Market Street, York, Penna. 17405. Phone: 717-843-3854. "An Equal Opportunity Employer."

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Executive: Registered architect, 34, willing to re-locate for right leadership position with design or construction firm, is now available to start. Has extensive experience in design—build administration and management, including construction document preparation, constructing buying, client relationships and sales, cashflow, contracts. Can make decisions and motivate people, likes to work. Individual has very good professional experience and personal qualifications for responsible position as a design firm or construction-design company executive. Salary open. Please reply to PW-3842. Architectural Record.

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American Professionals: Our agency has a complete range of Architectural openings. A "low key" approach is used with our client companies. Complete confidence is maintained at all times. All positions 100% Fee Paid. Send resume to 10730 Pacific St., Omaha, Nebraska 68114.

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Creativity in Action—Unique monthly Newsletter, shows how to use techniques for getting more creative ideas and stimulating your imagination for effective and creative action. Sample issues only \$1.00. Satisfaction guaranteed to subscription service includes patented binder and bi-monthly mailings of valuable items to reinforce creative action. Box 272-c, Roslyn, N.Y. 11576.

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456 Acres Interesting—Woodland less than one hour drive New York City. Adjoins town school. Has pond, creek and views. Cluster housing allowed. Can be purchased with low cash and long terms at \$1900 per acre. Holding this land affords possibility of growth in value with tax advantages. Contact owner: James Greenberg, 257 Park Avenue South, New York City.

Small Florida Architectural firm being sought to associate with Mid-west Architects/Planners for a variety of exciting Florida area projects. Replies to give all data pertinent to size and capability of office, and resumes of Principals. BO-3798. Architectural Record.

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