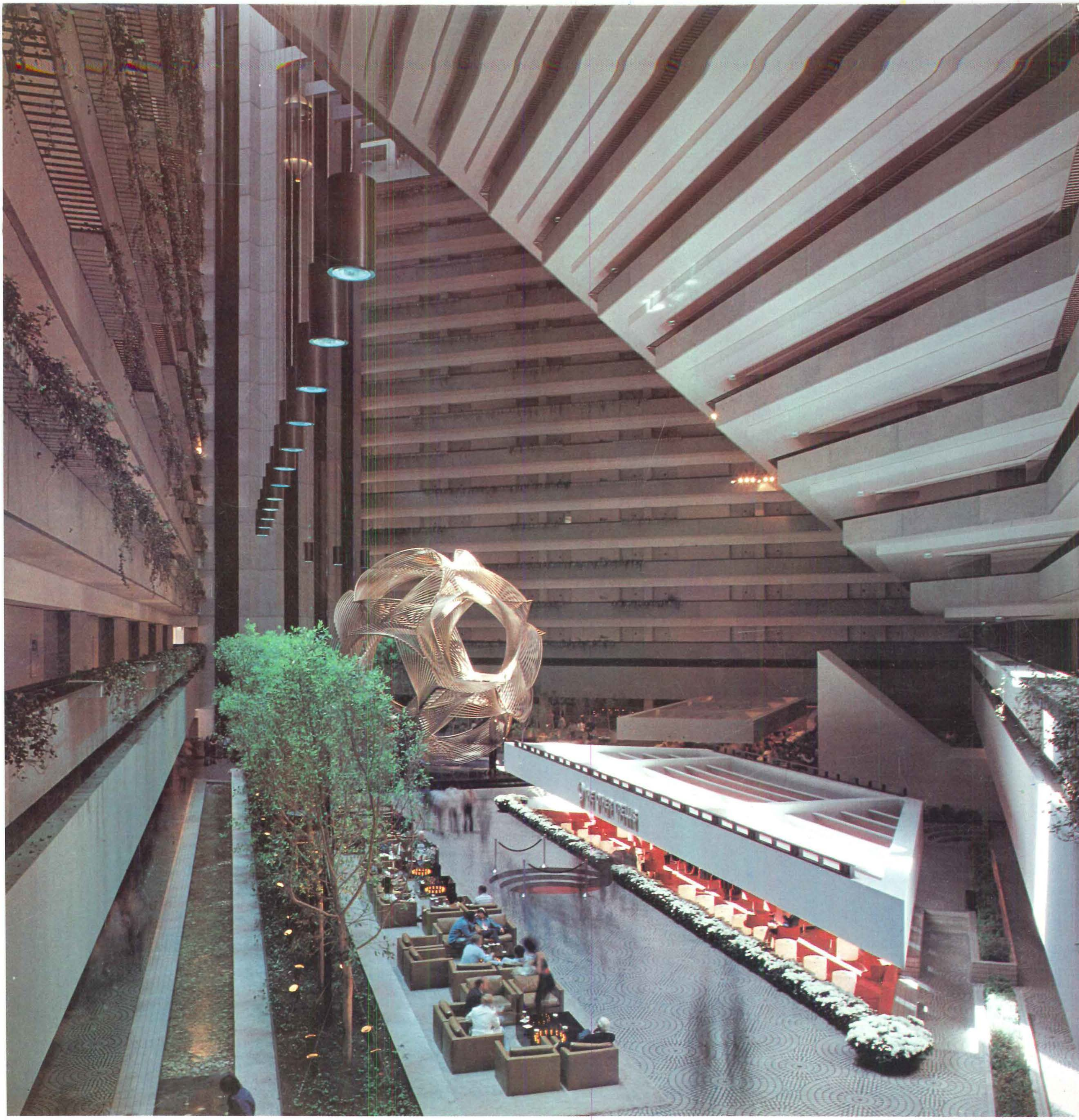


THE LOBBY COURT OF JOHN PORTMAN'S SAN FRANCISCO HOTEL
AN OPEN PLAN ELEMENTARY SCHOOL BY HARDY HOLZMAN PFEIFFER ASSOCIATES
ENVIRONMENTAL RESEARCH LABORATORIES IN MIAMI
HOUSES BY MLTW/MOORE-TURNBULL AND ROBERT A. M. STERN AND JOHN S. HAGMANN
BUILDING TYPES STUDY: HOSPITALS

FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

SEPTEMBER 1973 **9** A McGRAW-HILL PUBLICATION THREE DOLLARS PER COPY

Keene not only supplies interior products.

We also combine them into modular systems.

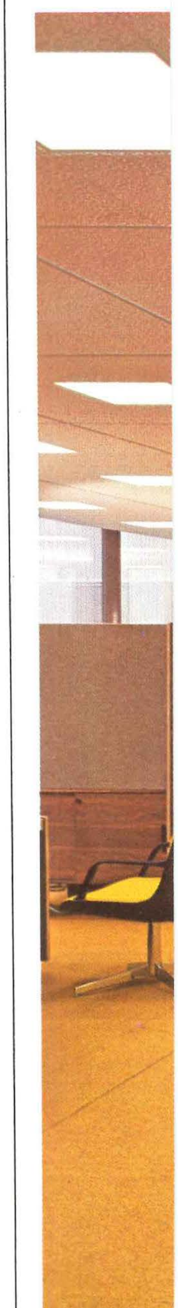
Costly delays, delivery problems, time-consuming details—these are some of the problems you face when you call in multiple suppliers and contractors to install interior products.

Keene decided there must be a better way. We developed a modular interior systems concept. In our Spec 100 package, for example, lighting and acoustical control are supported by an aluminum grid system that utilizes the slimmest air handling device on the market. Other Keene interior systems incorporate ceiling tile, lighting, air handling, movable partitions, acoustical control—all interdesigned by Keene. What's more, we don't just supply the system... we can also assure single-source responsibility for total job performance, with all work done under a single invoice.

Keene knows interior systems like nobody else because we make the products that go into them. Our interior lighting divisions make a full range of overhead fixtures, including new high-value lines of static, air handling and heat exchange troffers. Our Accesso™ ceiling system accommodates a wide variety of acoustical materials. And our movable partitions, all designed for snap-in installation on a single framing system, enable you to rearrange office space flexibly.

Keene's systems approach is catching on. Our Spec 100 system has gone into commercial buildings like the Detroit & Northern Savings & Loan. And other interior systems have proved especially useful for elementary, high school and college applications.

For details on interior systems, write Keene Corporation, Interior Products & Systems Division, U.S. Route #1, Princeton, N.J. 08540. For data on products, please circle Reader Service numbers.



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CORPORATION

345 Park Avenue, N.Y., N.Y. 10022

We've just begun to grow.

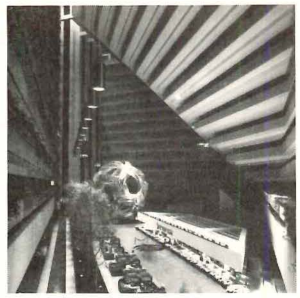
Spec 100 system **50;** *movable partitions* **52;** *custom lighting* **61;** *ceiling tile and board* **62;** *fluorescent fixtures* **63.**

In the Keene Spec 100 system shown here, air, light and acoustical functions are interdesigned in architecturally styled, self-contained modules. (Detroit & Northern Savings & Loan Association, Hancock, Mich. Architects: Tarapata, MacMahon, Paulsen Corporation, Bloomfield Hills, Mich.)

In addition to Spec 100, Keene can provide other interior systems, as well as individual components. Our ceiling suspension systems feature easy access. Keene movable partitions are available in many panel materials and colors. And as a major lighting manufacturer, we can provide every standard commercial fixture, or even help you individualize special lighting.

AN OFFICE PARK NEAR DENVER

GREENWOOD PLAZA, Englewood, Colo.—This is one of three main buildings of similar design that set the esthetic level of this campus-like office park. The 134-acre site also includes four other buildings completed three more under construction for a diversity of tenants. Dover Elevators are used exclusively. DEVELOPER: The John Madden Company, Denver. ARCHITECTS: Kirkham-Michael & Associates, Omaha. Elevators and dumbwaiters installed by Dover Elevator Company, Denver.



Cover: Regency Hyatt Hotel
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Architect: John Portman
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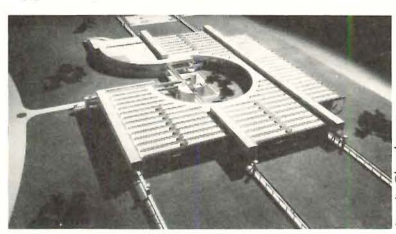
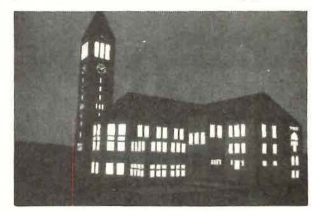
THE RECORD REPORTS



Louis Checkman

ARCHITECTURAL BUSINESS



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FEATURES

BUILDING TYPES STUDY 452

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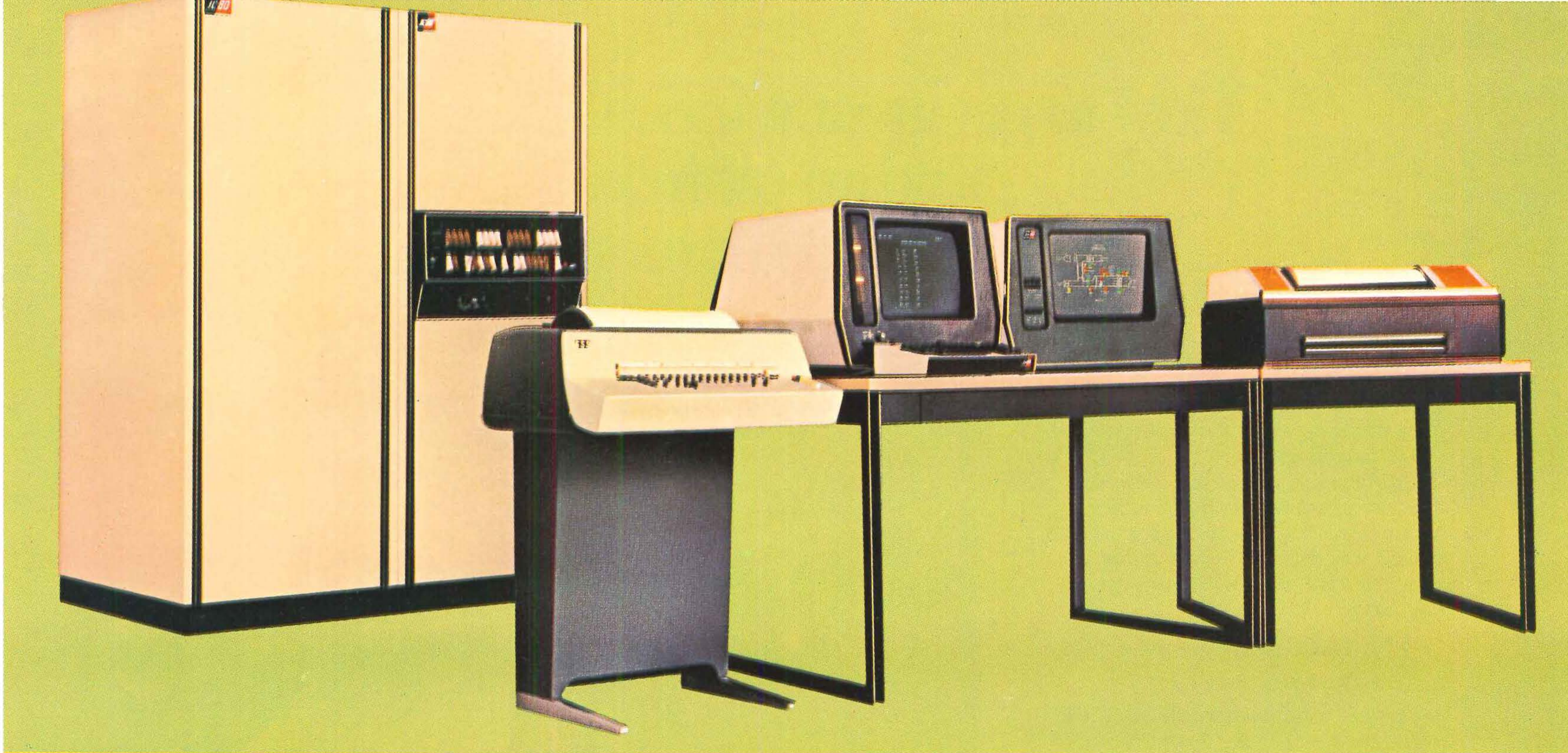

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Industrialization and costs: Are we making the same mistakes again?

It's getting so you can't go to a meeting or a seminar or listen to a speech these days without hearing that "true systems building" or "complete industrialization" is just around the corner, so our labor problems will be solved and our cost problems will be much relieved and all the building industry's problems will be solved.

I can't really see it that way. There is surely no doubt that the building industry has problems that need solving. While we're charging along at a great rate of production, and producing some very good buildings—residential and non-residential alike—along with some not-so-good buildings, there's no doubt that we need to keep working to cut down the undoubted inefficiency that marks so much building, and get our costs down. No professional can fail to read the signs of owner discontent with the process—the rise of cost consultants, construction managers, and other additions to the basic building team of owner, architect/engineer, and contractor (which makes sense), the immediate acceptance and proliferation of phased construction (which makes sense), and an almost desperate hope for a technological breakthrough (which to me doesn't make sense).

My concern is that we're counting too much on technology—to the point of forcing it

Take Operation Breakthrough (one more time). It was announced and promoted with enormous energy. Hosts of professionals and hosts of manufacturers spent hosts of thousands of hours and millions of dollars proposing possible Breakthroughs. We know what's happened: *When and if* the Federal government goes back into the business of subsidizing low- and moderate-income housing, it now looks as if *some* Breakthrough housing (in larger than demonstration volume) may get built on some sites. And it will take subsidy from Washington—can you see many recipients of Revenue-Sharing keeping that balloon in the air with their local money? Not many of the consortiums formed to bring "new expertise" to the building industry are still in business—and a lot of participants have a lot of time and money to write off to experience and government public relations.

So far as I can see there have been no breakthroughs, and—even if we do get volume production—there's no evidence I've seen of any kind of cost reduction.

SCSD is another effort that has taken a toll—this time mostly from manufacturers who made a major effort to bid successfully into "the system" and who have not seen much in the way of volume (which is what they wanted) come out the other end. Nonetheless, doesn't it make sense to keep trying to industrialize? Sure it does. We've got to keep experimenting—SEF in Toronto (RECORD, October 1970) continues to be one of the most promising experiments—but. . . .

Can't we stop announcing "breakthroughs" and "revolutions" before the facts are in?

I guess it goes without saying that there's nobody around here against adopting, forthwith, any new building technology that comes along that will cut costs by saving materials or labor or time—whether that new technology comes from architect, engineer, builder, manufacturer, or aerospace consortiums.

But I think it's important that we not try to talk ourselves into (or let our clients be talked into) counting on results from "the new systems building" in the absence of any evidence of success.

The truth is there has been precious little analysis of the results of any of our major experiments by qualified professionals. There are many efforts underway to import systems techniques that have become popular in Europe, with precious little professional analysis of how effective in cost reduction (or other benefit) they will be in this country, whatever their benefits have been back home.

I think that comments made by RECORD senior editor Bob Fischer in an article back in October 1970 hold firm: "A principal objective of any demonstration program obviously has to be to prove that the project can be accomplished in the first place to establish credibility; further, to insure that costs come in as projected. This can result in sacrifices in quality (particularly appearance) to prove a point.

"Because of the mystique, vagueness, and 'promise,' systems projects have been a refuge for clients who cannot or will not analyze their building-related problems and take responsibility for their decisions. . . .

"There is no commonly understood or accepted definition of what systems building is. Evaluation has been superficial; and from limited, and frequently theoretical, points of view."

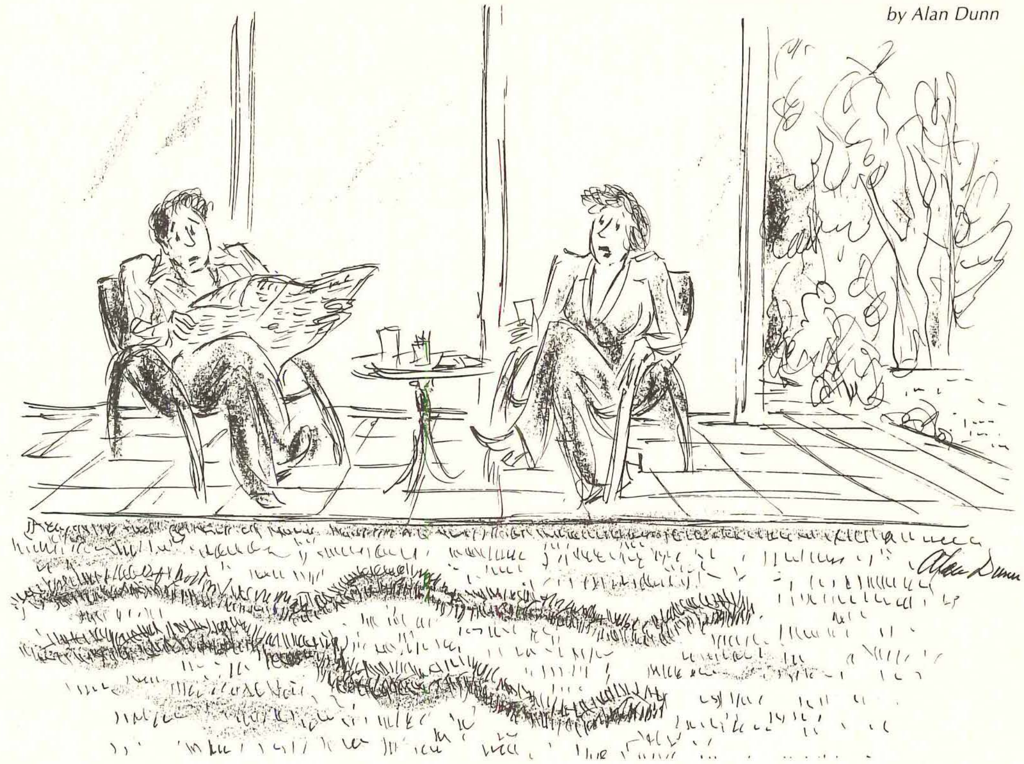
The housing industry offers some history about the white hope of technology

Anybody else old enough to remember right after World War II when "prefabrication" was going to make possible the house and the yard with the white picket fence for everyone who wanted it? Imagine, the house built in a factory—much more efficient, much lower costs, much lower prices for everyone! Well, we know now it didn't work that way. By the early 1950's, the smart home manufacturers realized that the cost savings which "had to be there" weren't there, but what they had instead was an absolutely great marketing and distribution scheme—they could ship houses to a lot of small builders (builders who needed less experience and technical know-how than the traditional carpenter-builder) and then support him with centralized marketing aids and advice, advertising, centralized buying, and sometimes even land acquisition.

Today, the manufactured house has a share of the market and has settled in—the manufacturers have created a market but not a cost breakthrough.

Today, in the housing end of the building business, "modulars" are a hot word. The idea of "completely finishing the box inside and out in a factory" and shipping it to the site has many of the appeals of non-residential "systems building"—mass buying, production-line efficiencies, minimum on-site labor. Yet, as reported in *House & Home's* March 1973 survey of modular housing, "keep in mind that despite all the noise about modulars, their share of the total housing market has never been more than 2½ per cent (in 1971), that last year it was only two per cent, and that this year total starts will probably be down 10 to 15 per cent from 1972. So it's reasonable to assume that the modular companies will be doing very well indeed in 1973 if they equal last year's total of about 55,000 units." Modulars—which must meet FHA or other standards just as a conventional house does—have not proved to save money, except perhaps in terms of the builder's construction loan, and that saving can easily be offset by shipping costs and extra construction costs in strengthening the house to protect against over-the-road wracking.

—Drawn for ARCHITECTURAL RECORD by Alan Dunn



"Don't they know it's Astroturf?"

What about mobile homes? Doesn't their cost and popularity argue industrialization?

For some systems enthusiasts, the mobile home is held up as the forerunner of industrialization of other building types. Some mobile homes are indeed built on highly mechanized lines—thoroughly engineered, preplanned, and "integrated" down to the pictures on the wall. You can buy one for $10,000 or $12,000 which compares—superficially—with a condominium costing $20,000 to $22,000. There's no doubt there's a booming market—this year the best estimates are 600,000 units or better—and that just counts units that are residences, not recreational vehicles.

What do you say to that kind of volume and price? You say that you wish you could sort out any production-line savings from the "savings" created by structural practices and choice of materials and finishes and fixtures and hardware that would simply not be accepted under FHA or any similar standard. Despite the volume, few banks will mortgage mobile homes, and most owners have to use personal loans (an extra cost that must be set off against "savings"). Another offsetting cost: Pad rentals, which are going up partly because of demand and partly because more and more communities are making life tougher by exclusionary laws or by taxation reflecting the fact that mobile-home owners are using the same services as tax-paying homeowners. Then there's depreciation: What do you suppose you could get for your 10-year-old mobile home? Finally (and this is admittedly subjective): Would you really like to live in a mobile home? Even the new double-wides (24-footers)? Have you really been in one? To me, it's no substitute for that $20,000 house. Proof of benefits of industrialization? I dont think so.

To sum up: We need to keep experimenting —but not just for new technology.

Mind you, I'm not arguing here for more of the status quo. We've got to keep looking for new ways to build better for less. I'm just arguing that we stop counting on a breakthrough, and re-focus our attention on an evolutionary pattern of development and improvement that has been working for some time.

Anybody that doesn't think that this industry's manufacturers have come a long, long way in producing (in a highly efficient, industrialized manner) more and better sub-systems or compatible component packages only has to look in a 10-year-old Sweet's Catalog. Or around his own office (at the partition system, the under-floor network of electrical and communication distribution, at the windows and glass, at the lighting fixtures overhead (which may well be part of an integrated lighting/air-handling/acoustical system).

And I think that architects and engineers haven't lost much time in taking advantage of all of those new developments. People who want to make a science out of interfacing forget that that is exactly what architects and engineers do all the time.

And a great many architects are—as part of their design and cost responsibility to the client—working effectively to expand and perfect the combining of various standard "subsystems" into their work. Examples from recent months in the RECORD: Robert Geddes' work in combining five off-the-shelf "subsystems" into a handsome and innovative campus in New Jersey (RECORD, March). Or the work of Charles Luckman for dormitories for the University of Delaware, using the Bison concrete system (April, 1972). Or the work of The Architects Collaborative (August) in combining a precast concrete structural scheme with prestressed floor planks, an integrated hvac-lighting system, and an innovative plug-in, flexible-cable electrical distribution system into a first rate architectural solution—which in design and plan flexibility makes no compromises with the standards TAC has set in the multitude of "conventional" schools it has designed.

The goal—architects and engineers and manufacturers and government and proponents of systems all need to remember all the time—is not systems for systems' sake. The goal is not hardware, the goal is better buildings, with all that implies in terms of human needs as well as technology. The goal is forwarding the cause of architecture.

—Walter F. Wagner Jr.

Don't forget! Last chance . . .

. . . to send in submissions for RECORD INTERIORS of 1974. We've begun studying submissions, but the deadline isn't until Oct. 15th, and all historical evidence indicates that we won't be able to resist a really great interior if it comes in a bit late and we haven't really locked up the schedule. Full details on submitting "architect-designed interiors of any building type" are on page 58, August issue.

—W.W.

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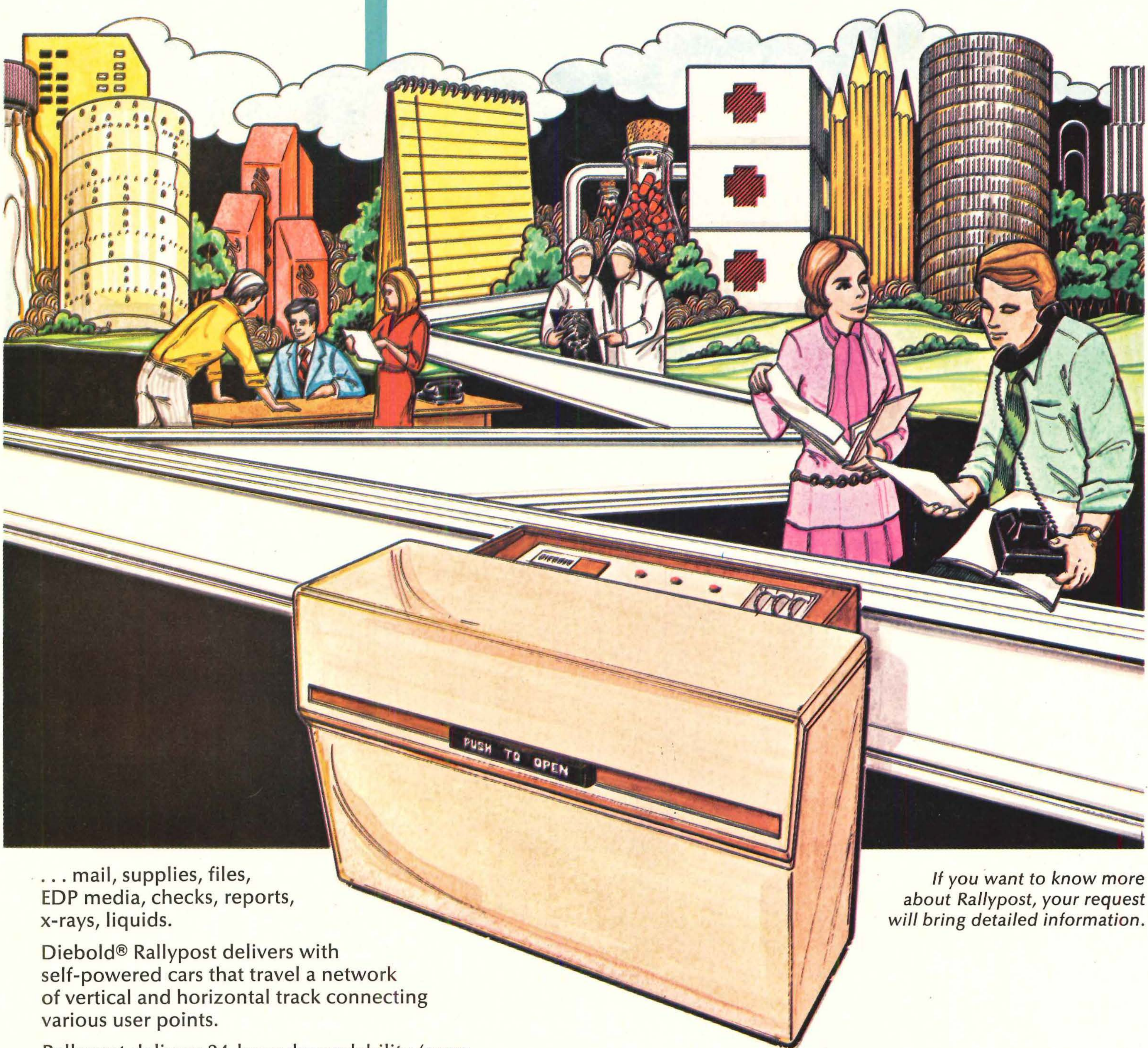

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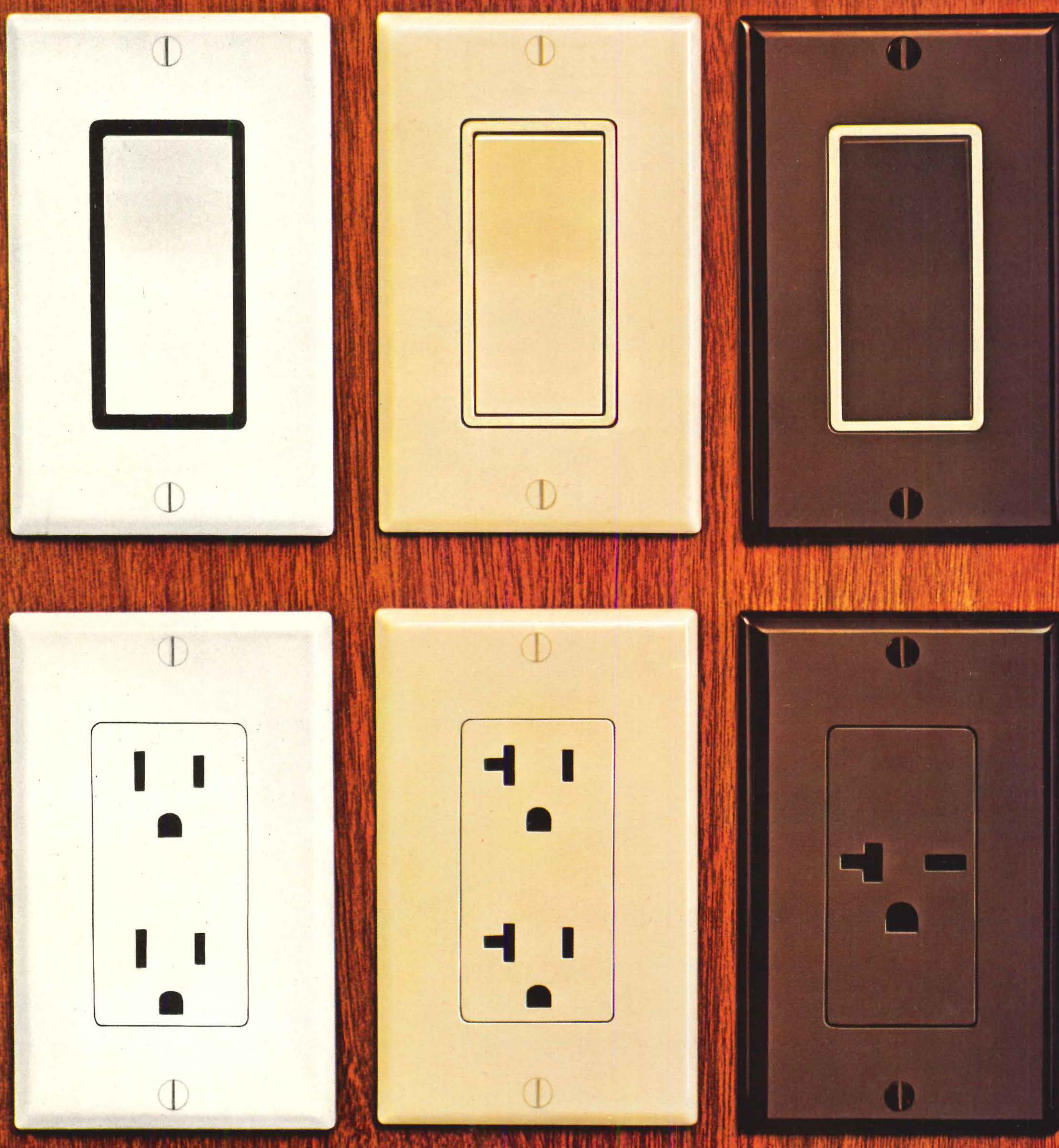

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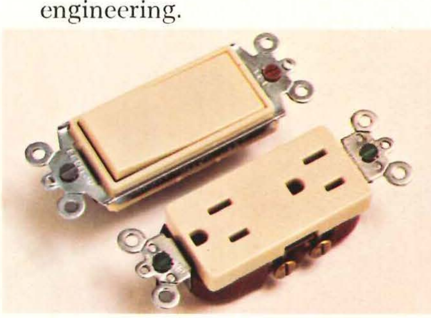

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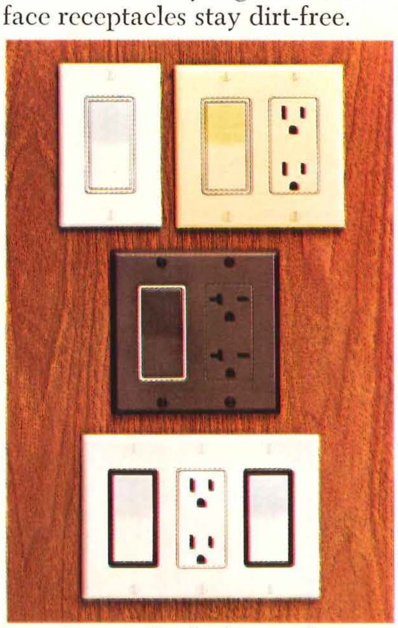

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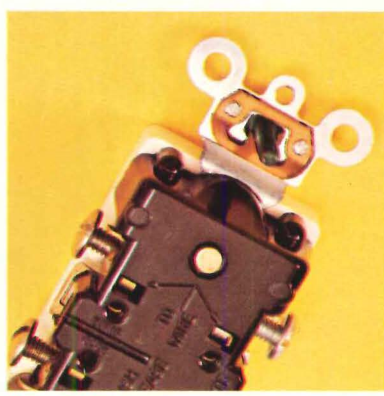

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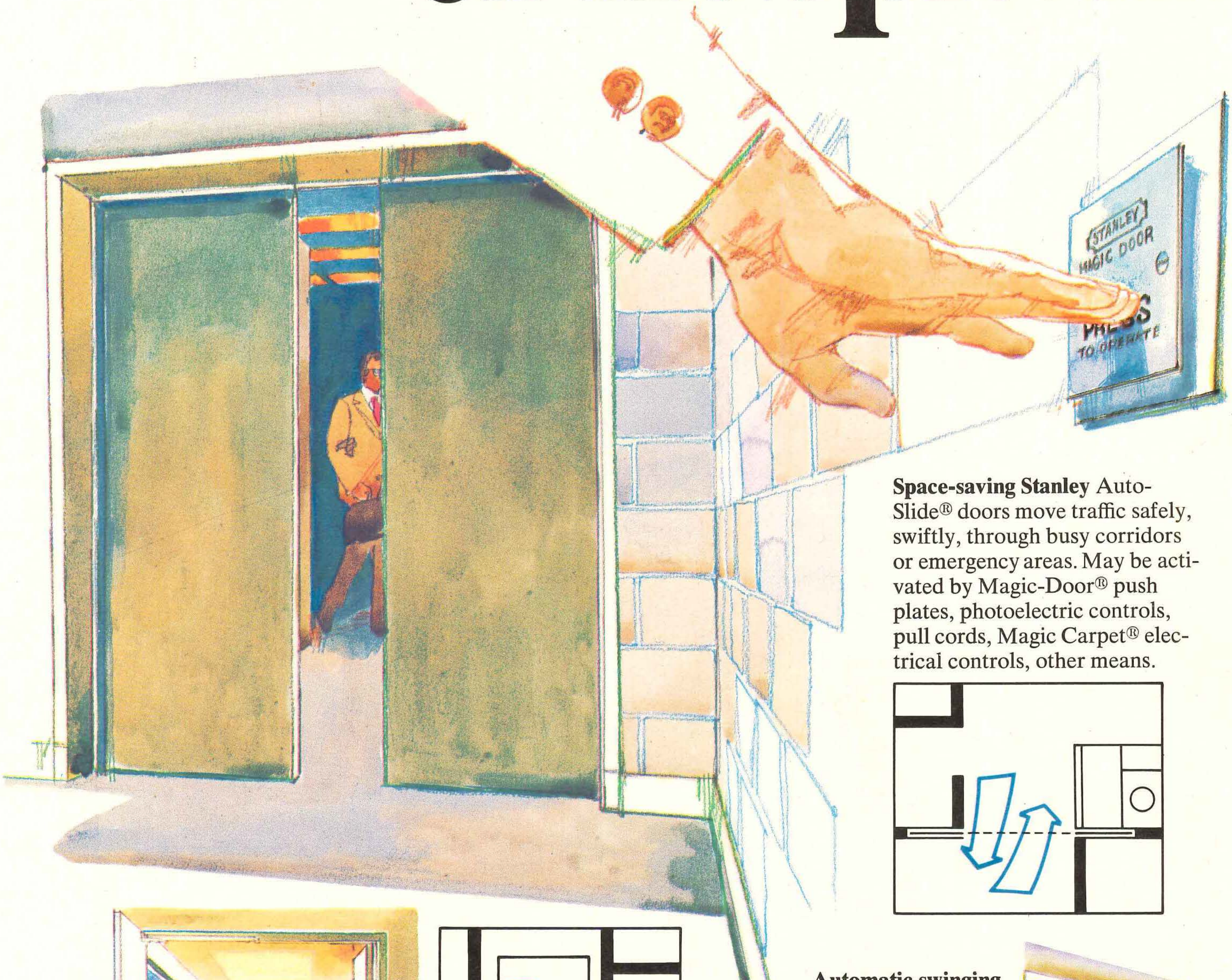
No one knows of hospitals



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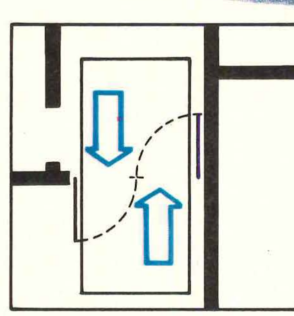

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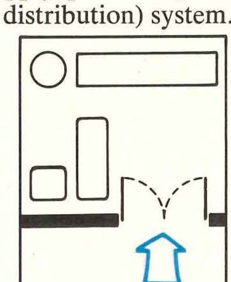
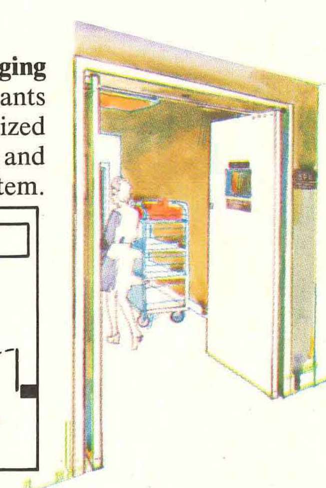
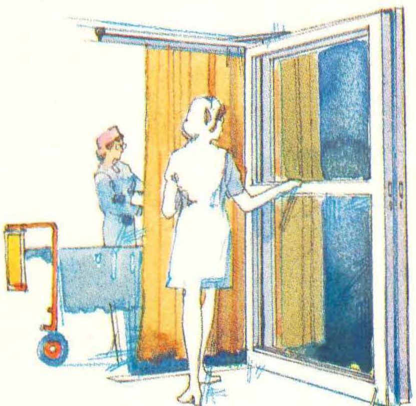




the ins and outs like Stanley.



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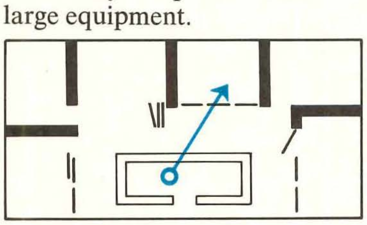
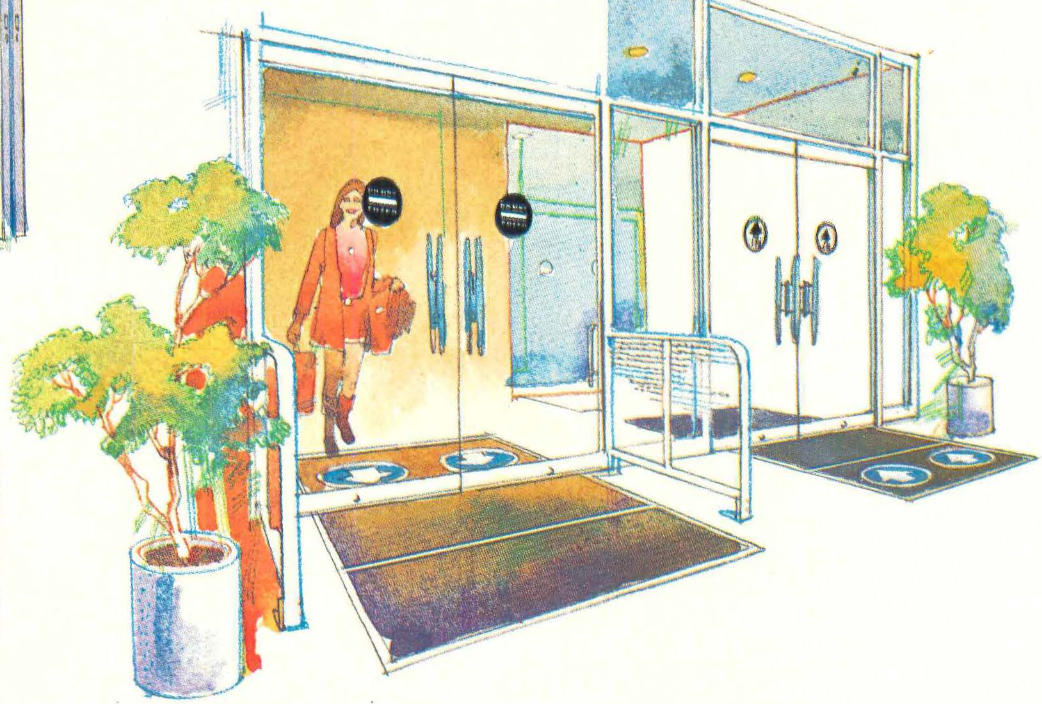
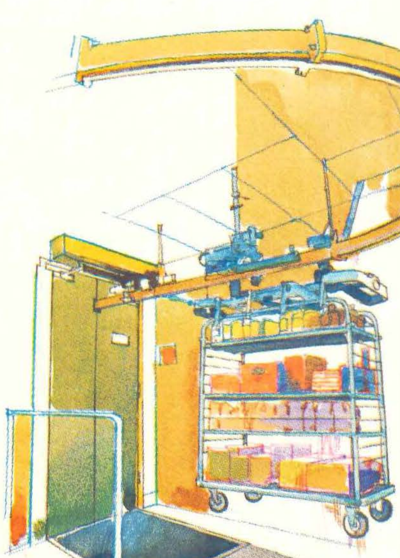


Efficient, practical, inviting – Stanley automatic entrances welcome patients, visitors, keep traffic flowing.





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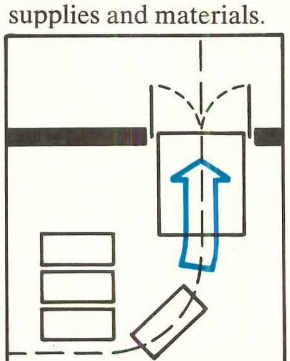

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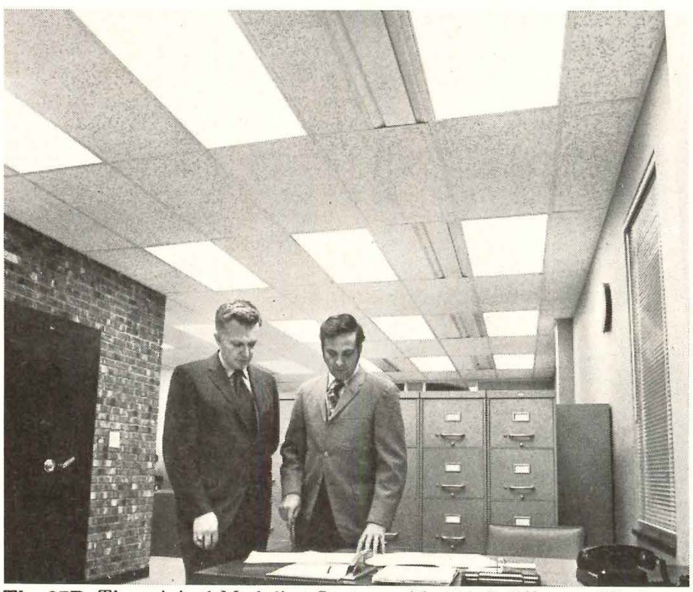

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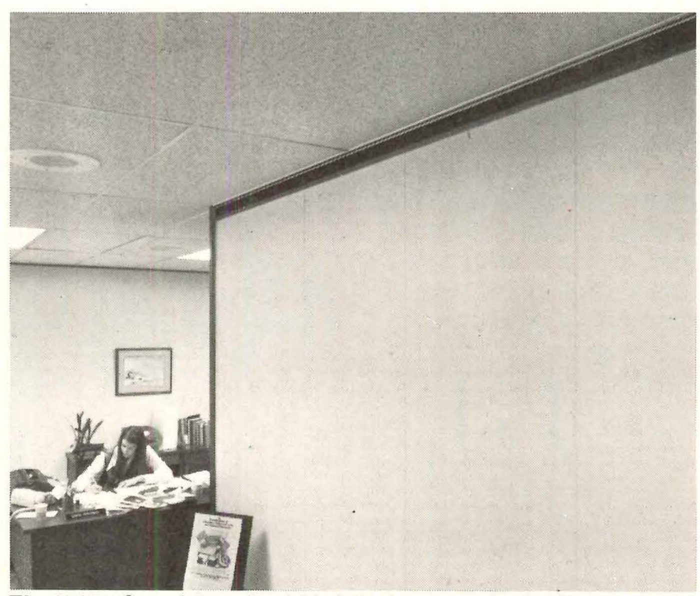

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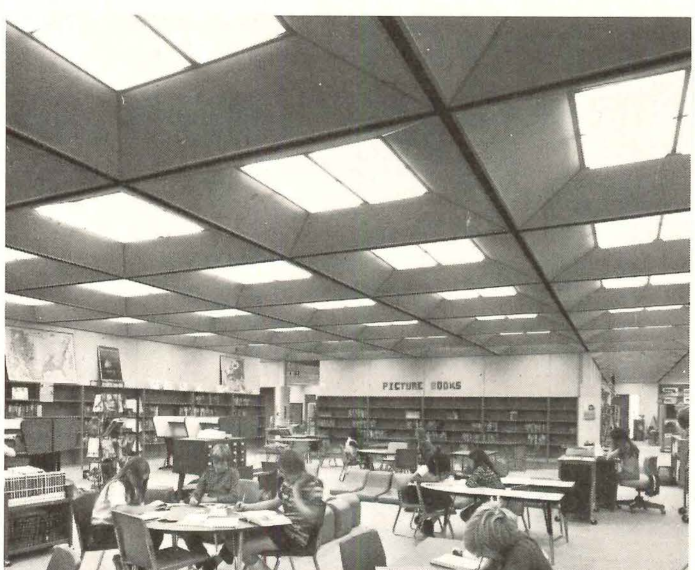
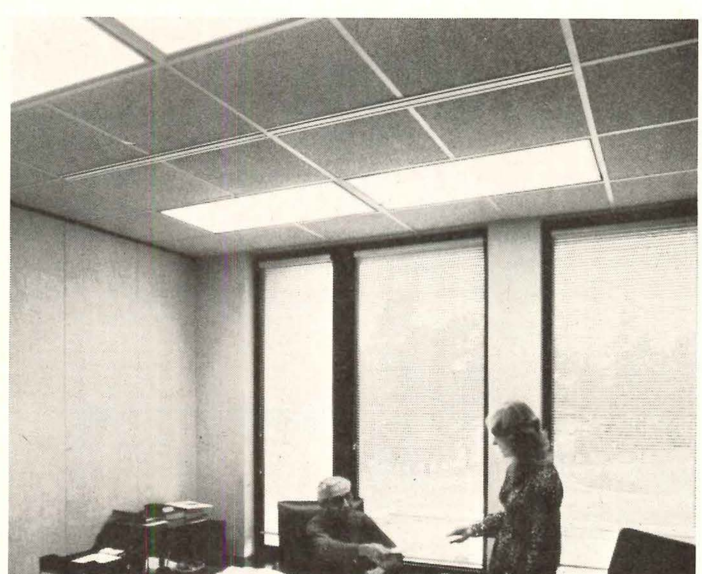
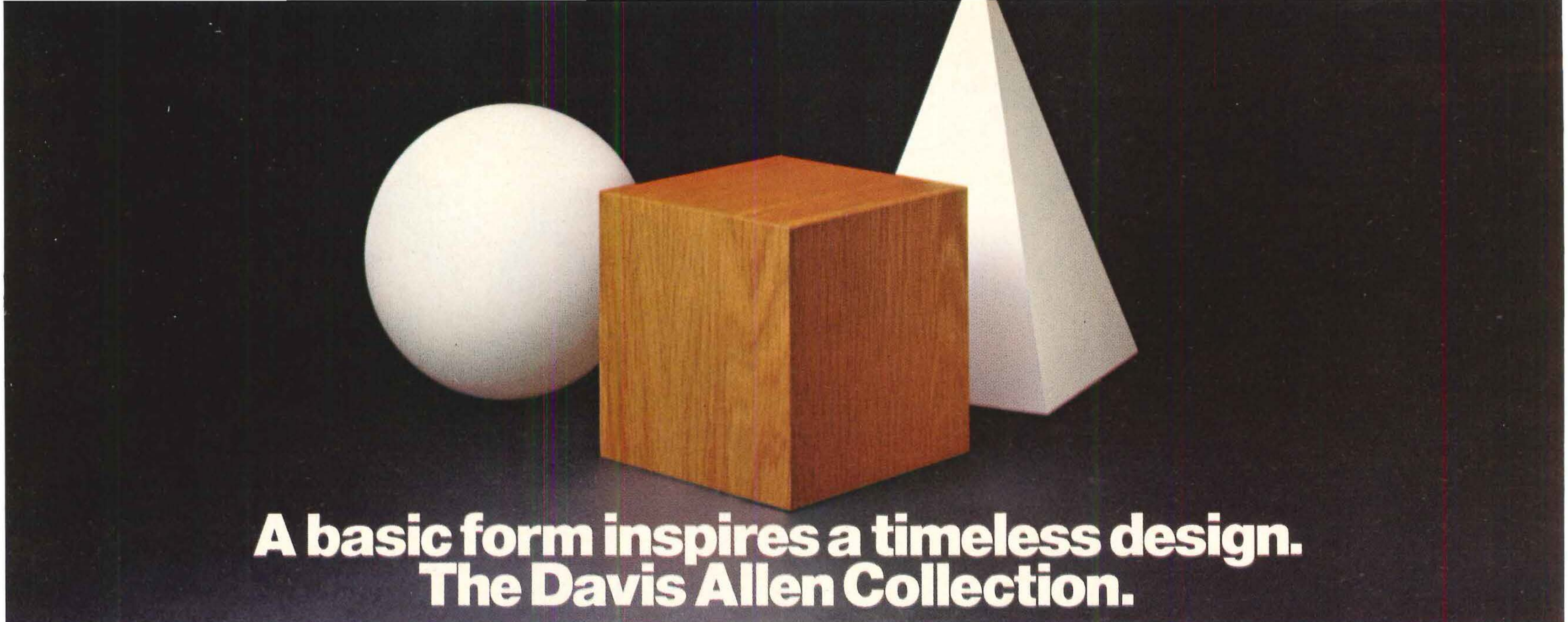


The 37AF (or MM5). The lightest dual-room cooler. Perfect for 2′ x 4′ tees, ideal for schools and clinics.



The 37AD. The unique Split-Plenum unit. Heats out of one side, cools out of the other. Lets you use all-ceiling units all over.



We started with the cube. Pure and simple. Completely in tune with the bold, massive shapes of the 1970's and 1980's. We've extended and varied this basic form through an integrated line of desks, tables, and consoles. The line includes a wide selection of finishes, colors, and trims. The model shown above, for instance, is an executive desk in oiled American white oak. (Also available with recessed back.) Turn the page to see how the Davis Allen Collection solves the problem of transition from executive through middle-management to clerical levels, while maintaining integrity of design.

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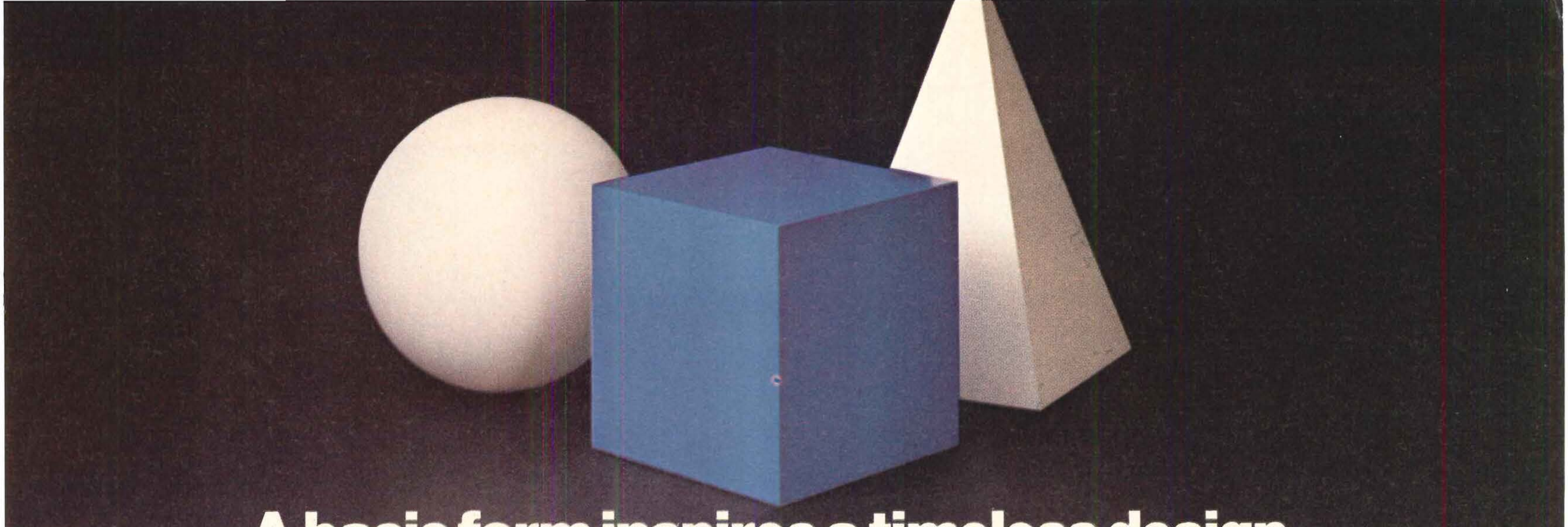
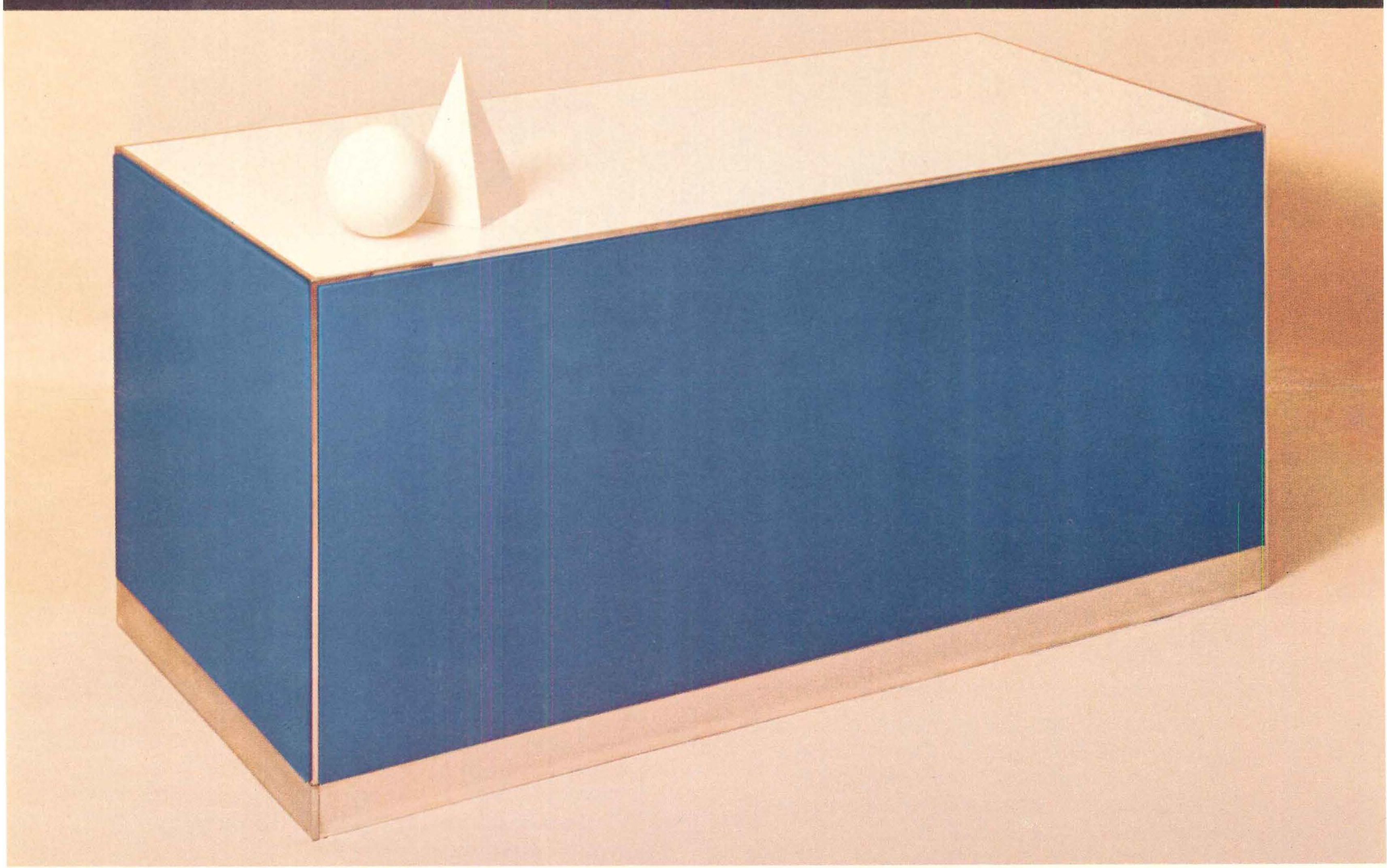


A basic form inspires a timeless design. The Davis Allen Collection.



This general office desk with enameled steel finish can easily be adapted to a middle-management function by adding a wood top. Like all other models, this desk is built around an all-welded, unitized steel frame. This vibration-free structure supports the top, exterior panels, and drawer suspensions. The top and end panels are easily removed for wiring installation or alteration. Once installed, wiring is completely concealed by full-height design. And to keep the surfaces of the desk clean and smooth, we've eliminated all protruding hardware.

GF Business Equipment, Inc.

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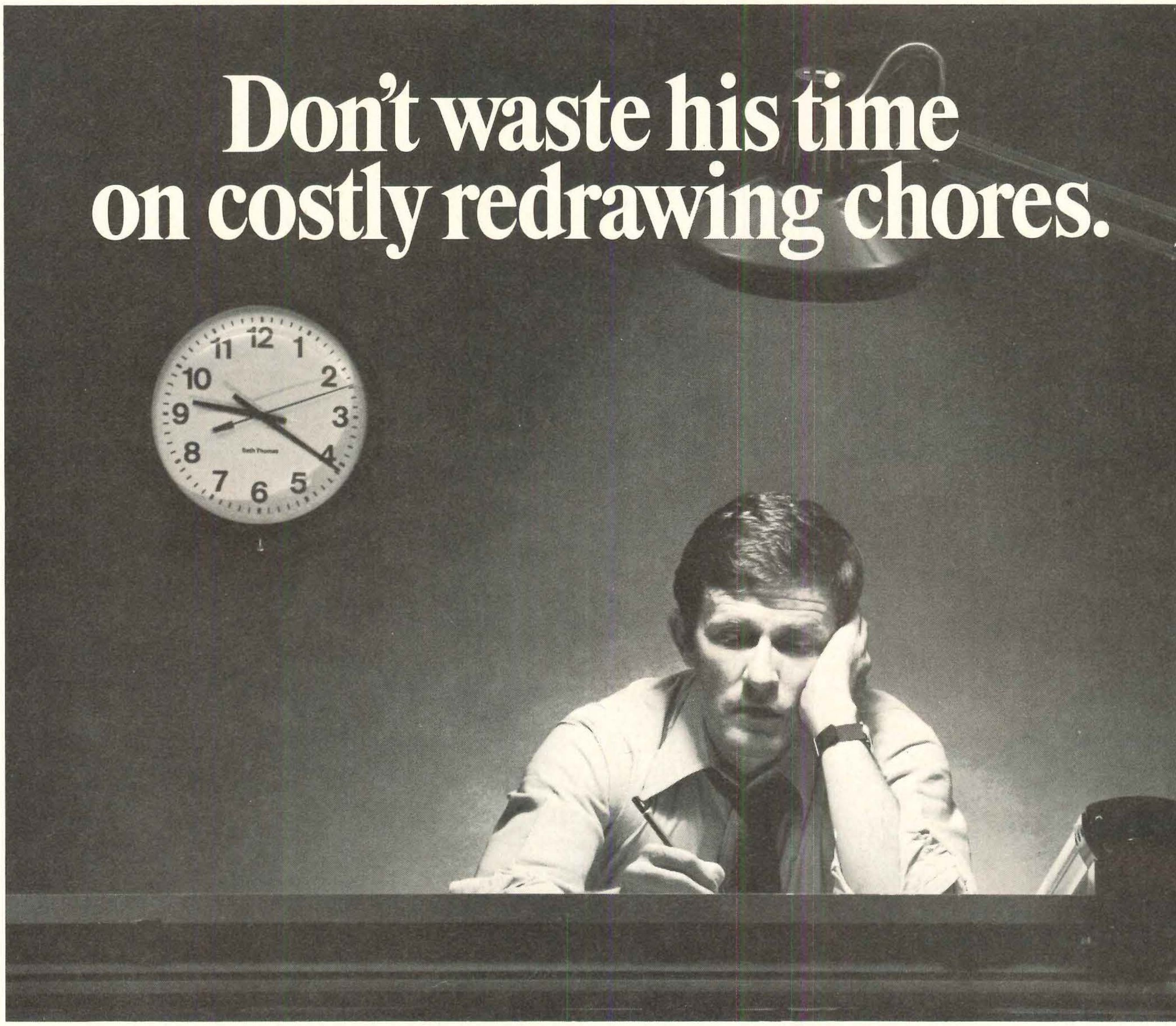
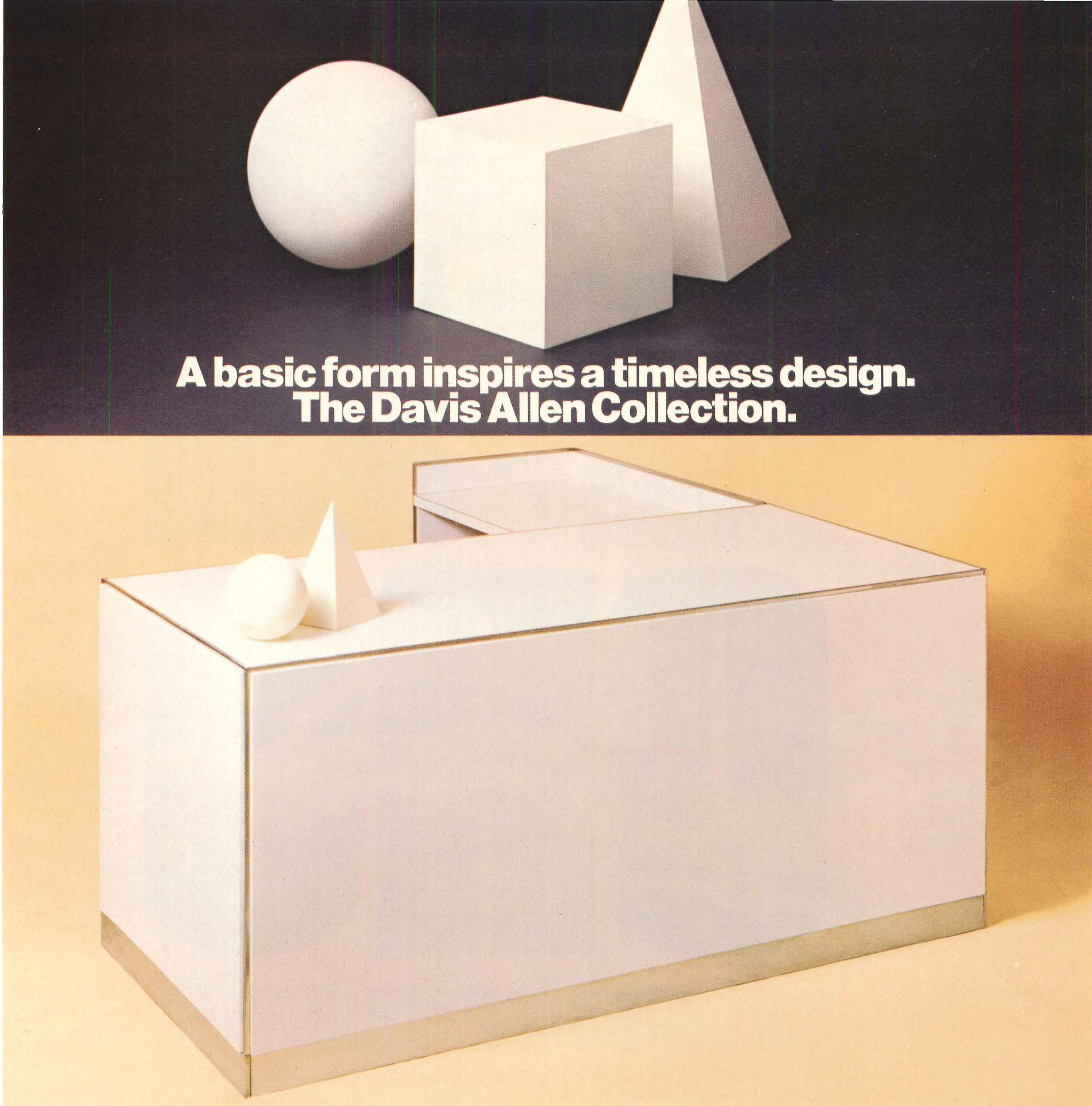

Don't waste his time
on costly redrawing chores.



Secretarial desk with extension. Even in this model, there's no sacrifice of attention to detail. The bold appearance, for instance, is crisply defined by polished stainless steel trim around the perimeter of the desk. Utility? Full-height design provides one-third more storage capacity than conventional desks. Elegant, practical: The Davis Allen Collection. See your GF representative. Or write to us. GF Business Equipment, Inc., Youngstown, Ohio 44501, and Toronto, Ontario, Canada.

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DON'T PLAY WITH FIRE.

CCC's New Naturalweave spongebonded carpet has a Class "A" Flamespread rating.

If you're looking at carpet for an office building and it doesn't have a Class "A" flamespread rating—25 or less in the Steiner Tunnel Test—you may be playing with fire. The danger of fire always exists, that's why fire safety standards are becoming more and more stringent. At CCC, we know all about fire safety. We've become experts, because we've installed millions of yards of carpet in offices, hospitals, schools and stores.

Since fire safety is a major concern to us, we've just introduced a fire-retardant, spongebonded carpet with a Class "A" flamespread rating. We call it NATURALWEAVE FLAMEGARD and it meets *all* governmental flamespread standards.

NATURALWEAVE FLAMEGARD is an addition to our heavy duty Densylon Carpet series. It has a five-year wear guarantee and is made of tightly-twisted, densely-packed ANSO nylon bonded to B. F. GOODRICH fire-retardant sponge rubber cushioning. This built-in cushion extends the carpet's wear-life by one-third compared to carpet without padding. It's guaranteed not to lose resiliency, enhances the carpet's appearance retention, reduces leg fatigue and increases floor safety. Among its other benefits, NATURALWEAVE contains a static control system, is easy to clean and keep clean, and helps cut maintenance costs.

But you get more than just superior carpet from CCC. We're the largest manufacturer of commercial and institutional carpet systems in the country. With CCC, you get SINGLE SOURCE RESPONSIBILITY for every aspect of your carpet projects anywhere in the country, starting with product selection and guaranteed installation through a comprehensive maintenance program that gives you maximum carpet wear-life at minimum life cycle cost. We even know how to effectively integrate carpet with subfloor access systems and can show you how it's done with trench headerducts and handhole covers.

For more information, just fill out the coupon below. CCC's NATURALWEAVE FLAMEGARD...THE SPONGEBONDED CARPET WITH A CLASS "A" RATING.

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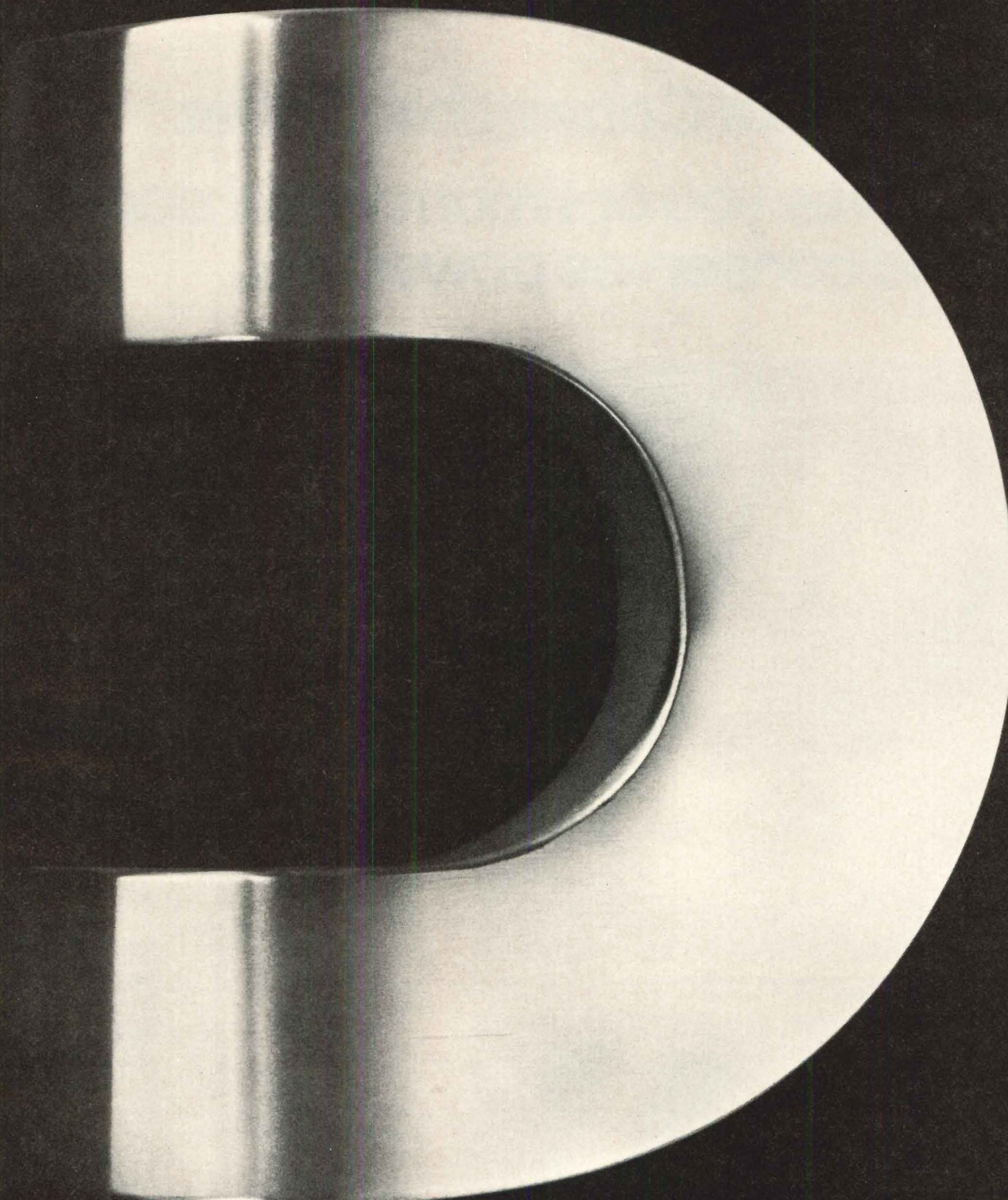
ML 110 actual size



New doorpull designs by Malcolm Leland meet

functional requirements with disciplined sculptural forms.

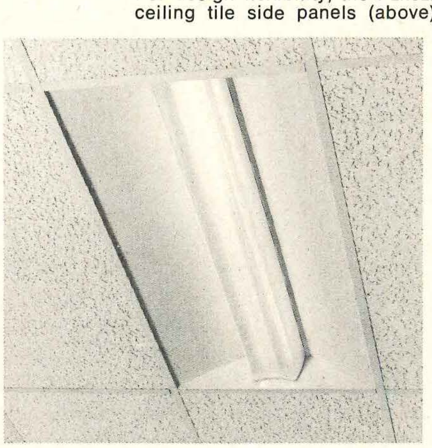
Handcrafted in solid bronze, nickel silver or aluminum.

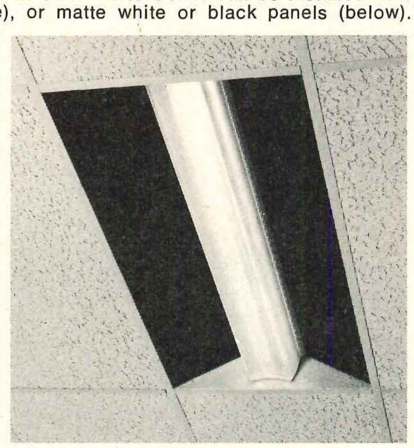
Forms & Surfaces Box 5215 Santa Barbara, Cal. 93108

FORMS & SURFACES

Percepta™ Convertible Coffer. It gives you optimum visual comfort and conserves power, too.

For design flexibility, the PERCEPTA Convertible Coffer can be installed with ceiling tile side panels (above), or matte white or black panels (below).





The introduction of PERCEPTA by Holophane brought an important new advance to lighting. A luminaire that eliminates veiling reflections (reflected glare). And thereby improves task seeability in places where eyes work the hardest. Schools. Offices. Libraries. Computer centers.

And with PERCEPTA, fewer lamps are needed to produce the required "effective" footcandles (E.S.I.). So your electric power and air conditioning requirements are substantially reduced, decreasing your operating costs and conserving energy resources.

Until now, PERCEPTA has been available only for surface-mounted applications.

But now you can have all the PERCEPTA benefits in a recessed unit as beautiful as it is effective.

You can even use it as a design element!

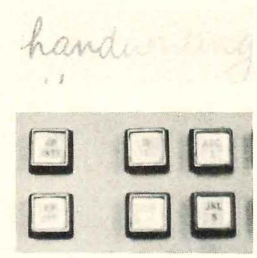
Install it in suspended ceilings with optional matte white or black metal side panels. Or paint the panels any color you wish. Or use ceiling tile instead. No matter which you choose, the glare-free light distribution is unaffected.

You can also choose between 430 and 800 ma luminaires to meet your specific lighting needs. Both are available in recessed or surface-mounted PERCEPTA units.

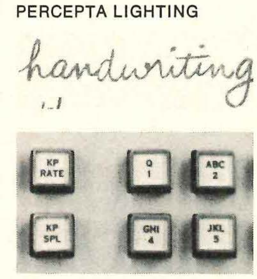
Highest visual comfort. Unusual flexibility. Lower power consumption. PERCEPTA Convertible Coffer offers all three.

Your local Holophane sales engineer has all the details on PERCEPTA and our other indoor and outdoor lighting products. Call him. Or write Dept. AR-9 Holophane Co., Inc., Montvale, N.J. 07645.

CONVENTIONAL LIGHTING



PERCEPTA LIGHTING



Unretouched photos of typical reading tasks: handwriting and keyboard. Conventional luminaires reflect light into viewer's eyes, producing veiling reflections. The unique PERCEPTA prismatic design virtually eliminates veiling reflections.

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A Johns-Manville Company

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A LONG, OPEN LOOK AT A

WASHINGTON LANDSCAPE.

THE WIDE OPEN SPACES OF WALL STREET.

88 PINE, NEW YORK CITY.

New York need not be a concrete jungle.

This building at 88 Pine in the heart of the Wall Street business district proves it.

"They chose this particular glazing system because it afforded the opportunity to open the building up to spectacular views of the city," notes Bob Hudspeth, LOF architectural consultant, New York City.

Again, butt-joint glazing, using silicone sealant, contributes to a feeling of open spaciousness—this time on the East Coast. Each bay opening provides 25 feet of uninterrupted view, although each light is only 9′4″ wide by 7′5″ high.

For additional information on LOF glass for your project, we'd be happy to respond to your call or letter to Dan Hall, (419) 242-5781, Libbey-Owens-Ford, 811 Madison Avenue, Toledo, Ohio 43695.

Owner: Orient Overseas Associates, New York, New York.
Architects: I. M. Pei & Partners, New York, New York.
Building Contractor: Carl A. Morse, Inc., New York, New York.
Glazing Contractor: Collyer-Sparks Co., Inc., New York, New York.

LOF

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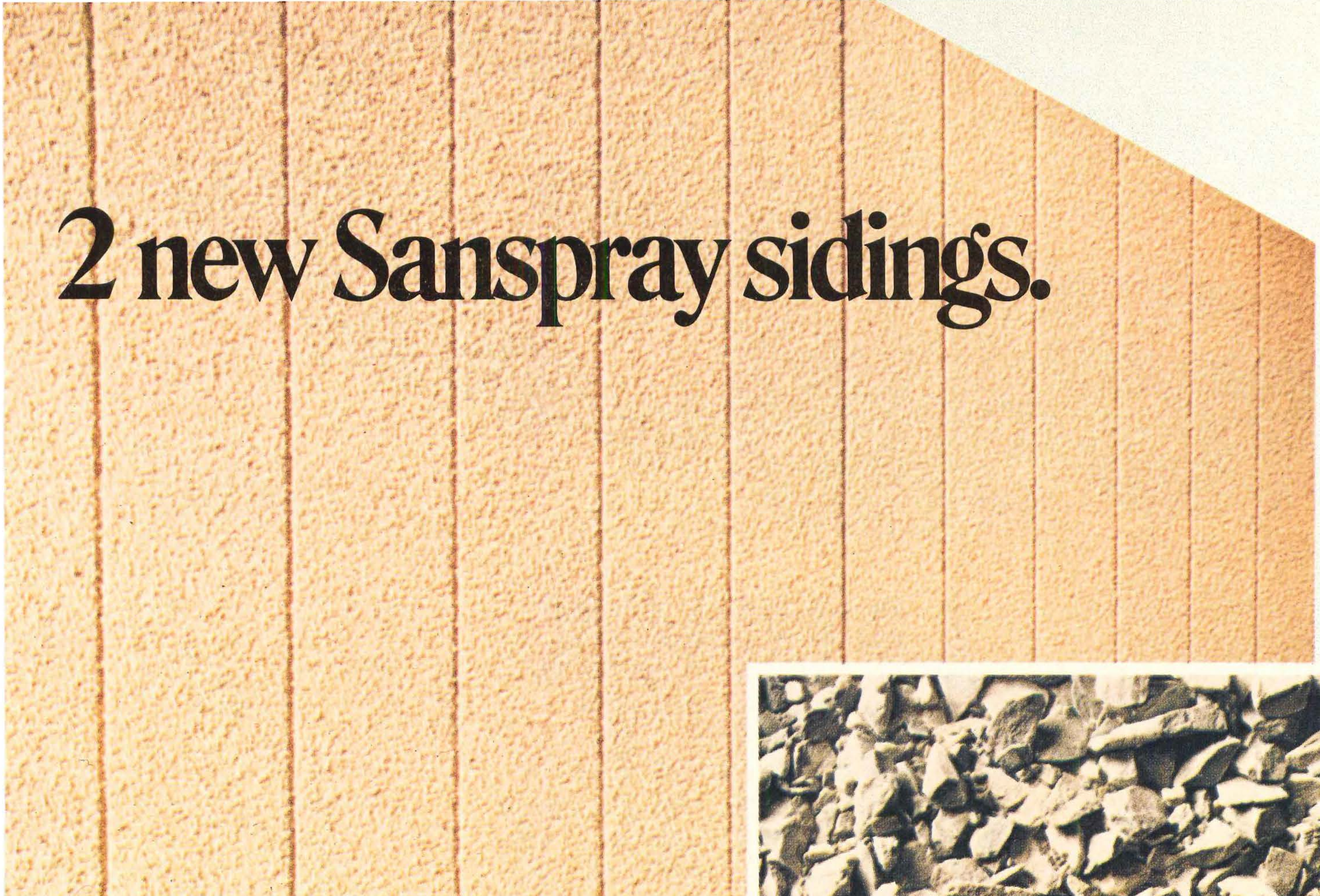

2 new Sanspray sidings.

The best part about this one is what you can't see.

Our Shadowline™ stone-on-plywood Sanspray® siding has a vertical groove pattern so there's no need for battens or mouldings. The shiplapped edges give a smooth fit and appearance which means you could nail up a wall a mile long and virtually never see a joint.

The distinctive look of Shadowline can give a vertical relief to a long horizontal wall. It incorporates a regular stone aggregate with ⅜″ wide, ¼″ deep grooves every 8 inches. And because the look is special, tones are special – 7 of them – ranging from cool white to warm tangerine to a glisteny black. Sizes in 4′ x 8′, 9′ and 10′.

The best part about this one is what you can't miss.

If you're looking for a chunky, rugged look, there's our new Jumbo aggregate Sanspray. We use oversize chips of stone for this texture. It gives you the look of pre-cast concrete without the weight – or the cost. And anything this natural deserves natural colors. Like Gaelic Green, Northern White and Tangerine. Sizes up to 5′ x 12′ are standard. Special sizes on order.

Besides Shadowline and Jumbo, we also have large- and regular-aggregate Sanspray siding.

Find out more about our extensive line of exterior cladding at your local U.S. Plywood Branch Office. Especially Sanspray – a face of stone, but a heart of wood.

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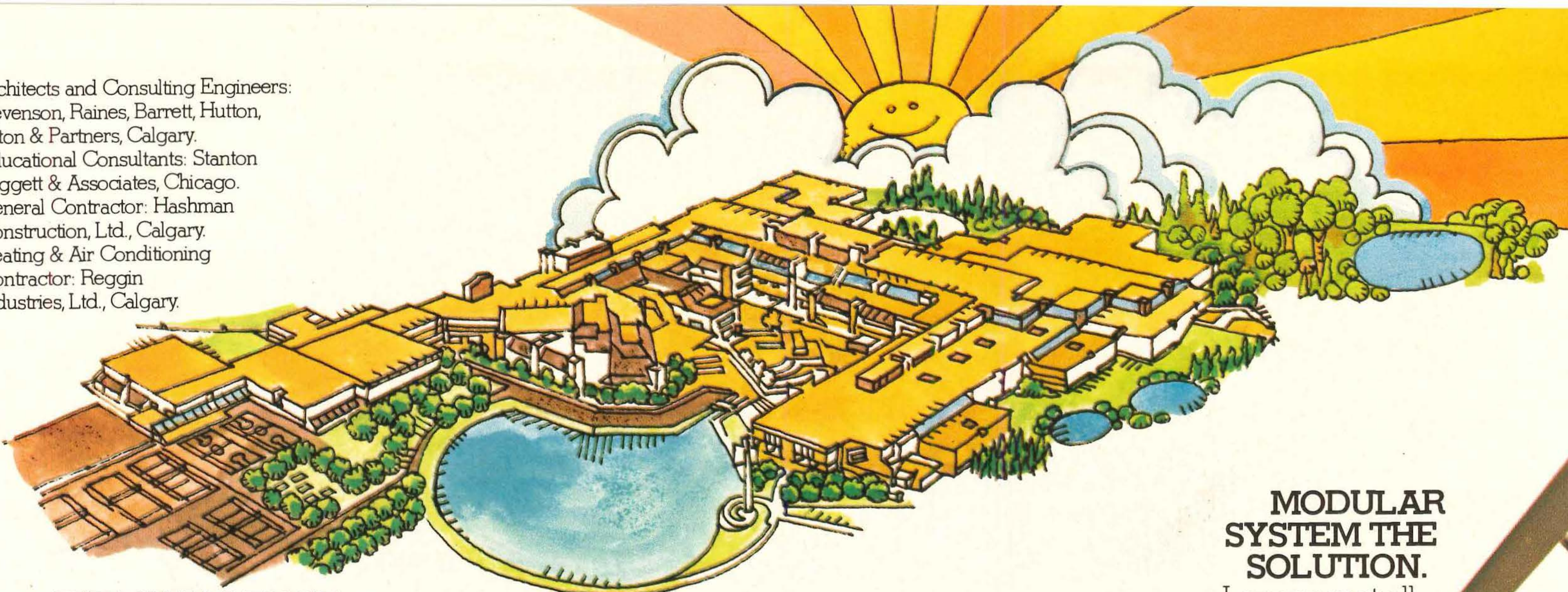
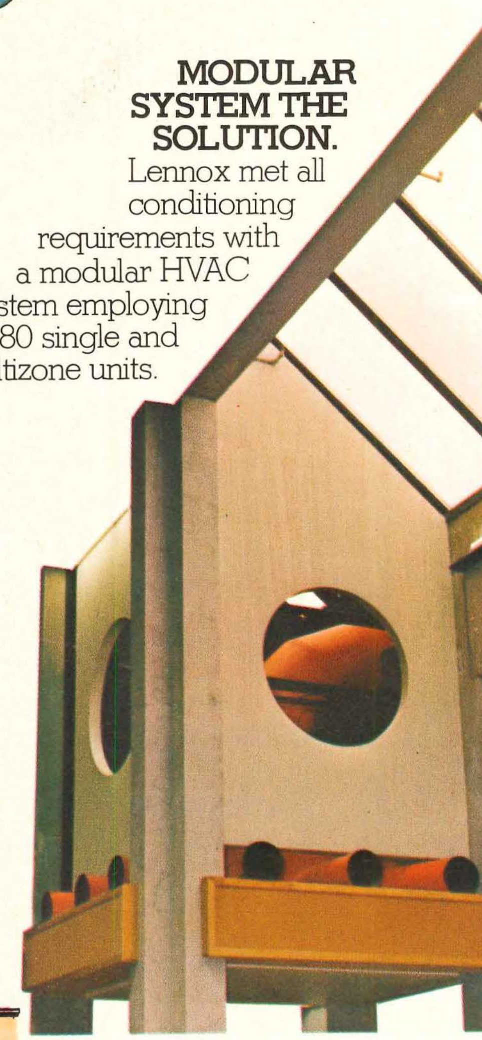
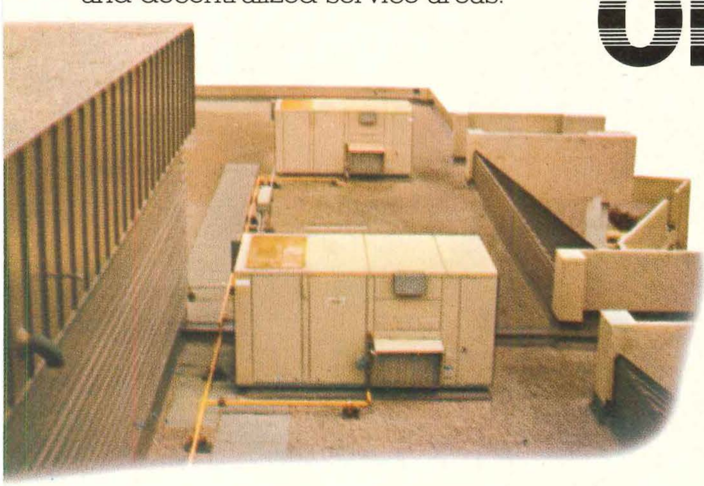
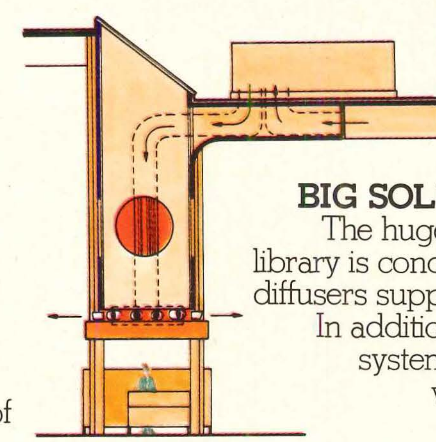
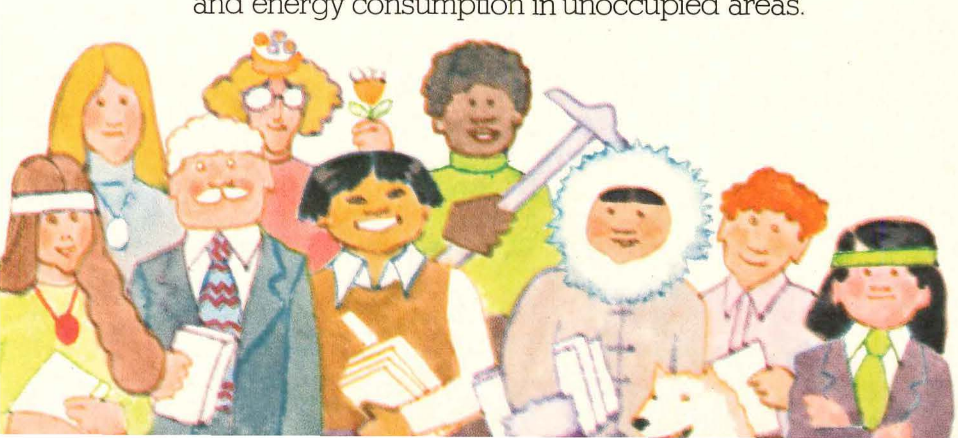










THE RECORD REPORTS

The Nixon administration expects housing starts to fall back to 2 million this year, compared with 2.4 million starts last year. This information was presented to Congress last month, in the President's fifth annual report on meeting national housing goals. A more complete report has been promised Congress this month, containing full details on the Administration's housing policy. This document has been eight months in preparation and will be covered next month in the RECORD.

Government procurement can and must be improved, according to a Federal report just published by the General Accounting Office. The report comes in the wake of alleged payoffs, kickbacks and questionable campaign contributions in the State of Maryland. GAO surveyed almost $100 million worth of contracts in the GSA, Department of Defense and the Tennessee Valley Authority and concluded these agencies should establish programs in each procurement office to stimulate competition. (GAO continues to oppose negotiated procedures now protected by the Brooks bill.) In 1972, the Federal government awarded $5.4 billion in contracts by formal advertising and $44.4 billion by negotiation.

An energy conservation performance standard for buildings is being developed by the National Bureau of Standards, which is responding to a request by the executive committee of the National Conference of States on Building Codes and Standards. The purpose of the NCSBCS request is to achieve national uniformity in the regulation of buildings and the acceptance of industrialized buildings across state lines.

The Maryland Society of Professional Engineers named a committee to investigate alleged kickbacks by engineers to Maryland politicians. Such illegal practices run contrary to the code of ethics of both NSPE and CEC.

Congress as passed an emergency short-term resolution extending FHA-operated programs that expired June 30. This new authority expires October 1 and Congress must soon take up a Senate-passed resolution extending authority for a full year. In that resolution is a provision for immediate reinstatement of HUD programs now under moratorium.

New construction in June was valued at a seasonally-adjusted annual rate of $137.6 billion, according to the Census Bureau. This compares with $121.6 billion in June 1972.

Designers Saturday, a tour of leading New York furniture showrooms, will be September 21-22, and architects are invited to attend special showings of contemporary furniture at: Atelier International, Stendig, C. I. Designs, Brickel, Cumberland Furniture, Directional, Dunbar, Eppinger, Fritz Hansen, Harter, Helikon, ICF, Intrex, J. G. Furniture, Knoll, Lehigh-Leopold, Herman Miller, PACE, Harvey Probber, Jens Rison, Roffman, John Stuart, Stow/Davis and Turner Ltd. For more information, write Designers Saturday, Box 152, Pleasantville, N.Y. 10570. The annual event for architects and designers is well worth attending.

Entries for the 1974 AIA Honor Awards program must be submitted by October 22, 1973, and entry slips must be postmarked by September 14, 1973. Works of architecture and urban design completed after January 1, 1963 in the United States and abroad are eligible. For more information, contact the American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006.

A national conference on managed growth will be held in Chicago on September 16-18, at the Sheraton-Chicago Hotel. The conference is sponsored by the Urban Research Corporation, in cooperation with Skidmore, Owings & Merrill, The Urban Land Institute and the Weyerhaeuser Company. Speakers will include members of local community groups who have changed land use rules, and experts on legislation, impact statements, architectural recycling and land banks. For more information, write or call the Urban Research Corporation, 5464 South Shore Drive, Chicago, Illinois 60615.

November 6-8, 1973, Illinois Institute of Technology will hold a symposium on designing for disaster, both natural and man-caused—in highrise buildings, critical facilities and conventional buildings. Program details may be obtained from Keith E. McKee, IIT Research Institute, 10 West 35th Street, Chicago, Illinois 60616.

A seminar on noise control engineering will be held on October 11-14, 1973 in Washington, D.C., at the Shoreham Hotel. Federal and private interests will be represented on the program and the seminar is suggested to be of interest to engineers and architects concerned with growing problems of noise pollution. For more information, contact Noise-Con 73, NBS-233, A147, Washington, D.C. 20234, or phone (301) 972-0064.

Louis A. Rossetti, AIA, has been appointed to the United States National Commission for UNESCO. Mr. Rossetti is currently vice president of the Detroit Chapter, AIA and serves on two national committees of AIA. He was selected by former Secretary of State William P. Rogers on the recommendation of AIA president S. Scott Ferebee, Jr.

Fabric roofs shelter new student union building

La Verne College near Pomona, California is constructing two buildings with roofs of fabric coated with a new formulation incorporating *Teflon* fluorocarbon resin and is woven from *Fiberglas* yarn.

The project calls for fabric roofs fastened over steel cables held under tension to shelter a 215-seat theater in one building and numerous services in another. The structures, designed by The Shaver Partnership are expected to be ready for occupancy this fall.

This new architectural fabric, according to the Du Pont Company, makers of *Teflon,* is fire-resistant, weather-resistant and strong. Strength can be specified from 200 to 1,000 pounds per inch of width, permitting structural configurations in which the fabric is kept taut by either internal pressure or cable arrangement. This strength permits designing to resist hurricane winds, snow loads and even earthquakes, according to Du Pont.

Roof fabric for La Verne was made by Chemical Fabrics Corporation, Bennington, Vermont and roof fabrication by Birdair Structures, Incorporated, Buffalo, New York.

Approximately 1.4 acres of flexible educational space are covered. Rather than utilizing interior walls to separate functions, earth berms and mounds form a series of elements covered with natural plant material and various forms of synthetic coverings. A student can pass from one activity and area to another in changing elevations and vistas without ever going outdoors.

Chicago architecture in German exhibit

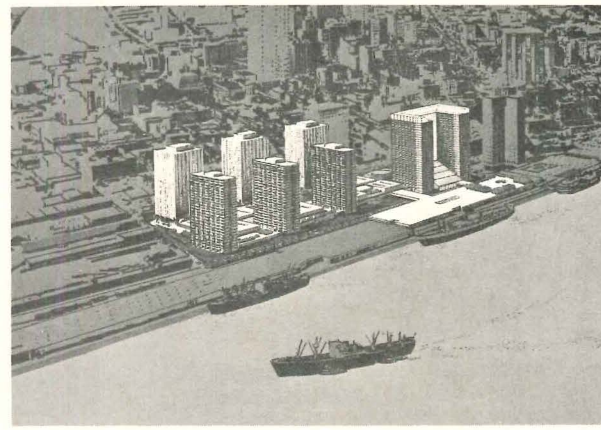
Die Neue Sammlung, the State Museum for the Applied Arts in Munich, Germany, with the assistance of a grant from the Graham Foundation for the Advanced Studies in the Fine Arts has just opened an exhibition "100 Years of Architecture in Chicago—Continuity of Structure and Form."

This exhibit will travel to other European cities later. Oswald W. Grube, architect and author who worked for a few years in Chicago and wrote the book "Industrial Buildings and Factories," has attempted in collaboration with Wend Fischer, director of Die Neue Sammlung, to illustrate the evolution and refinement of Chicago's architecture during the past 100 years.

Beginning with a survey of the original Chicago School of Architecture, the exhibit shows the continuous development of this School through the work and influence of Mies van der Rohe and his revival of the first Chicago School's consequent principles of steel construction.

Many excellent photographs, plans and models of completed structures and projects as well as a file of working drawings will be shown and this portion of architectural work is displayed for the first time in a comprehensive exhibit in Europe.

There will also be a significant special section on structures of more than 50 stories including examples of notable high-rise buildings as well as student projects completed at the Department of Architecture, Illinois Institute of Technology. Another section will include educational buildings designed and built during the last five years under an extensive school building program by the City.



Construction begins on New Orleans Rivercenter

The first phase of a $200-million "people-oriented mega-structure" bordering the Mississippi River in the heart of New Orleans is scheduled to be completed in the spring of 1976, developers of the massive project have announced.

The $97-million first phase of the International Rivercenter, which will be located three blocks from the Canal Street border of the city's famed French Quarter, will consist of a 1200-room hotel, a 200-unit condominium, an 800-car parking garage, shopping mall, enclosed air-conditioned tennis courts and club, specialty restaurants and a passenger ship terminal.

A six-story building will link the various buildings and allow more direct street level public access to the river than presently indicated in the three-block length. The hotel will contain a vast glass roofed court facing the river, which promises to be a fine public space, although raised high above pedestrians. The architects are Hellmuth, Obata & Kassabaum Incorporated, of St. Louis and Neuhaus and Taylor of Dallas; the Henry C. Beck Company is general contractor and construction manager.

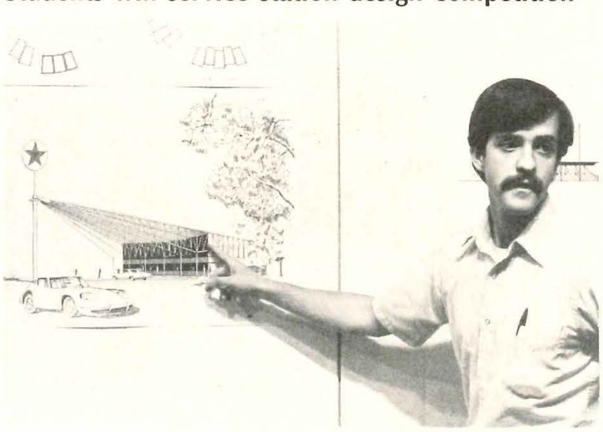
Gyo Obata, design director, said the megastructure is a new design concept of building a city within a city. Obata said his architects are working closely with the Hilton people to further improve the hotel. "Almost all of the rooms will have a view of the river and the functions room will look into a garden court which will be a gracious entry to the hotel."

The River center plan calls for more than 250,000 square feet of terrace area devoted to the public, and a sculpture court. Additionally, an international bazaar facility, similar to one in Hong Kong, is planned.

International Rivercenter is not the first magastructure project undertaken with the combined talents of Neuhaus and Taylor, and Hellmuth, Obata and Kassabaum. The two firms designed Houston's Galleria Post Oak, a high-density urban center that brings together a wide variety of commercial, residential, entertainment and leisure activities operating virtually around the clock.

Additionally, Neuhaus and Taylor recently completed master planning for Town Center (RECORD, July, page 38), a megastructure to be built in the Detroit suburb of Southfield.

Students win service station design competition



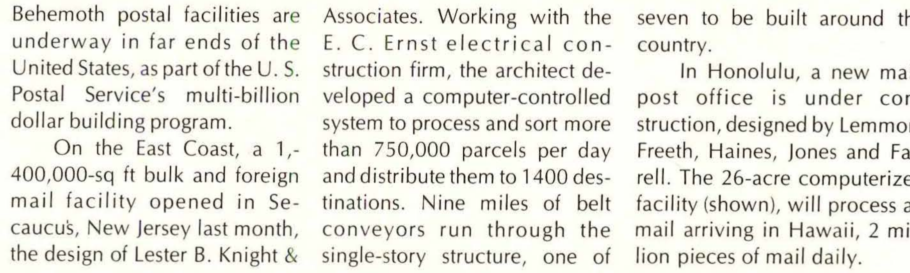
Texaco, Incorporated has presented eight architecture students at the University of Virginia with $500 worth of books as the result of a competition to design a new service station prototype.

Jonathan E. Frank of Newport News and Robert A. Langston (shown with design) tied for first place in the competition.

Texaco invited the school to participate in the possibility of creating a new image for their company through innovative design for their service centers.

Students were unrestricted in their use of materials, but were urged to consider cost of construction and land. The prototype centers were suitable to all highway conditions and facilitated easy maintenance and service and traffic flow.

Large mail facilities on both coasts show increase in postal construction



Behemoth postal facilities are underway in far ends of the United States, as part of the U. S. Postal Service's multi-billion dollar building program.

On the East Coast, a 1,400,000-sq ft bulk and foreign mail facility opened in Secaucus, New Jersey last month, the design of Lester B. Knight & Associates. Working with the E. C. Ernst electrical construction firm, the architect developed a computer-controlled system to process and sort more than 750,000 parcels per day and distribute them to 1400 destinations. Nine miles of belt conveyors run through the single-story structure, one of seven to be built around the country.

In Honolulu, a new main post office is under construction, designed by Lemmon, Freeth, Haines, Jones and Farrell. The 26-acre computerized facility (shown), will process all mail arriving in Hawaii, 2 million pieces of mail daily.

Design Necessity exhibit touring seven states

In response to public interest in the First Federal Design Assembly held for Federal administrators last April, a Design Necessity Exhibit will tour seven states through May, 1974. It illustrates the 10 performance criteria of effective design discussed at the Design Assembly.

The exhibition is sponsored by the Federal Council on the Arts and the Humanities under a grant from the National Endowment for the Arts.

Following is the schedule for the exhibit's remainder tour:

- Chattanooga, Tennessee
Tennessee Arts Commission
September 15-October 7, 1973
- Kansas City, Missouri
Design & Cultural Affairs
Crown Center
October 20-November 11
- Bloomington, Illinois
Illinois Wesleyan University
November 24-December 16
- Minneapolis, Minnesota
First National Bank of Minneapolis, January 6-27, 1974
- Detroit, Michigan
Michigan Council for the Arts
February 9-March 3, 1974
- Columbus, Ohio
Ohio Arts Council
March 16-April 7, 1974
- Lexington, Kentucky
Citizens Union Bank & Trust
April 20-May 12, 1974

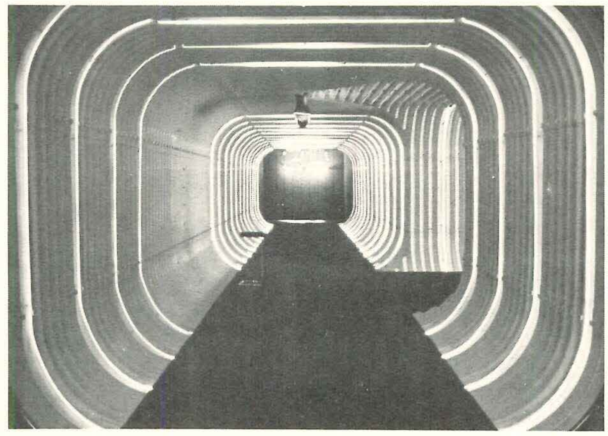
Paris conference sees rise in solar energy

Solar energy could be a reliable source of energy for the heating, cooling and electrical needs of homes, and may well be an economical energy source by the end of the century.

This was the major conclusion that emerged from "The Service of Mankind" conference held in Paris July 2-6. At the congress, architects and scientists presented findings on solar buildings, including systems for heating, cooling, and water pumping, plus the use of glass, natural lighting and conversion of solar energy into electricity.

Use of solar energy has proven to be exceptionally desirable in underdeveloped nations, according to congress participants, because of the maximum need and often maximum solar intensity. A "solar channeled" collector is providing energy to drive a water pump for a town of 2,000.

This system was presented at the congress by Georges and Jeanne-Marie Alexandroff, French architects who designed the integration of the pump and the solar collectors (placed on roofs) with regional buildings.



New York architect-developer adding to the fun in Fun City

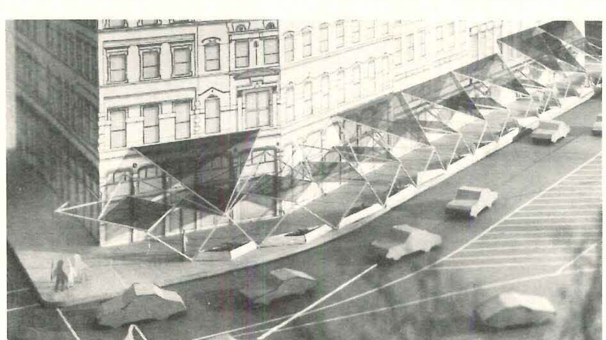
One of the latest office buildings to open in New York City is 747 Third Avenue, an efficient glass-clad tower with a jet-age sounding address—and a wooden front porch.

The creation of architect-developer Melvyn Kaufman, 747 Third Avenue is the latest in a series of Kaufman office buildings designed to "return to human scale" and "add levity to this somber city." All Kaufman buildings in New York tend to maximize the use of ground spaces for human activity, by adding interest and amenities, in place of "dead space."

The first such effort in this direction occurred in 1970 when a Kaufman building opened in the Wall Street area, sporting a roof-bound World War I Sopwith Camel. Nearby, at 127 John Street, workers in the tower can look down on another bit of Kaufman whimsey—the setback roof reveals a never-ending chase involving a malevolent cat after a robin.

The building is entered through a corrugated steel tunnel, ringed in blue neon, and on clear nights, thousands of New Yorkers are treated to the spectacle of 127 John Street's mechanical floor, fully exposed, brightly painted and flashing high above the financial district.

Union Square, long-neglected in New York City, redesigned by students



Recently announced proposals for the redesign of Union Square Park, New York City, the 14th Street-Union Square Subway Station, and the facade of S. Klein Department Store (six buildings fronting the Square) were developed by students at Parsons School of Design, during a year-long study project, made possible by a grant from the McCrory Corporation (S. Klein Department Store is a subsidiary of McCrory Corp.).

Four instructors from Parsons Environmental Design Department, 18 second- and third-year students from that department, and a graduate assistant from the Center for New York City Affairs at the New School participated.

Six students studying Union Square wanted to increase and unify its public space as an outdoor commercial area and a gathering place for people. Their design proposals include: a new path layout in the park related to activities within the area; a revised seating space layout; a commercial extension of the square through exhibition space and provisions for vendors; increased and more adequate lighting and more landscaping in the park itself.

Recently, local planning groups have adopted the redesign of Union Square Park as their top priority for next year.

Student proposals for the subway station attempted to accomplish modernization of the complex without making structural changes.

One of the group's first suggestions was for a new paint scheme within the station. This proposal, adopted by the Metropolitan Transit Authority in January, uses color (yellow, red, black, silver) to identify different areas and functions.

Research for the facade of S. Klein Department Store led to four proposals for its redesign. The third group of students worked on the following designs: a triangular plastic arcade extending across the building's front (shown); a re-creation of the store's street level windows (shown); and S. Klein painted diagonally, in gigantic letters, across the entire facade.

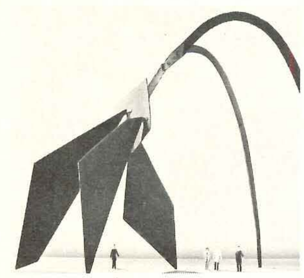
These proposals were presented to the store which selected two of them for costing.

State and Federal aid to the arts revealed

A monumental, steel sculpture by Alexander Calder will rise 53 feet on Dearborn Street in Chicago next spring following completion of the Federal Center in that city.

Arthur F. Sampson, head of the U.S. General Services Administration in presenting a model of the sculpture, said GSA will pay $250,000 for it and another $75,000 for installation. GSA renewed a program in 1972 that permits expenditures of up to one-half of one per cent of building construction costs for fine arts.

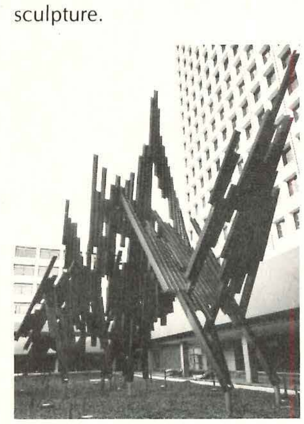
The untitled Calder stabile is a free-flowing assemblage of forms to be painted bright red to contrast with the dark facade of the Federal building it will front.



At the Governmental Civic Center Plaza in Binghamton, New York, a 35-ton weathering steel sculpture has been moored amid misting waters within a sunken plaza in front of the new State Office Building (below).

Masao Kinoshita, architect-sculptor of the architectural firm of Sasaki, Dawson, DeMay Associates conceived the idea and with the help of the office of Cummings and Pash, Binghamton, Governmental Center architects, nurtured it to reality.

To make the sculpture seem to come alive, motion was accomplished by arranging to have mists of water sprayed throughout the pool over which the sculpture soars. To enhance the effect, the scene will be lighted for evening display. All of the steel is 8-inch wide-flange structural type, in an assortment of lengths and weights per foot. Hundreds of steel beams were used in construction of the sculpture.

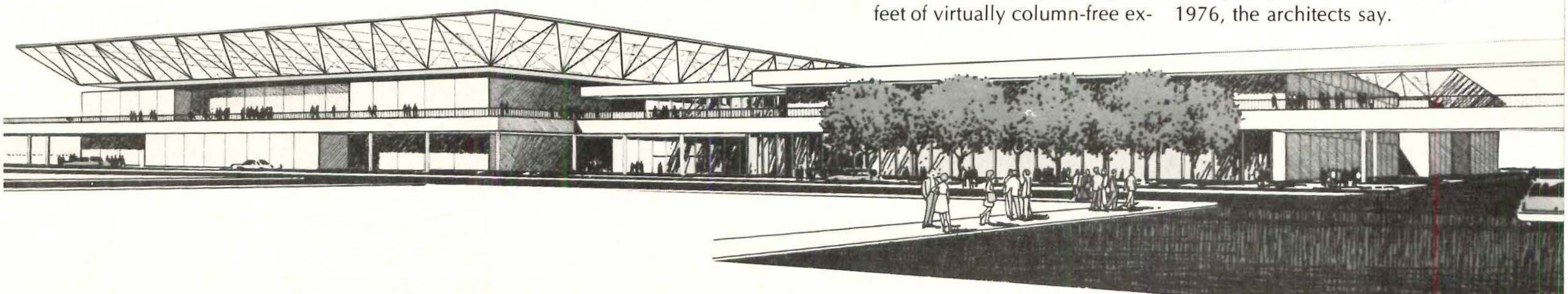


Renaissance Center will rise over the next ten years on Detroit's waterfront

The Detroit waterfront at the base of the central business district will be the scene of a ten-year project to develop 33 acres into offices, restaurants, a hotel, shops, apartments and places of entertainment. The $500-million project, for which ground was broken in May, was designed and master-planned by John Portman for the Detroit Downtown Development Corporation, a subsidiary of Ford Motor Land Development Corporation. The first phase, presently under construction, consists of a 70-story circular hotel (dark building in center of photo) with four 39-story octagonal office towers adjacent, these totaling 2.3 million square feet of rentable space. Covered walkways and bridges will link the buildings, expected to be finished by 1976. Concurrent with this construction will be 240 apartment and condominium units overlooking the river. Estimated cost of the first phase is $235 million. The second and third phases will include ten 19-story office buildings and expansion of a two-story podium structure for the complex containing shops, etc. Additional apartments are also planned. The site is currently a run-down warehouse district, with a prime location adjacent to Cobo Hall.

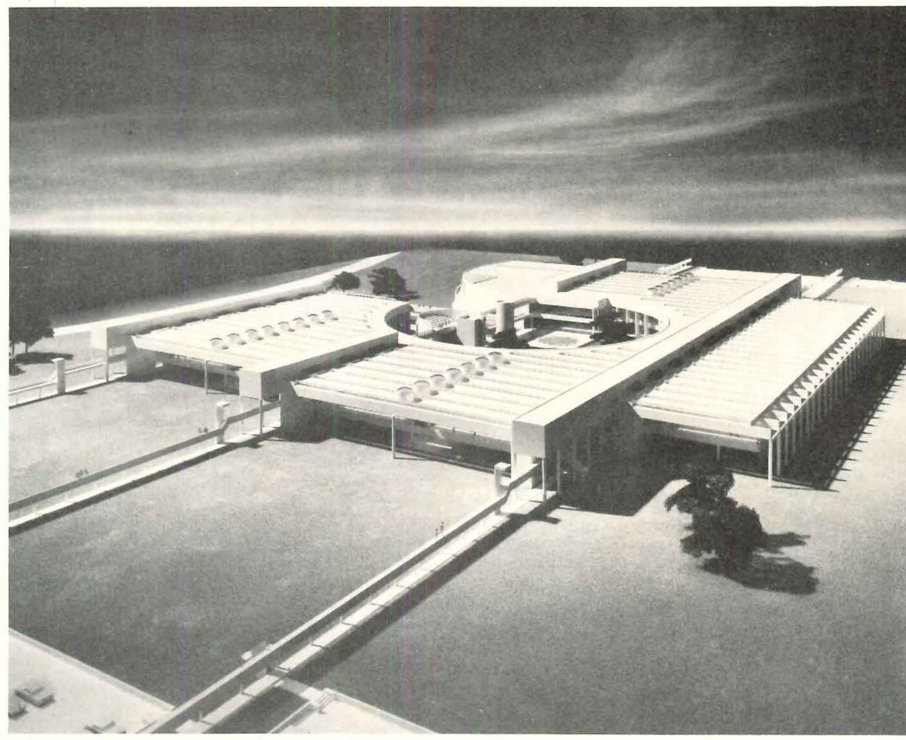
St. Louis Convention Center to be started this year

Preliminary design plans for a new St. Louis convention facility have been presented by architects Hellmuth, Obata & Kassabaum / Jenkins - Fleming, with work expected to begin late this year. Located downtown, the 482,540-square-foot building will cover four blocks and provide 240,000 square feet of virtually column-free exhibit space in an L-shaped hall. The building will be roofed with a large steel space frame, offering 45 feet clear height underneath and 15 feet within the frame. An elevated skywalk will connect the $20 million building to nearby hotels, parking and a proposed elevated mall. Occupancy is planned for early 1976, the architects say.



Wisconsin office building designed for insurance company

Construction has started this month on an office building near Appleton, Wisconsin, designed by the New York office of John Carl Warnecke & Associates for the Aid Association for Lutherans, a life insurance company. Because of future growth requirements—space for twice the present staff—the building is designed to expand horizontally; linear cores (shown in the foreground) show the direction for expansion, with two-story work areas located between. The problem of providing democratic space, usually made difficult by the greater desirability of areas near windows, was solved by a roof skylight system designed to distribute natural light evenly across the upper floor of the building (section). The half circle sections will be covered with a sound-absorbing cloth that will also help distribute the light. The lower floor will be given over to data processing and dead storage, with light let in through courts.



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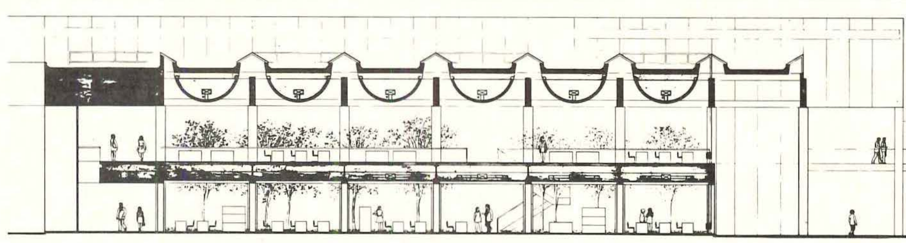
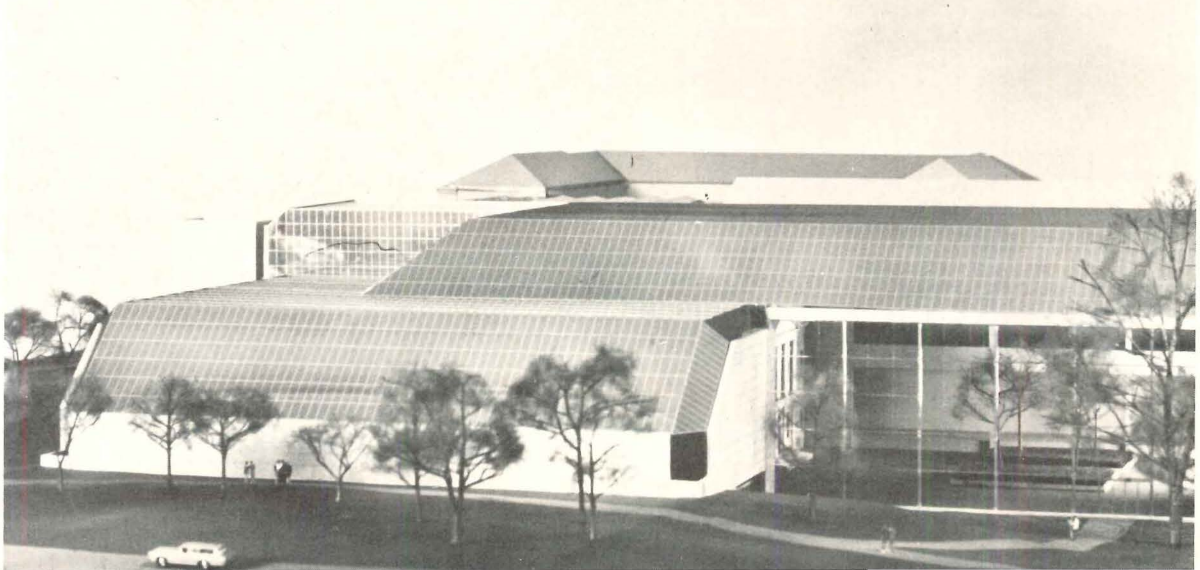


Section East-West

Office, shopping complex for New York

A 46-story tower resting on a platform 112-feet-high has been designed by Hugh Stubbins & Associates to create in its mid-Manhattan location ground level open space. The tower's platform, ten stories above the ground, will be supported by "super columns," each 24-feet-square. The plaza space thus created will give access to a new church (wedge-like structure) and a shopping galleria. Alternating banks of reflective glass and aluminum set flush will sheath the structure.

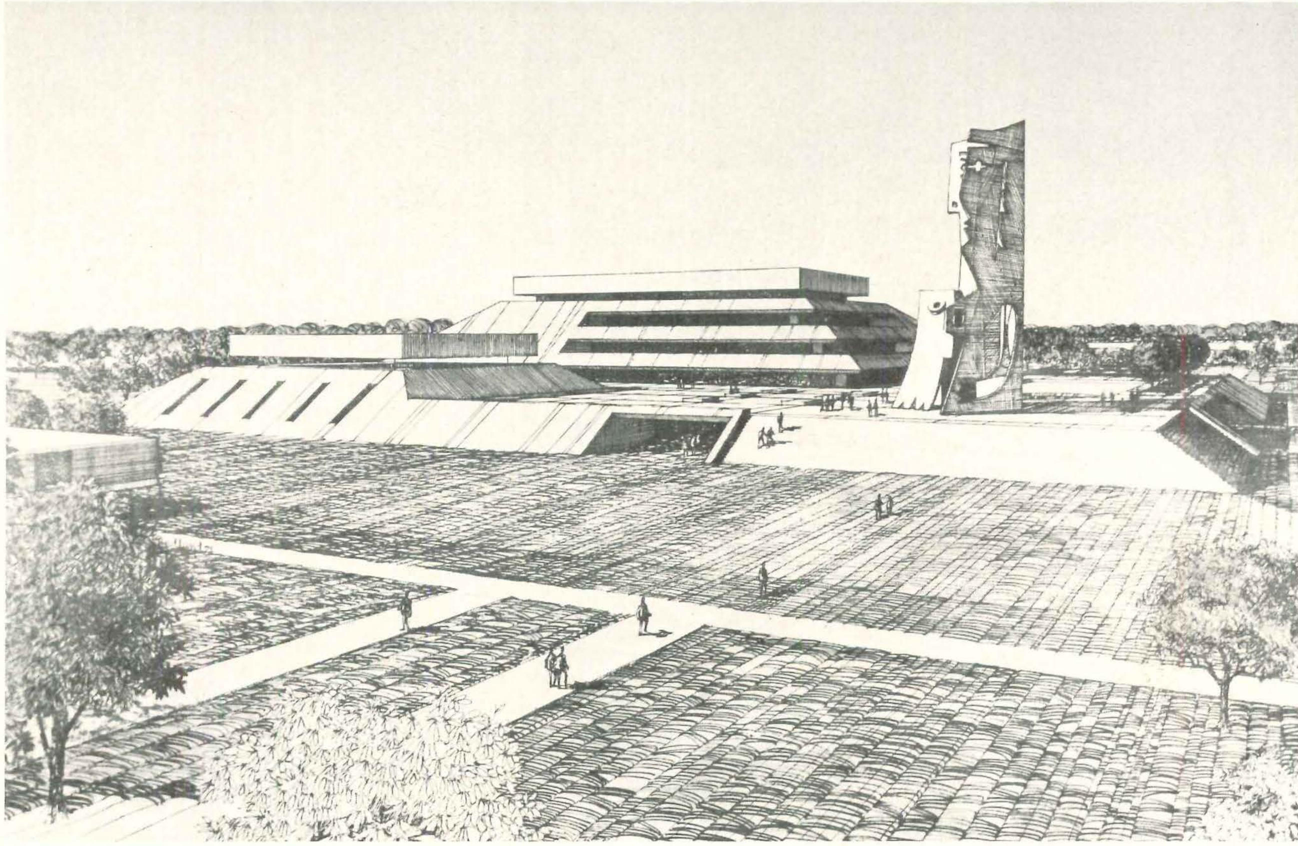
New York's Metropolitan Museum of Art building glass-roofed American wing

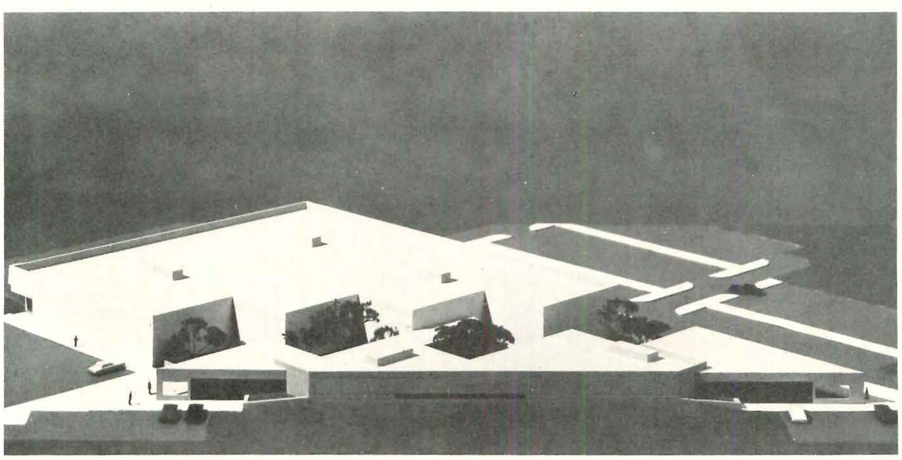


Presently under construction is a 55,000-square foot addition to the Metropolitan Museum of Art in New York City, to open in 1976 and to be called the American Bicentennial Wing. Designed by Kevin Roche John Dinkeloo, the structure will surround the existing American wing and provide three stories of public galleries. A four-story glass-roofed enclosure (right), preserving the 1823 facade of the United States Branch Bank and its courtyard, will become a Garden Court for American sculpture, usable the year round. A recently-acquired living room from one of Frank Lloyd Wright's famous prairie houses will be installed also.

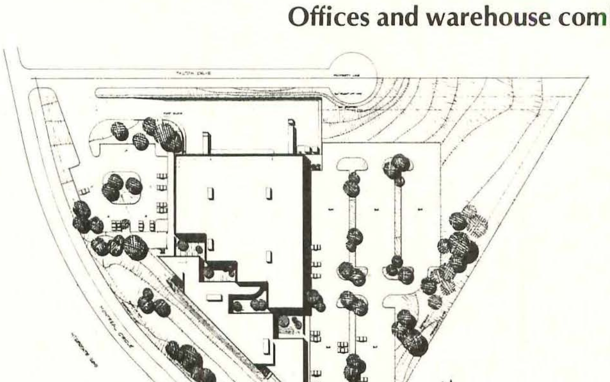
Picasso sculpture for Florida arts center

The performing and visual arts center of the University of Southern Florida, Tampa, is intended to house a complete range of animated communication activities including an experimental visual space surrounded by studios and guest apartments (left in the rendering) and a 2500-seat theater (center). Entrance by car will be under the podium and reflecting pool (to the right) where the drive will go around a ring of falling water from a circular opening above. Designed by Herbert H. Johnson Associates, with Mark Hampton in charge of design, the complex massing is meant to complement a 100-foot high Picasso sculpture presently being fabricated in concrete by architect-sculptor Carl Nesjar, who has executed two other concrete Picasso works at Princeton University and New York University. The podium on which this sculpture will rest is 250,000 square feet.





Offices and warehouse combined for Atlanta company



The $1.3 million Mary Kay Cosmetics distribution and training center under construction near Atlanta was designed by Heery & Heery, whose major design problem was to maintain a harmony between the offices and the large connecting warehouse. The solution was to design the offices as a series of four connected triangles with a single hypotenuse facing a highway, and the other sides creating interior courts. A connection between one triangle and the warehouse also separates the training center courts from the office triangles. Though connected the offices and training center have separate entrances.

Equipment building for telephone company

Harry Hake & Partners have designed this 13-story equipment building, one of several by the firm in and around Cincinnati for the Bell system. The concrete structure, faced in silo brick, will be completed in 1974. It is being built next to another telephone company building (left in photo) designed by the firm many years ago. The space in the new structure will accommodate equipment to be added over a period of years after completion.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Good start, bad show

THE SACK OF BATH, *by Adam Fergusson; Compton Russell, London, 1973, 77 pages, illus., $2.50.*
SURVEY OF LONDON, 1900-1970, *edited by F. H. W. Sheppard,* et al.; *AMS Press, London and New York, 1972-73, 36 volumes, illus., $765.00. (Volumes 1, 2, 10, 12, 17, 18, 19, and 22 are already available; the remaining volumes are scheduled to appear by the end of this year.)*

In his fascinating series of little essays collected under the title *The Englishness of English Art* (Architectural Press, London, 1956) Nikolaus Pevsner ascribed certain distinctive qualities to the character of his adopted nation: "A strictly upheld inefficiency in the little business-things of everyday, such as the workman's job in the house, windows that will never close and heating that will never heat, a certain comfortable conservatism of the wig in court, the gown in school and university." Pevsner included in his characterization, of course, a number of other qualities that everyone (including Englishmen) would find altogether admirable. But it was the inefficiencies, inconveniences and illogicalities that we Americans, practical to the core, dwelt on and laughed about when we went to England in the fifties and sixties—including taxis that looked more like Model T's than real cars, May Balls at Cambridge that took place in June, telephones that worked about as well as two tin cans connected by a string, and a ridiculous currency that taught only the wise meaning of the dozen. Well it turns out that, in a time of furious debate on almost every conceivable subject here at home, our telephones (at least in New York) don't seem to work so well, that the dollar—an eminently firm *and* rational form of currency—plummets like a stone dropped into Loch Ness, and that the new British currency, designed to be with-it in the world, is ugly, unintriguing and apparently rather unpopular. It turns out too that those old-fashioned London taxis were, and still are, very comfortable, and that the May Balls were fun, even in June.

All of this is a little embarrassing. For the architect or planner it is also galling as he arrives at Heathrow, a visual and schematic disaster which grew like Topsy but is inexplicably (according to any official rules) one of the most convenient large airports in the world. It is galling to note that in many aspects of planning, zoning and public housing Great Britain is decades ahead of America. Never mind, for the moment, that with our own and our Franco-Germanic training (and with what used to be our money) we may be ahead of them, building to building, in our architecture.

For preservationists, too, there is some cause for envy. In 1900 the London County Council published the first volume of the immense *Survey of London.* The publication of subsequent volumes continued over 70 years, attempting to cover almost every square foot of the old County of London in order to record all that remained of "historic or aesthetic interest," the goal being the "preservation of the things recorded." This, indeed, was a far-sighted objective. The *Survey of London* is a heavyweight companion, covering only one city, to Pevsner's dry but convenient series, *The Buildings of England* (Penguin Books) and to the Publications of the Royal Commission on Historical Monuments (Her Majesty's Stationery Office), handsome volumes most of which are unfortunately out of print. All of these books reflect a lively interest on the part of the British in the buildings of the past, and it is admirable that the *Survey of London* is now being reprinted; it will be a useful addition to architectural libraries and of interest to ardent Londinophiles, though they almost certainly will be impressed by the number of buildings listed in the *Survey* which no longer exist.

For all is not well in Great Britain, as the traveler will note when he makes the trip from Heathrow into London. Some British architects and planners, in an orgy of self-immolation, have learned the worst, not the best, from their former colonies and from their former colonies' masters on the Continent. In London they seem to be tearing themselves down and, in the rubble, building buildings that look like they were designed by someone who had heard about Los Angeles but never actually seen it. This phenomenon, for present purposes, takes us away from London to Bath and to a small but powerful book, *The Sack of Bath,* which is very much worth the reading. Bath is, or was, a near-perfect Georgian city. There—even now—are the Royal Crescent, the Circus, the Assembly Rooms—all ready for the Kodak. But what is gone, or going, as *The Sack of Bath* points out, is the context, the back-stage support for the monuments of note, the ordinary buildings for ordinary people (and that unfortunately includes most of us). In the view of the author of the book, these masses of less-than-great old buildings are being replaced by an architecture that is not only incongruous with the old city, but unsympathetic to the people who live there.

The Sack of Bath is an important new book because it phrases the problems of historic preservation in a new way—a way which may be depressingly burdensome to preservationists, particularly in America to the National Trust, whose members strive desperately with limited means merely to retain the monuments. But the problem is not just one of monuments, but of context. It was poignantly revealed recently to millions of beer-drinking Americans on the nightly news: the Covent Garden area of London is about to be "modernized," the ordinary buildings torn down to make way for what planners regard as more commercially viable facilities. The monuments, like the Royal Opera House and Inigo Jones's St. Paul's Church, will be preserved. What will go is, again, the context. Workers in the Covent Garden market, when interviewed, spoke almost universally against the modernization scheme, and their reasons were interesting; they pleaded that "atmosphere," a sense of history, a sense of place would be lost when they were moved to their future modern quarters; some talked of finding another trade.

So, with their opinions in mind, let's read John Betjeman's prefatory verse in *The Sack of Bath.* He compares the city of the eighteenth century to that of the twentieth:

In these days of course there was not so much taste
But now there's so much it has all run to waste

In working out methods of cutting down cost—
So that mouldings, proportion and texture are lost
In a uniform nothingness. (This I first find
In the terrible "Tech" with its pointed behind.)
Now houses are "units," and people are digits
And Bath has been planned into quarters for midgets.
Official designs are aggressively neuter,
The Puritan work of an eyeless computer.

In this set of circumstances one thinks of a more intimate poem that Betjeman wrote some 30 years ago, "In a Bath Teashop":

"Let us not speak, for the love we bear one another—
Let us hold hands and look."
She, such a very ordinary little woman;
He, such a thumping crook;
But both, for a moment, little lower than the angels
In the teashop's ingle-nook.

What do you suppose has become of that teashop in Bath? What do you suppose has become of that very ordinary little woman? What of that thumping crook? We should worry about that.

It is reassuring that the British, having documented and preserved a good many of their great buildings, have crossed a first hurdle and are now moving on to broader issues not only of historic preservation but of the quality of contemporary buildings in comparison to those of the past. For American preservationists, who have yet to cross the first hurdle, and for preservationists, architects and planners alike they are sending across signals of what our next challenge should be.

—*Gerald Allen*

Also Received

WESTERN WOODS USE BOOK; *Western Wood Products Association, Portland, Oregon, 1973, 316 pages, illus., $10.00.*
An expansion of the 1961 *Douglas Fir Use Book,* this first edition presents structural data and design tables for softwood lumber species, graded by the publisher. The book includes standards for grading, laminates, fasteners, preservatives, fire protection and sound control.

LOST AMERICA: *From the Mississippi to the Pacific, edited by Constance M. Greiff; The Pyne Press, Princeton, 1972, 243 pages, illus., $17.95.*
This handsome book of photographs continues across the nation the dreary chronicle of buildings that are no more.

HANDBOOK OF CONSTRUCTION MANAGEMENT AND ORGANIZATION, *John B. Bonny, editor, and Joseph P. Frein, associate editor; Van Nostrand Reinhold, New York, 1973, 650 pages, 326 illus., $32.50.*
Managing and field work on the construction site are the subject of this handbook; it is not about the professional service of scheduling and cost control extending through the entire design and construction process, as the term "construction management" is sometimes interpreted today. Editors Bonny and Frein, both retired executives of Morrison-Knudsen Company, Inc., have assembled the contributions of some 25 authors, attornies, bankers, tax experts, engineers, computer specialists and construction contracting authorities. Bidding techniques, estimating forms and basic construction contracts are discussed. This is principally a book for construction contractors.

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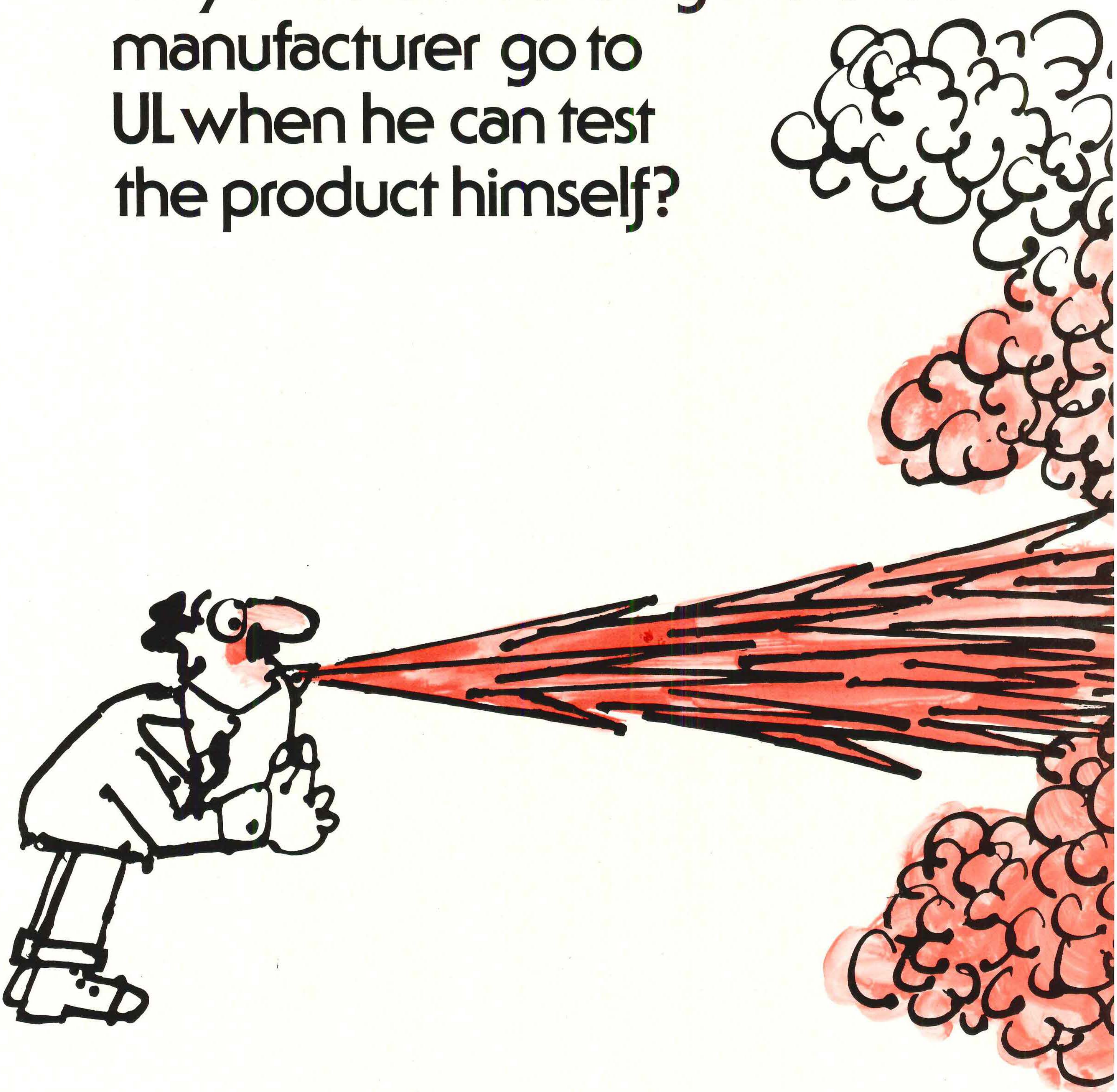

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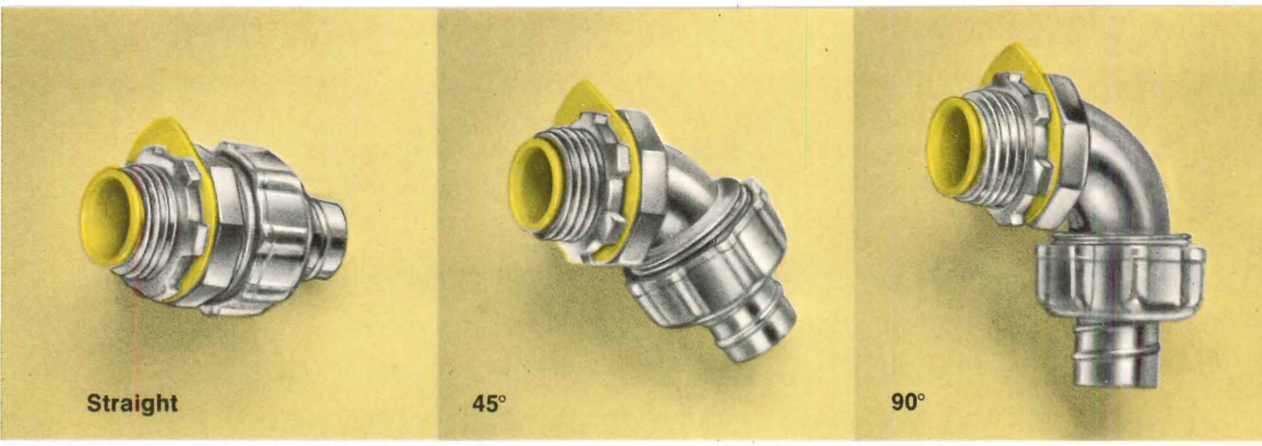

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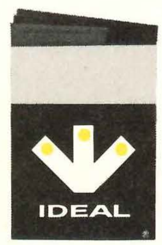

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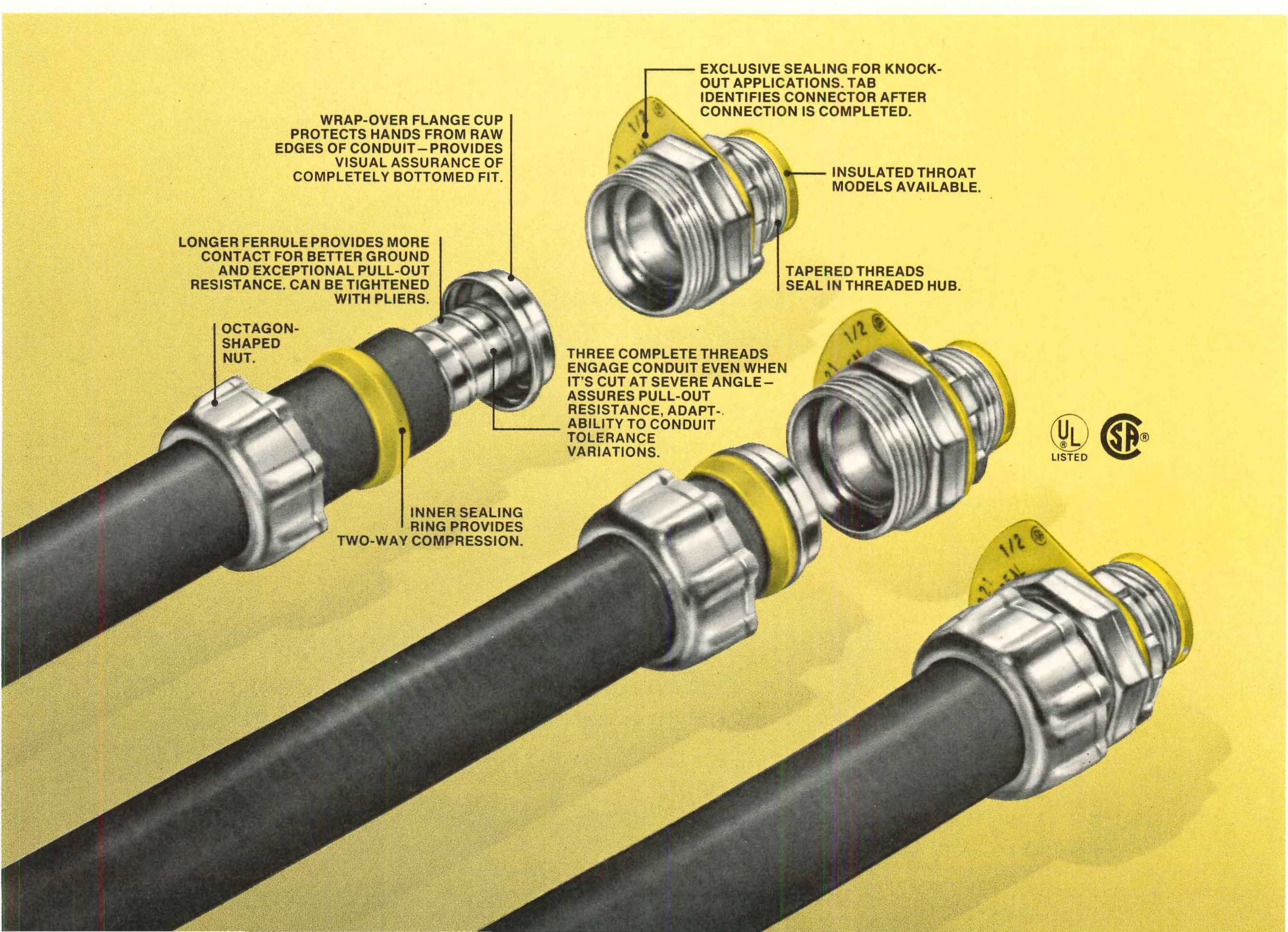

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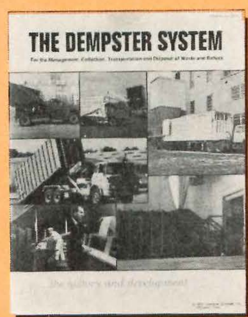

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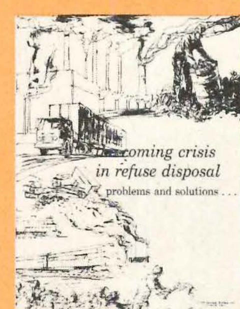

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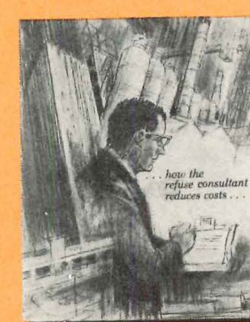

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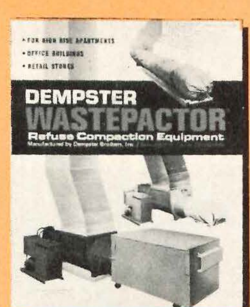

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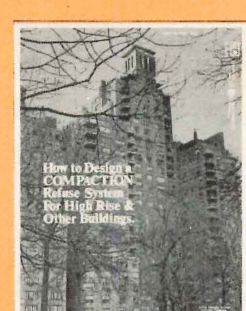

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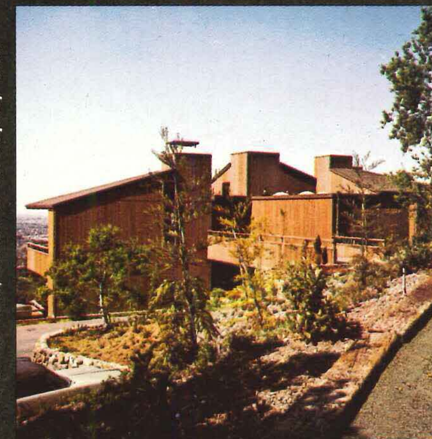

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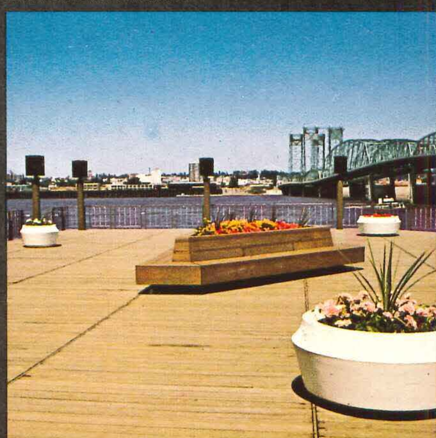

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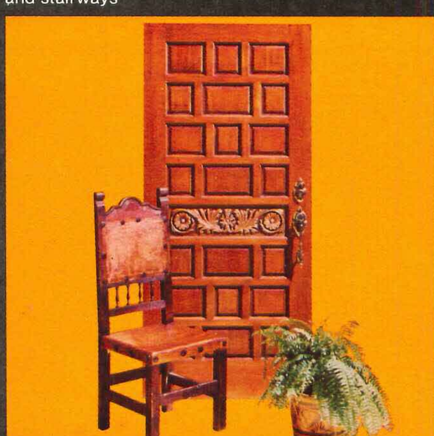

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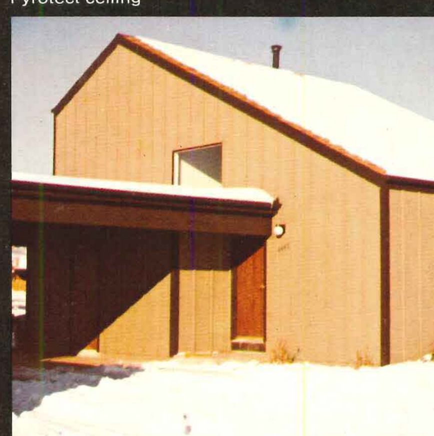

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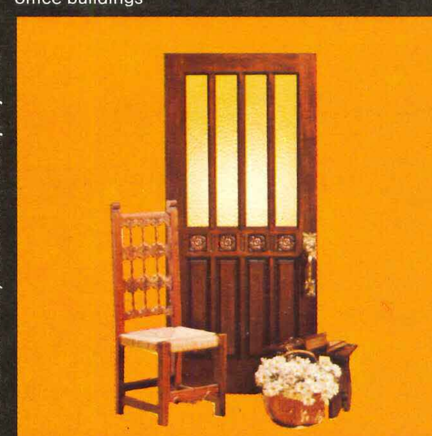

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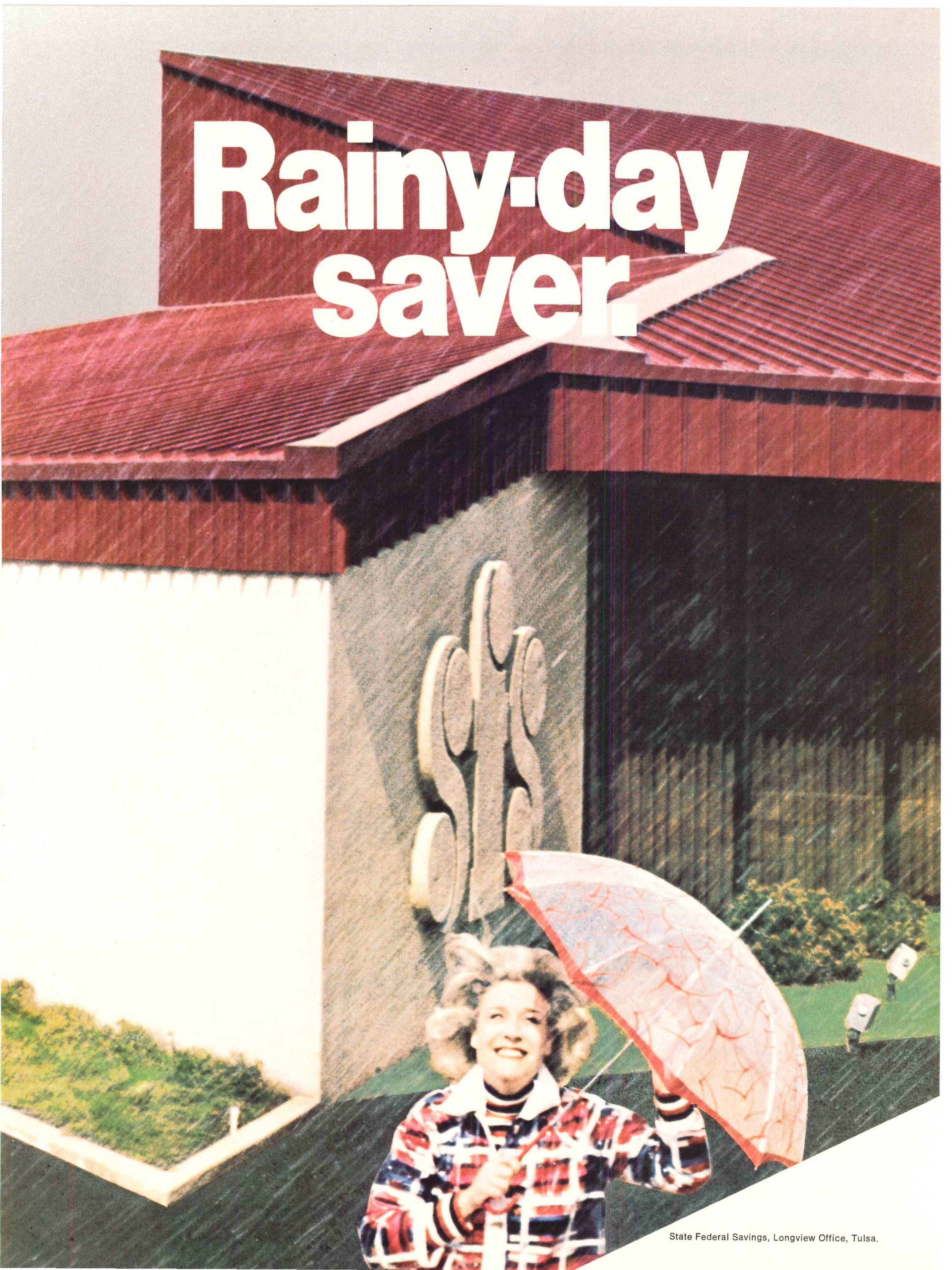

State Federal Savings, Longview Office, Tulsa.

A choice of colors with clean lines.

Rib design adds roof strength.

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The Zip-Rib roofing is beautifully secure without visible fasteners. Sealed without plastic seams. Tight without ugly endlaps.

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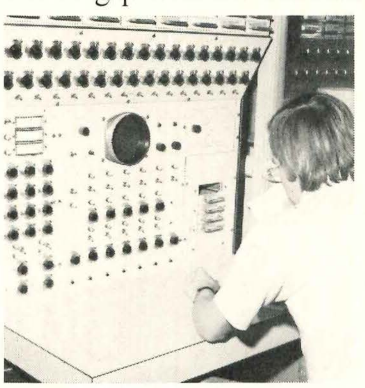

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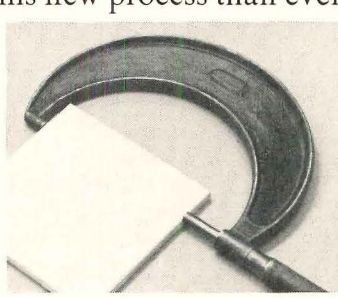

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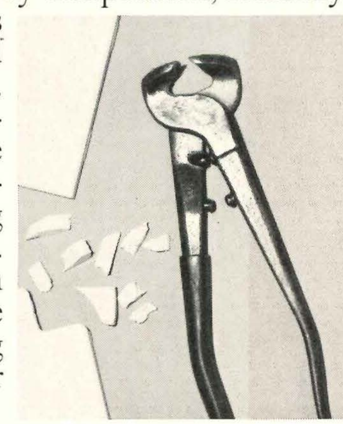

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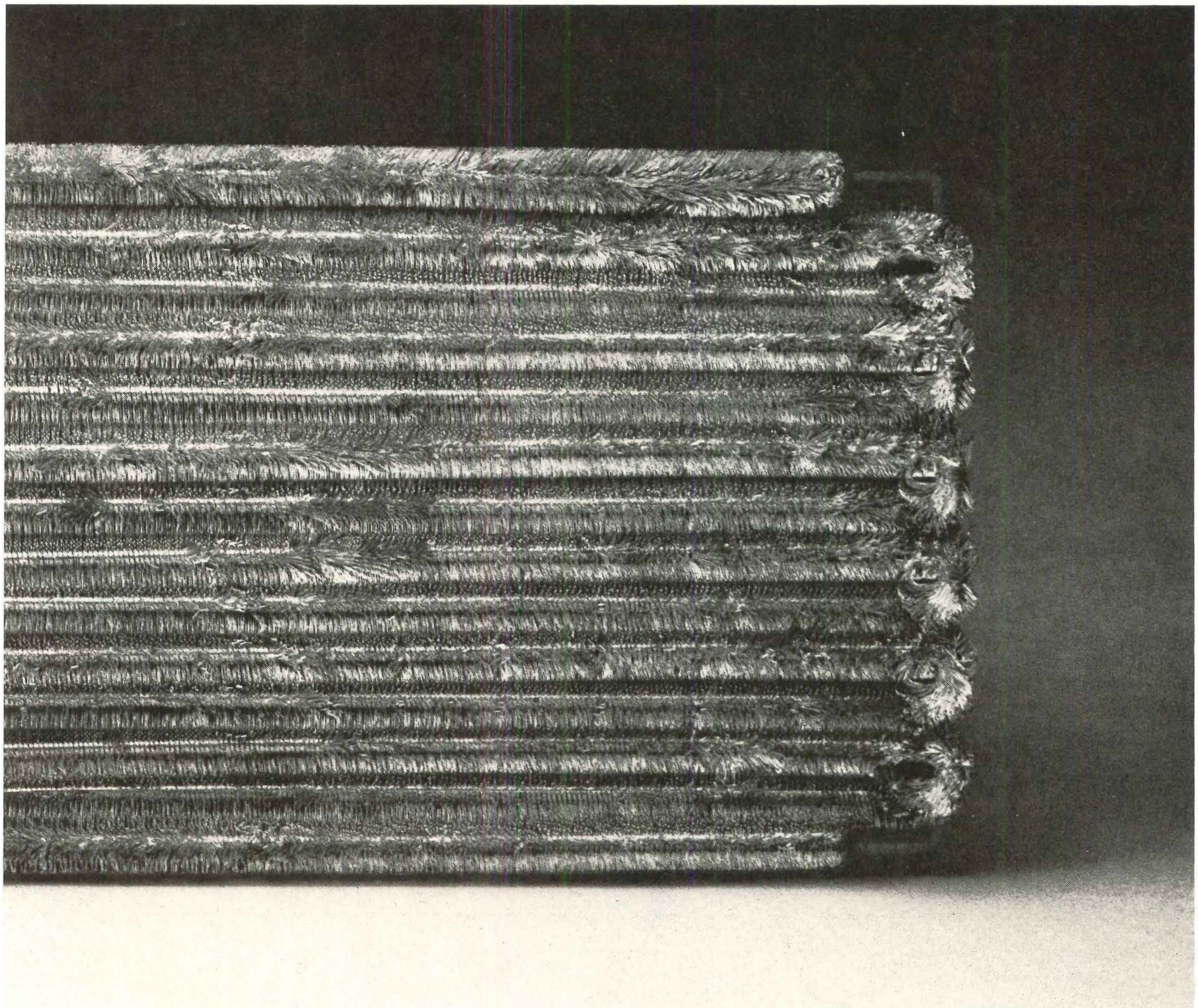

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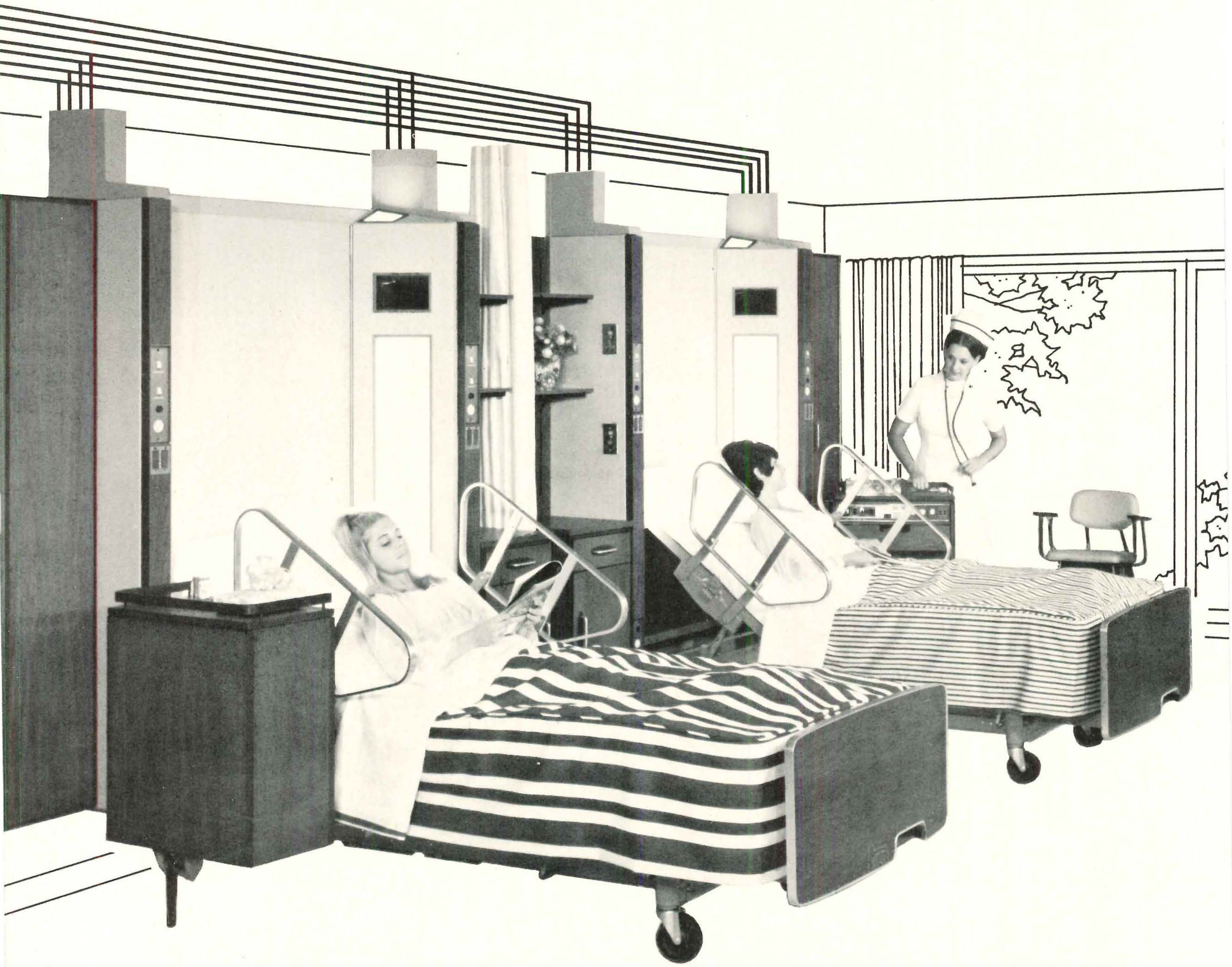

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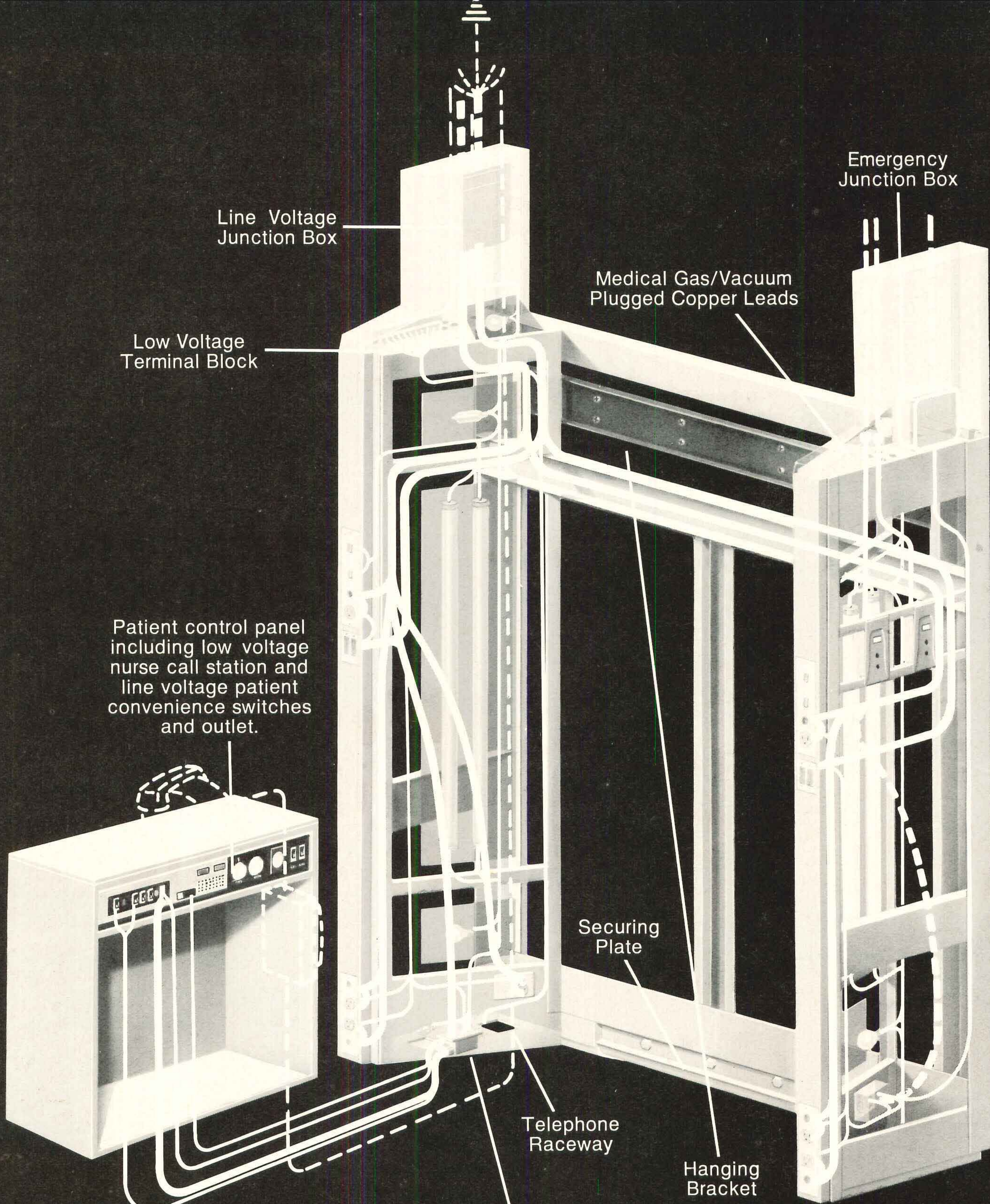

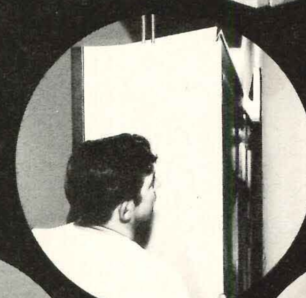

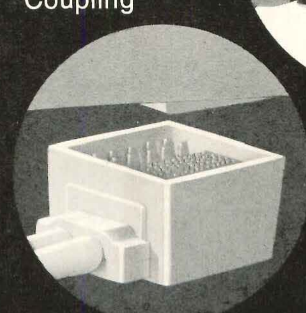

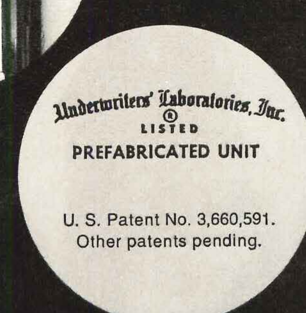

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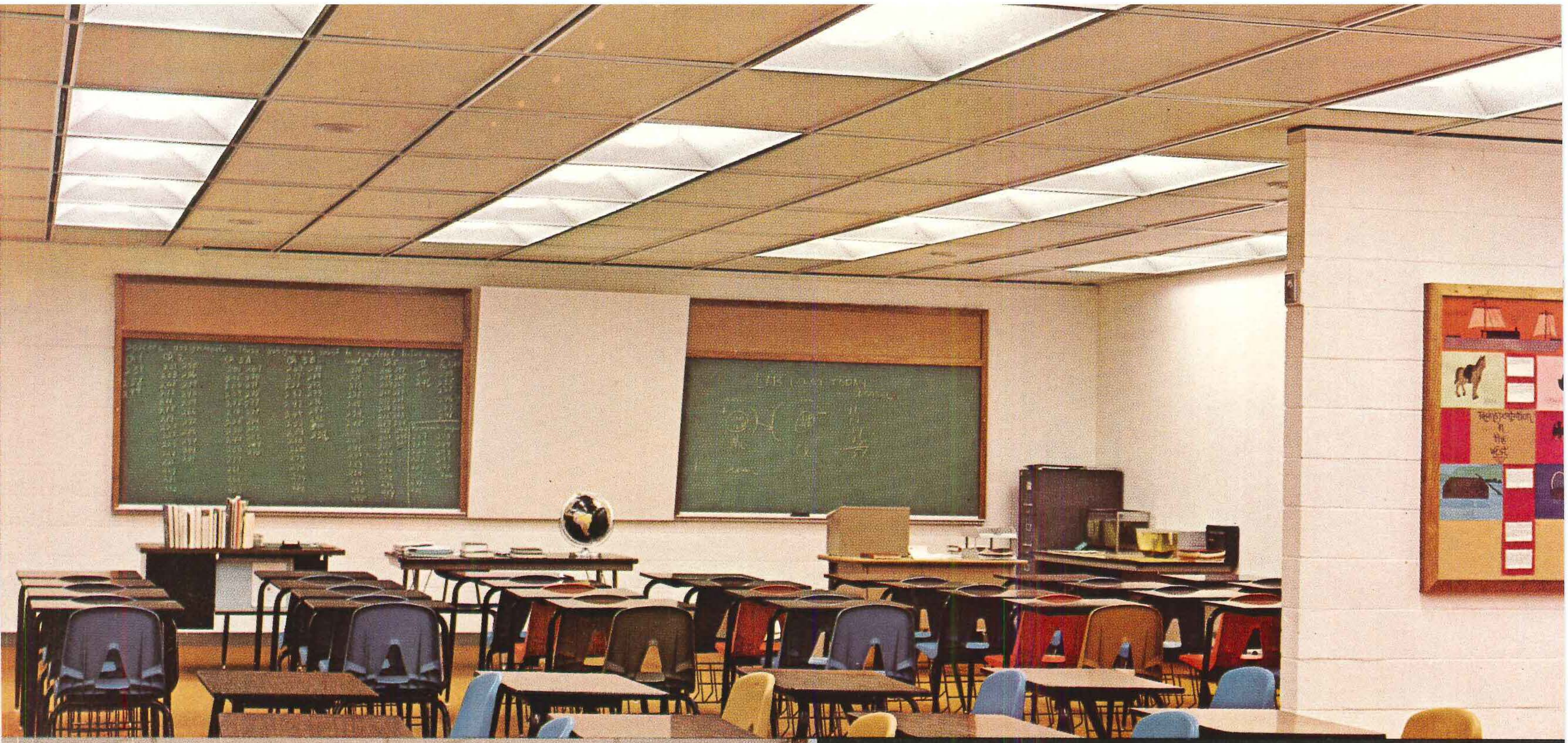

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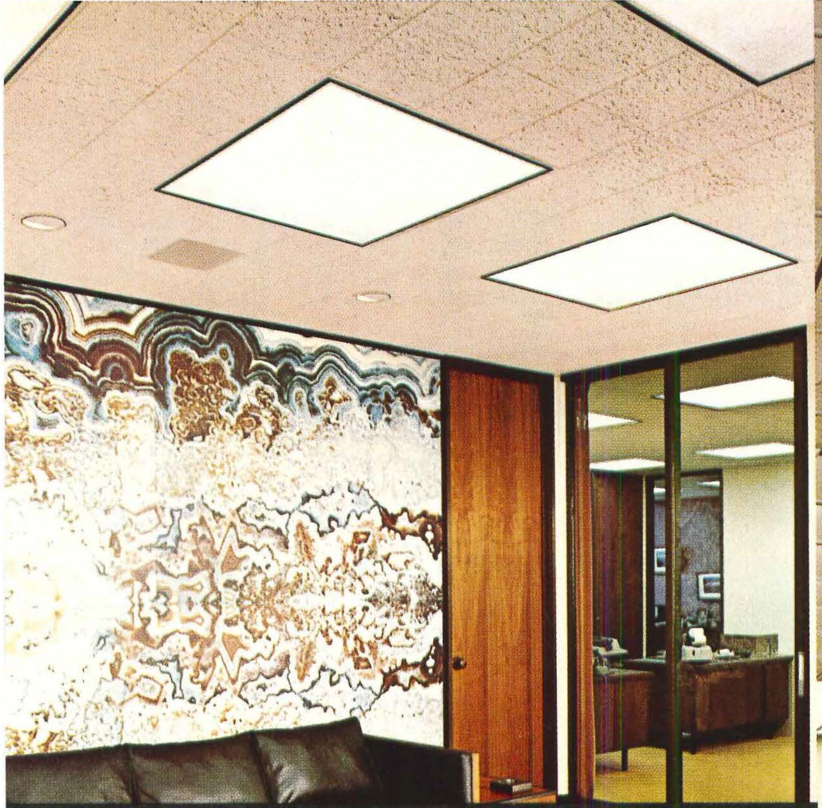


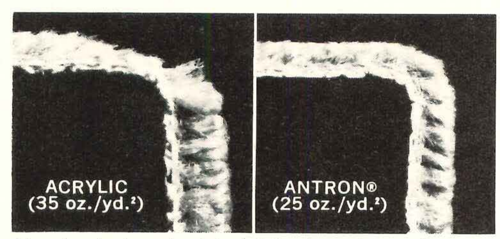
building has 52 floors.

You don't put down nineteen acres of carpeting without a great deal of certainty.

In the case of the new corporate headquarters building at 1221 Avenue of the Americas, Rockefeller Center, New York, the carpet specifications were rigid: it must be a custom carpet of unusual style, having the durability and resilience of nylon, be easy to care for, be soil-hiding by virtue of its pile fiber and color.

It was to be installed throughout most of the building, including offices, corridors, bookstore, library, storage, printing and graphic areas. The final selection: a woven cut/uncut construction with pile of Antron* nylon.

"Antron" scored high because of its unique hollow filament structure which optically screens out much 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.



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

"Antron" also has exceptional durability (see stair edge test) and resiliency. This, together with its superior soil-hiding, keeps carpet of "Antron" looking fresh longer.

And maintenance costs with carpet of "Antron" are minimized by the need for fewer wet cleanings than with carpets of other fibers.

Specify "Antron" for high-traffic commercial carpet. It has no equal in long-term appearance retention.

For further information and a list of mill resources, write: Du Pont, Contract Specialists, Room 108/AR, Centre Road Building, Wilmington, Delaware 19898.

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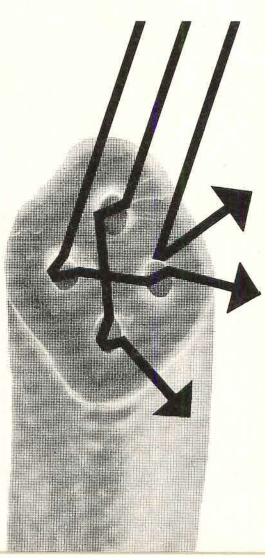

How "Antron" hides soil. Its filament structure is unique, as shown in this magnified (650 ×) cross-section. The four precisely-placed holes in each filament scatter light like the facets of a diamond to minimize the dulling effect of soil, while helping to retain color clarity and luster.

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

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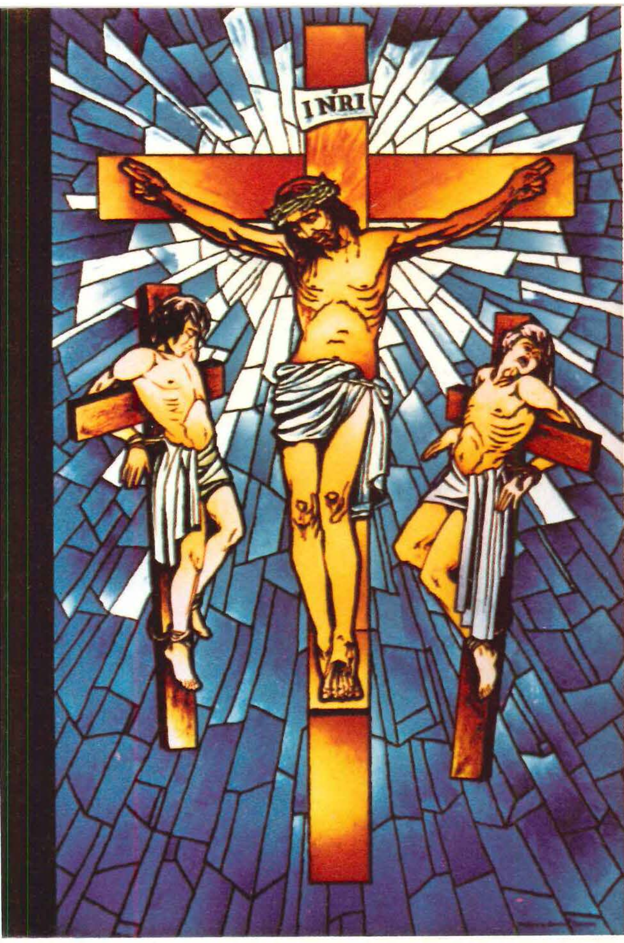

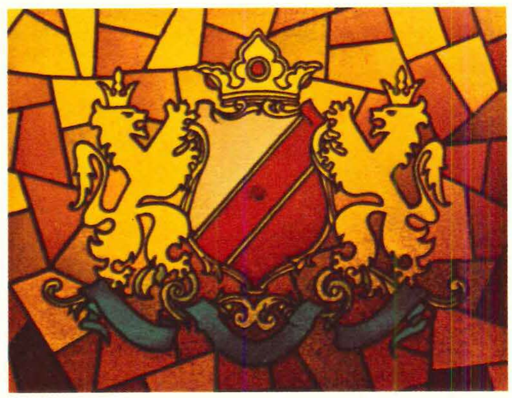

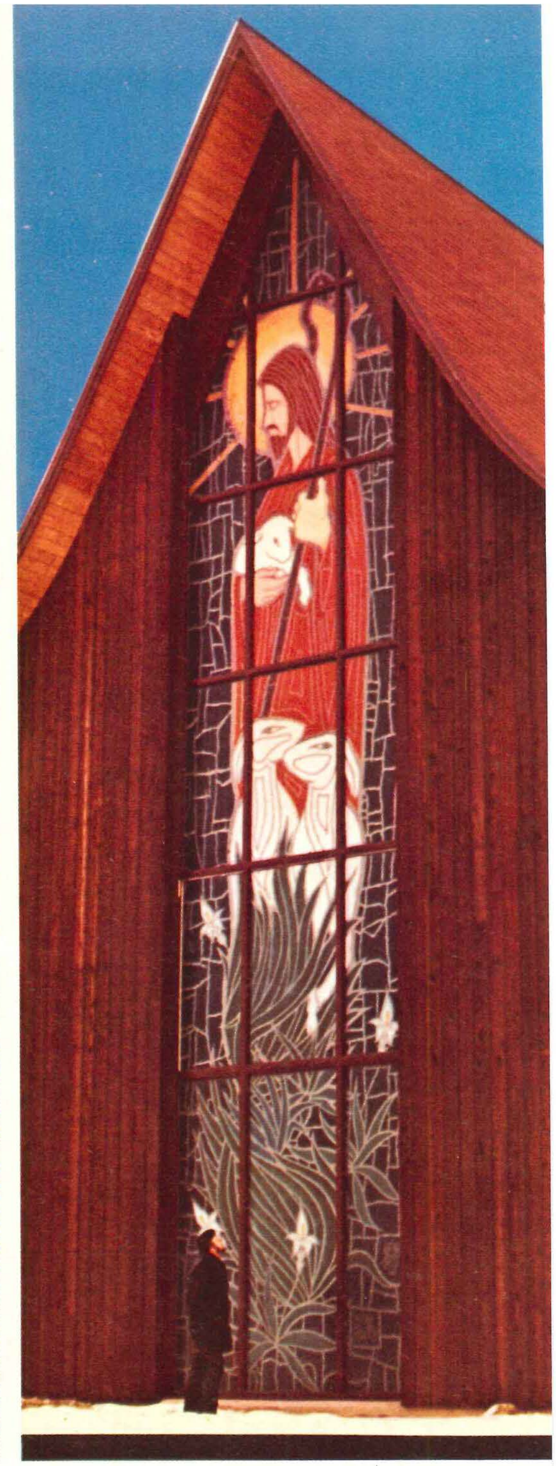

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Color computer graphics for architecture

Most discussions about the potential of computer graphics in architecture center about advantages "in the future." Common practice in today's professional offices, when client-oriented visual communication is required, is to build a sophisticated three-dimensional model or draw some elaborate perspectives, or both. These presentation methods are necessary to help explain and sell design proposals. These drawings and models are both expensive and time-consuming. Also, they have a limited lifespan in that they are inflexible in their response to changes during design.

Until recently, despite the disadvantages of existing presentation methods, the use of computer graphics has been basically rejected by the architectural profession because of mathematical difficulty, cost, and the abstract or crude appearance of the output. However, we have now reached a new plateau in our ability to produce realistic computer output with considerably less difficulty to the user. Today it is possible to generate detailed color perspective images of proposed designs with only a few hours of input preparation. And once this information has been properly coded to the machine, numerous perspectives from different viewing points can be displayed.

From the architects' point of view, there are three levels of computer displays. The first and simplest level is the wire frame or wire line drawing as shown in Figure 1a. Two-dimensional images are created on the picture plane according to the laws of perspective geometry. For each point on the real object, there is an analogous point on the picture plane. When all lines which are connected on the real object are also connected on the image plane, the wire line drawing results.

The second level of sophistication concerns the removal of lines which would not be seen by the observer. This is known as the "hidden line" problem. There are several different algorithms describing the logic to determine which lines should be removed. As can be seen in Figure 1b, this substantially improves the clarity of the resulting image. As the wire drawings are composed of lines connecting points, the resulting image may be drawn automatically on paper by a mechanical plotter, or displayed on a video screen.

The third and most complex class of displays is the color perspective image which is generated on a color television set. The image is composed of a set of opaque color faces, instead of lines (Figure 1c). Two different approaches have evolved which solve the prob-

FIGURE 1
Degrees of complexity of the basic problem of computer graphics are shown at right. The simple wire frame (a) is essentially a two-dimensional perspective. In the second drawing, the computer removes the lines that would be hidden to an observer. In diagram (c), images are composed of opaque faces instead of lines.

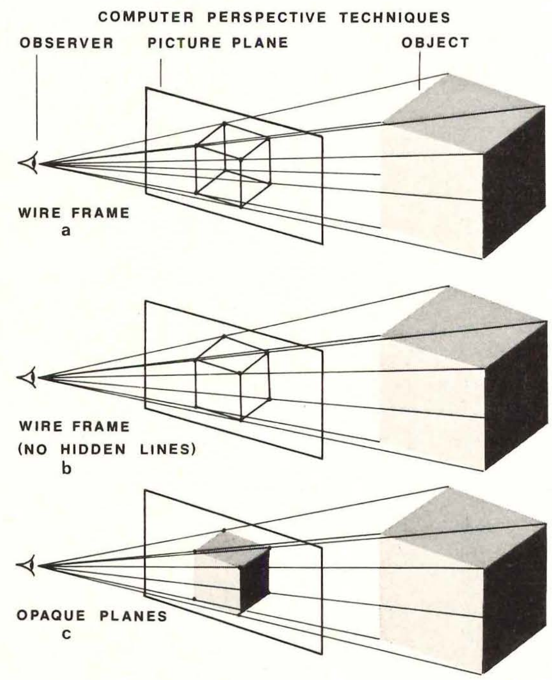
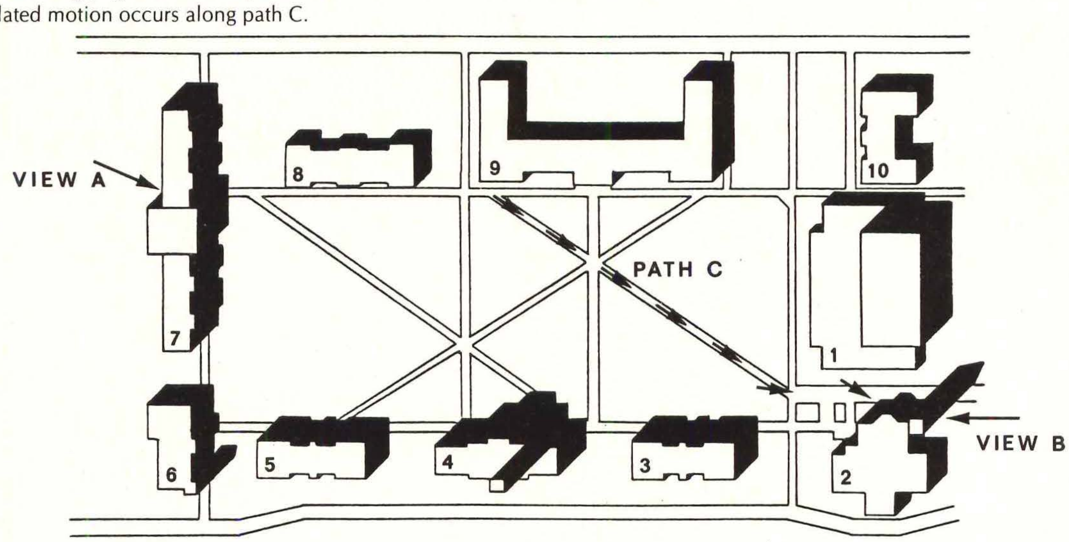


FIGURE 2
In the map of the Cornell Arts Quadrangle below, views A and B are the points from which illustrations on the following pages are developed. Simulated motion occurs along path C.



1 Olin Library
2 Uris Library
3 Morrill Hall
4 McGraw Hall
5 White Hall
6 Franklin Hall
7 Sibley Hall
8 Lincoln Hall
9 Goldwin-Smith Hall
10 Stimson Hall

lem of which opaque faces to display. One method determines the particular face to be displayed by continuously comparing it to other planes in the scene. For a given portion of the image, the plane closest to the observer will be shown. In a second method, the "hidden line" problem, is solved by determining the chronological order in which faces are painted. As any particular plane is "painted on" the screen, it obscures from view everything behind it. In this manner, the last planes to appear on the display screen will always be seen by the observer.

The process was first utilized by General Electric's Visual Simulation Laboratory to produce color perspective images for space flight simulation. In particular, the system developed was used to help train the astronauts for docking maneuvers in space. It was necessary to produce the television pictures rapidly enough so that the sequence of images implied movement, analogous to seeing a standard motion picture which is displayed at 24 frames per second. Because of this objective, the machine calculation time for each image was critical, and therefore only relatively simple objects could be utilized.

For architectural purposes, the need of "realtime" simulation is not required. One can afford to wait a few seconds before the entire perspective image is created. This allows the images to be considerably more detailed, which results in a vast improvement in the quality of the pictures.

To demonstrate, this hypothesis, 12 students of the Cornell University Department of Architecture, under the direction of Professor Donald P. Greenberg, undertook the task of modeling the Cornell Arts Quadrangle. Each student mathematically described both the geometry of a building and the logic to solve the "hidden line" problem. All of the buildings and the surrounding terrain were thus combined into a total environment. The processing and visual displays were performed at General Electric's Visual Simulation Laboratory.

The results of this project illustrate that the technology has sufficiently advanced to allow mathematical modeling of objects of almost any complexity. Although the logic behind the computational processing and the picture display is very complex, the input methodology is sufficiently simple that only a minimum amount of computer knowledge is necessary. The following discussion and Figures 2 to 8 demonstrate the feasibility of utilizing this technique for architectural presentations.

A partial plan of the Cornell quadrangle with ten existing buildings is shown in Figure 2. Two computer-generated perspective images show general views of the campus. The first picture (Figure 3) depicts a view of the quadrangle looking south from a point above Sibley Hall. (View A of Fig. 2). The second computer image (Figure 4) is a winter scene of the campus looking north from near the library tower. (View B of Figure 2). Figure 5 shows the order of detail possible.

One of the major advantages of this approach to generating computer images is the ability to simulate motion. Once an environment has been described mathematically, perspective images can be created from any viewpoint. By moving the location of the observer in small increments along a predetermined path, a series of pictures can be produced which simulate motion (Figure 6). Although in this project a movie was actually filmed, the following sequence of pictures should allow the reader to perceive the motion of walking towards the clock tower. (Path C, Figure 2).

A second major advantage to the system is the ability to change colors rapidly. Each opaque plane in the environment is color-coded with a numerical value, and for a given environment, any set of 64 colors can be designated. The designer may assign any color to each predetermined numerical value. In this way the daytime scenes can be easily changed to a nighttime view of the same sequence by simple color reassignment as illustrated in the next set of pictures (Figures 7).

A third advantage of a system which is mathematically modeled is shown by the ability to add or delete any given building from the total environment. This versatility allows the designer to realistically investigate the placement of a new building in a fixed context. For illustration, a sequence of pictures is shown where a new building (Olin Library) has replaced one of the original buildings in the scene (Figures 8).

The size and scope of the model environment to be depicted depends on the amount of storage available in the computer and the allowable time required to build up an image. The environment depicted in this article, including all of the buildings and terrain, consisted of approximately 7000 planes. Using the available Sigma 5 computer, each image required approximately ten to 20 seconds of computer time.

Furthermore, the clarity and detail of the pictures are restricted only by the limitations of the output devices, in this case, the resolution of an ordinary television screen. Again, as can be seen from the illustrations, this constraint does not prevent the creation of a very realistic simulation.

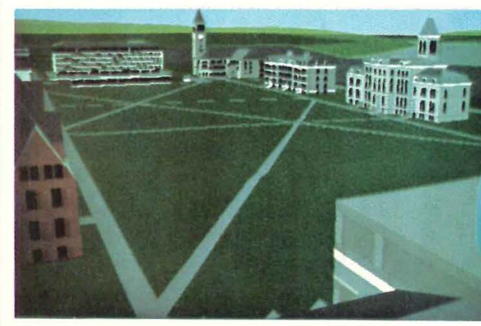
However, current graphic systems presently available or being experimented with are even more exciting. Curved surfaces can be easily displayed without faceted edges. Shading can be continuous and accomplished automatically. The number of available colors in a given picture as well as the level of resolution of the image has been increased. And all of this is being accomplished with greater ease.

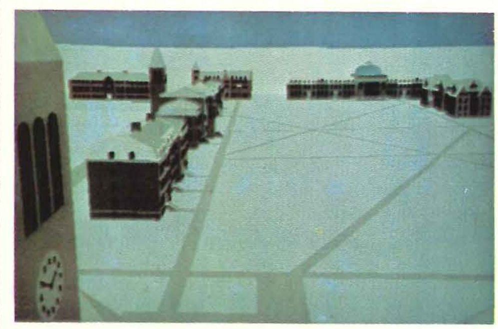
Clearly the system is not presently economical for individual usage in most architectural offices. However, considering the fact that computers and their peripheral equipment are becoming both more sophisticated and economical, in the future, hardware constraints and production costs should not limit the visual quality and clarity necessary for architectural usage. It is probable that as means of input become more practical and less time-consuming, the use of color computer-images will replace some standard presentation methods.

—Dr. Donald P. Greenberg, associate professor, S. Robert Hastings, graduate student in architectural science, and David Simons, associate professor, Department of Architecture, Cornell University.

FIGURES 3, 4 and 5

The top picture Figure 3 shows the quadrangle looking south. Figure 4, center below, demonstrates the capability of changing seasons. The bottom picture, Figure 5, is simply a demonstration of the detail and perspective possible in a computer program.





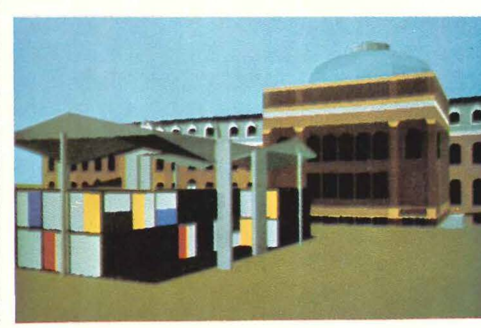


FIGURE 6

The series below demonstrates the ability of the observer to move by programmed increments along a predetermined path. This can actually be done as it would appear in a motion picture. The path in this case was path C, Figure 2.

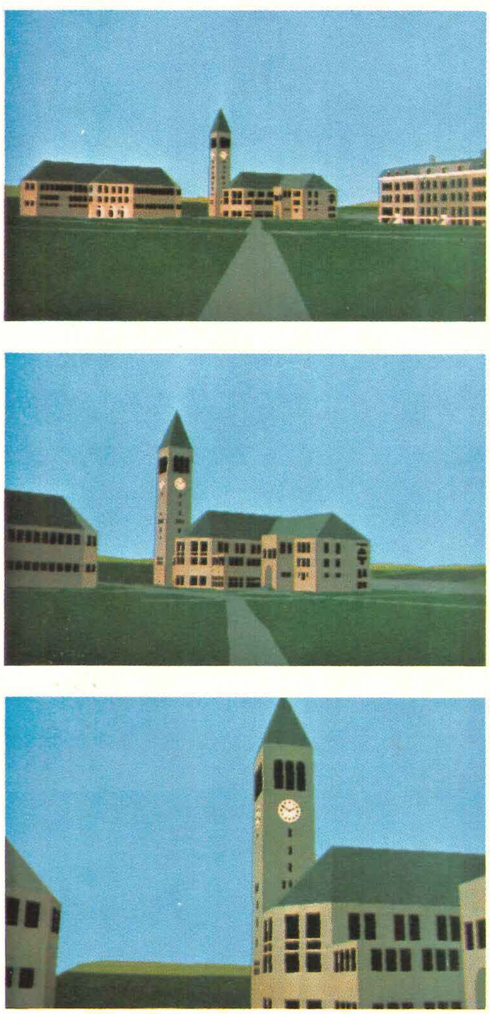


FIGURE 7

The series below demonstrates the ability of the computer to change colors rapidly by assignment of color sequences to each opaque plane. The demonstration below has changed day to night. Other color programs might illustrate changes in materials.

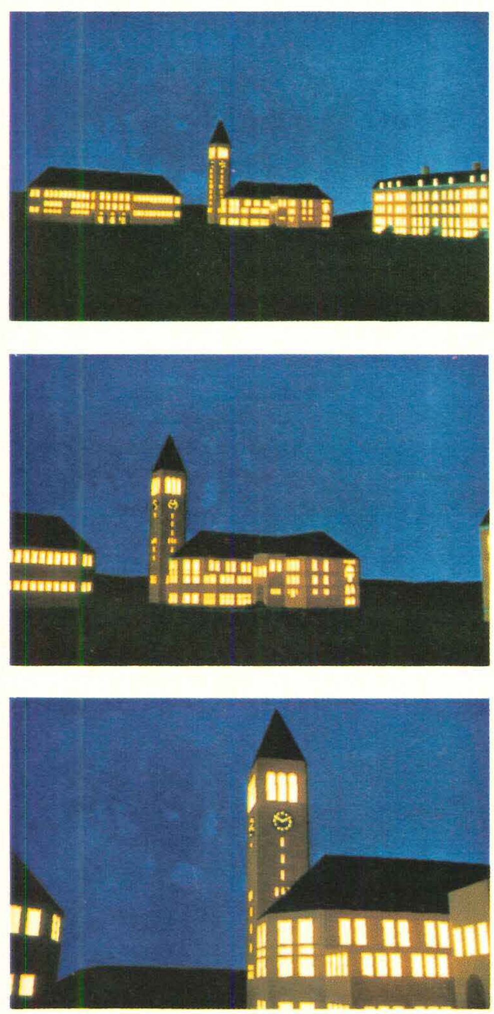
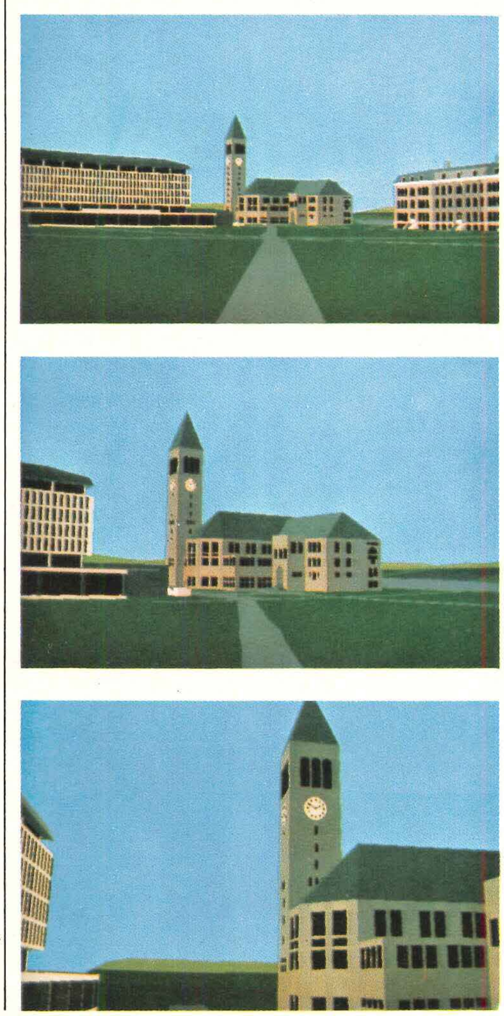


FIGURE 8

The series below demonstrates the ability to change not only the colors and viewing position but the actual components of the scene. Here a new building, the Olin Library, has replaced one of the original buildings in the quadrangle.



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An overview of cost management

This is the first in an intermittent series that will appear in this department reporting on the ideas and resources of CM Associates. This firm is a subsidiary of CRS Design Associates and offers construction management services to professional architects and owners. The following is an opening summary by Charles B. Thomsen, AIA, founder and president of the firm, which now has a staff of over 50 professionals in design and engineering with a current workload of some 49 projects in ten states.

When an owner starts a building project, one of his initial and most lasting worries is whether the budget he has established will still be intact when the project is complete. A publicly funded project usually has a fixed budget. A private owner decides how much income he realistically can commit to a desired facility. And then there's the plain, simple, basic fact that nobody—whatever his financial position—wants to spend any more than he has to for something.

Unfortunately, owners' fears about budget overruns are too often realized.

The blame can be placed on many things. Building trades have become more specialized and union negotiation more expensive. Technology has created a national building industry, which means a building now is manufactured in pieces all over the country, making supply coordination difficult. Most recently, the energy shortage has made some manufactured products scarce. The dollar devaluation has increased prices of others. Government regulations, especially in the area of safety and equal opportunity, have become more stringent, establishing worthwhile goals but also creating new expense considerations. Everyone is feeling the sting of inflation. And taxes certainly aren't on the decline.

Size and complexity, fragmentation, specialization, inflation, supply shortages, unpredictability of the labor market, increased government regulations—all these and more share the blame for rising building costs to varying degrees. But fixing blame is small consolation when the money's due and there's nothing to be done about it.

Avoiding the extra expenditures that obliterate budgets is always better than trying to explain them. That's the function of cost control. And cost control, in the final analysis, is the bread-and-butter of construction management. When it's effective, it is a design tool which establishes realistic guidelines right from the start, allows designers maximum latitude, eliminates gambling, and permits the design/construct team to know where the project stands financially at any point in time so that the project can, in fact, be controlled.

People involved in designing and constructing buildings have operated under some very basic assumptions in the past, among them that quality multiplied by quantity would equal cost and that cost could be controlled simply by good estimating. Neither of these premises is true any longer. There are too many new variables for the simple quality-times-quantity formula to work. And while estimating has become far more scientific, with computers to help handle the variables and data, all the computers in the world can't be assured of predicting a bid when a subcontractor is using the back of an envelope.

Certainly you need good estimating, and certainly quantity and quality affect cost. But these are only parts of a larger picture. If costs are to be controlled, it has to be through management—management by people who can deal not only with concepts but who also will deal patiently, comprehensively, and above all, consistently with detail. People who will help see that the objectives of detailing are efficiently achieved; who will see that realistic quality levels are maintained throughout a building; who will see that the subcontractors who bid a job are genuinely interested and that bid rigging isn't going on; people who will guard against unnecessary change orders, and who, when change orders are necessary, will see that they are made at a fair price.

Specifically, managing costs means knowing what an owner wants and has to spend, then establishing a budget to give the design/construct team a foundation for decision-making throughout the project; comparing, analyzing, and estimating the design in relation to that budget; purchasing the building components in line with the estimate, and accounting for expenditures in such a manner that the changes which inevitably occur in any building project can be managed within that overall bottom line figure. It's a continuing process that starts before design and does not let up until the project is complete.

To recapitulate, cost control is more than estimating. It is: 1) knowledgeable, realistic budgeting; 2) good engineering economics (value engineering, life-cycle costing, cost benefit ratios, and all the other buzz-words); 3) precise estimating; 4) intelligent, skillful purchasing; 5) comprehensive, timely accounting.

The responsibility for staying on top of these areas lies with construction management, whether it is provided by the architect or a consultant. Resources of the firm are brought to bear through the focus of a project manager. He anticipates and reacts. When something goes wrong, instead of letting it slide by and trigger other problems, he blows the whistle and sets the corrective machinery in motion. And there's a support group for him to draw from.

Establishing a data-based preliminary budget

CM Associates uses a computerized data file which provides a reasonable foundation for the pre-design start of a project's budgeting. It is an historical record of the firm's past projects—representing billions of dollars worth of construction estimates—and it contains specific cost information on thousands of building components as ultimately put in place. It is hierarchical, listing costs according to building type—educational, health, commercial, housing, and so on. It then subdivides these categories according to complexity. For instance, schools are broken down into university, secondary, and elementary levels, as well as into functional divisions such as gymnasium, laboratory, classroom, etc. The cost data are equated to national averages and to a specific point of time.

With this foundation, the owner, architect, and construction manager are able to analyze costs related to preliminary decisions about what a given building should be, the building systems that may be appropriate and the cost-related configurations (high- vs. low-rise, for example) the facility might have in response to basic program.

The data-bank-established budget is refined by a value-engineered pre-design estimate. Using a "what if" approach, the construction manager and architect brainstorm the project. Instead of becoming a remedial, after-the-fact function that forces the architect to go back and pare down his design, value engineering is used in the pre-design stage to unearth the best geometry, systems, and strategy for producing the maximum building at the minimum cost. The architect can then put things into full swing.

Once schematic design is reached, estimating, which has been nominally underway, begins to get very definitive. By design development time the construction manager is able to base his cost predictions on real take offs of quantities of specific building materials for a line by line, product by product cost appraisal.

And the architect is in a position early in the game to know in no uncertain terms whether his design is compatible with the budget.

Purchasing the project needs negotiation know-how

Realistic budgeting, astute value engineering, and accurate estimating will produce financial columns with comparable totals—but that won't mean a thing if the bottom line of the purchase column doesn't round out to a similar figure. All those preliminary efforts are useless if contracts can't be let for the estimates. Lots of times the estimate is right and the bid is off. An estimate merely states the fair price for some commodity. But fair prices aren't always available, and that's when a construction manager's judgment takes over.

Projects can be bought out in many ways: competitive bidding (with or without prequalification), cost plus, negotiation (with or without incentives or unit prices), two-stage negotiation. There are advantages and disadvantages to each, depending on the project. (Competitive bidding, for example, presupposes a competitive market. It won't work if a competitive market doesn't exist. A negotiated contract may work better.) It is the construction manager's responsibility to advise on the best method. Certainly he is in an excellent position to manage purchasing, since the subcontractors submit their bids individually instead of burying them in a general contractor's lump-sum bid. An excessively high contract is readily visible and can be rebid or renegotiated without slowing down the schedule.

Project accounting is communication as well as arithmetic

Through it all, there must be a method of measuring each of these processes to see how well they are working relative to one another. CM's project accounting system is a computer-based, time-sharing set up that can communicate from the home office to a field location through a computer terminal. It delineates the budget for each contract, along with the estimate and actual contracted amount, and keeps track of the change orders relating all these to the existing contingency fund.

An extremely detailed cash flow record is maintained with all the owner's financial commitments lined out on a month-by-month basis, showing those all-important bottom line figures. Because of the speed with which the system operates, the owner, architect, and construction manager can react instantly and knowledgeably when problems occur. This capability for on-course correction is imperative.

In the final analysis, each of these disciplines is dependent upon the other—no single element within the network can, by itself, assure an owner of the sanctity of his budget. Taken together, however, and implemented by experienced professionals willing to manage the myriad details—and not just the grand concepts—that typify the building process, budgeting, value engineering, estimating, purchasing, and accounting represent a framework that will support a budget securely, making cost control a reality. And the spin-off of that can be a successful and rewarding project.

Holes in construction price controls

The price controls for construction announced in July for certain implementation by August 15, have as their central feature a pass-through provision that will permit contractors to pass on the full amount of any wage and salary increases stipulated in collective bargaining agreements as approved by the Construction Industry Stabilization Committee.

There are some "ifs" surrounding the new Cost of Living Council ruling, however. The increases may be passed through only to the extent the action does not increase the firm's profit margin. And the mandatory provision subjects contractors to its terms only when more than $50 million of annual sales or revenues are derived from construction operations and, for conglomerates, where more than 20 per cent of annual revenues are from construction activity.

New definitions have been established for annual revenues and base period designations, making the new regulations somewhat more complex than those under which the industry has been operating. Held in abeyance until the freeze period terminates, the regulations do give the industry some advance guidance on what it can expect in the Phase IV pattern.

For the first time construction firms will be required to indicate their pro rata share of any joint venture operation, no matter how small that may be. Base period for measuring profit margins leaves the firm some option: It can select any one of the three fiscal years ending before Aug. 15, 1971. —*Ernest Mickel*

INDEXES: September 1973 — 1941=100.00 (except as noted)

Metropolitan area	Cost differential	Current Indexes non-res.	residential	masonry	steel	% change last 12 months
U.S. Average	8.2	413.7	388.5	404.8	394.8	+ 9.26
Atlanta	7.6	525.7	495.8	511.1	499.5	+ 9.33
Baltimore	8.0	452.4	425.4	441.5	428.0	+13.91
Birmingham	7.2	379.5	353.1	366.9	362.5	+ 9.22
Boston	8.9	422.4	399.2	417.7	405.9	+ 9.78
Buffalo	9.0	462.1	434.0	454.9	441.0	+ 9.61
Chicago	8.2	474.9	451.6	458.9	451.8	+10.09
Cincinnati	8.4	439.0	413.2	428.4	417.4	+ 7.68
Cleveland	8.8	445.9	419.6	436.0	425.3	+ 5.25
Columbus, Ohio	8.0	433.1	406.9	420.2	412.4	+ 7.45
Dallas	7.5	414.0	400.9	412.5	396.7	+11.66
Denver	7.8	437.3	411.5	431.0	417.0	+ 7.89
Detroit	9.4	471.6	449.3	473.8	455.2	+11.19
Houston	7.2	382.9	360.6	374.0	366.4	+ 6.53
Indianapolis	7.6	377.1	354.3	368.1	360.0	+ 5.72
Kansas City	8.1	395.7	374.0	386.4	376.6	+11.23
Los Angeles	8.1	466.3	426.4	450.8	442.6	+11.20
Louisville	7.4	409.3	384.5	398.7	389.5	+ 8.74
Memphis	7.3	385.0	361.6	371.7	366.0	+ 6.75
Miami	7.7	427.0	406.9	414.4	406.1	+ 7.09
Milwaukee	8.1	458.1	430.3	449.9	435.9	+ 6.24
Minneapolis	8.6	438.4	412.5	431.4	420.6	+ 7.25
Newark	8.6	406.4	381.7	399.8	391.4	+ 7.87
New Orleans	7.1	390.0	368.3	382.9	374.4	+ 8.95
New York	10.0	467.0	434.2	455.2	443.5	+11.60
Philadelphia	9.1	467.4	445.4	463.0	450.1	+16.52
Phoenix (1947 = 100)	7.8	239.3	224.8	231.0	227.3	+10.55
Pittsburgh	8.8	413.9	389.4	408.2	396.1	+11.51
St. Louis	8.6	435.4	412.0	428.8	418.7	+11.01
San Antonio (1960 = 100)	7.0	152.5	143.4	147.0	144.7	+ 3.87
San Diego (1960 = 100)	8.0	167.2	157.2	163.5	159.9	+10.23
San Francisco	9.4	622.9	569.6	616.2	598.7	+13.30
Seattle	8.2	401.5	359.5	397.0	381.6	+ 6.98
Washington, D.C.	7.7	390.9	367.2	379.3	370.4	+ 9.46

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) 1st	2nd	3rd	4th	1973 (Quarterly) 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		
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		
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		
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		
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		
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		
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		
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		
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		
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		
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		
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		
Miami	269.3	274.4	277.5	284.0	286.1	305.3	392.3	353.2	384.7	391.5	392.7	404.8	406.4	419.0	420.6		
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		
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		
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		
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		
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		
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		
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		
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		

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.

Phipps Plaza Shopping Mall, Atlanta

This floor has been stomped, trampled, wheeled over and ice-creamed on for 5 years. But it wears and looks like it's only been tip-toed on.

You know what a shopping mall is like. Thousands of people and kids running, kicking, dropping and dragging things.

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Powerbond is the best possible fused combination of hard and soft surface floor covering. It's soft, yet it has vinyl's durability. Not only for shopping mall floors, but for school, hospital, office building and department store floors. Anywhere you need the permanence of vinyl.

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And unlike hard-surface vinyl, maintenance costs are low. No waxing, no stripping ever. The pile is so dense that most soils can just be vacuumed or sponged off.

But perhaps the real power behind our Powerbond is our guarantee.

We guarantee against excessive surface wear (more than 15% reduction in weight of pile surface) for 7 years. Or we'll replace the affected area.

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Public building: where's the current strength coming from?

Here's a good question: Why, when a number of Federal construction spending programs were being abolished, and a number more were having their funds frozen or reduced in the name of the "New Federalism" during the first six months of 1973, were contracts for public construction projects roughly one-third higher than they were in the first six months of 1972?

Part of the answer to this question becomes clear when we look at the impact Revenue Sharing, one of the programs designed to partially replace these funding cuts under the New Federalism scheme, is having on the construction industry. Another part of the answer becomes evident once you appreciate how rapidly appropriations that are, technically, no longer a part of the Federal budget are allowed to grow.

The "State and Local Fiscal Assistance Act", Revenue Sharing's enabling legislation, was passed last October. Basically, the Act authorized that payments totaling $30.2 billion be distributed among state and local governments in accordance with a specific formula based on population, tax effort, per capita income, urbanized population, and state income tax collections. These payments are to be made in specific amounts over a five-year period ending in June, 1977. Within a state, one-third of the funds remains with the state government, while two-thirds is parceled out to local governments.

The law attaches certain minimal restrictions on these funds. Local governments, for instance, must spend their allotments within a grouping of so-called priority areas: public safety, environmental protection, public transportation, health, recreation, libraries, social services for the poor and aged, financial administration, and *"ordinary and necessary" capital expenditures*. This really doesn't amount to much of a restriction at all, and it doesn't even apply to the state government's share. One thing these monies can't be used for, though, is to match Federal funds provided under other grant programs.

Since the law contains retroactive payments back to January first 1972, the actual fiscal impact is weighted heavily to the near-term. Although the program runs to mid-1977, roughly one-fourth of the funds has already been parceled out.

By design, local governments were to be given as much discretion as possible in the use of these funds. But, this "wild card" aspect of the revenue-sharing measure makes any assessment of its economic impact extremely difficult. There are still no firm data available on just where the money is going. A survey released by the United Conference of Mayors at their San Francisco meeting in June showed, though, that 72 per cent of all governmental units listed capital investment (building projects) as their top priority when questioned about the use of these monies. And, from the way public building contract award statistics have been behaving through mid-year, the emphasis this survey placed on construction seems to be holding up. Virtually every category of public building has been contributing to the strong performance through six months. Especially those building categories that typically result from expenditure at the state and local level. Police and fire stations, for instance, have shown good growth so far this year. The same is true for parks, playgrounds, penal and correctional buildings, and public amusement and recreational buildings.

While, no doubt, much of this expanded volume of public construction is in response to a pressing backlog of needs that the sudden arrival of revenue-sharing funds has been able to satisfy, the structure of the law itself appears to be a factor in determining the list of priorities. State and local governments have been reluctant to commit these monies to any type of long-term program, like an increase in welfare benefits, say, that, once started, would be difficult to turn off. Because of the 1977 expiration date of the law, other funds would have to be found to continue these programs. Considering the way "safe" Federal programs have been tampered with by freezes and impoundments in the past, the local authorities are probably well advised in the emphasis they are putting on one-time capital improvements.

Since experience has shown that public building tends to be the most postponeable of all public expenditures, because it's usually the hardest to justify to the taxpayer, revenue-sharing provides a convenient, relatively painless way to get capital improvement projects off the drawing board, and into the construction stage. But, local governments should keep their perspective here, being sure that the structure they intend to build is on the priority list because there's money available to build it.

Post offices contribute to the bulge

One category of public building has been generating contract awards at more than double the rate of the first six months of 1972, but for reasons unrelated to revenue-sharing. That's Post Offices. The Postal Department, now a quasi-public agency and outside the purview of the Federal budget, lives under a different set of rules than other Federal agencies. While other areas have been held in tight rein, it has raised appropriations for capital improvements from a figure of $235 million in fiscal year 1971, to $1,327 million in fiscal year 1973.

As far as timing is concerned, the revenue-sharing measure, was a particular boon to states and municipalities, faced as they are with a period of sharply rising interest rates. Surveys show that state and local government borrowing is particularly sensitive to credit conditions. Currently, issues of new state and local capital are down eight per cent from the comparable year-ago period. And, last year's figure was down nine per cent from the 1971 peak, when local governments took full advantage of the easier credit conditions that followed on the heels of the 1970 recession. It's likely, that if tight money persists, and, the consensus is that it will, for a time anyway, increasingly larger portions of the revenue-sharing dollar will be used for capital investment purposes as local governments seek ways to avoid issuing new securities under stringent credit conditions.

There are indications that over the longer term state and local borrowing will be reduced still further for another reason. More and more of these governments are sporting budget surpluses. Although it's hard to believe when you consider the financial problems of some of our major cities, in the aggregate, state and local governments moved into a small net surplus position in 1969, and this surplus has grown consistently larger even since. And, expectations are that the 1970's generally, will be a period of fiscal pluses at this level of government. A prime cause of this anticipated development is that, with elementary and secondary enrollments on the decline, growth in educational expenditures will be nowhere near as rapid as it's been during the decade of the 1960's. The educational portion accounted for nearly 40 per cent of total state and local expenditures during the sixties. It will probably average closer to 35 per cent during the seventies. This, of course, means reduced levels of expenditures on educational construction, but it appears that there is a large enough backlog of needed public projects to more than fill the educational building void.

James E. Carlson, Manager, Economic Research, McGraw-Hill Information Systems Company

LETTERS

Now you've gone and cheesed-off one of your most dogged admirers. There I was, you see, grooving contentedly with your editorial in the August issue . . .

> ". . . and enjoying it immensely,
> when suddenly, I gave a cry
> and gripped the volume tensely."
> (to paraphrase P. G. Wodehouse).

What's with the paranoia regarding campers? I'll have you know, sir, that I am, like, a camper; and I assure you (harrumph) that there are campers and then there are . . . well, Kampers.

If you want to go trotting off to der Dear Olde Vaterland to dig some low-cost, bucolic living in the high style, fine. But, a backhanded (legged?) kung fu kick at campers in passing before you have seen the real thing is not quite the straight bat.

Have you ever taken a peek—or better yet, a professionally tough minded tour—at some of the exceptional campgrounds in this country? Walter, I perceive you've had a bummer of a camping trip somewhere along the way. C'mon out with the rest of us. Aside from that, you make for fascinating reading.

Hugh Abercrombie, Jr.
Assistant Manager
Glass Advertising and Promotion
PPG Industries, Inc.

OK, Hugh, as long as your kamper has facilities for making ice for Martinis. Aside from that, you make for fascinating reading. —W.W.

I enjoy your magazine more than any other American architectural publication and appreciate the high standard of photography and reproduction.

A strange fact became apparent, however, as I looked through the RECORD HOUSES OF 1973. Out of 130 photographs of the exteriors and interiors of houses, only *1* contained a human being!

Is it the architect or the photographer who objects to seeing the human environment cluttered up with humans. Oddly enough most architects include people in their renderings.

I know this all sounds a bit facetious, but seriously, is this an indication of an entirely wrong approach to the whole scene? (On looking through my own photographs I find that they also reflect this tendency.)

Has anyone else shown signs of worry over this possible indication of "pure" design at the expense of humanity?

A. H. Lester
Peterson & Lester

I was pleased to see Pine Grove Suburban Apartments selected as representing an outstanding development for your RECORD HOUSES OF 1973. The entire issue is a handsome one and reflects high architectural quality.

However, I could not help but be greatly dismayed at the manner in which credits were allocated on the page entitled "Architects of the Apartments of the Year 1973." Since we were the prime architects performing the leading role, the omission of our names and photographs is very misleading.

I therefore request this error be corrected for all future publication or reprinting of this material.

David J. Paul, AIA
The Office of Samuel Paul, Architect

We were somewhat shocked and embarrassed at the omission of Samuel Paul's name and photograph from the credits page of RECORD HOUSES OF 1973.

The Office of Samuel Paul was the principal architect for our project and Mr. Paul made an invaluable personal contribution to the design effort.

Please do what you can to correct this omission.

Robert Brannen, AIA
Pietro Belluschi Inc. and
Jung/Brannen Associates Inc.

"S-t-r-i-k-e O-n-e" was called when we failed to transfer credits properly from Mr. Paul's submission. The omission of Mr. Paul's picture from page 92 was Strike Two. Then, with only one swing left, we entitled the project "Pink Grove Townhouses" when it should have read "Pine Grove Townhouses."

What can we say after striking out so ignomimiously except we are ashamed of ourselves and "give us another chance, Coach."—[Ed.]

It is regrettable that misinformation spiced with misinterpretation will be gleaned by some readers of your April 1973 article on "Communications technology and its implications for library design."

In quoting the EFL document, "The Impact of Technology on the Library Building," you failed to give either the date of those deliberations or the final (and I think erroneous) conclusion that the architecture of libraries need not change because people are not changing. I have challenged EFL to gather a less conservative group of library users to assess the coming changes that will affect libraries. EFL claims to be interested in this idea because they recognize that rate of change is increasing and that the conclusions of yesteryear may require review. The interest of your readers would be better served, I believe, if you had challenged the EFL pamphlet rather than accepted its conclusions without a careful review of new evidence.

Perhaps more serious (to me, at least) is your misinterpretation of Project Intrex at M.I.T. You represent that project in your article as recent evidence for the conclusion that no architectural changes are, for the foreseeable future, required by the technology of computers and communications. I believe that your readers should know that Project Intrex is not a system of any kind and was never designed as a system to become operational. Intrex stands for Information Transfer *Experiments* and the emphasis here is on the final word. An experimental program originally planned for five years and ten million dollars produced very significant results in five years for one quarter of the money. The results are in the reports of the Project and those results will be felt for a decade to come. Furthermore, the environment designed for Project Intrex was a special adaptation of the oldest building at M.I.T. The space was arranged for the widest possible use for the present and the future. Design plans permitted total reconversion of the space for conventional library access and also for total conversion to machine-based library access. The possibility of conversion of the space to non-library uses was also preplanned. The space was also designed as an experimental laboratory for a variety of information transfer experiments. Some of the special design elements in the Barker Library, such as electrical and communication distribution arrangements, movable partitions, and special acoustic treatment, deserve careful attention by future designers of library space.

In the synopsis of Intrex that you have taken from a briefing brochure, you have erred in your evaluation of the project by giving to two experiments the status of the entire project. An investigation would have revealed much more. Unfortunately, the work of Project Intrex is suspended but its value remains if those who can profit from the lessons taught there use the information wisely. One way in which the information can be used is in library building design and construction.

Charles H. Stevens, Executive Director
(Associate Director, 1969-1972 Project Intrex)
National Commission on Libraries
and Information Science

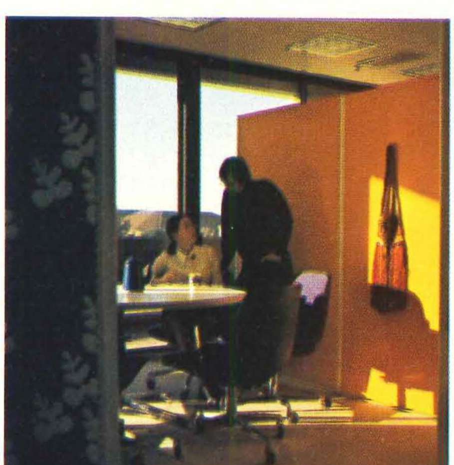
We are sorry to have implied in our article that Project Intrex was designed as a system to become operational.

We did not realize that it was conceived as an experimental program. We were misled by the fact that the Intrex experiment had been installed and indeed appeared to be "operating" on the day we visited M.I.T.'s Barker Engineering Library.

We cannot apoligize, however, for publishing without challenge EFL's conservative assessment of coming technological changes and their effect on library design. When and if EFL produces a document which reviews and revises their "conclusions of yesteryear" we will review it in our pages.

Our article makes the point that while computer technology has begun to affect the design of libraries, change will not come about as quickly or radically as once supposed. This is our current belief, but we will be happy to revise it if evidence proves the contrary. We would be grateful if you could keep us informed of current development in communications technology as it affects the design of libraries. —*M.F.S.*

Great ideas in inner space:



Stanford Center for Research and Development in Teaching, School of Education, Stanford University, Stanford, California

Architecture, Engineering, Interior Design and Space Planning: Skidmore, Owings and Merrill, San Francisco

Westinghouse ASD Group enriches new R & D environment at Stanford.

"At first, there was general skepticism here about the whole idea of open office planning," reports Dr. Robert N. Bush, Director of Stanford University's new Center for Research and Development in Teaching.

"Many of our people felt this sort of system might work for business and industry, but not in academic life.

"Now, after a few months' experience with it, some of our strongest critics tell us they like the way the open environment improves the communications and workflow of contiguous groups. It is a pleasant place to work.

"What I like especially about the system is its capacity for modification as program needs change.

"The ASD people have worked with us more as partners than suppliers," says Dr. Bush. Westinghouse problem-solving resources are helping make Stanford's first open planning experience a good one.

Inviting open offices at Stanford have encouraged freer interaction among the researchers, reduced the number of time-consuming meetings.

If you are considering a change at your office—either new construction or renovation—look into flexible, functional Westinghouse ASD Group. Showrooms in New York, Chicago, Los Angeles, and Grand Rapids.

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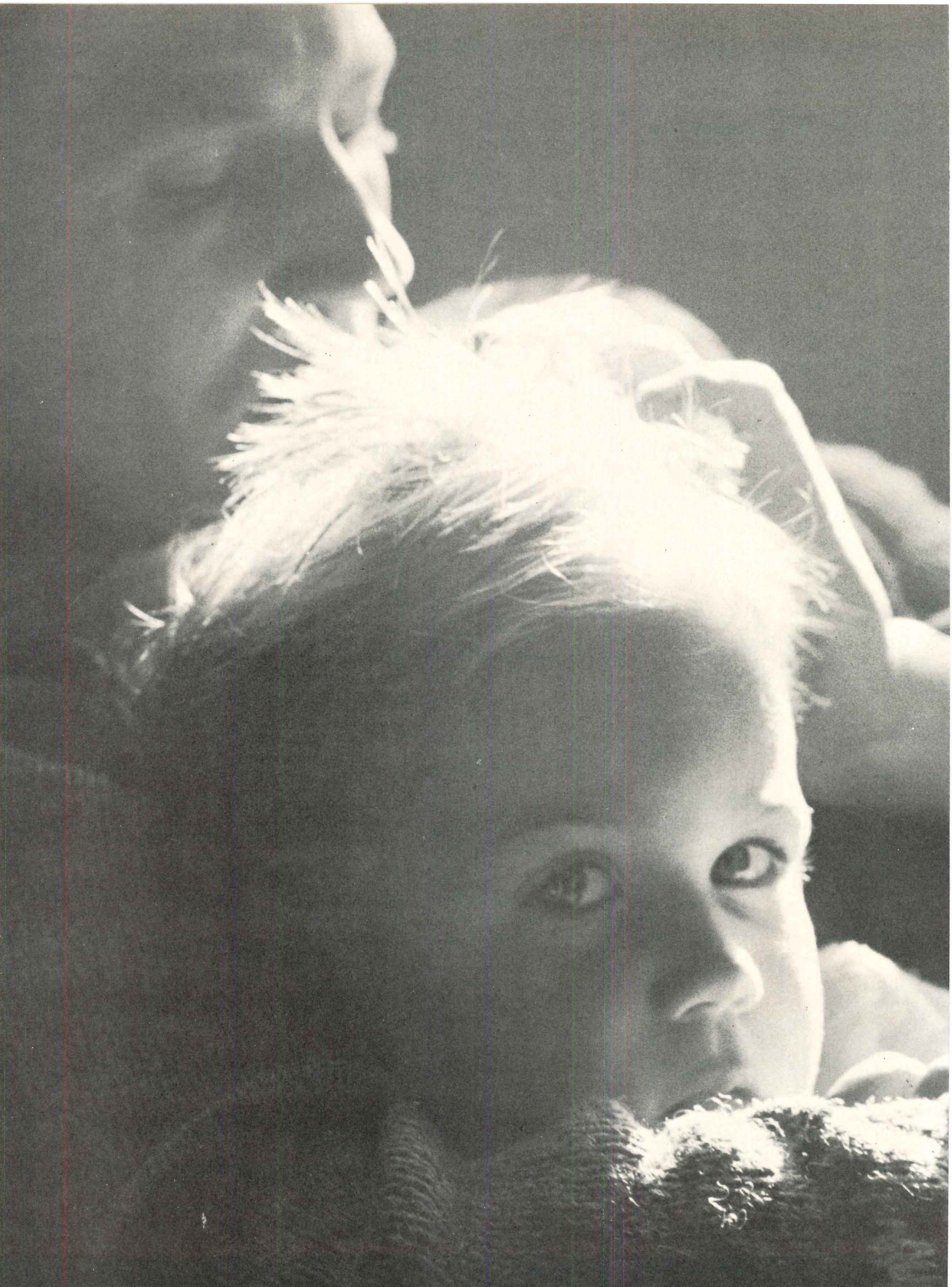


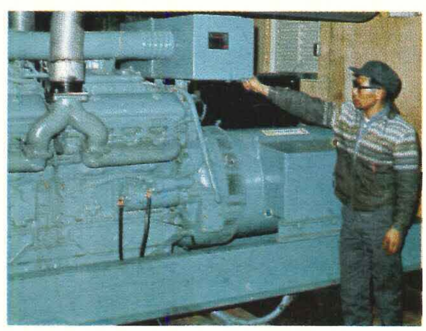
We replaced the sun in St. Mary's.

Around October, heat and light become precious in St. Mary's, Alaska. Winter comes early. It stretches down from the Arctic Circle like a giant sheet, blotting out the sun and smothering the warmth.

The people of St. Mary's must be ready. And, they are.

Two days after Christmas of 1969, the Mayor of St. Mary's flicked the switch of their new generating plant. The generators whirled and brought a new life to these Arctic people. And the power behind this new life was supplied by a 16V-71N Detroit Diesel engine . . . an engine which has performed flawlessly ever since.

Electricity came to St. Mary's, as it has to other Alaskan villages, through the cooperation and skill of a Detroit Diesel Allison distributor. This distributor was provided specs by the Alaska Village Electric Co-op. He then custom built the complete generating plant, including a second peaking and service generator powered by a Detroit Diesel 6-71.



Why were Detroit Diesels chosen for the job? Three reasons: 1. They are reliable, proven in countless hours of the toughest kind of work. 2. They are basically simple engines, easy to maintain. 3. And most important, the Detroit Diesel Allison distributor had the know-how to handle the entire job, from start to finish.

The installation of this new power plant has meant everything to the people of St. Mary's. A new fish processing plant has opened on the waterfront. The nearby airport uses it for vital navigational aids. And the generators will soon be used to power St. Mary's new 50-bed hospital.

Needless to say, these people depend entirely on this power source. And if part of your job is finding and specifying dependable power, 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 possible way, actually custom building the exact electric set for your job. Any job, whether it's prime power for an entire town, or standby for emergency use.

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

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

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Detroit Diesel Powered Electric Sets
Now you're talking power.

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New Facad is so sculptured, it's almost sculpture.

There's a new way to incorporate sculpture and textural relief in building design. It can be done with Facad®.

This sculptured facing system of easy-to-install thin, molded, reinforced cement panels can be used as a total wall element; as spandrel panels, fascias, balcony panels or soffits.

Sturdy, but lightweight (2 pounds/square foot), Facad is easy to handle. It comes in sizes up to 4′x 10′. No special skills or extra structures are required. Installation is within the competence of carpenters or glazers.

Facad is durable. Because it is all mineral, it is completely incombustible.

Facad comes in a series of standard panel surfaces, one of which is shown above. It can also be custom molded to afford architectural designers a broad choice of texture, color and pattern.

For complete information, call the Architects Service Representative at your nearest U.S. Plywood office or write:

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A Division of Champion International
777 Third Avenue, New York, N.Y. 10017

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Jeno's® pizza ordered the works on Gulistan carpet of Herculon®...

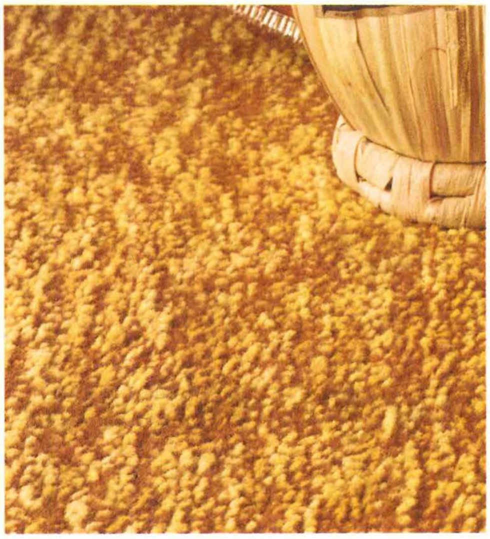
and picked up right away.

Gulistan "Testimony" carpet, with pile blended of HERCULON* olefin fiber and nylon, had a run-in. With a piping-hot portion of Jeno's† exclusive Serv-A-Slice pizza. But for "Testimony" it was merely a parlor game. Its lush plush pile cleaned up quickly and easily.

The HERCULON specially blended with nylon in "Testimony" results in significantly greater resistance to static build-up. An important plus in any commercial installation.

Gulistan distinctively striated "Testimony" carpet of HERCULON disposed of Jeno's pizza in short order. But "Testimony" will stay with your clients for a very long time.

For detailed information on HERCULON olefin fiber, see Sweet's Ⓢ Light Construction, Architecture and Interior Design files. Or write Fibers Merchandising, Dept. 318. Hercules, Incorporated, Wilmington, Delaware 19899 for free 24 page booklet.



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*Hercules registered trademark.

Specify carpet of stain resistant Herculon®

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MODINE®
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In senior citizens housing

Conventional, steel-framed high-rise apartment "beats" HUD guidelines by $100,000.

Owner: Manchester Housing Authority; architect: Isaak, Moyer, Walsh & Dudley; structural engineer: Albert Goldberg & Associates, Inc.; fabricator: Lyons Iron Works, Inc.; erector: Concrete Erectors, Inc.; general contractor: Davison Construction Company, Inc.

Generally speaking, Pariseau Apartments in Manchester, New Hampshire, is a plain, ordinary apartment building. The high-rise residential home provides low-rent housing for the elderly. Its construction was federally funded under The Housing and Urban Development program.

What makes the structure distinctive is the fact that it was built within the budget. None of the construction principals could think of another HUD structure in their area with a similar budget record. They lauded the fact that the building was constructed using conventional contracting methods as opposed to the more common "turnkey" method.

$100,000 within HUD guidelines

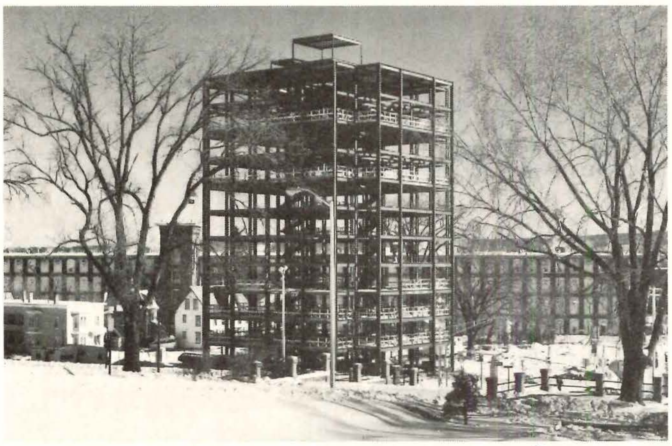
Said the architect, "all the others were 'turnkey' projects. This was one of the first HUD high-rise projects to be handled by a conventional contracting method that comes well within the budget. We estimate that we stayed within the HUD guidelines by more than $100,000. We accepted a challenge" he said, "and decided on the most economical, practical design."

The Housing Authority home for the elderly is part of a larger $3.5-million development known as the Flatiron Urban Renewal Project located on 21.6 acres in Manchester. Pariseau Apartments occupies 1.7 acres in the project. The structure incorporates 100 apartments surrounding a central core flanked by two stairways. There are 58 efficiency (studio-type) apartments in the building, 41 one-bedroom apartments, and 1 two-bedroom unit.

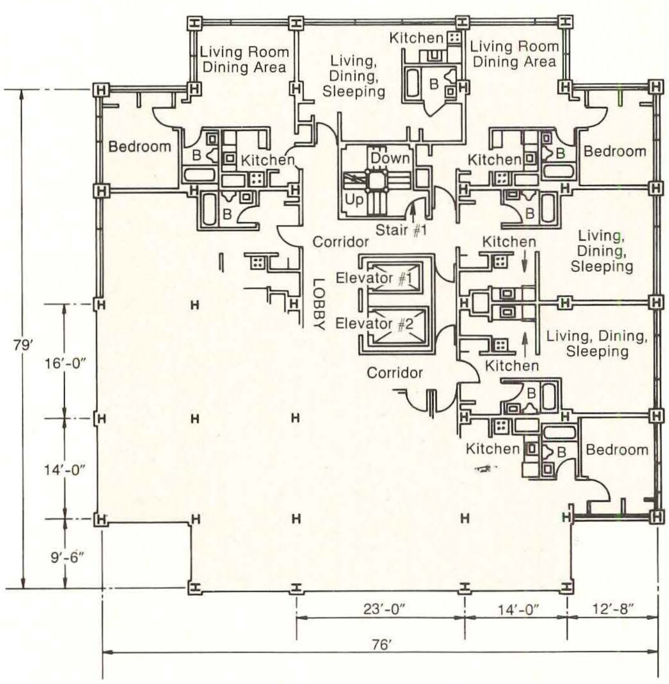
The 11-story structure measures 76 by 79 ft. Floor to floor heights are as follows: ground floor—12 ft; floors 2 through 11—9 ft, 8 in.; floor to ceiling height is typically 8 ft. The structure encompasses 61,548 sq ft. Overall costs are $2 million, but the basic construction costs are $1,787,800, about $29.00 per sq ft.

Explains housing director Paul Lamie, "HUD allowed prototype costs, and we came within the limitations. These limitations varied per unit. This is a good basic building with no frills."

Steel framework required approximately 310 tons of structural steel—all Bethlehem, and all ASTM A36. A single crane erected the framework operating from one side of the building. Typical columns in the framing system are W16 members ranging from 96 to 31 plf. Three- and 4-story columns were used. The long columns helped speed the overall project. Their use meant that lower floors could be turned over faster to the other building trades.



On a typical floor, girders are W14 sections; tie beams and spandrels are W12 and W14 members. An additional 75 tons of open web steel joists and some 60,000 sq ft of permanent steel forms are included in the building. The 28 gage steel centering, 9/16-in. deep, is used to support the 2-1/2-in. reinforced concrete floor slab. Design live loads are 40 psf for the floors and roof; dead loads are 60 psf.



The structure incorporates 100 apartments surrounding a central core flanked by two stairways. There are 58 efficiency (studio-type) apartments in the building, 41 one-bedroom apartments, and 1 two-bedroom unit.

Conventional contracting favored over "turnkey"

The apartment building is designed as a rigid frame in both directions and primarily incorporates end-plate moment connections. No vertical bracing is used in the framework. In the opinion of the fabricator, "It's an economical structure—easy to fabricate and erect, with few alignment problems. With the use of end-plate, high-strength (ASTM A325) field-bolted connections, we gained economies over welded column connections.

"In a project like this everyone knows exactly what the costs are," he added. "We can compare 'apples and apples' as opposed to the 'turnkey' type of project where it's conceivable that some costly items may be present which are not essential."

The steel framework required approximately 310 tons of structural steel—all Bethlehem, and all ASTM A36. An additional 75 tons of open web steel joists and some 60,000 sq ft of permanent forms are included in the building. During construction, 28 gage steel centering, 9/16-in. deep, was used as a permanent form for the 2½ in. reinforced concrete floor slab.

Although the framing system looks relatively simple, it required a good deal of analysis to evaluate theoretical seismic and wind forces, especially in relation to the end connections of the framework and subsequent transmittal of forces to tied spread footings. "The construction site is near the Laurentian Fault," commented the structural engineer, "so the structure is designed for Zone 2 Siesmic conditions. The foundation required ties so we used spread footings tied together with reinforced concrete tie beams."

Benefits of steel framing praised

The housing director noted that about 80 per cent of his elderly tenants live on social security payments. Rents for public housing are limited to 25 per cent of individuals' incomes. "And that isn't much," commented Lamie. "Lack of funding is a critical problem. In projects like ours, steel framing benefits can provide a meaningful contribution to economy. The time factor is important. Because steel frames go up faster than alternate framing systems, a housing authority can look forward to earlier occupancy."

The Manchester Housing Authority operates 1,396 units including 916 for the elderly and 480 for family and general occupancy. Perhaps steel framing can provide economies for your next construction project. Call your local Bethlehem sales engineer, or write: Bethlehem Steel Corporation, Bethlehem, Pa 18016.

Bethlehem

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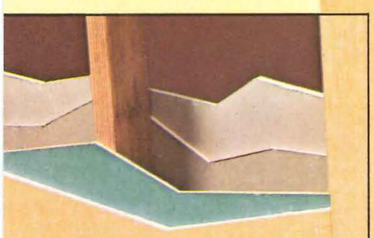

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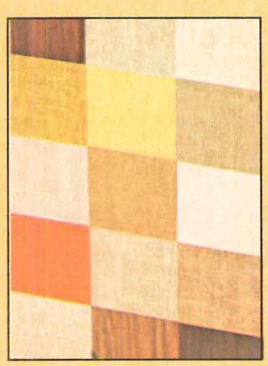

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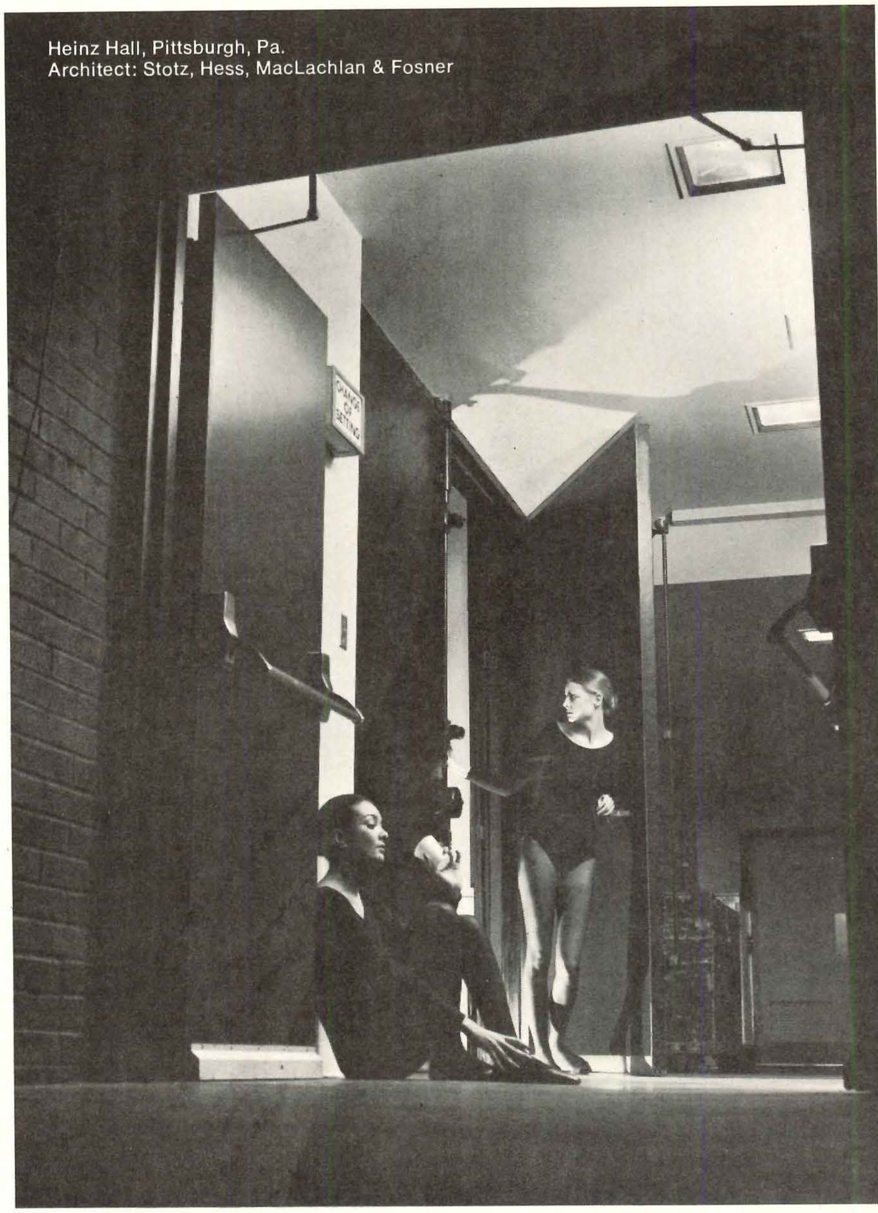
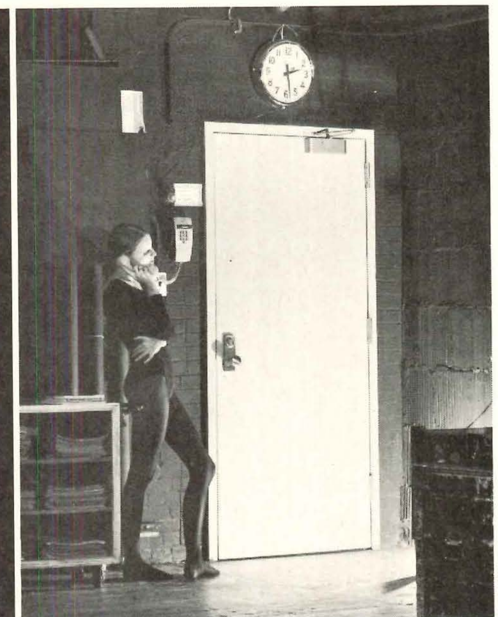
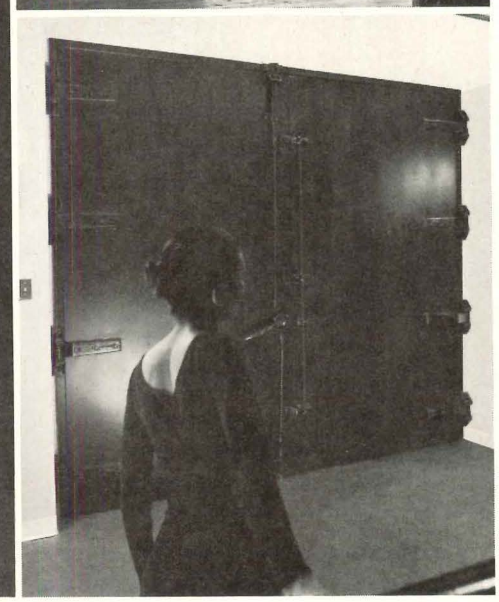


Heinz Hall, Pittsburgh, Pa.
Architect: Stotz, Hess, MacLachlan & Fosner





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Overseas Factories:

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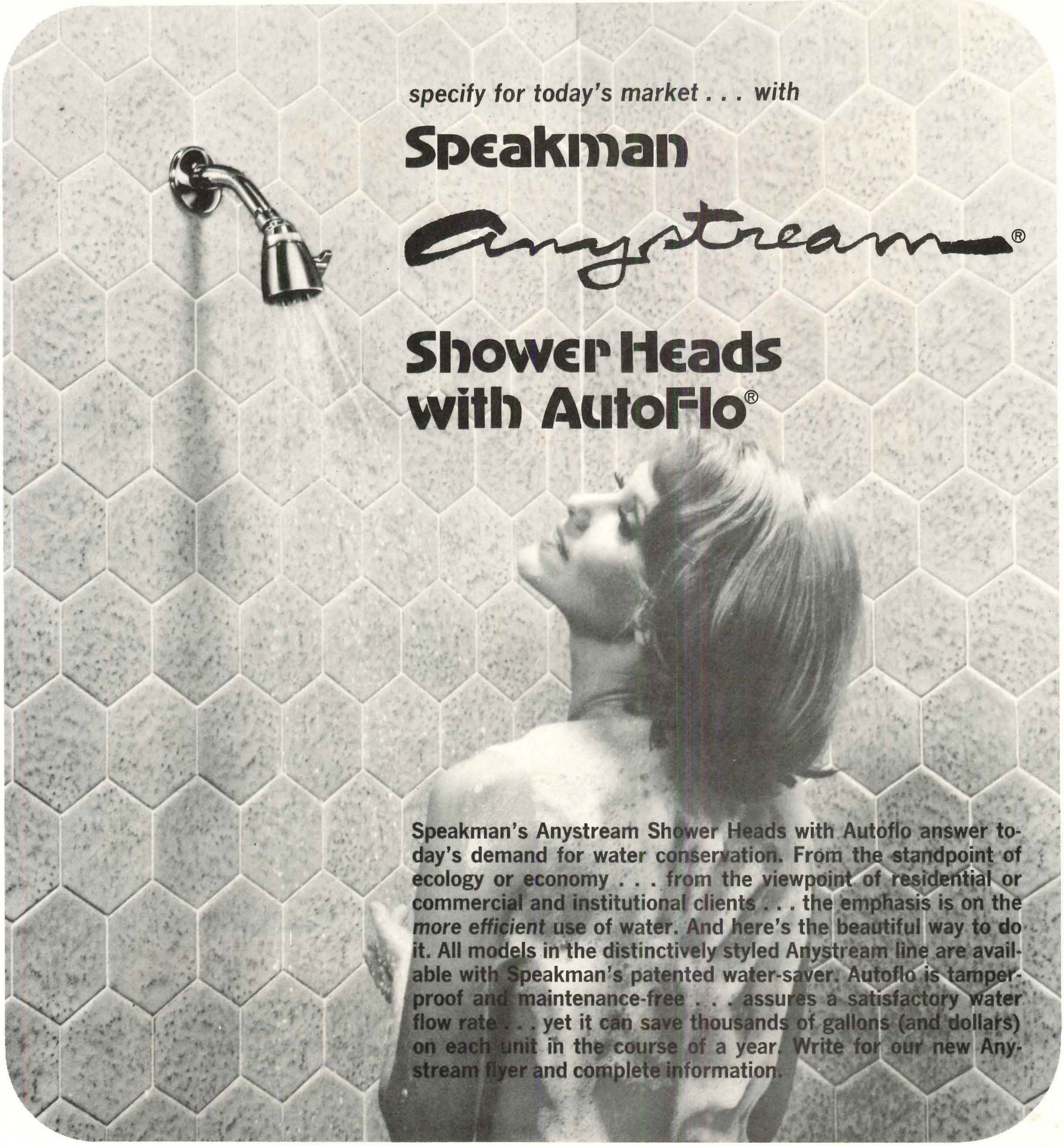

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ARCHITECTS: George Tanner Smith & Associate, C. Robert Buchanan & Associates
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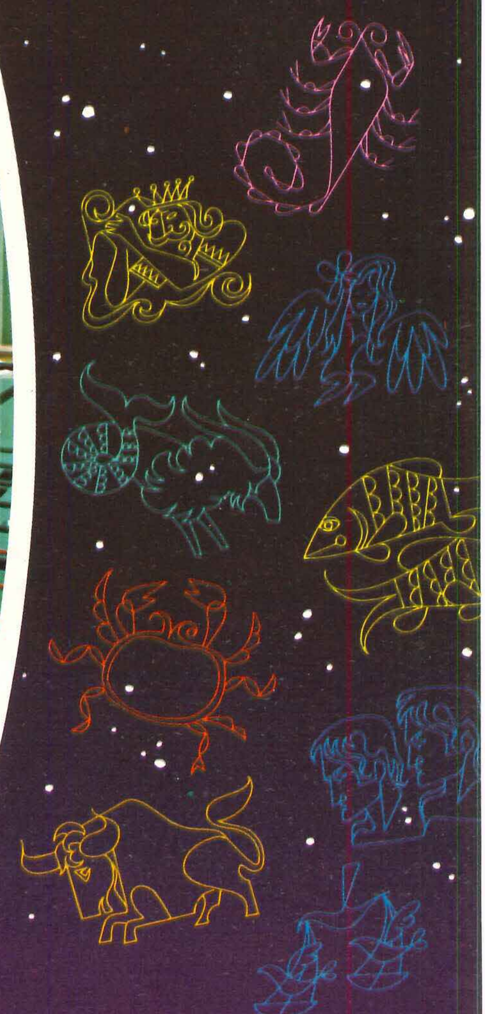

Heritage Ceramic Ceilings resist humidity ...beautifully.

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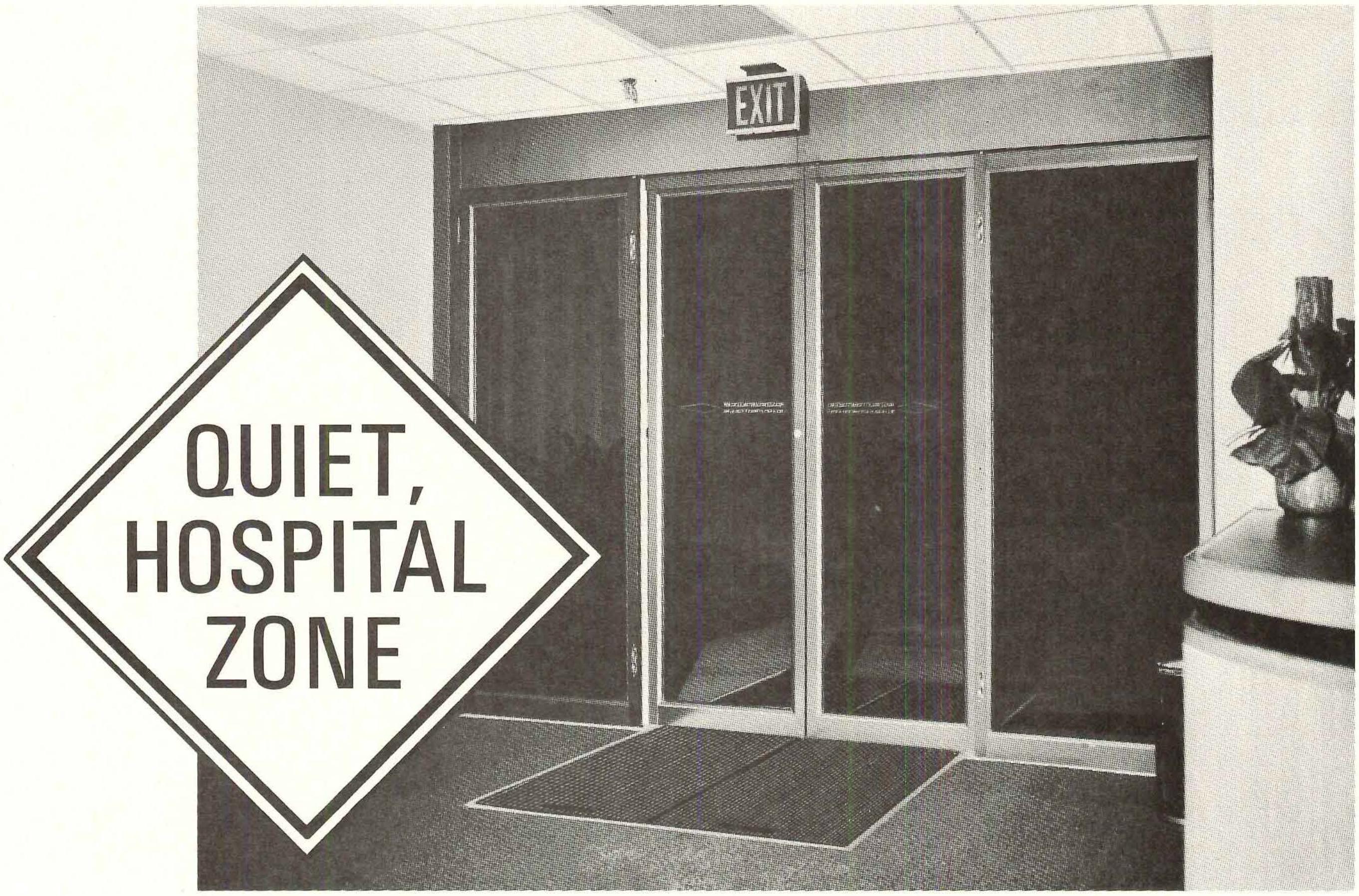

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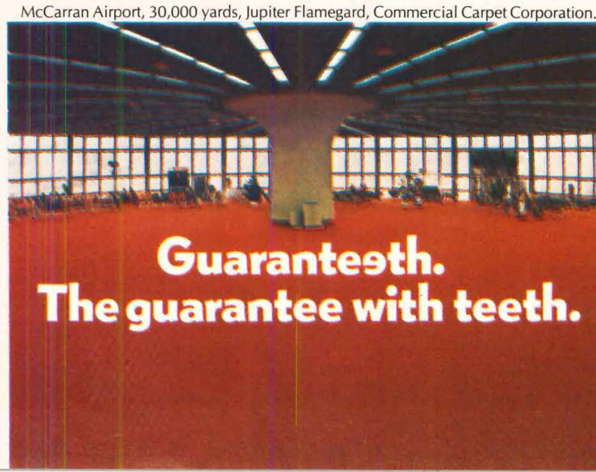

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INNOVATION IN DESIGN. One of a series created for DAP Architectural Sealants. Design and rendering by Richard P. Howard Associates, Architectural Illustrators, Sylvania, Ohio. Harold R. Roe, A.I.A.

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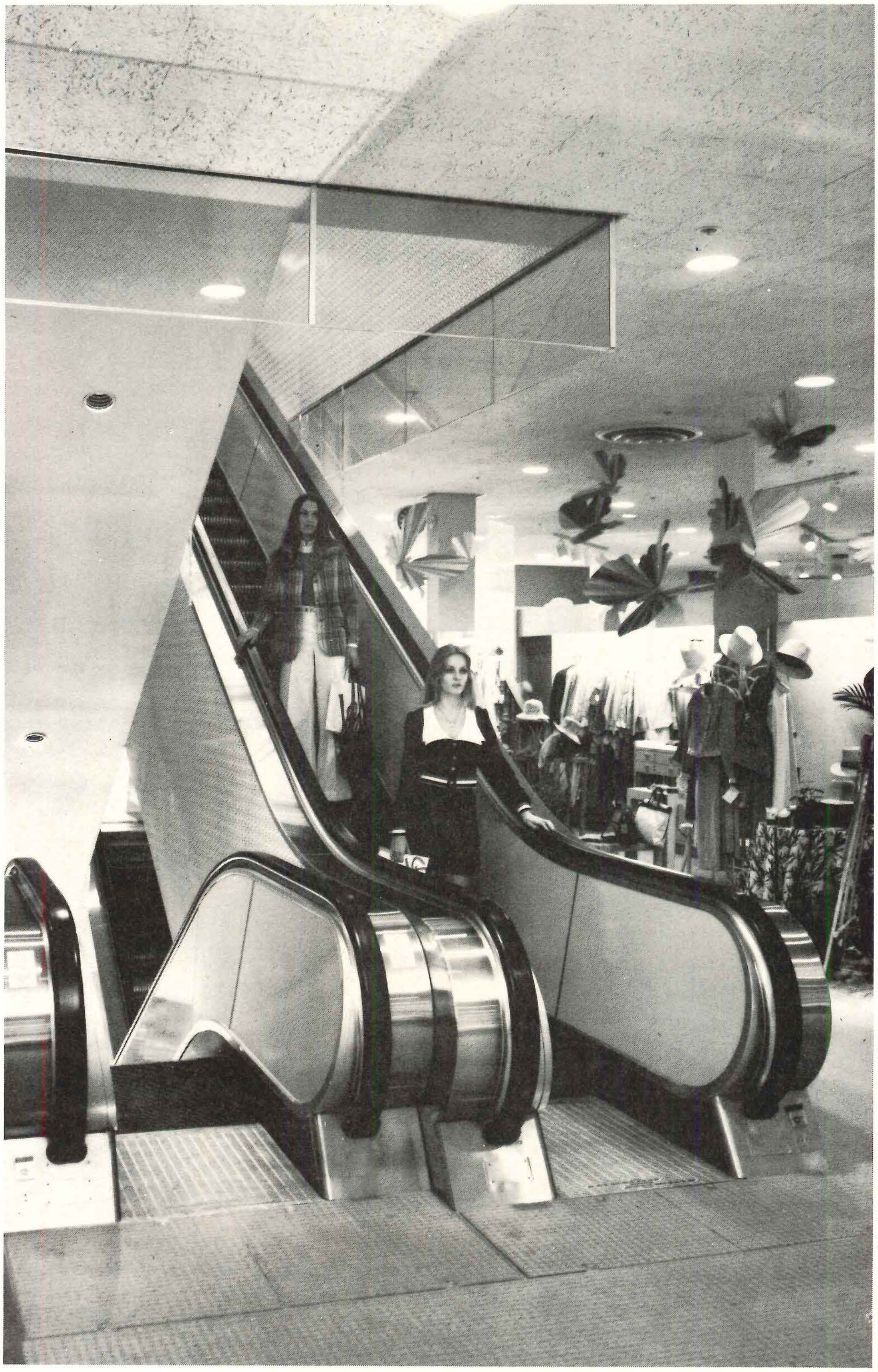

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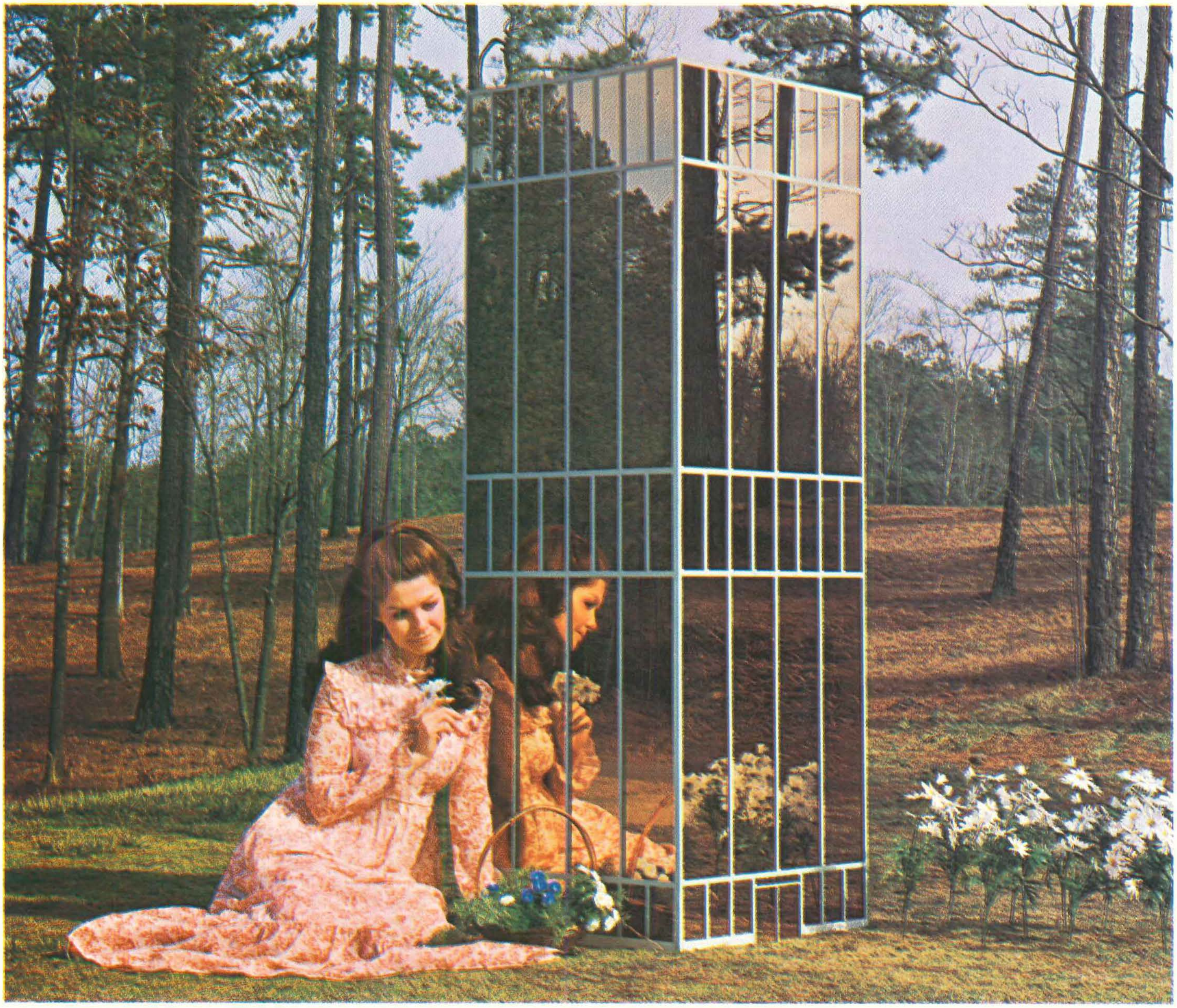

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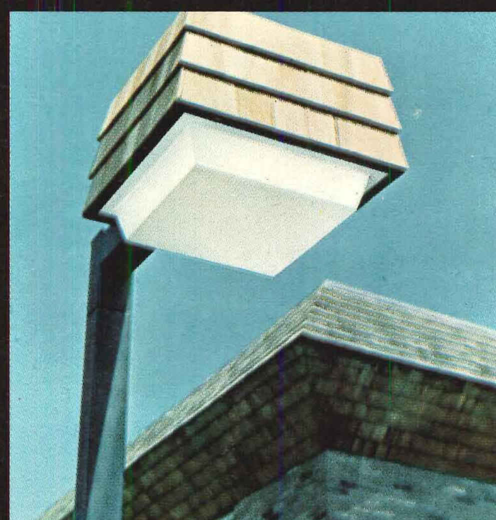

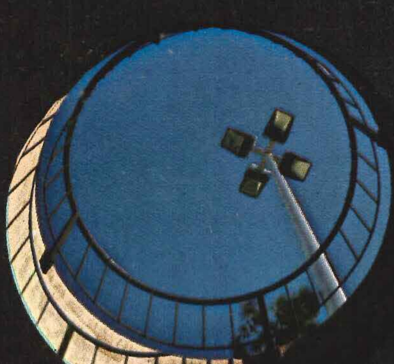

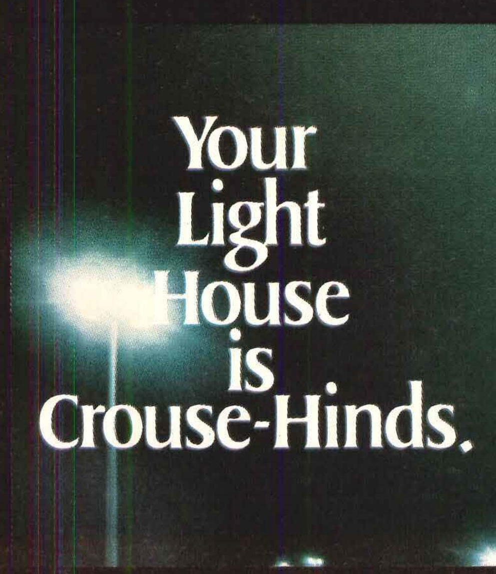
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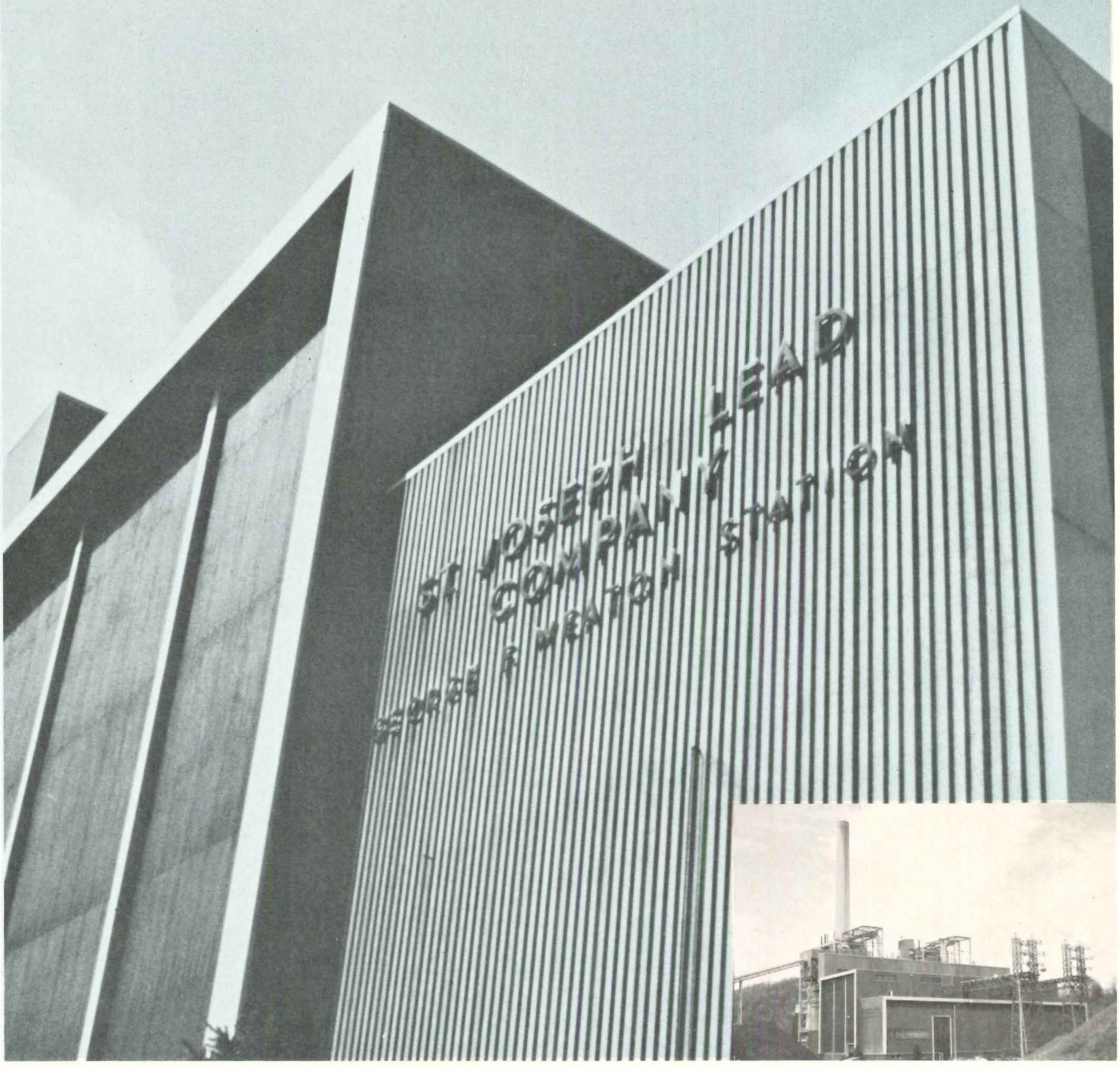

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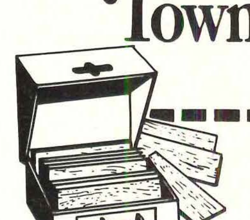

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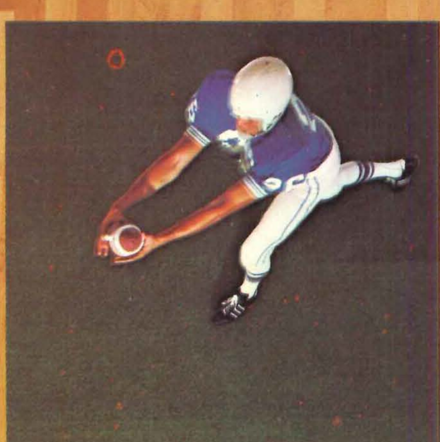

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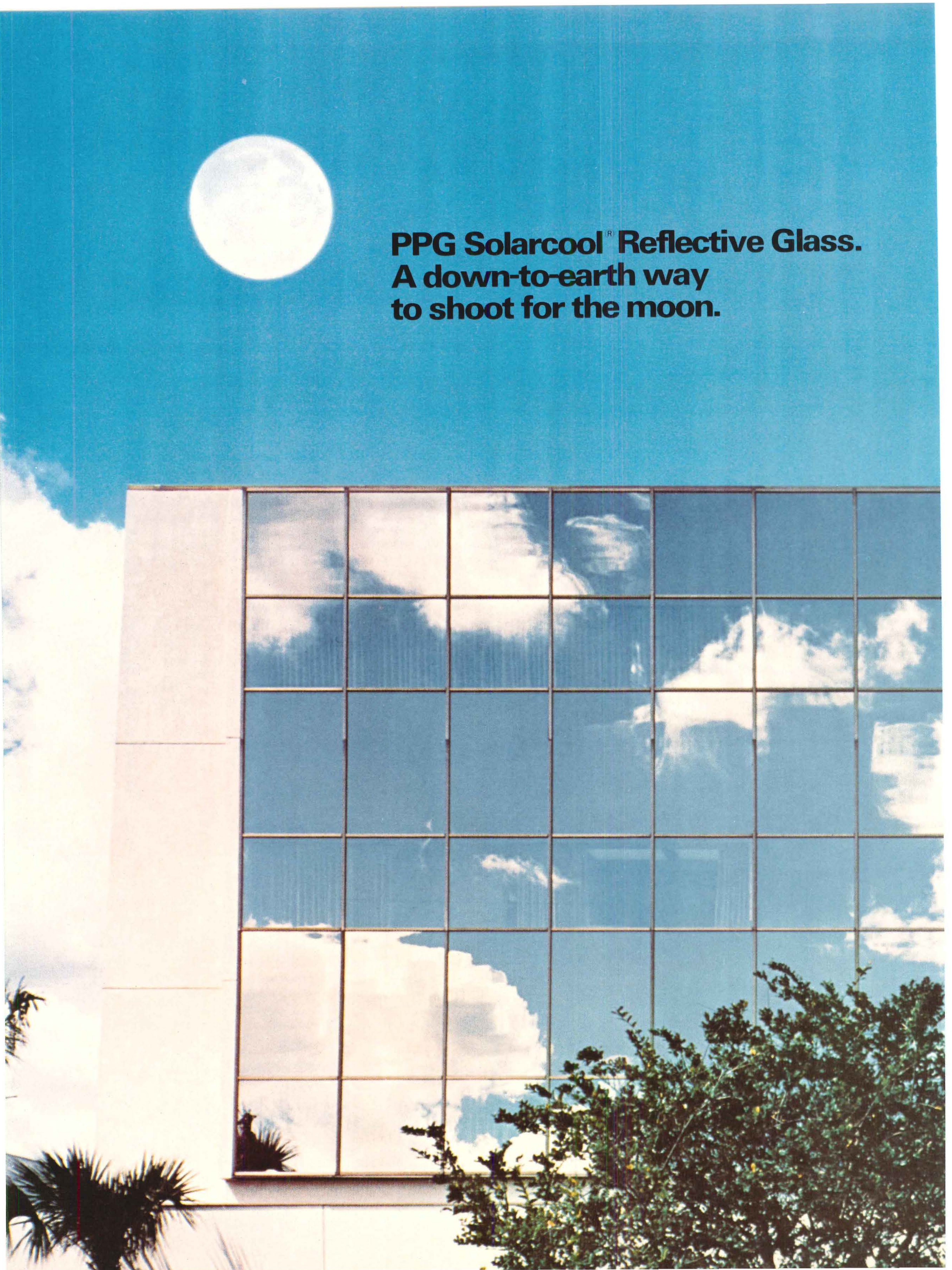
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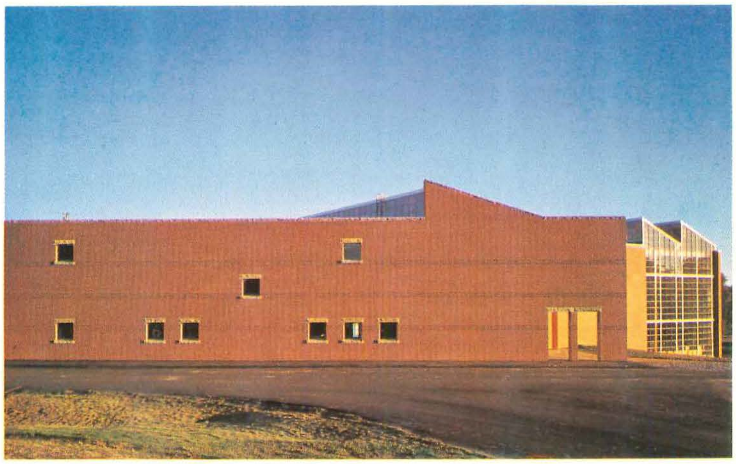
AN OPEN PLAN ELEMENTARY SCHOOL

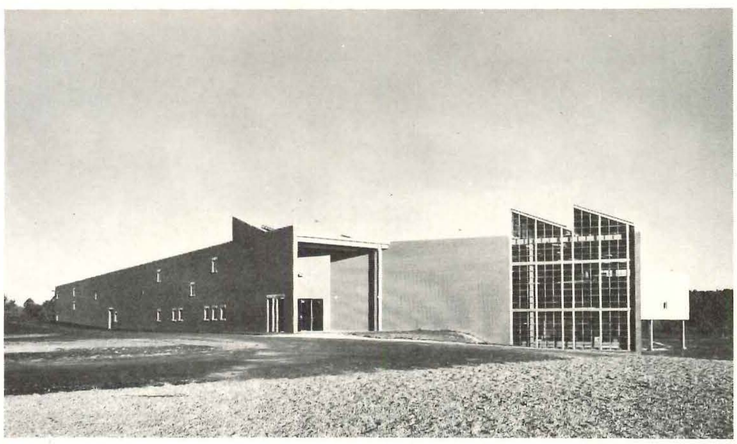
The Mt. Healthy School in Columbus, Indiana by Hardy Holzman Pfeiffer Associates is a bold architectural experiment staffed by teachers dedicated to the principles of open education. It is certainly one of the best centers for informal learning so far built in the United States. For this reason it deserves careful evaluation and study by architects, school administrators, teachers, school boards and parents, indeed by everyone with a stake in creating a better environment for learning. It is the first open plan school for open education to be built in Columbus, Indiana, a community widely known for its high standard of public architecture and the quality of its schools and school buildings. The following article sets forth the principles of open education and the ways in which the Mt. Healthy School building strengthens and furthers these principles. —*Mildred F. Schmertz*

Norman McGrath photos

The school is divided into three multi-level "clusters" of 180 pupils each. The kindergarten (above) is within the lower primary cluster, but occupies its own spatial level for increased privacy and quiet. It has its own entrance from the parking area and access to the outdoor play area. It is conventionally equipped with toilets, built-in cabinets and work sinks and movable and storable furniture. The small amphitheater doubles as a story-telling center and a series of stepped work ledges.

"Architects Hardy, Holzman and Pfeiffer see no reasons why all sides of the

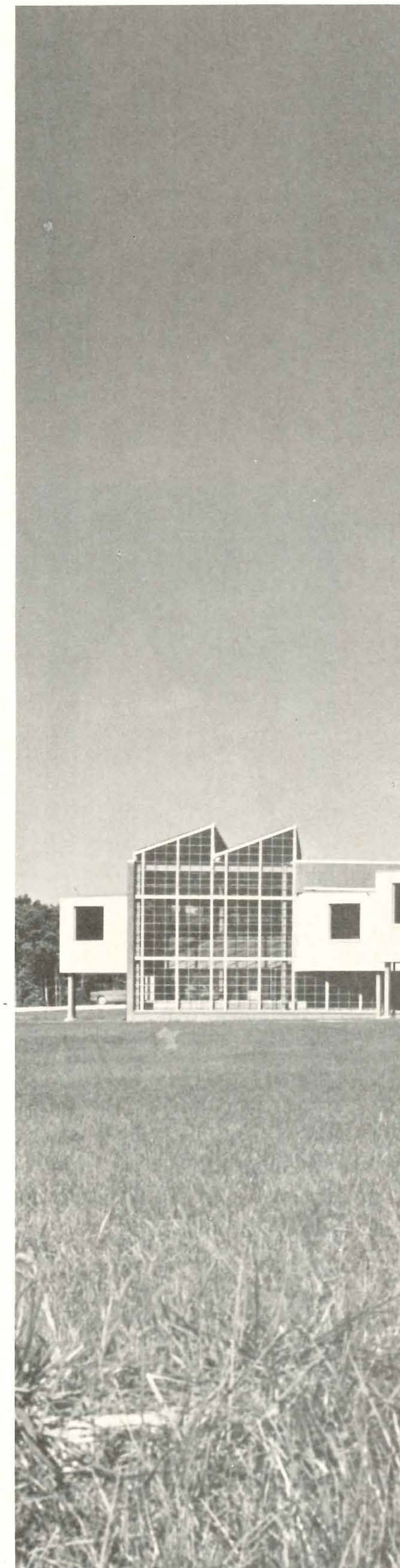




Innovative architects versus conservative programs

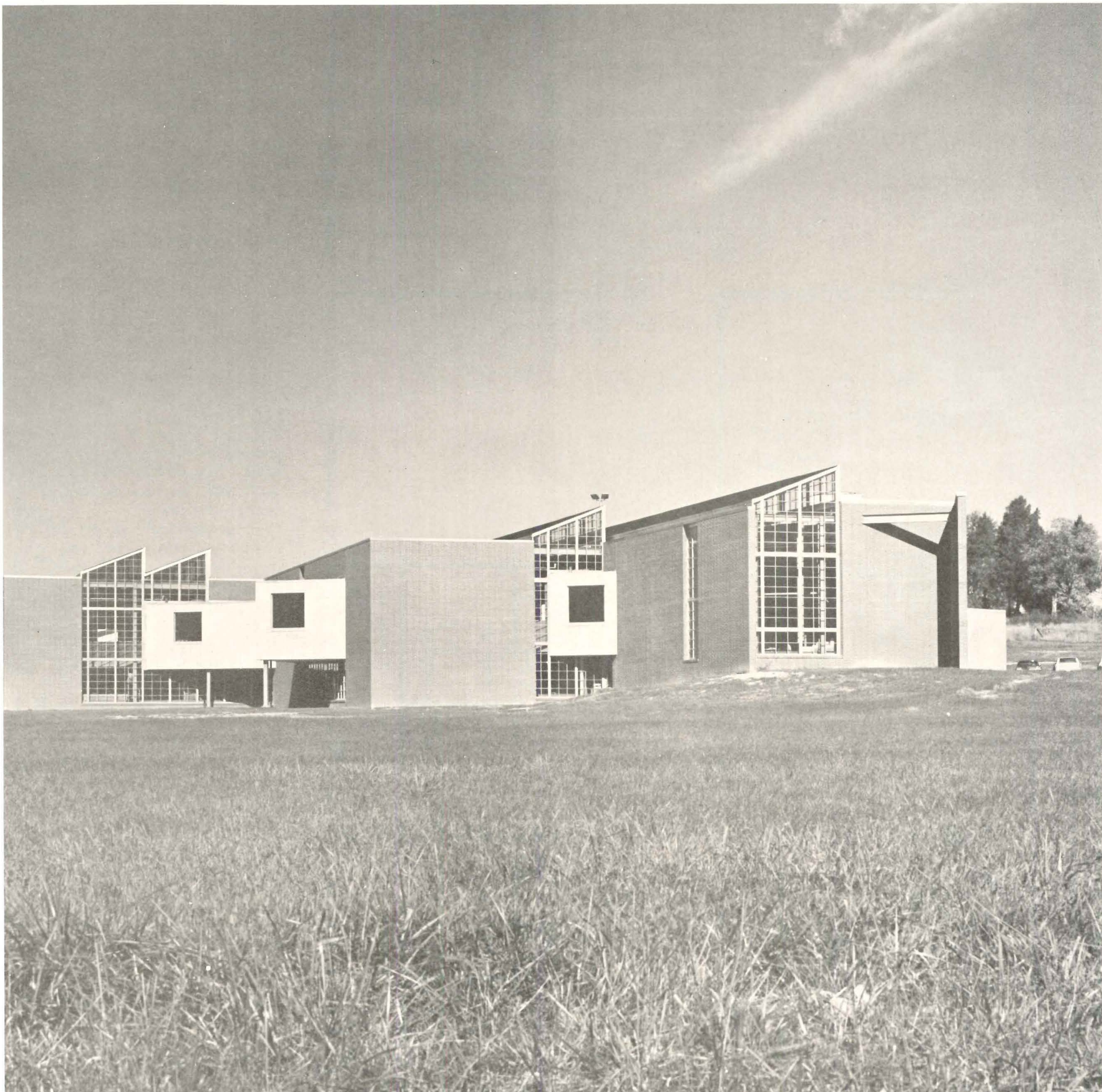
The Mt. Healthy School is the first open-plan school for team teaching to be built in or near Columbus, Indiana. Columbus has been in the vanguard as a center for good architecture since 1942 when the congregation of the First Christian Church dedicated its new sanctuary, office and school designed by Eliel Saarinen. In 1953 the Cummins Engine Foundation, maintained by donations from Columbus' major industry, the Cummins Engine Company, offered to pay the architects' fees for school buildings, and later, all public buildings. J. Irwin Miller, chairman of Cummins' board and of the foundation instigated this enlightened policy.

When architects Hardy Holzman Pfeiffer Associates began work on the Mt. Healthy School, they joined the list of leading architects who have worked on schools in Columbus and the surrounding county. Starting with Harry Weese, who completed an elementary school in 1956, the roster includes schools by John Carl Warnecke, Norman Fletcher of TAC, Gunnar Birkerts, Edward L. Barnes, John Johansen, Eliot Noyes and Mitchell Giurgola. Caudill Rowlett Scott have an open plan school underway. All of these architects, however, with the exception of Hardy Holzman Pfeiffer and CRS found that in meeting programmatic requirements they were acting as conservators of traditional educational values, rather than initiators of change. Because the Bartholomew County school board has been highly conservative, none of these schools except Mt. Healthy and the forthcoming CRS school has been designed for open education. Edward L. Barnes tried and failed to get the board interested in team teaching in the early 1960's at the time he was designing the W.D. Richards Elementary School completed in 1965. Team teaching and "continuous



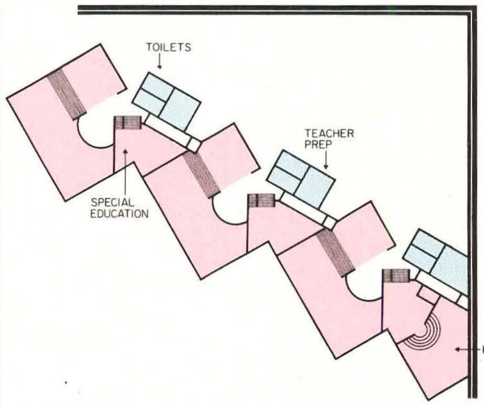
This elementary school occupies a broad, flat 16-acre country site several miles from the outskirts of Columbus. Most of the buildings in the vicinity are farm buildings and the students, almost all of whom come by bus, are from rural homes.

building should look like the same building."

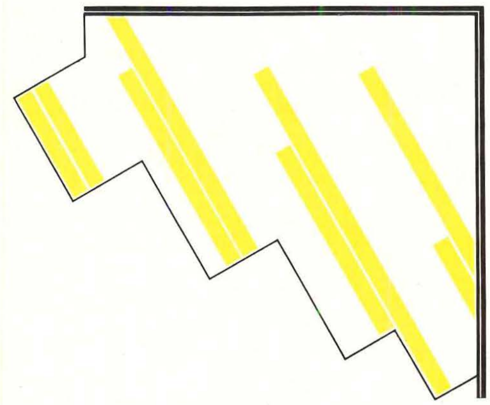


Architects Hardy Holzman Pfeiffer have created a triangular building which on two sides looks like their version of a typical red-brick consolidated school with a flag out front, and on the third expresses the complexity of the cluster form. These architects see no reasons why all sides of a building should look like the same building. Nostalgia is popular—and to this end the architects have used rusticated limestone lintels and sills (opposite page, top) for the windows on the two straight sides. Like those commonplace structures which Robert Venturi has made us see—modest sheds hidden behind huge signs which proclaim their symbolic function—the Mt. Healthy School has two facades which appear to be detached from the building and proclaim what the building is not and yet somehow is. The saw-toothed facade (above) has an unrepentant modern factory look—no nostalgia facing southeast. Lighter brick expresses the pivoting upper levels of the clusters.

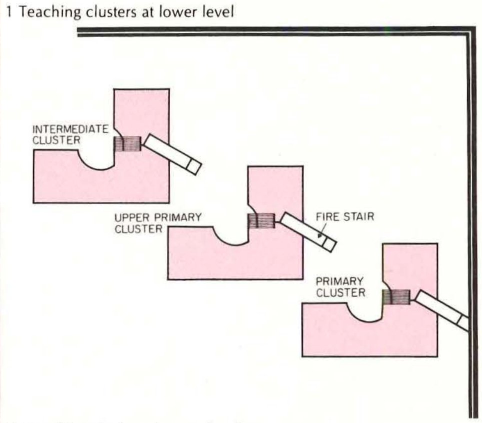
"The structural frame and the elements which furnish the interior spaces . . . act



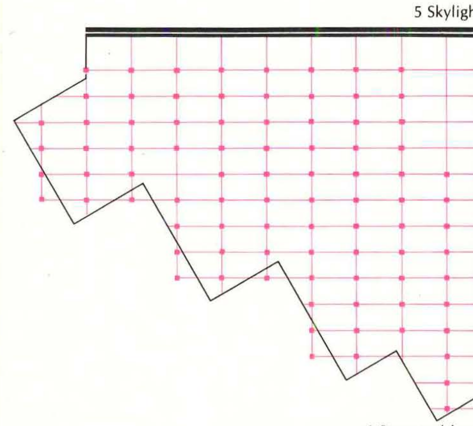
1 Teaching clusters at lower level



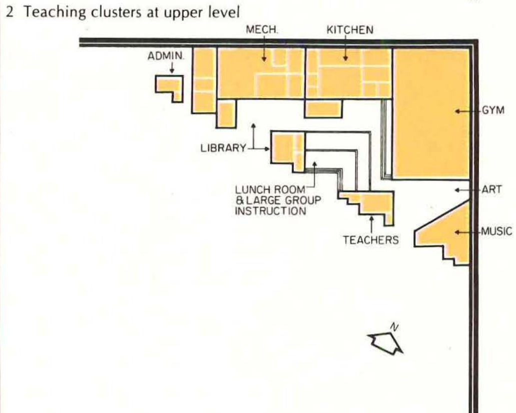
5 Skylights



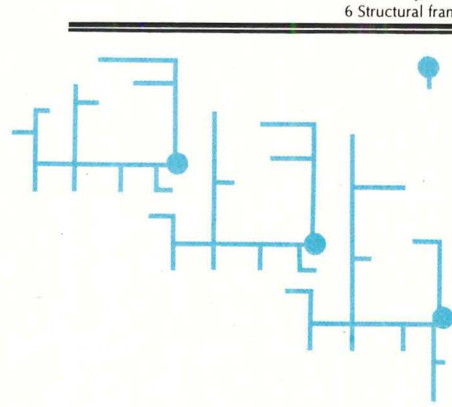
2 Teaching clusters at upper level



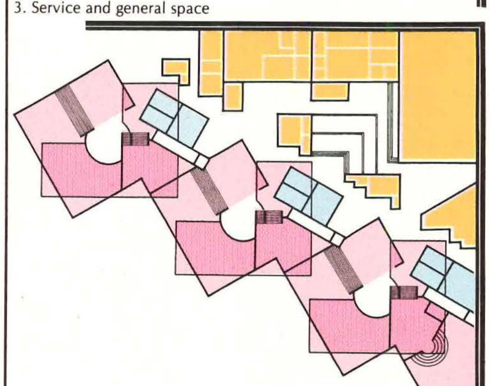
6 Structural frame



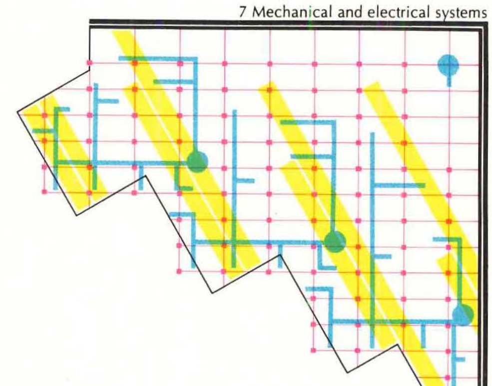
3. Service and general space



7 Mechanical and electrical systems



4 Spatial amalgam



8 Skylight, structural and mechanical amalgam

In spite of its apparent complexity, the Mt. Healthy School is a simple building—spatially, and as a structural and mechanical system. The uncomplicated structural steel frame (Figure 6) consists of regular bays. The mechanical and electrical systems (Figure 7) branch out from a central trunk located above the school's main circulation spine. The amalgam (Figure 8) reveals how these systems interweave. The three clusters, of 180 students each, have two principal levels (Figures 1, 2). Variations of elevation within these levels provide a total of six class areas per cluster. There are 30 students per class. The upper cluster level is superimposed upon the structural grid, while the lower level pivots at 30 degrees (Figure 4).

progress" as opposed to the grading system began to take place in John M. Johansen's Francis Smith Elementary School of 1969, but the school had not been programmed nor specifically designed for it. Hardy Holzman Pfeiffer got the chance to design a school for open education because the school board was this time ready to build one.

What an open classroom is not—a warning to designers

"Open education," "open classroom," "informal education" or "the integrated day" are interchangeable phrases which describe a complete change in the atmosphere of schools through new ways of helping children teach themselves. To many architects these phrases mean open planning, but their connotations, though they have architectural significance, are not primarily about physical space.

Large open spaces do not by themselves constitute open education; getting rid of desks and chairs and substituting special interest centers for math, reading and writing, arts and crafts, etc. does not by itself assure an open classroom; multi-use circulation space may increase the flow within the school and thus develop a sense of community or even family—but spatial concepts alone will not enhance the value of informal education or more than merely facilitate the integrated day.

Neither do these phrases solely imply a body of teaching techniques. To individualize instruction, place children in multi-age groups, put teachers in pairs and abolish grades does not by itself mean that open education will be accomplished.

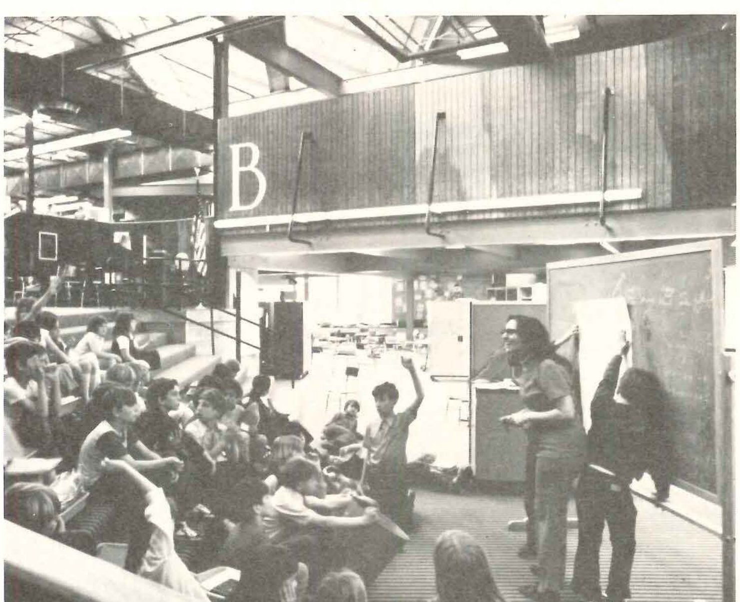
What then is an open classroom? A starting point for design.

It is a setting for shared convictions about teaching and learning. To contrast a traditional classroom with an open classroom is to dis-

as visual cues to aid a child in orientating himself."

The photograph taken at the entrance lobby (above) shows a portion of the administrative area at the left and paired toilets to the right. The central spine extends in an east-west direction the entire length of the building. On the north side of the spine beyond the administrative area are the library, combined lunch room and large group instruction space, mechanical equipment, kitchen, gymnasium and art and music areas. On the south side of the spine are the mutli-level clusters, toilets and teacher preparation rooms. No partitions go to the roof except those which surround the mechanical equipment areas, kitchen and gym. The structural system and the mechanical ductwork are completely exposed, and the building shell has no interior finishes as such. Wood fiber cement plank is used on the underside of the roof and the floors are surfaced with maple flooring, quarry tile and rush mats where appropriate. For acoustical reasons and because children spend a lot of time on the floor, carpet has been used wherever possible. The mechanical system was designed to provide a background hum to further modify sound transmission. Excluding the skylights, the interior is 24 feet, 6 inches high.

"The open classroom is alive with the things which the children have made



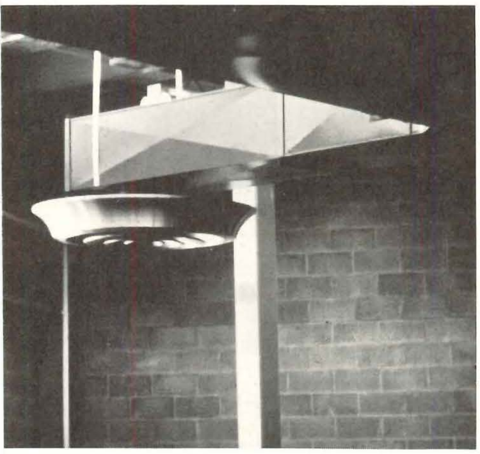
The combined lunch space and large group instruction area (top) is adjacent to the library. Since it is not large enough to handle the entire school for one sitting at lunchtime, some children will be attempting to concentrate in the library and its nearby study carrels while other students are having a noisy lunch. Since this area has no acoustic separation, this conjunction of activities is unfortunate. The broad steps within each cluster (above) double as seats and work ledges.

cover that in the open classroom, teachers and children are leading lives which are extraordinarily different from those of their counterparts in the traditional classroom. In the open classroom the teacher is no longer the fount of all wisdom, standing at the blackboard feeding information to silent children bound to their desks. She is not obsessed with maintaining order, silence and control. There is little direct teaching. Children talk to one another and move about freely. The classroom has become a workshop stocked with fascinating materials, but the children are not just doing their own thing. They educate themselves while participating in projects which interest them, and thus the learning grows out of their own interest. They learn the systems of weights and measures, for example, by making a table in the carpentry shop or cookies at the stove. The teacher is there not only to answer questions but to guide the child in the ways of finding out the things he wants to learn. Their days are not broken into brief class periods, interrupted by class bells but are ordered into longer rhythms of time, marked by breaks for lunch or gym. The conventional barriers between subjects have disappeared. The teachers initiate projects which give the children things to talk and write about. Such projects stimulate a complex of interests interrelating reading, writing, poetry, painting, sculpture, drama, dance, mathematics and science. The open classroom is alive with the things which the children have made and the excitement of work under way. The children themselves are alert, productive and committed to the projects at hand.

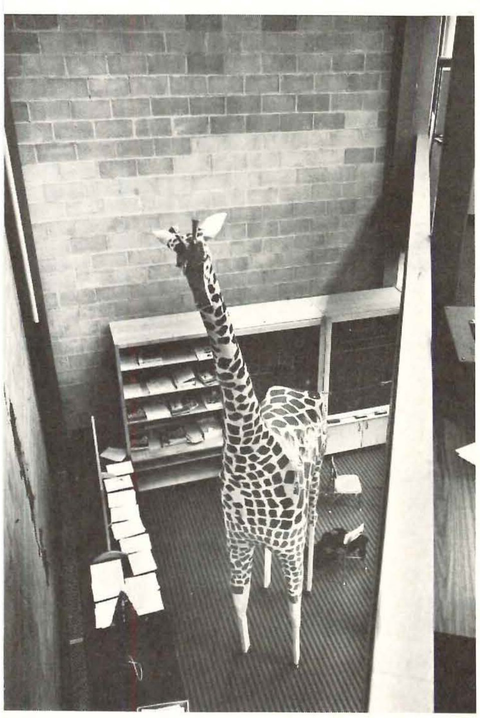
The purpose of open education is to produce adults who no longer need teachers, but know how to educate themselves—human beings who will continue to be self-renewing learners for the rest of their lives.

and the excitement of work underway."

The only thing wrong with this picture are the lined-up children who in an open plan school are normally sprawled about on the carpet or seated at the work tables. The spaciousness and complexity of the cluster is well indicated. While the building's spatial geometries are too intricate to be easily grasped as such by anyone moving about and through it, the structural frame and the elements which furnish the interior spaces have sufficient clarity to act as visual cues to aid a child in orientating himself. The architects' color codings of the structural and mechanical systems help, as do the varying carpet patterns. In addition, each cluster has its own super graphic designation as "A," "B" or "C." The photo has been taken from the upper level of the cluster. At the foot of the steps is the lowest level of the cluster. A special education section can be seen beyond. The children are lined up on the intermediate level which handles 30 pupils and is open to the roof.



For Hardy, Holzman and Pfeiffer this duct and diffuser have intrinsic interest as objects to be celebrated, rather than covered up. Almost all the elements from which the Mt. Healthy School was made are exposed and the structural and mechanical systems are cheerfully accented with bright colors. One hopes that some children, rather than quietly accepting the building, are asking questions about it: "What are those yellow pipes, where does the green snake go and what are those round silver things?" Such questions lead to learning that buildings can teach a lot of things.



A teacher, stimulated by the vertically interpenetrating spaces formed by the teaching clusters, created a full-size papier-maché giraffe during her summer vacation and gave it to the school. The building can absorb similar large-scale works.

The architectural implications of open education

A humble truth which should strengthen the modesty of architects is the fact that since open education began (in England's infant schools during World War II), it has largely been conducted in old and unsuitable school buildings, the insides of which have been carefully adapted for the purpose by dedicated teachers. It has been the success of this vital new life in decaying old buildings in some of England's most remote and shabby towns and industrial cities which is inspiring U.S. educators to adapt some of our own school buildings to conform to the British models. The adaptation may simply consist of freeing the rigid classroom structure by turning the school's halls and corridors into learning as well as circulation spaces, using them as extensions of the classrooms.

More educators now consider open education as an alternative when they set out to build a new school, and since 1969 over 50 per cent of newly built schools have been designed for informal learning. This has been a period in which architects have been truly challenged to come up with new forms for new functions. We are now building for a new and well articulated philosophy. This should make it easier, but it hasn't.

Unfortunately, too many design solutions resemble the traditional double-loaded corridor schemes with classrooms on either side. The only difference is that the interior walls have been left out. Now six classrooms and intervening corridor are one barn-like space. Teachers are finding that these spaces are too big and undifferentiated to work very well. Spaces that are too large usually share the same noise level and appearance in all their subdivisions and thus lack important environmental cues. The child lacks the opportunity to develop a different feeling for different spaces.

Designing the Mt. Healthy School

From the start, architects Hardy, Holzman and Pfeiffer wished to avoid the creation of overscaled spaces. To this end they developed three multi-level clusters of 180 students each—a primary cluster (kindergarten through second grade), an upper primary cluster (third grade and fourth grade) and an intermediate cluster (fifth and sixth grades). Within each cluster are six articulated spaces which accommodate 30 students each. The plan was generated by pivoting the superimposed layers of each cluster in a manner which produces four half-levels or two two-story buildings. Within the clusters are well scaled one-story spaces and two-story spaces creating a variety of interior enclosures. At the same time, each cluster is a place with which the child can identify and to which he belongs. Essentially the clusters are simple rectangular boxes skewed within a standard skeleton grid. Essentially the clusters are one building, the service and general space is another and the corridor spine divides them.

The corridor is not defined by open volumes or walls, but all elements open upon it—the principal's office, administration space, library, reading carrels, coat rooms, toilets, teacher preparation rooms, the combined lunch and large group instruction space, the gym, art and music areas. The school has as few walls as possible and most rooms are boxes without lids.

The architects contend that there are no acoustic problems, and have not acknowledged that there might be excessive crowding at particular points in the spine at certain times of day. Unfortunately this writer visited the school after the children had gone home and therefore was unable to assess the noise level, or to see if skillful timing of student circulation in the spine (arriving, leaving, putting on and removing wraps, going to lunch etc.) makes the space patterns work for 540 children. Because the plan of the Mt. Healthy School is so innovative it should be evaluated in action. If the cluster concept holds up under long-term scrutiny it should be widely adopted.

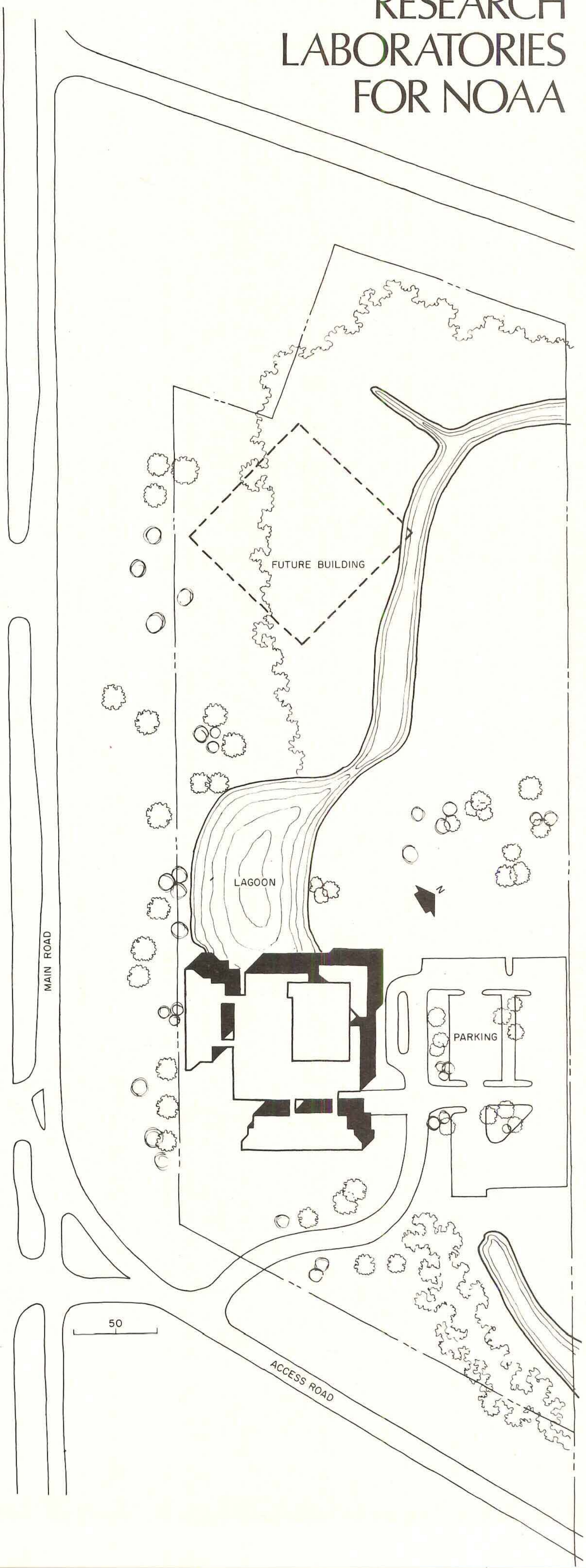
Hugh Hardy correctly points out that it will take time for the teachers and children to learn how to use the building. As open education begins to work at Mt. Healthy, it is to be hoped that the children will be relatively quiet as they concentrate on their tasks.

Children and adults can tune out distraction, but at the same time they reduce their openness to other people and pay a physiological price in muscular tension. Although the school's ingenious cluster plan provides oddly-shaped corners which can function as quiet spaces for reading and other forms of concentration, there is no quiet room as such for the child who may be tiring of interacting with his peers, suffering from sensory overload, and wishing to make a total commitment to his book. Such a room could be created within Mt. Healthy's highly flexible format.

The architects are proud to point out that for all this flexibility and spatial interest, the school's costs were within the budget. The total cost of the school (660 maximum student capacity, 50,000 square feet) including furnishings, carpet and cabinet work, but excluding architects' fees, was $1,533,825. The building will accommodate another cluster for 180 more pupils. *—M.F.S.*

MT. HEALTHY ELEMENTARY SCHOOL, Columbus, Indiana. Owner: *Bartholomew Consolidated School Corporation.* Architects: *Hardy Holzman Pfeiffer Associates—project architect: Michael Kaplan.* Associated architects: *David B. Hill & Associates.* Engineers: *Paul Weidlinger* (structural); *J. M. Rotz Engineering Co., Inc.* (mechanical); *Robert A. Hansen Associates* (acoustical). General contractor: *A. E. Pitcher Construction Company.*

ATLANTIC ENVIRONMENTAL RESEARCH LABORATORIES FOR NOAA

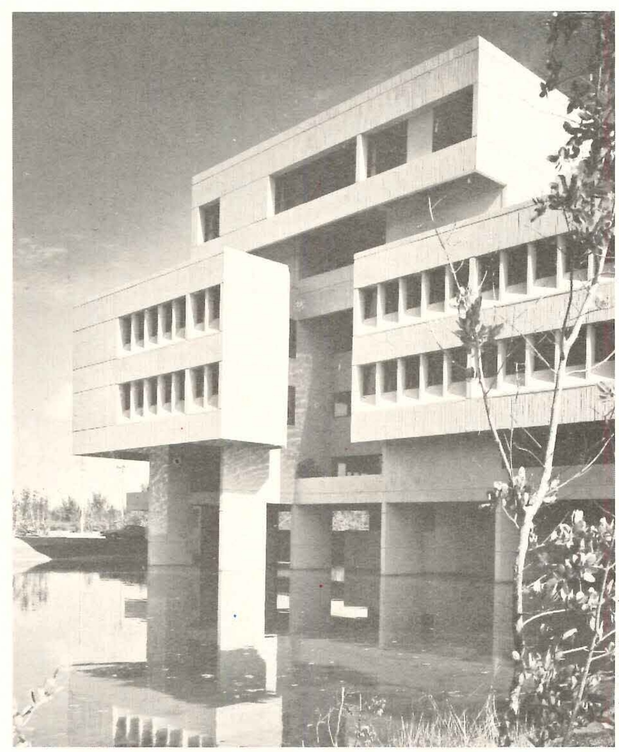


The National Oceanic and Atmospheric Administration's new Miami facility is designed for the analysis of data and specimens gained at sea and for the subsequent production of practical information used in a wide range of pursuits, including weather forecasting. Separate laboratories are provided for four basic categories of interrelated activities: ocean floor exploration, behavior of water movements, sea-air interaction and hurricane research. The divisions are expressed in the building's articulation.

In order to determine the client's specialized needs, the architects, Ferendino, Grafton, Spillis, Candela, did extensive consultation and preplanning. The building reflects the results on two program levels.

First was the practical planning required to facilitate the basic research tasks of each division. An analysis of the flow of study materials produced a rough-work area on the first floor, from which processed specimens are distributed to the laboratories on the second and third floors above (see typical plan, next page). These laboratories required very different physical configurations for each division, and were grouped in the freely partitioned central part of the building. The more conventional individual office needs were accommodated in the rigidly defined projecting elements around the perimeter. Full scale mockups of the unusual-shaped senior scientist's offices were made to illustrate how they would be used.

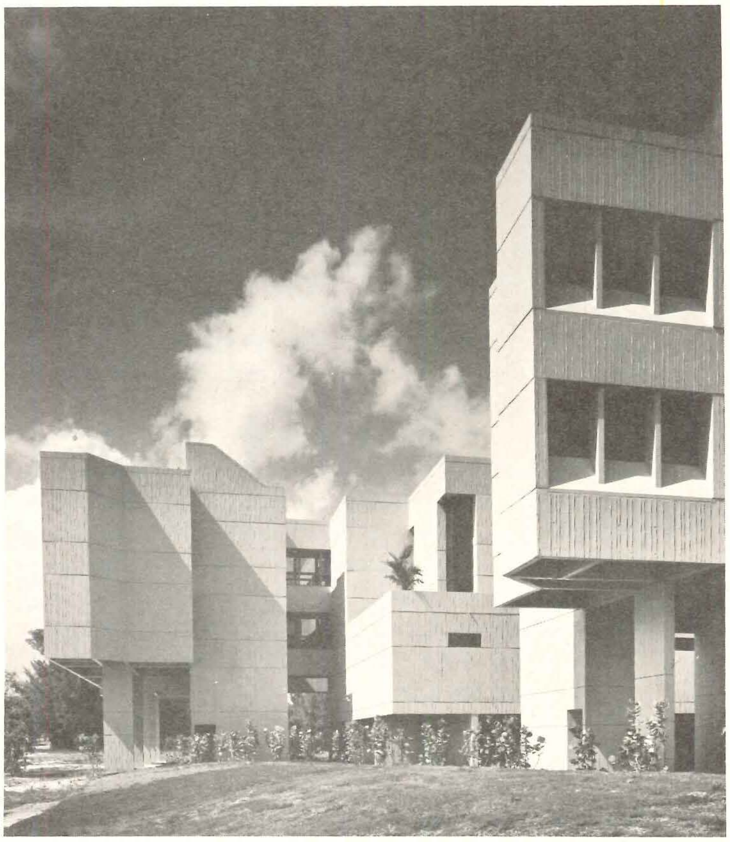
A second program level was the provision of social as

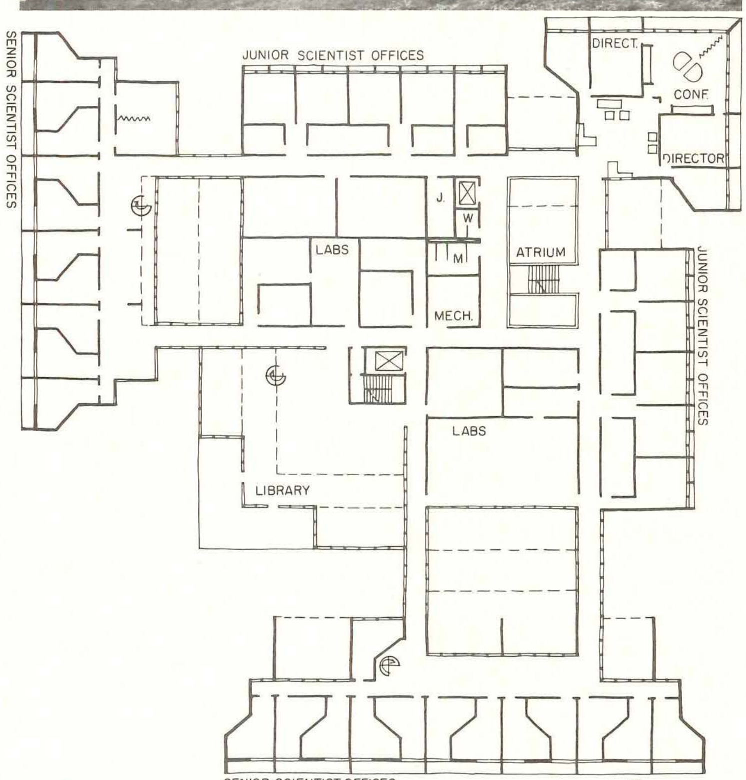


Joseph W. Molitor photos

well as functional interaction between scientists in the four working divisions. Peter Spillis, the partner-in-charge, and Hilario Candela, the design partner, consciously introduced planning elements that would allow personnel in specialized parts of the building to be in touch with the general activities. For example: there is a single main entrance into a full-building-height lobby, a library in common to the two laboratory floors, several lounges, and a careful positioning of junior scientists' offices on the route to senior scientists' offices.

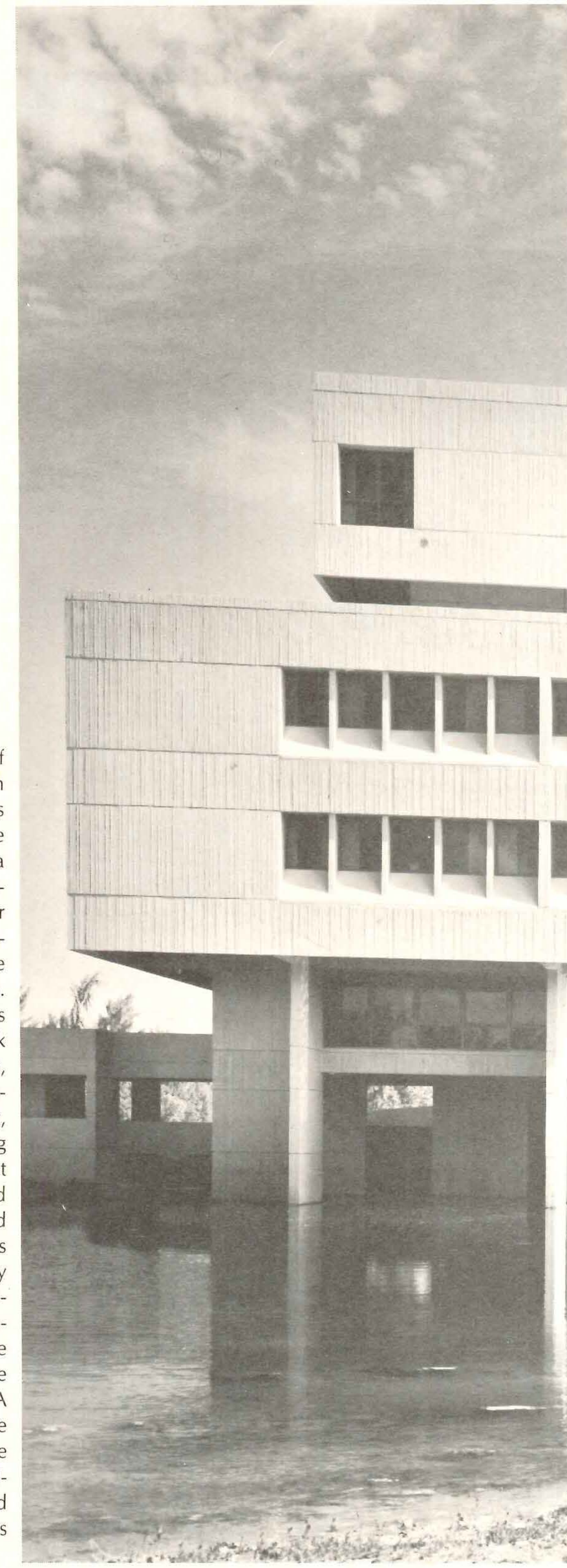
The site is adjacent to five other marine exploration facilities near Biscayne Bay. The newly dredged lagoon was created to test water-related equipment, and the removed coral rock and sand was used for fill around the landward sides of the building, though budget restrictions limited the amount of this fill and the landscaping.

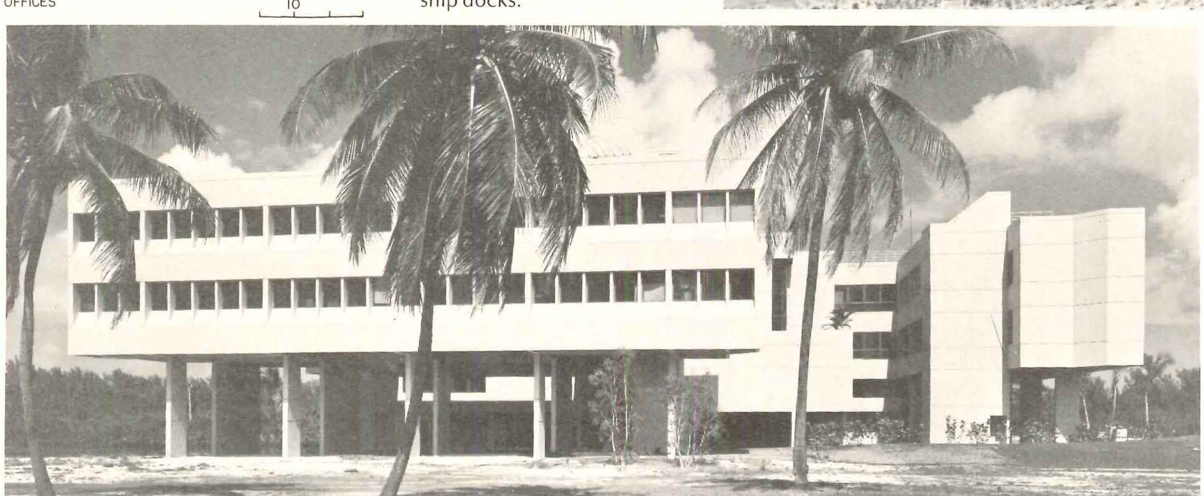




SECOND FLOOR

Some 74,000 square feet of highly specialized research space are contained in this poured concrete structure. The exterior surface is stained to a warm sand color and was textured by using rough lumber forms. The windows are contained in precast units and are recessed to reduce heat loads. The view from the main road is shown below. The library block is seen in the view to the left, and the parking lot entrance facade is seen on the lower right, opposite page. The two working lab floors above (typical plan at left) are seen strongly projected on all sides and are articulated to express differing functions within. Each lab floor roughly contains two of the four interrelated divisions, and the respective directors are housed in the foremost element as seen in the view from the lagoon (right). A fourth-story mechanical space is above and the executive director's offices top the building in a separate element placed for distant views of NOAA's ship docks.





A single main stair, in the vertical lobby-atrium, is intended to facilitate visual contact between occupants and to orient visitors. A panoramic view and activities on the other floors can be seen from the fourth floor lounge (below).

ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORIES, Virginia Key, Miami, Florida. Owner: *National Oceanic and Atmospheric Administration.* Architects and Engineers: *Ferendino, Grafton, Spillis, Candela.* General contractor: *Shafir & Miller.*

Mapping out realms for the body and mind and memory

A house is a most individual form of building; no matter what idol its architect bows to it is designed (or should be) to the special needs, and desires and even follies of its owners, and these particulars are usually as passionately demanded as they are different in every case. A house, as all the old saws proclaim, seems a uniquely personal world; novelists recognize this fact when they describe characters by describing their houses, and tourists recognize it too by flocking to see the houses of the famous. Houses tell us what people are like. They map the patterns of people's lives, describing their preferences for being enclosed or in the open, alone or in company, and the sequence through which the body moves to attain these and many other conditions. They display the shapes, textures, colors and objects which have meaning in their worlds, and the memories from which these choices derive. Memory means recalling the forms of the past—*eclecticism,* an activity frowned on by some Modern orthodoxies but nevertheless validated by several millenia of practice. The houses that follow here are by architectural cartographers who borrowed freely from the past in the names of their clients. Forget them not. —*Gerald Allen*

W. Hamilton Budge house by MLTW/Moore-Turnbull

Morley Baer photos

A house with rooms which open up to make a giant screen porch, a pavilion among the trees

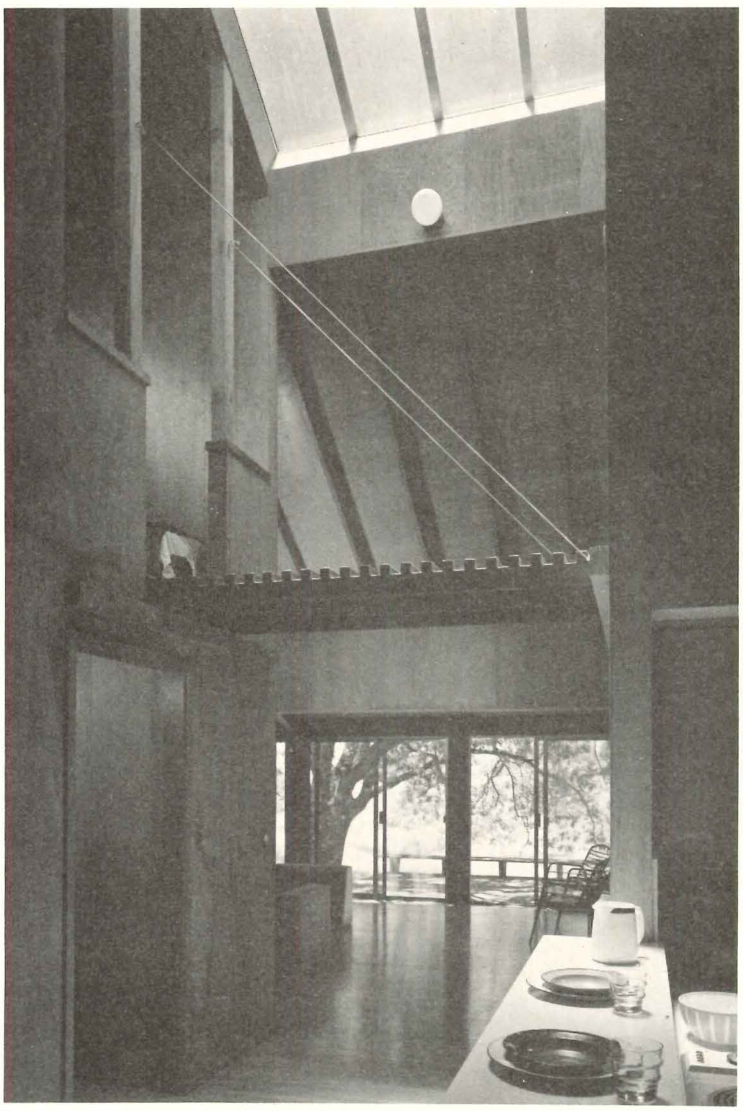
This house was built for weekends and summers in a beautiful oak forest above a pond 70 miles north of San Francisco. In these hills the summer, when the house is most used, is six months long and almost cloudless; rain is virtually unknown, the days are hot and still, and in the evening cool breezes blow.

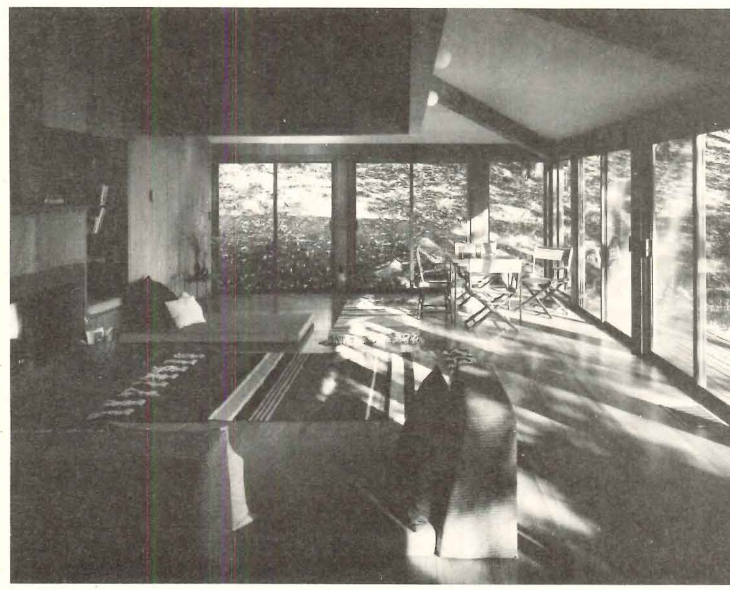
In that nostalgic world of endless quiet summer days the architects made a very simple house, like the classical farmhouses of California. These farmhouses of memory were generally gabled or hip-roofed rectangles surrounded by porches which kept off the hot summer sun. In this version, the walls themselves are made so that they fold up against the porch ceiling to merge indoors and out. In each corner lies a room, two bedrooms in opposite corners and in the alternate spaces a kitchen (below left and opposite) and a living room. The living room corner breaks the system (see plan and photo below); its walls of fixed glass and glass sliding doors reach to the edge of the house and give it space and outlook even in winter, when the counterbalanced walls in the other rooms are shut down against the wind and cold. The living room has for those days and nights a fireplace.

For the closed-up winter days, and for the summer too, the middle of the house, unlike a classical California farmhouse (but like a California barn), is open to the peak of the redwood roof, and skylights dramatize the center of the house. A stair leads to one half of the upper floor—the other half can be reached only by crossing a drawbridge under the skylights (below left).

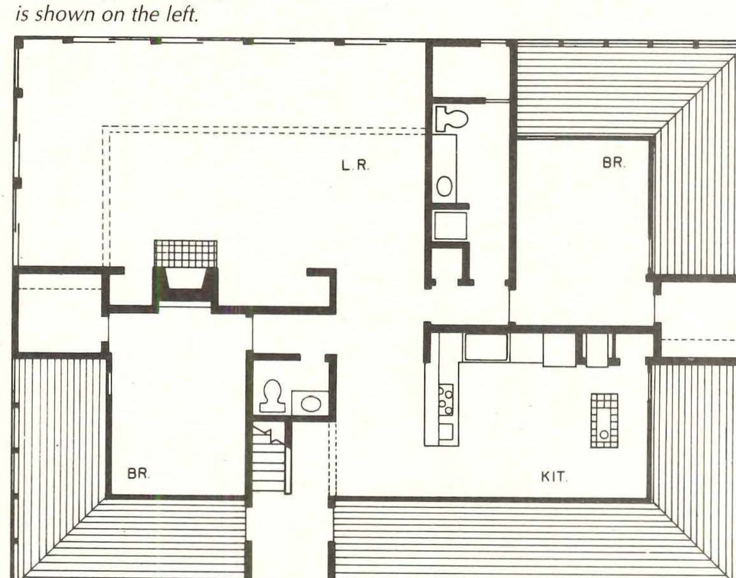
In this house the journeys of the memory come from the recollections of local vernacular architecture, and those of the mind's eye come from the soft light that filters into the house past the branches of the giant oaks, and from the errant summer breezes which rustle through their leaves.

W. HAMILTON BUDGE HOUSE, Healdsburg, California. Architects: *MLTW/Charles Moore and William Turnbull—Edward B. Allen, associate.* Engineers: *G.F.D.S.* (structural); *Brelje and Race* (civil). Contractor: *Chester Robbins.*



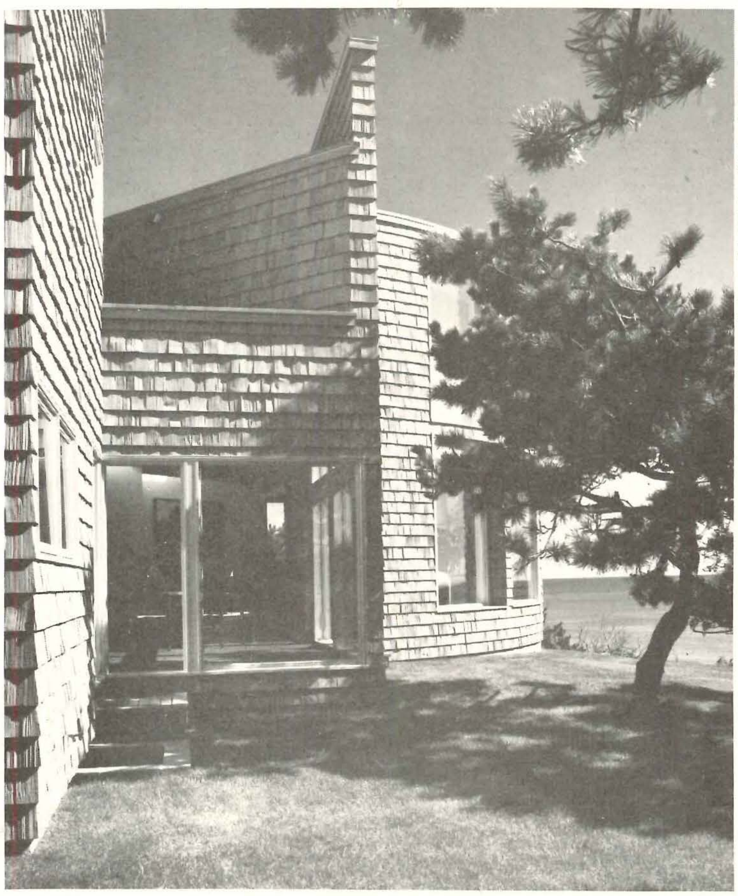


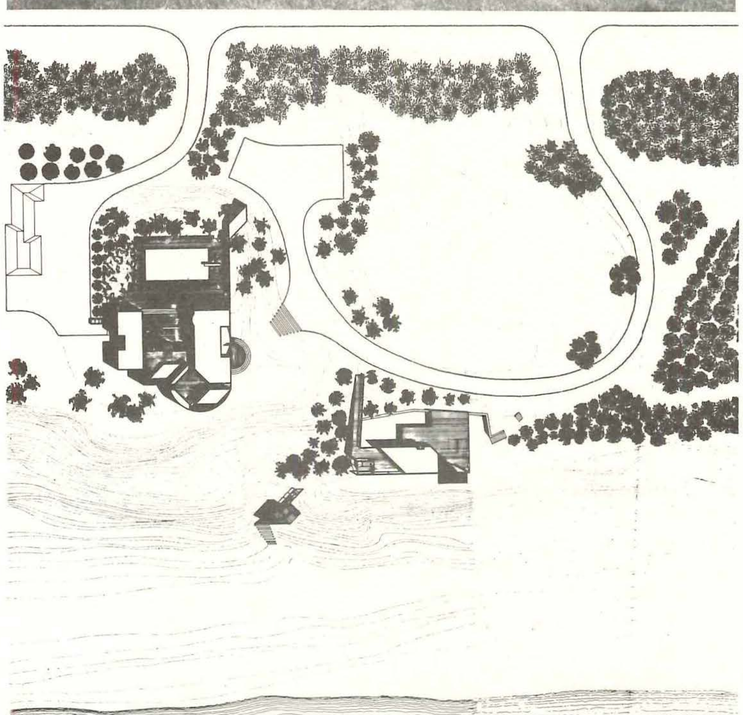
The photograph of the kitchen on the opposite page shows the plywood panels raised and the room open to the screen porch. Below left the kitchen is shown as it would be on a cold day, with the wall panels down. The high center of the house with its skylights and drawbridge connecting the two upper sleeping areas is shown on the left.

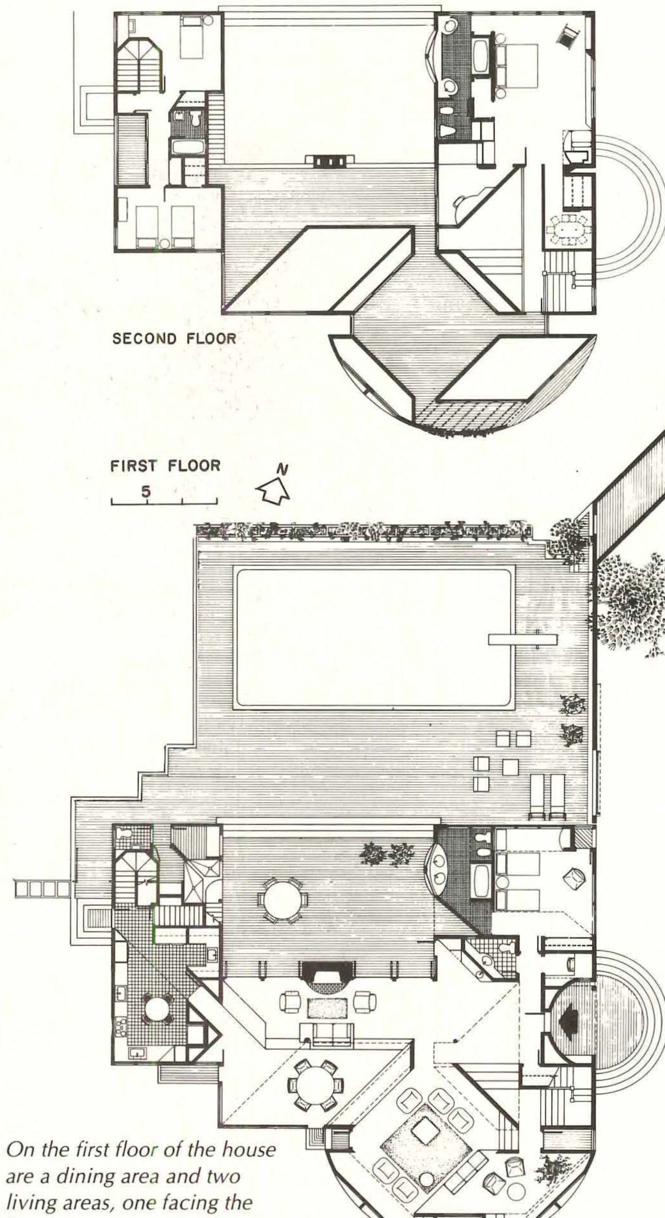


Shingled houses on the Long Island dunes

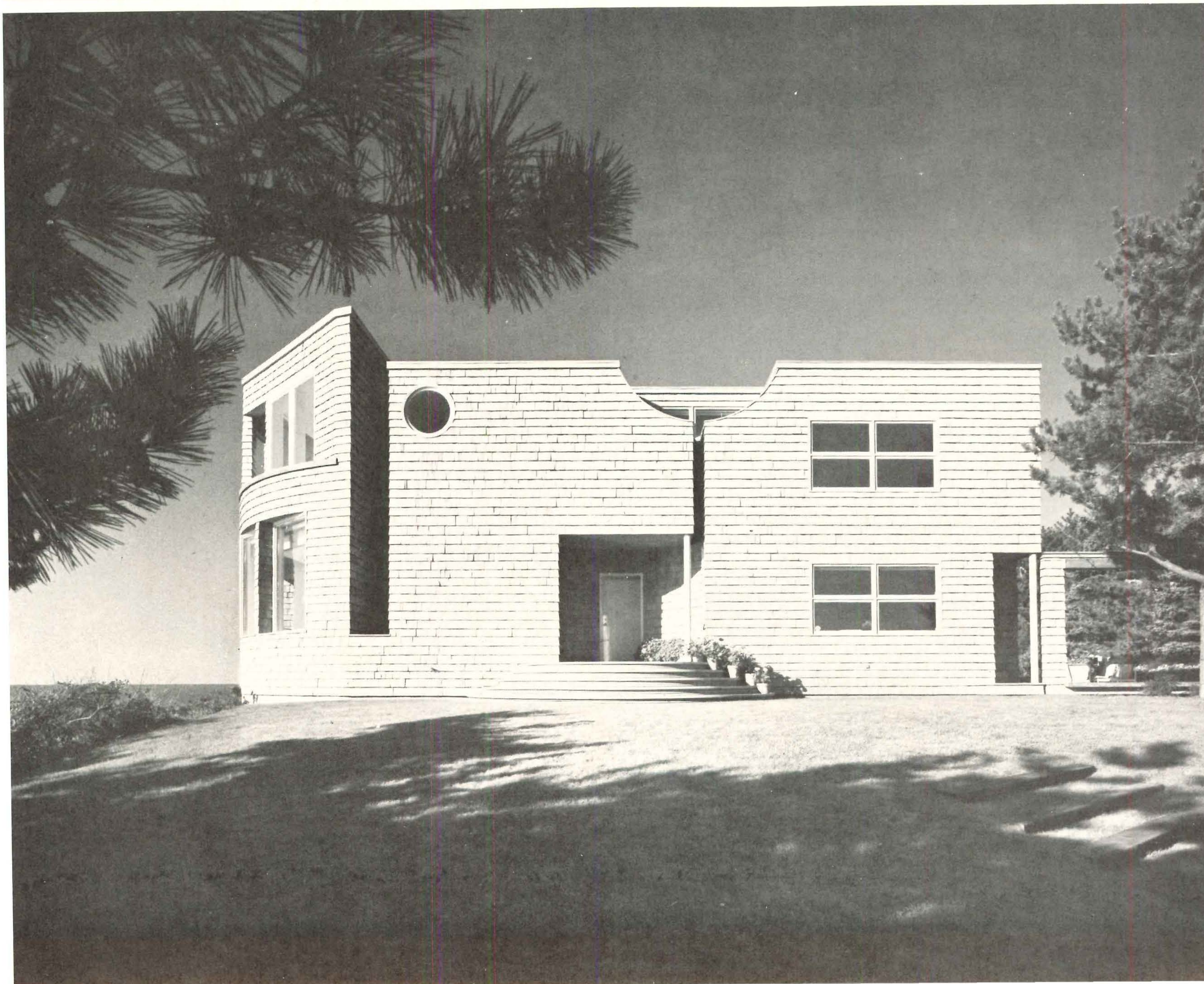
In the little California cabin shown on the past three pages the movements of the body are rather simply mapped—from the outdoors to the screen porches (half outdoors, half in) to the rooms (more or less open, depending on the weather) to the high and more protected center. The rectangular plan is so simple that it sticks in the mind, and you know just how any one part of the house you happen to be in relates to the encompassing order of the whole. By contrast, a compound of beach houses on Long Island (opposite page, above) is orchestrated to a much different choreography. From the first approach by car the way is, literally, circuitous; it presents sequential views of clusters and great gatherings of trees, of the sea and finally of the front door of the main house (opposite page, below). The more public rooms of the house are spaces peculiarly configured and assembled, sometimes high, sometimes low, sometimes opening to the sea, sometimes turning away to the patio and pool behind. The plans (right) show that long diagonal vistas are provided through all this complexity, anchoring axes that give the inhabi-







On the first floor of the house are a dining area and two living areas, one facing the fireplace and one looking out over the ocean; towards the back, on the left and right respectively, are a kitchen and breakfast room and a bedroom and bath. The stairway near the front door leads to the master bedroom and bath and to an open deck; the stairway shown in the upper left hand corner of the plan leads to servants' rooms.

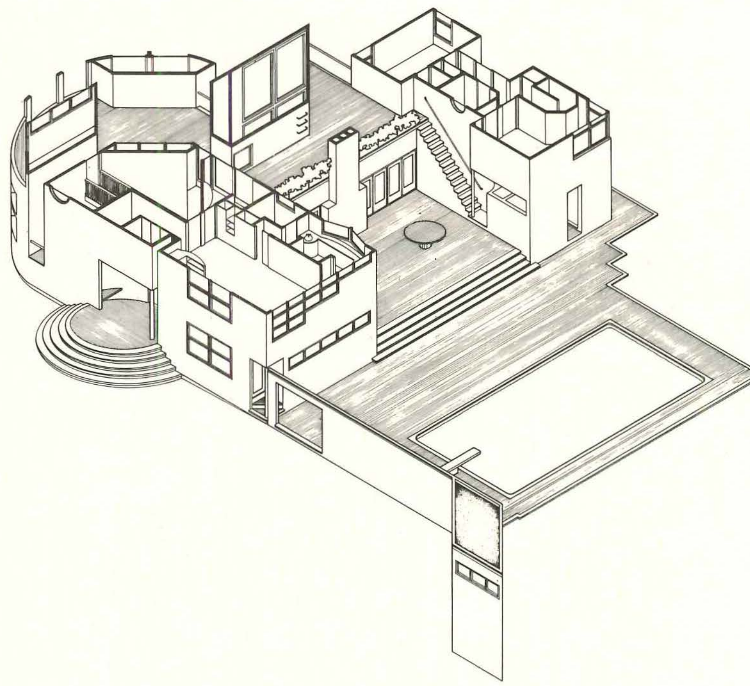


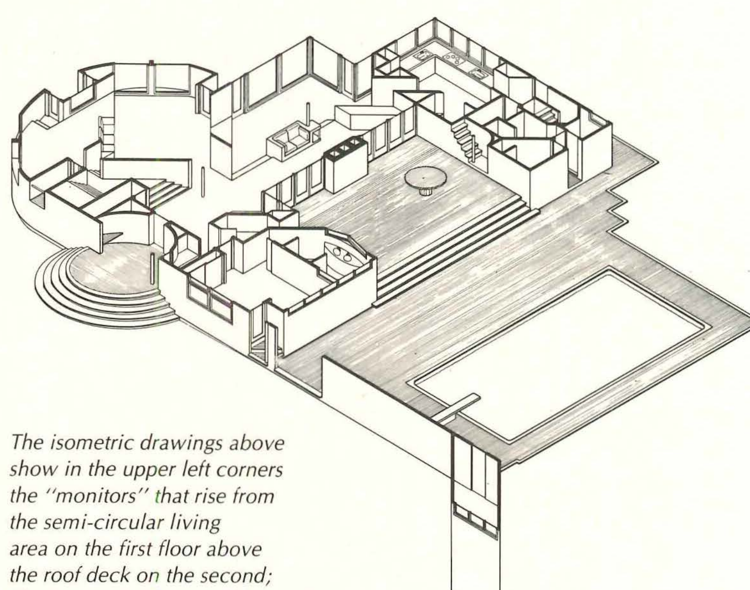
tants some sense of the whole from any one part. The complex order of the house is thus revealed by these swaths cut through the inside, just the reverse of the house in California.

Faint memories of old beach houses on the Atlantic are evoked on the outside by the cedar shingles and on the inside by the old-fashioned, consciously clumsy brick fireplace (below center). Memories are evoked, too, by the surfaces of the walls and ceilings, made from narrow tongue and groove boards with half-round beadings at their joints—the kind that used to be used for wainscoting, or for porch ceilings, now available (but not used here) in plastic.

With these elements of recall, with its light and airy spaces and with its handsome contemporary furnishings and bright colors, the house is a complicated potpourri of the old and the new, allying itself exclusively with neither, but to the needs and dreams of its owners.

A little distance away from the main house is a cottage for guests (one of the owners' dreams was that guests and their children should, for certain parts of their visits, be kept at arm's length), and a little farther away still is the beach (site plan, page 136). The way that movement

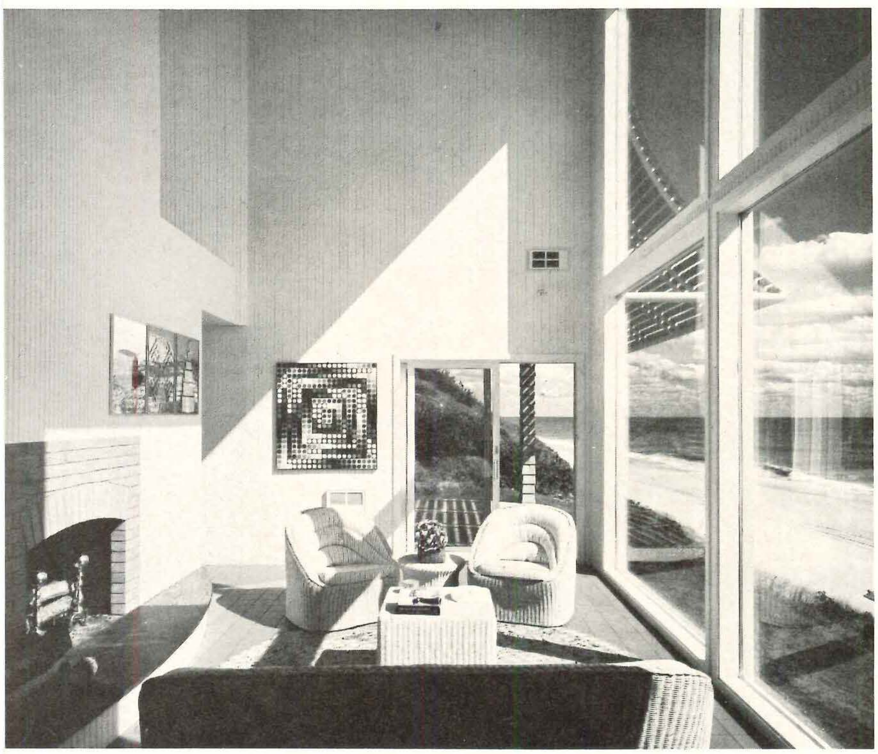


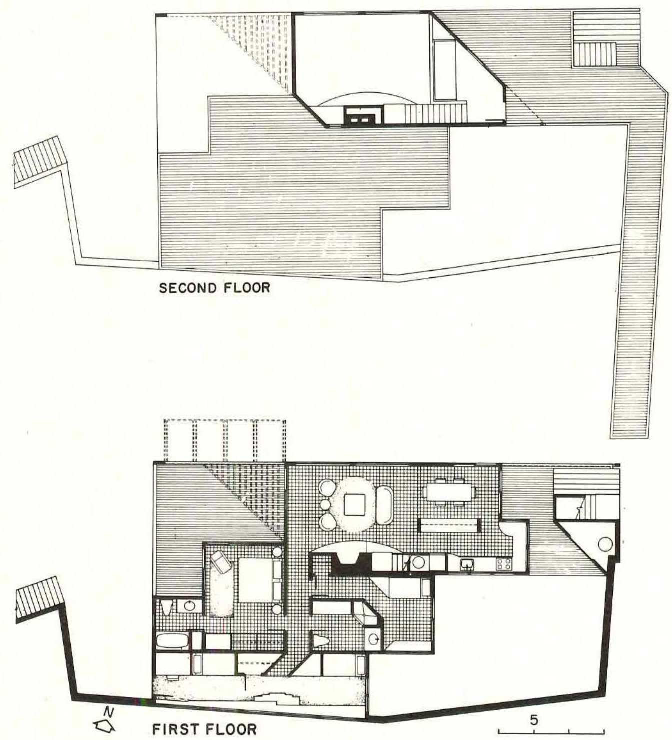


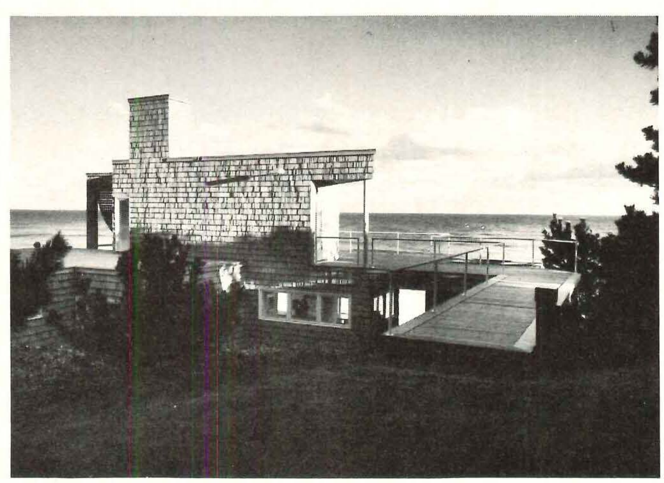
The isometric drawings above show in the upper left corners the "monitors" that rise from the semi-circular living area on the first floor above the roof deck on the second; These monitors have windows at both levels, and the effect of light cascading in from above can be seen in the photograph on the opposite page.

is organized up and down and across the site, from one part of the compound to another, is in its careful clarity not unlike that used by Philip Johnson—in an altogether different idiom—for his own glass and brick houses and other buildings in New Canaan, Connecticut. At these houses on Long Island one moves from the front door of the main house down across a grassy lawn and a short wooden bridge towards the guest house, which from this vantage seems as much sundeck as house (below right); once there one has the choice of going into the house down a flight of steps (bottom right) or else continuing down an alternate flight of steps to the beach. On what began as a spectacular but undifferentiated site, the architects have made a set of places, indoors and out, with evident relationship to each other and to the wishes of the particular people for whom the houses were made.

HOUSE ON EASTERN LONG ISLAND, New York. Architects, landscapers and interior designers: *Robert A.M. Stern and John S. Hagmann—assistants for this project: Daniel Colbert, Jeremy Lang, John Anhorn and William Parker.* Engineers: *Zoldos-Silman* (structural); *Langer/Polise* (mechanical). Consultant: *Carroll Cline* (lighting). Contractor: *Edward Pospisil & Son, Inc.*

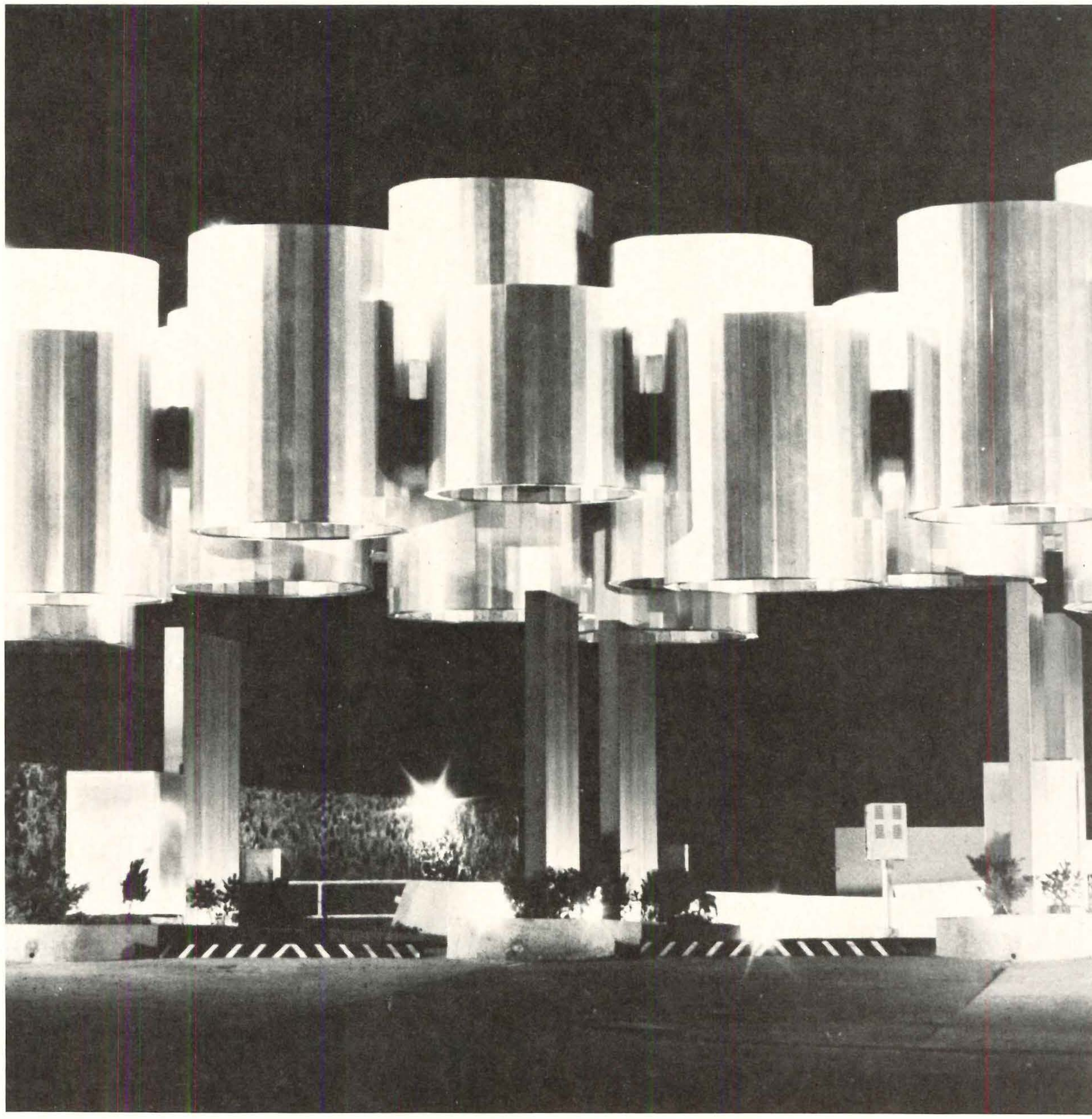






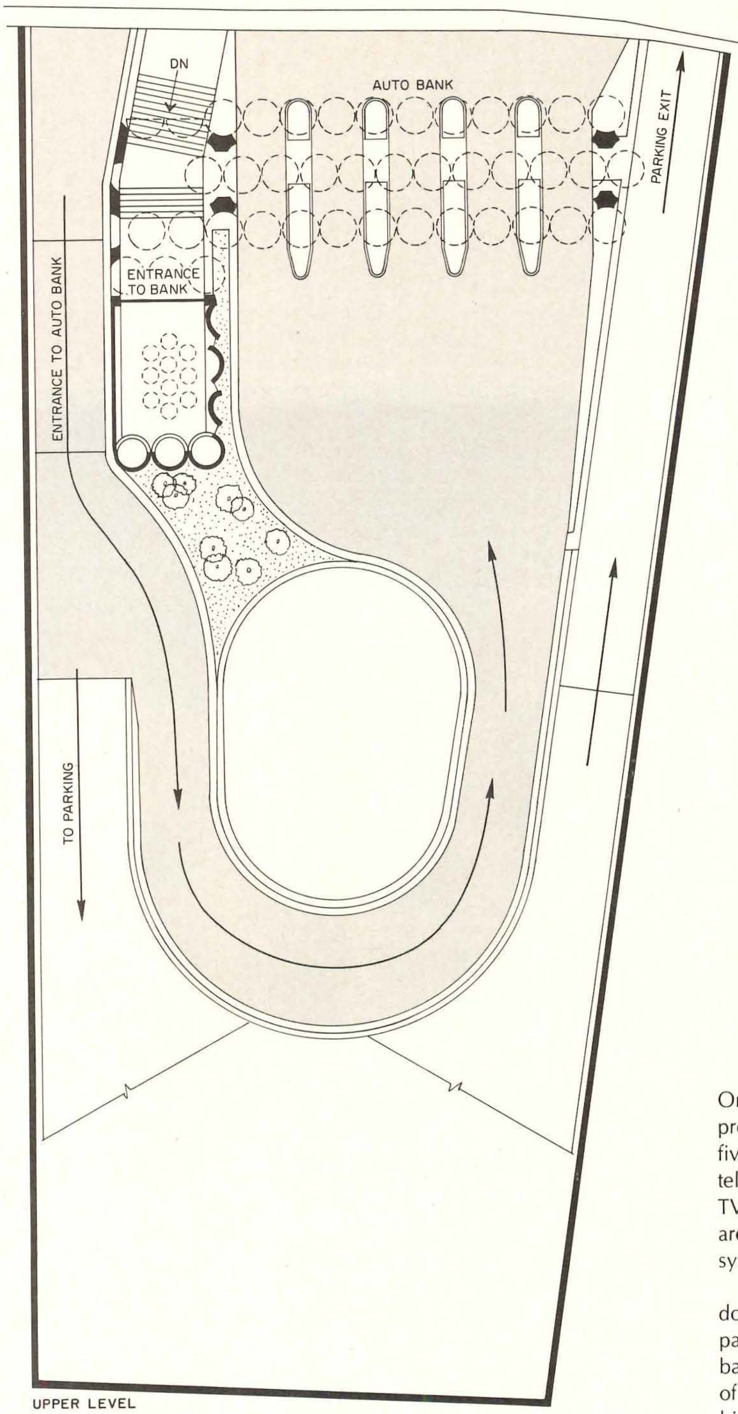
The living room of the guest house, two stories high, is shown, with its commanding views of the ocean, in the photographs at the left. A private bedroom and bath are seen on the left hand side of the bottom floor plan above; at the lower left hand corner is the "Pullman Car Room," with bunk beds for children.

BANCO NACIONAL DE MEXICO

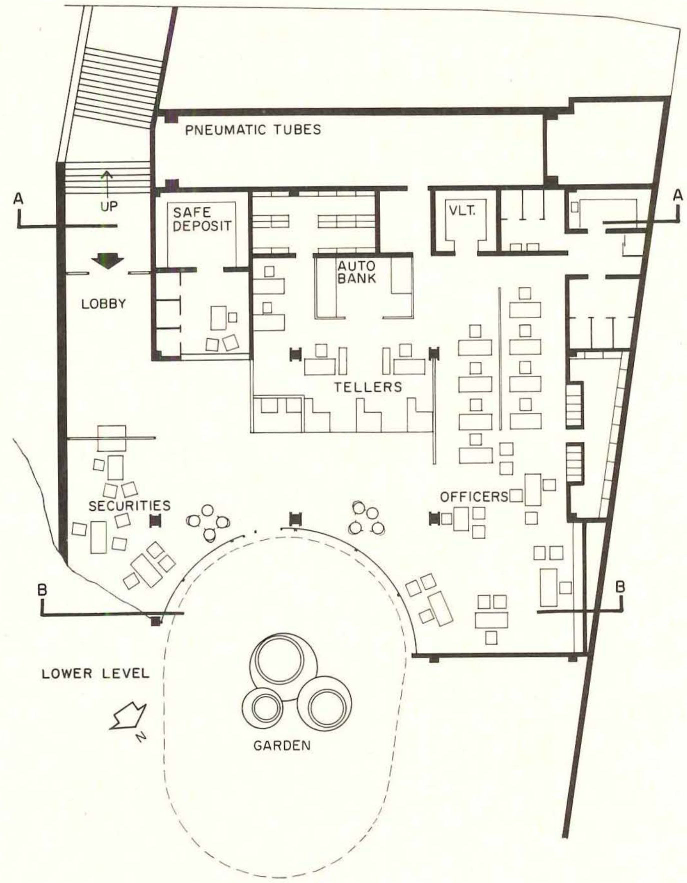


This branch of the Banco National de Mexico, designed by Jesus Enriquez Vega, is located in the *Jardines del Pedregal de San Angel*, a residential community just to the south of Mexico City. This site was once a lava flow and is now justly famous for its natural beauty and the vigor of its architecture. One interesting feature of the bank is that it is the first Mexican installation of this type of automated equipment—a marriage of telecommunications, pneumatics and the automobile. The marriage works well in the United States where many such installations are already in operation. Mexican bankers have, until now, been reluctant to employ the system. If it works well here, however, many similar installations will certainly follow.

Vega's accomplishment has been to graft an innovative banking process to a more traditional one. This he has done with skill, using forms that have Latin flavor, but retain a clarity and legibility that is a mark of good design everywhere.



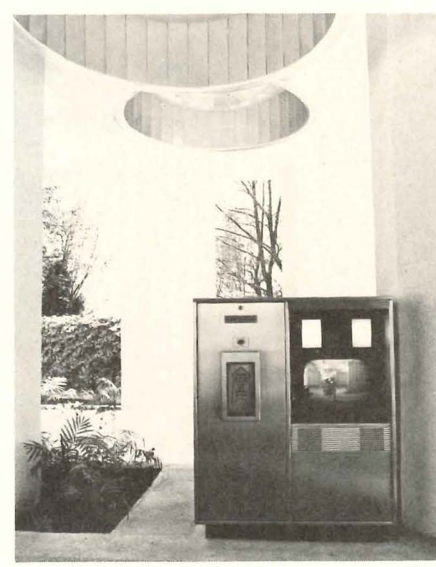
UPPER LEVEL

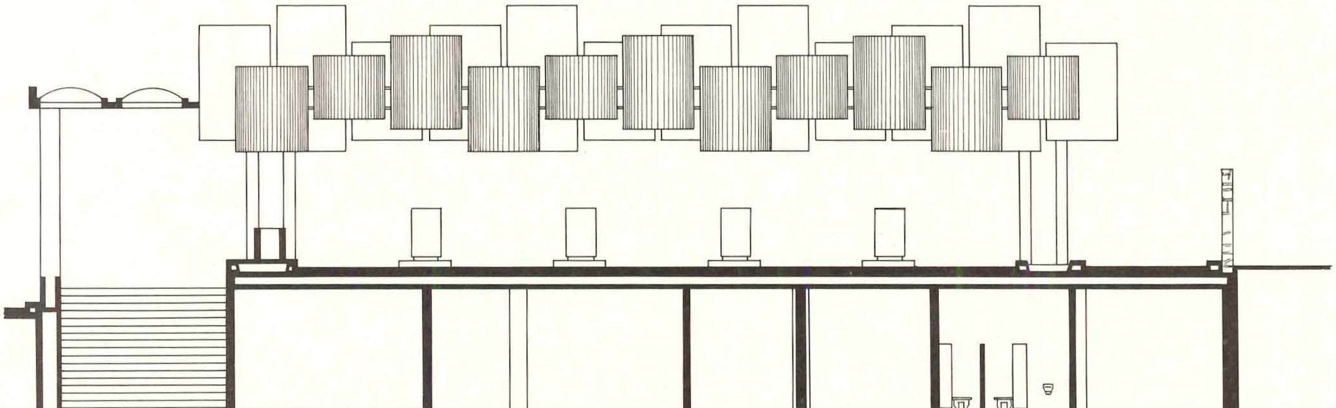


On the upper level, auto-customers proceed around the garden to one of five auto stations. Here driver and teller communicate by closed-circuit TV. Moneys, checks and deposit slips are exchanged vertically through a system of pneumatic tubes.

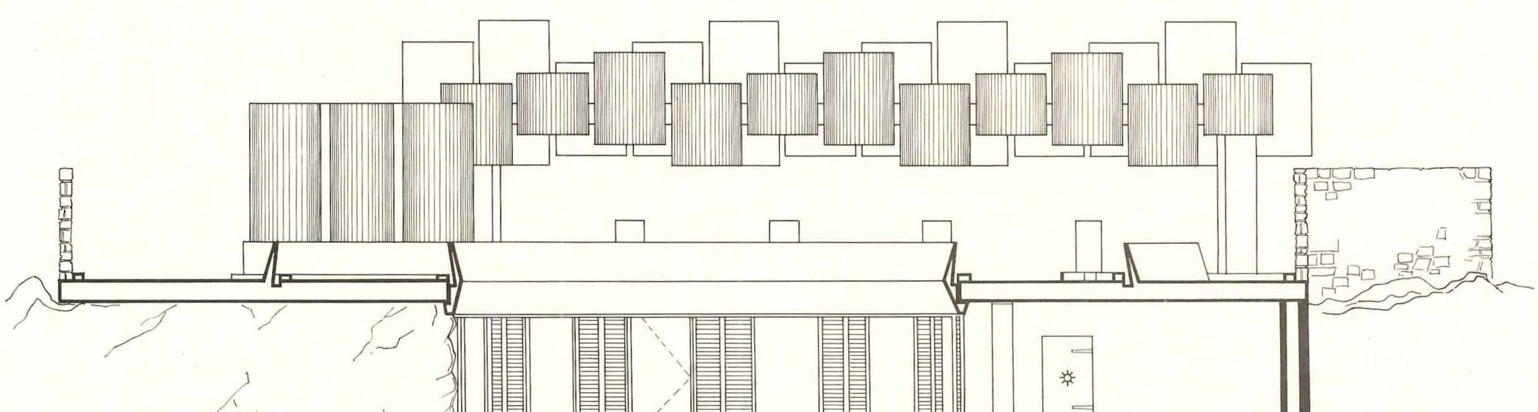
Customers who arrive by car but do not want to use the auto-teller, may park and proceed to the downstairs banking area on foot. Careful control of circulation keeps pedestrian and vehicular traffic apart.

Vega designed the canopy over the auto-teller stations as a series of cylindrical, aluminum drums symbolically expressing automobile pistons in motion. Each drum is fitted at the top with a tinted acrylic dome that controls the light level in the area of the TV receivers below.

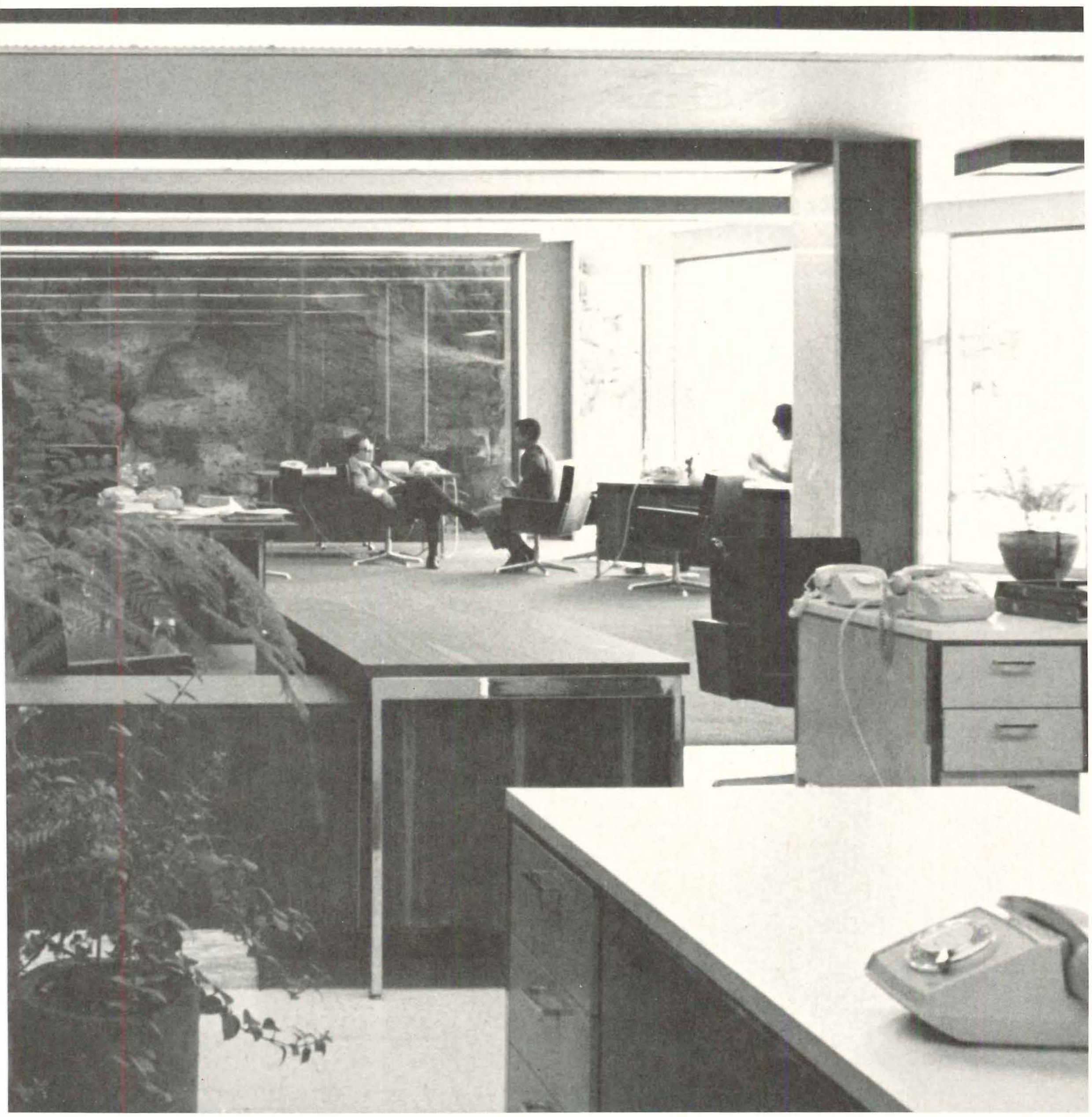




SECTION A-A



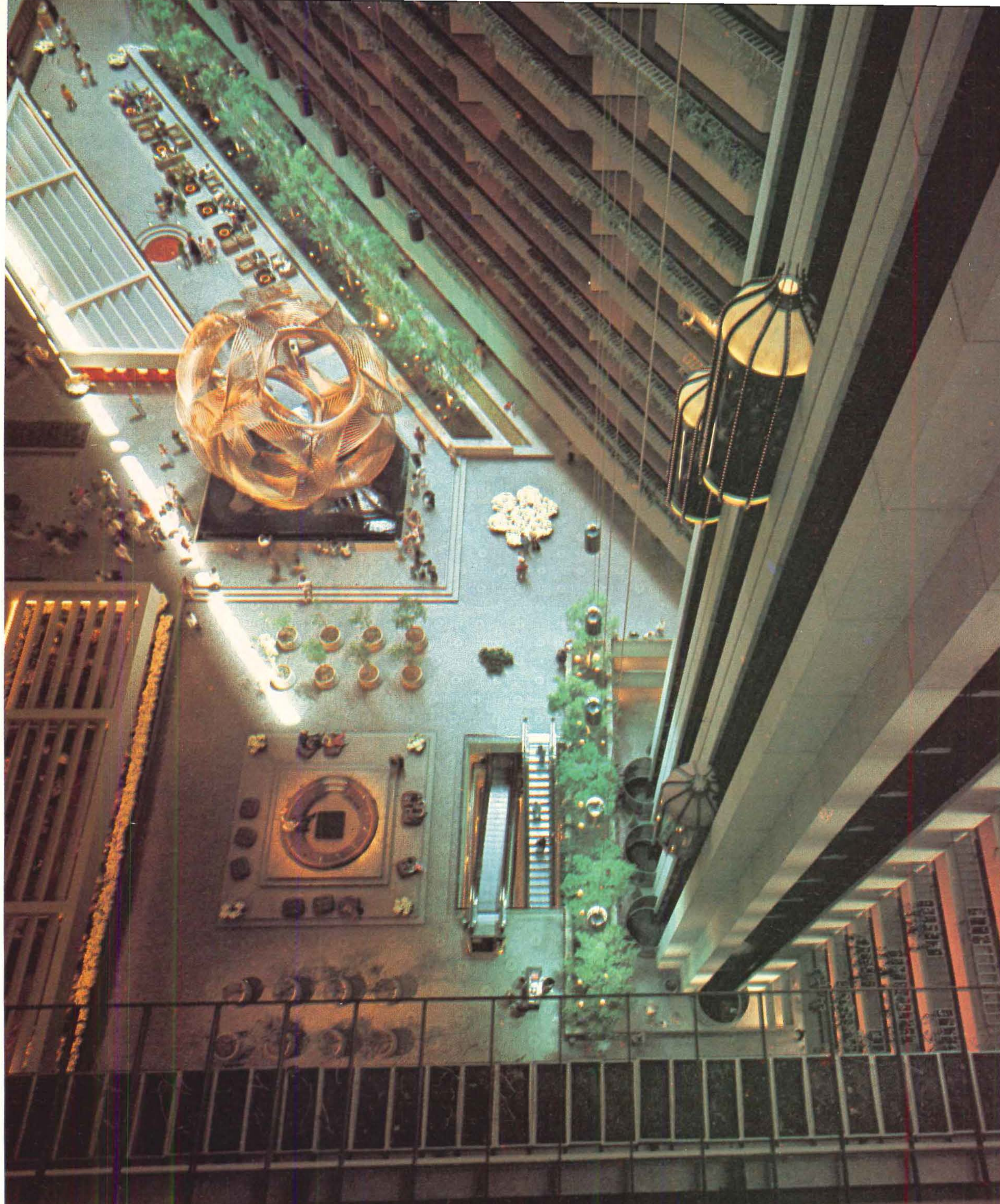
SECTION B-B



The bank's lower level contains a fairly orthodox banking operation except that tellers face a curved glass wall through which they look into a beautifully landscaped rock garden—a garden that makes liberal use of the region's natural volcanic stone. Customers, arriving from the street, descend to this level by a stair that issues directly through a vestibule into the banking space.

Other construction and finish materials include: concrete for the basic structure, marble and carpeting for floors, and aluminum for fittings and window sash. Costs for this handsome building, including landscaping, were approximately $340,000.

BRANCH, BANCO NACIONAL DE MEXICO, Mexico City, D. F. Architect and landscape architect: *Jesus Enriquez Vega.* Engineers: *Departamento de Proyectos Banco Nacional de Mexico.* Contractor: *Estructuras y Cimentaciones, S. A.*



All photos Alexandre Georges except as noted

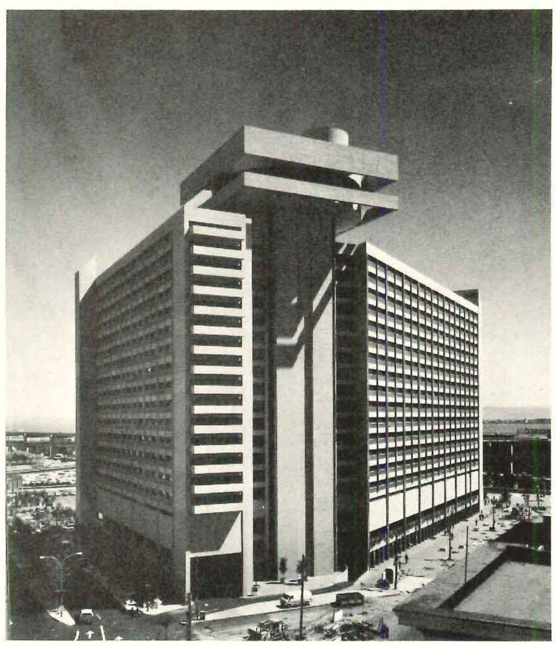
Dramatic space for a new hotel in San Francisco

The dramatic space pictured above is the eye-dazzling 17-story lobby of the new Hyatt Regency San Francisco hotel for which John Portman & Associates were architects. In a city where great interior spaces are something of a tradition and have been surprising and delighting people for half a century and more, this unusual, exciting and largest space updates such justly famous earlier examples as the Palace Hotel's Garden Court, the rotunda of the City Hall, the crystalline lobby of the Crown Zellerbach Building and the court of the old City of Paris store. There is no question that John Portman succeeded in making the "people space" he intended: people throng to it, in obvious enjoyment of its effect on them. —*Elizabeth Kendall Thompson*

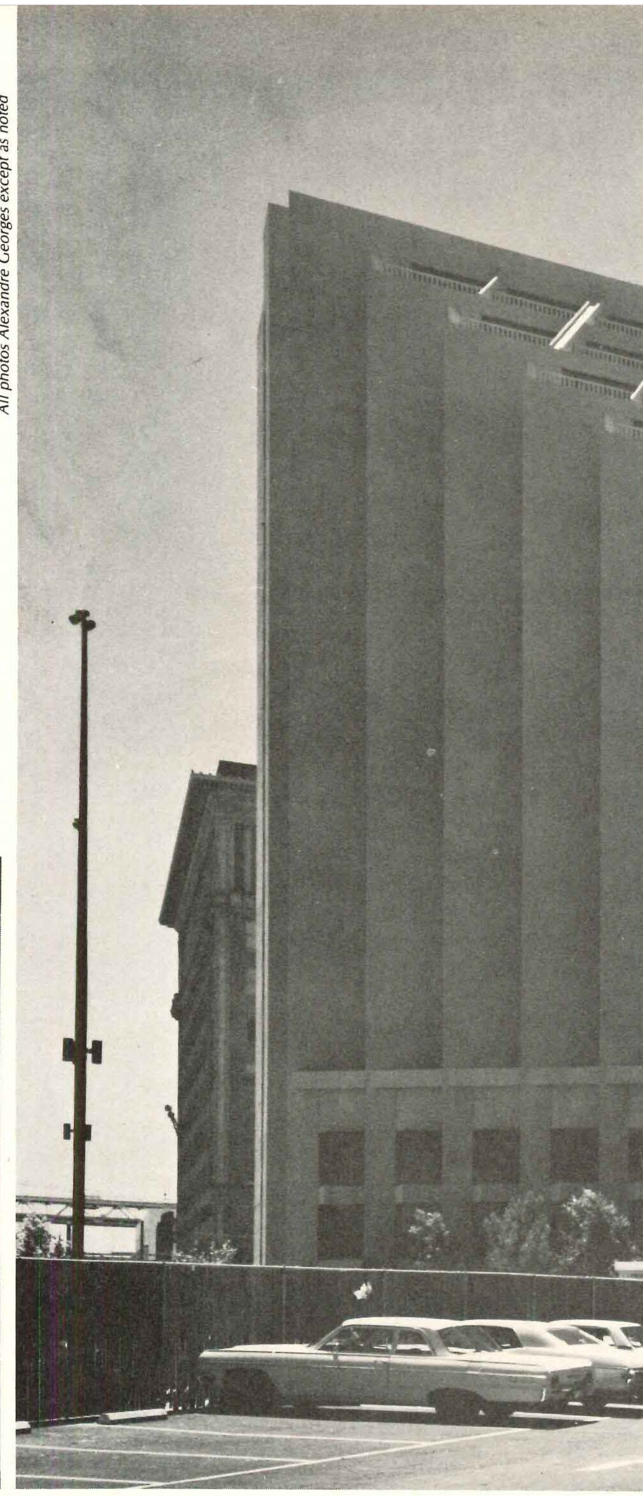
When plans for development of the commercial parcel of the Golden Gateway Redevelopment Area along San Francisco's waterfront were announced in 1967, only one aspect of the plan was uncontested and uncriticized: the design for the hotel which was to be a part of the office building-shop complex. True, there was discussion of the building's orientation to the north, and the suggestion was made that it might more appropriately occupy the proposed site of the fourth office building but, by and large, the hotel design proposal was taken as a happy one and was agreeable to all, including local design professionals. Now that the hotel is complete and in use, and there is no disputing the correctness of that 1967 appraisal and acceptance; it is a smashing success.

The hotel—the Hyatt Regency San Francisco—is one of five buildings in Embarcadero Center, the last parcel to be sold in the fabulous Golden Gateway Redevelopment Project. The site cost its developers—David Rockefeller and Associates, Trammell Crow, PIC Realty Corporation and architect John Portman, Jr.—$11.5 million in 1966, a high price then even though the site was unique. The sale was conditioned on acceptance of certain requirements of the Redevelopment Agency; that the development include only commercial facilities; that it accept and work with the already established concept of buildings rising from a two-story base topped by a landscaped plaza; that the developer provide a ground level site for recreational-cultural uses; and that one per cent of construction costs be allocated for works of art on public view. The developers, too, made conditions: Their design proposal exceeded by far the 23-story height limit set by the Agency (in line with existing city policy). No one had expected either such height (one building was to be 60 stories high) or such density. To permit the project, the Agency had to alter its criteria, and it did. The first building was a 46-story office building; the 20-story hotel followed; a 31-story office building is underway.

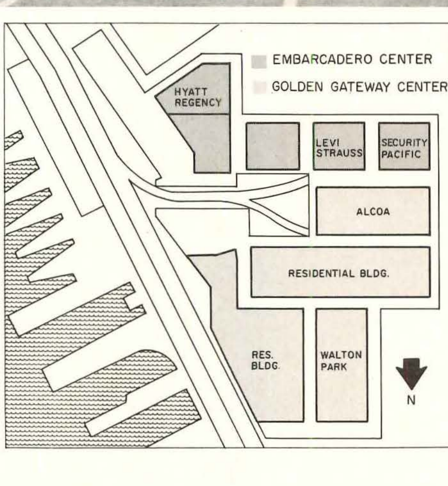
The hotel is an extraordinary building. Two of its sides rise conventionally from the streets they abut. The north face, however, slopes back at a 45 degree angle and on the bias, giving the building wall an unusual dynamic effect which varies with the light and the view point.

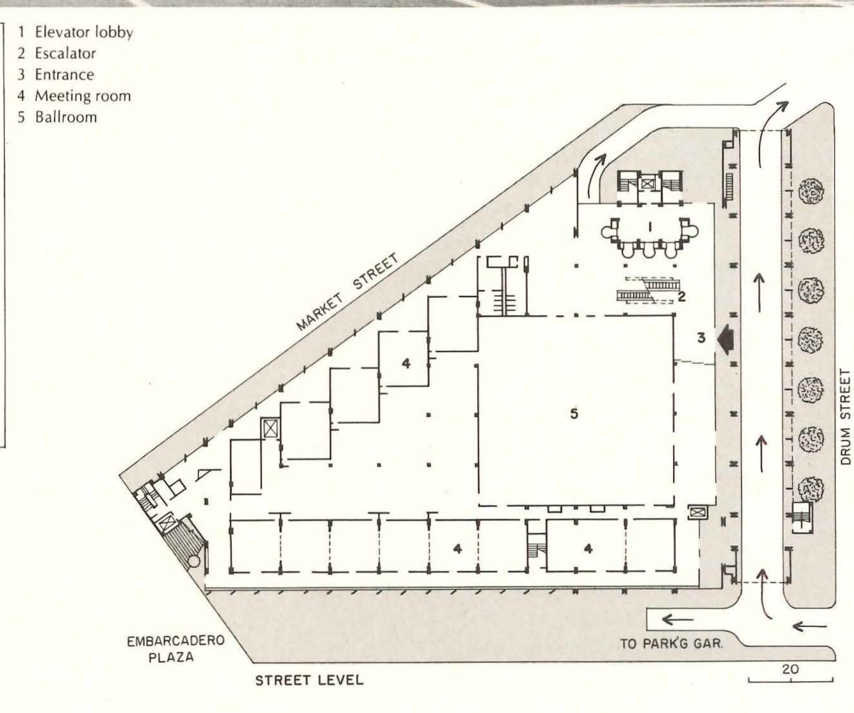


All photos Alexandre Georges except as noted



Joshua Freiwald



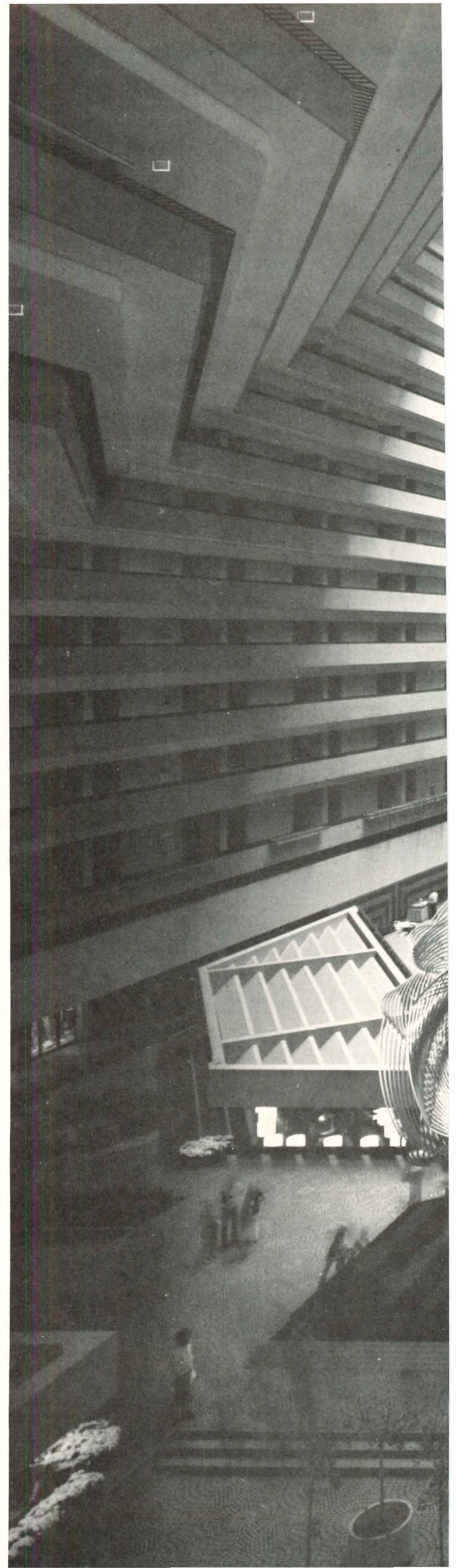


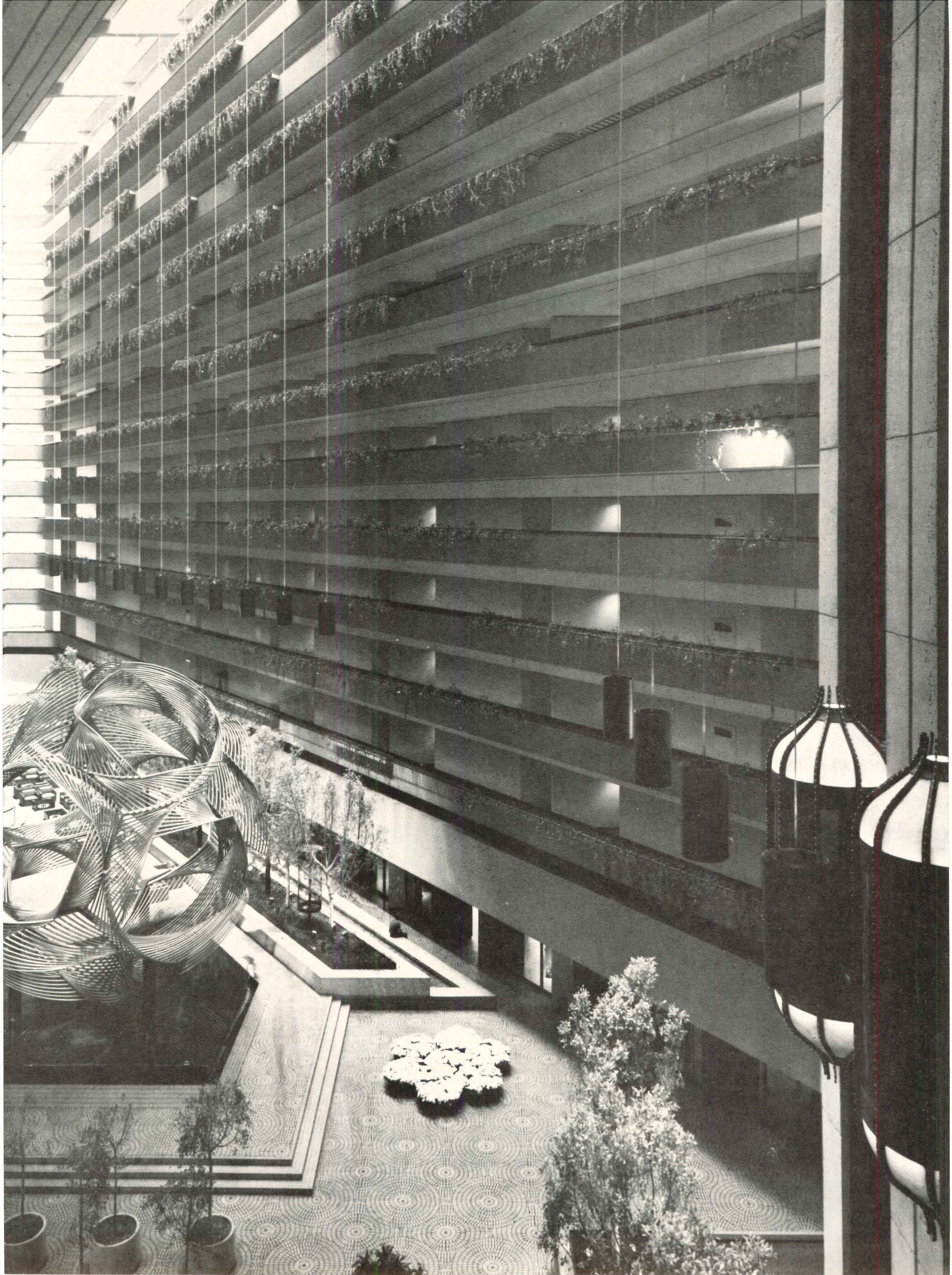
The hotel's unique site—adjacent to a newly created plaza, near the landmark Ferry Building (far left of photo at left), and at the foot of the city's main thoroughfare, Market Street—is part of the Golden Gateway Redevelopment Area. A porte cochere along the Drumm Street side provides the principal entrance to the hotel.

The building's exterior, however, is only prelude to the spectacular space inside, 17 stories high, daylighted by a narrow skylight, molded and modulated by the planes which enclose it, perpendicular on one side, sharply angled on the other. The asymmetry of this great volume of space and the reverse-ziggurat effect of its projecting balconies creates an exciting, dramatic and tantalizing effect. The focal point for this stupendous space, the cynosure without which it would not be complete, is a great hollow sphere standing on three massive legs in a pool of quiet water, curved tubes of gold anodized aluminum making a web of intersecting pentagons, stacked and rotated about a central axis. Enigmatic, arresting, endlessly fascinating, this masterpiece by former San Francisco architect (now a sculptor in Rome) Charles O. Perry brings the whole interior into scale. It is 40 feet high, 35 feet in diameter. Anything smaller would have been lost in the vast space. Anything less open than this golden maze would have made the space mundane. Sculpture and building complement each other with rare affinity.

One does not become aware of this great space gradually. The sudden surprise of the first view of it was carefully planned; whether by elevator or by escalator from the street level entrance, the arriving guest turns unsuspecting toward the light and is overwhelmed by what he sees. The sheer volume of the lobby is breathtaking; and then the variety of more tangible amenities asserts itself. Trees, shrubs, flowers, water; the patterned paving on the floor; unusual places to sit; small changes in floor level—this is not barrier-free design; the handicapped may view but would find it difficult to use this lobby; the trellis "roofs" over the restaurants and lounges: all these bring the awesome dimensions into human proportions and make it—as John Portman, the architect and the developer, intended—a place for people. People are always there, doing all the things the lobby asks them to do. Guests get changing perspectives of the lobby as they use the exposed glass-cage elevators and walk along the balconies to their rooms. Once in their rooms, those lucky enough to be on the north side have terraced balconies from which to view the new Embarcadero Plaza and the Bay beyond.

Joshua Freiwald





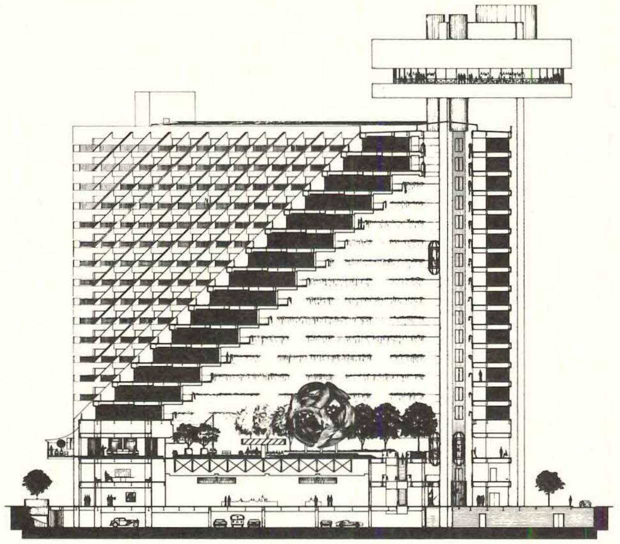
REGENCY HYATT SAN FRANCISCO

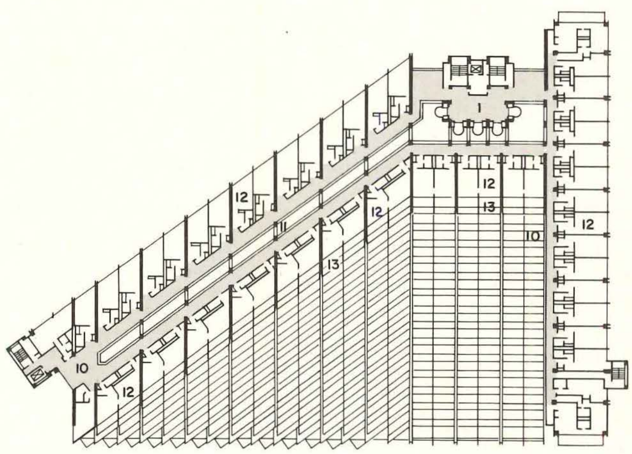
Other Portman-designed hotels (in Atlanta and Chicago) have had atrium lobbies, but not with the asymetrical configuration of the San Francisco hotel—"a geometric nightmare," structural engineer Stanley Steinberg calls it. He designed it as a series of modified A-frames connected at the top, so apparently simple it seems more dream than nightmare, indistinguishable from the architecture but maintaining its structural integrity. He also had to contend with exceptional foundation problems, since the site was once part of the Bay and has an unusually high water table. The building rests on a concrete mat on prestressed concrete piles.

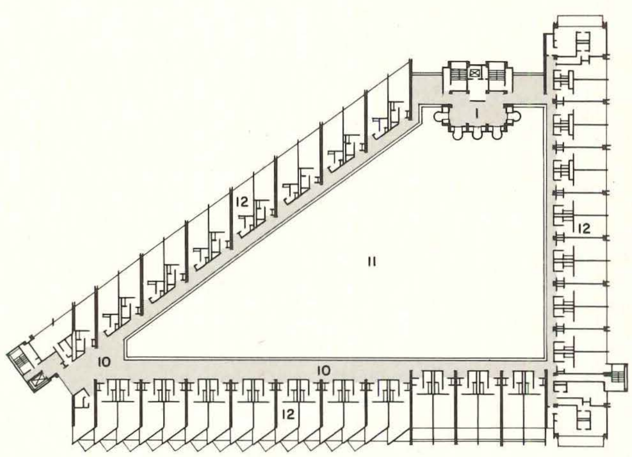
The huge lobby—it is 170 feet high by 170 feet wide, and 300 feet long—was not without other problems, after the structural solution was assured. To reconcile the atrium concept with city and state fire laws, architects and engineers worked very closely with San Francisco building department officials from the beginning, especially with engineers Robert Levy and Alfred Goldberg who, while they "gave nothing," as Steinberg says, helped to work out "equivalent safety" measures to make the design acceptable. The building is fully sprinklered; there is an early alarm system; a smoke exhaust system is located directly under the skylight; and two smoke towers—one at each end of the building—are provided. Furthermore, because the corridors are open to view, any room fire would be detectable much sooner, says Steinberg, than in the usual hotel corridor.

Designed primarily for conventions, the 840-room hotel works for other functions as well. Its ballroom on the street level can be independently entered, and its meeting rooms, pleasantly ranged on the perimeter of the lower floors, can also be used without entering the lobby. Three entrances serve the hotel, on the west, east and south sides.

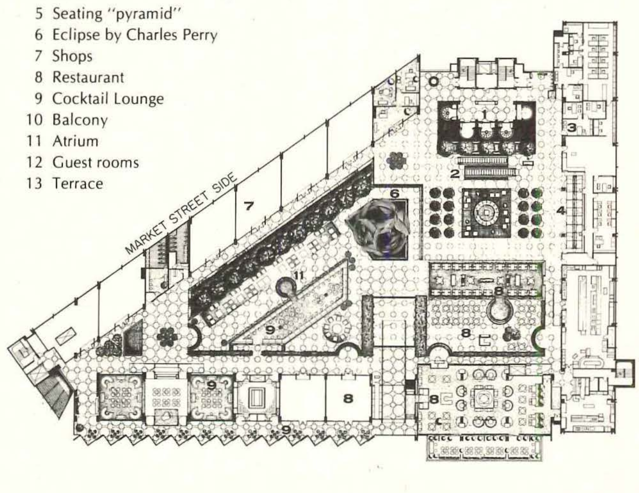
HYATT REGENCY SAN FRANCISCO, San Francisco, California. Architect: *John Portman & Associates—John Portman, Jr., architect in charge.* Engineers: *John Portman & Associates* (structural), *Harding Miller Lawson & Associates* (soils), *Britt Alderman, Jr. & Associates* (mechanical), *Morris E. Harrison & Associates* (electrical). Consultants: *John Blume* (static and seismic analyst), *William Lam* (lighting), *John Portman & Associates* (interiors, public spaces; graphics), *Elster's* (guest rooms; kitchens). General contractor: *Jones-Allen-Dillingham.*





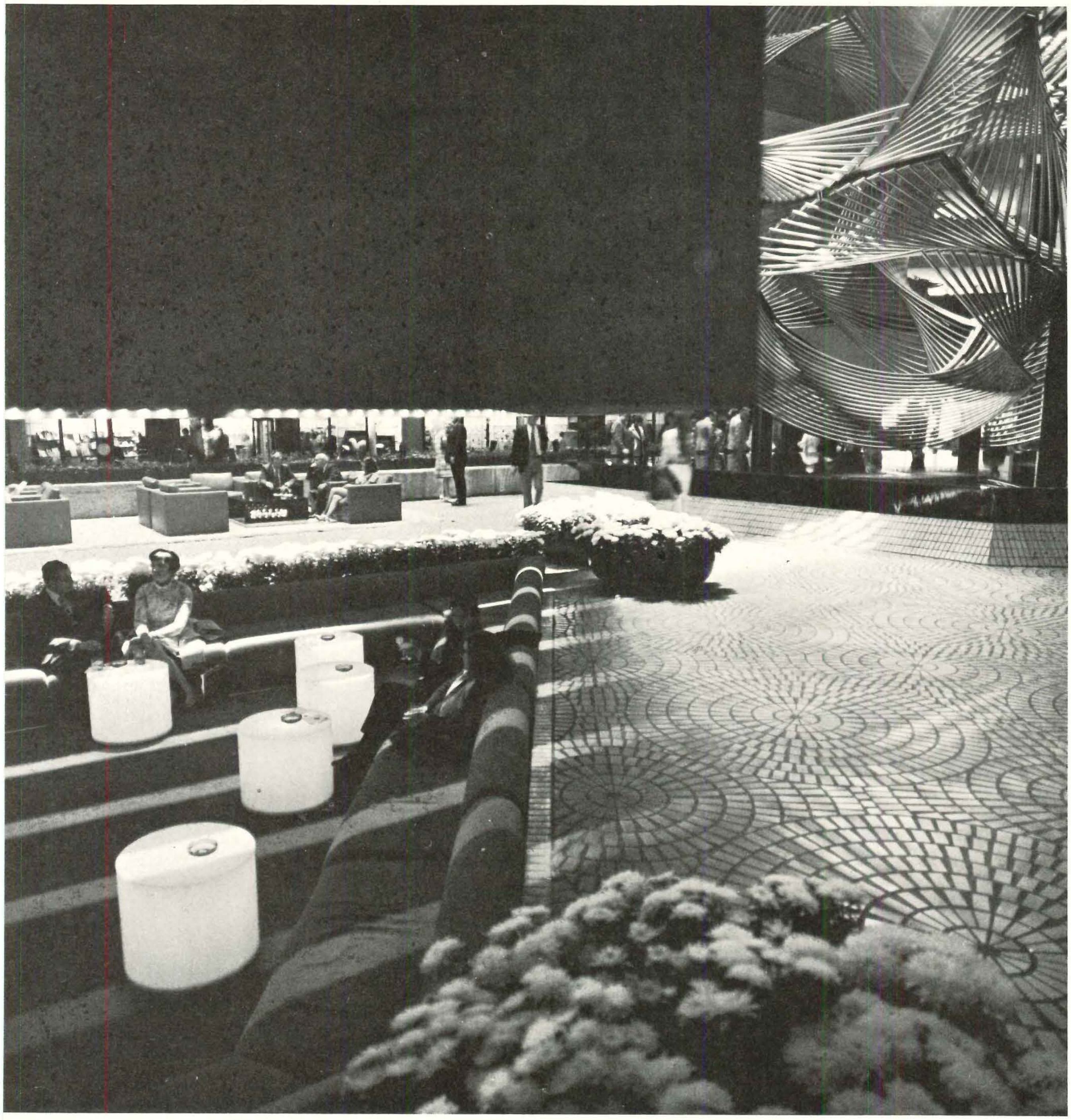


1 Elevator Lobby
2 Escalator
3 Offices
4 Desk
5 Seating "pyramid"
6 Eclipse by Charles Perry
7 Shops
8 Restaurant
9 Cocktail Lounge
10 Balcony
11 Atrium
12 Guest rooms
13 Terrace



Joshua Freiwald

Joshua Freiwald



There are six restaurants and cocktail lounges on the lobby level, three of them situated in the main line of traffic through the lobby mall or in the circulation pattern around the mall. These eating and drinking places are like sidewalk cafes—part of the Portman premise that the lobby is designed for people. The "Other Trellis" is an eyecatching sunken lounge, open to view of and from the mall, in which translucent tables, illuminated from within, contrast with brilliant red carpet and upholstery. Three other cocktail lounges open off the lobby, one of which "13 Views" (left)—faces the Embarcadero Plaza and its controversial fountain. This lounge consists of 13 glass enclosed bays, each with table and chairs. Opposite these bays are shops and a nightclub.

Client supports region-wide study of hospital obsolescence prior to design of Emanuel Hospital in Portland

HOSPITALS

Kaplan and McLaughlin, San Francisco architects and planners, have frequently engaged in extra-service studies of background, when new commissions have introduced problems about which little consensus of solution exists. These studies range in context from the inner-city studies in connection with the Martin Luther King housing development, through the psychiatric and post-design studies in connection with various community mental health centers, and the studies of optimum hospital room and nursing unit configurations (RECORD, March, 1970).

It was perhaps this history of research that led Paul Hanson, president of Emanuel Hospital, to encourage the Kaplan and McLaughlin firm, with some financial support, to make a detailed study of available materials handling systems and to complete a study of the actual history of physical change in various departments of six existing hospitals over a 21-year period from 1950 to 1971. This was preamble to full-scale expansion of Emanuel facilities.

The architects' interest and considerable outlay was not only to research the Emanuel hospital project, but also to resolve basic questions of rational investment in long-term physical and functional flexibility in hospital design in general. It was their view that debates regarding the merits of interstitial space, long-span construction, in-built automation and modular concepts of various dimensions—although highly vocal and sometimes emotional—have seldom gained statistical or arithmetical analysis in support of any pro or con position.

Herbert McLaughlin himself has voiced misgivings about the effectiveness of interstitial space in terms of value received. Also he has postulated in various published accounts that design to facilitate future internal remodeling (i.e., design of long-span loft space) has never been demonstrated as superior (in terms of owners' real needs) to design for addition with long-range plans for programmed demolition.

Architects gather facts about obsolescence and hospital design

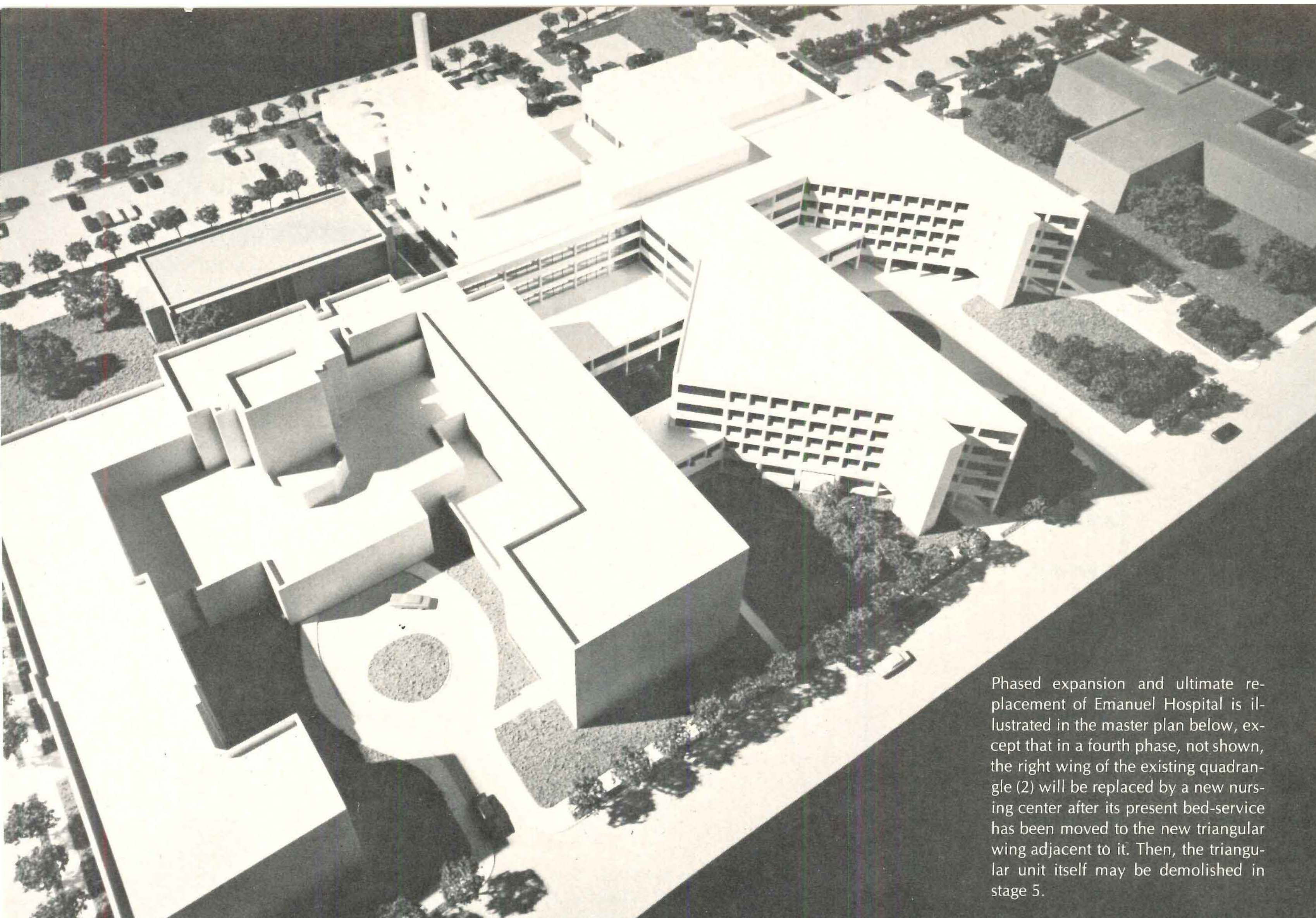
The study that acquired the name "Obsolescence Study" was really a two-part effort. First was the assembly of facts regarding actual changes, department by department, in six comparable hospitals. Second, was a comment on the character of the demand for change as it affects principles of hospital planning for greatest economy and highest long-term efficiency. Herbert McLaughlin and John Kibre (of K&M) and Mort Raphael (consultant of Francouer and Company) say in their report of the study: "There is perhaps greater safety in reporting data alone, but it is our belief that research is most useful when it is directly applied to the solution of everyday problems. The purpose of this study is to give individual hospitals particular principles with which to design for change."

The degree of change reported for the six hospitals was generally classified as either remodeling or addition. Maintenance changes, defined as replacement of an item without functional alteration, were not statistically recorded. Remodeling was in turn divided into three degrees: 1) amenity improvement, such as lighting or oxygen systems; 2) small area changes, such as subdividing spaces or altering nursing stations; 3) large area remodeling. Additions also were at two levels: 1) minor, up to about 2,500 sq ft; and 2) major, more than 2,500 sq ft. The classification system, departments studied and record of changes are apparent in the table next page.

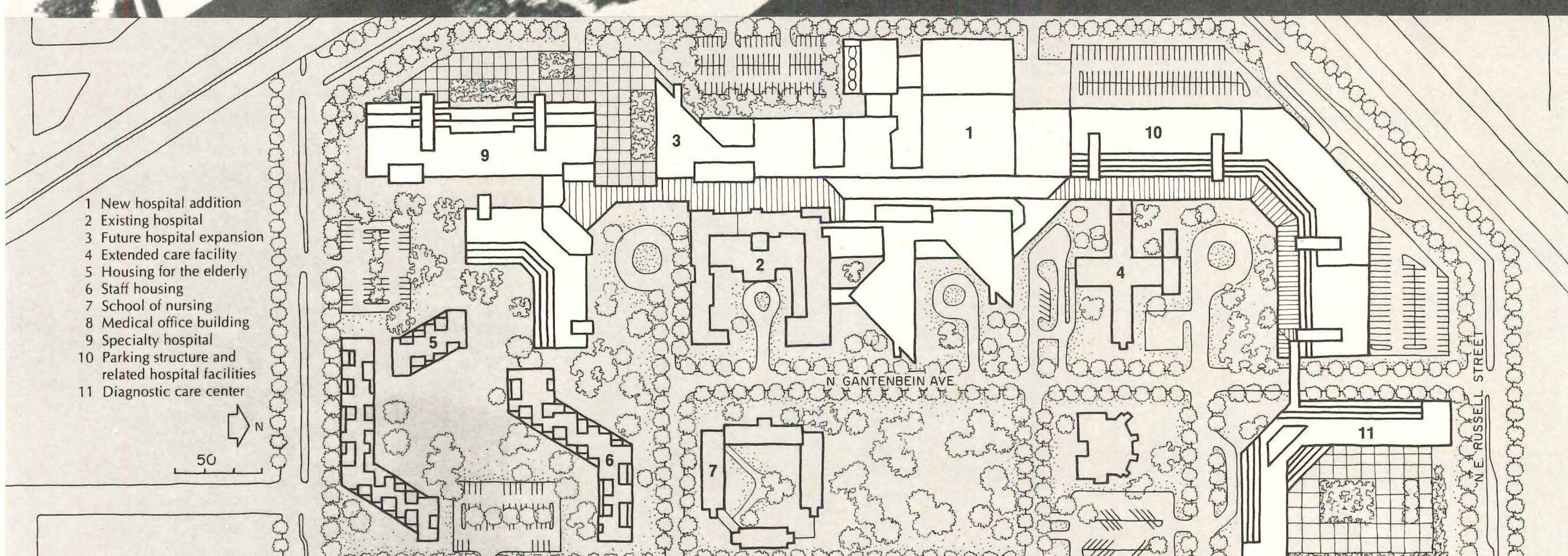
By statistical conversion of findings to a hypothetical mean hospital, the frequencies of change in each department can be related to average experience during a mean 17-year period (i.e., the total life span of all studied hospitals from 1950 to 1971 divided by 6). By this method a frequency for each department is developed in terms of expected changes per year. Nursing service changes were most frequent and average at least one change of some degree every 1.2 years. These changes apply to all degrees of remodeling or addition in the entire nursing srevice block. Considering bedspaces of nursing units separately, the approximate frequency of internal remodeling is only one change every 10 to 12 years. Other departments show the following frequencies: surgery, one change every 2.6 years; radiology, one every 3.8 years; laboratory, one every 4.0 years; and emergency, one every 6.9 years.

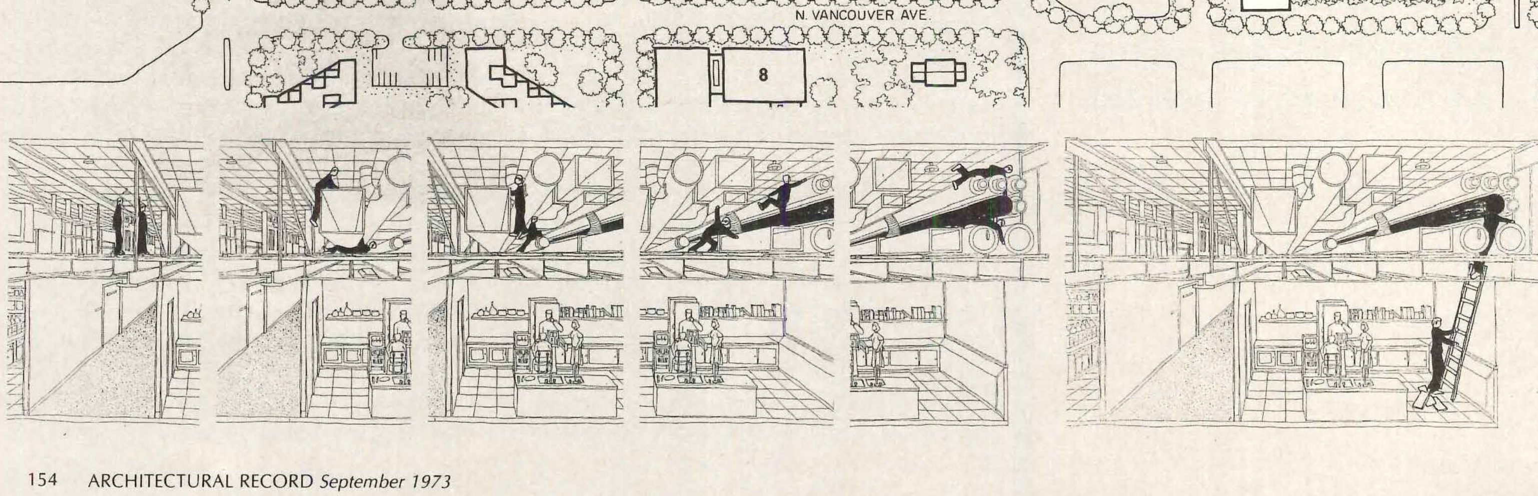
Details of the 59-page report are beyond the scope of this presentation. The authors do, indeed, penetrate beyond the numbers into the reasons behind them. Significant are their considerations of the internal factors affecting owners' decisions to change at all. These include the management methods of handling the demands for change, the presence or absence of a master plan, and effects of financing methods.

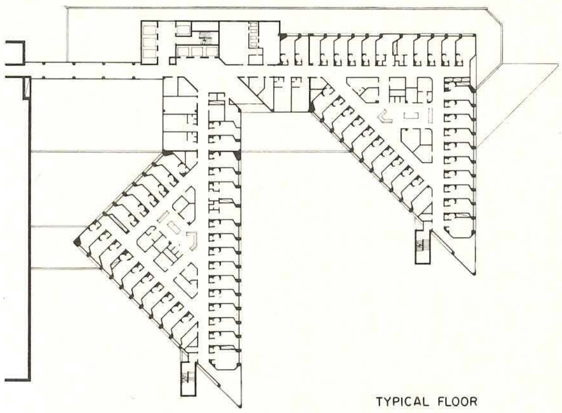
For example, political ownership, proprietary ownership and non-profit private ownership were all represented among the financing methods. This introduces differences in the responsiveness of the owner to a developing need. Where publicly voted bonds are the financing method, for example, there is reluctance to go to the voters too often for funds. This can result in both overbuilding and underbuilding depending on whether hospital officials have over-anticipated needs on the princi-



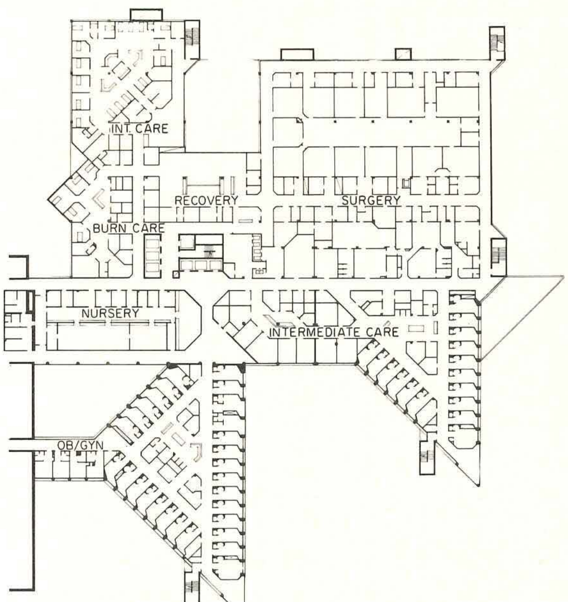
Phased expansion and ultimate replacement of Emanuel Hospital is illustrated in the master plan below, except that in a fourth phase, not shown, the right wing of the existing quadrangle (2) will be replaced by a new nursing center after its present bed-service has been moved to the new triangular wing adjacent to it. Then, the triangular unit itself may be demolished in stage 5.



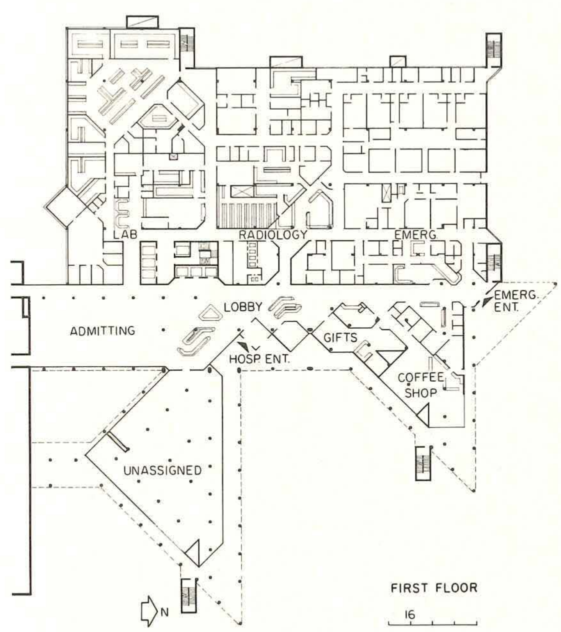




TYPICAL FLOOR



SECOND FLOOR



FIRST FLOOR

The triangular nursing unit concept was developed through studies for St. Mark's Hospital shown on the following pages and reported previously in RECORD, March 1970. Cartoons left satirize the journey of custodians through interstitial space compared with direct access through ceiling panels.

	NURSING SERVICE*					SURGERY					RADIOLOGY					LAB					EMERGENCY				
	REMODEL			ADD.		REMODEL			ADD.		REMODEL			ADD.		REMODEL			ADD.		REMODEL			ADD.	
	OVERALL AMENITY	SMALL AREA	LARGE AREA	MINOR ADDITION	MAJOR ADDITION	OVERALL AMENITY	SMALL AREA	LARGE AREA	MINOR ADDITION	MAJOR ADDITION	OVERALL AMENITY	SMALL AREA	LARGE AREA	MINOR ADDITION	MAJOR ADDITION	OVERALL AMENITY	SMALL AREA	LARGE AREA	MINOR ADDITION	MAJOR ADDITION	OVERALL AMENITY	SMALL AREA	LARGE AREA	MINOR ADDITION	MAJOR ADDITION
HOSPITAL 01	1	9	1		2	2	2		1	1	1	4	1		1		4	1		2			2		1
HOSPITAL 02	1	1		1	2		1					2					1							1	
HOSPITAL 03	2	9	4		3	2	5		1	1		2	2	1	1		2	1		1				1	2
HOSPITAL 04		12	1	1	3		5			1		4		1	1		2			1					
HOSPITAL 05	6	9	2		2	2	6			2		2						2			1	4			
HOSPITAL 06	1	8			4		6			2		2			2	2	5		1	1		2		1	
PERCENT	13	56	10	2	19	15	62		5	18	4	59	11	7	19	8	54	15	4	19	7	40	13	20	20
TOTAL	11	48	8	2	16	6	25		2	7	1	16	3	2	5	2	14	4	1	5	1	6	2	3	3

ple of "get it while you can," or have under-stated needs to improve the chances of "half a loaf." The effects of the modes of financing can be rationalized and are spelled out in the report.

Another important factor is the impact of past design on both the need for change and the ability to change. None of the hospitals studied had a master plan taking into account the actual growth factors of a changing technology. Most such plans were simple extrapolations of existing configurations, and the real-life shifting of ratios of support spaces per bed were not taken into account.

Common faults of existing plans included: absence of expansible vertical circulation, land-locked departments with no space to expand into, unforeseen emergence of specialty care requirements, etc.

Translation of the pre-design studies into programmed expansion of the Emanuel facility is covered in the following statement by Herbert McLaughlin: "Our specific experience at Emanuel in difficulties in the existing plant confirmed the findings of the Obsolescence Study, as did our review of five other hospitals on which we had worked but which were not a part of the six-hospital sample for the study.

"Briefly, significant plant planning problems at Emanuel have revolved around the facts that: 1) Facilities and layout of nursing units, even those constructed in the late 50's, are almost totally obsolete. Renovation is prohibitively expensive and also disruptive of the ongoing operation and economy of the hospital. Remodeling of the nursing units is further complicated by the fact that new codes apply in these areas and are retroactively enforced in some instances. The ideal solution for these nursing units is abandonment, since bringing them up to contemporary standards is not only expensive but reduces the number of patients per unit, and therefore, their operational efficiency. Adding on directly to the units in the hope of holding the number of beds constant while adding to the number of square feet per bed is difficult or sometimes impossible. The only reasonable solution is the construction of totally new units.

"2) Other departments reflect the findings of our Obsolescence Study as well. The Laboratory has seen incredible increases in workload. Space requirements have also grown but expansion has been practical, although not ideal, in space not directly adjacent to the main lab. Generally speaking, changes of lab space have been minor, generally involving new equipment, casework and clerical space, etc. Plumbing and HVAC, the theoretical bugaboos of lab remodeling, have not been much affected by change. Our expansion plan does call for a new consolidated lab which is planned to allow expansion on a room-by-room basis.

"Radiology has undergone continual renovation, generally through acquisition of adjacent spaces. Now, however, the spaces for acquisition by radiology have disappeared on the first floor.

"Changes in surgery have been difficult due to the problems of disruption but have occurred and could continue to occur in the future. Here again, the demand has been for small increments of space.

"Emanuel is virtually a case study for the Obsolescence Study. The plan (opposite) shows in simplified form how we propose that Emanuel will grow and replace itself over the years. Note that we schedule some existing nursing units (right wing of the existing quadrangle built in the 60's) for demolition in Stage 4 of development. We would, however, anticipate that they would be downgraded in use to administrative functions well before that time. The concept of replacement is a vital one.

"In many instances the addition of beds through vertical expansion is undesirable due to cost and the necessity of sticking with an old shape unit which may well be outdated.

"Even when horizontal expansion is projected, plans should call for demolition and replacement of obsolete units once the full projected capacity has been reached. Time and again in actual experience we have been faced with the necessity to downgrade or demolish nursing units."

EMANUEL HOSPITAL, Portland, Oregon. Architects: *Kaplan and McLaughlin—project team: Herbert McLaughlin, James Diaz and Jeffrey Heller;* associated architects: *Newberry, Schuette & Associates.* Engineers: *Rose & Breedlove* (struct.); *Morrison, Funatake & Associates* (mech.); *Grant Kelley & Associates* (elec.).

New St. Mark's Hospital now complete and occupied in Salt Lake City is subject for continuing evaluation studies

The new St. Mark's Hospital in Salt Lake City—also designed by Kaplan and McLaughlin—brings together the results of study and innovation on the part of architects, consultants and owners over a long period of time. The architects' studies of nursing unit and room configurations resulting in the triangular nursing unit of predominantly single-bed rooms was described in the RECORD for March 1970. The active participation of hospital administrator T. J. Hartford, Jr. and his staff had initiated a study in depth of conditions developing at the older St. Mark's, founded more than a century ago in what is now an over-built section just north of the center of Salt Lake City. The studies, noting the drift of urban growth toward the south away from the constraints of the older site, prompted the decision to move the entire hospital to a new site central to the projected growth patterns now developing.

A small group of representatives of the architects, the client, and consultants isolated themselves in Bolinas, a California fishing village, and hammered out the major principles of the objectives of design relationships and growth objectives. The techniques of group encounter and gaming combined to permit a genuine analysis of innovative approaches. These were also described in the March 1970 article.

Basic to the design approach is the architect's contemplation of the hospital as a village of differentiated parts. The parallel relates to the nursing unit as residence, the supply systems as mercantile and the administrative areas as offices. This is not really a revolutionary concept, but it defines an attitude of approach that is convenient and understandable under the circumstances of the group encounter.

The design imperatives developed at Bolinas were: 1) that all major circulation corridors have an exterior view along one side or at the end; 2) that ceiling heights be varied as much as possible to accommodate the character of various spaces and their mechanical or functional demands; 3) to provide as many windows as possible for departments that traditionally are isolated or windowless such as surgery, delivery and radiology. Patient bedrooms also allow the patient to view both the outside and the corridor from the bed, and an unusual magnetic device permits the patient to shut the door from his bed by pressing a button.

Evaluation studies enlist university aid

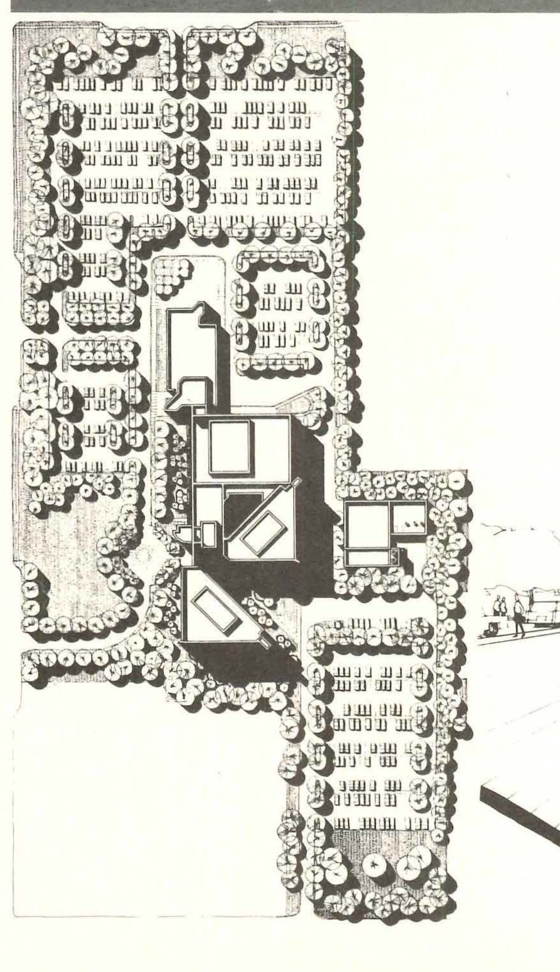
The University of Utah fosters a uniquely close relationship between the Department of Architecture and the Department of Psychology. A specific program of interdiscipline communication was initiated about 10 years ago by Roger Bailey, first chairman of the Department of Architecture, and Hardin Branch, then chairman of the Department of Psychiatry. Professor Bailey and Calvin W. Taylor, Professor of Psychology, subsequently joined forces as co-directors of a formal architectural psychology program which now continues under the directorship of Professor Taylor and offers graduate degrees in the combined disciplines.

The research orientation of the Kaplan and McLaughlin firm and the resources of the architectural psychology program, in terms of student interest and the broad background of Professor Taylor, fostered a well-defined program of evaluation of the St. Mark's project. The evaluation will occur in three phases: 1) prior to occupancy; 2) soon after occupancy; and 3) after three or four years of occupancy.

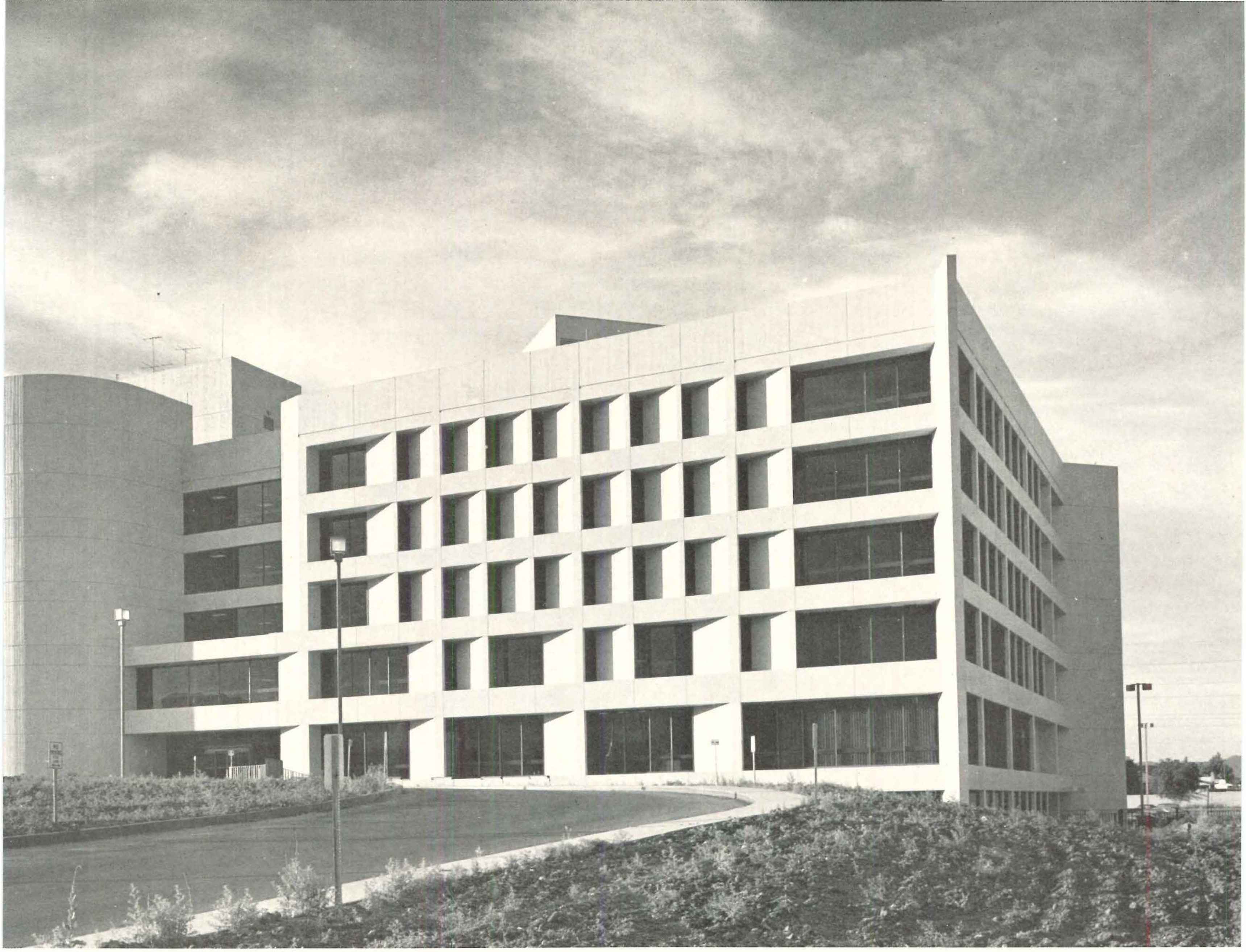
On May 4, 1973, an evaluation conference was held at the hospital only a few days prior to its opening. The conference was organized by Jim Diaz and Herb McLaughlin and attended by representatives of other architectural firms, administrators of St. Mark's, Emanuel and other hospitals, consultants, engineers, and interested government departments and, of course, Professor Calvin Taylor, together with several students who had already begun collecting data for evaluation of both the old hospital and the new St. Mark's.

Participants actually stayed overnight in patient beds (comfortably firm) and held their conference in the spacious lobby of the nursing floor.

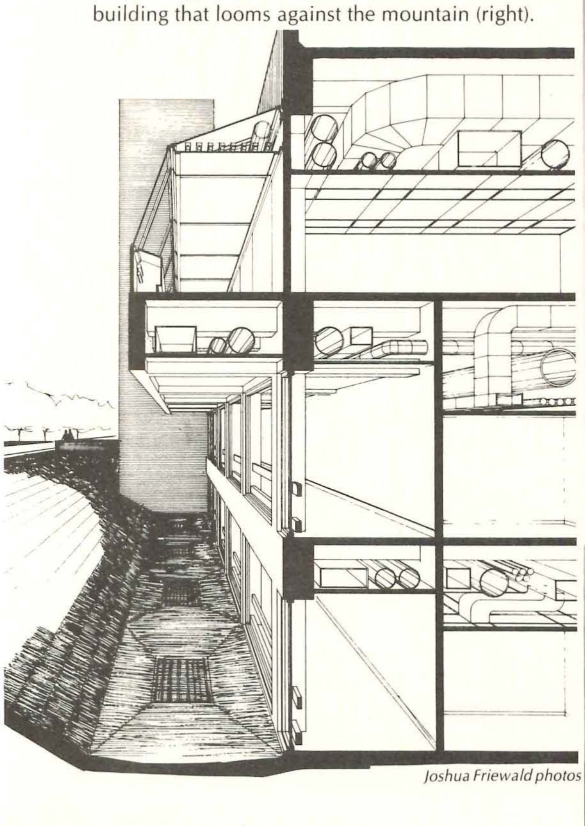
Highlight of the meeting was a series of reports by students on their interviews with hospital personnel, patients in the old hospital and visitors to both institutions. The architectural psychology discipline framed quite orderly approaches not only to recording of reactions to the environment in subjective terms, but also to anlaysis in planning terms of transportation both external and internal, and traffic patterns generated by both visitors and staff. It's early yet to report on these interviews in detail until they have been analyzed and continued through a report of early occupancy, but the fact of this research and its significance as an interdiscipline communication is notable.



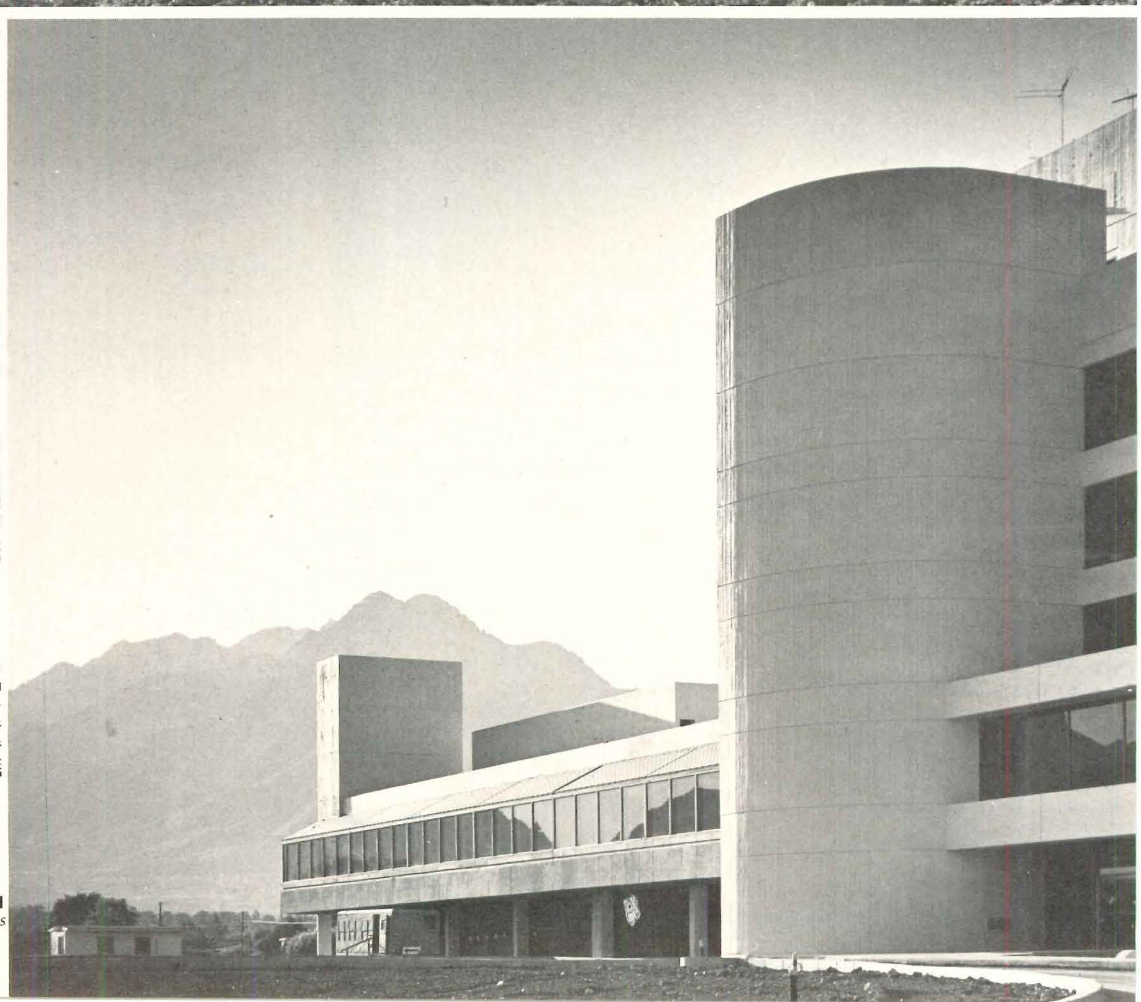
ST. MARK'S HOSPITAL, Salt Lake City, Utah. Architects: *Kaplan and McLaughlin—project team: Herbert McLaughlin, James Diaz and Roy Latke;* associated architects: *Snedaker, Budd & Watts;* consultants: *Medical Planning Associates;* interiors: *Marilyn H. Clansky;* graphics: *Joyce R. Heller.* Engineers: *H. C. Hughes, Page & Associates* (structural); *Bridgers & Paxton* (mechanical); *Uhl & Lopez* (electrical). Movable equipment: *Health Facilities Systems.* General contractor: *Tolboe Construction Co.*

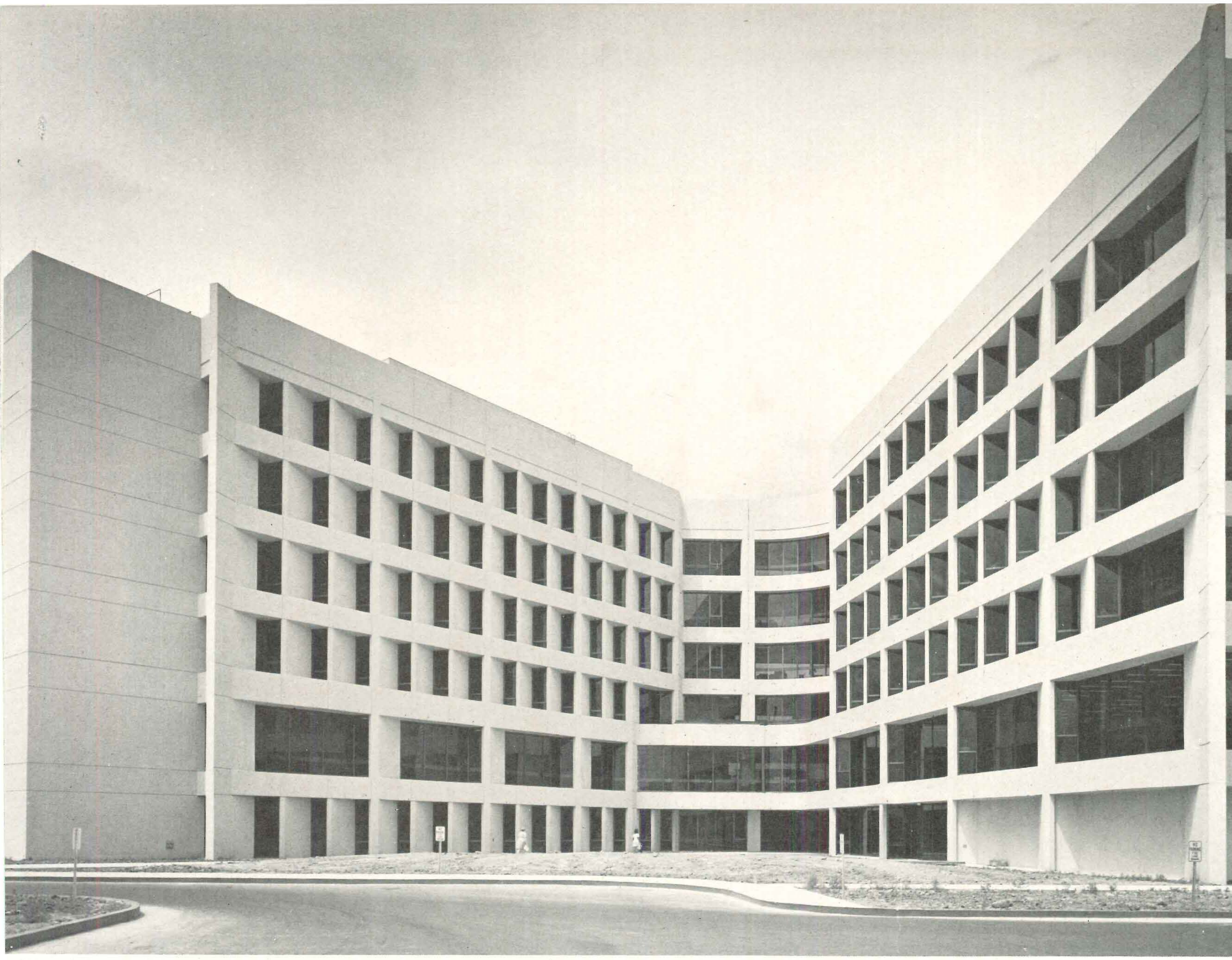


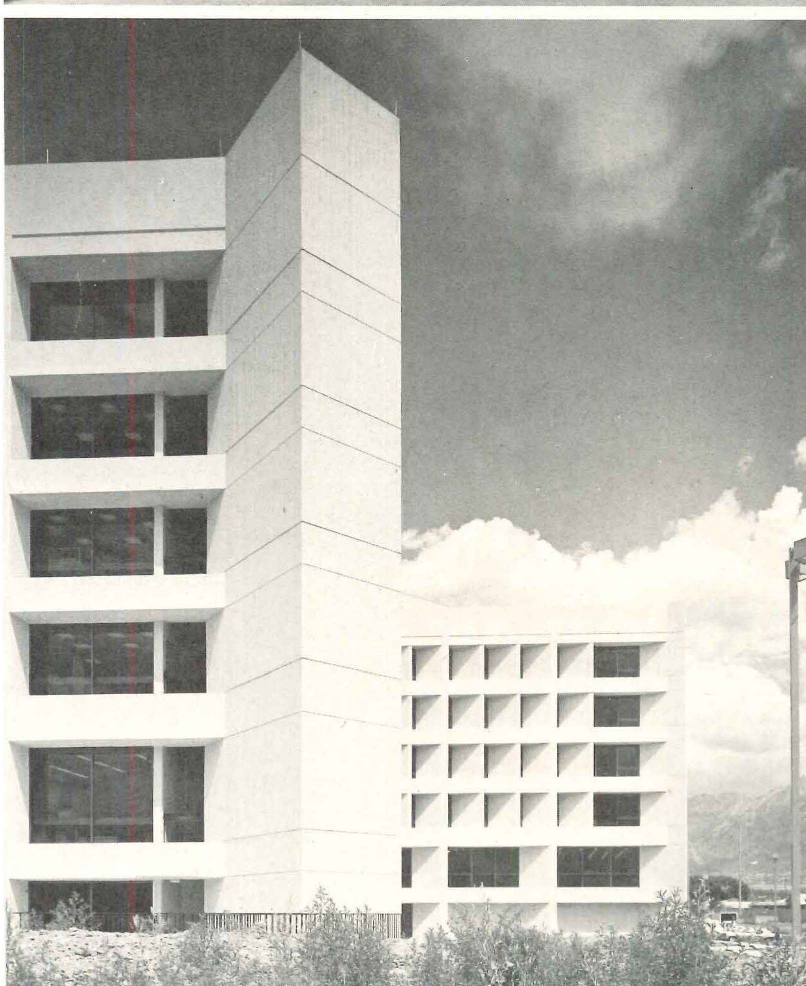
Configuration of St. Mark's 19-acre site (left) may not be ideal for parking, but it and the sculptural building relate to the surrounding mountains as does the glass enclosed exterior corridor that serves internal traffic and gives access to the attached medical office building that looms against the mountain (right).



Joshua Friewald photos





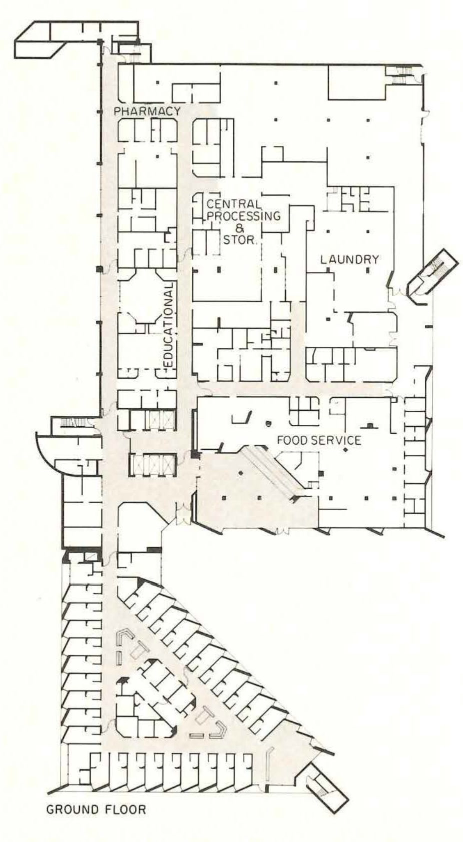


St. Mark's Hospital data

Number of beds	304
Total square feet	277,640
Bid date	December 1969
Bid on building	$9,946,960
Cost/square foot	35.80
Excluding:	
laundry equipment	$ 160,000
site work	600,000
landscaping	155,000
directional graphics	12,000
art	11,000
change orders	235,000
radiology equipment	275,000
type II equipment	1,300,000

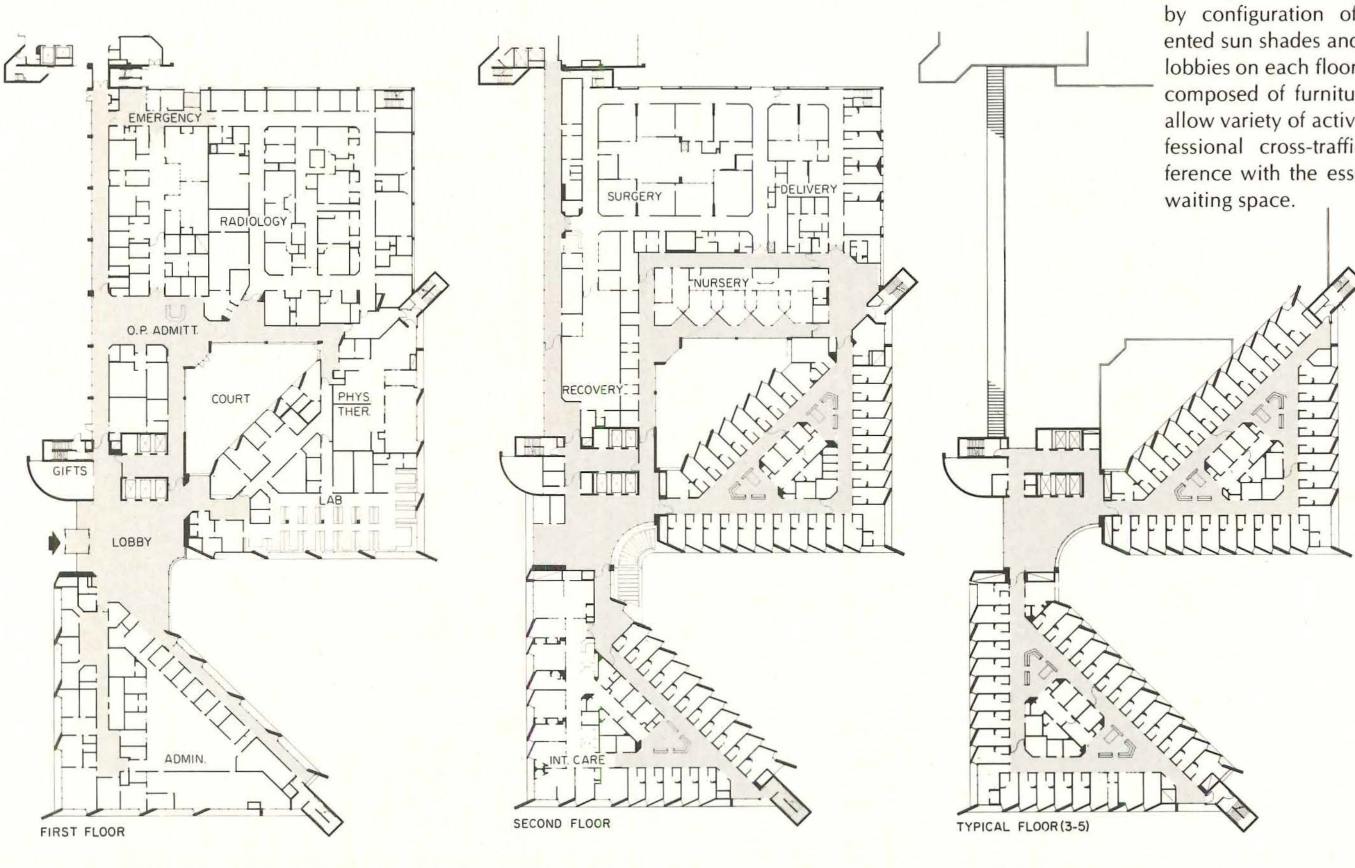
Medical Office Building

Approximate number of physicians	35
Gross square feet	56,557
Bid date	October 1972
Bid price including all interior finishes	$1,400,000
Bid price/gross square foot	24.70
Net rentable square feet	39,367



GROUND FLOOR

Visibility and privacy are the reconciled opposites achieved at St. Mark's by configuration of diagonally oriented sun shades and wall angles. The lobbies on each floor are spacious and composed of furniture groupings that allow variety of activity as well as professional cross-traffic without interference with the essential function of waiting space.



Administrator Hartford observes that nursing floors are more dedicated to their purpose, and the occurrence of coffeebreaks or socializing, frequently the practice in utility corners at other institutions, is here reserved for a cafeteria which is both convenient and physically pleasant. Ceiling treatment of lobby areas varies as can be seen in the photo on the previous page and the skylighted ceiling at right. These differences reflect functional changes in the required mechanical systems in each area.

St. Mark's Hospital interiors

The skillful uses of wood, concrete, glass and colorful fabrics in the furniture and carpeting combine in a sense of what can only be called efficient comfort. The nurses' work station also is generous, although the combination of the rollabout files and mechanical materials delivery stations within this area may call for a little discipline in housekeeping.

Evaluation studies of nursing units and lobbies so far indicate that nurses are enthusiastic despite the fact that the new facility has generated a surge of admissions at more critical levels of illness.

Application of the VA hospital building system to the design of the Loma Linda VA Hospital

In this report, George Agron, senior vice-president of Stone, Marraccini & Patterson describes the actual design application of the Veterans Administration Hospital Building System Development Study undertaken for the Research Staff, Office of Construction of the agency by the joint venture team of Stone, Marraccini & Patterson and Building Systems Development, Inc. That study was reported in RECORD, June, 1972.

The application of the VA building system described here is to the design of the proposed 500-bed Loma Linda VA Hospital for which the same joint venture is the Architect/Engineer. This report also includes a summary of a study of transport systems for VA hospitals, undertaken by the same team. The design of the Loma Linda VA Hospital is currently at completion of block diagrams (schematic stage), and the exhibits in this article are at that stage of design development. In our approaches to the design problem at Loma Linda, there are six governing design constraints:

1) The master plan (program) calls for a 500-bed acute general hospital to be affiliated with the nearby Medical School of Loma Linda University.

2) The design is to be based on the VA Hospital Building System described in the appended references.

3) The design is to incorporate the findings to date of the current study of transport systems, and be both a "test bed" and an "example" hospital for that study.

4) The design is to incorporate new requirements that the facility resist the force of a "design" earthquake and remain operational after such an event.

5) In order to achieve earliest possible project delivery, the development schedule requires phased bidding.

6) The cost of the facility is to be held within normal costs for hospitals of comparable content and quality, and no special premium is allowed for application or expected benefit of the building system.

Development of the master plan and program

The hospital is to be located in Loma Linda, California, some 60 miles east of Los Angeles on a 40-acre site. A large outpatient service is required, and inpatient provision calls for a complement of 500 beds, of which 320 are acute medical, surgical, neurological and special care beds, 60 are for psychiatric treatment, and 60 are for a nursing home care unit. Expansion and function change can be accommodated. Laundry service will be provided by the VA regional system. Certain diagnostic and treatment programs will be shared between the VA hospital and the Loma Linda University Medical Center. In general, the hospital program reflects the impact of widely ranging patient care services, and significant provision for medical education and research activities.

The hospital design represents an almost pure application of the VA Hospital Building System to a specific hospital program. All basic principles, design strategies and organizational disciplines are respected in the design concept. Both planning and component system rules have been followed without significant variation.

The hospital is considered as an assembly of service modules (see plans, page 164). Each service module is independently served by an external service bay which houses mechanical and electrical equipment. The perimeter location of service bays eliminates internal shafts and roof-housed mechanical equipment. It also permits accessibility for equipment removal and change without disruption to hospital activity. The service module is divided into functional and service zones, the latter providing for service distribution in interstitial space.

The service module derives from ward-planning requirements. For this hospital, a single service module, in terms of size and shape, provides the basic planning unit of the whole hospital. Service modules are linked by non-system elements housing vertical transportation systems and by special areas, such as the auditorium and service building.

Ward requirements for this hospital vary substantially from those developed in the research study. There is a different program of bedroom distribution and a different pattern of bathroom requirements. The accommodation of this significant change can be considered to add to the "catalog" of ward designs of the research study, and indicates the flexibility of the building system for planning response.

As developed in the research study, pairs of service modules form fire sections. Shear walls fall on service module boundaries, or cross those boundaries where there is no disruption to the discipline of service distribution of the building system.

Uniform application of a component systems vocabulary

Both building shell and service systems follow system rules precisely. The structural system is a steel frame, with concrete shear walls for lateral force resistance. The bay spacing and spans are within the recommended vocabulary of the research study. An 11 ft-3 in. beam spacing is used in this design, as against the 7 ft-6 in. spacing used as an example in the study, without departure from system rules. The ceiling system will provide a floor platform for the interstitial space (sections, page 163), affording general accessibility to services for construction, maintenance and modification. The ceiling system will provide thermal and acoustical separation between functional and service zones, as well as provide support to partitions and equipment. It is a poured gypsum assembly supported by a light beam system suspended from the structure by hangers which define the lateral zones for services and access within the interstitial space.

Services within the service zone are disciplined in size and location, both vertically and horizontally. Penetrations of shear walls of service bays are coordinated to meet service distribution requirements, and requirements for lateral force resistance of the shear walls. Services will be sized for maximum anticipated load, or provision will be made for additional services where this reflects the best engineering/economic judgment to meet future demands.

Departures from the research study's recommendations are minimal, but noteworthy. The first floor will be a slab on grade, and there will, in general, be no floor depressions or floor fill. Finishes will be surface applied. The ceiling platform will be omitted in the warehouse to allow additional ceiling height. Neither of these decisions will adversely affect the use or adaptability of the hospital, but they will permit a more economic design solution.

Design implications of the transport system study

The primary objective of the transport study is to provide a methodology for transport system selection and design which integrates with the building system and with effective hospital planning, within a cost-benefit framework. Since every hospital function creates an inherent transport demand for movement of people and goods, the size, activity and organization of those functions establishes a specific transport demand pattern that generates consideration of all pertinent modes of transport for goods and people. The transport study provides the data base and methodology for developing the transport demand pattern, and for display and evaluation of transport system alternatives for response to the demand pattern. It is a corollary that the organization of the hospital into compatible sets of functions on the one hand, and their proper placement relative to transport systems on the other, can minimize transport demands and consequent transport costs.

If the horizontal organization of functional activity is based on desired adjacency between activities within limits of space and configuration, the vertical organization of the hospital is based on transport-generated sets, that is, clusters derived from their transport demand characteristics. The over-all organization is thus a combination of horizontal and vertical clusters, which define over-all hospital organization and transport requirements.

While these concepts are inherent in every considered hospital design, the current research study provides tools for:

1) Providing measurement of compatibility between clusters within given space and configuration envelopes.

2) Determining transport demand characteristics including peak volumes and cost.

3) Determining loads to be accommodated by transport systems relative to their capacity and location.

4) Studying array and cost-benefit considerations for various hospital designs.

The application of this program to the Loma Linda hospital design has been significant in value. It has assisted in evaluation of alternative hospital configurations, of alternative locations within the selected configuration of departments and transport systems, in quantifying transport equipment, and in cost-evaluation of alternatives.

Seismic studies probe site, develop a design earthquake

Prior to commencement of design, a team of consultants collaborated in establishing seismic design parameters for the hospital. The site lies between two major fault systems, and minor faults occur widely in the Southern California area. It was necessary to undertake a multi-phase program to determine site integrity and to develop a "design" earthquake for this facility.

The integrity of the site as being free from faults was established by trenching the diagonal of the site 15 feet deep for its full 1800-ft diagonal length. Examination revealed no fault trace, which assured that the site would act as a unit in an earthquake.

The "design" earthquake was determined by a study of the geo-seismic history of the region, by fault-tracing photography, by sub-surface explorations, and by application of these findings to appropriate earthquake computer models. The resultant "design" earthquake is one of considerable intensity, but well within the range of building resistance, providing certain design constraints were respected:

1) The building should be relatively low. A four-story hospital utilizing this building system falls within this definition.

2) Symmetry and regularity are wanted.

3) The design should be as repetitive as possible for proportionate distribution of lateral forces.

4) The structure should be stiff, and stiffness should be as uniform as possible.

5) Heavy loads should be confined, as far as possible, to the lowest floor.

While these constraints appear formidable, they were in fact compatible with planning principles derived from functional objectives, and with system application.

Design was begun in January, 1973. Hospital delivery is scheduled for November, 1976. This program requires hospital completion one year to 18 months earlier than can be achieved through conventional design and construction procedures.

The current program is to award successive contracts for site development, structure, automated material handling systems and for building completion. The design schedule to meet this program will be correspondingly phased.

The Architect's construction cost estimate for the project as of July, 1973 is approximately \$40,000,000. Cost per square foot is estimated at \$63.10. The cost projections are well within the range of cost of comparable teaching hospitals.

The systems approach does not obscure design purpose

While the substance of our report has been focused on technical considerations, careful attention has been given in the design exercise to view the hospital as an environment which will house two to 3000 people on a given day, and which will be a most significant facility in the community for many decades.

Hospital design based on building systems, considered esthetically, is not a simple problem. System buildings of this type and scale do not lend themselves to articulate manipulation, a situation confirmed by constraints which demand regularity and symmetry as design parameters. The design emphasis is therefore on simplicity of building form expressed directly.

Site development planning is a response to the warm, dry setting of the hospital, to the scale and location of the building, and to traffic and parking needs. The site is intended for use as well as aspect, and it is considered that the developed site will provide a setting for the hospital having interest and variety which will enhance both the hospital and the community.

In the judgment of the design team, the VA Hospital Building System is an effective envelope for hospital design, in terms of function, cost, adaptability and for response to requirements for early project delivery. As a pre-design tool, it has proved of significant value in design acceleration, in precoordination of design disciplines, and in establishing usable and rationale design constraints. The Transport Study has helped materially to integrate transport design with functional planning and building system design. As a consequence, it is the considered opinion of the architect that there is assurance of long-term capability and performance of the Loma Linda VA Hospital which would have been difficult to achieve by more conventional design procedures.

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Development Study, VA Hospital Building System

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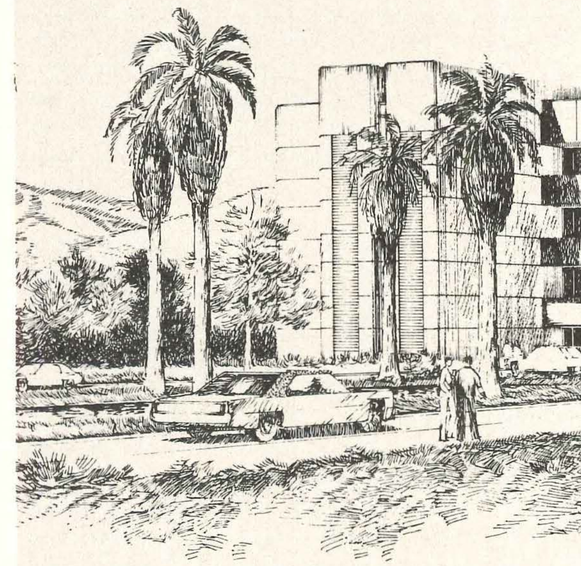
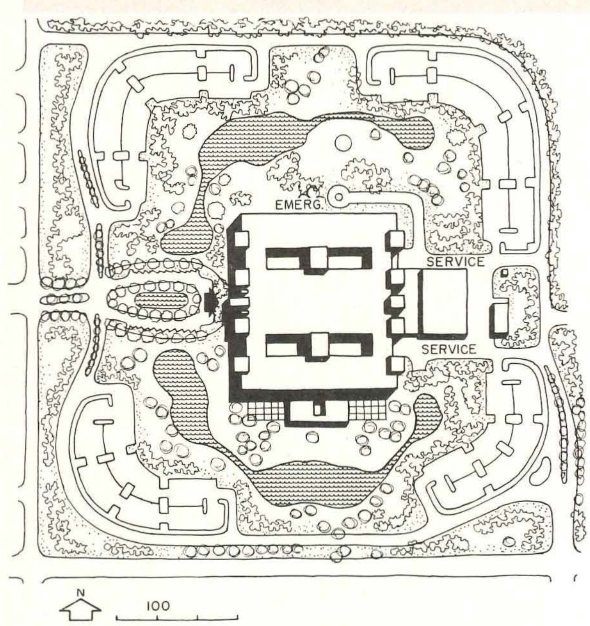
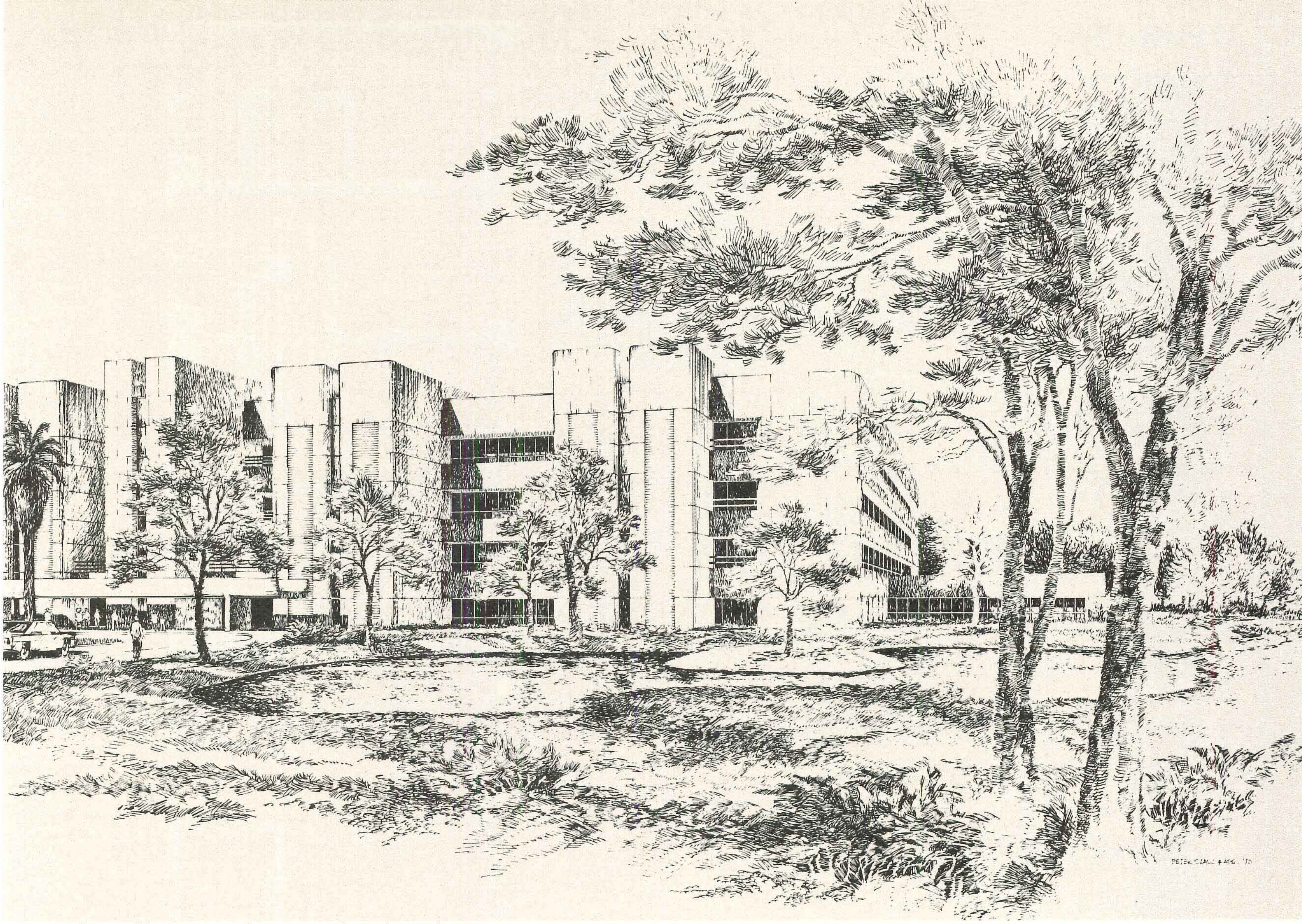
A Study of Transport Systems for VA Hospitals

Publication expected about January 1974.



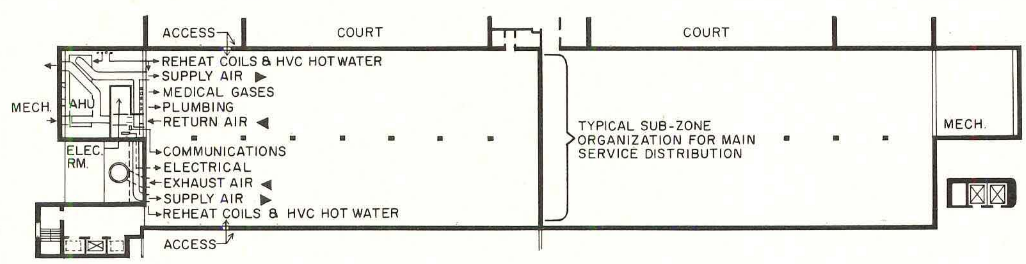


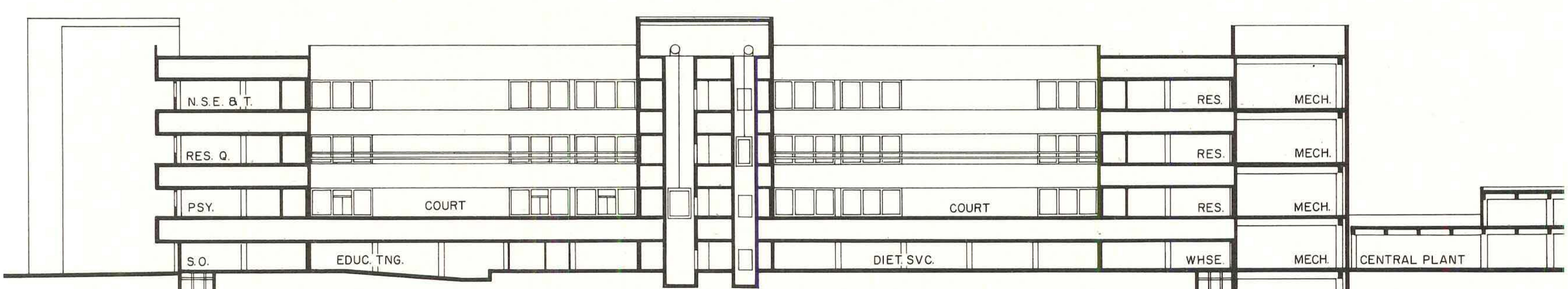
VETERANS ADMINISTRATION HOSPITAL, Loma Linda, California. Architects: *Stone, Marraccini & Patterson and Building Systems Development, Inc., a Joint Venture—managing principal: George Agron; co-principal: Christopher Arnold; project architect: Roger Hill; design team: James Borthwick, John Vilett, Charles Edison, Gary Pope.* Engineers: *Rutherford & Chekene* (structural and civil); *Ayres, Cohen & Hayakawa* (mechanical/electrical). Soils and seismic investigations: *Woodward-Lundgren & Associates.* Consultants: *H. Bolton Seed* (site response); *Ray Clough and Edward Wilson* (dynamic Analysis). Landscape architect: *Arutunian and Kinney Associates.*



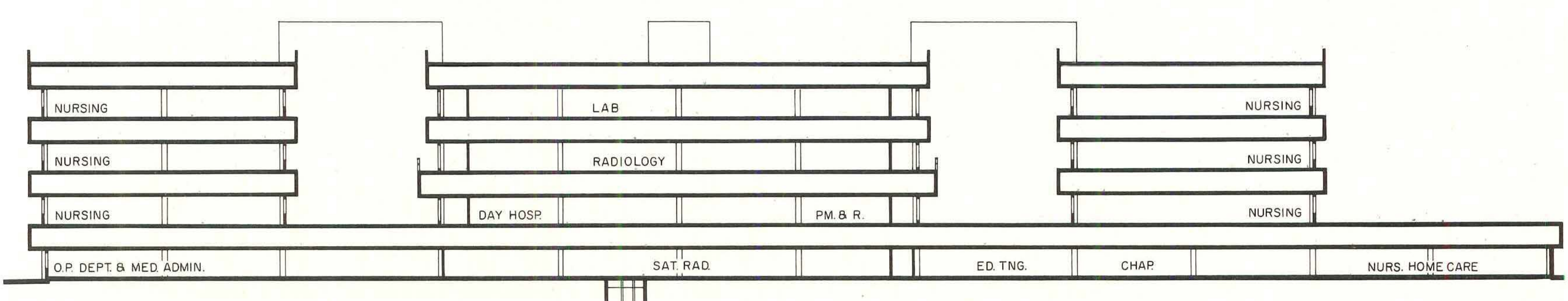
The roughly square site for Loma Linda VA hospital was trenched diagonally some 15 ft in depth to establish the seismic characteristics as they might relate to foundation and structure. The structural system is steel frame with concrete shear walls for lateral force resistance.

The plans and sections illustrate how the basic modular system is adaptable to various functions of the spaces. The concept of the mechanical end spaces serving the interstitial distribution system is visible in the section and in the typical sub-zone shown at right.

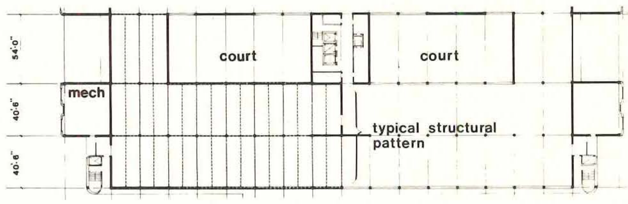




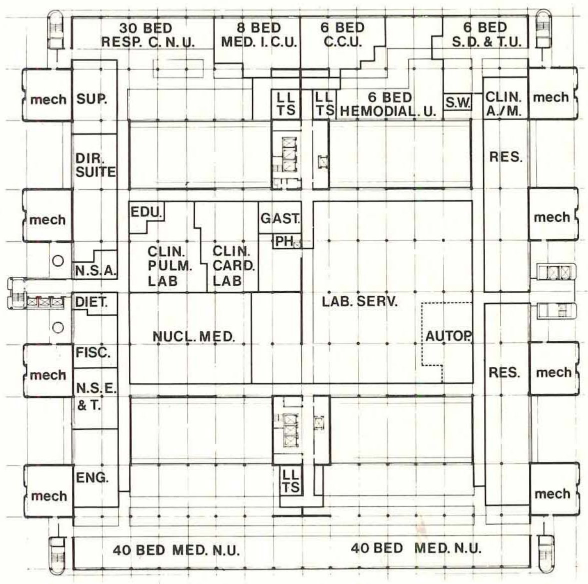
EAST-WEST SECTION



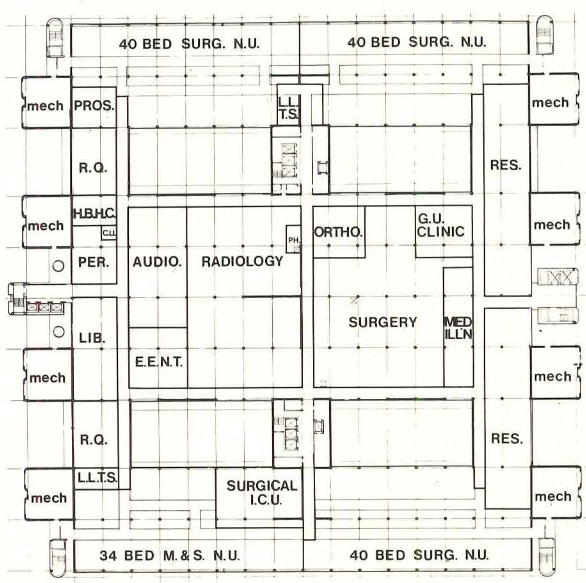
NORTH-SOUTH SECTION



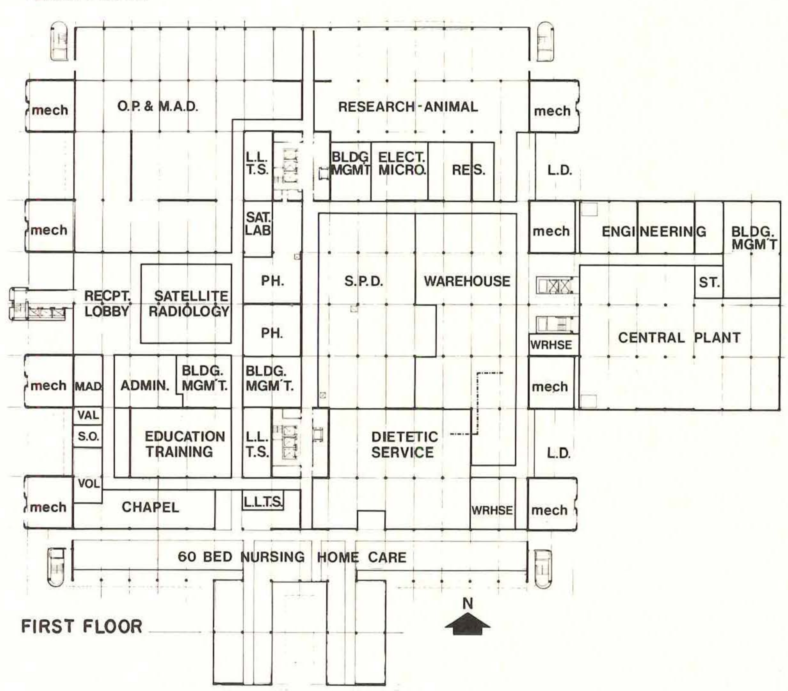
Typical structural system applied at Loma Linda is shown in the partial diagram at left. The uniform application of component systems to various functions is illustrated in the floor plans. The system is adaptable to both a diversity of original occupancy and also to changes of function as the hospital program develops. Bedroom layouts at right are still in development phases and show the various options of privacy and shared bath facilities.



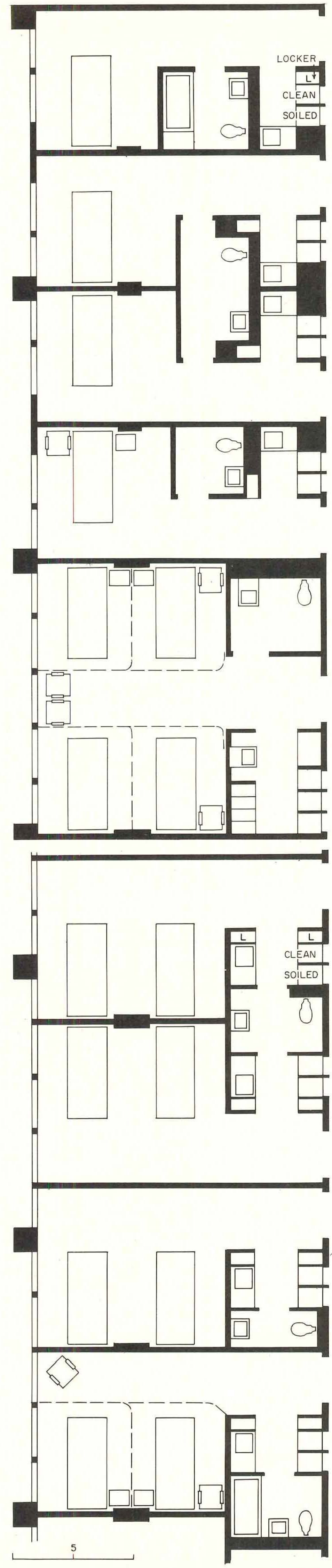
FOURTH FLOOR



THIRD FLOOR



FIRST FLOOR



Inventing the systems for planned expansion of University of Minnesota Health Sciences Complex

The complex of new and remodeled buildings comprising the health sciences campus at the University of Minnesota is an example of sophisticated solution, by architects, of the complex management and planning problems typical of today's large projects. The university's expansion not only enlarges, renews and replaces existing facilities but consolidates the units of the university hospital and schools of medicine, dentistry, public health, nursing, and pharmacy in terms of both physical and curricular integration. That was the goal of the master plan and subsequent building designs developed by The Architects Collaborative of Cambridge in association with a consortium of Minnesota firms including The Cerny Associates, Inc.; Hammel, Greene & Abrahamson, Inc. and Setter, Leach, Lindstrom, Inc.

The planning process began in 1964 with the appointment of a university long-range planning committee. This committee, headed by Elmer W. Learn as chairman, was made up of key staff members and formed the nucleus of a structured network of sub-committees representing departments of the health sciences complex.

A foundation-supported study in 1966 collated the input of the university committees in a report that helped Regents formulate their presentation of a $54-million planning budget to the Minnesota Legislative Building Commission.

The architects were commissioned in August 1967 to develop the master plan and proceed with schematic designs.

The University was about to expand student admissions by several hundred students in the health field. So despite some adjacent land acquisitions, the problem remained one of increasing the density of an already tight building complex on an urban site while promoting strong relationships among historically disparate major facilities. The building system to be developed had to accommodate not only planned increments of physical expansion but also the pervading need for functional flexibility inherent in facilities designed for teaching health sciences.

TAC's initial effort was to develop a master plan that provided for both short and long-term expansion while responding to the increasing interrelationships among the disciplines to be housed. The master plan established major paths of circulation projected through forseeable phases of new and remodeled buildings. These traffic considerations were not only for the campus itself but were related to highway traffic and parking problems of the entire university.

Within the health sciences center, a centralized receiving unit is the focus of a materials service circulation network connecting all units two floors below grade. The steep pitch of the site toward River Road provides grade access to the system through building KE shown in the plot plan below. Route of the circulation system is outlined in the sketch on the next page.

This material circulation system is overlaid by a pedestrian circulation passage one level below grade with branches to all building units and to a 3000 car parking facility. Thus, movement of goods and people among all parts of the center is possible without exposure to the frequently severe Minnesota weather.

Roland Kluver and John C. Harkness, TAC principals-in-charge, describe the over-all project as one presenting almost all of the problems typical in large government-related university medical projects. In addition to complexities of the multi-client, multi-discipline, multi-building situation, the constraints of state and Federal funding forced rapid conversion of proposals into physical facilities. One result of this was the use of phased, multi-contract construction processes. Another constraint was the requirement to tie into existing structures at their established floor-to-floor heights. This ruled out consideration of interstitial spaces for mechanical systems in new buildings despite the urgencies of long-term flexibility of function.

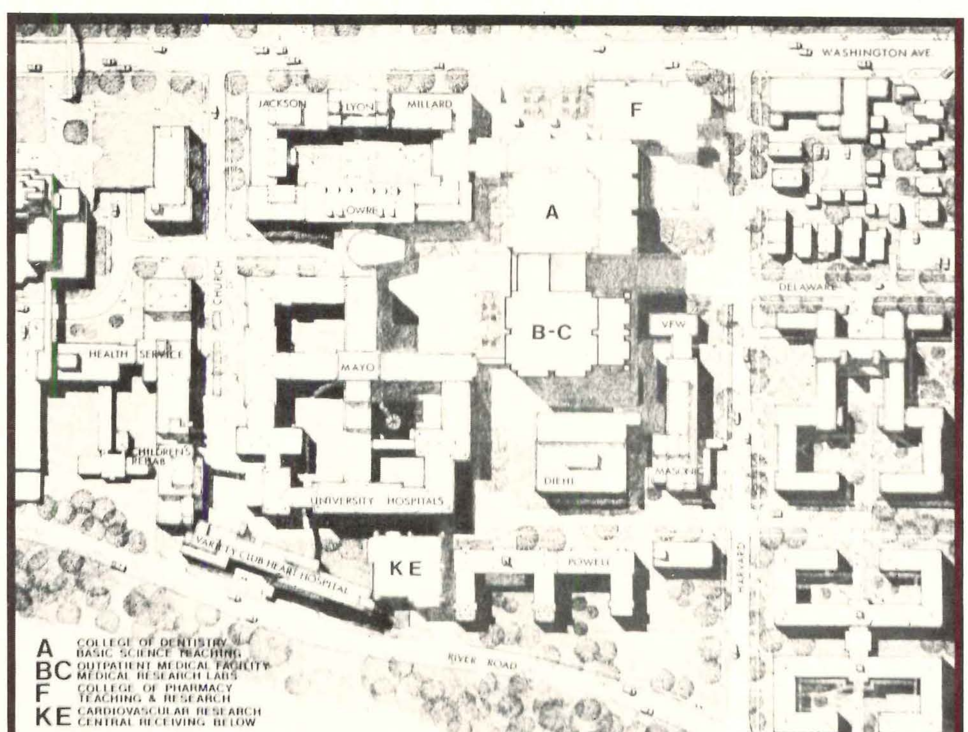
The design grid, prelude to the systems module

The design method was to derive an over-all design grid for the entire campus. This was related not only to the existing structures but also to relationships of projected new structures and to the master plan for traffic development. The grid (see sketch next page) was not so much a framework for constraint of form or placement as it was a discipline upon which could be based development of optimum modules suitable for over-all requirements. University functions designated by the master plan to be housed in new construction were analyzed for common system criteria that had to do with both mechanical and structural requirements as well as with the interrelationships of facilities throughout the campus. These criteria generated a single over-all building system which, with appropriate variations, could respond to the requirements of teaching, research, clinics, offices, etc.

Within the over-all building system, a subsystem basic module, 12 feet 4 inches square, is applied. The square is modified in position and configuration by the spacing of service towers 49 feet 4 inches apart in two directions on the planning grid. The framing of the modules and towers creates a tartan grid which is apparent in the sketches on succeeding pages. The structural system is integral with service shafts which occur at the corners of each square module and provide passage for vertical distribution as well as structural support.

Computer-based information aids planning and purchasing

A considerable part of the architects' problem in approaching both the master plan and the building design for this kind of project resides not only in the complex political interplay, but also in the multiplication of the client identity. While the University planning committee's system of developing the over-all program was a productive one, it did involve hundreds of faculty members in literally dozens of departments, each with a separate history and habit of bailiwick contemplation. Further, the complexities of analyzing the physical attributes of facilities so diverse and technical on so



compact a site called for extremely massive manipulation of data about area requirements and juxtapositions. The dual problems of developing reasonable space allocations for each department and maintaining a consistent vocabulary in furnishings and equipment throughout the institution called for two major efforts for which computerization was the logical procedure.

The Architects Collaborative had previously completed a 15-month study and implementation of a computer-based information system for building design. Basis for the data system development was a preliminary study by Roland Kluver and Ronald Axelrod of TAC and C. G. Davis, Jr., of the Medical Center of Vermont. The resulting proprietary Facilities Planning Data Bank will be refined as its applications proceed and its capabilities are extended. At present, the FPDB is designed to process tabular data for large projects with many rooms and elaborate sets of attributes and equipment. So far, the system lends itself most usefully to those portions of the design and construction process which are tabular in aspect, such as cost estimates, room attributes, occupancy densities, related areas and furnishings inventories.

Application of the data system at the University of Minnesota in the design development phase was to store and report information on the location, area, finish, acoustic requirements, health hazards, fire hazards and other attributes of spaces and to provide a running account of the handling of special considerations updated at regular intervals during the design development process. At any given date, the print-out would include a column of comment carrying such notations as "room may be combined with adjacent lab" or "consult department head" or "check special power requirements," etc. Print-out progress reports at later intervals check out handling of these comments and also provide summations of completed areas and costs at each phase of development.

A second effective use of the computer was in the development of catalogs of equipment within the vocabularies established by the architects and distributed among the client department heads to enable them to select such items as casework components within controlled hierarchies of style and cost. The orders for such equipment could then be fed back to the computer and summarized item by item in various combinations for purposes of purchasing and cost estimates. Another catalog function provides representative equipment layouts for circulation among client personnel to assist them in making selections.

One out of many is master plan objective

The over-all planning grid and layered traffic patterns do more than solve an immediate problem of tie-in for a multi-building campus. They provide also a basis for unifying the whole process of replacement as it is bound to occur over a long-term period. It is projected, for example, but not physically designed, that certain buildings now active in one role (say the nurses' residence building marked Powell in the plan) may one day be changed in function or replaced physically as new construction adjacent to the research and receiving structures (K-E) now being built at the River Road level. The process of unifying the curriculum of the whole Medical Sciences Center in a way that will accommodate increases in student enrollment will affect the precise problem of physical changes as need arises. The basic grid pattern and structural system developed responds to these unpredictable demands for change.

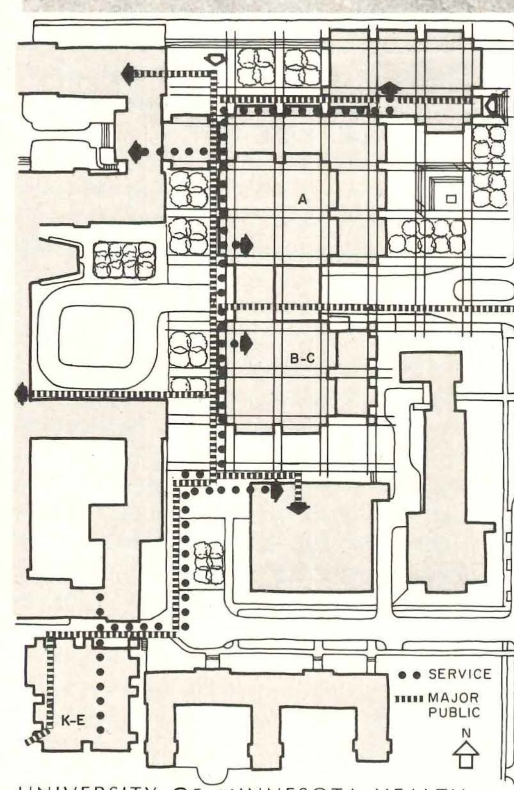
Phased construction calls for detailed contract analysis

On a project involving concurrent demolition and new construction within an operating complex, the schedule of utility changes alone can be critical. With a target date of occupancy by an increase in class size on the opening day of the university semester, the advantages of phased construction in saving both time and money are substantial.

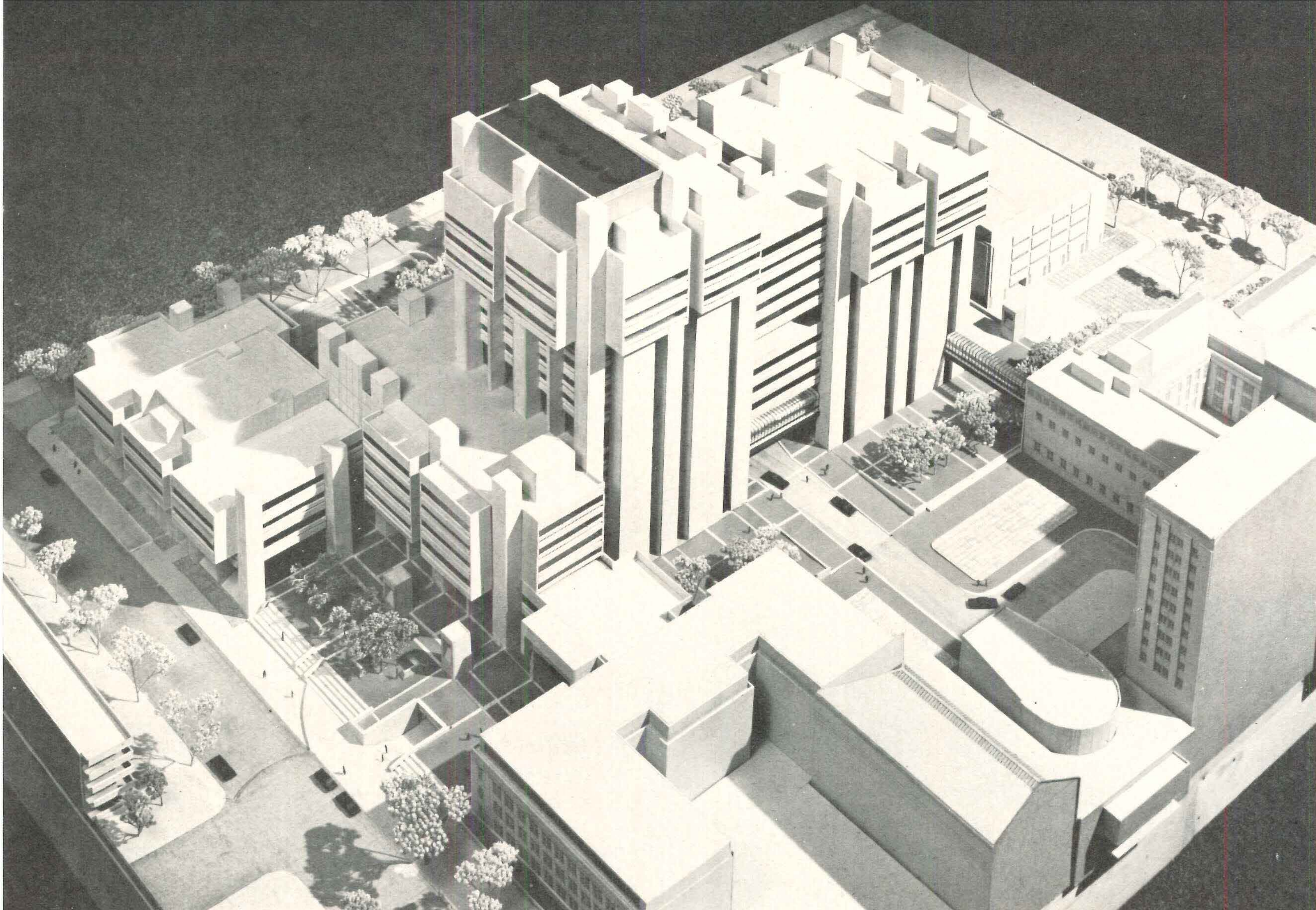
The files of The Architects Collaborative contain a 26-page summary of the construction sequence and awards on a single building, unit A in the plot plans. This document, dated 1 July, 1970, has set forth a complete list of tasks and the parties responsible for their performance. For example, among tasks assigned to arrangement by the University Plant Services Department for performance prior to October 1, 1970, are such items as: 1) new gas service to various buildings connected by the gas utility; 2) new electric power lines by the power company; 3) relocation of police call boxes by the city; and many others. The list is a long one covering work necessary prior to getting started on the job itself and is followed by a tabulation of responsibilities of the architects and engineers relative to excavation, footings, structural steel, and many other contract packages.

Assignments and responsibilities among the joint venturers with respect to documentation were also detailed, and a list of critical dates for starting and completion of various operations was compiled. The list is too long for insertion here, but four dates are of special interest: June 1970, start contract documents for unit A excavation and footings; August 1970, start demolition on sites for units A and B-C; September 1973, unit A complete and occupied; April 1974, unit B-C complete and occupied.

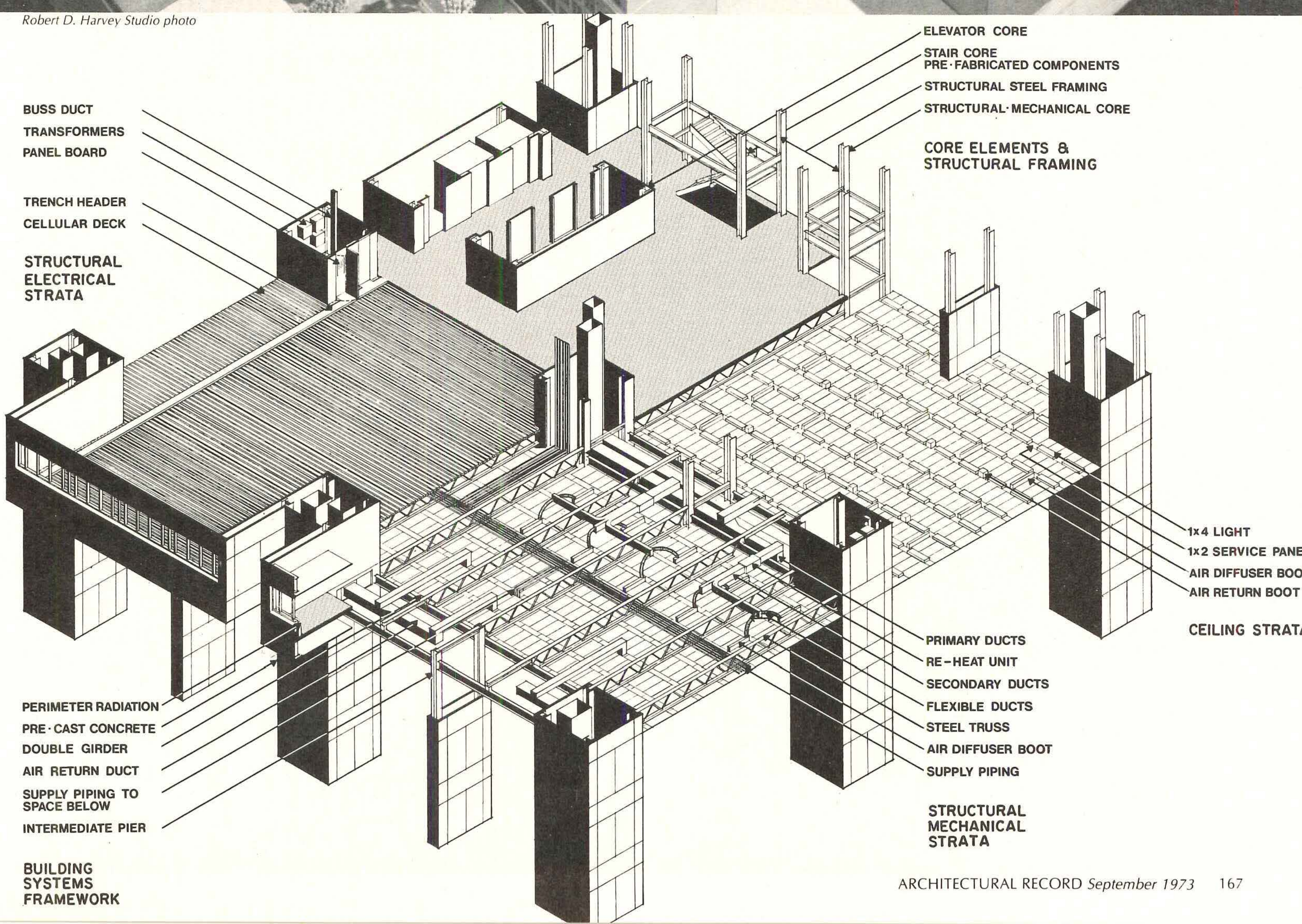
This complex coordination of many activities was managed by the architects and engineers and was supported by a series of phased sitework diagrams showing the location and contract limits of each operation. Each diagram carries the critical date of its activity, and a computer-aided variation of CPM was applied to be sure that all operations were in phase and on time. The effectiveness of these procedures is documented by the fact that unit A is indeed ready for occupancy in September 1973, and all other work is on schedule.



UNIVERSITY OF MINNESOTA HEALTH SCIENCES EXPANSION, Minneapolis, Minnesota. Architects: *The Architects Collaborative; principals-in-charge: Roland Kluver, John C. Harkness; associates-in-charge: John J. Scott, Ken Taylor, Robert D. Turner; job captain, John Mawha.* Associated Health Sciences Architects and Engineers: *The Cerny Associates Inc., Hammel Green & Abrahamson Inc., Setter Leach & Lindstrom Inc.*

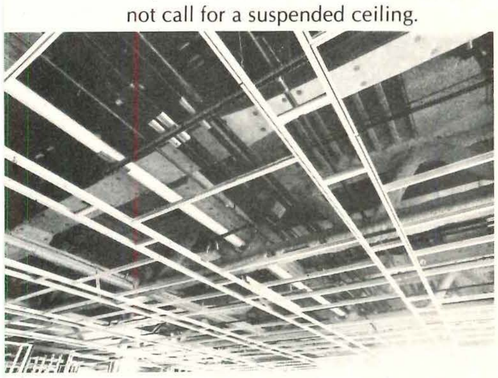


Robert D. Harvey Studio photo



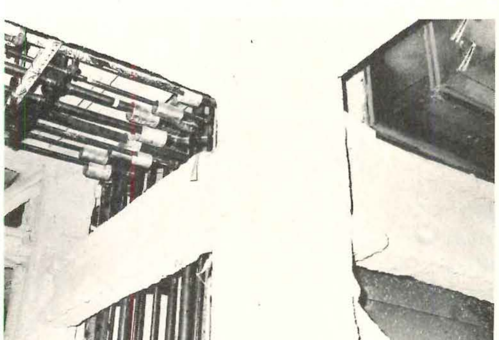
Adaptability of the system to various functional uses is shown in the sketches and photographs on this page. The diagrams at right illustrate how the basic module lends itself to uniform planning of the various electrical and mechanical requirements.

Photo above shows how a basic ceiling pattern can remain exposed in sections where mechanical and electrical requirements and interior finishes do not call for a suspended ceiling.

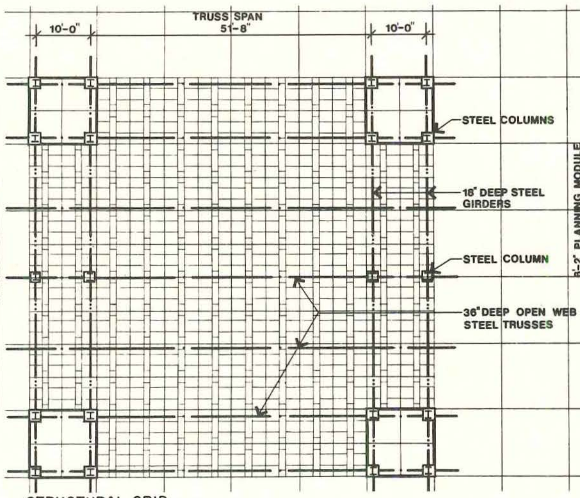


Where lighting and mechanical requirements are heavier, the suspended ceiling system provides an opportunity for both interior finish and distritution of utilities and air.

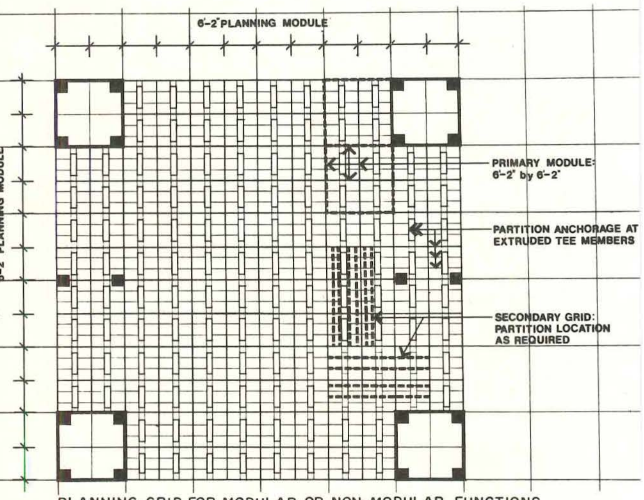
The module of the ceiling grid permits flexible installation of units for both lighting and air distribution at any required position.



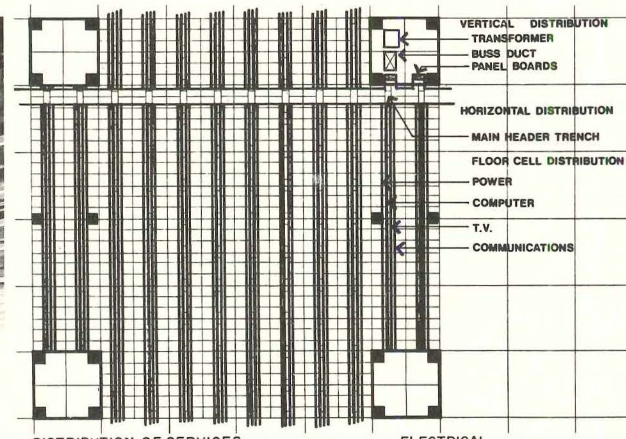
Integration of the vertical square columns with floor structural systems is shown in the photo above.



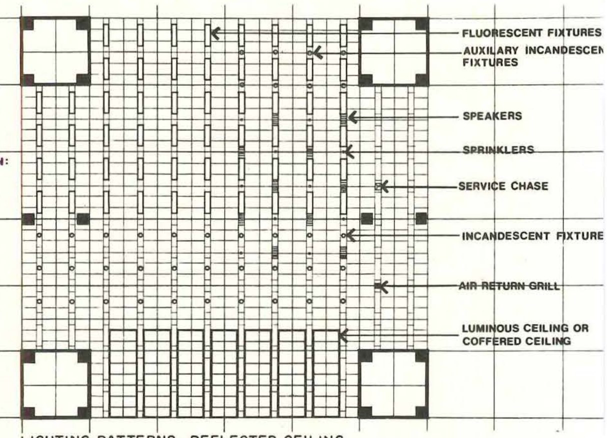
STRUCTURAL GRID



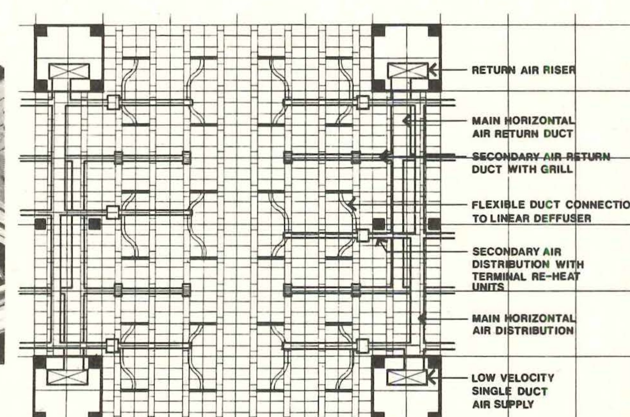
PLANNING GRID FOR MODULAR OR NON-MODULAR FUNCTIONS



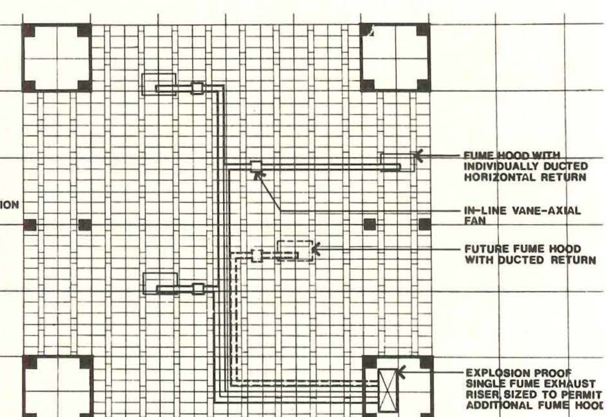
DISTRIBUTION OF SERVICES ELECTRICAL



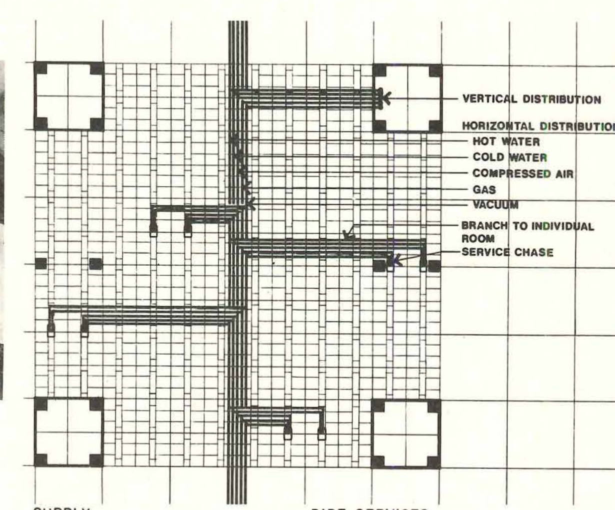
LIGHTING PATTERNS - REFLECTED CEILING



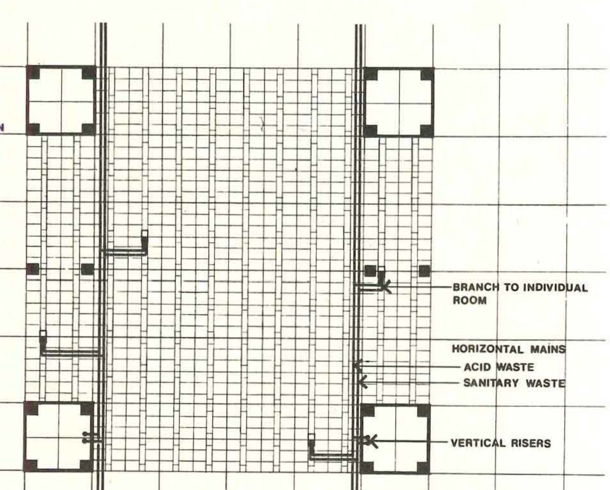
AIR DISTRIBUTION



FUME HOOD EXHAUST



SUPPLY PIPE SERVICES



WASTE

A refresher on specifying and detailing weathering steel

by L. J. McDevitt, Sheet Committees, American Iron & Steel Institute

Architects have always had a hankering for natural materials and natural colors. So it wasn't surprising that they took to weathering steel. They have found, however, that the characteristics of weathering steel need to be understood—particularly the nature of formation of the protective oxide coating—if the desirable qualities are to be obtained, and problems avoided. In particular, design details have to be carefully thought out and examined to encourage proper formation of the oxide coating on the one hand, and to avoid deleterious loss of it on the other (e.g., staining of other building materials; continually wet surfaces that never allow the protective oxide to form).

Weathering steel belongs to the group classified as high-strength, low-alloy (HSLA). The HSLA steels were first developed in the early 1930's as economical higher strength structural members for transportation equipment such as railroad cars. They contain small additions of alloying elements which, depending on their composition, often make them two to eight times more corrosion resistant than carbon steel.

Not all HSLA steels are weathering. But those whose corrosion resistance is approximately five to eight times that of mild carbon steel will normally develop the dense brown oxide coating characteristic of weathering steels, which inhibits further corrosion.

In normal environments, the thickness of weathering steel which will erode away in 20 years is only a mere .002-.004 in.

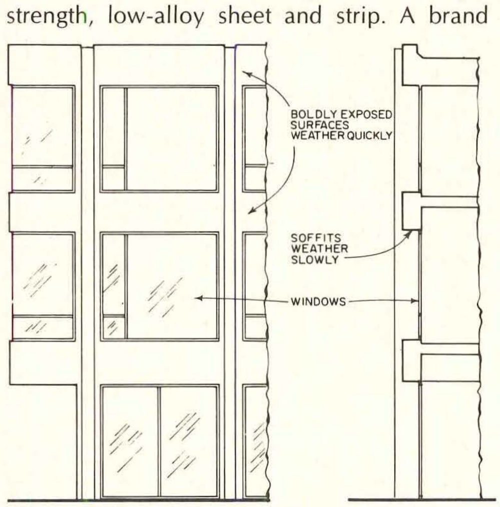
When ordering weathering steel sheets for roofing or siding, it is advisable that an architect consult with a steel producer for several reasons. First, each producer manufactures several grades of high-strength, low-alloy steel which can be made more or less corrosion resistant. By knowing the end application, the producer can furnish his most appropriate grade.

Also weathering steel sheets should be regarded as a finished material. They should be properly blast cleaned (preferably after fabrication) or pickled to remove mill scale. Pickling is most suitable for sheets, and is often used for light gages to avoid distortion that can result from heavy blast cleaning. Cold-rolled sheets usually do not require post-mill surface preparation if the material is properly protected after cold rolling. They should be handled and shipped with more care than sheets which have yet to receive their final finish.

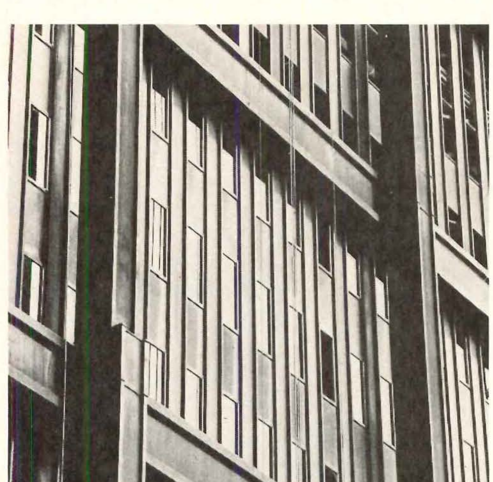
Weathering steel should not be oiled or have grease or chalk marks. The sheets should be specified to be delivered without steel die stamps or paint markings. If weathering steel is going to be pressed or roll formed into a specific siding or roofing shape, the producer should be informed. In many cases, it's possible to furnish grades that are more amenable to forming.

The steel producer can furnish advice as to the suitability of weathering steel sheets in a particular atmospheric environment. There are special problems, for example, in a desert atmosphere on one hand, or a location subject to salt water sprays on the other.

The basic steel specifications for weathering steel sheets are ASTM A374 covering cold-rolled, high-strength, low-alloy sheet strip and the new ASTM A606 covering hot-rolled, high-strength, low-alloy sheet and strip. A brand name should follow each specification number to ensure best weathering properties.



PARTIAL ELEVATION SECTION



Weathering properties. Neither the architect nor his client should expect a fully weathered building immediately after erection. It takes a few months for the patina to form and a few years to develop the maximum full richness. Weathering steel is a natural material—like stone, marble, or granite—with a character only time and nature can give. Attempts to artificially accelerate the process have not proven successful because they have not produced a tightly adhering protective oxide coating.

Thus, the initial appearance of the building is virtually identical to the steel color and finish of bare carbon steel sheets. When exposed to the wet and dry cycles of weather, it begins to take on the dark brown oxide coating culminating in colors variously described as a warm, dark brown; a brown-black to blue-black; or a deeply colored brown-red-purple.

The wet and dry cycles are important to weathering steel. In normal atmosphere, it takes about 2½ years of outdoor exposure before the oxide coating becomes sufficiently dense, thick, non-porous and tightly adherent to inhibit further corrosive attack. In a very arid desert, the coating may never properly form. In a marine atmosphere subject to salt spray, the coating could be continuously washed away before ever forming properly. Some concentrated industrial fumes could also prevent proper formation of the protective oxide coating. In moderate industrial atmospheres, the oxide coating forms more rapidly, and turns the darkest color. In rural locations, the coating forms more slowly and is lighter in color.

If the surface is continuously wet, the oxide coating that forms will be loose and flaky instead of light and dense, and can be washed away.

Because the wet and dry cycles are important to the formation of the oxide coating, the architect can understand the importance of his design in the formation of the coating. Boldly exposed surfaces will weather quickly, while sheltered surfaces, such as soffits, weather much more slowly. On sheltered surfaces, the oxide tends to be rougher and somewhat less dense.

If there are areas of the building where water can condense or become entrapped, they should be painted. This could happen on the bottom side of roofing and siding sheets. Good ventilation can help minimize this problem, however. Similarly, any steel below grade should be painted.

Some areas where water may collect and provide permanent wet surfaces are in the bottom of gutters where leaves and dirt collect, in hollow members or pockets in the vicinity of glazing that are improperly sealed.

Weep holes should always be provided in components whenever there is a possibility of entrapped moisture even though protection has been provided.

Effect on other parts of the structure. When the oxide patina is forming, a certain amount is washed away. This oxide can stain light-colored and porous materials such as concrete walks. The architect should provide run-off systems to divert oxide laden water from such materials, or use materials that are compatible with the stain, such as dark colored concrete or masonry.

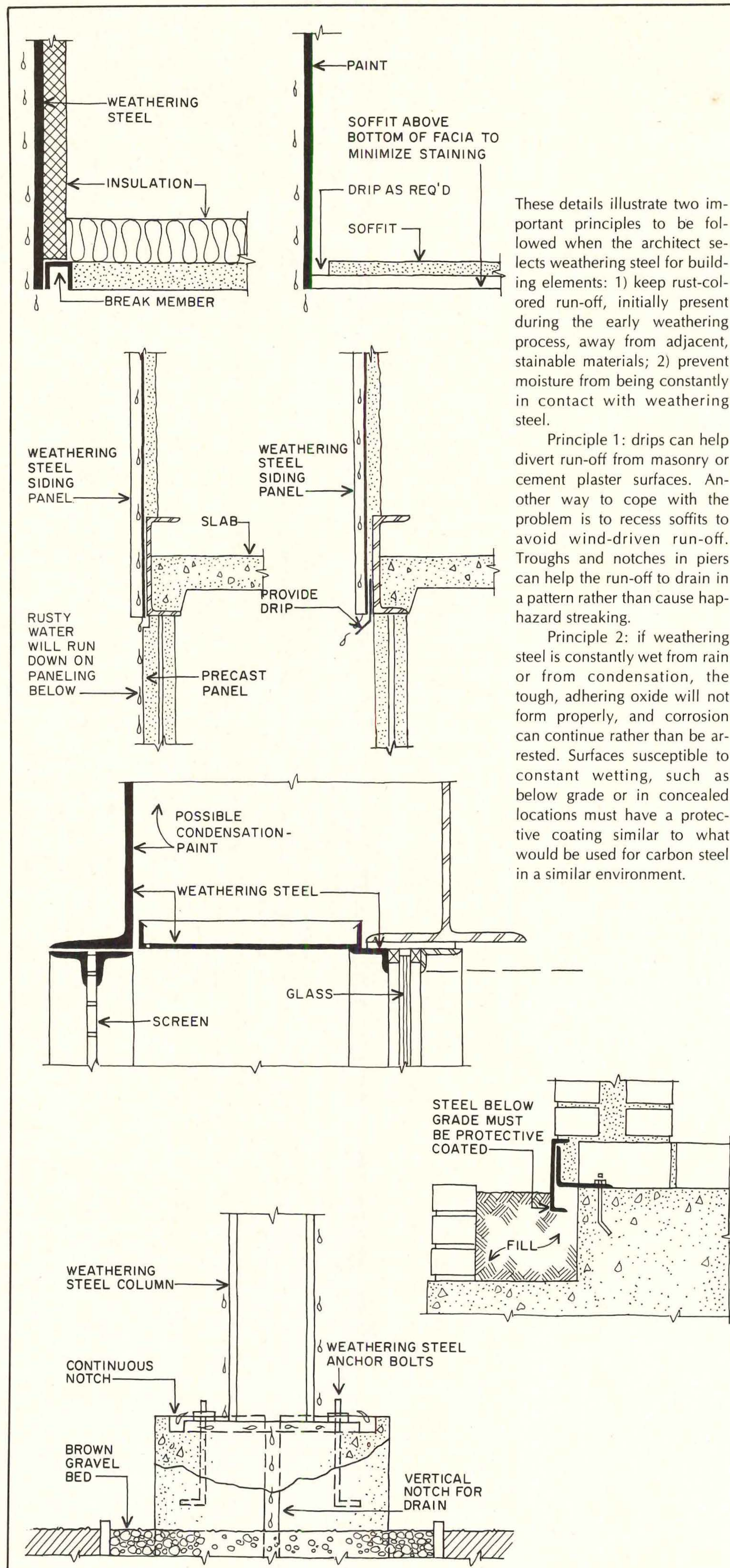
Possible ways to divert run-off water from other materials include overhangs, gutters and downspouts at eaves or fascia edges, sinks or drains at column bases, strategic placement of planting or planters and bands of dark brick or masonry at drip lines. Sometimes the staining water can be put to use, such as by providing chases in concrete to localize the oxide and provide an accent strip.

Windy locations may pose problems during the weathering process. Oxide particles can be washed off by rain and blown onto other building materials. This can result in staining of porous masonry and even of glass. Precautions include proper detailing of the weathering steel, using sealer coatings for masonry, and washing stains off windows. Noticeable deposits on windows must be cleaned off to avoid permanent staining.

Forming and joining roofing and siding. If weathering steel sheets are to be formed into proprietary roofing and siding shapes, the steel producer should be consulted for forming guidelines. Many steels in this category have yield strengths of 50,000 psi and tensile strengths of 70,000 psi. Normally they should not be formed with radii less than 1½ times the thickness of the steel. Forming pressure will be approximately 1.7 times that required of mild carbon steel. Allowance must also be made for greater springback to reach final shape.

When using fasteners to join the sheets, they should also be made of weathering steel or high-strength steel meeting the specifications of ASTM A325.

Weathering steel can be easily welded by any of the various arc welding processes. Mild steel electrodes can be used in any single-pass method, provided the procedure ensures suitable composition and enrichment of the weld metal. To ensure color match with multiple-pass sheltered metal-arc welds, AWS A.5.5, E80XX, -B1, -B2, -C1, -C2, -C3, or -G low hydrogen-type alloy steel electrodes should be used. For flux-cored-arc welding, an electrode should be selected that provides filler metal similar to those listed above. Multiple-pass welds may also be partially made with mild steel electrodes and completed with alloy steel electrodes. When welding is planned, it is a good idea to discuss the procedures with the steel supplier, getting his recommendations for preheat and interpass temperatures.



These details illustrate two important principles to be followed when the architect selects weathering steel for building elements: 1) keep rust-colored run-off, initially present during the early weathering process, away from adjacent, stainable materials; 2) prevent moisture from being constantly in contact with weathering steel.

Principle 1: drips can help divert run-off from masonry or cement plaster surfaces. Another way to cope with the problem is to recess soffits to avoid wind-driven run-off. Troughs and notches in piers can help the run-off to drain in a pattern rather than cause haphazard streaking.

Principle 2: if weathering steel is constantly wet from rain or from condensation, the tough, adhering oxide will not form properly, and corrosion can continue rather than be arrested. Surfaces susceptible to constant wetting, such as below grade or in concealed locations must have a protective coating similar to what would be used for carbon steel in a similar environment.

Continuing education on built-up roofing

A manufacturer's course for professionals stimulates an interchange of information, experience and ideas

Built-up roofing is still the mainstay of water protection for low-slope (nearly flat) roofs, despite the potential problems of leakage, deterioration and wind damage. The reasons seem to be that the materials (bitumens and felts) are low cost, and that they are aptly suited, in this cost context, to resist water on the one hand, and the stresses induced by temperature change and building movement, on the other. Various changes in application technique and new products have been developed in recent years to cope with the problems posed by large roof areas, increased use of thermal insulation, increased use of rooftop equipment, and the proliferation of roof deck materials with their concommitant hazards and difficulties—moisture, cracks, uneven deflection, etc.

Because built-up roofing is sure to be a primary roofing material in the forseeable future, and because there are so many aspects of roofing design and specification that need to be understood better by architects and engineers, Johns-Manville established The Built-up Roofing Systems Institute in Denver a year ago to offer a, "definitive and objective training school in the design and technology of built-up roofing systems." The four-day course offers intensive instruction in: the proper design and use of the structural deck, vapor barriers, insulation, the roof membrane and flashing systems, and also a discussion of the legal aspects of built-up roofing systems.

Undoubtedly one of the reasons that the A/E groups (about 15 in each class) deem the course a real success, in addition to the comprehensive course materials, is the free interchange of experience with the manufacturer's technical staff and also among themselves. The mix of the attendees includes both private architects and staff architects and engineers from many different parts of the country with wide ranges of experience with different types of buildings and different types of roof situations and material applications. In sum, the course is far from academic, instead a forum of recent, direct experience of successes and failures in built-up roofing design, material and specification.

An overview of built-up roofing problems and solutions is presented at the beginning of the course by the director of the Built-up Roofing Systems Institute, J. C. Robinson. Following is an excerpted version of his paper:

The manufacturer states that there are five basic reasons for built-up roofing failures

Experience over a great number of years with built-up roof performance has indicated that most failures can be attributed to a few basic causes: 1) faulty workmanship, 2) faulty design, 3) application of roofing materials during inclement weather, 4) the use of improper materials, and 5) poorly designed or installed flashing systems.

Faulty materials and faulty roofing specifications can be causes of roofing failures, but they very rarely are. Poor materials and faulty manufacturers' roofing specifications are not unknown but they both have a tendency to be relatively short-lived.

Blistering is probably the most common of the common roofing problems, and interply blistering is the most common type. Interply blisters are usually relatively small in size through repetitive cycling from hot to cold. They are caused by air or moisture entrapped between the plies. When this air or water expands as the roof temperature rises, a blister is formed.

It is easy to blame the problem on the roofing applicator, and to a degree this criticism is valid. We can fault the roofer for his failure to spread the bitumen uniformly, to place the felt in the bitumen while it is still hot enough to ensure adequate adhesion, and to vigorously broom the felts in place to insure elimination of entrapped air and moisture.

We cannot blame the roofer for poor or nonexistent perforations in the felt which makes the felt brooming operation a game of chasing entrapped air under the felt. Nor can we always blame the roofer for application during frigid weather when the bitumen chills so quickly that there is no opportunity for the felts to be properly seated before the bitumen is too cold for proper adhesion. Often such roofing jobs proceeed because of the pressures exerted on the roofer by the general contractor or the owner.

In the case of interply blistering, insistence by the roofing inspector on well perforated felts, proper bitumen temperatures on application and thorough brooming or felts, immediately after placement, will prevent most of this problem.

Phased construction can also introduce moisture and cause this problem. If, because of unusual circumstances, the roofer cannot fully cover all the base sheet on the same day, then he must wait to apply the ply sheets until the sun and wind have dried the base sheet.

Wet-type decking materials can generate blistering unless they are properly vented

A more serious blistering problem occurs when blisters form beneath the membrane between the membrane and the substrate. This problem is most common over wet decks or deck fills and over insulated decks where a vapor barrier has been installed. This type of blistering is much more serious than the interply blistering because blisters beneath the membrane usually grow in size through repetitive cycling. Because the area beneath the membrane is not a sealed chamber, a blister here can draw in air and moisture at night when the temperature drops and thus have a greater volume of gas to exert pressure when the temperature increases the following day.

The use of wet deck fills has become more common because they furnish one way of achieving slope and drainage. Unfortunately, such fills can also contribute to blistering problems. Because most of them are cementitious, they require water for proper set and cure and, thus, can be a source for contributing water and water vapor for blister growth.

Proper venting of these fills will prevent problems. Edge venting of the supporting structural deck usually will provide sufficient relief of vapor pressure. The application of a venting felt over the fill, which is designed with edge venting at the periphery of the roof, is a more positive approach. The placement of vent stacks through the membrane to relieve the vapor pressure is recommended by several manufacturers of lightweight concrete fills.

Imperfect vapor barriers can cause blisters unless the insulation layer is vented

The problem of blistering over insulated decks where the blister is formed under the membrane is not very common, but it does happen. All of such cases with which we are familiar involve systems which have been installed using vapor barriers. Water vapor finds its way through an imperfect vapor barrier and collects in the insulation layer. Over a period of time more water collects in the insulation layer. This water cycles from liquid to gas as temperatures rise and fall until such a volume exists as to exert sufficient force to break the bond between the insulation and the membrane.

A vapor barrier may be indicated for a roofing system where the conditions of occupancy generate unusual quantities of vapor. But the designer must recognize that a vapor barrier is seldom perfect, which means that the insulation layer needs to be ventilated. This can be accomplished by the strategic placement of one or more roof vents through the membrane, or by the use of a special venting felt over the insulation layer.

Expansion joints properly placed can avoid the problem of structural splitting

Splitting of the built-up roofing membrane is undoubtedly the most serious of the common roofing problems because splits almost always result in leakage into the building interior. The causes of roof splits can be divided into two basic types—structural and thermal.

Structural splits are the most easily understood and with proper foresight in roof design the most easily prevented. The proper placement of structural expansion joints is basic in preventing splits. Expansion joints should be placed in the roof system: first, at each construction or expansion joint in masonry or steel; second, at proper intervals, usually 200 feet; third, at each intersection where the roof changes direction; fourth, at the intersection between different types of roof deck materials and between existing roofs and new additions.

As a general rule, solid continuous attachment of the component parts of the roofing system to each other and the total system to the structural deck, is the best way to construct a roof. This allows the entire roof system to move as a unit with the movement being compensated at the structural expansion joints. However, if a deck is discontinuous, or is subject to cracking, or changes dimension as it gains and loses moisture, solid continuous attachment of the membrane will result in splitting of the membrane. Examples of decks that are discontinuous are panel or plank types. Some decks that are subject to cracking are poured gypsum and lightweight concrete. And examples of decks that change dimension with changes in moisture content are wood and structural wood fiber.

When these kind of decks are used, the designer must specify the attachment of the first ply of the roofing membrane so as to provide accommodation for the movement in the structural deck and thereby prevent the membrane from being split by this movement. Whenever the deck will allow mechanical fastening, this should be first choice for attachment of the first ply, because mechanical attachment is the most positive. Other methods include spot mopping and strip mopping, but these should only be specified when the deck will not accept a satisfactory mechanical fastener.

Considerable study, much of it in the laboratory, has been given to the possibility of roofing splits caused by thermal shock. Records show that the temperature of black roof surfaces can change as much as 50 degrees in an hour, and the roofing membrane expands and contracts proportionately with temperature. The effect of large changes in temperature can be minimized by:

1. Dividing the large roof areas into smaller ones by proper use of expansion joints.
2. Running the roofing felts in the same direction as the long dimension of the structural deck, to better utilize the strength of the membrane to resist deck movement.
3. Butting the insulation units tightly, and using two layers of insulation with joints broken in both directions whenever possible.
4. Making sure, especially in cold climates, that all components are firmly attached to each other.
5. Fastening the membrane mechanically to wood nailers at the periphery of the roof.

Membrane slippage is becoming more common as a built-up roofing problem

Slippage of the roofing membranes is relative lateral movement between plies. Slippage seldom occurs between the substrate and the roof membrane. When slippage occurs, it results in random, wrinkled appearance and often, if not arrested, will expose the base sheet of the membrane. Slippage can, and has, occurred on decks from almost dead level to steeply sloped, but is more common on roofs with slopes above ½ inch per foot.

Usual contributing causes are: 1) insulated roof membranes; 2) inadequate mechanical attachment; 3) a bitumen having too low softening point; 4) overweight bitumen moppings; 5) overweight aggregate surfacing; and 6) high roof surface temperatures.

Let's consider each of these causes separately:

First, *the insulated roof assembly.* In warm weather insulation causes the membrane to stay hotter for a longer period of time, and may soften the ply bitumens, increasing the opportunity for slippage. In hot climates the designer should specify the use of a higher softening point asphalt than usually, in order to discourage differential movement. It is true that 190-degree asphalt will not weather as well as asphalt with a softening point range between 145 and 155 F on low slope roofs, but it is better to decrease the longevity of the roof than it is to take a chance on the possibility of slippage.

Next, *inadequate mechanical attachment.* It is very important that nailing strips be provided when and as required on non-nailable decks. Where the climate is conducive to slippage of the roofing membrane, the slope limits ordinarily specified should be reduced and nailers used with lower slopes.

The incidence of membrane slippage has increased markedly in the past few years due to changes in the characteristics of the bitumens and to the methods of handling from the refinery or pitch point to the roof. In the case of coal tar pitch, it used to be common for pitch to be used on roof slopes up to and including 2 in. per foot with no nailing required. Today, most manufacturers require that roofs utilizing pitch be back nailed on slopes exceeding ½ in. per foot; and that coal tar pitch not be used on any slope above 1-in. per foot. These changes are due to slippage problems.

Changes in the handling of bitumens have contributed to physical changes in the bitumens which have led to slippage. Today, both pitch and asphalt are often handled in bulk from the refinery to the job site. Heated tankers haul the material in a liquid state to the job or to holding tanks and then to the job. This can cause problems if the bitumen is held at elevated temperatures for a long time, causing chemical changes which lower the softening point of the bitumen. If held for even longer periods of time, it can cause hardening of the bitumen.

Over-heavy bitumen moppings also will often cause slippage, particularly at the inner face between the base sheet and ply felts.

Overweight aggregate can also contribute to membrane slippage. As the aggregate moves toward the low points on the roof, it tends to drag the ply felts with it when the bitumen is in a semi-fluid state.

All of the causes of slippage can usually be avoided by the simple expedient of keeping a membrane cool and these include: 1) reflective coatings; 2) white or gray cap sheets; 3) sprayed or ceramic granules; and 4) white marble ships. In hot climates or areas with intense sun, one of these alternates should be specified.

Another source of trouble in built-up roofing is called wrinkling. Wrinkling of the roofing membrane over roof insulation joints and the joints of some types of deck units is fairly common. This problem is first noticed in smooth roofs as "picture framing" around individual deck or insulation units. Visual examination at this early state usually reveals no discernible ridging of the membrane at the insulation or deck joint. At this state there is nothing visible on a gravel surfaced roof. Wrinkling can, and often does, lead to leakage when the laps of the felt separate and allow water entry. Wrinkle cracking occurs when the felts become fatigued and break. In order to understand this problem it is necessary to understand those characteristics of roofing materials which tend to play a role in contributing to this type of failure.

The first of these characteristics to be considered is the dimensional changes in the roofing felt laminate, particularly organic felts, from changes in temperature and humidity. Studies have shown that organic felt roofing laminates move in response to both temperature and humidity variations. The movement due to humidity change is so great relative to that due to temperature change that it often obscures the thermal effect. We would expect the felt laminate to expand as it is heated, but it contracts as the heat makes it lose moisture.

Inorganic felt laminates show a moderate response to both temperature and humidity. The response to humidity changes is slight compared to the large response for organic felt laminates.

To prevent wrinkling from occurring:

1. Don't use decks or insulation that are susceptible to moisture movement if the building occupancy generates moisture.
2. Insist that materials be dry when received at the job site, that they be kept dry in storage, and that they be kept dry during application.
3. Specify firm attachment of insulation to structural decks. Minimal attachment methods such as cold adhesives contribute to wrinkle problems.
4. Whenever possible, specify that insulation be applied in two layers, breaking joints in both directions.
5. Apply insulation units with long dimension at right angles to long dimension of deck units.
6. Insist that all roof insulation units be applied with joints tightly butted together.

The next problem area is flashings, which cause more difficulties in performance than any of the other built-up roofing elements.

The flashing of metal closures at roof edges causes more problems than any other type of flashing. It is absolutely necessary to raise these metal closures and all other flashings above the highest water level on the roof if trouble is to be avoided.

To avoid flashing problems: 1) connect flashings solidly to the element being flashed; 2) detail the base flashing so that it is always a minimum of 8 in. in height and at least 12 in. in areas of heavy snows; 3) locate flashed joints above the waterline; 4) slope the roof away from the flashing; 5) allow for differential movement; and 6) avoid sharp bends in the base flashing.

Most roofing problems are easy to avoid. The most important elements in avoiding roofing problems are:

1. Proper supervision of the job while the roofing is being installed.
2. Good design to begin with.
3. The proper storage of materials to keep them dry and undamaged.
4. Insistence upon properly installed and properly designed flashing systems.
5. And above all, the elimination of trapped moisture within and under the roof membranes.

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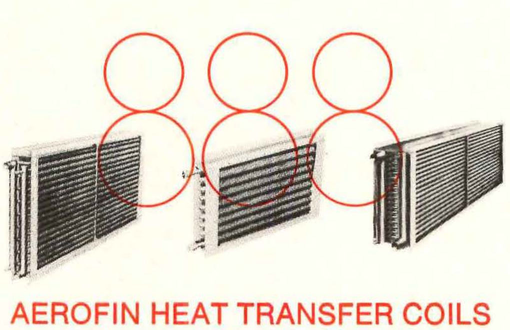

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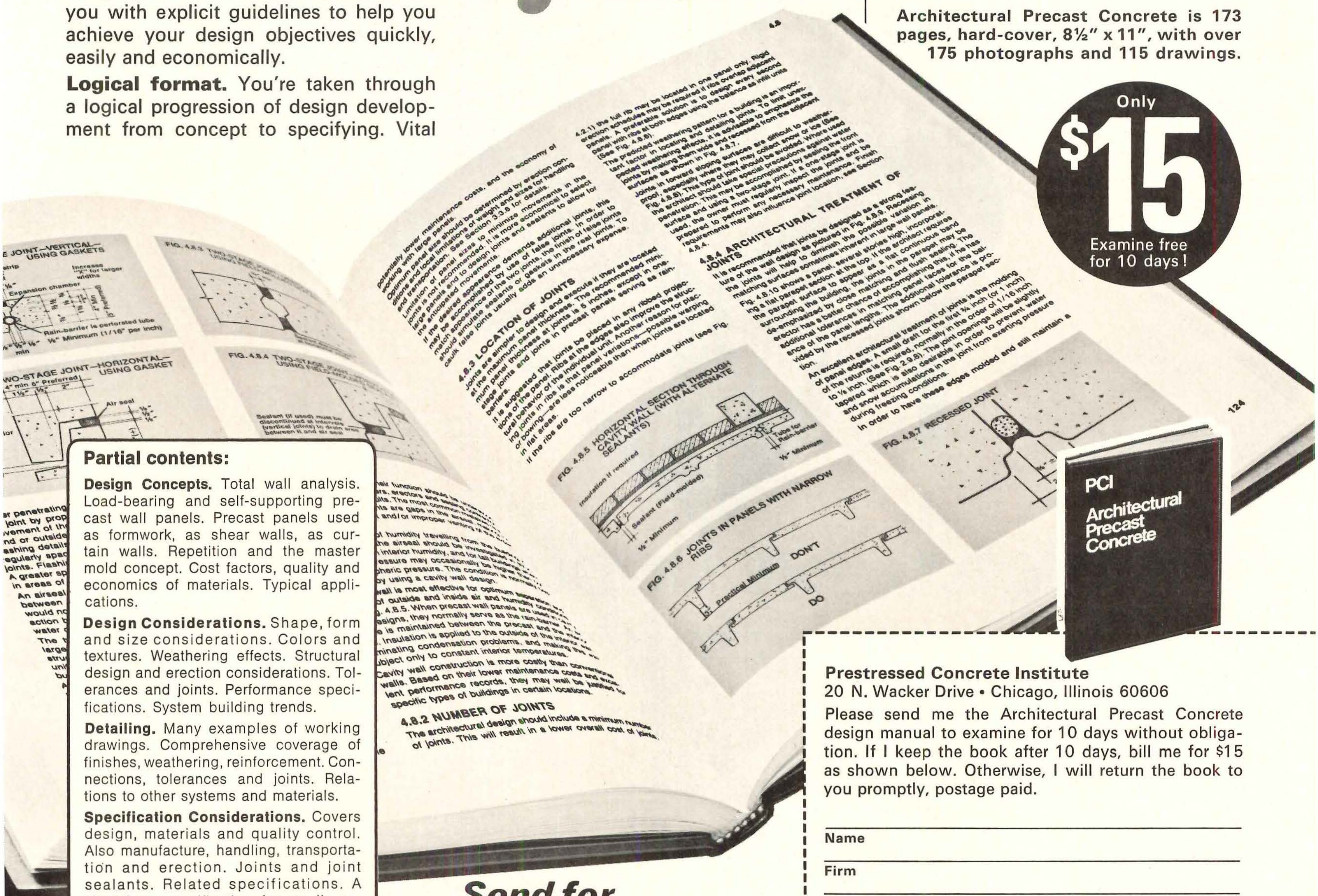

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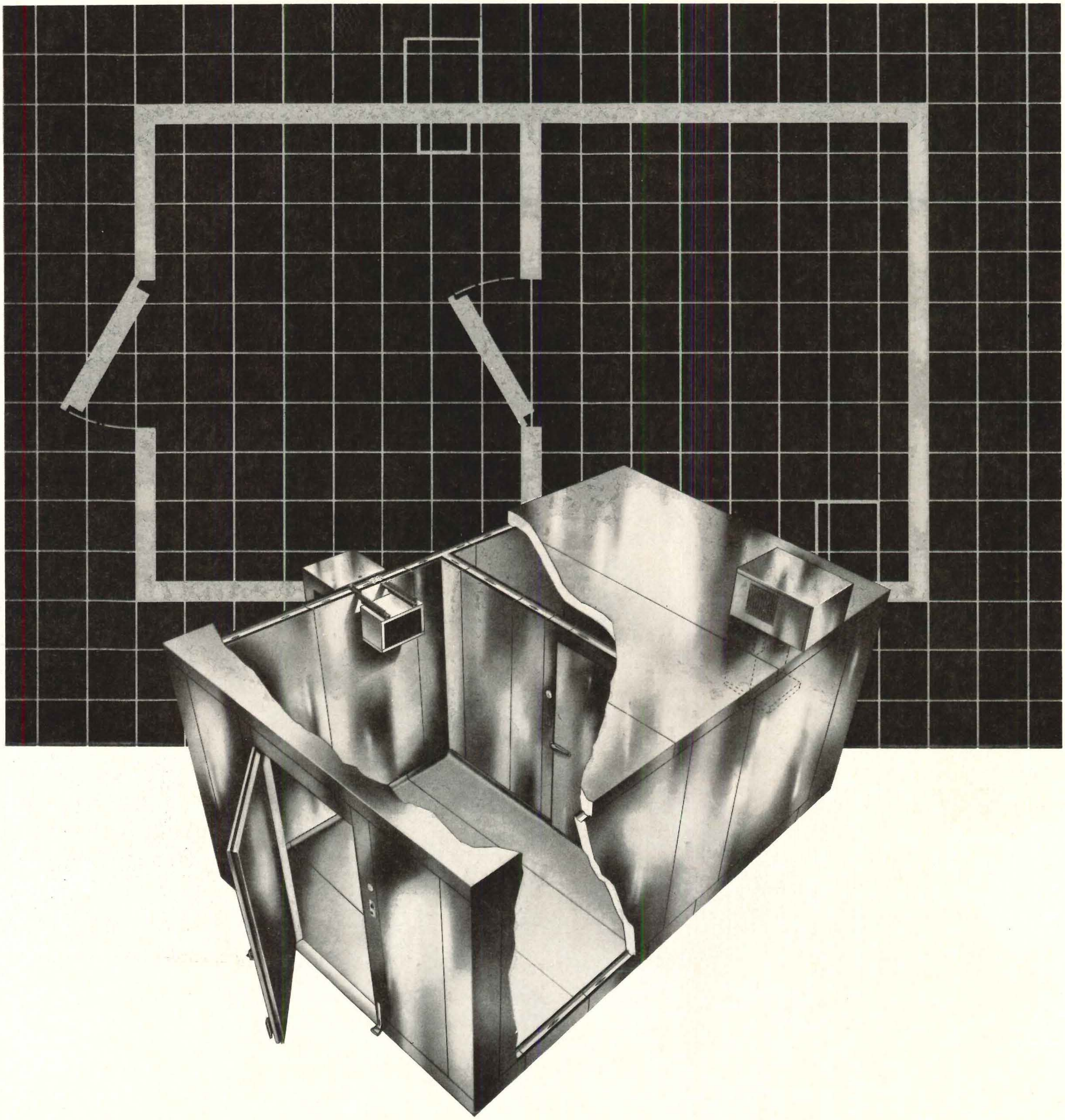

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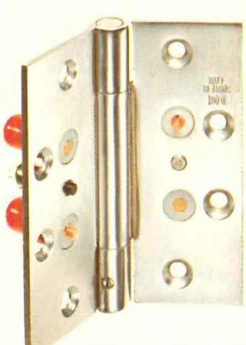

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Molded fiberglass line includes benches, planters, tables and seating

The deep color finish of this line of molded fiberglass furniture is achieved by a polyester gel coat integrally applied during the molding process. The finish, according to the company, is impact-and abrasion-resistant, easily cleaned. Ten colors are available with a wide variety of upholstery materials. In the seating shown, large radius corners are featured. Upholstery is applied over a cushioned wood frame which can be detached from the shell. ▪ Cramer Industries Inc., Kansas City, Kan.

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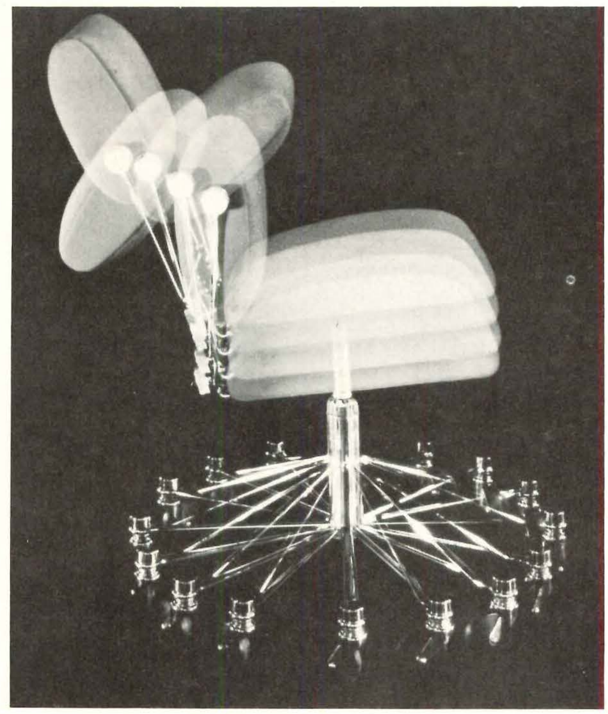

Office chair designed to match anatomical needs

One of three models, this secretarial chair features a back that rotates 360 degrees to any of 40 positions, while adjusting forward and back also. Construction is foam on contoured plywood and all exposed metal is finished in chrome. ▪ Curtis Products Ltd., Cobourg, Ont.

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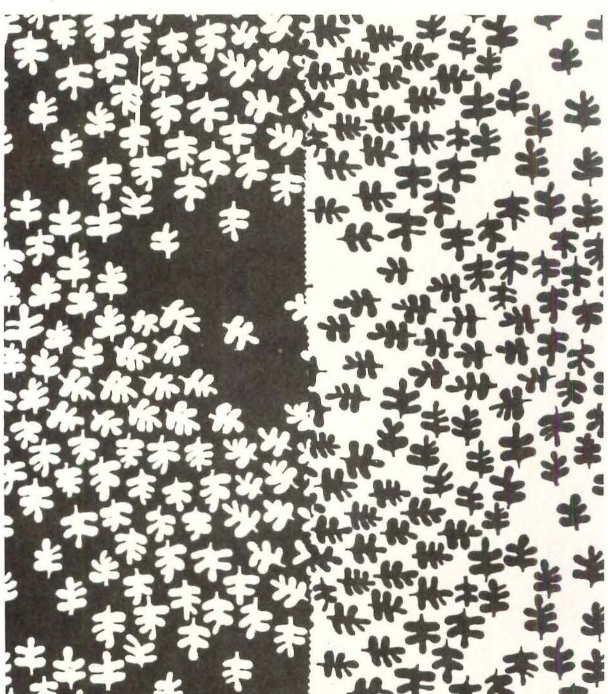
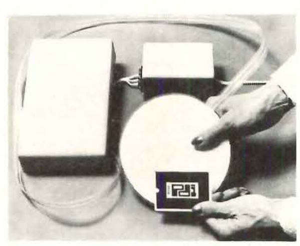


Scandinavian casement designs inspired by nature

These small-scaled designs, part of an environmentally inspired line by Swedish designer Sven Fristedt, are printed on 100 per cent cotton, with approximate 47-in. printed width. In the pattern shown, a positive and negative rendition is available in chestnut on natural, natural on chestnut, saffron on natural, natural on saffron colorways. ▪ Jack Lenor Larsen, Inc., New York City.

Circle 301 on inquiry card



Keyless lock security

Shown here are the components of a system that unlocks doors with the aid of a special card passed near a sensing device concealed anywhere near the door. With no keyhole to be picked or card slot to be jammed, the access system provides no exterior mechanisms at all. Protective circuits prevent electronic tampering, which would set off an alarm. The lock can be changed easily by replacing the coding card. ▪ Schlage, San Francisco, Cal.

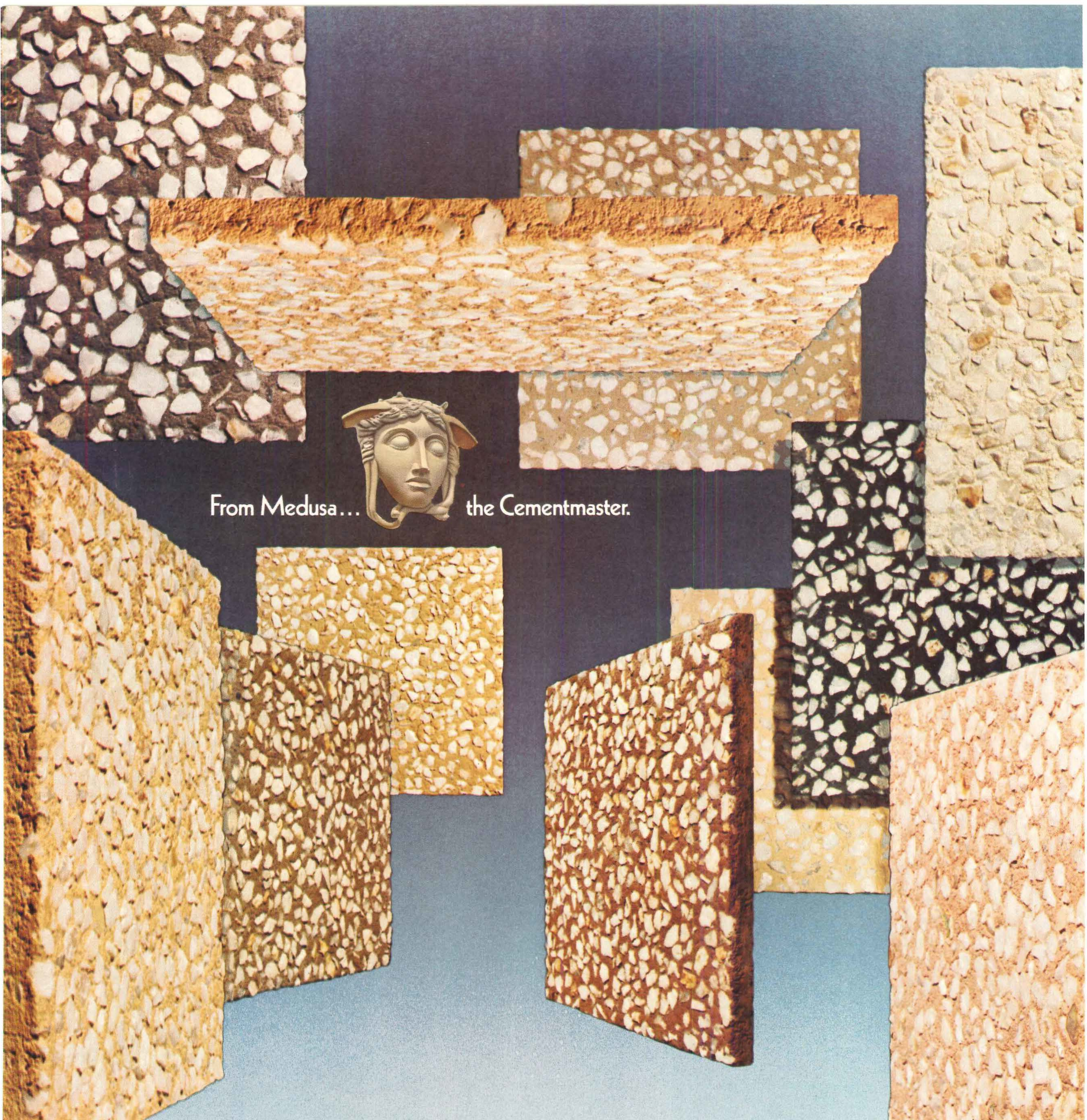
Circle 302 on inquiry card

Steel system for open office is interchangeable

A system of interchangeable components features work surfaces and storage units that can be combined in virtually any combination. A wall storage and filing system in steel is offered, plus a panel system that can be finished in laminate or soft covered. With the storage system, swing or sliding doors are available. ▪ Sunar Industries, Ltd., Toronto, Ont.

Circle 304 on inquiry card

More products on page 183



NOW... FULL COLOR CONTROL IN ARCHITECTURAL CONCRETES

Let your imagination soar with the wide range of color designs now possible with Medusa's new colored portland cements. They offer creative freedom with assurance of color and strength uniformity to the architect and precast producer.

Medusa, the only manufacturer of colored portland cements, invites you to take advantage of the greater design flexibility offered by these ten new colors, plus white. All are pigmented, intermilled white cement base products manufactured under a strict scientific process for maximum color control. Eliminate job site mixing. Select the color you want and know that it will be uniform from start to finish.

Medusa Colored Portland Cements are readily available on order from a midwest and east coast production facility.

Write for our new Colored Portland Cements brochure. Medusa Cement Company, P. O. Box 5668, Cleveland, Ohio 44101.

MEDUSA

MEDUSA CEMENT COMPANY Division of Medusa Corporation

For more data, circle 101 on inquiry card

For more information, circle item numbers on Readers Service Inquiry Card, pages 267-268.

TRASH COMPACTION / The brochure gives full engineering details on the company's models, including suggested trash room layouts and utility connections. Features noted on models include a 24-in. intake throat that prevents trash backup in the chute, maintenance-free power units and high compaction ratios. ▪ Auto Pak, Red Lion, Pa.
Circle 400 on inquiry card

WATER TREATMENT / A pre-packaged water treatment system, called the *Metro-Matic Tower Tender* for automatically controlling the chemical treatment of cooling tower water to keep the tower free from scale corrosion and at the same time provide a backup function is described in a four-page, illustrated bulletin recently issued by the manufacturer. ▪ Metropolitan Refining Co., Long Island City, N.Y.
Circle 401 on inquiry card

GAS-FIRED AIR INTAKE / A bulletin contains technical data on the company's propeller, centrifugal, duct axial and vaneaxial units, including control operating sequence, design and installation options, specifications, accessories, rating tables, and installation weights. ▪ Hartzell Propeller Fan Co., Piqua, Ohio.
Circle 402 on inquiry card

STERILIZER BROCHURE / A cost-savings program for a complete line of sterilizers and autoclaves includes different types and sizes available for hospital, industrial and laboratory use. A concept of reusing the body with all new controls and accessories offers savings up to 40 per cent with a new equipment guarantee, according to the company. ▪ The Hospital Supply Co., Inc., Mineola, N.Y.
Circle 403 on inquiry card

BRASS FITTINGS / The brochure lists the design and functional features of the *Lustra* lavatory, sink and bath/shower fittings. Color photographs illustrate features in the line such as choice of metal and translucent handles and tubular or cast brass spouts on sink fittings. ▪ Eljer, Pittsburgh, Pa.
Circle 404 on inquiry card

PORTABLE MICROFICHE / A compact, portable microfiche reader designed for architectural applications will display on its screen either one "B-size" (11 by 17 in.) engineering drawing, two "A-size" (8½ by 11 in.) drawings side by side, an "A-size drawing and a page of explanatory text simultaneously, or an 11 by 14 in. page of computer output microfilm output. ▪ Visidyne Inc., Burlington, Mass.
Circle 405 on inquiry card

VAPOR BARRIER / A bulletin describing the physical characteristics and Underwriters Laboratories' test results for *Ultralam* vapor barrier, shows that the product is strong and resistant to cold weather cracking. ▪ Stauffer Chemical Co., Westport, Conn.
Circle 406 on inquiry card

PVC WINDOWS / A catalog covers the advantages, technical data and details of *Mipolam* (semi-rigid) and *Trocal* (rigid) PVC windows and doors for building. ▪ Thermal Units, Inc., Pawtucket, R.I.
Circle 407 on inquiry card

PNEUMATIC TUBE SYSTEMS / A 26-page study involving the use of pneumatic tube systems in hospitals includes usage analysis, specialized material handling characteristics of key hospital departments, and methodology for determining the cost/benefit relationship of installing a pneumatic tube system. Available at $5. ▪ Powers Regulator Co., Skokie, Ill.
Circle 408 on inquiry card

HEATING DESIGN / A four-page color bulletin reportedly allows architects, consulting and heating engineers to design radiation directly from technical information contained within its pages. Printed piece illustrates product and application with color photographs, diagrams and charts. Sample specification for electric baseboard radiation outlined; rating and dimensions, maximum circuit loads and wiring information are presented. ▪ Shaw-Perkins Mfg. Co., West Pittsburgh, Pa.
Circle 409 on inquiry card

BALLASTS / A product bulletin describing a line of ballasts specifically designed for use in indoor commercial High Intensity Discharge (HID) fixtures includes complete ordering information, dimensions, weights and wiring diagrams. ▪ Advance Transformer Co., Chicago, Ill.
Circle 410 on inquiry card

DEHUMIDIFIERS / A four-page folder explains the use of dehumidifiers in water treatment filter plants, sewage treatment plants and pumping lift stations. Among the items covered are explanations of the principles of physical absorption and how humidity control saves money, as well as practical guidelines to help estimate dehumidifier requirements. ▪ Bry-Air, Inc., Sunbury, Ohio.
Circle 411 on inquiry card

HOSPITAL CART CONVEYOR / Better patient care through automated supply distribution is the subject of a color brochure outlining the step-by-step description of the equipment and procedures of a specific installation. ▪ Rapistan Inc. Grand Rapids, Mich.
Circle 412 on inquiry card

LAB WATER / A laboratory water purification catalog contains selector tables enabling the user to select from among 240 stills and 39 tanks, the proper combinations. Products in the catalog are a cabinetized still and tank combination for laboratories and hospitals. ▪ Barnstead, Boston, Mass.
Circle 413 on inquiry card

GRAB BARS / A four-page catalog shows a complete line of 15 stainless steel grab bars for institutions, hospitals, clinics, schools gyms, factories, and homes. Styles include urinal, commode, shower and tub bars in type 300 stainless steel. ▪ Trent Tube Div., Colt Industries, East Troy, Wis.
Circle 414 on inquiry card

SURGICAL LIGHTING / A 14-page color catalog, covering a range of surgical lighting systems, is elaborately illustrated with detailed photographs. Designed to meet the needs of modern surgical practice, these lights can be personalized to meet specific requirements. ▪ Americal Sterilizer Co., Erie, Pa.
Circle 415 on inquiry card

More literature on page 197

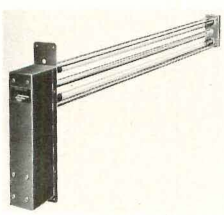
WHEEL CHAIR FOUNTAIN / The unit conforms to new laws regarding Federally-constructed or leased buildings. The unit is furnished with wall hanger and comes with drain and trap assembly. Unit is constructed of 18-gauge nickel-bearing stainless steel and is designed for minimum splash. ▪ General Electric Co., Chicago Hts., Ill.

Circle 305 on inquiry card

WHEEL CHAIR LAVATORY / This sanitary vitreous china fixture features an anti-splash rim, concealed front overflow opening, plus a contoured front that is 1¾ in. lower than the back of the lavatory so patients can use the large basin without stretching. Available with either combination or centerset fittings. ▪ Eljer Plumbingware, Pittsburgh, Pa.

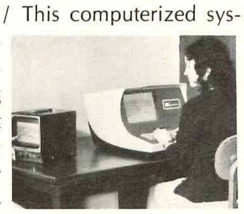
Circle 306 on inquiry card

BACTERIA CONTROL / Up to 99.9 per cent reduction of bacteria microorganisms, viruses, yeast and mold spores in air intake or exhaust duct systems is claimed with this product. Uses germicidal ultraviolet tubular lamps. ▪ American Ultraviolet Co., Chatham, N.J.



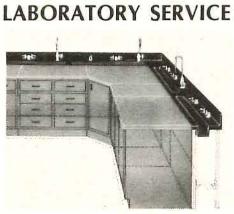
Circle 307 on inquiry card

HOSPITAL ADMITTING / This computerized system enters, stores and retrieves inpatient, outpatient and pre-admitting data for long term patient identification. The system can tie in with existing or planned hospital information systems. ▪ Medelco Inc., Schiller Park, Ill.



Circle 308 on inquiry card

LABORATORY SERVICE STRIP / This epoxy resin service strip provides in both freestanding and wall mounted types, gas, electrical, plumbing, oxygen and similar service lines, in addition to waste. If desired, a continuous integral waste trough can be supplied. ▪ The Durion Co., Inc., Dayton, Ohio.



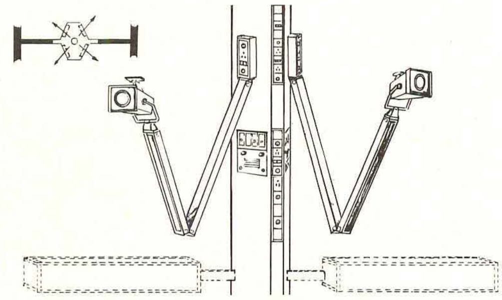
Circle 309 on inquiry card

FOOD SERVER / A food service delivery system keeps food hot and cold in the same tray for up to 1½ hours without mechanical equipment. ▪ Aladdin Synergetics, Inc., Nashville, Tenn.

Circle 310 on inquiry card

WALL SYSTEM / Fifteen-inch, 30-in. and 60-in. modules can be freely arranged and rearranged. This system is custom manufactured for contract projects, in selected woods and veneers. Complemented by a series of free-standing desks and credenzas. ▪ Stow/Davis, Grand Rapids, Mich.

Circle 311 on inquiry card



MEDICAL LIGHTING / With a vertical console system to service two beds, or four back-to-back, this system extends from floor to ceiling so risers can be introduced anywhere for electrical, mechanical and plumbing connections. Provides in a single unit all needed services for patient care, according to the company. ▪ Lumeco, Chicago, Ill.

Circle 312 on inquiry card

More products on page 187

BRUNSLON® is flying high with architects and specifiers. Come fly with us.

Ask architects and specifiers. When the job calls for carpeting, the specs call for BRUNSLON® static-control yarn in the carpet construction.

BRUNSLON rates high for lots of down-to-earth reasons. It's America's #1 static-control system, and the best choice you can make for your clients. Over 50 million square yards of carpeting with BRUNSLON have been specified and installed. And only BRUNSLON comes in such a wide choice of carpet lines—over 300 lines of contract and residential carpeting, in all colors, patterns, fibers. So, let your fancies take flight.

For more reasons why BRUNSLON is the specifier's top choice, send for Ben Franklin's Hero Kit. It's packed with information for architects and specifiers about carpeting, static, and static-control.

Be a Hero. Send for Ben's Kit. And when you specify, insist on BRUNSLON. It's the only way to fly.

For more data, circle 106 on inquiry card

AR-9

BRUNSLON®
static-control yarns

BRUNSWICK CORPORATION
TECHNICAL PRODUCTS DIVISION

One Brunswick Plaza, Skokie, Illinois 60076

☐ O.K. Show me how to be a Hero to my Clients. Send me Ben Franklin's Hero Kit.

☐ I hear you've got a fascinating Audio-Visual Presentation on BRUNSLON. I'd like to see it.

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Company____________________

Address____________________

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Stress-Spun® Concrete Light Poles.

Stress-Spun concrete poles offer a beautiful solution for street and area lighting installations which must conform to the environment.

Whether to blend with architectures, landscapes or luminaires, there is a Stress-Spun pole in a design and color to meet your needs. Colors are not just skin deep; they go all the way through. Their polished, texturized surfaces consist of attractive hues that improve with age.

Stress-Spun concrete poles have great density and strength to resist the elements and to minimize vandalism. Their good looks remain care-free.

They are available in popular mounting heights with interior wiring raceways, plus a choice of bases, including pre-cast foundations for fast, economical installation.

Beauty, durability and economy—three reasons why you should specify and install Stress-Spun concrete light poles.

Call or write: Union Metal Manufacturing Co., P.O. Box 8530, Canton, OH 44711. Phone (216) 454-6111.

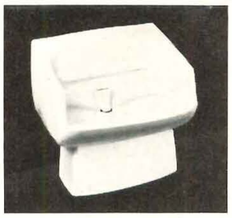
We've got what it takes!

American Concrete

Division of Union Metal MANUFACTURING COMPANY

For more data, circle 107 on inquiry card

SITZ BATH / For the aged, infirm and post-operative patients, arm chair comfort is offered in this vitreous china perineal sitz bath, featuring sanitary concealed water circulation slots, plus a china overflow that can be removed when maximum drainage is required. ▪ Eljer Plumbingware, Pittsburgh, Pa.



Circle 313 on inquiry card

FOOD CART / The cart, according to the company, accelerates smoothly as it moves into the lift, then decelerates to a gentle stop at the pre-selected floor. No special training is needed to operate the system. ▪ Security Fire Door Co., St. Louis, Mo.

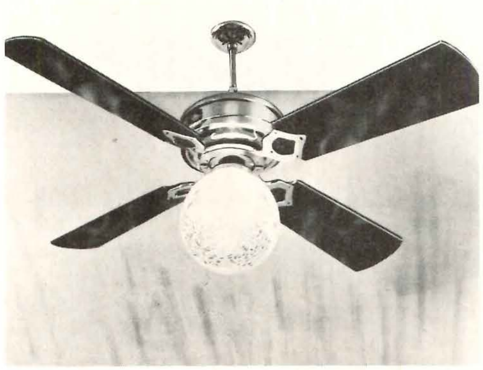
Circle 314 on inquiry card

HEALTH CARE SEAT / Included in the line are arm chairs, geriatric rockers and articulating chairs that adjust to the patient's seating posture. Fire-retardant fabrics and protective finishes are combined with structural durability and comfort for prolonged sitting. ▪ Nemschoff Chairs, Inc. Sheboygan, Wis.

Circle 315 on inquiry card

COCKTAIL TABLE / A supersize cocktail table designed by Lella Vignelli measures 51-in. square with 6-in. thick columns of stainless steel, joined by double steel rods, across which sits a plate glass top. Height, 15 in. overall. Available to architects and designers. ▪ Brueton Designs, New York City.

Circle 316 on inquiry card



FANLIGHT / A polished chrome version of this classic ceiling fan is offered with smoked *lucite* blades. Applications include homes, restaurants, hotels and other institutions. ▪ A & G Machinery Corp., Oceanside, N.Y.

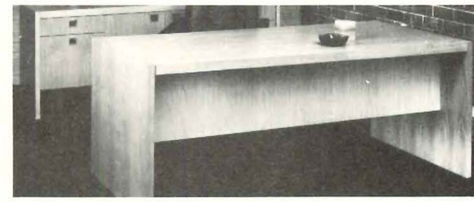
Circle 317 on inquiry card

LATERAL FILES / Choosing from a range of 3-, 6-, 9-, 12- and 15-in. deep drawers and shelves, the user can install any combination which equals the overall interior height of the case. In addition to the 60-in. unit, the company offers cases with 15-, 24-, 36-, and 48-in. interior heights. Widths of 30-, 36-, and 42-in. are available. ▪ Steelcase Inc., Grand Rapids, Mich.

Circle 318 on inquiry card

OAK DESK / The company is introducing an oak version of its *1000 series* executive office furniture. Shown is the *107F* desk with a 9-in. overhang recess. On the opposite side are three storage drawers in the left pedestal and a deep file drawer for legal or letter filing in the right pedestal. At rear is the service unit which has a file drawer, storage drawer and hinged door cabinets with shelf. ▪ Myrtle Desk Co., High Point, N.C.

Circle 319 on inquiry card



More products on page 191

This man makes it easy to put Heatilator factory-built fireplacing in your plans.

He's the Heatilator Man—the fireplacing expert. An experienced specialist prepared to help you take best advantage of Heatilator fireplacing simplified. It's easy, economical and competitively favorable to factor this important amenity into your homes and apartments.

Your Heatilator Man will show you how to work fireplacing into your plans—help you select the right type for your needs, and determine the best installation procedures.

He'll have the facts on fireplace economics, too—increased cash flow, increased sales and rental profits, and higher loan values.

He can show you any type of fireplace—built-in, wall-hung and free-standing—woodburning as well as gas. All may be set anywhere in any room, right on a wooden floor, against combustible wall materials—no masonry foundation required.

Call collect (319) 385-3198 for fireplacing assistance from your Heatilator Man. He'll help you factor fireplacing simplified into your plans and leave behind a useful Fireplace Planning Guide. Heatilator Fireplace, A Division of Vega Industries, Inc., 3393 W. Saunders St., Mt. Pleasant, Iowa 52641. Also available in Canada.

See Catalog in Sweet's Architectural and Light Construction File.

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AMERICA'S LEADING FIREPLACE SYSTEMS


Built-in wood or gas fireplacing.


Wall-hung gas fireplacing.


Free-standing wood fireplacing.

For more data, circle 109 on inquiry card

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.

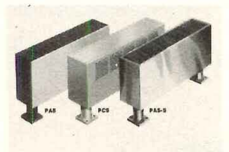
ENKALURE II. NO NYLON HIDES SOIL BETTER.

ENKA

For more data, circle 111 on inquiry card

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

PEDESTAL HEATERS / *PCS* commercial series heaters can be mounted on or embedded in flooring material, leaving a minimum of 2¼-in. clearance between the floor surface and bottom of heater.



Heater bodies are made of 16-gauge steel to resist scuffs, scrapes and unusual abuse. The manufacturer claims the pedestal heaters are particularly suitable for air, rail and bus terminals, auditoriums, meeting centers and expansive lobbies and foyers. ▪ Berko Electric Mfg. Corp., Michigan City, Ind.

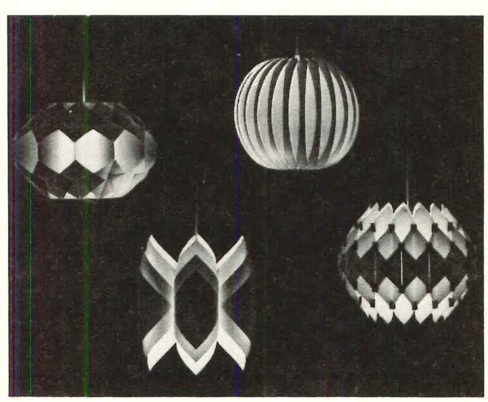
Circle 320 on inquiry card

INDUSTRIAL HUMIDIFIER / Designed for applications where the maintenance of proper humidity level is necessary for comfort of personnel or to protect supplies, this unit features an evaporation rate of 50 gallons per day at 72 degrees F. The unit is 19½ in. high. Other features are automatic operation, corrosion-resistant construction, and ease of service. Completely factory-assembled and pre-wired. ▪ Lau Inc., Lebanon, Ind.

Circle 321 on inquiry card

TABLE GROUP / The *Solar Table Group* featuring a curved triangular tub pedestal base comes in round, rectangular or square shapes in a multitude of top patterns and colors. Exceptional strength and stability of the graceful pedestals are obtained through the utilization of a 2¼-in. triangular steel column. Adjustable leveling glides on all tube columns compensate for uneven floor conditions. ▪ American Seating Co., Grand Rapids, Mich.

Circle 322 on inquiry card



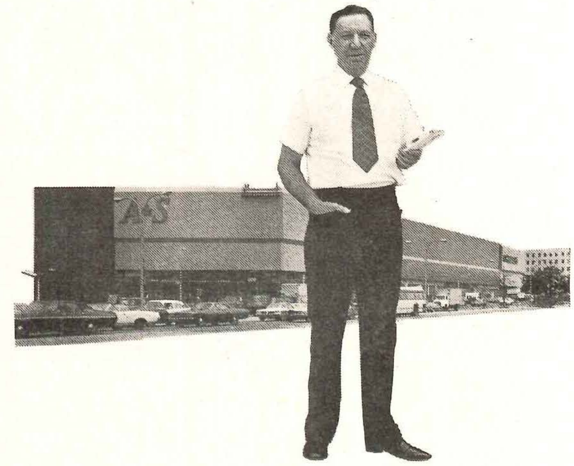
LIGHTING / The company is importing a line of contemporary shades designed by the Danish designer Lars E. Schioler and manufactured in Copenhagen. Four different electric sets, a table lamp and an adapter for existing table or floor lamps are manufactured in the U. S. Twelve styles of shades in five colors are offered. Combined with the different electric sets the company can offer 120 different fixtures, 120 different swag lamps, 60 different table lamps and 60 different shades. ▪ House of Dansk, Ft. Lauderdale, Fla.

Circle 323 on inquiry card

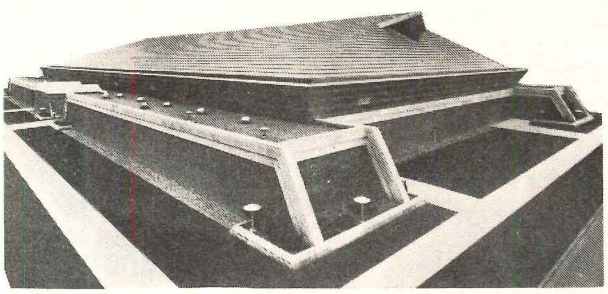
Fred Munder, one of the east coast's leading roofing and sheet metal contractors, talks about DUROFLASH:

"Ever since we started in business in 1895, we've been keeping up with the latest product innovations.

Such as DUROFLASH®, Republic Steel's stainless roofing and flashing material. We've been using it since it was introduced a little over six years ago.



We used it here as flashing.



And it has been used as a complete roof system on many other structures. To the great satisfaction of architects and builders . . . and roofers.

No springback. Duroflash is dead soft. You can form it by hand if you want.

No change in color. Less fluctuation in price. And it lasts a lifetime.

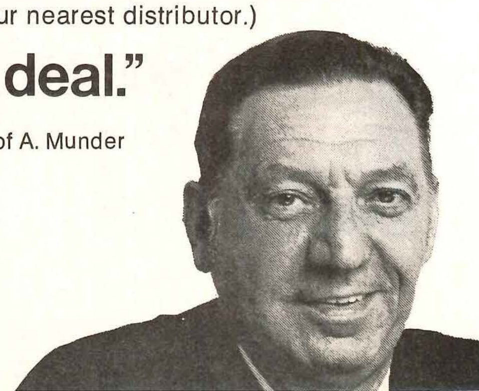
You can get Duroflash in sheet form or in convenient 100 pound coils from most distributors.

And it's backed by America's leading producer of stainless steel . . . which, to me, means consistent quality and service after the sale.

And Republic makes all kinds of data available." (Write Republic Steel, Cleveland OH 44101 for Information Kit and the name of your nearest distributor.)

"Take it from me, DUROFLASH is a good deal."

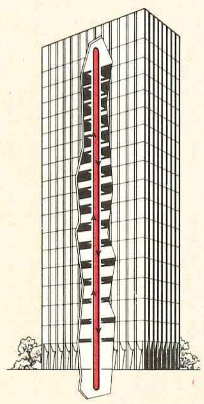
Fred Munder is president of A. Munder & Son, New York N Y



Republicsteel

For more data, circle 114 on inquiry card

RECORDLIFT®



The Recordlift is an automated, selective vertical conveyor. It rapidly moves mail, records, books and supplies in office buildings, libraries, hospitals.

Pre-addressed trays, moving at speeds up to twelve per minute, may be received by or sent from every floor.

Seven tons of material—or more, depending upon the Recordlift model and tray size—may be dispatched from a single station in just one hour.

Each Recordlift station is quietly independent, with its own drive motors and solid-state control pack. There is no mechanical linkage with the main drive chain.

Pads dampen vibration. Tray cars move in and out on small wheels, synchronized by silent proximity switches in the shaftway.

At the bottom, a large maple take-up guides the chain smoothly around the bend.

We tell the whole Recordlift story in our new eight-page brochure. Write Standard Conveyor Co., 815 No. Second St., North St. Paul, MN 55109.
Or call (612) 777-8171.

Ties the floors together.

For more data, circle 115 on inquiry card

New...from Eljer—62 pages of modern hospital/institutional plumbingware

You won't notice much change from the hospital fixtures of yesterday unless you look at this Eljer catalog. The Eljer line is different, modern. Smooth, flowing contours provide generally unbroken surfaces, remarkably free of difficult-to-clean nooks and crannies. From every standpoint — appearance, functional design and highest quality, the Eljer line of hospital and commercial fixtures is in keeping with any modern building, from a corner gas station to a large medical center.

Don't specify another commercial job until you have the full Eljer story. Eljer's new 62-page Hospital/Institutional catalog contains all you need to know about hundreds of modern, freshly-styled and easily-installed specialized fixtures and fittings.

Sitz baths and scrub-up sinks . . . specimen toilets and instrument trays . . . and much more, including wrist-, knee-, and pedal-control valves. Like the rest of the complete Eljer commercial line, they are available through independent plumbing supply wholesalers.

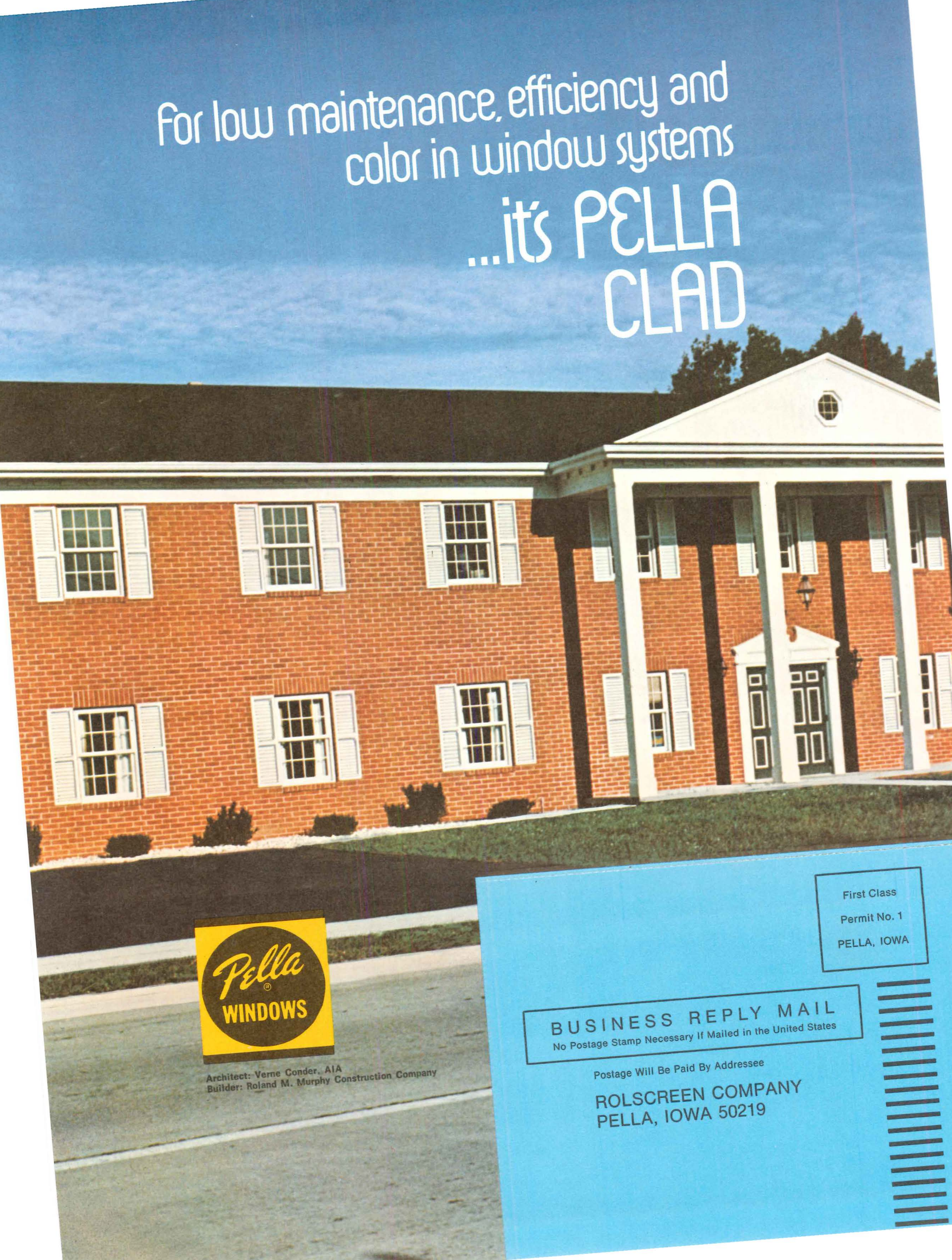
So, before you specify your next commercial job, ask your Eljer wholesaler for information on the complete Eljer line, or write today for the new Hospital/Institutional catalog: Eljer, Dept. AR, 3 Gateway Center, Pittsburgh, Pa. 15222.

ELJER®

Eljer Plumbingware Division
Wallace-Murray Corporation

For more data, circle 116 on inquiry card

For more data, circle 117 on inquiry card



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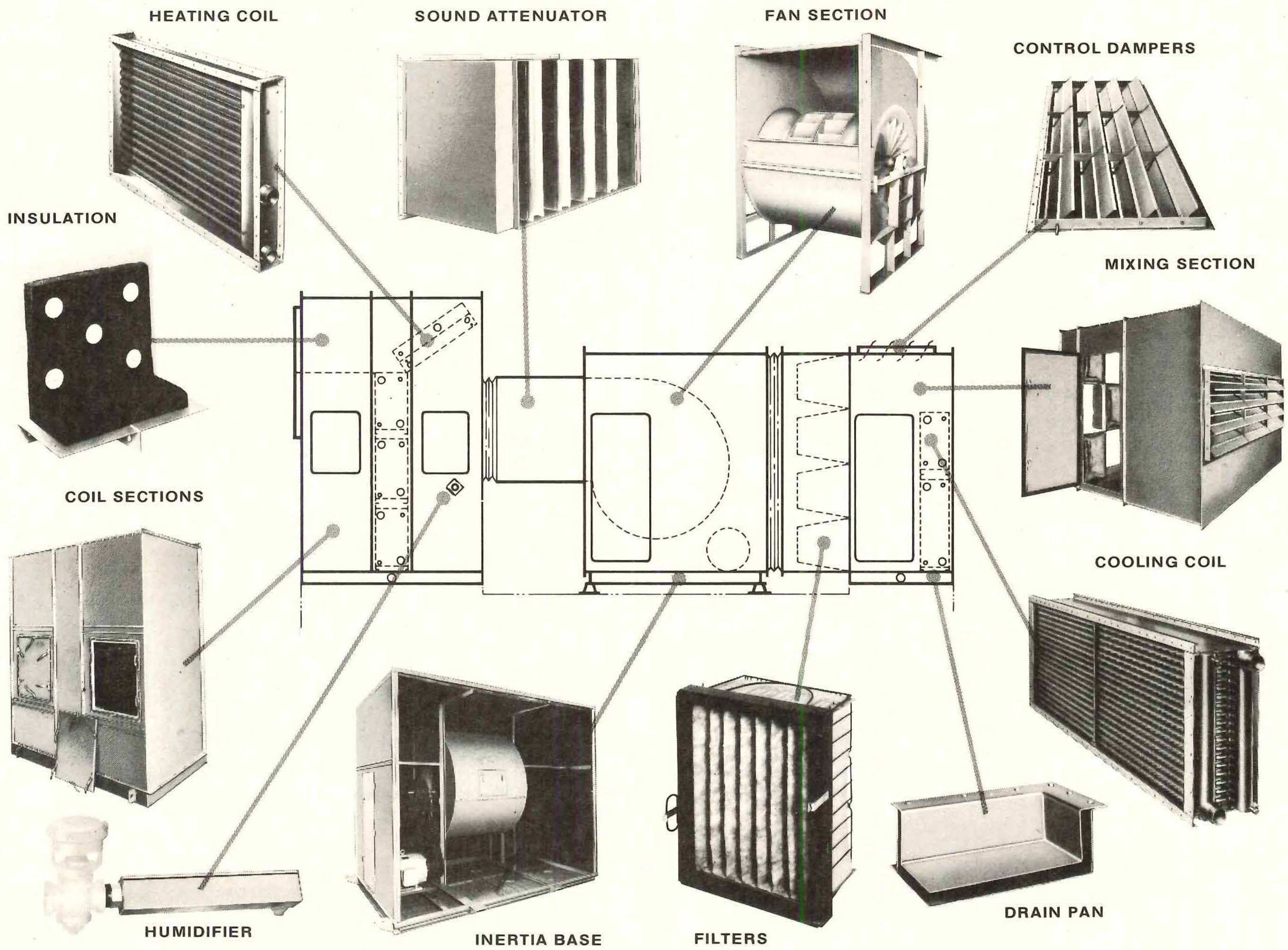
now the advantages of a built-up system with the economies of factory fabrication



it's 'Buffalo's' MODEL "J" air handling systems

You have a pretty good idea what results you want from the air handling system. Right? Question is, how to get the correct components quickly — easily — at the right price.

Buffalo's new Model "J" Air Handling Systems are the answer. Without a doubt, this system provides you with the most comprehensive choice of components available in a factory fabricated package. Best of all, these components are cataloged in a way that maximizes your specifying effort. This precise cataloging also gives you and the others on the building team complete control of the Air Handling System. And your Buffalo Sales Engineer has detailed pricing information so he can give you a quote when you need it. The end result—the right system at the right price.

To really appreciate what this new system can mean to you, spend a few minutes with a Buffalo Sales Engineering Representative. He's listed in the Yellow Pages of the business center near you. Or, request Bulletin AC-100.

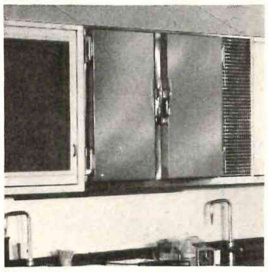
Air Handling Division, Buffalo Forge Company, Buffalo, New York 14240. In Canada: The Canadian Blower and Forge Co. Ltd. *Air Handling Equipment • Finned Coils • Centrifugal Pumps • Machine Tools.*

"Buffalo" **BuffaloForgeCompany**

For more data, circle 119 on inquiry card

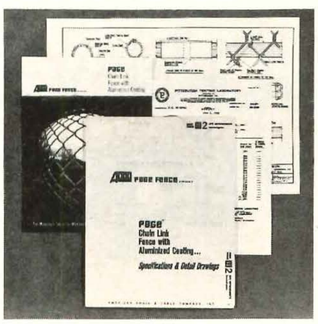
AE/UPDATE

A classified advertising section devoted to helping architects and engineers keep up to date on building product manufacturers.



EYE-LEVEL LAB REFRIGERATORS WITH MODULAR COMPATIBILITY fit flush with existing or planned casework to achieve a clean, uninterrupted line of design. Stainless steel throughout, exteriors can be finished to your specifications. Model illustrated, 30"H x 54"L x 13"D, has a 6.6 foot capacity. Blower coil cooling system with condensate evaporator and accumulator eliminates need for drain. Explosion-proof interior available. Easily serviced from front. Write: Jewett Refrigerator Co., Inc., 2 Letchworth St., Buffalo, N.Y. 14213.

For more data, circle 120 on inquiry card



FREE FENCE SPEC KIT saves time, trouble. Invaluable for planning chain link fencing. Kit includes drawings on styles, wire gauges, gates, fittings, framework. Also includes lab reports, work sheets and specifications. Page® aluminized fabric lasts 3-5 times longer than the best of galvanized. Send for your kit today. Page Fence Division of Acco. P.O. Box 430, Bridgeport, Conn. 06602.

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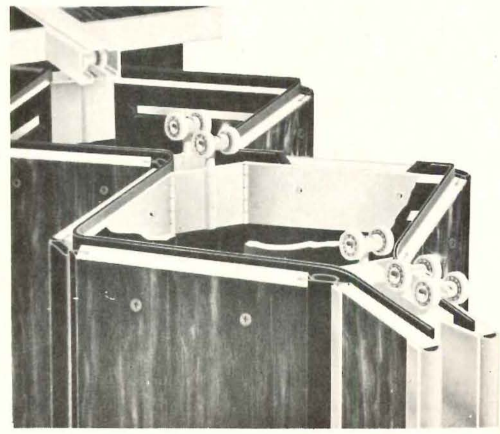
SONICWAL®



STC 40 in WOOD

Wouldn't you rather control sound with wood folding partitions? You can now...with Twin Panel Sonicwal®. Panelfold has the better way.

PANELFOLD DOORS AND PARTITIONS
10710 N.W. 36th Avenue, Miami, Florida 33167
SEE US IN YOUR SWEET'S FILE 10.3 Pa.

Panelfold

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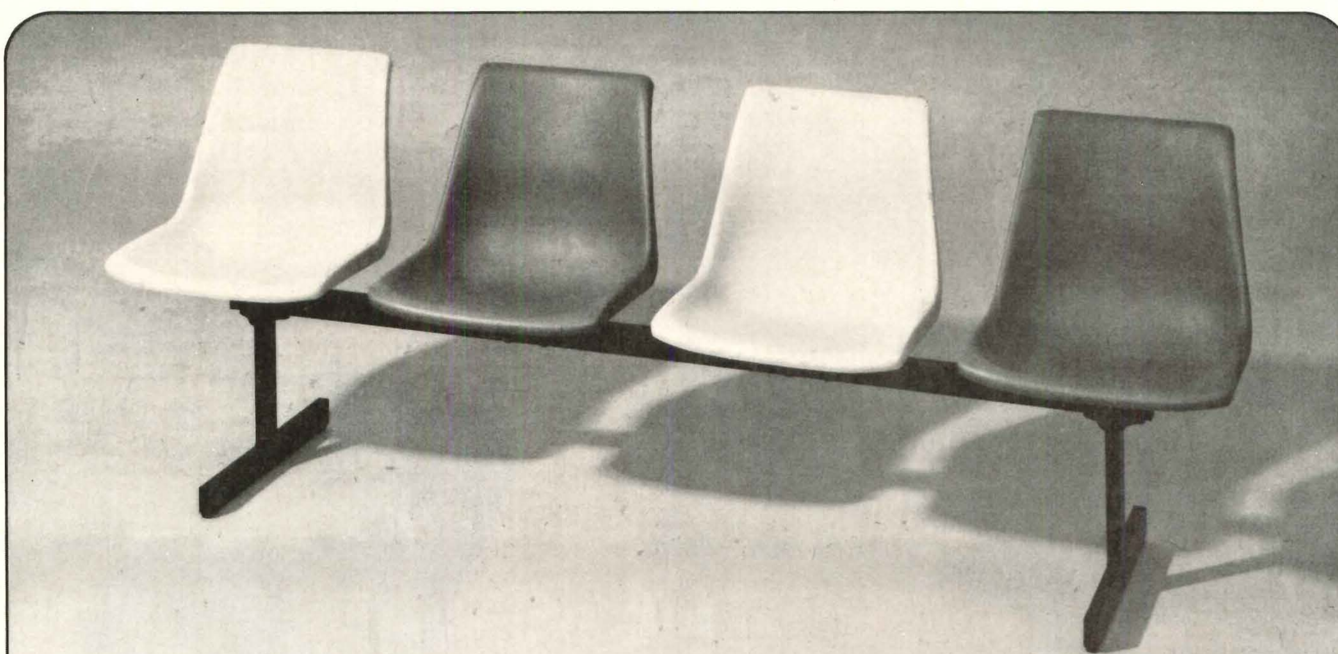

More design potential than any other line...

KRUEGER MODULAR SEATING

Choose from 6 sturdy, comfortable shell designs, ranging from modestly priced polypropylene to luxuriously upholstered fiberglass. Select from 4 base styles. Add the versatility of interchangeable tables, ganging, corner units, infinite lengths, and a spectrum of colors. Now you know why Krueger Modular Seating has more design potential than any other line. Write for brochure.

krueger

Green Bay, Wisconsin 54306 414/437-3245

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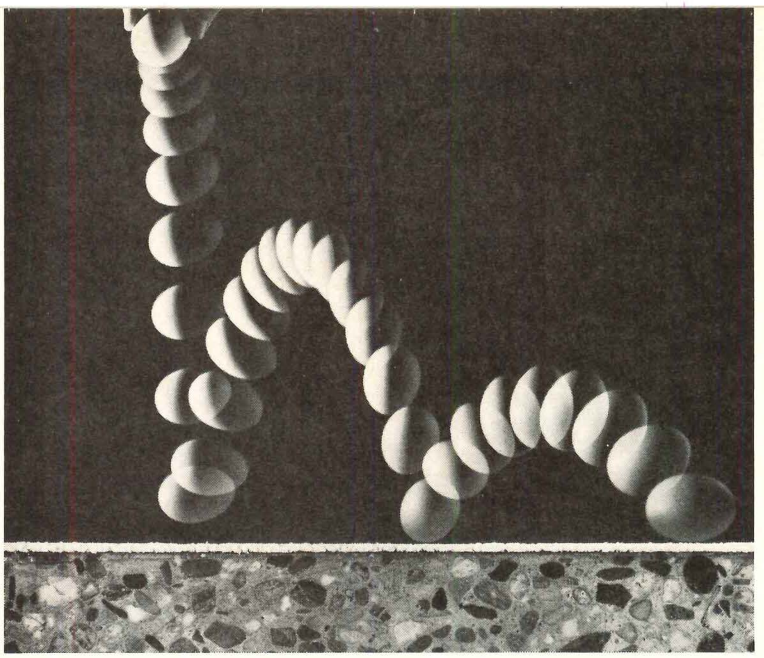
Chicago (312/467-5255) • Dallas (214/823-4183)
Houston (713/222-1408) • Denver (303/534-6060)
Los Angeles (213/272-0301)

For more data, circle 123 on inquiry card



Stroboscopic photograph shows bounce of a fresh egg dropped from 20 inches onto concrete cushioned by 0.30 inch commercial style pneumacel.

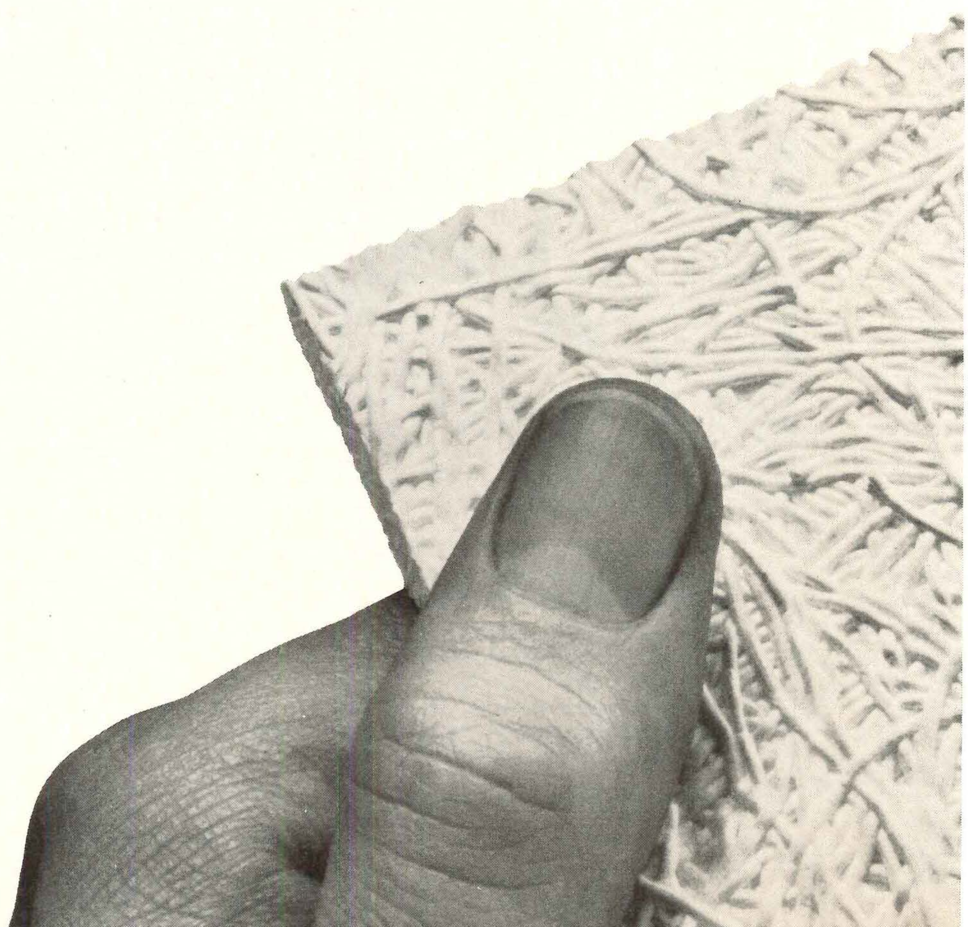
Du Pont polyester pneumacel* is a first.

It is a cushion like nothing you've ever experienced.

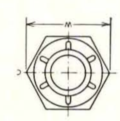
Even an egg dropped on it bounces. Yet the heaviest traffic doesn't bottom.

This is because pneumacel cushion contains billions of closed cells. Each cell is pneumatic—pressurized with an inert inflatant and air. The result is a springiness that cannot be fully compressed.

This bounce introduces a from Du Pont. And a unique

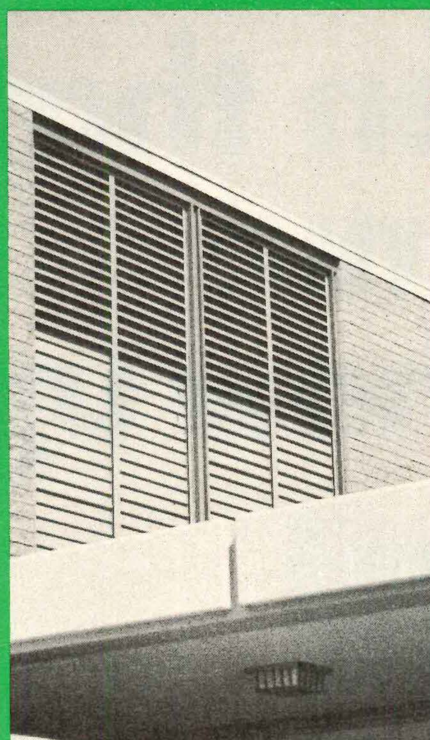


*Pneumacel is the generic term for pneumatic cellular polymeric cushioning material.



Something New from Smith

LOUVERS...a Complete Line for Commercial and Industrial Applications



- **THE RIGHT LOUVER TO SUIT YOUR NEEDS**
  Fixed Louvers, Operating Louvers, Mechanical Equipment Enclosures, Sun Control . . . vertical or horizontal . . . standard units custom-fitted to your application.
- **MODERN STYLING IS COMPATIBLE**
  SMITH Louvers are designed for installation into wood, masonry or metal. A wide range of architectural colors and finishes offers harmony or pleasing contrast.
- **STURDY, LONG-LASTING CONSTRUCTION**
  Extruded from aluminum alloy, SMITH Louvers are designed to withstand wind and weather buffeting. Heavy-duty frames hold the blades firmly. Available with bird and insect screens.
- **FUNCTIONAL PERFORMANCE**
  Controlled ventilation, protection against the elements, privacy, aesthetics . . . SMITH Louvers add to the efficiency and beauty of any commercial, institutional or Industrial building.

24 PAGE LOUVER CATALOG contains detail drawings, complete information on design, fabrication, features and specifications for fixed louvers, operating louvers, mechanical equipment enclosures and sun control. Photos show typical installations. Free area tables and performance data chart are included. Also has data on protective finishes and coatings available. Ask for Catalog 106.

SINGLE RESPONSIBILITY

SMITH systems approach

- TECHNICAL CONSULTING SERVICE
- SALES ENGINEERING
- CUSTOM ENGINEERING
- RESEARCH & DEVELOPMENT
- MANUFACTURING
- COLOR COATING
- SHIPPING & JOB SITE STORAGE
- FIELD ERECTION
- FIELD SUPERVISION
- CENTRAL COORDINATING

SMITH'S Single Responsibility concept is the Systems Approach to solving your metal wall problems. It's a complete system . . . from the earliest Architectural/Engineering contact to placement of the final product fastener on the job site. SMITH Sales Engineers are specially trained to estimate and submit quotations, provide assistance in specification writing and detail suggestions. SMITH engineers design the products to suit your specific project. The material is color-coated and fabricated by SMITH personnel . . . erected on the job site by experienced SMITH erection crews.

Specify SMITH Single Responsibility for your next building project. For full details and specifications, consult Sweets Architectural File or write.

EGS 109

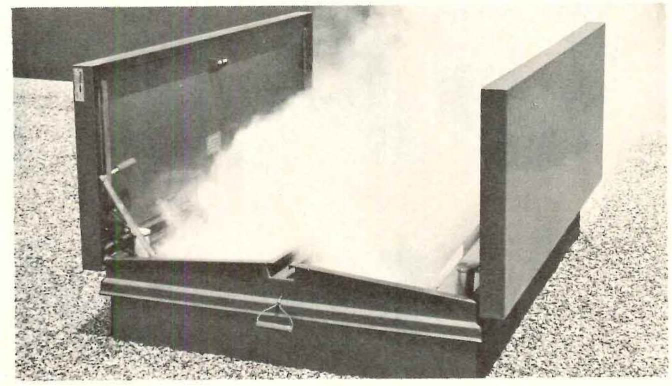
cyclops CORPORATION

ELWIN G. SMITH DIVISION

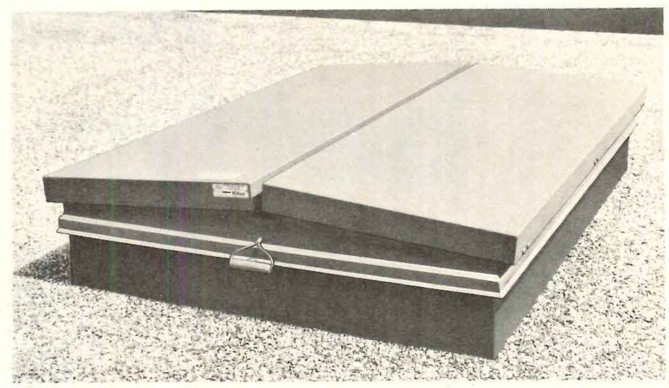
100 WALLS STREET, PITTSBURGH, PENNSYLVANIA 15202

For more data, circle 126 on inquiry card

The Bilco Automatic Fire Vent.



When you need it, it works.



When you don't need it, it still works.

There are two requirements for an automatic fire vent. It must work in an emergency. It must work when there is no emergency.

Bilco Automatic Fire Vents do both. Our exclusive patented Thermolatch™ mechanism* is foolproof in an emergency. It is equally foolproof at other times, preventing the covers opening accidentally due to vibrations within the building or high winds (often accompanied by torrential rain). Bilco Vents work to protect a building and its contents **all the time.** They are gasketed, insulated, ruggedly built and carry our guarantee of proper operation.

Write for out booklet, "Automatic Fire Venting Guide" that makes it easy for you to determine vent size and spacing. It also points out the importance of automatic venting and why Bilco Vents offer your clients the soundest possible value in this type of emergency equipment. Value your clients can measure in terms of reliability and long, trouble-free service.

Eight standard sizes with UL and FM lables. Special sizes to order

*Normally actuated by fusible link. Also available with easily resettable electric operator for actuation by smoke detector or other emergency device.

Since 1926. Building our reputation for products that satisfy.

Bilco® DOORS FOR SPECIAL SERVICES

The Bilco Company, Dept. AR-93, New Haven, Connecticut 06505

Manufactured in Canada by: Richards-Wilcox of Canada, Ltd., London, Ontario

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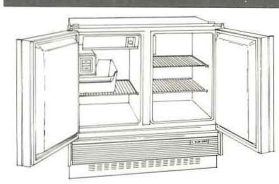


As you can see, you can't see our built-in refreshment center very easily. We designed it to blend into your decor. 6 cubic feet of refrig/freezer/icemaker.

Write for info on model 801 and our full line of built-in refrigeration for the home.

SUB-ZERO

Box 4130 Madison, Wis. 53711

For more data, circle 128 on inquiry card

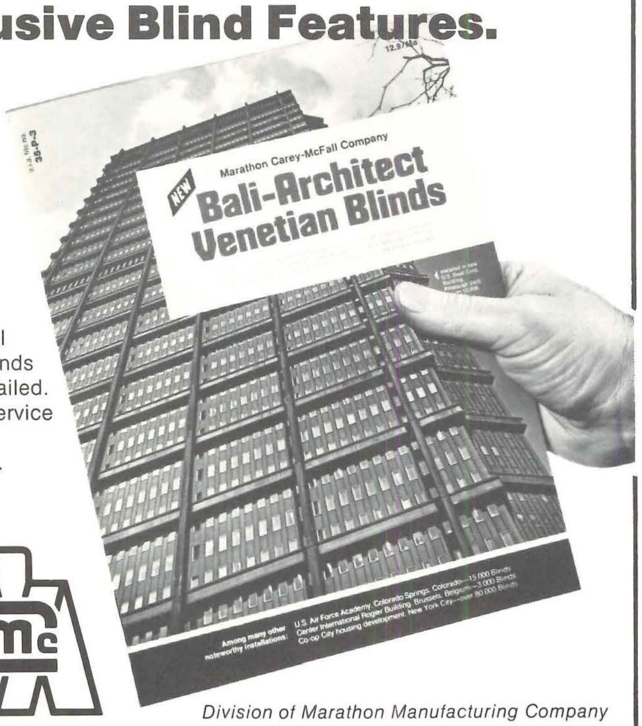
Seen this *Sweet's Insert ?

If not, write for your special copy today. It details Bali-Architect's many impressive

Exclusive Blind Features.

*Architectural and Interior Design files

Our famous Betsy Ross conventional Venetian Blinds are also detailed. Sales and service available nation-wide.



Division of Marathon Manufacturing Company

marathon carey - mcfall company

2156 E. DAUPHIN ST. • PHILADELPHIA, PA 19125

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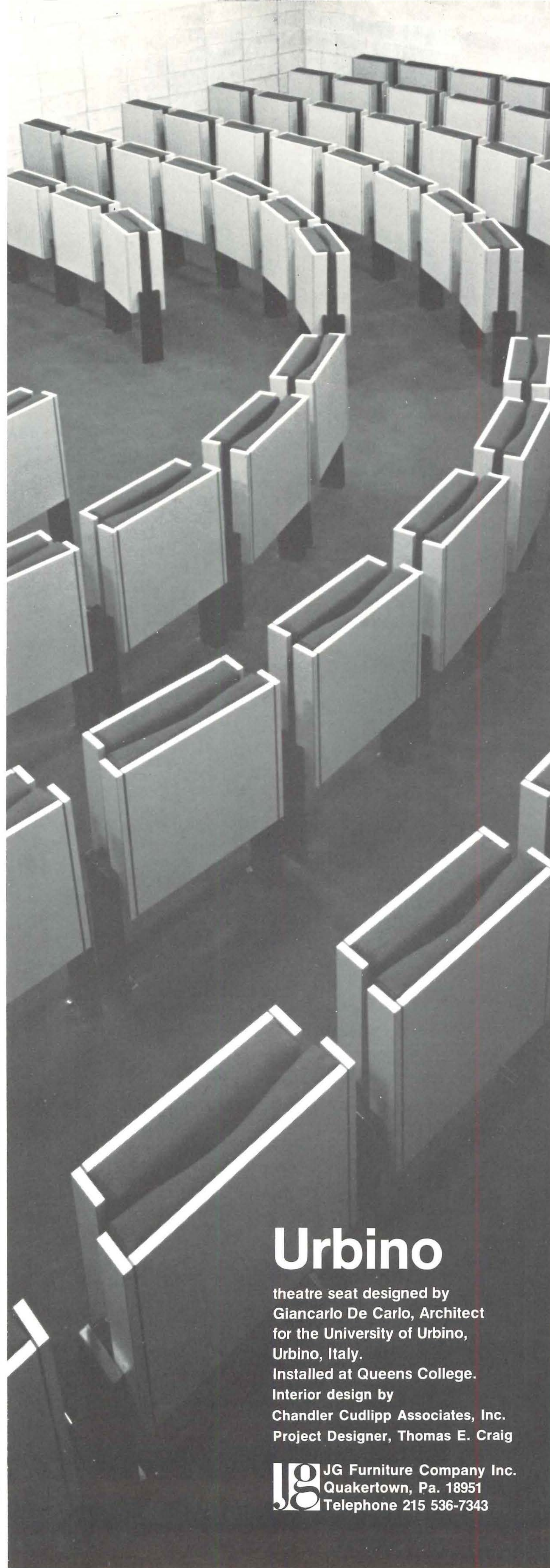
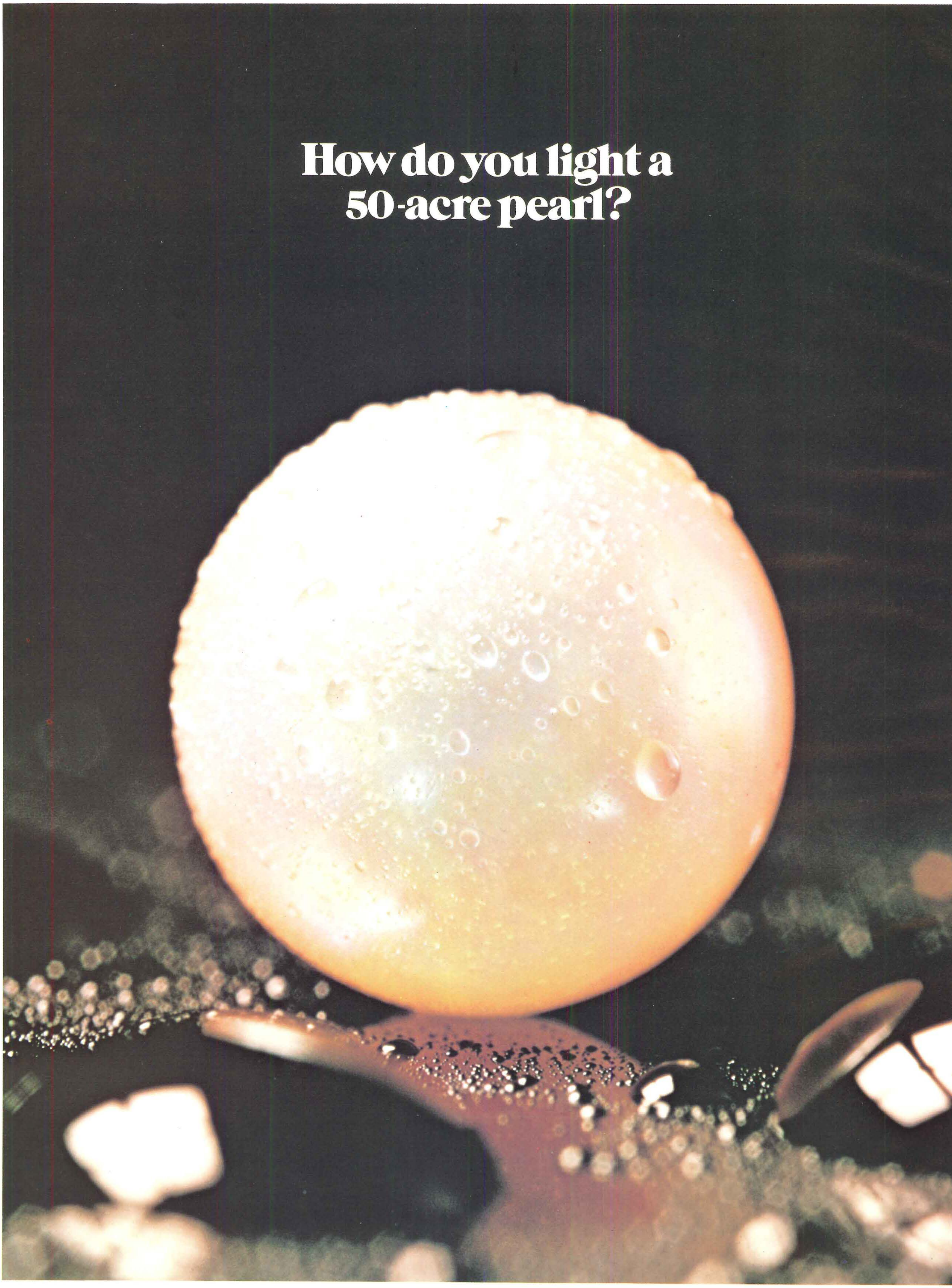
For more data, circle 131 on inquiry card



Urbino

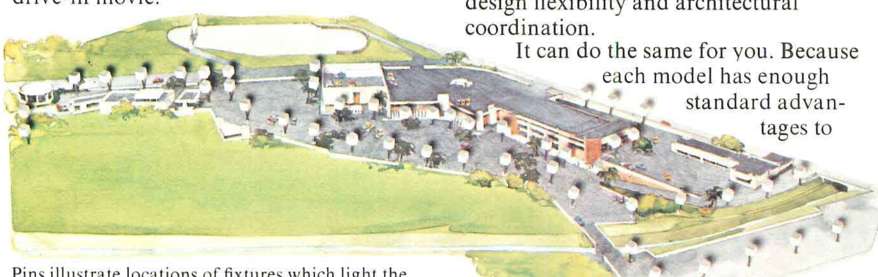
theatre seat designed by
Giancarlo De Carlo, Architect
for the University of Urbino,
Urbino, Italy.
Installed at Queens College.
Interior design by
Chandler Cudlipp Associates, Inc.
Project Designer, Thomas E. Craig

JG Furniture Company Inc.
Quakertown, Pa. 18951
Telephone 215 536-7343


How do you light a
50-acre pearl?

Wide-Lite sized up the perfect solution for Hawaii's Pearl Ridge Mall.

You'll find Honolulu's new marketplace in the heart of a residential development, and across the street from a drive-in movie.



Pins illustrate locations of fixtures which light the main parking area and buildings.

So, highly directional lighting is a sure requirement for what will be one of the world's largest shopping centers when completed.

But how do you light a 50-acre pearl for dramatic effect, while maintaining an uncluttered appearance, in addition to keeping light from spilling into outlying areas?

Try the Spectra Series for size.

It takes only 88 Spectra I, II and III fixtures (more about our other Spectra models later) to light the buildings with a minimum of three footcandles and the parking area with a minimum of one footcandle.

Three different light sources including metal halide, high pressure sodium and quartz are inside selected fixtures. A special timer controls the sources so that each evening the pearl is bathed in a different color and intensity of light—thus giving it a surprisingly new appearance for returning shoppers.

To keep the pearl uncluttered, the main parking area is lighted from the perimeter. Every luminaire has a satin white baked enamel finish to complement the overall decor.

And, to keep light in its place, selected Spectra fixtures have louvers at angles of 20°, 45° or 60°, depending on location.

The Spectra Series can suit you.

Honolulu's new shopping center is one example of how Spectra allows for design flexibility and architectural coordination.

It can do the same for you. Because each model has enough standard advantages to make customizing a simple, low-cost procedure should you need it.

Here are some:

Spectra I is designed for shopping center parking lots, plazas and fairgrounds. It spreads uniform illumination over more than an acre; is available in models for four 1000 watt, four 400 watt or two 1000 watt high intensity discharge lamps; and may also be ordered with any combination of embossed glass and ribbed aluminum panels.

Shown clockwise from top right: Spectra I, Spectra II, Spectra III *low wattage*, Spectra III *high wattage*, Spectra IV and Spectra VII.

Spectra II projects smooth, uniform lighting in a 360° pattern and also comes in models specifically designed for street lighting applications. It's available for use with 100 to 1000 watt mercury vapor lamps; 400 and 1000 watt metal halide lamps; and 400 watt high pressure sodium lamps.

Spectra III has an exclusive adjustable reflector which allows light to be aimed vertically without moving the fixture. It's designed for building facades and general floodlighting; can be pole, wall or ground mounted singly or in multiples of 2, 3 or 4 on matching Spectra poles; is available for use with lamps ranging from 100 to 1000 watts; and comes in two styles.

Spectra IV is our wall washer. It installs directly to walls without auxiliary mounting brackets; is available for use with 250 and 175 watt mercury vapor lamps; and is the final touch of elegance to installations where design and continuity is important.

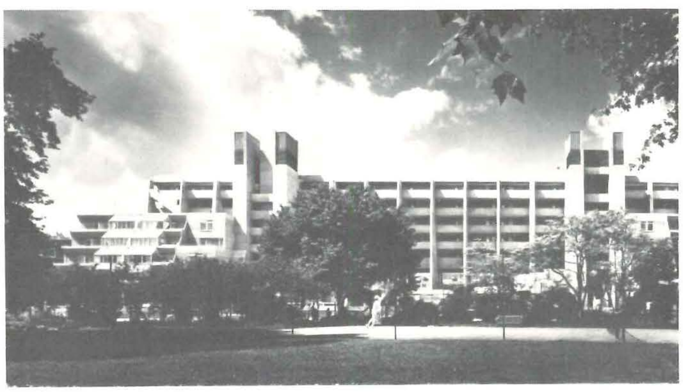
Spectra VII is our newest addition. It's ideal for shopping centers, airports, or anywhere rigid light control is important. All light is confined below the horizontal plane when it's mounted lens down (an optional mounting bracket allows other positions). It may also be mounted singly or in multiples, and is available for use with 400 and 1000 watt lamps.

All Spectra luminaires are available in golden bronze as well as four optional finishes: terra cotta, slate blue, avocado and dark bronze.

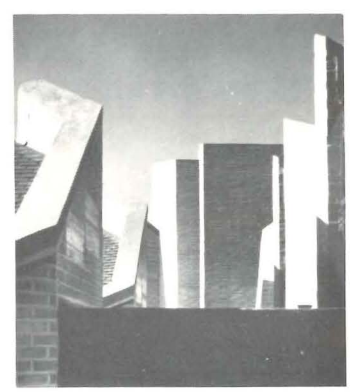
Need to size up an outdoor or indoor lighting situation? Call your Wide-Lite* representative in the Yellow Pages, under Lighting.

Wide-Lite®

P. O. Box 191, Dept. AR-1122-9/73
Houston, Texas 77001
Also manufactured in Australia, Belgium, Canada, Mexico and Great Britain
A company of the Esquire Lighting Group
*Trademark of Wide-Lite Corporation




19



ceramic
Summitstones...
creative walls anywhere...imagine that!

Summitstones . . . the extruded ceramic wall tile with the handcrafted 'look'. The perfect "size" for creativity . . . they're as "wide" as your imagination and as "deep" as your desire for sparkling versatile beauty . . . for walls everywhere. Available in 2"x4", 4"x4", 3" hex and LaVinchy contour . . . in 18 color ranges from earth tones to brilliant brights. You'll want the full story . . . ask your ceramic tile contractor/dealer or write . . .

Summitville® TILES, INC.
SUMMITVILLE, OHIO 43962
Member: Tile Council of America, Inc./Producers Council

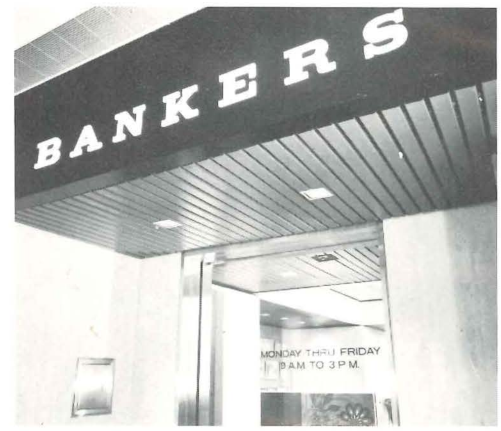



Last year, we invited architects to look into the new Alcan Planar Aluminum Ceiling.

Here are some of the R.S.V.P.'s

Harvard School of Design
Cambridge, Mass.
Architects: John Andrews, Anderson, Baldwin
Toronto, Canada

Southfield Athletic Club
Southfield, Mich.
Architects: Rosetti Associates
Detroit, Mich.



Bankers Trust Company
New York, N.Y.
Architects: Shreve, Lamb and Harmon
New York, N.Y.

KLM Terminal at J.F.K. International Airport
Long Island, N.Y.
Architects: Liebowitz and Budova
New York, N.Y.

IBM Classroom
Poughkeepsie, N.Y.
Architects: IBM

University of Wisconsin Education and Science Building, Madison, Wisc.
Architects: Durrant, Deininger, Dommer, Kramer & Gordon; Watertown, Wisc.

Architects and contractors are using the crisp, colorful, "floating" ceiling system by Alcan to create a whole range of new interior (and exterior) effects. And because the system has no size limitations, "monumental" ceilings are already well represented in the first year's case histories. But whatever the scale, you'll find Alcan Planar Aluminum Ceilings beautiful, functional, durable, and simple to install.

Write for details and we'll rsvp with full color literature and spec's. Address
Alcan Building Products
4519 Mahoning Avenue
Warren, Ohio 44483.

ALCAN ALUMINUM

ALCAN

Listed in Sweets and Spec-Data.

For more data, circle 134 on inquiry card

For more data, circle 135 on inquiry card

the new washroom:

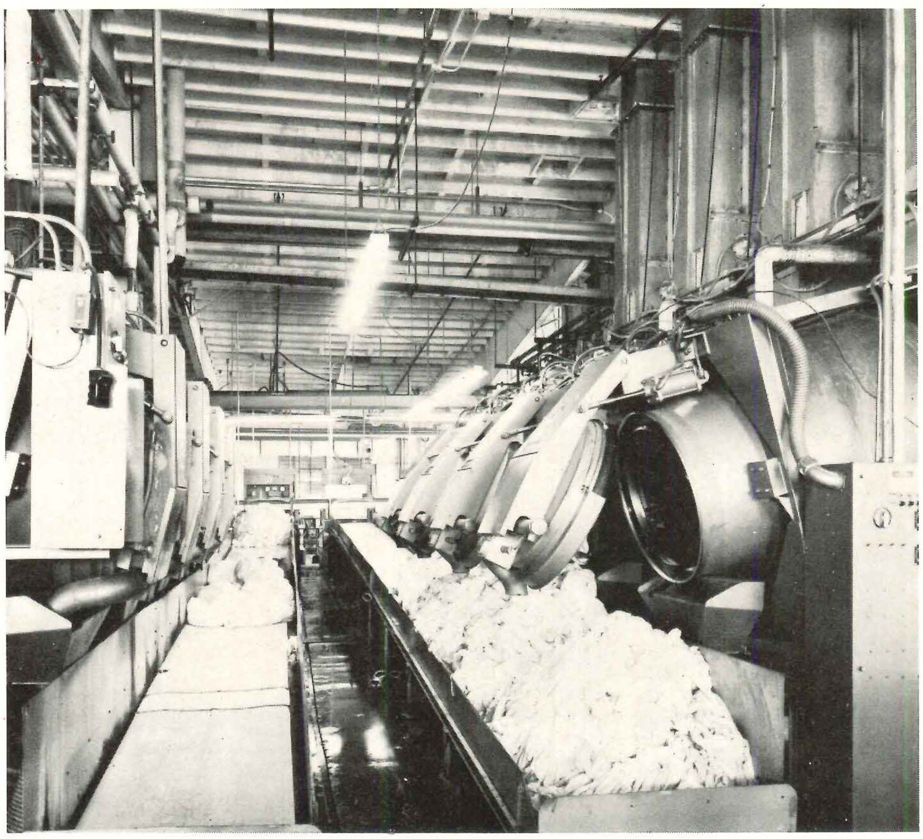
How do you meet the demands of space, traffic flow, maintenance and budget in today's new washroom?

Bobrick helps with a "Total Design Concept" of coordinated stainless steel washroom accessories and laminated plastic toilet compartments for every type of building.

In this washroom, Bobrick recessed multi-purpose units combine large capacity soap and towel dispensers with two soap valves, serving two lavatories. Large capacity stainless steel waste receptacles reduce maintenance time. Bobrick "flush-front" laminated plastic toilet compartments and matching counter tops complete this up-to-date washroom.

To help you plan today's new washroom, send for our Planning Guides and Catalogs. Bobrick, Architectural Service Dept., 101 Park Ave., New York 10017. Bobrick products are available internationally.

bobrick SINCE 1906



Today's modern laundry needs to be uniquely adaptable to change. It should be able to handle cottons or the new synthetic fabrics. Or both. It should be adaptable to increase in the size of work loads. And, considering rising labor costs, it should be automated.

In planning laundries to meet these conditions you can count on qualified help from American.. Having long ago recognized the need for new, more versatile and more productive types of laundry equipment, American now leads the field in producing the kind of machinery that satisfies these requirements. And this equipment is now proving itself in many new laundry operations today. The system pictured here is a typical example.

Let us help you with complete floor plans, equipment recommendations, flow diagrams, capacity and personnel data — anything you need to provide the most efficient facility for this purpose.

Put American's forward thinking to work for you. Just write American at the address below.

Plan your laundries with a leader.

AMERICAN LAUNDRY MACHINERY
a McGraw-Edison Company Division

5050 Section Avenue, Cincinnati, Ohio 45212

For more data, circle 136 on inquiry card

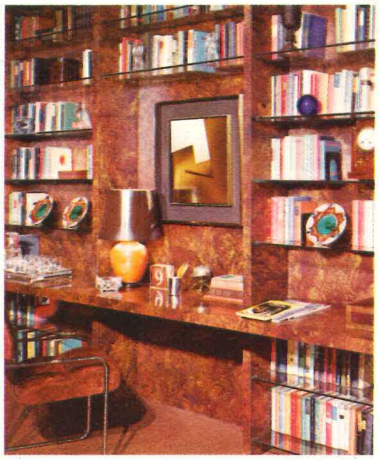
Today you can build a better shopping center

Westinghouse central air conditioning turns the worst hot weather days into the best shopping days. Our complete line of rooftop units includes the right size and type for your building. We also make a broad line of central-station air conditioners featuring unique Westinghouse centrifugal chillers. Outstandingly simple, small and quiet.

Westinghouse vapor lamp lighting makes everything look great. Mercury vapor lamps have come indoors in stores across the country. Why? In addition to long life, high efficiency, and compact size, Beauty-Lite™ lamps provide pleasing color characteristics for products, displays and people.

Westinghouse

Bewitching bronze.


Room designed by Louis Tregre, F.A.I.D.

Bronze Tableau from Formica. It's classic, contemporary, mysteriously timeless. Its uniquely dimensional surface invites your touch. Its warm earthen tones complement both casual and formal interiors.

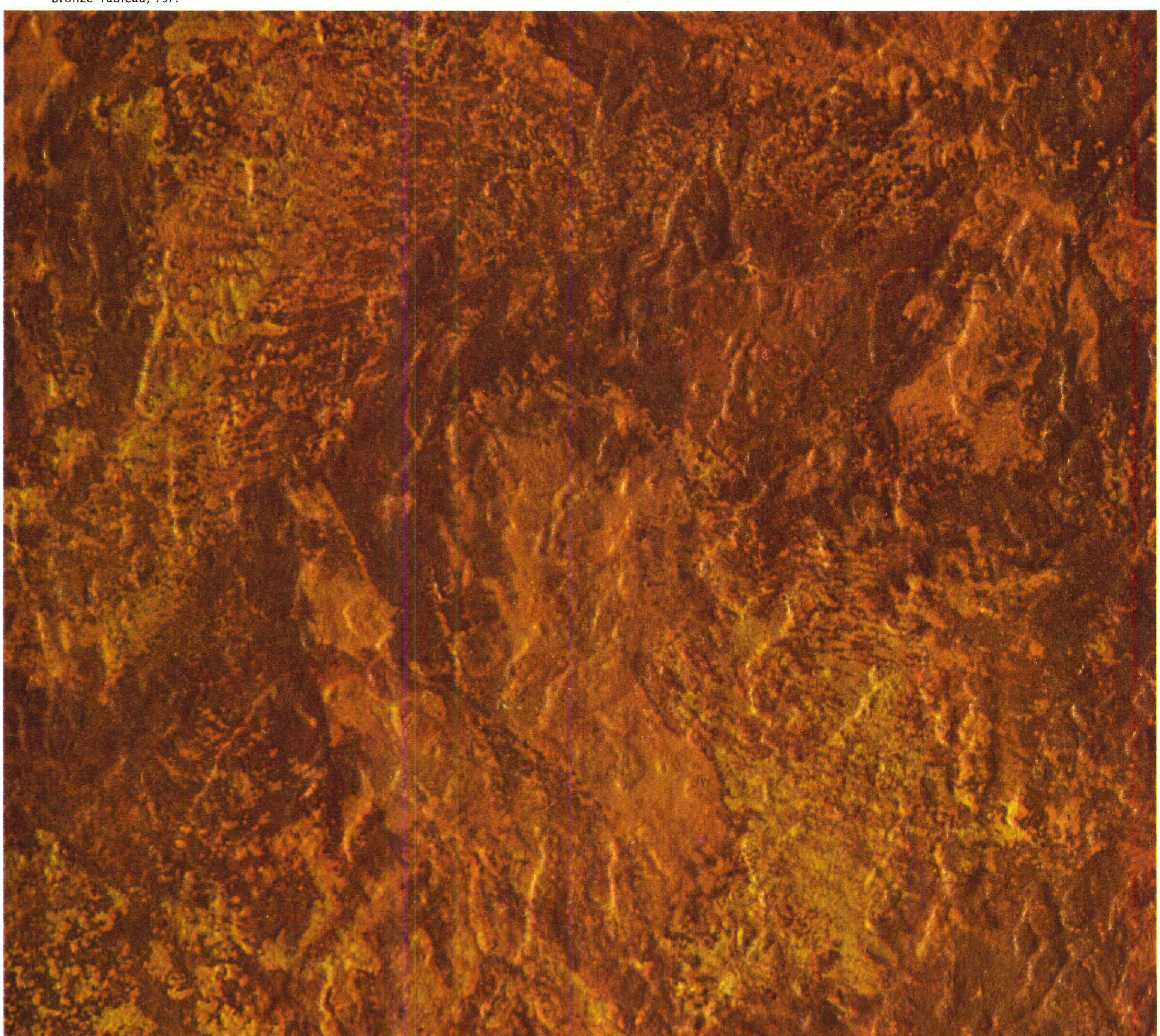
Louis Tregre utilized the practical beauty of Bronze Tableau for the walls, shelf unit and study desk in the den shown above. His intent was not only to provide a comfortable, chic retreat, but to keep maintenance at a minimum.

We offer you scores of exciting colors, patterns and woodgrains in Formica® brand laminated plastics, including 14 contemporary new designs in our Formica '73 collection.

Your Formica representative has all the details. If you prefer, consult Sweets Architectural File 6.14/Fo or write Dept. AR-9.

FORMICA® BRAND
laminated plastic

Bronze Tableau, 797.



For more data, circle 140 on inquiry card

a) Grandstand, Indiana State Fairgrounds, Indianapolis, Ind. b) Kimberly-Clark Warehouse, Fullerton, Calif. c) Berths 80 & 82, Elizabeth-Port Authority Marine Terminal, in Elizabeth, N.J. d) Indoor pool, Kensington Club, Inc., South Bend, Ind. e) Delta Air Lines Hangar, Atlanta, Ga.

This is Alcoa Snug Rib roofing.

It's flat, tight and handsome.

Alcoa® Snug Rib roofing gives you all the advantages and savings of low-pitch construction plus excellent leak resistance. Since slopes as low as ¼ in. in 12 in. are possible, there's less dead space to heat or air condition. The patented Snug Seam® joint holds panel edges securely in place to create a weathertight seal, and there are no through fasteners to penetrate the weathering membrane. Since Snug Rib roofing is a "floating" system, it moves under thermal cycling, so locked-up thermal stresses are eliminated. Installation is fast and easy, and savings continue over the life of the building because aluminum requires so little maintenance. On most buildings end laps can be eliminated because lengths are limited only by shipping conditions. Handsome Alcoa Snug Rib roofing is ideal for swim clubs, industrial and port buildings, warehouses, grandstands and aircraft hangars. For more information on economical Snug Rib roofing, write Aluminum Company of America, 1130–J Alcoa Building, Pittsburgh, Pa. 15219.

Change for the better with Alcoa Aluminum

ALCOA

For more data, circle 142 on inquiry card

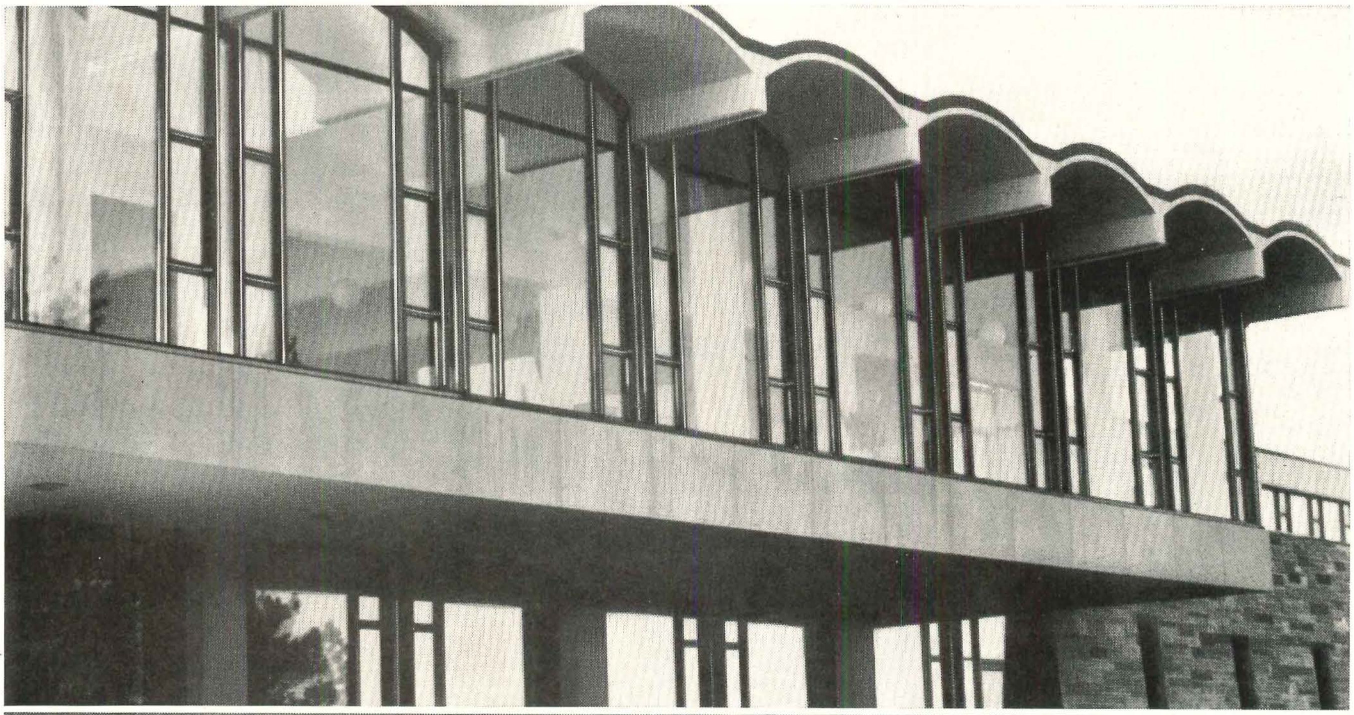
How to set insulating glass longevity records.

The Student Union at St. Scholastica College, Duluth, Minnesota, provides an education on what keeps insulating glass insulating. All 475 windows in the building were sealed with an LP® polysulfide base compound nearly 10 years ago. No problems ever since.

The Holiday Inn at Ann Arbor, Michigan, is an even older polysulfide application. Its hundreds of large window units have proven our polymer's excellent adhesion, flexibility and resistance to moisture vapor transmission for over a decade of summer sun and winter cold. No problems here, either.

LP polysulfide polymers are just a few of the many products made by our Chemical Division. For aircraft, automobiles, buses, trucks and trains. For joint and window sealants, and insulating glass. For seals, gaskets, printing rollers, hose and industrial tires.

Would you like more information? Write Thiokol Chemical Corporation, Chemical Division, Trenton, N.J. 08607.



Thiokol

Specialty Polymers • Off-The-Road Vehicles • Synthetic Fibers • Sprayers • Propulsion • Human Development
Friction Materials • Ski Lifts • Pyrotechnics • Closures • Rubber and Rubber Chemicals • Medical Electronics Equipment

For more data, circle 143 on inquiry card

The Brick* that has everything

- Rustic antique beauty
- Wide choice of permanent colors
- Strength that exceeds all requirements, by actual test
- Variety of sizes: oversize standard, modular standard, large utility and 8″ thru-the-wall
- Competitively priced with ordinary clay brick
- Available NOW in many areas

Rus-tique Brik* is truly antique and rustic . . . and it's available for immediate delivery in many areas of the country.

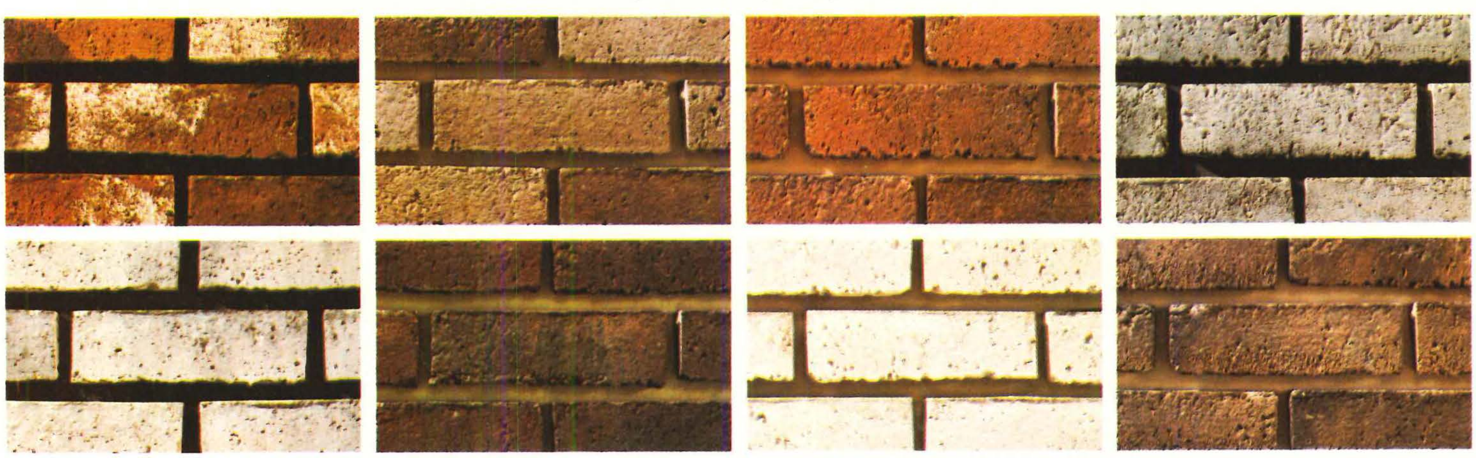
Rus-tique Brik* is a dense aggregate concrete . . . practically impossible to distinguish from a clay brick . . . and has all the strength and lasting qualities you expect from a concrete product.

And it's colorful! The coded formulas for color batching are perpetually consistent and permanent.

Like more information and our architectural file folder? Write or call:

TOLL FREE (800) 331-3288

Rus-tique Brik Speedy Info Line



Shown here are only a few of the wide range of permanent colors available from your nearest Rus-tique Brik plant. Final color selection should be made from actual samples.*

Rus-tique® Brik INTERNATIONAL

Post Office Box 7603, 2202 East 49th Street, Tulsa, Oklahoma 74105, (918) 742-7321

*Rus-tique Brik is a dense aggregate concrete—no clay used.

For more data, circle 145 on inquiry card

Which stain offers greater color retention . . .

Test after test has proven . . .

. . . that *latex* stains offer superior color retention and durability over oil-based stains. We've proven it in our own laboratories (as shown in the test photos above) and in extensive field tests.*

Specify REZ Latex Solid Color or Semi- transparent Stains

With REZ Latex Stains you are assured that the job won't have to be re-stained next year or for years to come. On exterior surfaces, REX Latex Stains form a tough, flexible film that clings to the wood and resists cracking and peeling—they're even mildew resistant.

Choose from a palette of quality colors

REZ Latex Stains are available in 38 solid colors designed to give the rustic look to the rough sawn woods or textured sidings that are so popular today. There are 38 semi-transparent colors, too, for use where it is desirable for the natural wood grain beauty and texture to show through.

For detailed information on REZ Latex Stains see Sweet's Catalog (9.9/Re) or write to The REZ Company, One Gateway Center, Pittsburgh, PA. 15222; or Box 3638, Torrance, CA. 90505.

* Additional test results furnished on request.

Rez®
Natural Wood Finishes
by
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PAINTS

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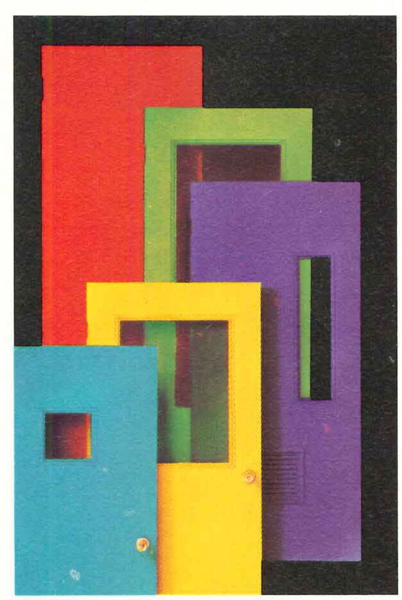

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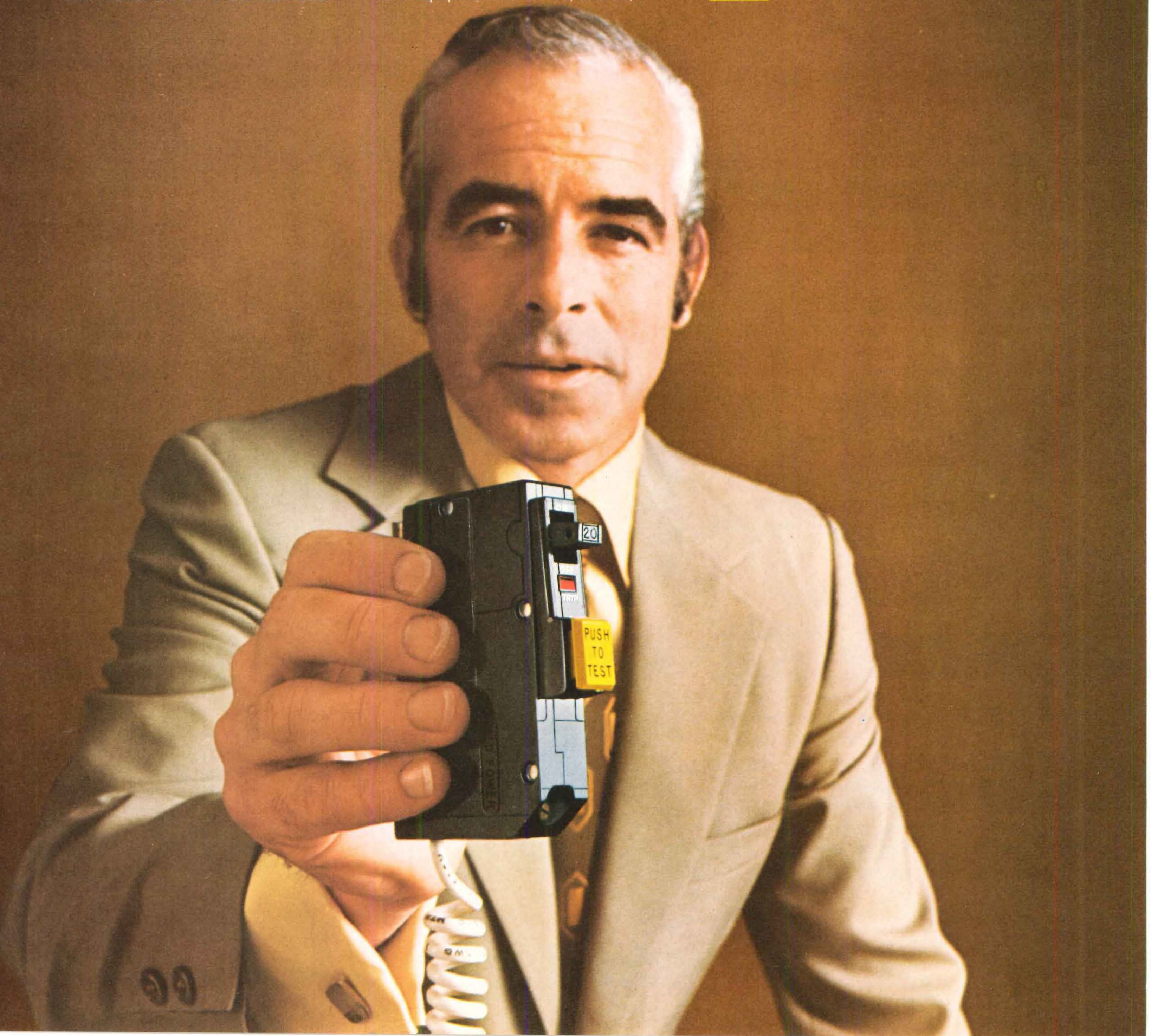


20
PUSH TO TEST

LEAD NEWSLETTER

FOR ARCHITECTS AND BUILDERS

Vol. 17, No. 4

New building material—Lead clad steel

A new composite, lead clad steel, has recently been developed. Because it combines the durability of lead with the strength of steel, it has potential of wide architectural application. It has already been specified by British architects. This office building of the National Life Association of Australasia Ltd., London, provides an example. In this application, the lead clad steel provides lead's corrosion resistance, aesthetic appeal and sound barrier properties as well as the strength of steel.

Lead clad steel is produced by pressure bonding lead to steel which has been pre-coated with lead-tin alloy. In extensive test programs, the lead clad steel was subjected to mechanical and thermal stresses without bond failure. Lead clad steel is currently being produced in sheet form in the United Kingdom. Both single (one side) and double (both sides) cladding are available. The standard coating for building applications ranges from .020-inch to .030-inch thickness of lead bonded to 20 gage steel.

Installation data

Lead clad steel can be bent through 180° without loss of adhesion and, although some thinning of the lead occurs where it forms the outer surface of the bend, the local reduction in thickness is normally acceptable.

Most types of fasteners can be used to mechanically join lead coated steel. When decorative architectural panels are secured to wood battens or other structural members, lead capping pieces can be incorporated to provide a continuous lead surface. The use of lead capping pieces also helps to waterproof the fastener and retain the pleasing appearance of lead throughout.

With certain limitations, lead burning and soldering can be performed on lead clad steel almost as easily as when using sheet lead. Welding the steel section of the composite material will destroy the lead coating in the heat affected zone of the weld and therefore requires special care. However, stud and projection welding can be used to produce satisfactory joints; similarly mechanical fasteners can be attached by these methods without detriment to the lead coating.

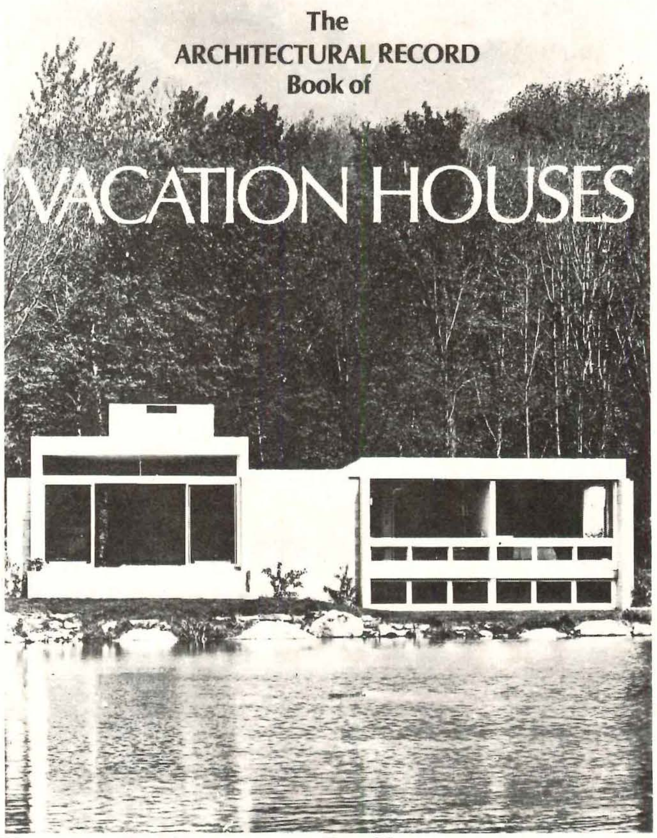
Building applications

Applications of lead clad steel include fascias and wall covering. Design applications include roof coverings, ventilating ducts and related equipment, gutters, rainwater pipes (downspouts) and parapet coverings. Formerly it was often impractical to use lead for such applications because the lead normally requires structural support which the steel now supplies.

For additional information write to Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017.

The fascia of the roof of this six-story building is in the form of an open screen comprised of 200 panels of lead clad steel. The panels are fabricated from 20 gage steel with a lead coating of about 1½ pounds per sq. ft. (.0234" thick) on each side.

by the editors of Architectural Record



Exciting ideas from 60 different dream hideaways

A sparkling collection of architect-designed vacation houses for all climates and terrains—from a mountain-top chalet in British Columbia to a beach house in Florida.
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Edited by Mildred Schmertz, AIA
Senior Editor
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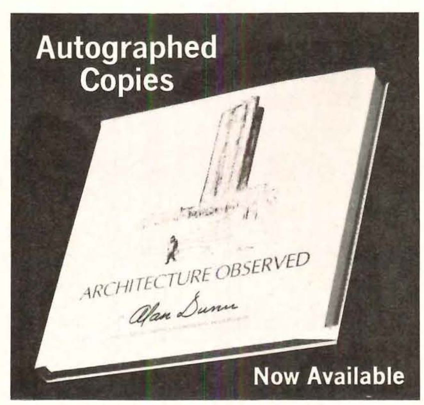

Alan Dunn's

ARCHITECTURE OBSERVED

Recently Architectural Record published—in hardcover book form—a collection of 139 of Alan Dunn's best cartoons which appeared in the RECORD over the years. The warm reception of this book by architects and others has prompted us to plan a second printing.

In the meantime, Alan Dunn has graciously consented to autograph a limited number of available copies which are being offered at this time on a first-come, first-served basis. The price of these personally autographed copies is $10 each.

In addition to the autographed copies, unsigned copies are also available at $6.95 each. These also make excellent gifts for your business associates and friends. **To order your copies, use the coupon below.**

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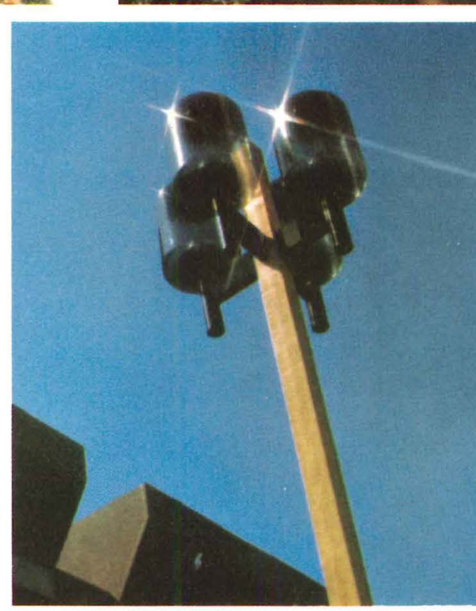

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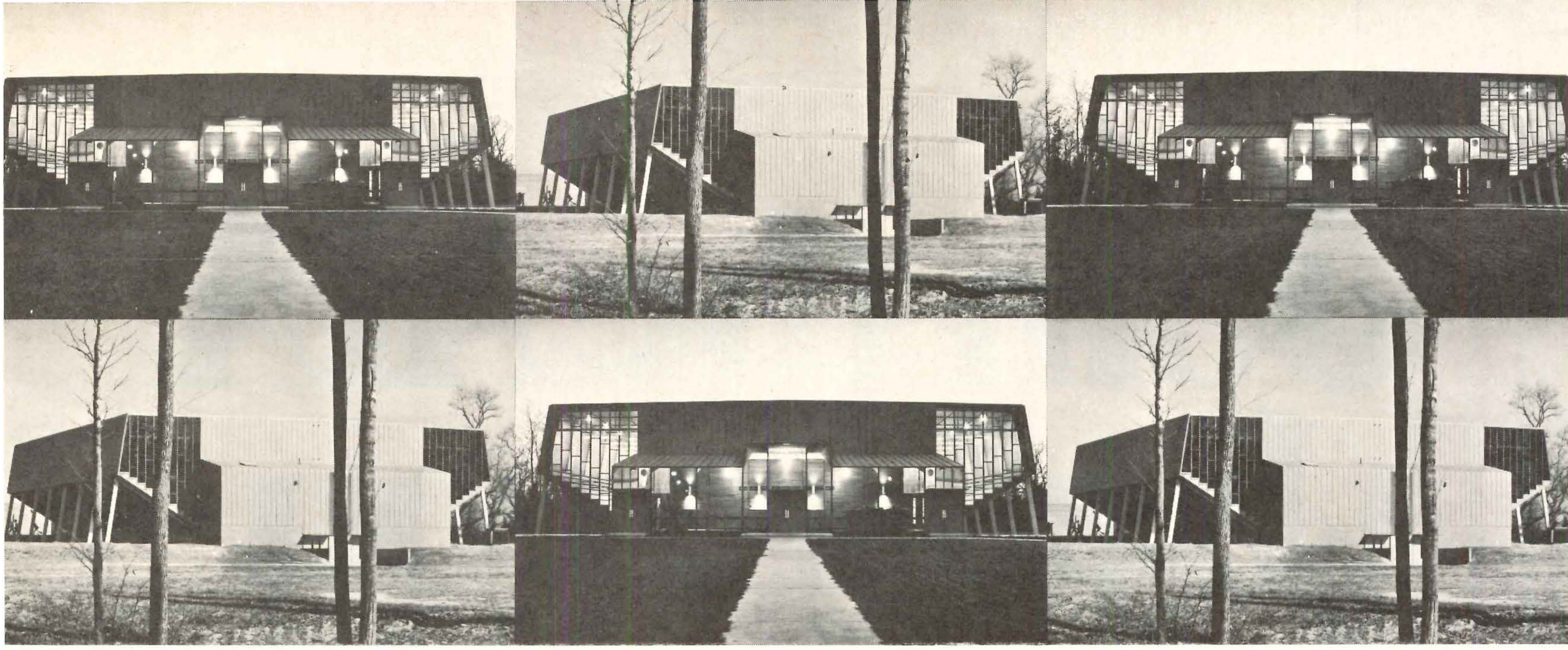
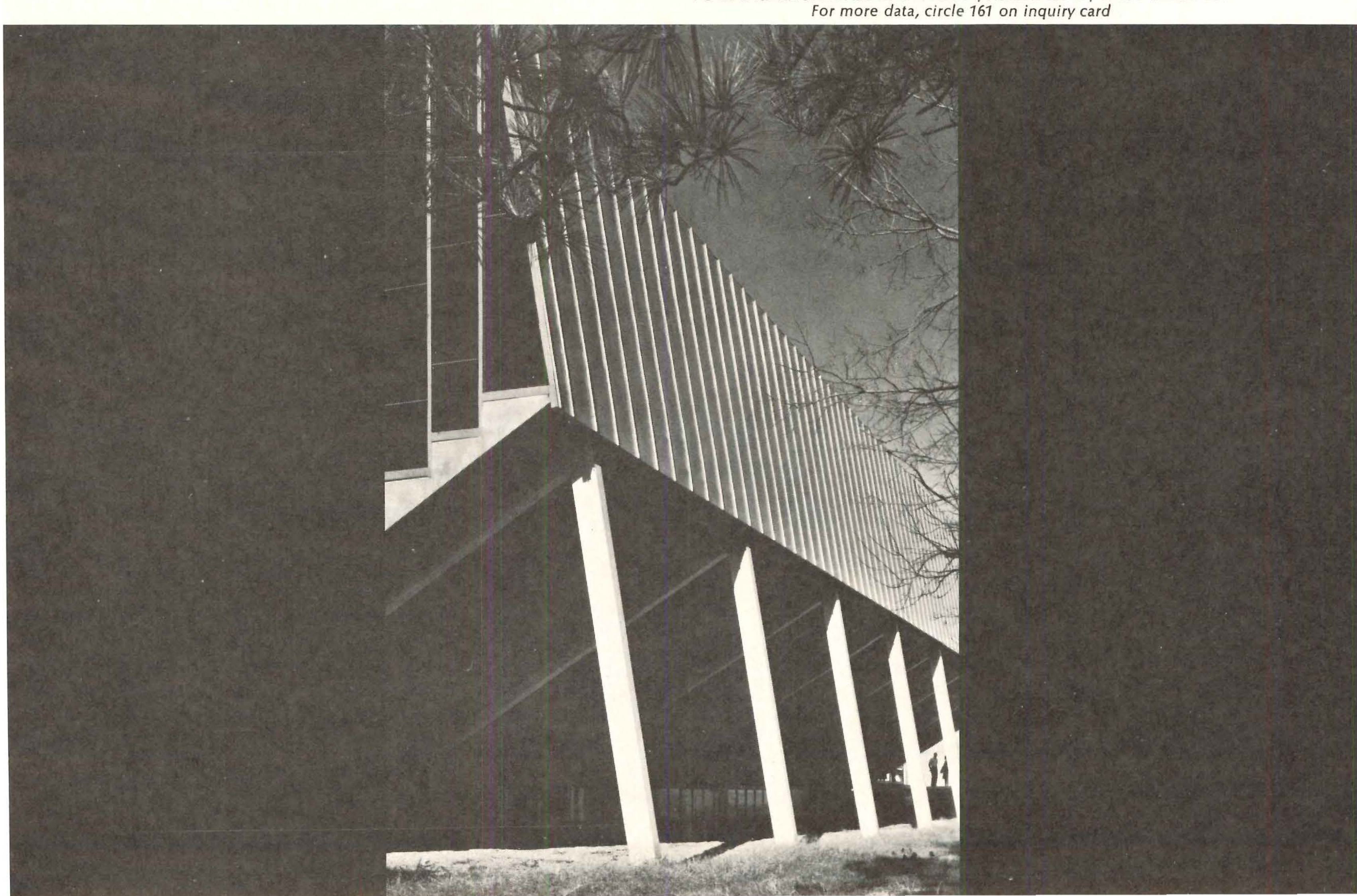
Campbell Centre, Dallas
Architects: Neuhaus + Taylor
Polarpane Gold #2016





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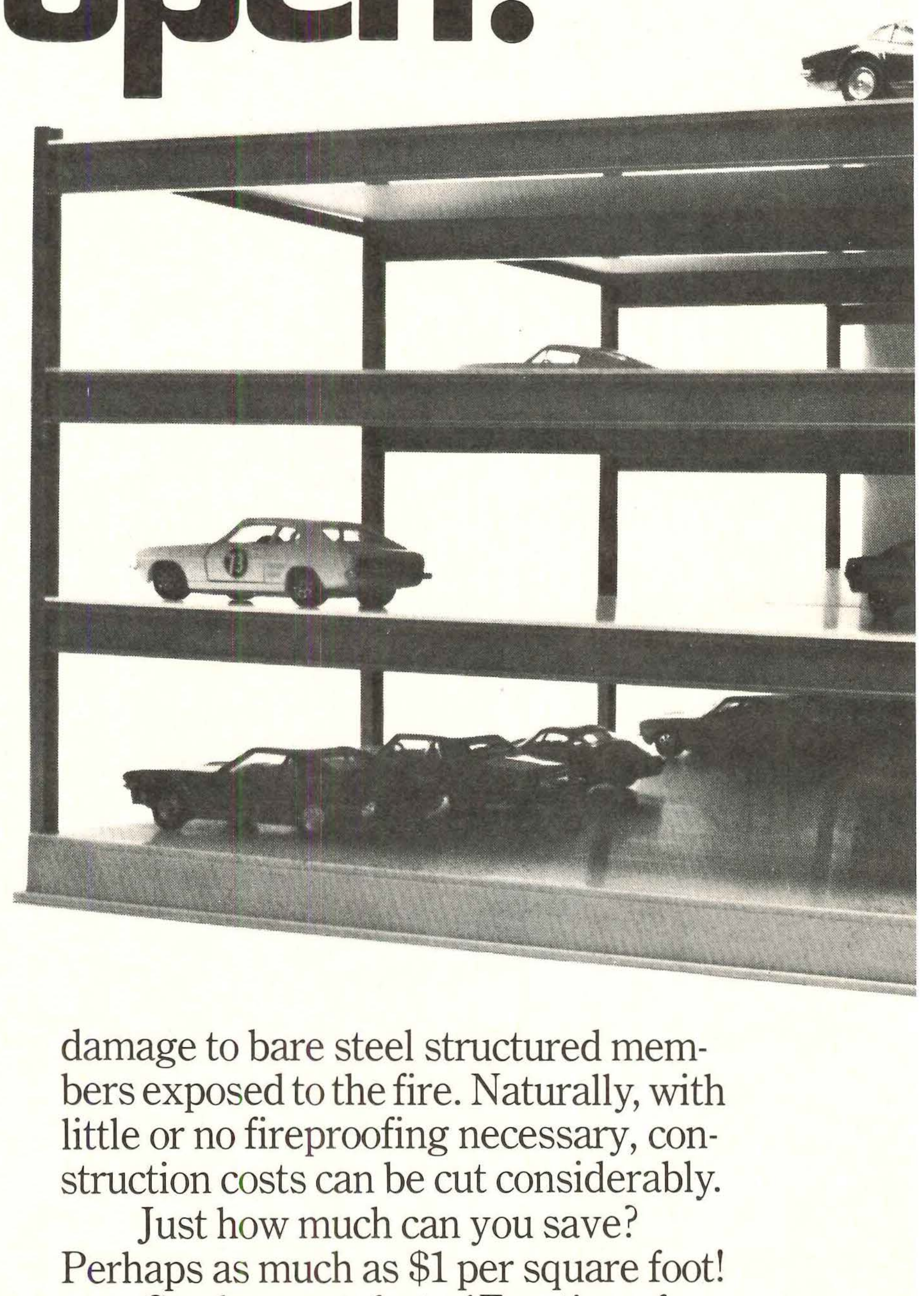
The future of parking garages is wide open!



(Because the steel-framed, long-span concept gives you more usable space at lower cost.)

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.

Steel means fewer interior columns! Long-span, steel-framed structures are lighter, reduce the number of interior columns and need fewer footings. This means more wide open spaces. So, self-parking is easier and attendant-parking more efficient. And with steel, you're not tightly locked-in to a structural plan—you can rearrange the parking layout, and even add more levels at a later date.

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 structure 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 structure 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!

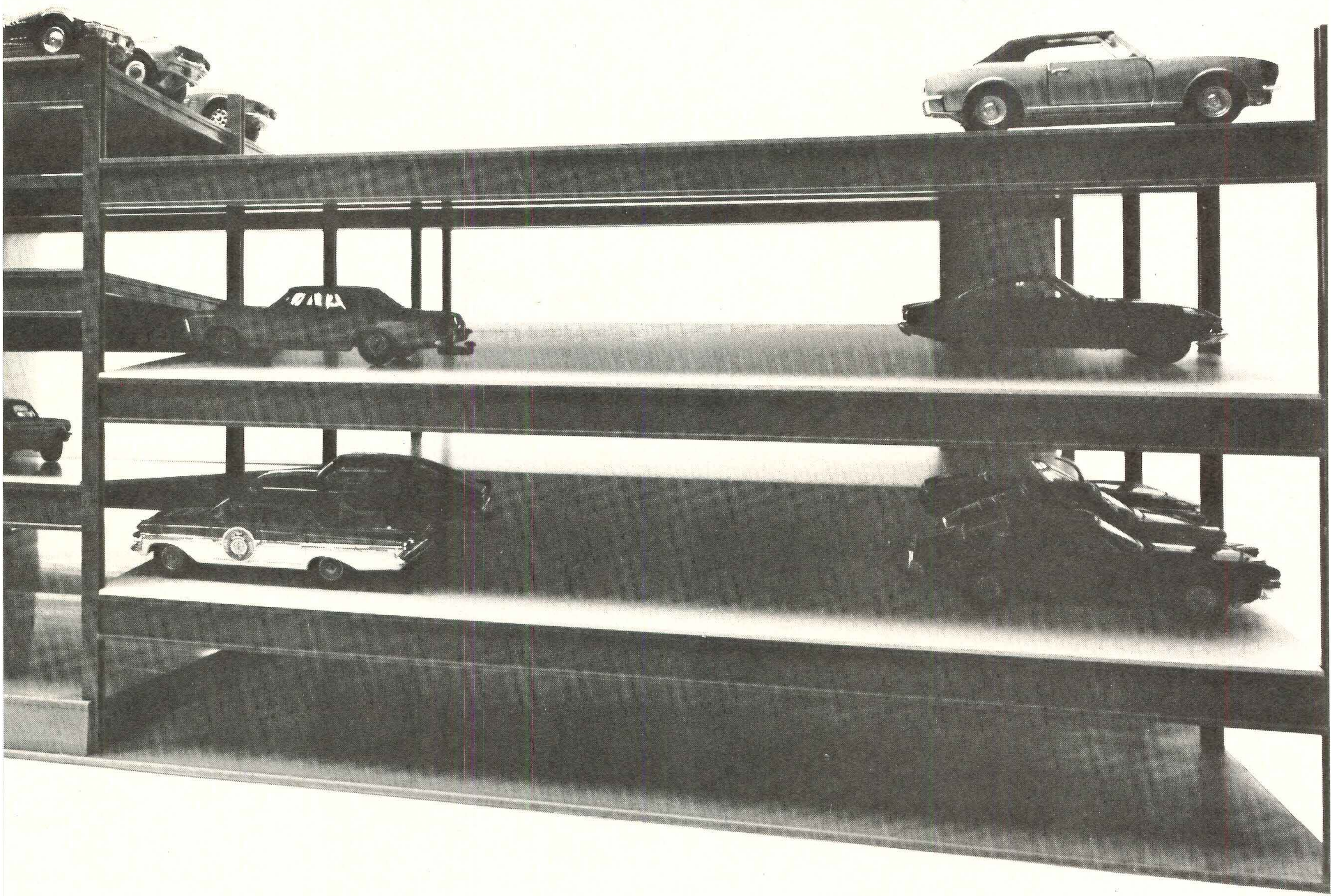
Steel is more economical! Faster construction also means that you can generate cash flow much sooner. With this factor and all others considered, steel framing often turns out to be the most economical system. And with the benefit of more usable space, it is proving to be the most practical and desirable 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.

USS United States Steel

TRADEMARK



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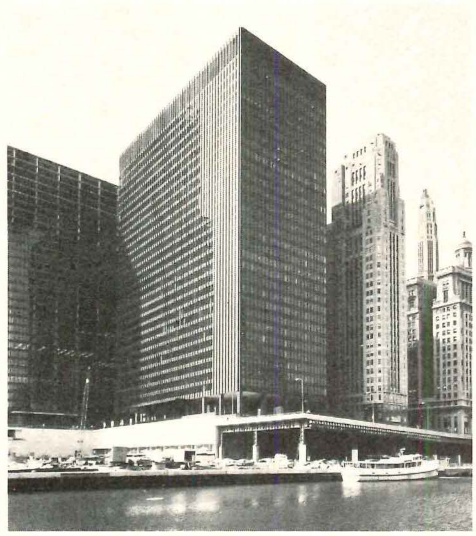
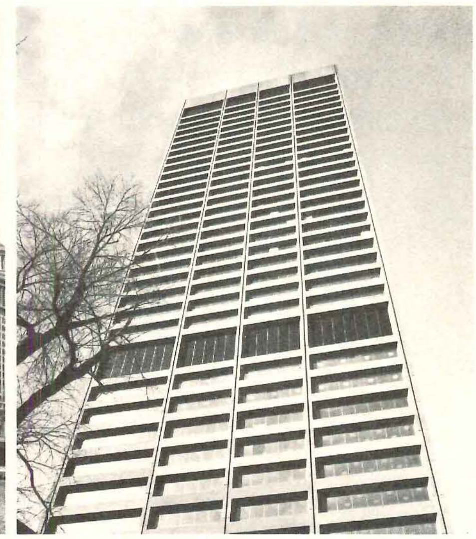
Three blind concepts. See how they work.

AHMANSON CENTER, LOS ANGELES.
ARCHITECT: EDWARD DURRELL STONE.

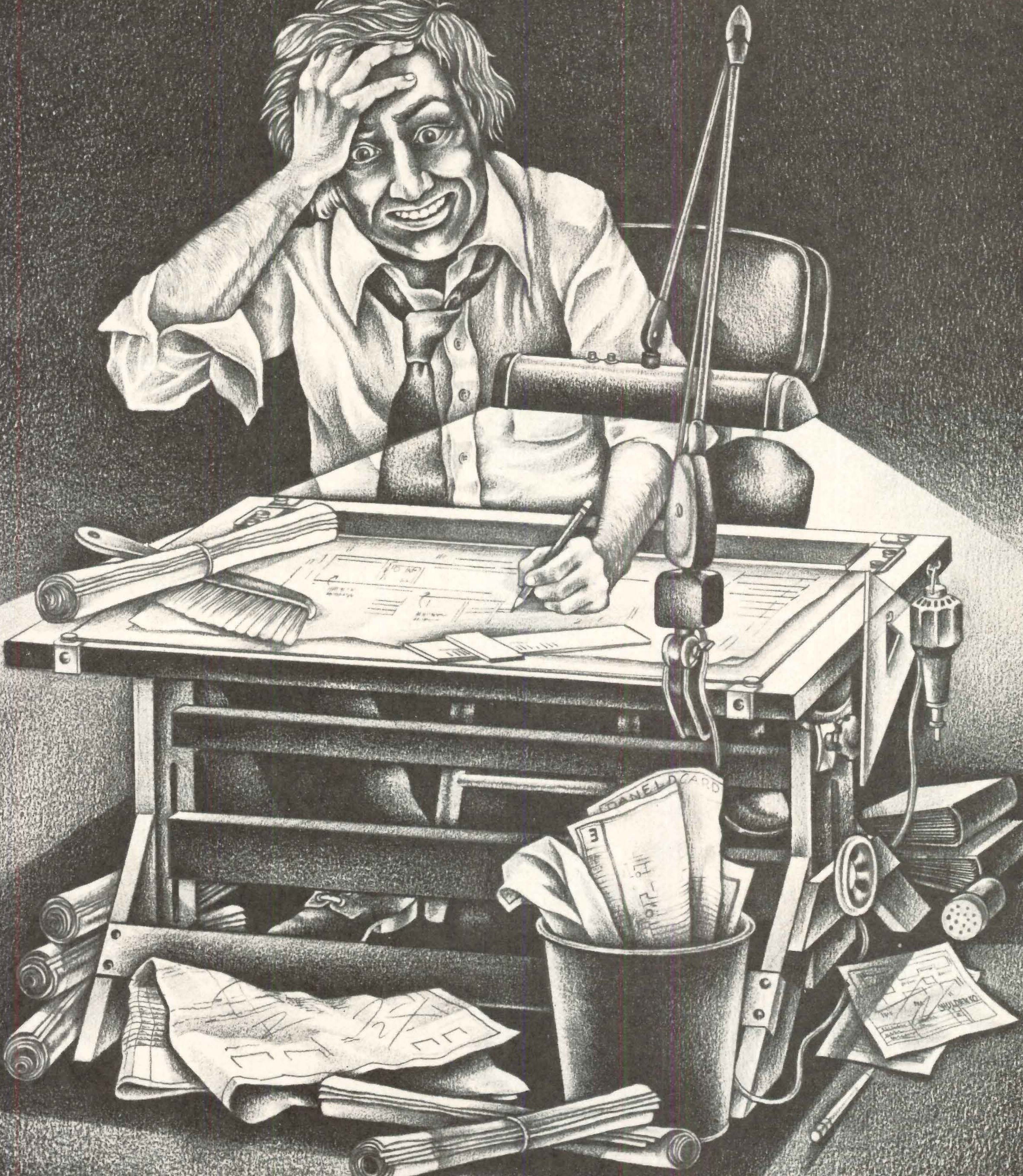


111 EAST WACKER DRIVE, CHICAGO.
ARCHITECT: MIES VAN DER ROHE.

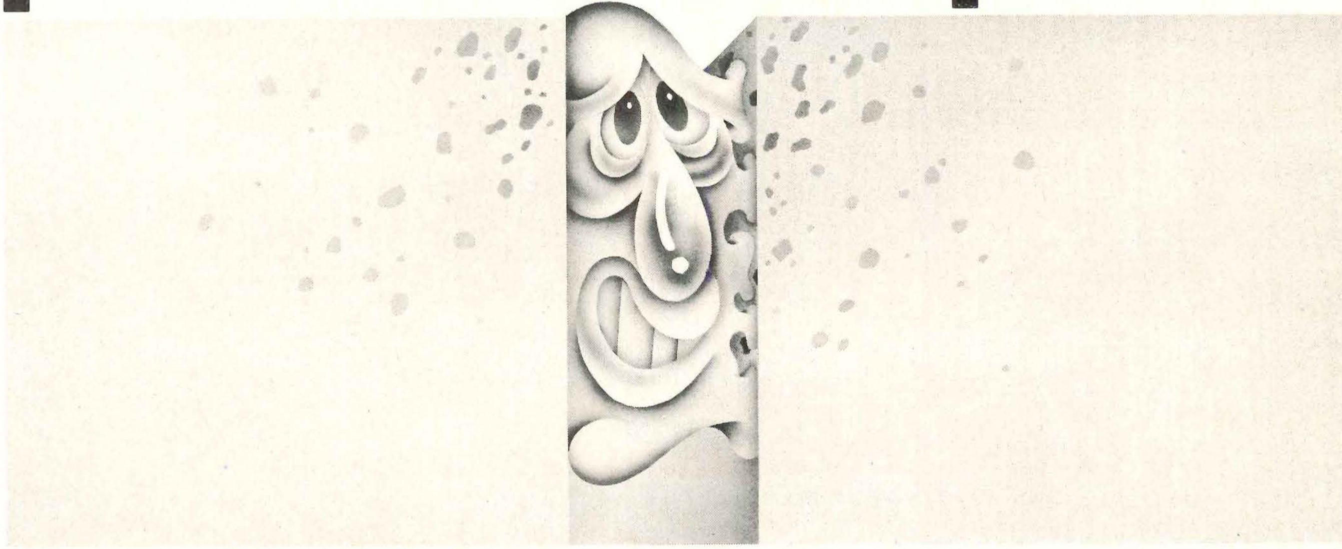


ONE BEACON STREET, BOSTON.
ARCHITECT: SKIDMORE OWINGS & MERRILL.

IF YOU JUST SPECIFIED I-BEAMS FOR A 10,000 SQUARE-FOOT ROOF, GO BACK TO THE DRAWING BOARD.



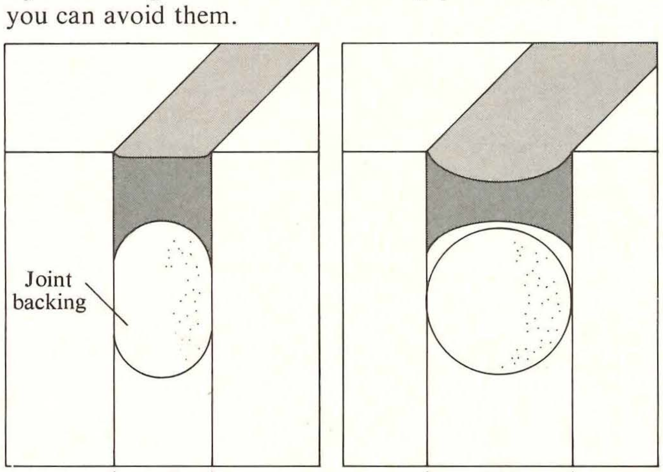
How to avoid sealant problems when you design with precast concrete panels.

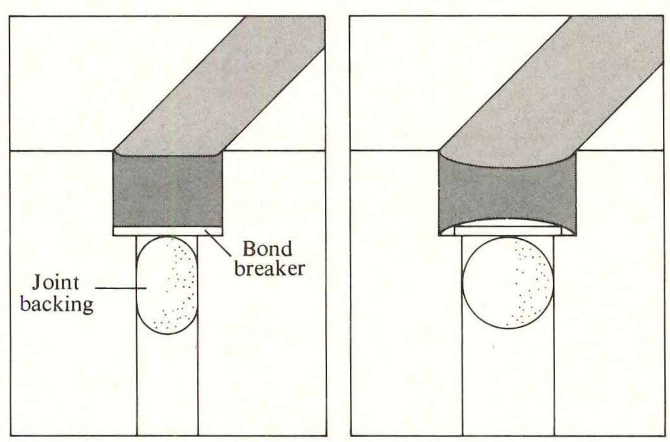


Obviously, you don't want sealant-adhesive failure in the joints between the panels. Your precast contractor doesn't want it. And certainly we — Tremco — don't want it. So here's a brief guide to potential problem areas and tips on how to prevent and solve them.

Let's start with design. When you're designing a joint, be sure it's wide enough to allow the sealant to move within its capabilities. If the joint is found to be too small on-site, it should be saw cut to a sufficient width. A good rule of thumb is to design ½″ wide joints for panels up to 15 feet. Larger panels will require a ¾″ or wider joint.

While you're in the design stage is also a good time to meet with your precast contractor and your Tremco man. By discussing some of the following problems, odds are you can avoid them.





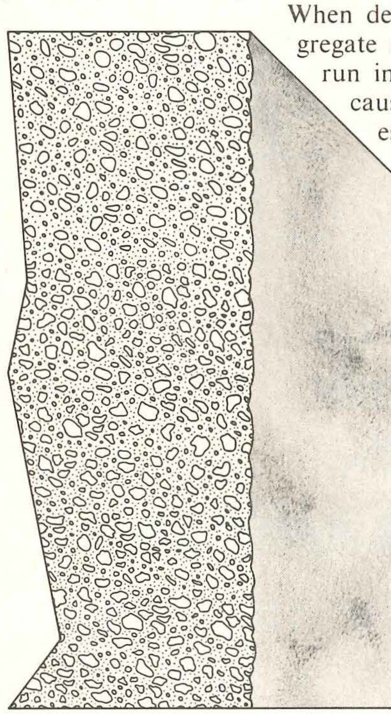
Form release agents: friend and foe. Form release agents are helpful in removing dense concrete panels from forms. But they can also become a major problem for sealants.

Agents containing wax, oil or silicone create a surface film which impairs adhesion of the sealant bead to the joint interface. When this happens, the sealant may lose its grip. This could happen within weeks or months, depending on the type of sealant and the amount of joint movement.

To prevent this, your precaster should use an agent that will be absorbed by the concrete in the curing process. If your precaster uses new fiberglass forms, he should remove the wax from any portion that comes in contact with the joint interface.

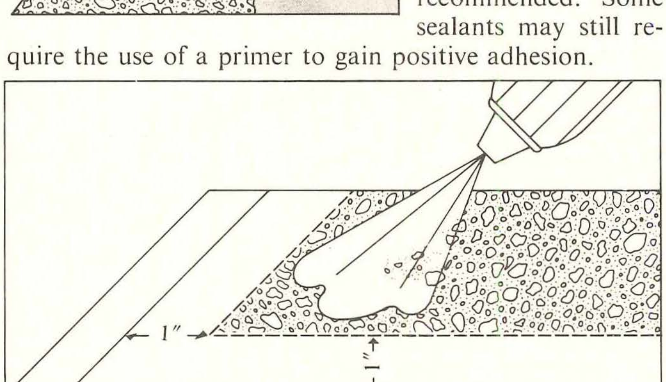
If release agents are found on the joint interface, they must be removed before caulking. The only sure method of removal is light sandblasting. If this isn't possible, the job may call for mechanical wire-brushing, grinding or high-pressure water and detergent, depending on the type of release agent used.

Don't take a powder. Another common problem affecting sealant adhesion is laitance — a dusty or powdery condition — of the joint surface. Interfaces should always be checked for laitance. If masking tape picks up loose particles, laitance is present.



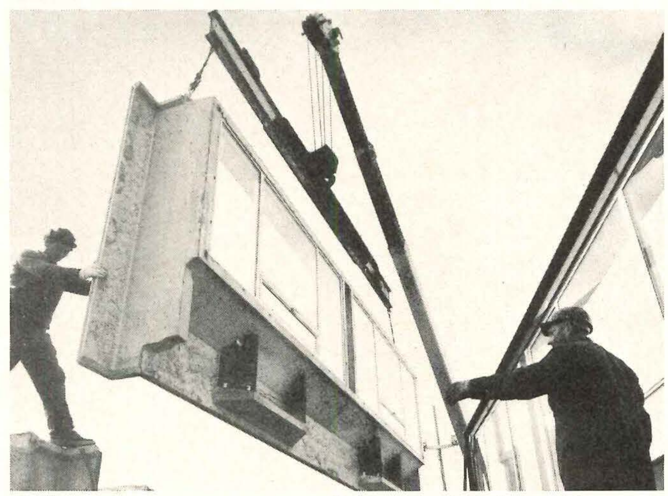
When dealing with exposed aggregate surfaces, you may also run into a powdery problem caused by the retarder process. To prevent this, your precaster should select an application technique that will limit the retarder to the panel face only and prevent migration to the joint interface. The application should stop at least one inch from the panel edge.

To correct either problem, wire-brush. Or use a high-pressure water spray. Or grind lightly. Before caulking, a wipe with an oil-free solvent is recommended. Some sealants may still require the use of a primer to gain positive adhesion.



Waterproofing woes. Waterproofing solutions can also cause sealant failure.

If your precaster is going to apply waterproofing to the panel before delivery, he should mask the joint interface before he sprays the panel. Or, if your specs call for waterproofing when the panel is in place, the caulking should be done first.



There are some waterproofing materials that will impair sealant adhesion. The waterproofing can only be removed by mechanical wire-brushing, grinding, or light sandblasting.

To avoid potential problems, always caulk first, then waterproof.

An ounce of prevention. Remember, your Tremco man will be happy to meet with you and your precaster before the job is begun to discuss effective sealing of the walls and to identify potential problem areas.

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So talk to Tremco first. And you won't have joint sealing problems later. For help, contact your Tremco rep. Or The Tremco Manufacturing Company, Cleveland, Ohio 44104. Toronto, Canada M4H 1G7.

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OFFICE NOTES

NEW FIRMS, FIRM CHANGES

Charles F. McAfee, architects and planners in Wichita, Kansas, will open its first branch office at Crown Center in Kansas City.

William C. McCulloch, AIA, and Gregory E. Heimos, AIA, announced the formation of **Heimos & McCulloch,** Architects, AIA, with offices at 17925 "B" Sky Park Blvd., Irvine, California.

Bernard Soep Associates, Inc., space planning, store planning, and interior design consultants, opened a new office at 280 Lincoln Street, Allston, Mass.

Booth & Nagle, Architects/Planners, have announced a new office location at 230 East Ohio Street, Chicago, Illinois.

Werner Rosenthal, urban planner, has opened a practice at 19562 Ventura Boulevard in Tarzana, Cal., offering master planning, site planning, transportation studies and environmental impact reports.

Frederick S. Truog, AIA, opened his new practice of architecture in the New England Building, 112 West Ninth Street, Kansas City, Mo.

Henningson, Durham & Richardson, Architects and Engineers, Omaha, and Stanton and Stockwell, Architects, Los Angeles, Calif., have established a new firm to be known as **Stanton, Stockwell/Henningson, Durham & Richardson,** with offices at 3625 West Sixth Street, Suite 202.

A new practice of architecture and planning has been announced by Architect John M. Amundson, AIA, former principal in the firm of Lutes & Amundson, AIA, Springfield, Oregon. **The Amundson Associates** will continue to be located on the Millrace at 200 South Mill Street.

Formation of **Planning/Design Collaborative** was announced by Larry Klein and Edward Noonan, the principals. Its offices are at 600 Davis Street, Evanston, Illinois.

Canadian architects, **van Ginkel Associates, Ltd.,** recently moved to new offices located at 1315 Boulevard de Maisonneuve W., Montreal 107, Quebec.

Omaha architect, John R. Tilly, has formed a new firm **The Tilly Associates, Inc.,** 202 South Seventy-first Street.

D. K. Renshaw, Ed Wimberly and Jim Daily announced the formation of **Design 3,** architects and interior designers, 140 National Old Line Building, Little Rock, Arkansas.

Robert I. Abrash and Philip R. Eddy have announced the formation of their new firm known as **Abrash & Eddy,** Architect and Designer, at 11418 Washington Plaza, West, Reston, Virginia.

The office of Charles James Koulbanis Associates is now known as **Koulbanis Brandreth Associates,** Architects, 510 Madison Avenue, New York City.

ERRATA

We neglected to give credit to Eric Park as associate in charge and to Rosario Piomelli as project designer of Brown University Sciences Library.

Danforth W. Toan
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ADVERTISING INDEX

Prefiled catalogs of the manufacturers listed below are available in the 1973 Sweet's Catalog File as follows.

A Architectural File (green)
I Industrial Construction File (blue)
L Light Construction File (yellow)
D Interior Design File (black)

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"My two-man painting team covered 12 apartments in 3 hours with *Hide-A-Spray*™"

New improved *Hide-A-Spray*, now with rust control added

A rust control additive in this water base paint protects small scratched rust free areas on metal, as well as unprimed nail heads, from flash rusting and consequently staining the newly painted surface.

For Painting Contractor Bob Friessen, and for the Developer and General Contractor, and the Project Owner, *Hide-A-Spray* High Build Interior Flat Latex Paint was the answer at the Meadowland Apartments. According to Mr. Friessen, "The *Hide-A-Spray* Coating covered interior surfaces in one 8-10 mil wet coat at a rate of one to one and a half gallons per minute, without priming, ghosting or sag. Taped and spackled joints in the drywall construction disappeared in one pass of the airless spray gun. And, it dried uniformly to a 4-mil dry coat in just two hours. It would have required 150 hours for two men with brush and roller to do the same 12 apartments, using conventional paint."

Painting contractors and builders everywhere are turning to *Hide-A-Spray* High Build Interior Flat Latex as the top quality, competitively priced, airless spray paint system that provides maximum coverage, saves time and money, and returns a handsome profit. Cover yourself with the facts by writing PPG Industries, One Gateway Center, 3W, Pittsburgh, Penna. 15222.

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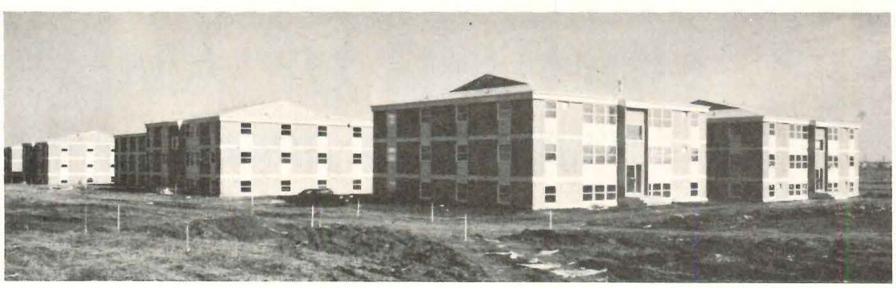

The Project:
Meadowland Apartments
Sioux Falls, S. D.
Ten 12-apartment units.
Developer & General Contractor:
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Architects: Koch Hazzard Associates,
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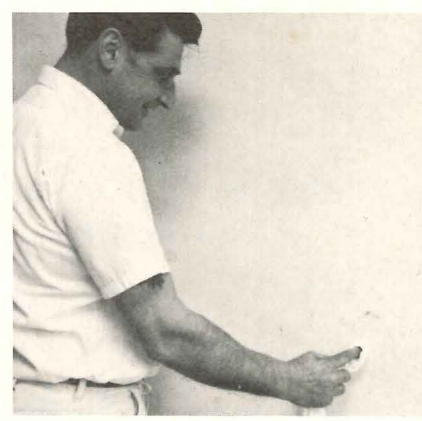
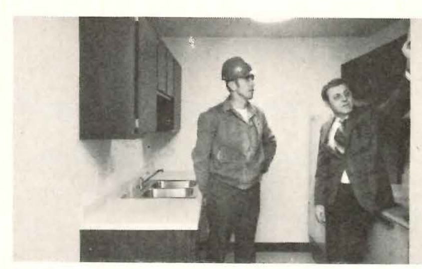


Incidental marks and dirt came off quickly and easily with a damp cloth.

Hide-A-Spray Latex paint completely covered taped and spackled joints in drywall in one pass of the airless gun.



Hide-A-Spray paint dried in two hours. Contractor installed cabinets and floor covering the same day. Walter Scharfe, left, Job Superintendent for Lloyd Construction, commented, "Conventional two-coat paints would have meant a week's time between painting and any such installation." PPG Paint Center Manager, Eugene Lee, is shown at right.

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