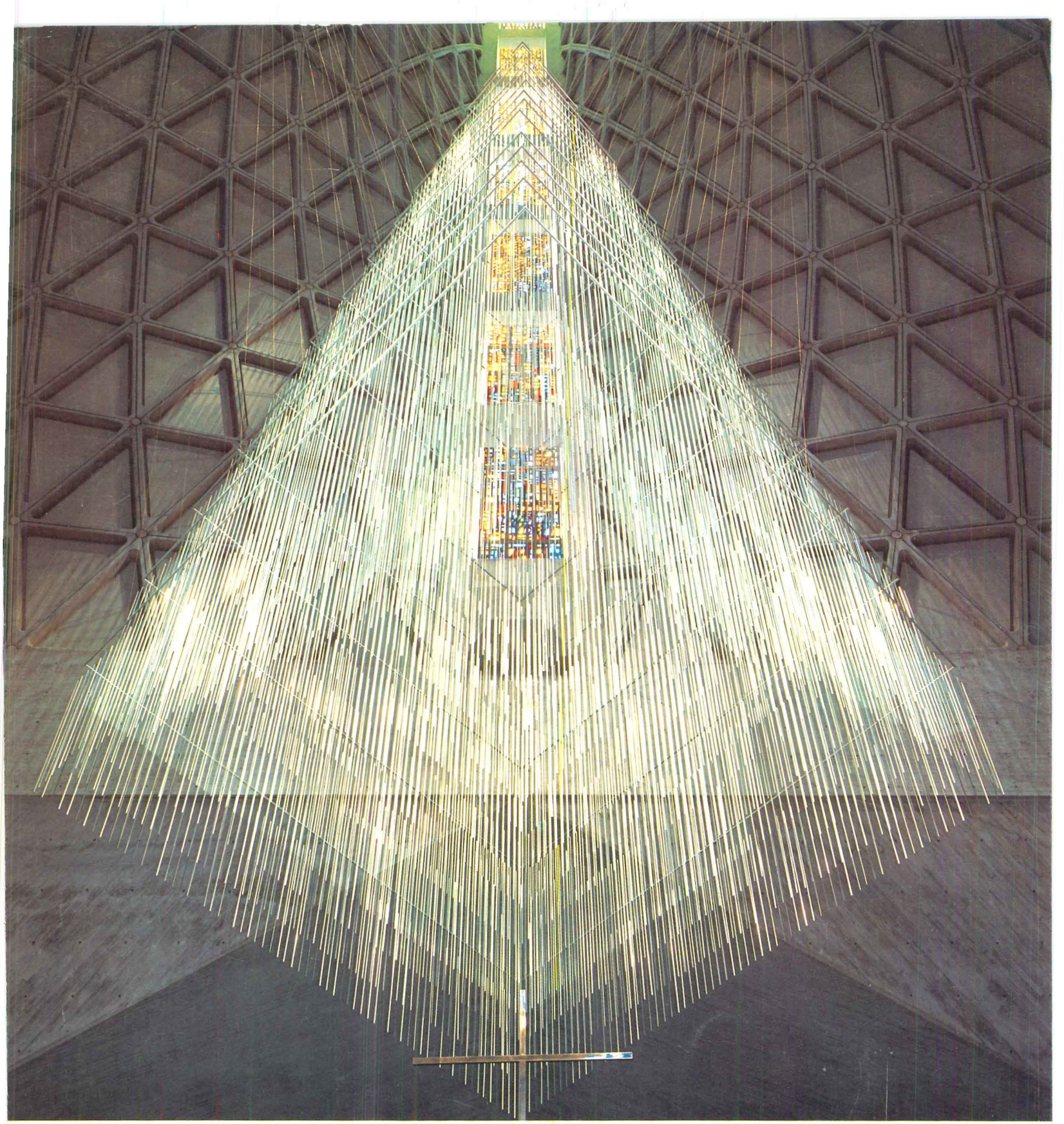

SAINT MARY'S CATHEDRAL, SAN FRANCISCO

FLORIDA STATE MUSEUM BY WILLIAM MORGAN

BUILDING TYPES STUDY: HOSPITALS

ARCHITECTURAL ENGINEERING: WIND DAMPING OF WORLD TRADE CENTER TOWERS

FULL CONTENTS ON PAGES 4 AND 5

# ARCHITECTURAL RECORD

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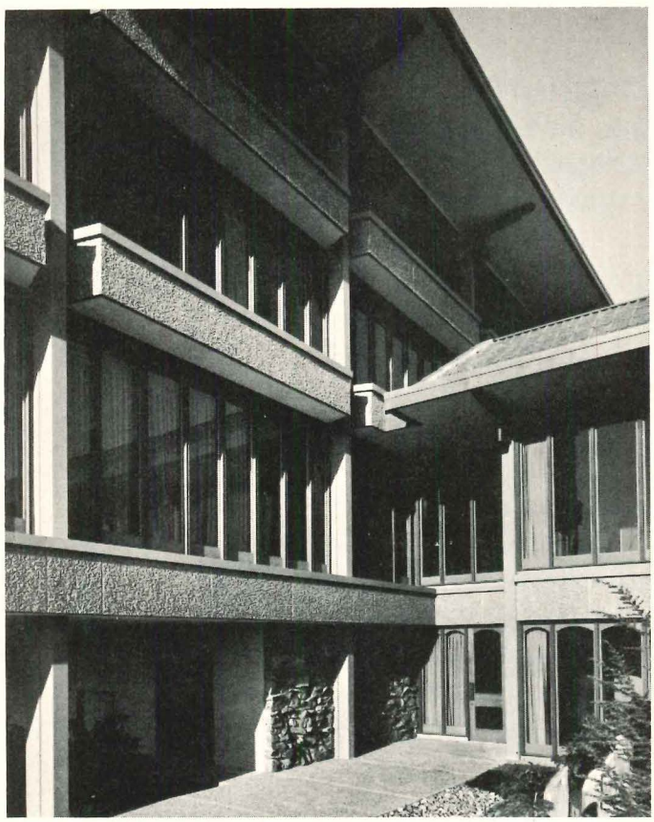
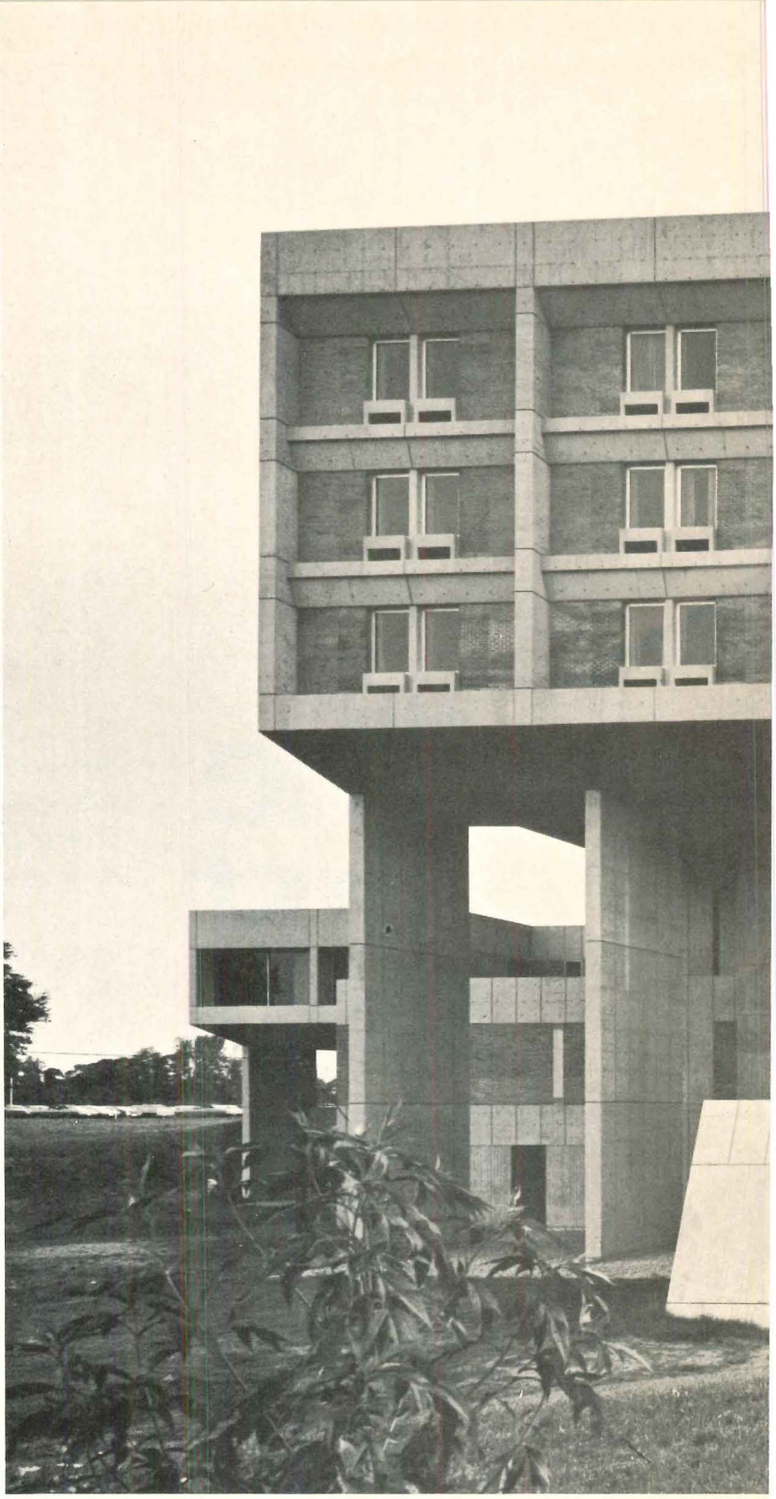
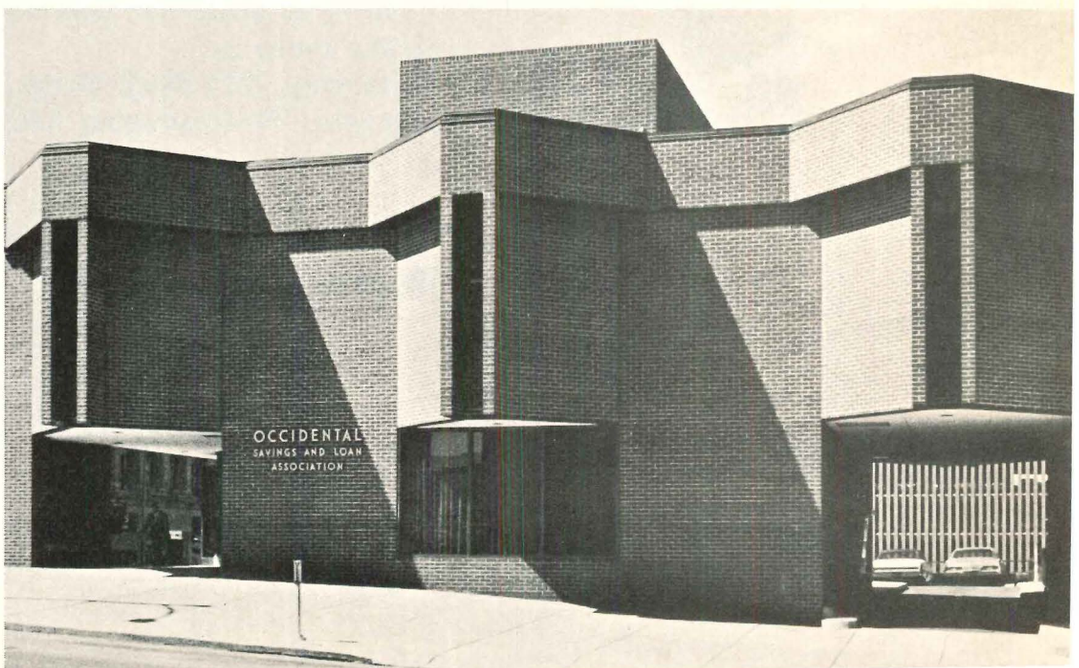
BETHESDA HOSPITAL NORTH, Montgomery, Ohio. ARCHITECTS: Adolf H. Roessling, AIA, of Smith, Hinchman & Grylls Associates, Inc., Detroit, Mich. John V. Sheoris, Project Designer. Sullivan, Isaacs & Sullivan, AIA, Architects and Associated Engineers, Cincinnati, Ohio. GENERAL CONTRACTOR: Dugan & Meyers Construction Co., Inc., Cincinnati. Dover traction elevators installed by Dover Elevator Co., Cincinnati.





Above: NORTHWEST BUILDING, Bellevue, Washington. ARCHITECTS: Jack Woodman and Associates, Bellevue. GENERAL CONTRACTOR: Swanson-Dean Corporation, Bellevue. Dover Oildraulic Elevator with speed of 200 f.p.m. installed by Sound Elevator Company, Seattle.

Right: OCCIDENTAL SAVINGS & LOAN ASSOCIATION, Omaha, Neb. ARCHITECTS: Leo A. Daly Co. GENERAL CONTRACTOR: Lueder Construction Company, Omaha. Dover pre-engineered Oildraulic Elevator installed by O'Keefe Elevator Company, Inc., Omaha.



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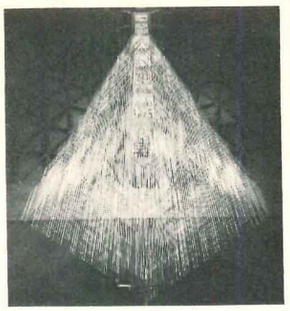

Cover: Saint Mary's Cathedral, San Francisco
Architects: McSweeney, Ryan and Lee;
Pietro Belluschi, consulting architect, design;
Pier Luigi Nervi, consulting engineer, design;
Photographer: Morley Baer



## THE RECORD REPORTS



## ARCHITECTURAL BUSINESS




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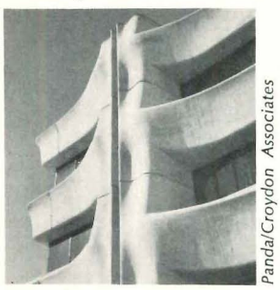
## BUILDING TYPES STUDY 426





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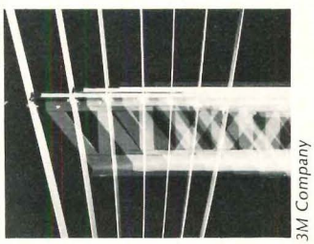

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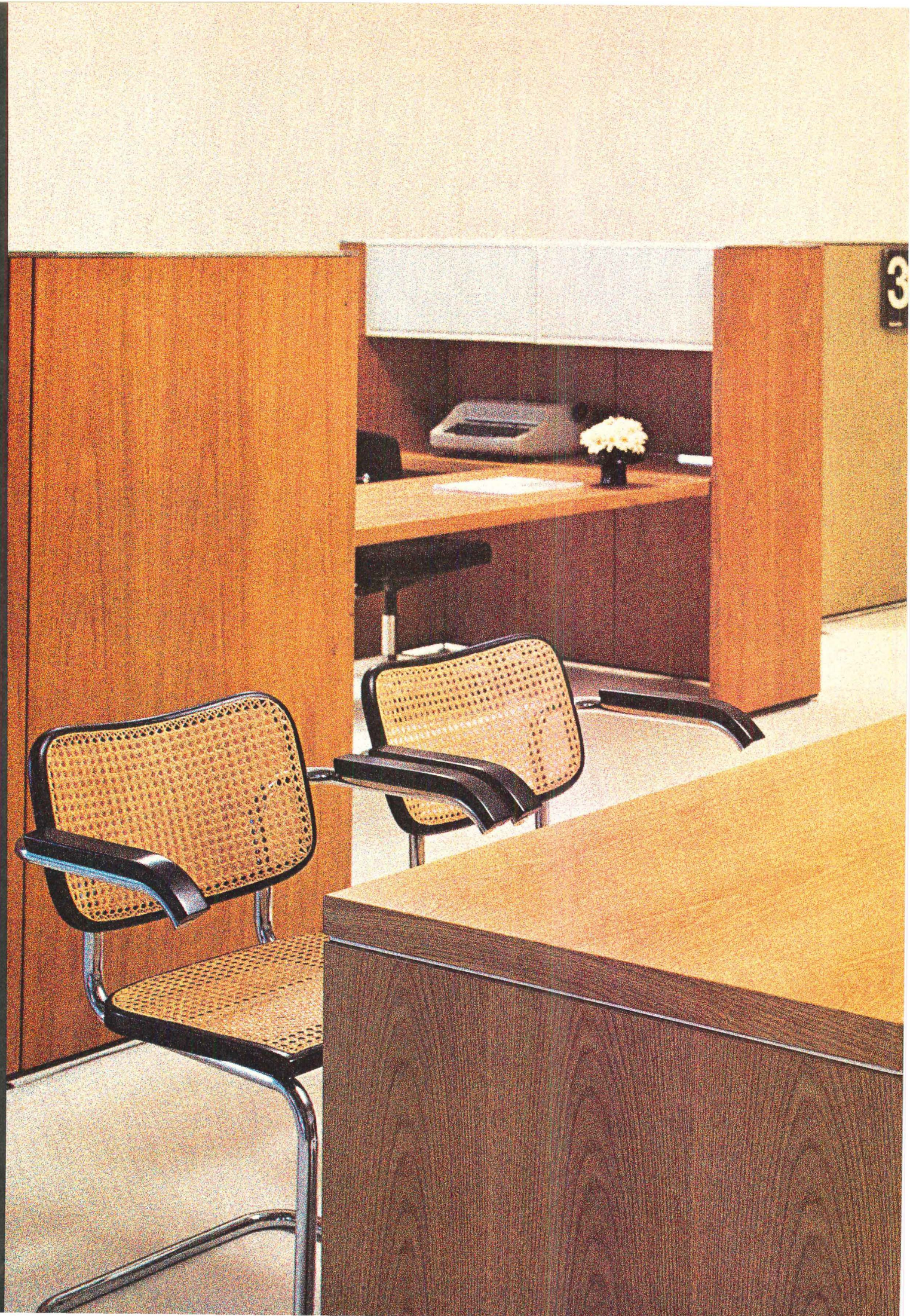

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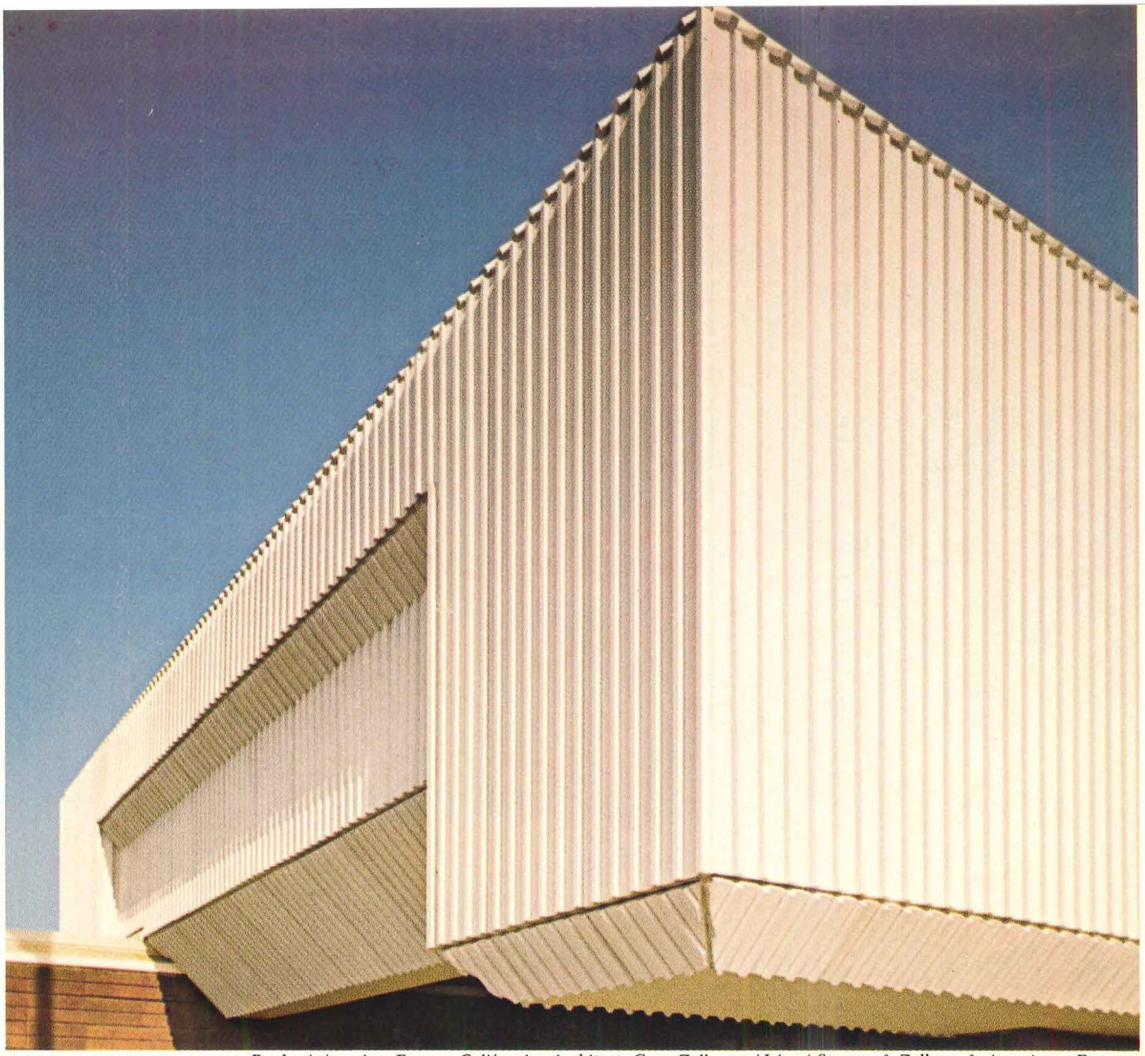

*Bank of America, Fresno, California. Architect: Gene Zellmer, AIA, of Stevens & Zellmer & Associates, Fresno.*

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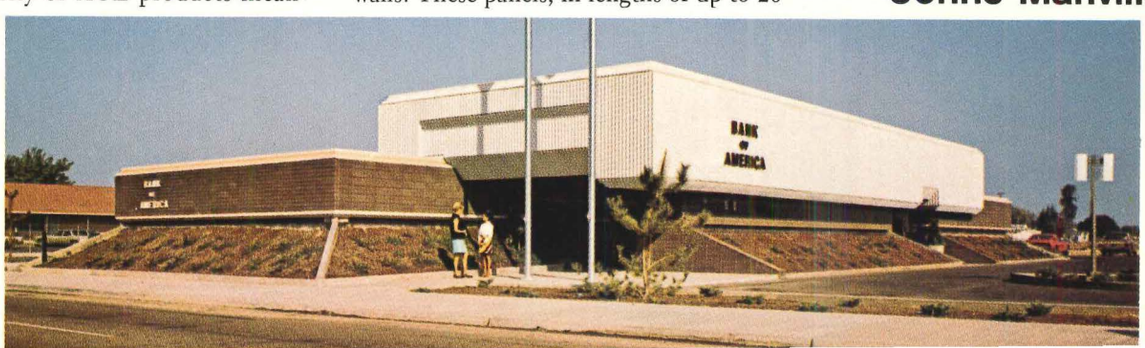


# A new look at registration and licensing

*Few matters can so affect architectural practice as much as the new and controversial proposals by NCARB to drastically change examination and licensing procedures. This editorial comment has been written by Record senior editor Elisabeth Kendall Thompson, who attended the critical NCARB meeting in San Francisco in July.—W. W.*

A revolution is under way in the procedure for licensing to practice architecture—and its ramifications are bound to be felt throughout the profession. In its look to the future, in its recognition that change is as desirable as it is inevitable, and its realization that new opportunities are already soliciting participation by architects, it is a good revolution. But not everyone sees it as good, despite the fact that by an affirmative vote of 43 of the 49 member boards present at the recent San Francisco convention the National Council of Architectural Registration Boards authorized final development of the new procedure.

The examination—or, rather, the examinations, for there will be two: one a qualifying or "equivalency," the other a professional, exam—which is at the heart of the procedure will be presented to and acted upon at next year's convention in Seattle. But acceptance by NCARB will not mean immediate use of the new exams in every state. Legislative changes will be necessary in some states before they can be used. Where allowable, however, the qualifying exam will be used for the first time in December 1972 and the professional exam in June 1973. Special provisions are made for those already in the process of taking the present examinations.

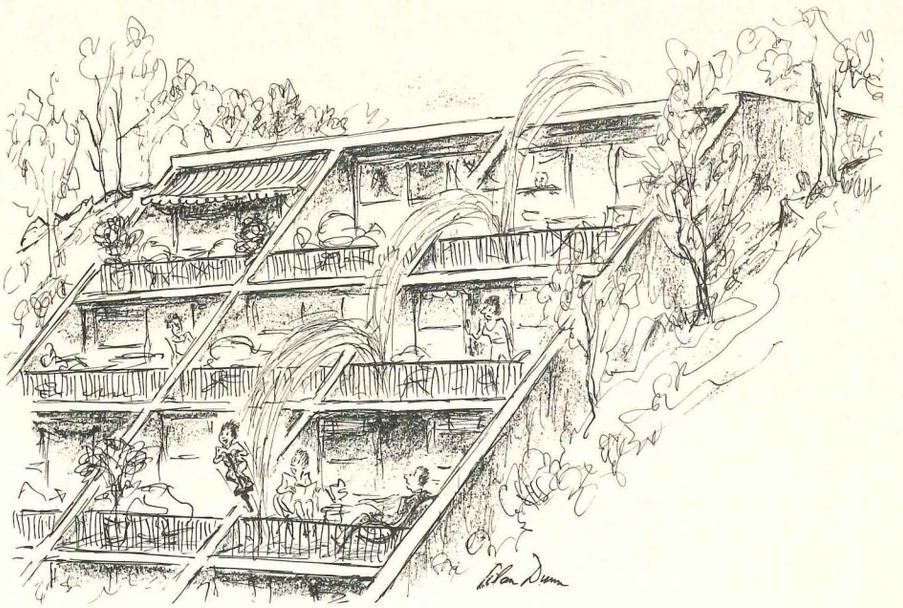
Of the two exams, the professional is the more revolutionary and therefore the more controversial. The qualifying exam is very like the present exam, but briefer. The professional exam, on the other hand, is not at all like the existing exam. It eliminates the currently required site and design problems and bases its questions (all of which will be machine-graded and consequently multiple-choice) entirely in the area of architectural judgments related to the environment. It assumes that the candidate's education, as manifested in his professional degree from an accredited school, has provided him with knowledge and proficiency in architectural design and technology; and it therefore does not retest him in what the school has, presumably, already tested him. And there's the rub, at least for some board members and for some boards. For without a test of what the candidate knows and without the implied confidence in the present curricula in professional schools, a state board may well feel that certification is a chancy thing. State boards are charged with the responsibility of certifying to the public that a licensee has demonstrated his professional capability in regard to the public health, safety and welfare; and the act of certifying to that capability hangs heavy over the heads of state board members. If all candidates had to take the qualifying exam *and* the professional exam, or some modification of these which would satisfy both NCARB's ideal of a broadened definition of practice and the state boards' real need for appropriate testing, there would be little argument about the new procedures. But that is not the proposal.

NCARB takes its position backed by a memo from its legal counsel Carl Sapers which deals with two aspects of the problem: the "general welfare" as a basis for use of the police power in regulating the practice of architecture; and the determination of a reasonable and appropriate period of apprenticeship (which the new procedure will change from the present three years for everyone to two years for holders of Bachelor of Architecture degrees and one year for Master of Architecture degrees).

His conclusion is that "a state need not confine its attention to whether a building may stand or fall; it may be concerned as well with the building's commodiousness, appearance and relation to other aspects of the land or cityscape," and that "there is no legal doctrine by which three years of apprenticeship is an adequate exercise of the police power and one year inadequate. . . . Whatever may be the wisdom of the proposed changes must be decided on the merits and not on the basis of some imagined legal (or constitutional) prohibition."

Even so, the question remains: can the state accept a college degree as proof enough of capability in the areas of public health and safety? That seems to be the real argument, not whether or not state boards can examine on matters of design and relation to the land or cityscape, for

—Drawn for the RECORD by Alan Dunn



that they already do and have for many years. Indeed, one state—California—has indicated that even when the necessary legislative changes are made to permit use of the new exam, it will continue to require site and design portions in its exam and that it will also require a three-year apprenticeship period.

It is more than likely that those states which, like California, are swamped with applicants each year (California has over 3,000 applications for the exam, and some 2,200 actually take the exam) get a very different view of the fitness for licensing of a large percentage of the candidates. With such a broad spectrum of candidates from all over the country, the California Board, for example, gets a cross section of the product of today's architectural education quite unlike that of states confronted by a very small number of candidates (Mississippi had two in 1969, Utah nine).

NCARB's proposed new procedure will, it expects, put pressure on the National Association of Accrediting Boards to press the Association of Collegiate Schools of Architecture to insist that the schools provide the necessary curricula and testing to rebuild confidence in the schools' ability to train professionals in the necessary technical and design proficiency. And NCARB, of the three organizations, has the muscle for such leadership.

But the real thrust of NCARB's new program is to broaden the concept of professional responsibility to include the environment, and to open the practice of architecture to persons with other than conventional backgrounds. For as William J. Geddis of Boston, retiring president of NCARB, firmly stated it in San Francisco, "If the profession is indeed serious and dedicated to the problem of creating a better environment, it must drastically adjust its attitudes and firmly commit itself to change, responsibility, leadership and accountability. With such a commitment, the profession needs to develop new competencies, new methods, and new associations to meet the challenges. Multi-discipline teams, skilled in large-scale planning, management, problem solving, and delivery systems will be required. For those who reject change and are reluctant to break with traditional practice, I only ask that they remain open-minded and support those of us who seek involvement and commitment. The severe limitations to architects that presently exist both in licensing and in ethical standards of the profession, have to be liberated."

There is no argument with that statement. There must be new ways to examine and to license. New attitudes are imperative. What is now under development actually began five years ago when three members—Dean Gustavson of Salt Lake City, Charles Graves of Kentucky and William Geddis—developed a long-range policy for NCARB "to cope with the drastic changes underway in education and in the profession." The new exam procedure is a primary result of that far-seeing policy. How much the revolution it suggests will change the profession cannot be assessed now. And the questions that are inevitable among those who bear the burden of administering the laws that regulate the practice of architecture will find their answers only in the actual examinations to be written between now and next June. But one thing is certain, even now: a good environment will be made up of good buildings as well as good open space, and only good architects—proficient in design and technology *and* in making decisions related to the environment—will do them.

*—Elisabeth Kendall Thompson*

## Submissions invited for Record Interiors of 1972

ARCHITECTURAL RECORD invites submissions to its third annual Interior Design Awards Program. Any architect-designed interior can qualify and individual architects may submit as many entries as they choose. Deadline for receipt of material is November 1, 1971 and winning submissions will be published in the January 1972 issue. For further information, turn to pages 104-105.

## . . . and Record Houses of 1972 plus Apartments of the year

Architects are also invited to submit single-family houses and multi-family apartment buildings built in the United States for inclusion in *Record Houses* 1972. Please include a brief fact sheet as well as relevant plan and section drawings with the photographs. Photographs need not be of professional quality but should be clear, fully describing the architectural intent, both on the interior and the exterior. See Record Houses 1971, page 2 for exact submission details.

## Coming in the Record for October and November

October will have a portfolio of projects under construction designed by Gunnar Birkerts of Birmingham, Michigan. The designs—for a variety of building types—are most innovative; and the drawings, done expressly for the RECORD, are worth the price of admission by themselves.

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November's Building Types Study will be hotels and motels, highlighted by an extraordinary ski resort in France.


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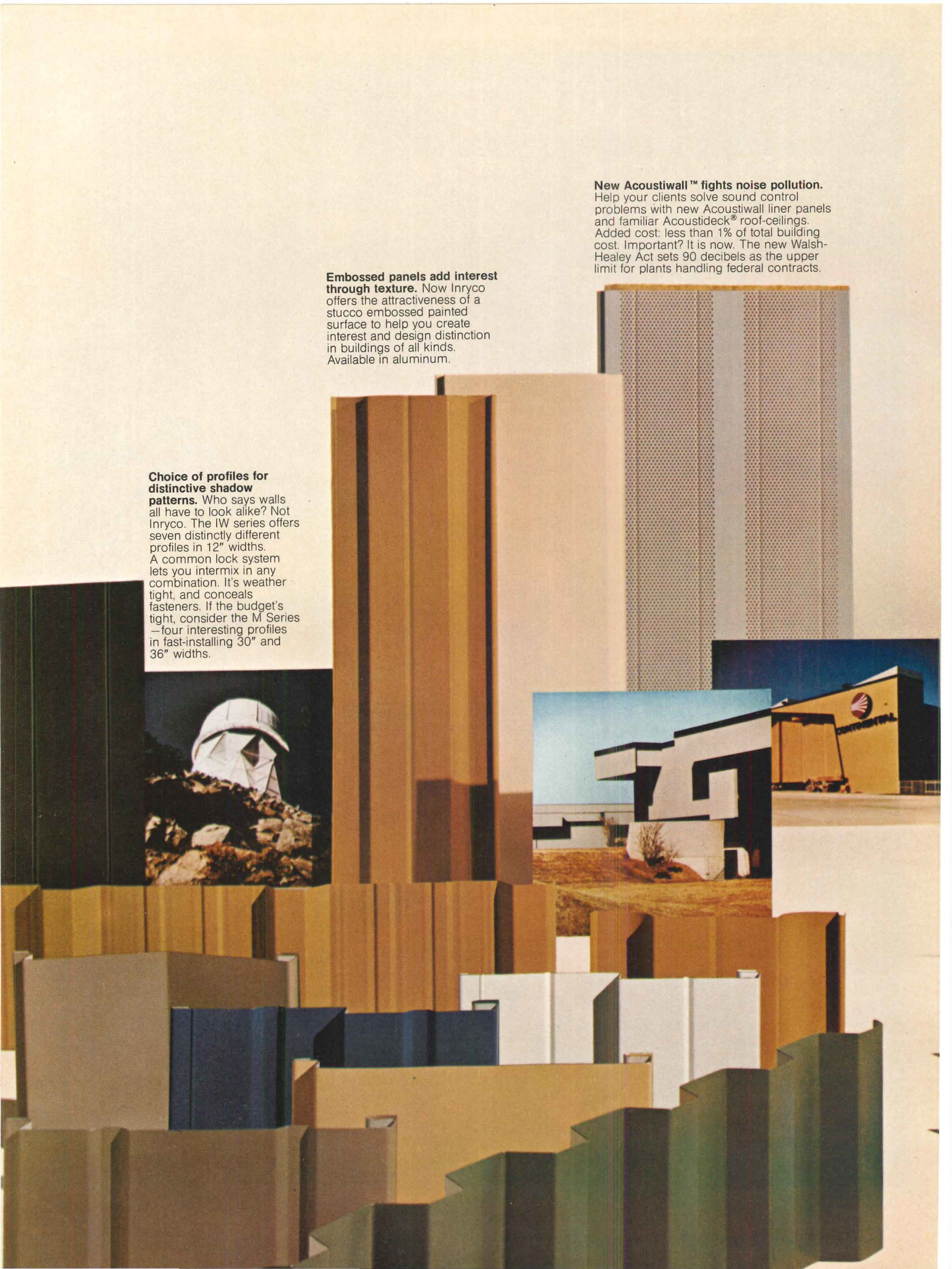

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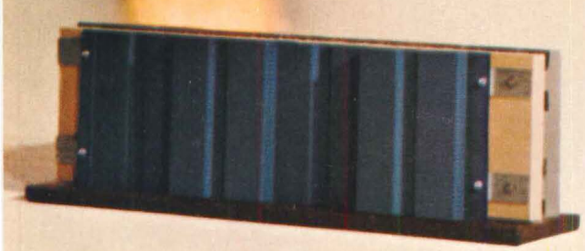

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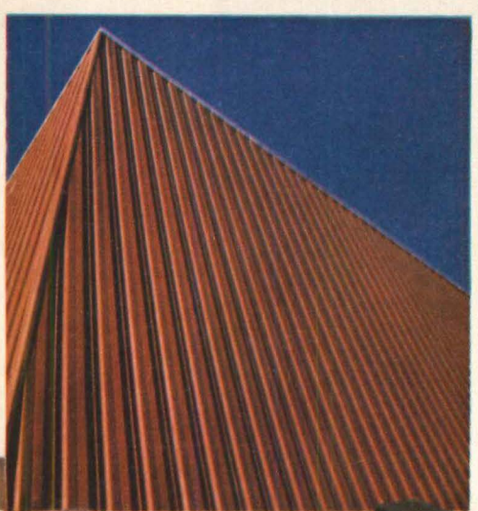

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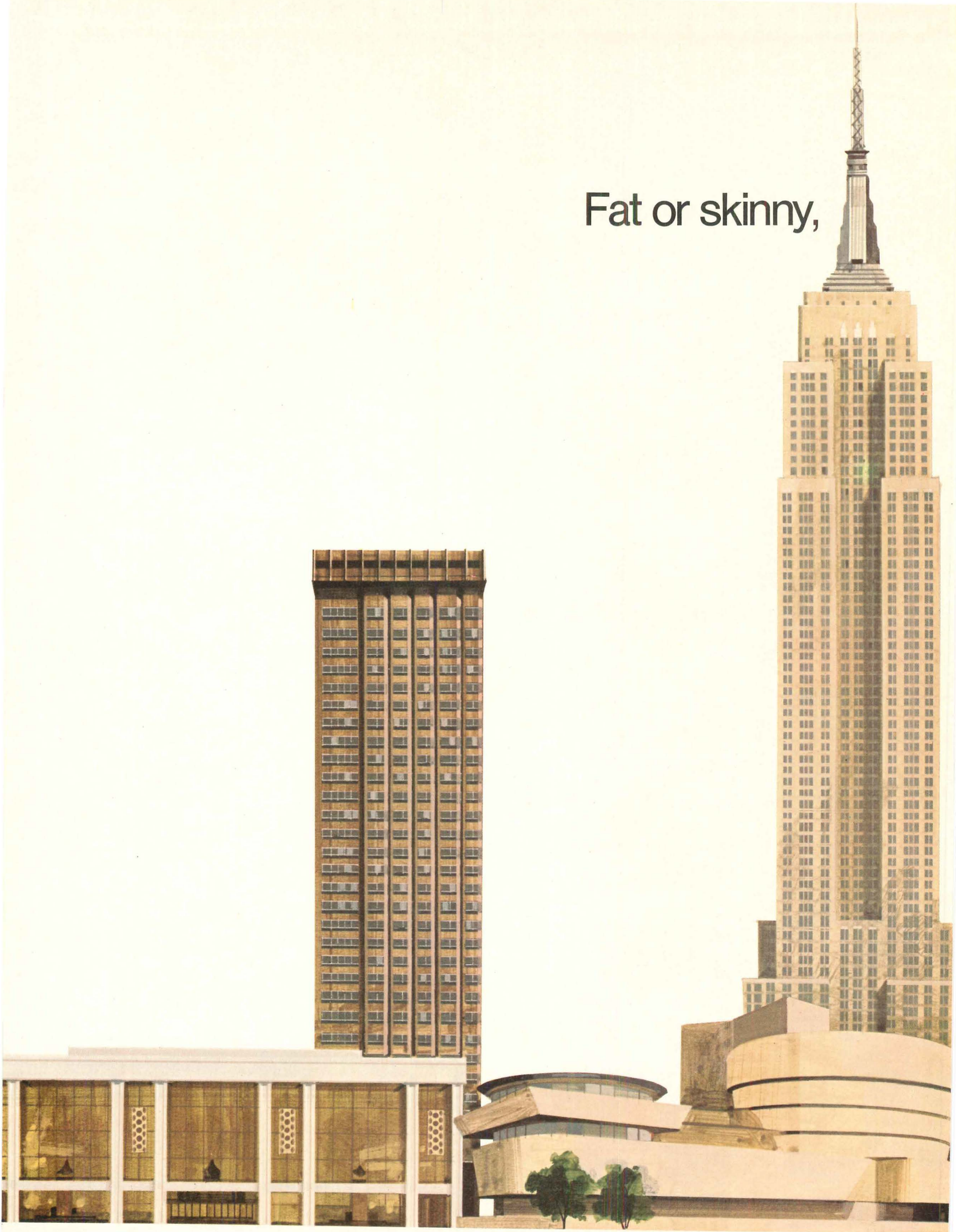

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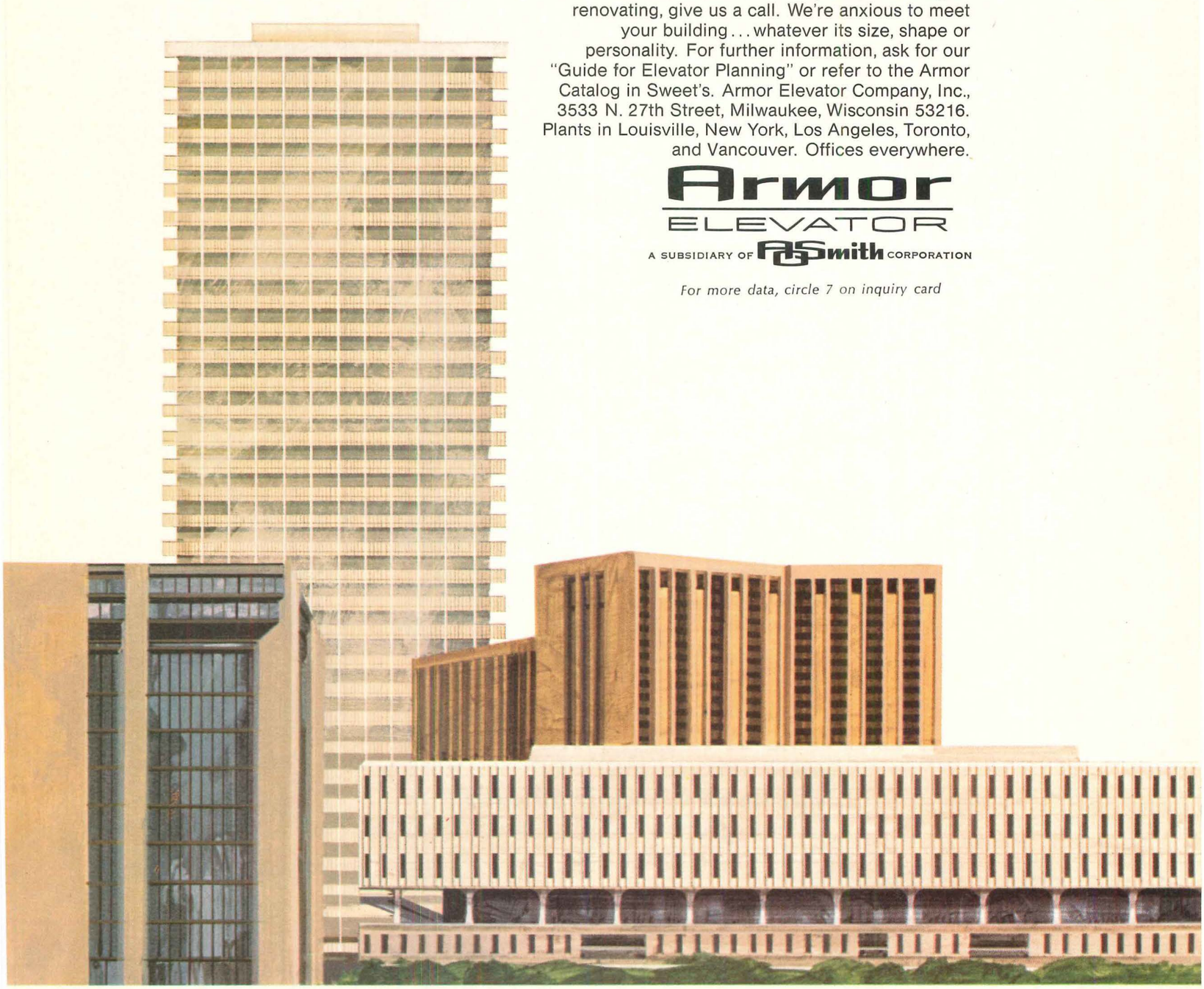

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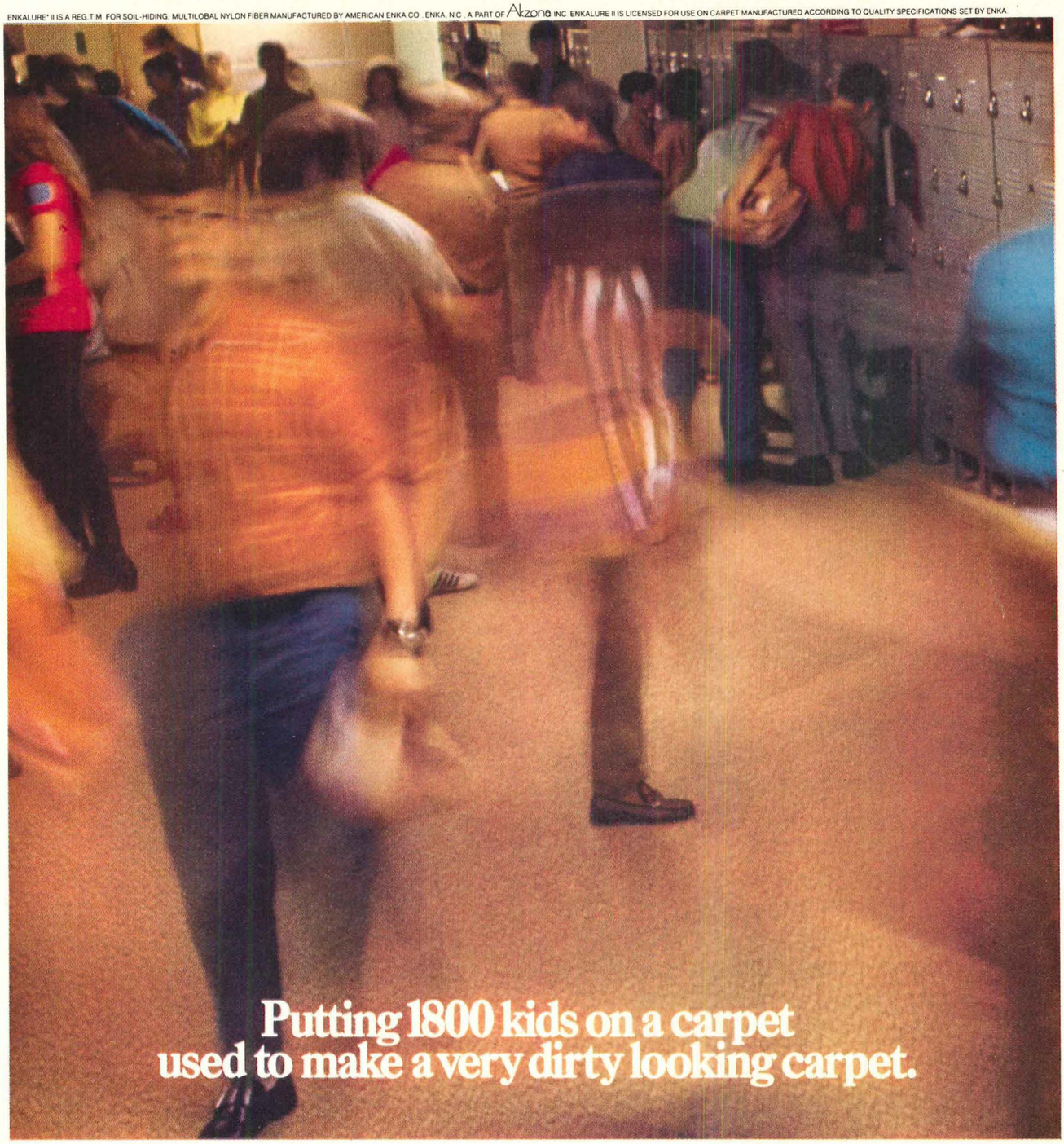

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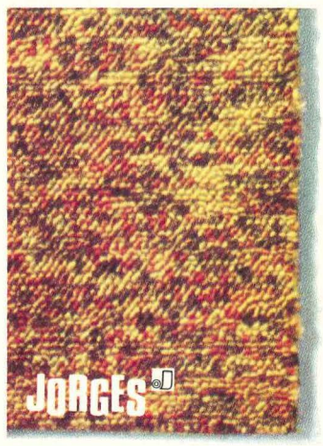

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Enkalure II soil-hiding nylon. It's the colorful carpet fiber that can stand up to the pressures of public life. Contact American Enka for additional specifications. We're at 530 Fifth Avenue, N.Y., N.Y. 10036 (212) 661-6600.

Carpets made of Enkalure II must meet the following minimum specifications:

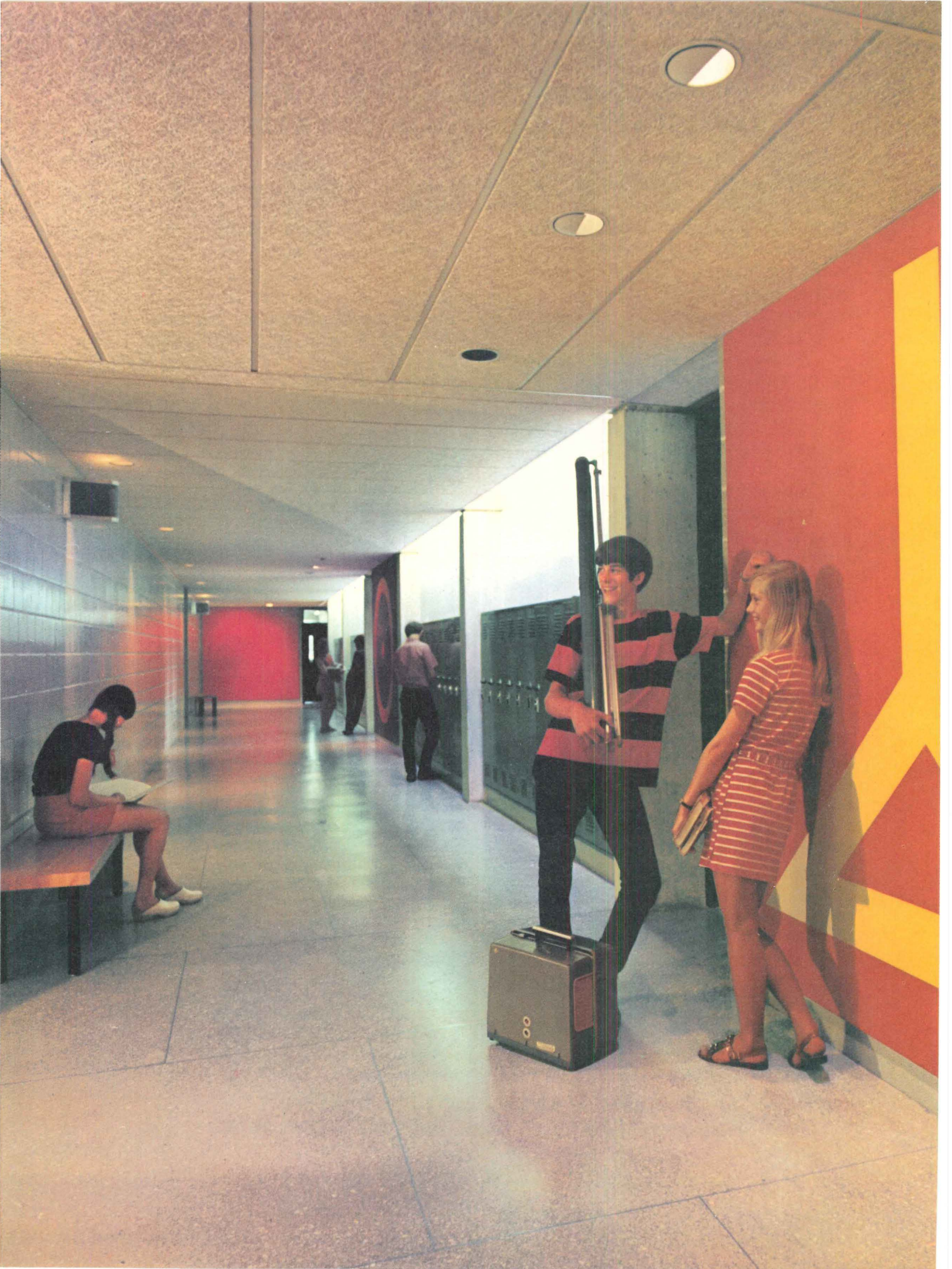
1. Pile yarn: One hundred per cent Enkalure II Nylon.
2. Pile weight: Minimum of 20 ounces per square yard.
3. Pile density: Minimum 5,000. Formula: $D=\frac{36W}{T}$

W = average pile weight (oz. per square yard)
T = average pile yarn thickness in inches

4. Tuftbind: Nine pounds, minimum.
5. Wear: Minimum—10,000 revolutions (NBS. modified using #320 Aloxite cloth with a torque of 60 inch pounds.)
6. Flammability: Must pass Flammable Fabric Act Standard DOC FF 1-70 Methenamine Tablet Test. Must not propagate a flame.
7. Pilling: Must resist pilling after 10 hours in abrasive tumble-drum tester with a rating of 2.5 or less.
8. Resiliency: Must recover at least 80 per cent of its pile height after 48 hours of pressure at 50 psi.
9. Crocking: AATCC 8-1964 rating 4 or better.
10. Colorfastness: AATCC 16 A-1964 minimum of 20 SFH with no color change.

**Enkalure II soil-hiding nylon, by ENKA.**
**The color stays clean when the carpet gets dirty.**

*For more data, circle 8 on inquiry card*



# They may give you an honorary degree if you specify Tectum corridor panels.

Tectum® soaks up noise — but things like books bounce off harmlessly. That's Tectum's unique textured surface of resiliant wood fibers. (Don't worry about the wood content — Tectum is rated non-combustible.) Here you see it in full-span corridor panels — available 'natural' or painted, from 6′ to 12′ long. They go up fast, are easily worked on the job to accommodate recesses (no pun intended) and light fixtures. Constructive suggestion: consider this versatile material for everything from schools to offices to high-rise apartments. For details, write National Gypsum Company, Dept. AR-91G, Buffalo, New York 14225.

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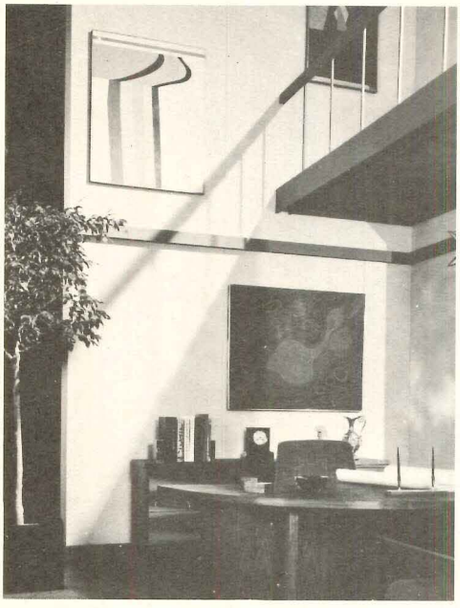
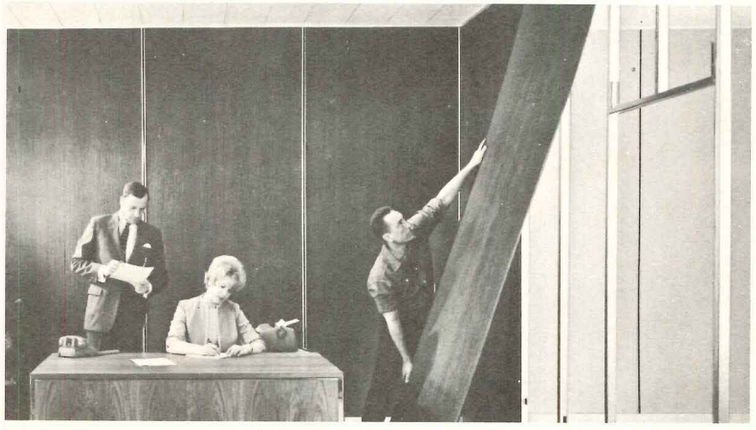
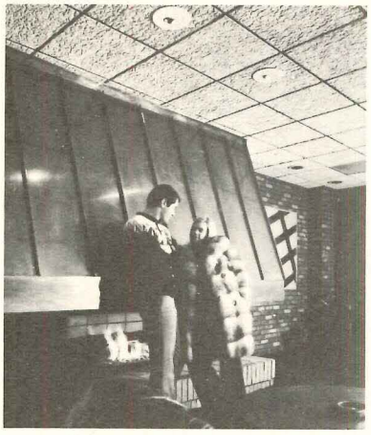


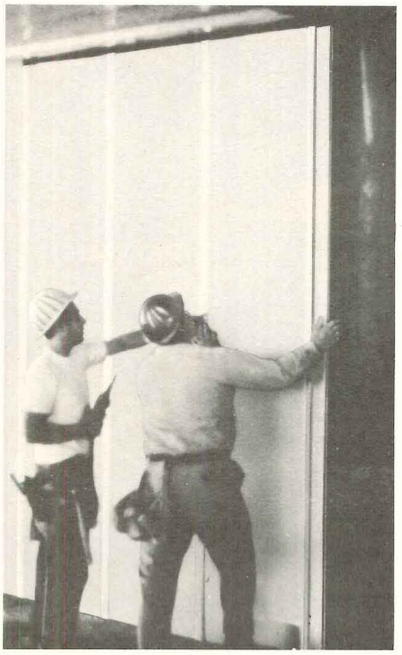
**Durasan® Vinyl-Surfaced Gypsum Wallboard Panels** are one answer to low-cost maintenance. They're rugged, abrasion resistant and washable. Durasan is available in a wide range of textures, colors and woodgrains.



**Contempo-Wall®** lets you divide space at will. Complete tenant flexibility! All components are demountable and reusable. Partitions come in four heights: ceiling, cornice, bank rail and low rail — all with Durasan vinyl-surfaced gypsum wallboard.



**Tonico® Cumulus Acoustical Ceiling Panels** help solve the problem of noise. They have an NRC of .65-.75 and a 35-39 STC range. They're noncombustible, and have a richly textured finish for any interior design.



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BUILDING PRODUCTS

**Gold Bond Metaledge Corewall®** is the answer to the fast, lightweight, low-cost enclosure of elevator shafts and stairwells. Two-inch thick, two-feet wide, long-length panels of gypsum have metal edges for attachment, rigidity and increased fire resistance.

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No, we're not an insurance company.

Actually, our windows are a part of a remarkable new concept in hospital patient care and plant operation.

Every patient entering Lutheran General gets a private room with TV, shower and toilet and highly personalized, individual care.

Sound expensive? It isn't.

Patients pay about the same rates other hospitals charge for double rooms.

It's possible because the hospital is planned to operate around built-in efficiencies that drastically cut costs.

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The natural beauty of wood helps put warmth and charm into what must necessarily be a somewhat sterile atmosphere.

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Building: Lutheran General Hospital, Omaha, Nebraska
Architect: Henningson, Durham & Richardson, Omaha, Nebraska

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Credits/Architects: Wilson, Morris, Crain & Anderson/General Contractor: W. S. Bellows Construction Co.

# Good news reported in white concrete--Cast-in-Place and Precast.

Utilizing the advantages of white concrete cast-in-place, beauty and complete flexibility were designed into the Houston Post's main office building. The structure is part of a three building complex recently occupied by the Post, a leading Southwest newspaper.

The clean beauty of the distinctive white concrete fins almost hides their functional purpose. In order to provide the utmost in open office space, the architects designed the fins to support the building's floors and roof.

The cast-in-place method was selected because it provides the most practical method of achieving the bearing-wall concept.

The ten towers, also cast-in-place white concrete, grow naturally from the fins. They contain stairways, elevators, and miscellaneous equipment rooms—helping to provide maximum open office space.

Exterior finish was created by medium sandblasting to enhance the monolithic look of the structure. To accent the main building, a white concrete sloping terrace wall surrounds the structure.

The two other buildings in the complex, totaling 96,759 square feet, have precast exteriors finished to match the cast-in-place exterior of the main building. Because their function is different than that of the main building, precast white concrete proved the most practical method of achieving the desired architectural goals.

We'd like to help make cast-in-place and precast architectural concrete with Trinity White Cement good news for your building plans. Please feel free to call us.

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Wall-Tex® GUARD®

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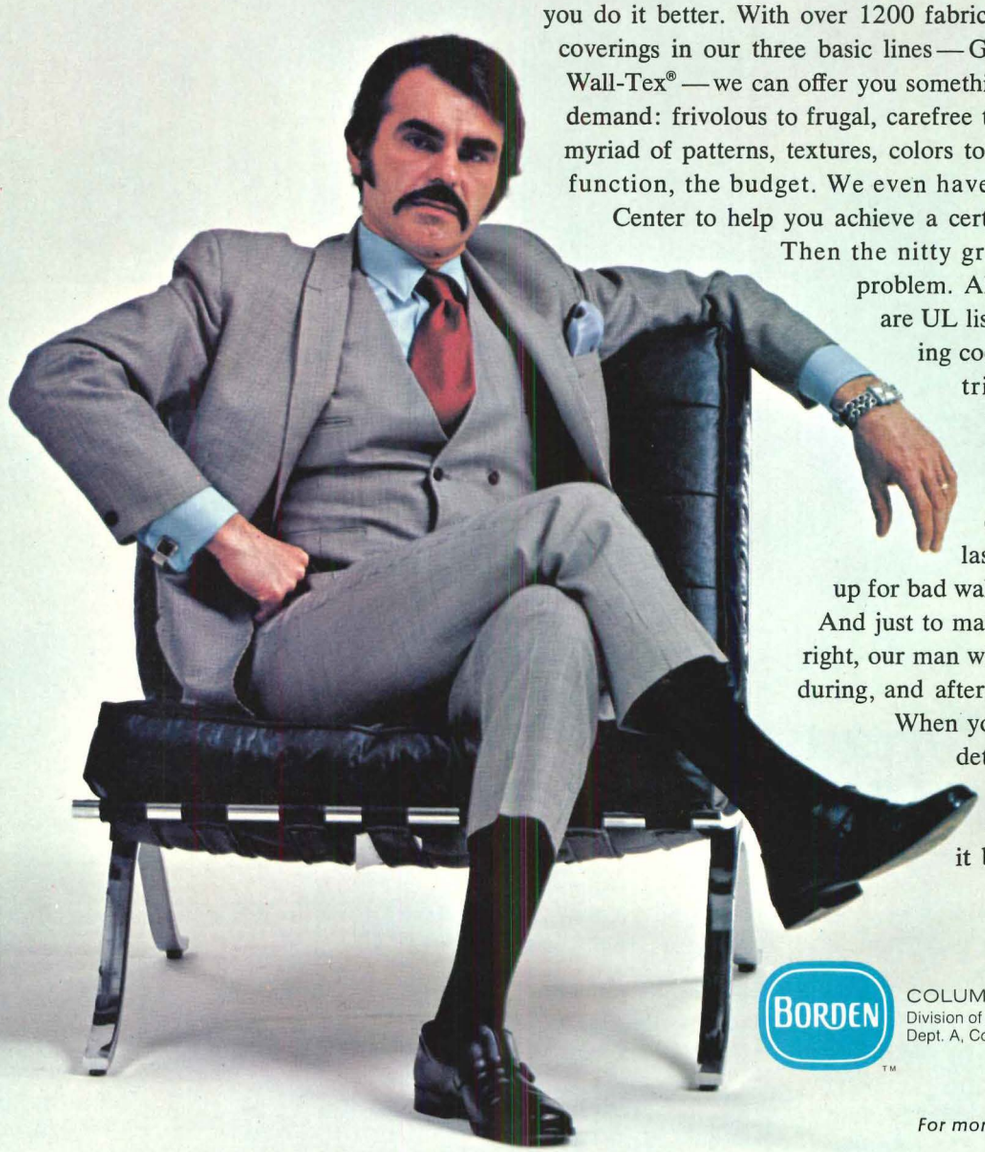

No matter what an interior has to do, who it has to do it for, or where it has to do it, Columbus Coated Fabrics is there to help you do it better. With over 1200 fabric-backed vinyl wallcoverings in our three basic lines — Guard®, Satinesque®, Wall-Tex® — we can offer you something for any business demand: frivolous to frugal, carefree to careful. A virtual myriad of patterns, textures, colors to please the eye, the function, the budget. We even have a Custom Design Center to help you achieve a certain look you want. Then the nitty gritty problems? No problem. All our wallcoverings are UL listed, meet the building codes . . . and are pretrimmed for perfect matches, simple to hang, practically maintenance-free, easy to remove, long lasting, a good cover-up for bad walls when renovating. And just to make sure everything's right, our man will go on site before, during, and after installation. Write. When you see our complete details, you'll know we know what we're doing . . . and doing it best for you.

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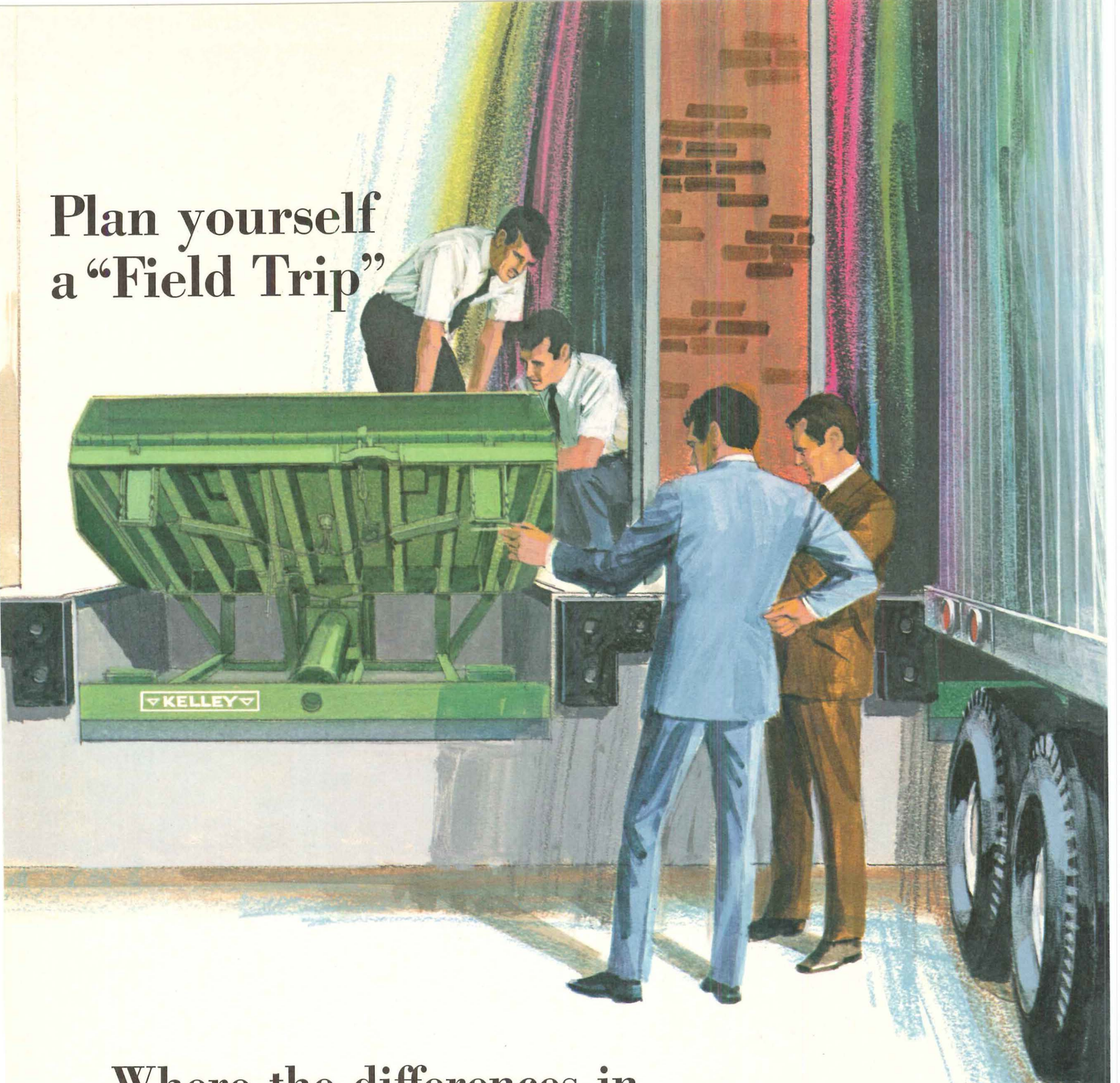


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Permanent Adjustable Dockboards look alike, and have similar sounding features. But put them in operation and the resemblance ends.

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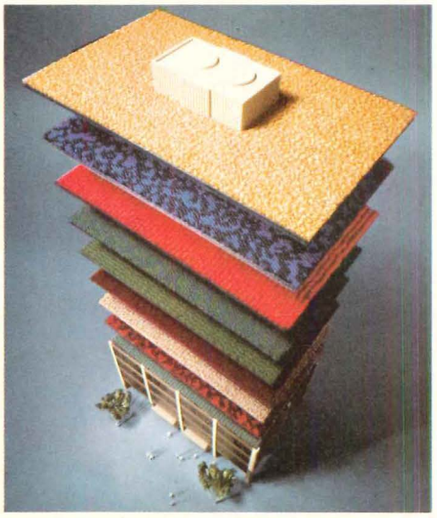

Have all the benefits of a completely carpeted building without using capital funds... through leasing.

Commercial Carpet Corp.—world's largest carpet systems manufacturer—introduces Showplace, the program that provides a leased carpet system *plus* complete building maintenance.

The money your carpet system saves on janitorial maintenance will substantially pay for the lease cost. And you'll speed up and increase your cash flow.

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The Showplace program could only be developed by CCC because *only* CCC has the system and carpets that make the maintenance savings possible.

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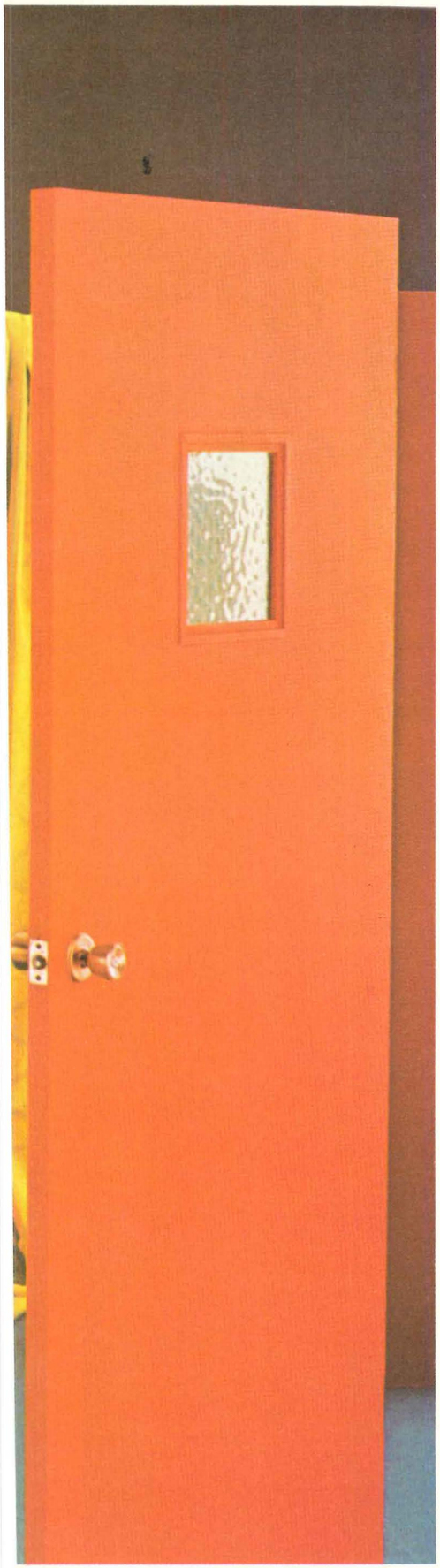
# Republic stylable steel doors.



You've designed a beautiful building. And now there's no reason for your being forced to line the halls with repetitious, monolithic entrance closures.

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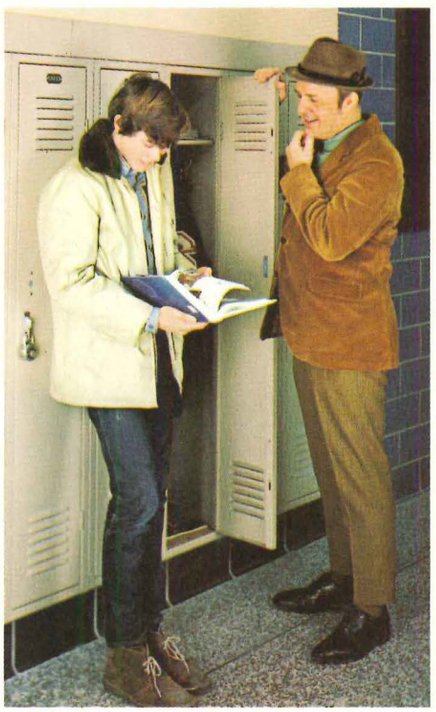
All this at standard prices and without delivery delay.

Doors, frames, and our FRAME-A-LITE stick systems come to the job accurate in every dimension — ready to install without last-minute fiddling.

Information? Check the Yellow Pages under Doors — Metal, and call our nearest distributor. Or write Republic Steel Corporation, Manufacturing Division, Youngstown OH 44505.

Lockers are interior decor, too. We supply them in 19 decorator colors and the styles you want — single or double tier, two person or box type.



**Republic**steel
Manufacturing Division

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Put them together or use them separately. Wilson-Art laminated plastic solids and woodgrains are the contract specifier's most useful aid to environmental control.

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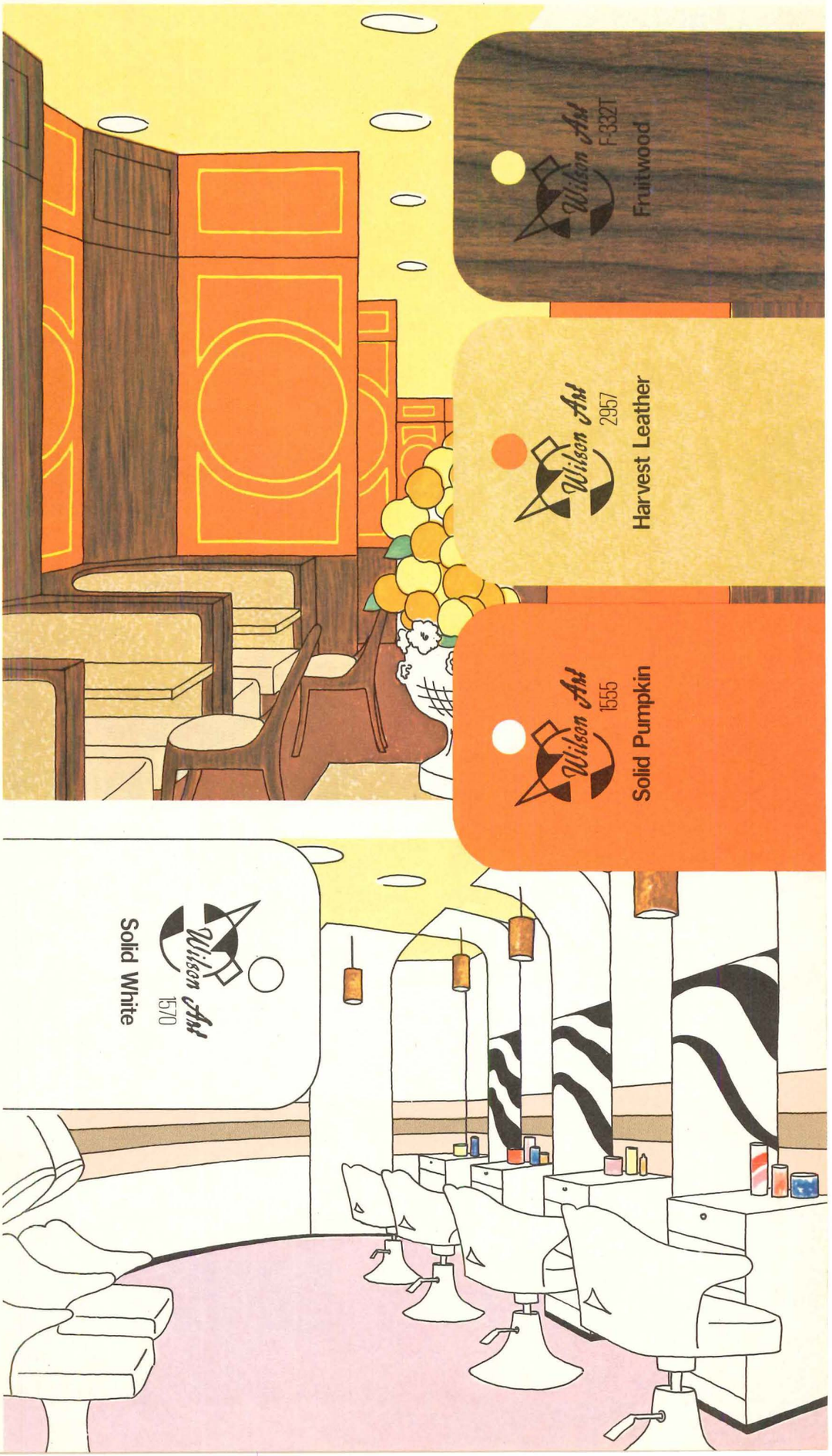
Wilson-Art covered panels are tastefully enhanced with delicate reveals—an exclusive one-step fabricating technique for permanent laminated plastic reveals with Wilson-Art Color Core.

Beauty meets beauty with a flair for function as Wilson-Art laminated plastics add charm and maintenance freedom to this salon.

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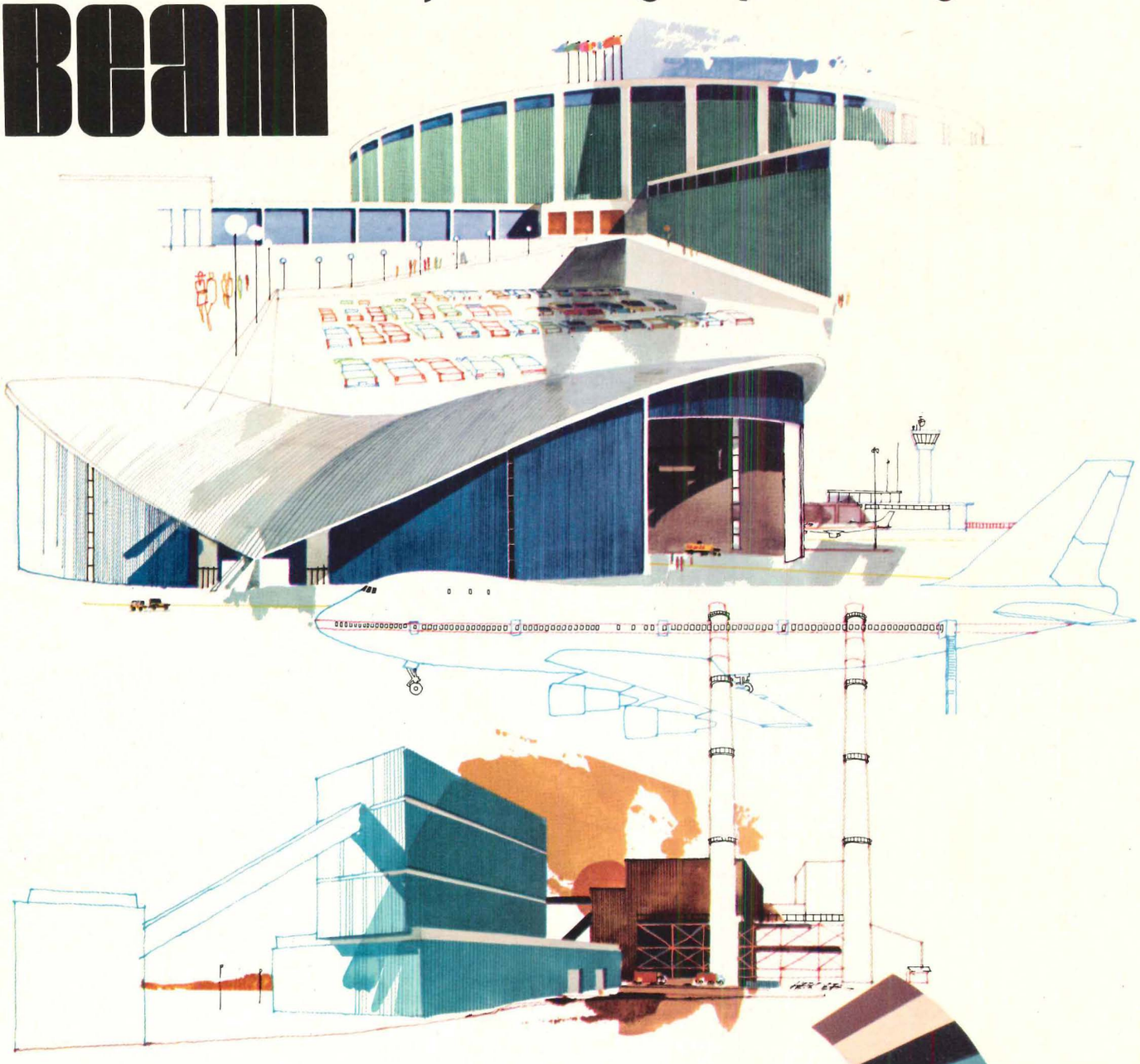
# BOLD BEAM

ALUMINUM ROOFING AND SIDING

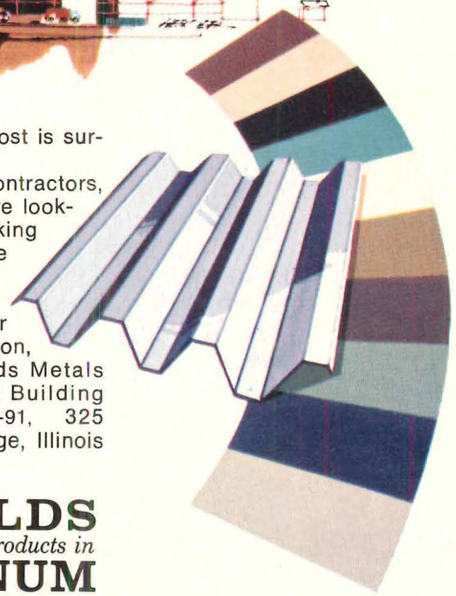
## for jobs as big as your imagination.



The structures of the 70's and beyond will be bigger, bolder, and more dramatic than ever before. New sports complexes will hold tens of thousands. Gigantic airline hangars will be built to service the new jumbo jets. Huge new power plants will light our cities.

To help you meet these new building challenges, Reynolds has developed Bold Beam . . . the new ultra deep-ribbed roofing and siding product. Bold Beam's extra depth gives you a spanning strength about 30% stronger than other configurations. Its bold shape and rugged shadow line add drama to any perspective. What's more, Bold Beam is light and easy to handle and install, and, as you would expect, maintenance costs are almost nonexistent. Colors? As new as tomorrow. Cost? That's the big surprise. Bold Beam's installed cost is surprisingly low.

For those architects, contractors, builders and engineers who are looking ahead and literally "thinking big," we urge you to investigate the newest aluminum industrial construction system . . . Bold Beam, from Reynolds. For free literature, without obligation, write Roger Moore, Reynolds Metals Company, Architectural and Building Products Division, Dept. AR-91, 325 West Touhy Avenue, Park Ridge, Illinois 60068.



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## just a doggone millisecond!

**It takes the instantaneous response of integrated circuit logic—to set a new pace for passenger service. That's the secret of Haughton's new 1092-IC elevator control system.**

Passenger Destination Time—from corridor call to arrival at destination—involves factors that conventional systems have to ignore. But 1092-IC applies a new technology. Integrated circuitry supplies the unlimited logic to break away from inflexible operating patterns. Passengers now can arrive at destinations sooner.

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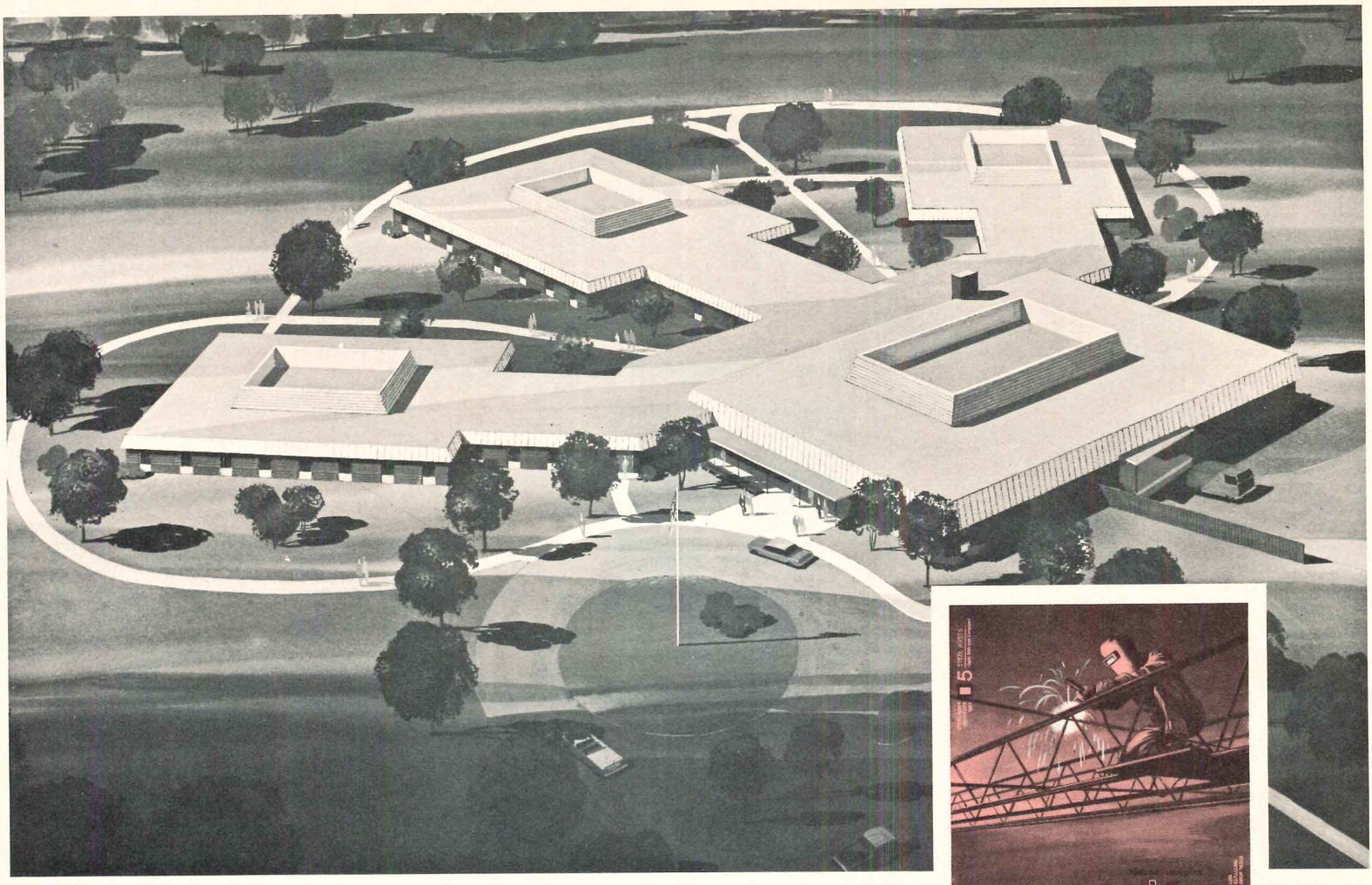




*Why steel joists were the right answer to this building need*

# MONTGOMERY COUNTY INFIRMARY: A MODERN HEALTH FACILITY AT ECONOMICAL COST

Montgomery County Infirmary in Amsterdam, New York, offers the finest facilities and professional staff for general nursing care. The design includes three 40-bed wings connected with a center hub housing adjunct facilities to service each wing, and basement area for general storage, mechanical equipment, laundry, additional service and storage areas. Total area is approximately 60,000 square feet main floor.

The type of construction and reason for selection? Architect William E. Cooper explains: "The building is constructed primarily of steel frame on concrete foundation with steel joists between structural steel beams. Over the steel joists, a steel deck, two inches of rigid insulation and built-up gravel surface roof. This type of construction has been proven the most economical of any we have encountered. Even when we eliminate the steel frame and use bearing wall construction, steel joists are our first choice, because it is relatively easy to meet the firerating requirements by virtue of the suspended ceilings."

Yes, for this and many other types of construction, open web steel joists offer the greatest efficiency and economy. Get the complete story. Send coupon for your free copy of the Specifications and Load Tables for Open Web Steel Joists and Longspan Steel Joists.

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71-013

# News in brief

**Effect of President Nixon's new economic policy on construction is still far from clear.** But McGraw-Hill economist George Christie sees the general effect as favorable. For details, see overleaf.

**Construction of Federal buildings would be speeded by new legislation proposed by the GSA** and just introduced in the House and Senate. If enacted, the law would amend the Public Buildings Act of 1959 and provide a method for rapidly reducing the large backlog of authorized but unconstructed Federal buildings. Important feature would be the establishment of a revolving fund, financed with "rents" from Federal buildings. This money would permit the Public Buildings Service, GSA's construction arm, to carry on a continuing construction program without the delays now involved in financing procedures, which require heavy Congressional involvement. An article on the proposed system, written for RECORD by PBS Commissioner Arthur Sampson, appears on page 65 of this issue.

**Lewis Mumford has been elected an honorary fellow of The Royal Institute of the Architects of Ireland.** In his presentation, RIAI president William A. Maguire said: "In all his works Lewis Mumford has asked: What ends are being served by technical progress and social organization? Are they enhancing life or denying it? All who practice architecture and planning have been influenced by his answers. . . . He has spoken out against the inequities, ugliness and congestion of cities and has advocated the principles of renewal and integration on which personal and social development should be based. . . ."

**A National Academy of Code Administration has been formed** to develop and establish regulatory code administration as a recognized profession. In announcing the formation of the Academy, its president, Richard L. Sanderson, said: "Inept administration is the essence of the ills of code enforcement in the United States. It restricts the use of new materials and concepts in building construction, and is the root cause of the continuing and accelerating decay of our older cities." The function of the Academy is to conduct research, develop curricula, establish standards for accreditation and certification, sponsor educational activities, and "engage in all other scholarly activities necessary to the development and establishment of a profession." Address: 1313 East Sixtieth Street, Chicago.

**Upcoming events: The NYSAA/AIA 1971 Convention** will be held at Kutsher's Monticello, beginning Monday, October 18 and ending on Thursday, October 21. A one-day special will be held on Wednesday, October 20 for those members and guests who can only attend that day. **Secretary of Transportation John A. Volpe heads a list of speakers for the Producers' Council's 50th Anniversary Meeting,** scheduled for the Mayflower Hotel, Washington, D.C., October 26th and 27th, 1971. Contact: Francis X. Brown 667-8727. **The White House Conference on Aging** has scheduled a major Conference event when its 3,400 delegates meet in Washington the week of November 28; **Environment Design Research Association will hold its Third Annual Conference** at the University of California Los Angeles' School of Architecture and Urban Planning on January 24-27 1972. All submissions and requests for information should be addressed to William J. Mitchell, chairman, conference planning committee, School of Architecture and Urban Planning, University of California, 405 Hilgard Avenue, Los Angeles, 90024; **The American Plywood Association is initiating a plywood design competition** for architects throughout the United States. A top award of $1,000, plus three citations, will be presented. Deadline for entries is January 31, 1972. Contact APA, 1119 A Street, Tacoma, 98401. **The 17th Annual Convention of Precast Concrete Institute** will be held at the Los Angeles Hilton, on September 19-23, 1971. **The 11th UIA Congress will be held in Bulgaria** on September 25-30th 1972. The general report is being prepared under the supervision of the architect Nikola Nikolov. Reports on four sub-topics must be finished by the end of 1971. Any information concerning the Congress must be sent directly to the General Commissary: Architect Mihaylov (Bulgarian Union of Architects—11 rue Dimiter Polianov. Sofia 4). New York City Community College, Division of Continuing Education and Extension Services and the Metropolitan New York Chapter, Construction Specifications Institute are jointly offering a special course in **Principles of Construction Specificaton Writing** to be held Tuesdays, 6-8 p.m., October 5 through January 4, 1972 at a mid-Manhattan location. Contact: Prof. Judith McGaughey at 212/643-5572. **A program focusing on the architect and his role in project development** has been finalized for the American Institute of Architects Central States Regional Conference to be held in Kansas City, Mo., October 13, 14, and 15.

## The President's new economic policy: the biggest boost is confidence

"While there are definite incentives for both consumers and businessmen to increase their spending (as a result of the President's new policy) it may well turn out that the most important aspect of the new program is psychological—government now seems to be doing something; showing leadership; providing justification for the return of that all-important ingredient that has been missing in this recovery: confidence." So says George Christie, chief economist of McGraw-Hill Information Systems Company.

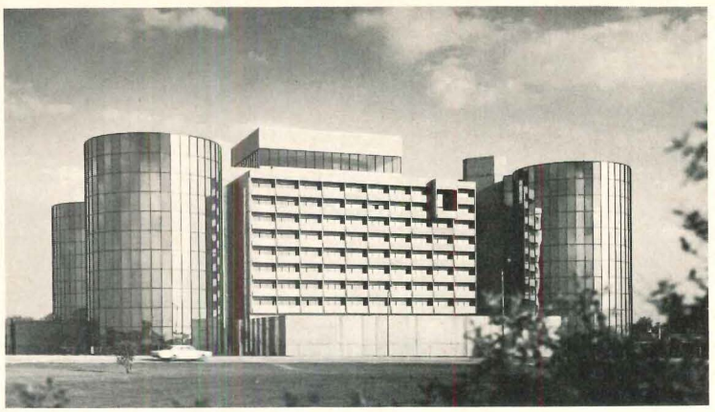
The first effect of the new policy on construction (as for all sectors of the economy) is an instant, if temporary, halt to rising costs. The wage freeze over-rides the Construction Industry Stabilization Committee actions. But chances are this body, given the 90- (or perhaps 120-) day breathing spell, will have ready some reasonable long-run guidelines for construction industry settlements that might have *more* hope of labor acceptance—now that the Administration has declared that enough is enough, and if every one is in something like the same boat.

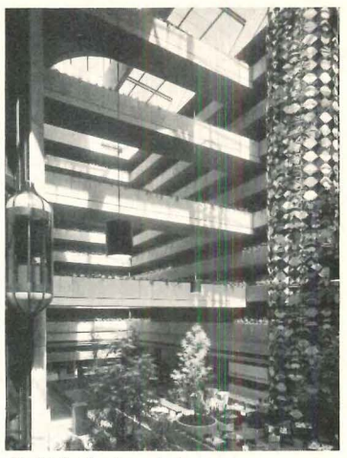
There is a possibility of some delayed impact on some kinds of buildings, the theory being that some companies will hustle their money into machinery and equipment while the 10 per cent investment credit is in force. But that remains to be seen.

The proposed $5 billion cut in Fed spending and 5 per cent reduction in Federal employment is not being taken too seriously by most experts. But you've got to guess that Federal money for construction will remain tight, for in today's social climate, the government will be reluctant to spend much on new facilities for government while it cuts down on welfare and other social programs and (most probably) puts revenue sharing back on the shelf.

Interest rates? Mortgage money is bound to be tighter as individuals spend more and save less; but diminishing inflation should help halt or at least slow down today's upward drift of interest rates (another possibility: rates may be frozen by fiat.)

Best guess over-all: a boost for non-residential building.





*Hedrich-Blessing photos*

## An interior "city square" dominates new hotel at Chicago's O'Hare Airport

A mini-city of restaurants, guest rooms, recreation facilities and meeting rooms, the new Regency Hyatt House at O'Hare by architects John Portman & Associates is dominated by a spectacular ten-story-high, skylighted atrium (left), replete with trees, balconies and pedestrian bridges leading to a central tower with glass-cylinder elevators. The exterior (above) is also dazzling, with one-way copper-colored glass sheathing four cylindrical corner towers and all windows in the central square. Interiors are by Tom Hughes.

## Texas architects begin public education on environment

The Texas Society of Architects (TSA) will undertake a wide public education campaign to promote active citizen participation in protecting the environment. TSA president Tom Bullock, Houston, said Texas architects will, during the next 12 months, use all resources available to "unite Texans and encourage them to adopt a positive protective attitude toward our state's environment."

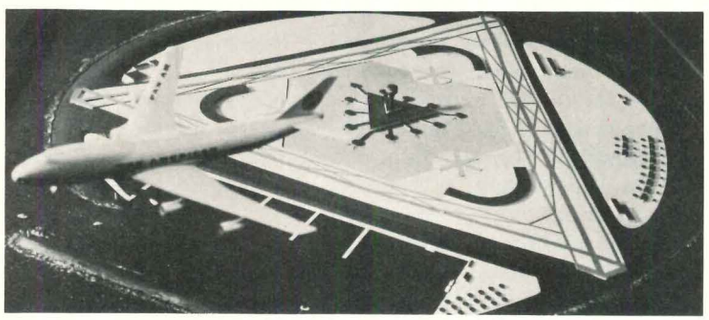
"Architects feel an obligation to speak out loud and clear about what is happening to the environment," Bullock said. "We will do this through a positive, far-reaching public education campaign and we intend the theme, "Texas: Handle With Care," to become a constant reminder to every Texan to be environmentally aware every day." Bullock pointed out that the purpose of the campaign is not to provide a final solution to all the environmental problems of the state, but "to create an atmosphere in which solutions will be possible, even demanded."

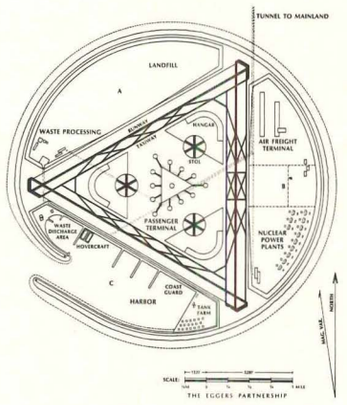
While the architects initiated the drive, they are enlisting other groups, businesses and individuals to unite behind the campaign in order to involve the maximum number of people. The thrust of the campaign will be completely positive, urging protection and magnification of the beauties and advantages of Texas, and broader than most environmental campaigns since it will cover seven areas which the architects see as major environmental concerns—conservation, historic resources, transportation, health, education, housing and human resources.

## Metrification gets go-ahead; next step is legislation

The Federal government has completed its intensive study of pro and con arguments concerning a changeover to the metric system and Congress now has the 172-page report which advocates a 10-year phased program leading to metrication for the U.S. The report was submitted by Commerce Secretary Stans after more than two years of work by the National Bureau of Standards. Congress was told that—within a broad framework—industries, education and other segments of society should work out their own specific timetables and programs. But this cannot begin until a final decision has been made by the Congress concerning conversion. Should a law be passed, say next year, affirming the Commerce Department recommendation, joint planning by all groups affected would begin.

Trade associations and agencies of the Federal, state and local government would be advised by the coordinating group of changes in codes and regulations requiring attention. The report includes this argument regarding the international aspects: ". . . The U.S. has the opportunity to ensure that its practices and technology are taken into account in international standards negotiations. And as the nation changed to metric, it would be changing to metric-based international standards that it had a hand in setting up."






## Offshore polder might solve environmental problems

Offshore developments combining three-mile-long runways for aircraft, a nuclear-power generating plant, waste disposal and landfill, and a deep-water port for tankers, have been proposed by The Eggers Partnership, architects, and Syska & Hennesey, engineers, of New York. Their proposal envisions creation of a seafloor island—or, the Dutch would have it, a polder—connected to the mainland by tunnel. The proposal shown, for New York City, would cover 9.5 square miles and be located three miles offshore. The enclosing ring dike would be 11 miles long. The feasibility of the system, says David Eggers, has been demonstrated by the Zuyder Zee dike, now 40 years old. "Considering today's more advanced technologies, the proposal does not seem overly difficult."

The scheme, he points out, would provide a solution to the problems of disposing of solid waste (it would be used as fill), and place "out at sea" the noise of aircraft, the possible hazards of nuclear power generation, and oil unloading.

## F.W. Dodge forecast for 1971 amended upward

The previous estimate of a 10 per cent gain in this year's value of construction contracts has been raised to 13 per cent. The new estimate of $76.7 billion in construction contracts was made by George A. Christie, vice president and chief economist of McGraw-Hill Information Systems Company. "Most of the 13 per cent increase now expected for 1971 will materialize during the remaining months of the year," says Christie. During the second half he also believes the presently high level of the housing market will be joined by a gradually improving demand for most types of nonresidential building. He observed that for the first four months of this year, total construction contract value was ahead of the comparable 1970 figure by four per cent.

In reporting the second periodic update of the *F. W. Dodge Construction Outlook,* which was originally issued last October, Christie said that construction markets at present are fulfilling earlier expectations. "Housing has already made it in a big way. By spring, the rate of housing starts had already reached and surpassed the 1.8-million level anticipated for the year as a whole. With a steady volume of homebuilding during the second half, the year should end with a 26 per cent gain in this category and reach $31.2 billion," the Dodge economist stated.

The biggest revision necessary in the earlier forecast, according to the economist, was in the nonbuilding group where electric utility construction "has reached epidemic proportions."

Christie said "interim adjustments have been made in the earlier forecast of nonresidential building markets" but that he still expects a generally stronger second half to turn the first half year decline into a gain of some three per cent.

Further, the Dodge Business Construction Index, which measures new contracting for the construction of industrial, commercial, and other business facilities, moved up an additional eight per cent in the second quarter to 170 (1967-100). This latest advance followed a sharp first-quarter rise of better than 50 per cent from the low point reached during last year's final three months, according to Christie.

"The second quarter's continued improvement in contracts for new business facilities shows that the large gain reported earlier this year was not an isolated fluke," he said, "and indicates that business is now committed to a higher level of capital spending for 1972, the time when most of this business-connected construction will be put in place."

*Rockefeller Center, Inc. photos*

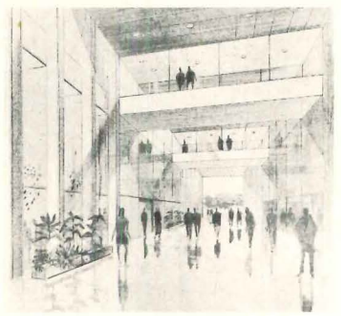
## Plazas, concourses and mid-block malls highlight Rockefeller Center expansion

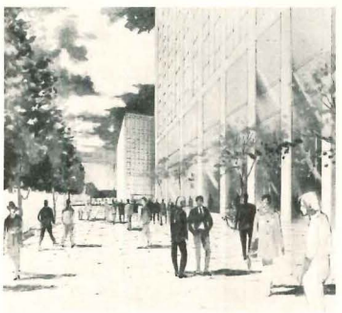
The civic amenities which have made New York's Rockefeller Center world famous since the original 14 buildings were constructed—plazas, wide promenades, underground concourses and good lighting, among many others—are all being incorporated in three new buildings for the Center to headquarter Celanese Corporation, McGraw-Hill, Inc., and Standard Oil Company (N.J.). All were designed and developed as a group (together with the existing Time & Life Building) by architects Harrison & Abramovitz & Harris. The new buildings, which devote 40 per cent of the land area to open space, are now under construction and bring the total number of buildings in the complex to 21, on 25 acres of land, with 15 million square feet of space.

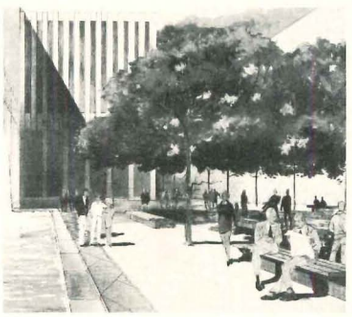
The effect of a four-block-long plaza, bracketed by lower-rise building extensions at each end, will be created along the Avenue of the Americas from 47th to 51st Street. The Center's underground concourses will also be extended beneath the new skyscrapers.

But perhaps the greatest applause should go to the creation of a mid-block pedestrian way behind the buildings (shown in order in the sketches below), which range from a 35-foot-high "galleria" through the Celanese Building, a tree-lined mall behind the McGraw-Hill Building, to a promenade and mini-park behind the Jersey Standard structure.

Though planned together, the big tree-edged plazas fronting the buildings (shown in the same order above) each have their own differences and individuality: sculptures, a sunken plaza, a large pool.







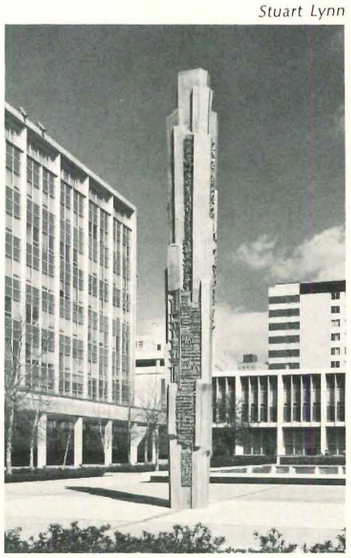
## New Orleans completes its Civic Center Plaza

Continuing its laudable tradition of honoring distinguished citizens with green parks, squares and suitable monuments, New Orleans has added an effective new memorial plaza in the middle of its post-World War II Civic Center complex.

The work of designer-sculptor Lin Emery, and dedicated to the late deLesseps S. Morrison (long time city mayor and former U.S. Ambassador to the Organization of American States), the plaza incorporates some refreshing downtown amenities (pools, trees, flowers, seats) and some highly inventive art: a fascinating aquamobile fountain (below); and an obelisk-like monolith (below, right), with a relief figure and open-work texts about Morrison, that is reportedly one of the largest cast-aluminum sculptures ever attempted (40 feet high, 10,000 pounds). It is made of a special alloy developed and donated by Kaiser Aluminum & Chemical Corporation; other contributors were Service Foundry Division of Avondale Shipyards and W & A Engineers. The $200,000 project was commissioned by the State of Louisiana in 1964 and completed this year.

*Clarion Herald*

*Stuart Lynn*



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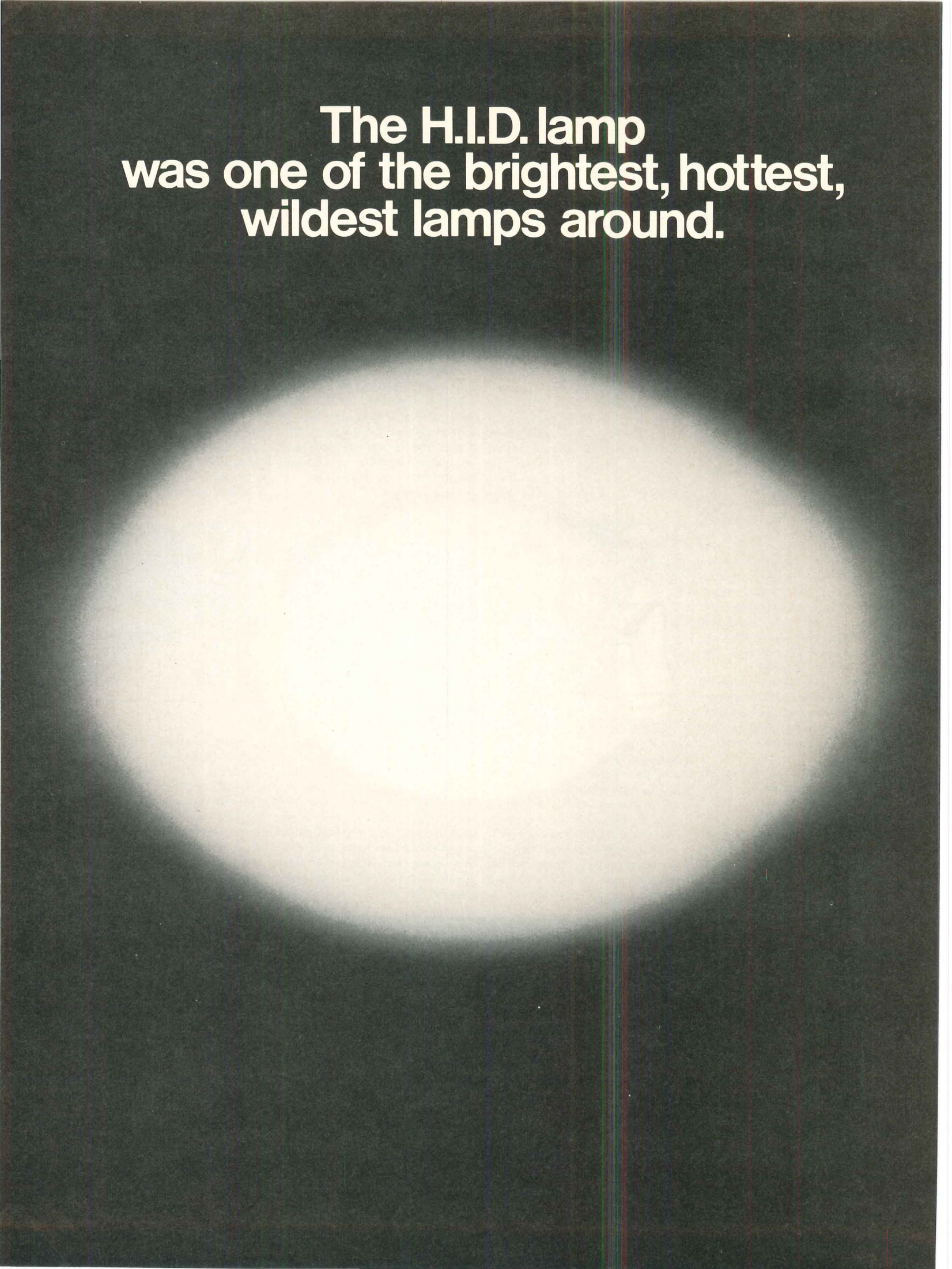

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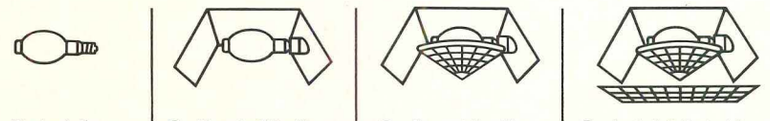
**How we tamed a wild lamp.**



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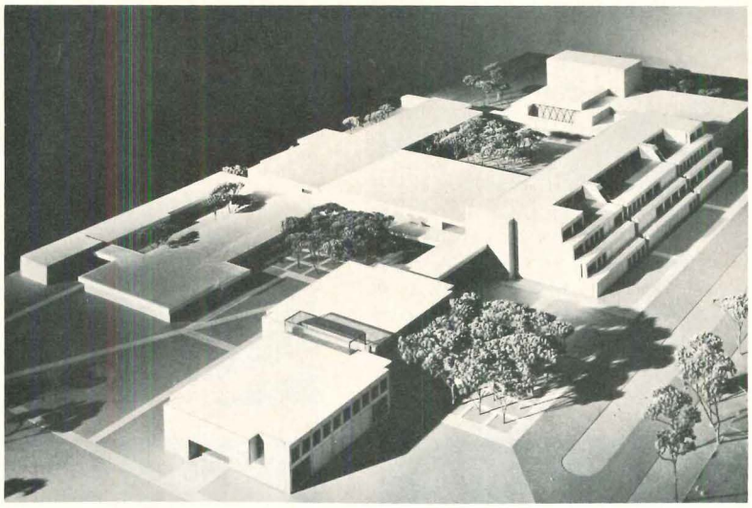
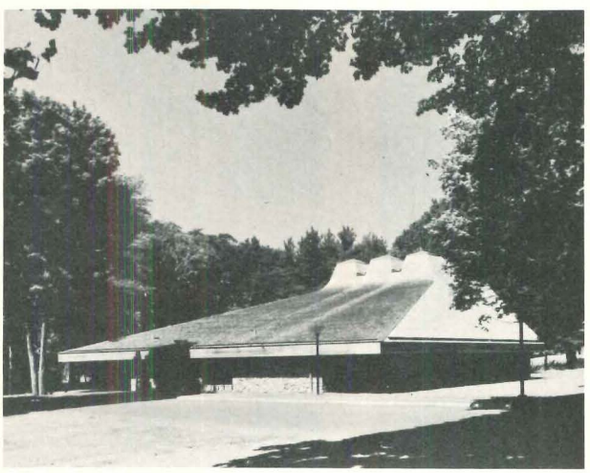
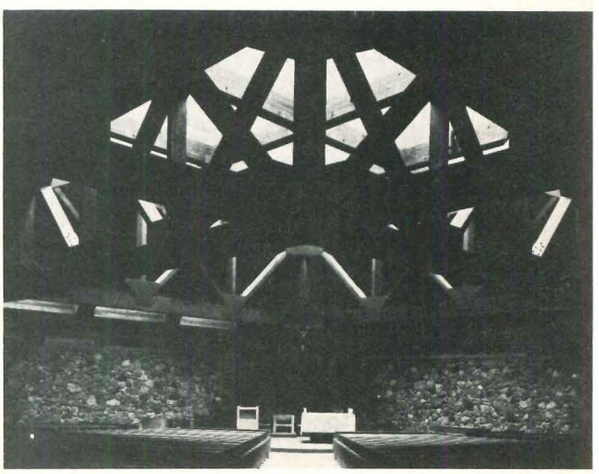
**Tarapata-MacMahon-Paulsen Associates, Inc.** were awarded a Special Jury Citation for Outstanding Architectural Excellence by The College and University Conference and Exposition for the two-story Fine Arts and Classroom Building (foreground) on the campus of Delta College in University Center, Michigan. Its two blocks are connected by a glass enclosure providing a secondary entry, gathering place and exhibit space. Their plan for Academic Complex II, Grand Valley State College, Allendale, Michigan was also exhibited.

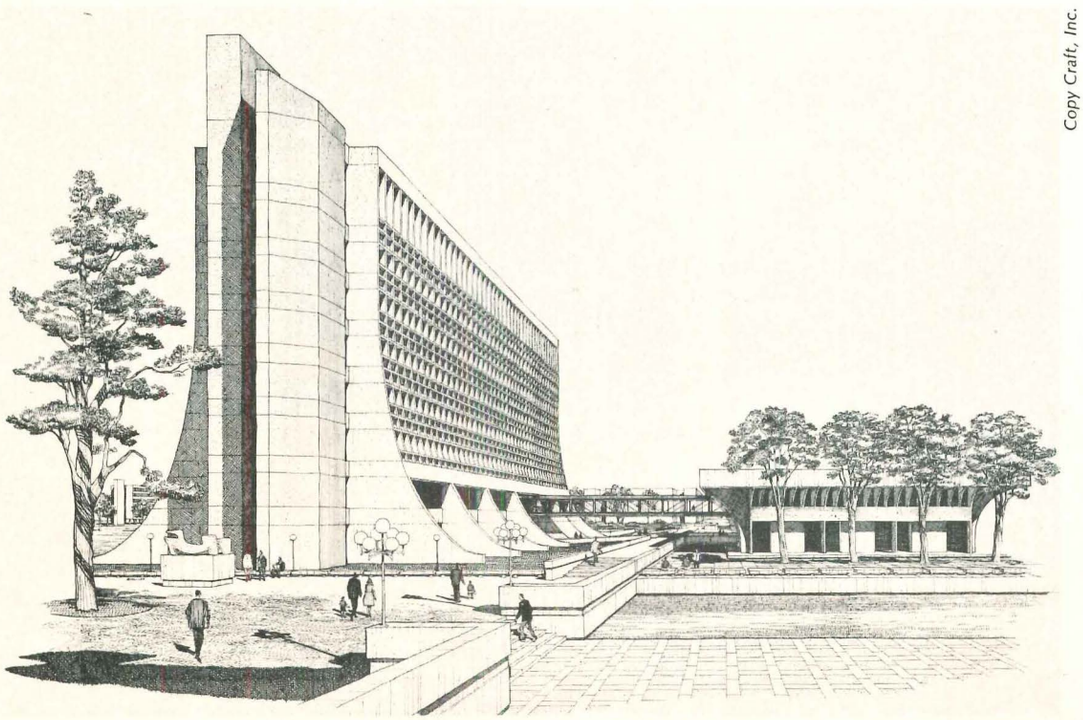


**Russell Gibson von Dohlen**, architect, received a citation for The Church of St. Peter Claver's "contribution to environmental quality" from the Connecticut Building Congress. Rough textured fieldstone walls and cedar planking on a laminated timber structure are in tune with the natural site and residential neighborhood. The jury: John Embersits, Vincent Scully and Herman Spiegel of Yale; Gerald Foster of C. N. Flagg; Saul Horowitz, Jr. of HRH Construction; Edward Kozlowski of Connecticut Public Works and Robert Venturi.

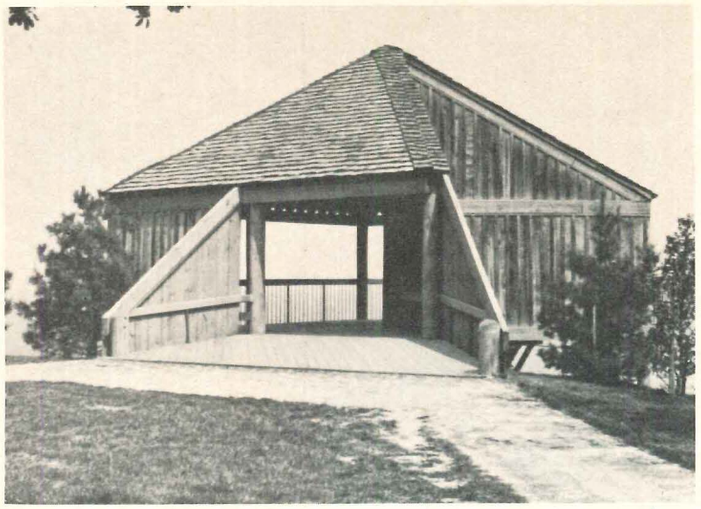








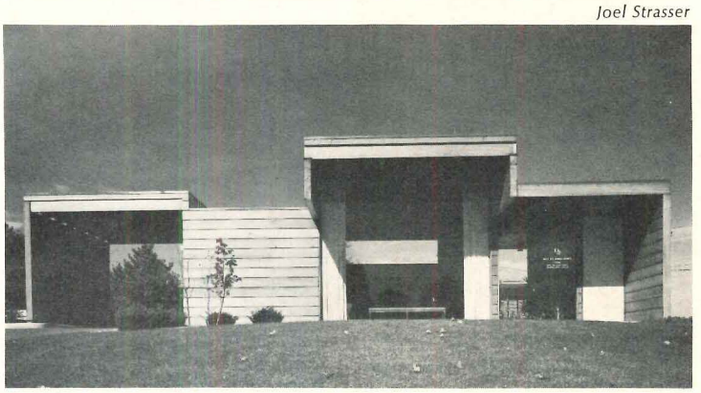
**Pancoast/Ferendino/Grafton/Architects** in joint venture with **Watson, Deutschman & Kruse, Architects** were honored with the Outstanding Concrete Structure Award by the American Concrete Institute, for the Mailman Center for Child Development at the University of Miami School of Medicine. A tower of diminishing floor sizes met the program requirements of this facility for the mentally handicapped which has a large out-patient clinic. The small building (right), related to the lower tower floors, houses a school and in-patient living areas.



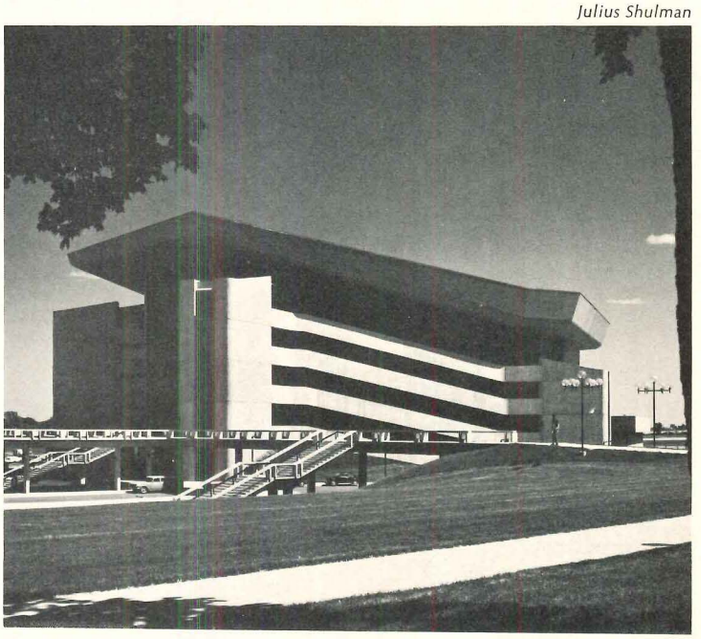
**The Visitors Center,** Calvert Cliffs Nuclear Power Plant, Maryland by Kamstra, Abrash, Dickerson & Associates of Reston received an honor award from the A.I.A. Mid-Atlantic Regional Conference. It previously got an honor award from the Virginia Chapter and was in a Virginia Museum of Fine Arts traveling show. The building provides an overlook and exhibits local geological and historical specimens. It is constructed of barn siding, cedar shakes and timber poles.

*Howard Heemstra*

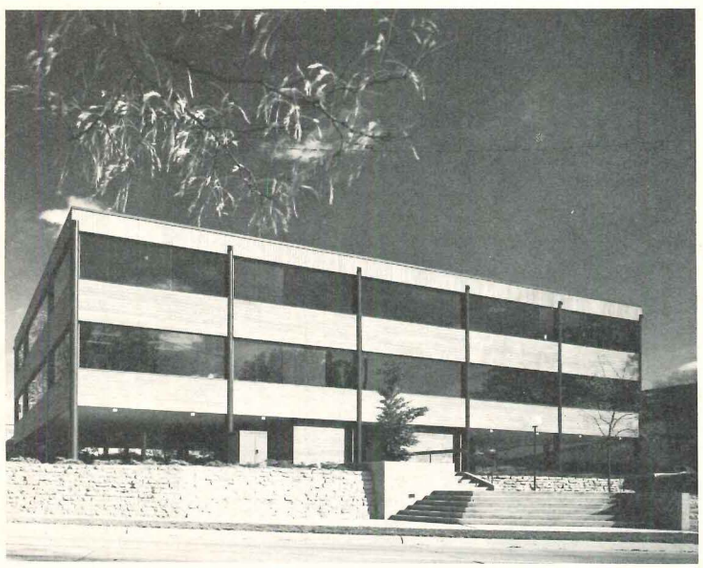
*Joel Strasser*



*Julius Shulman*

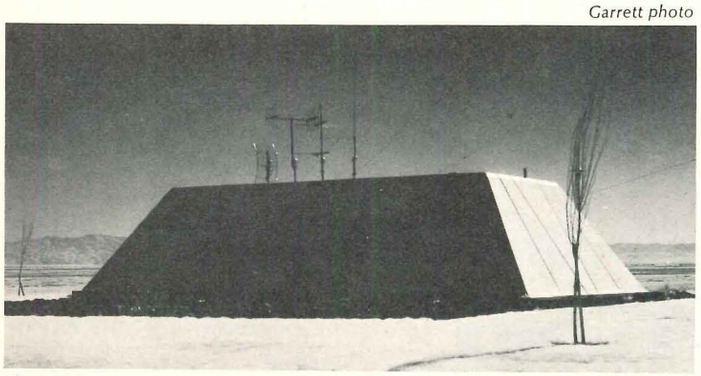


**The Gordon Residence** (top) by Norman Rudi & Associates received a merit award from the Iowa A.I.A. It was a speculative home designed for a contractor. All trees on the site were saved. Honor Awards went to a suburban branch of the Des Moines Savings and Loan Association (middle) by Lynch, Payne, Champion, Bernabe, Inc., and the C. Y. Stephens Theater (bottom) by Brooks-Borg and Crites & McConnell (December, 1970, pages 75-80). The bank provides drive-in and walk-up service. The multi-use theater seats 2,700 and is poured in place, board-formed concrete with a western red cedar fascia. The solution expresses sight, acoustical and circulation considerations.



**The 101 Southfield building** in Birmingham by O'Dell, Hewlett & Luckenbach, Inc. received an award from the Detroit Chapter A.I.A. Other winners were William Kessler & Associates, Inc. for the Bundy Tubing Office Building in Warren; Smith, Hinchman & Grylls, Inc. for the Michigan Electric Power Pool Control Center in Ann Arbor; Eberle M. Smith Associates, Inc. for the Frank Murphy Hall of Justice, Detroit; and Ziegelman & Ziegelman for a Troy bank.

*Garrett photo*

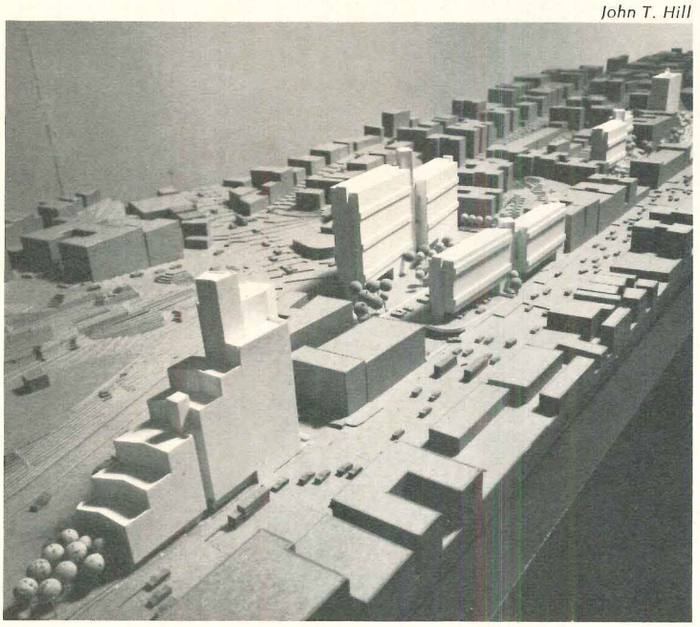


**The KBOI Transmitter Building** by Cline, Smull, Hamill, Shaw & Associates received a merit award from the Idaho Chapter A.I.A., as did the Root residence by Neil Wright, and the American Reserve Insurance Building by Watson & Leatham. Honor awards went to the Idaho First National Bank by Dropping, Kelley, Hosford & LaMarche, and the Federal Office by Hummel, Hummel, Jones & Shawver.

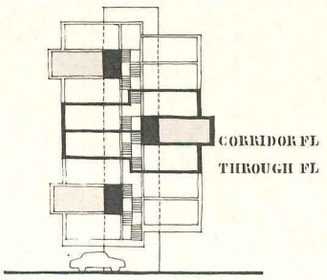
# New York Chapter A.I.A. Residential Design Awards

The 1970 jury consisted of Stanley Salzman, architect; Jenepher Walker of House & Home and Burton Eaton of Shelter Realty Corp. In its selections the jury hoped to emphasize the present need for architects to be involved in urban rehabilitation and imaginative planning of interior and exterior spaces. Not shown below is the residence for Rev. and Mrs. Frederick Q. Shafer in Annandale-on-Hudson designed by James Baker and Peter Blake RECORD HOUSES, mid-May 1971); it received Special Mention.

*John T. Hill*



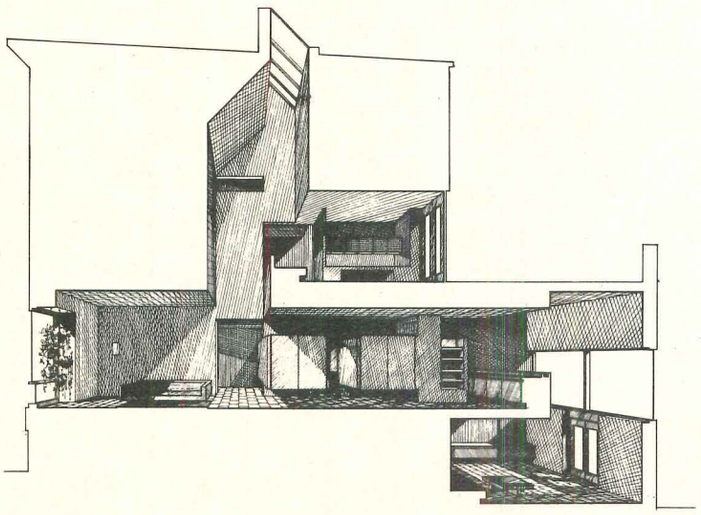
**Housing in Twin Parks West,** a Bronx renewal area, designed by Giovanni Pasanella for the New York State Urban Development Corp. received a First Award. The building heights are varied and related to the remaining low housing. The 536 apartments, with split-level sections, and served by skip-stop elevators, have two exposures and are more houselike than most apartments. Some are specifically for the elderly.




*David Hirsch*

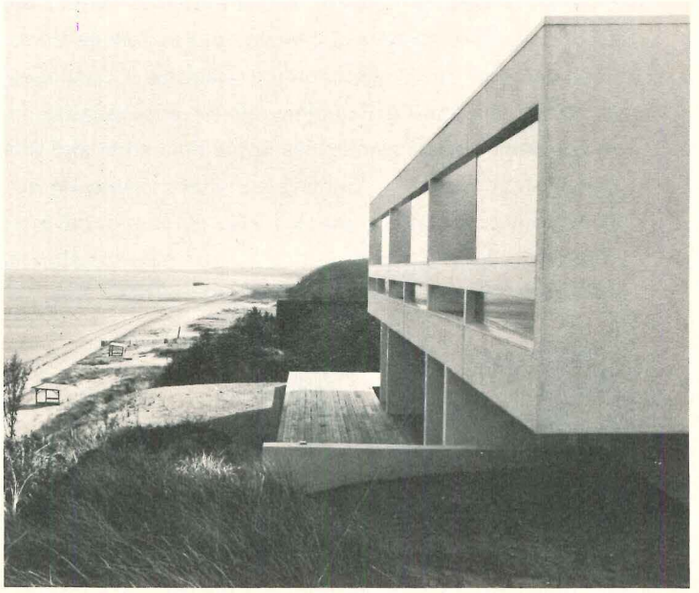
**Harbor Village** at Paerdegat, a row housing project for the United Automobile Workers Local 365, designed by Gruzen & Partners received Special Mention. It will have 900 middle-income cooperative duplexes. All major living areas face grass rather than parking. Open spaces will have playlots, seating and swimming.

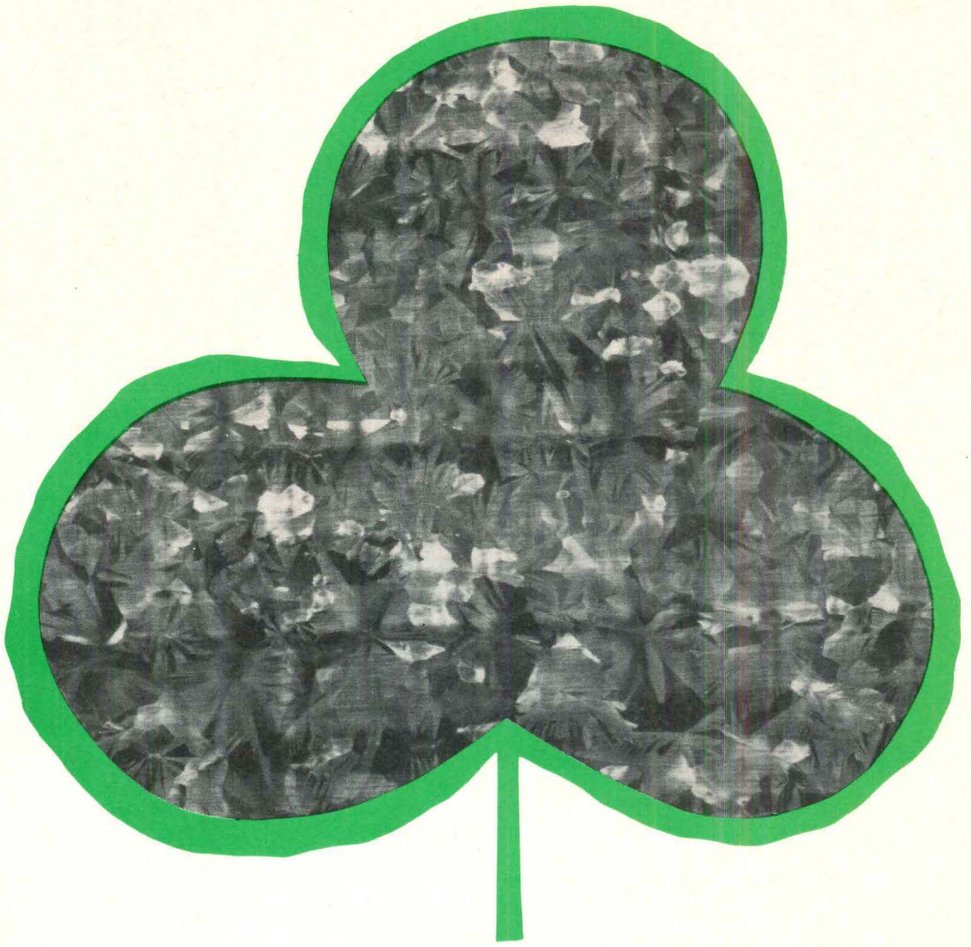
**A West 78th Street New York Tenement** renovated by architect William B. Gleckman for the Sole Purpose Corp. also received a First Award. The building has been converted into a cooperative having triplexes and duplexes with generously proportioned rooms and wood-burning fireplaces creating the feeling of large private homes.



**A Brooklyn brownstone,** in a Landmarks area, renovated by Stanley and Laurie Maurer for their own home also received a First Award. Above the basement apartment is the living room and two cantilevered closets. At the back of the house the kitchen on the second level overlooks the playroom below. The study above the closets is open to the central light well with children's rooms above. The master bedroom is on the third floor in front.

**A beach house in Amagansett,** New York for Dr. and Mrs. Cates, designed by Julian Neski received a Special Mention. The jury said it's "a direct lift from the Thirties—in Germany—so simplified on the exterior as to be almost stark, the whole second floor rectangle floating above a smaller base." It can be divided into two apartments.





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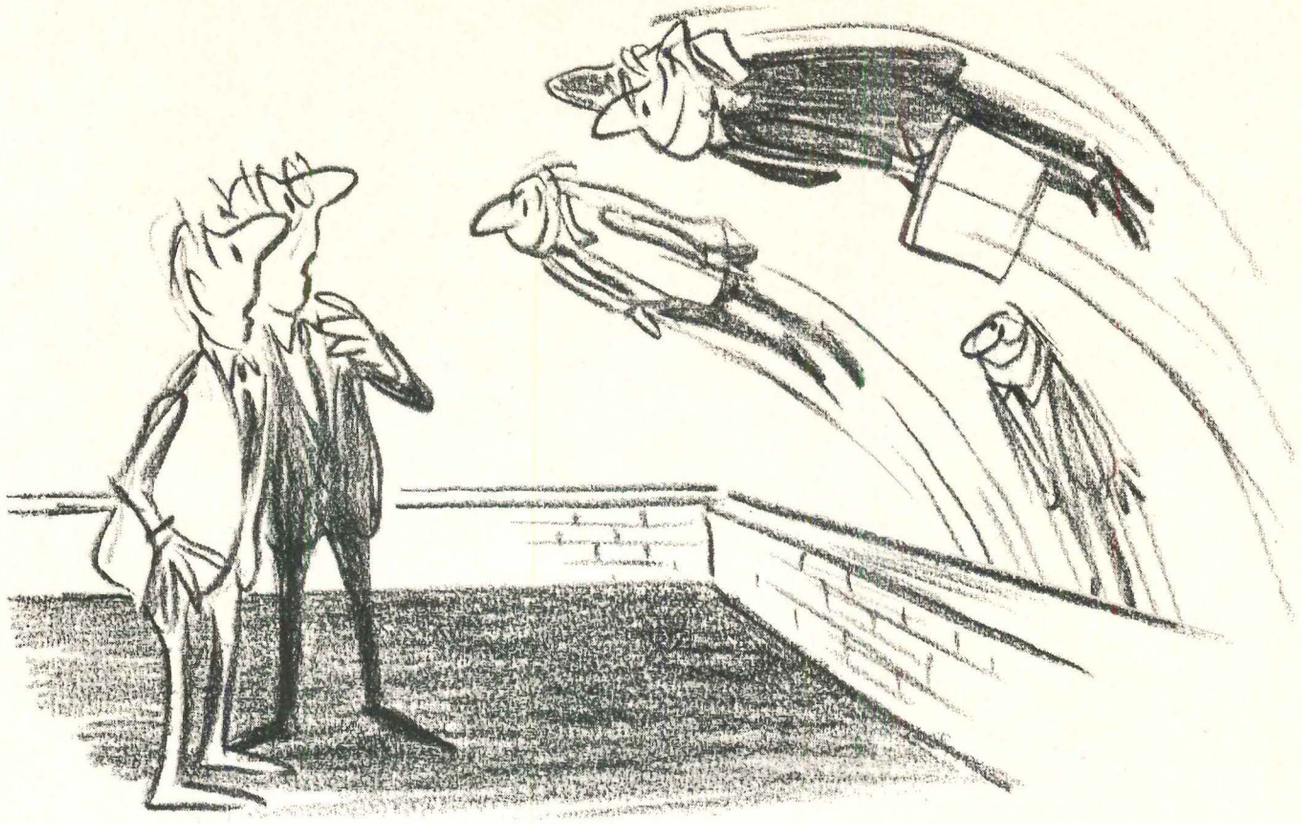

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Maybe you'll want to do business with someone else. Maybe you have a relative who sells roofing. Naturally, we'll be disappointed. But we won't cry. And, whether you use J-M roofing materials or something else, there is no charge for our inspection and recommendation.

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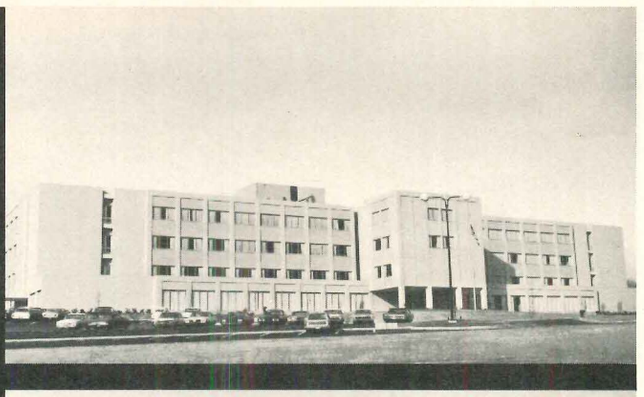

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*Mechanical Engineers:* Smith, Seckman & Reid, Inc., Nashville
*Mechanical Contractor*—(Macon and Albany, Ga.): Gay Plumbing & Heating—(Chattanooga): Corlew Engineering Company
*General Contractor* (for three facilities shown above): Joe M. Rodgers & Associates

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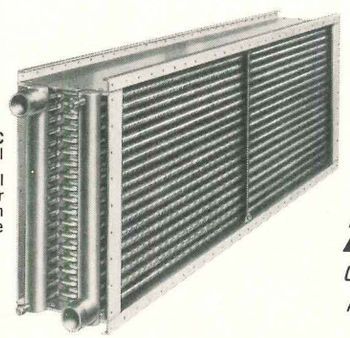

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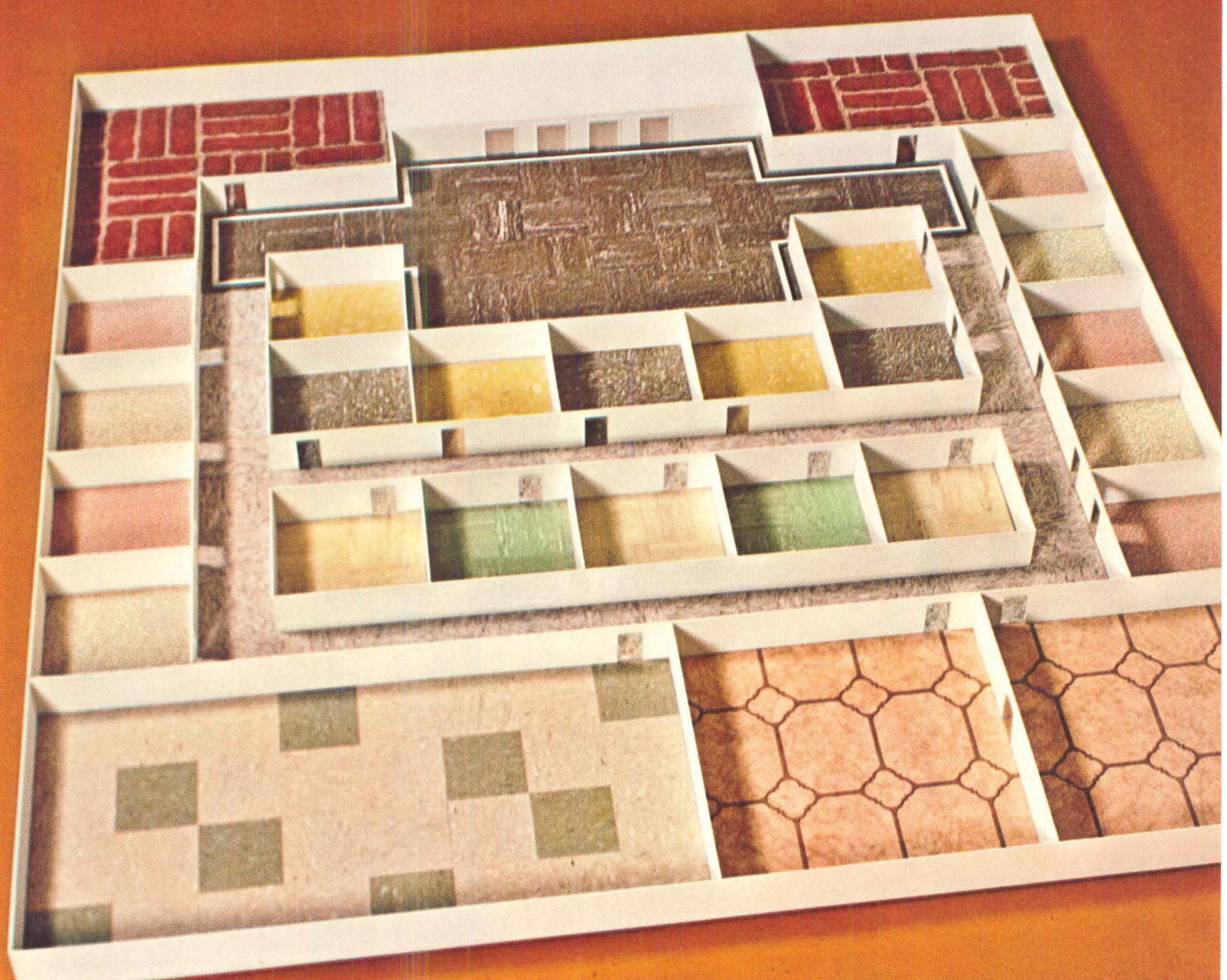

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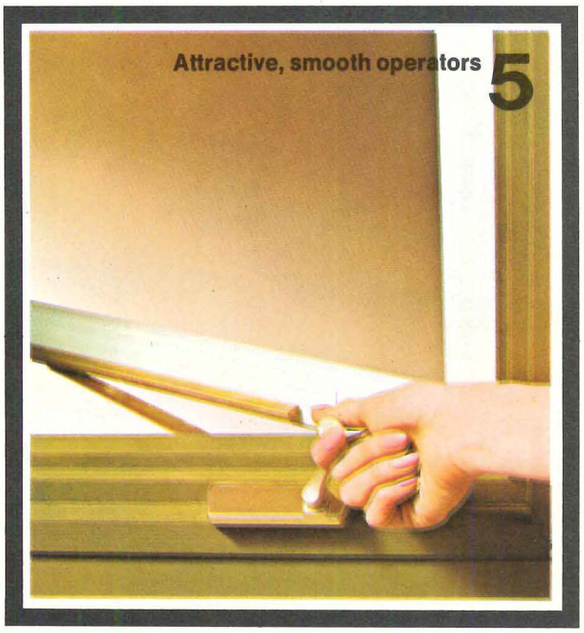
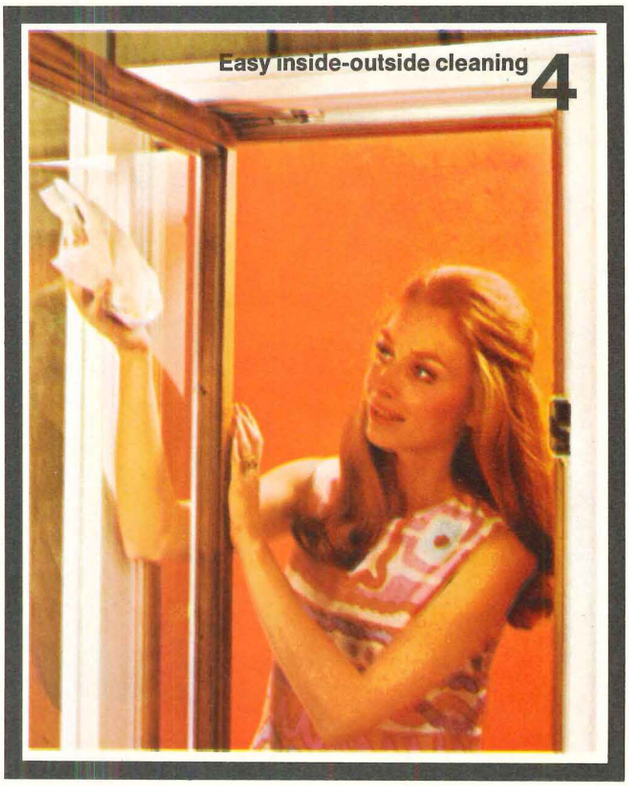
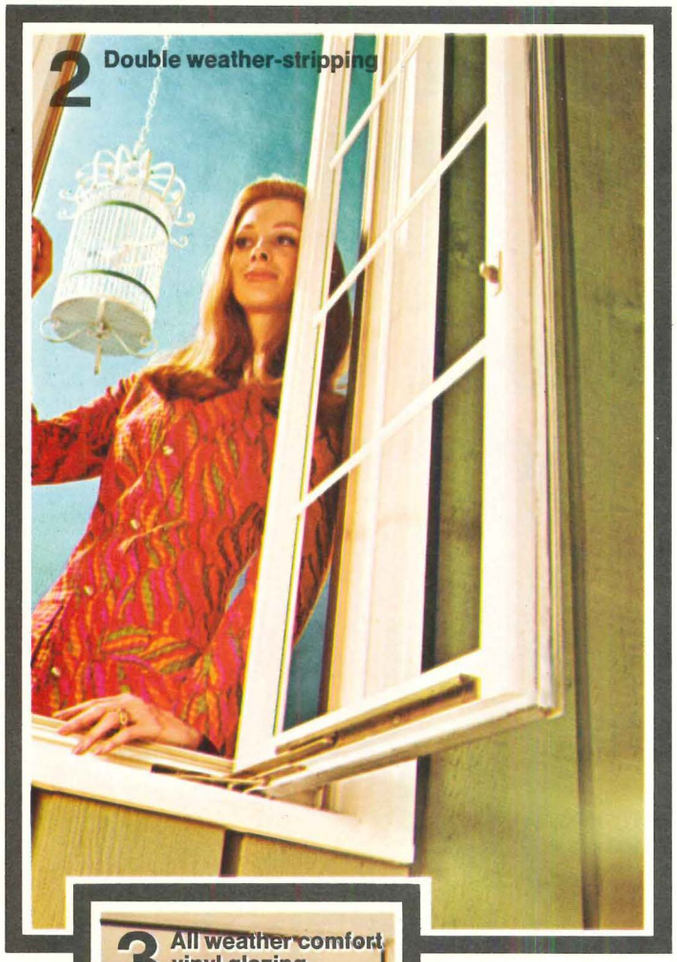
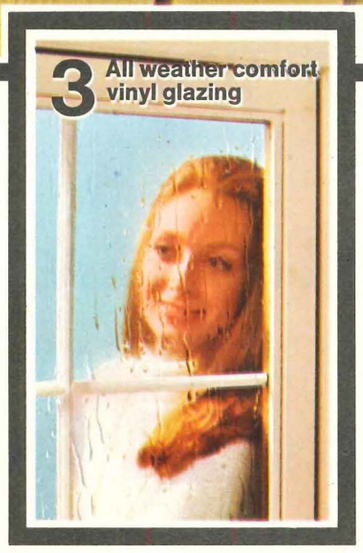


# wood casement windows

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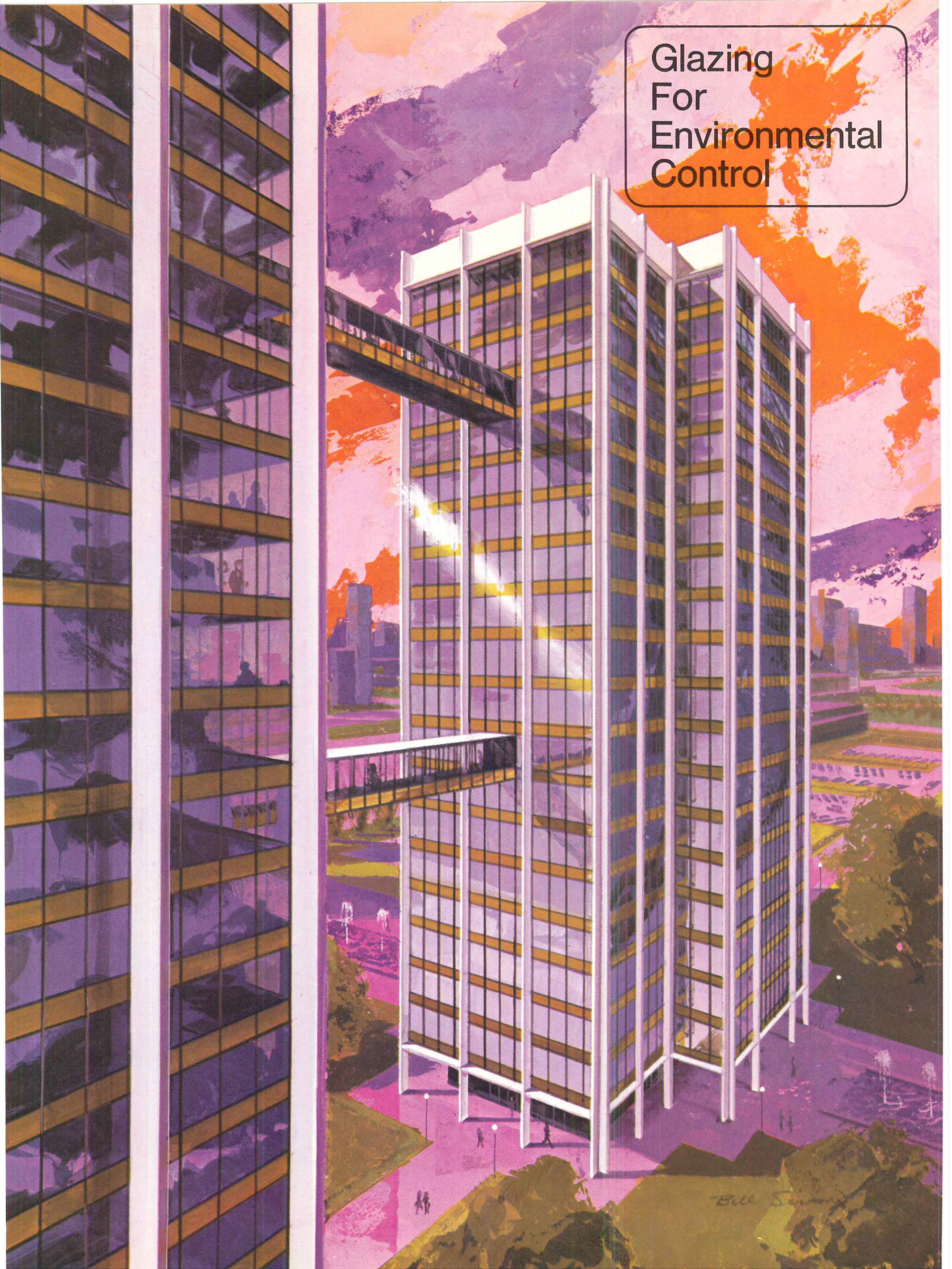

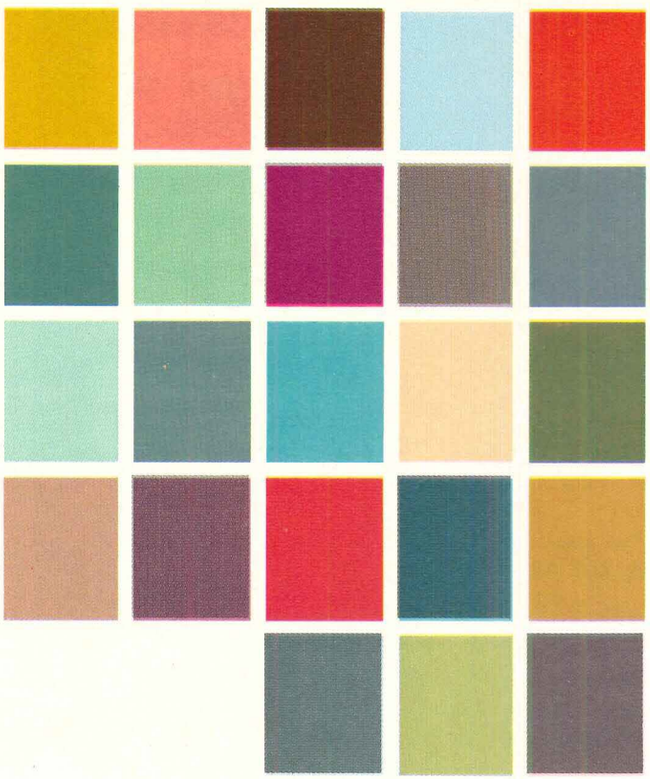

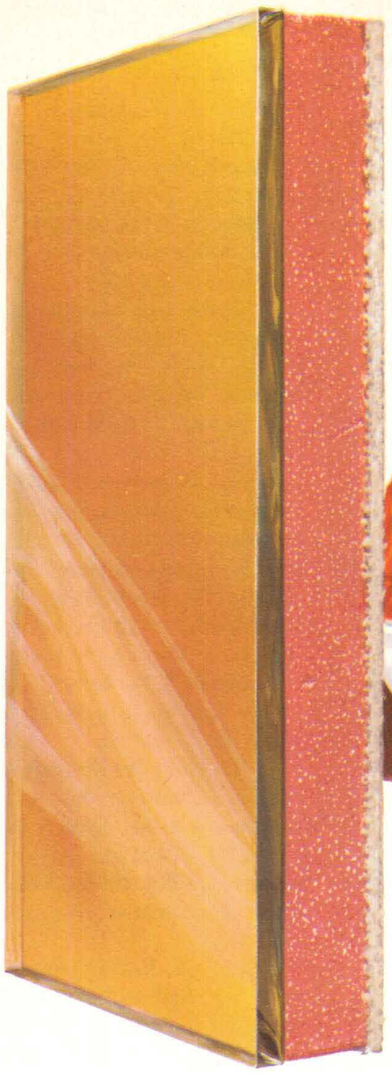

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# OFFICE NOTES

## NEW FIRMS—FIRM CHANGES

**Sigmund F. Blum,** A.I.A. announces the opening of his new firm, **The Office of Sigmund Blum Vaporciyan & Mitch, Inc.,** located in Detroit, Michigan.

**Joseph W. Santamaria,** A.I.A. has been made a vice president in the firm of Clovis Heimsath Associates.

**Brown Guenther Battaglia,** New York Architects announced that **Arthur J. Seckler, Jr.,** A.I.A. has become a partner and **Louis A. Miraglia,** an associate of the firm.

**Martin J. Goldman** Consulting Engineers has announced a change in the firm name to **Goldman & Sokolow** Consulting Engineers, accepting as a partner **Irving Sokolow.** Included in the reorganization are the following new department heads: **Charles Copeland, Joseph Desiderio, William Spathias.** Offices are at 101 Park Avenue, New York, New York.

**Lyman S. A. Perry** is now an associate in the firm of **Roland C. Davis** and Associates, Philadelphia.

**The Ballinger Company,** Architects and Engineers, Philadelphia, announces the appointment of **Mr. Robert W. Hill,** A.I.A., as a Senior Associate of the firm. **Joseph Archut, Frank J. Butler, Robert H. Rand** and **Ruth R. Richards** were appointed Associates.

**John A. Kreishman, Charles R. Nash,** and **G. Stephen Scott** have been made Associates in the firm of **Anselevicius/Rupe** Architects. The name of the firm has been changed to **Anselevicius/Rupe/Associates** Architects.

The Architectural, Engineering and Planning firm of **Ferendino/Grafton/Pancoast** has announced a change in the firm name to **Ferendino/Grafton/Spillis/Candela.** The first is expanding its headquarters at 800 Douglas Entrance in Coral Gables.

**Jeanne Daschbach Carlson** has been appointed director of communications at **William A. Gould & Associates,** architects and city planners, Cleveland firm.

The firm of **Rich, Phinney, Lang & Coté, Inc.,** Architects announced that **Berton V. Phinney, Jr.,** A.I.A. is no longer associated with the firm, and that the firm name is changed to: **Rich, Lang & Coté, Inc.,** Architects.

**Bert Pousma, Jr.** joins **Knorr & Elliott and Associates,** A.I.A. as an associate.

**Benham-Blair-Ditzler and Vanlandingham,** a Phoenix, Arizona, architect-engineer-consultant firm is now **Benham-Blair-Ditzler and Sayler.** The change was made to incorporate the name of **Al H. Sayler,** A.I.A. vice president and principal architect, into the firm name.

## ERRATUM

The RECORD regrets that it inadvertently neglected to state that **Peter Barbone** was the associated architect for Orange County Government Center published in the August issue.

# 4726 Corbin... where the crowd moves with safety

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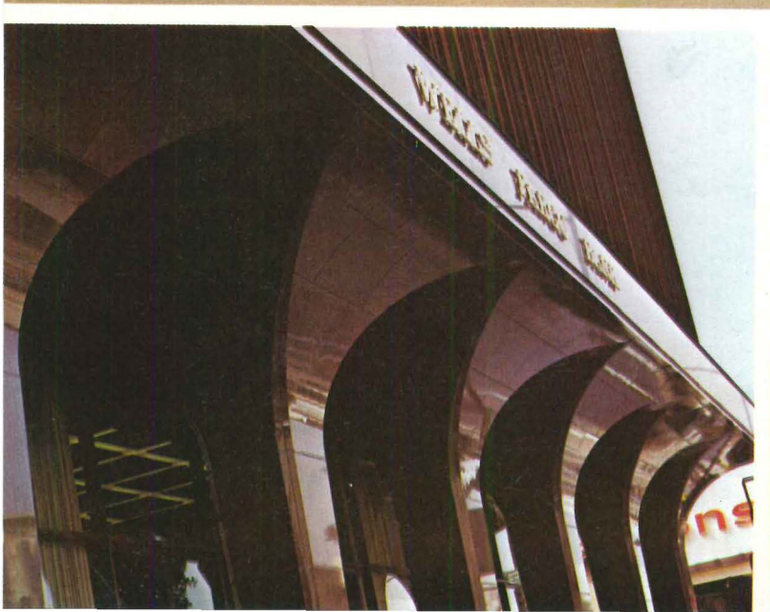
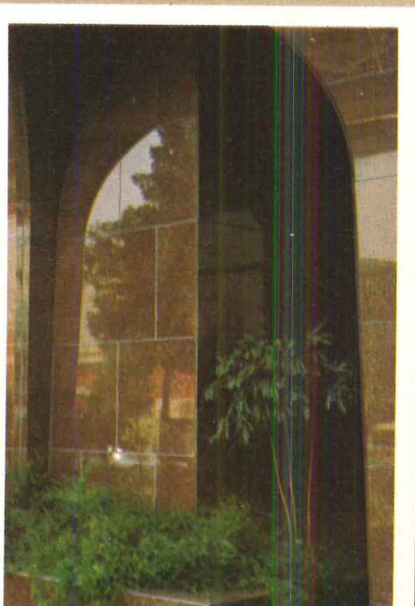
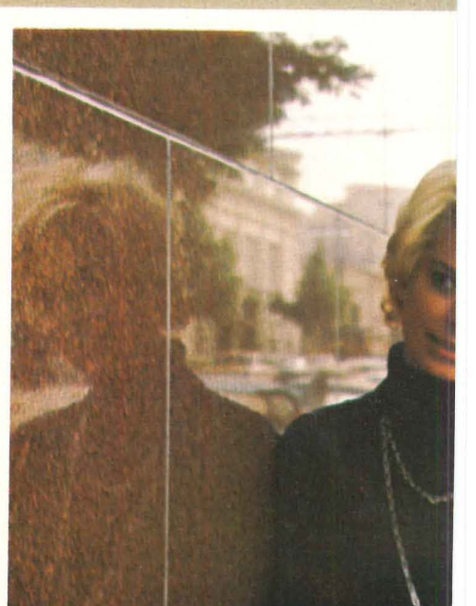
WELLS FARGO BANK







# If granite is just for 40 story buildings, why didn't someone tell Wells Fargo?

Some people get the impression — they're never sure where — that granite is just for big jobs. But the architect and the management of this new branch of Wells Fargo Bank in Beverly Hills don't deal in impressions. They insist on facts. And when they got the facts about granite, they insisted on using it on their building.

Granite's being used on a lot of smaller jobs these days — including one- and two-story buildings. Because of facts like these: the natural beauty of polished granite resists weather, stains and all types of traffic as no other building material can. It won't fade or deteriorate, and it requires virtually no maintenance. Comes in a wide spectrum of colors, too.

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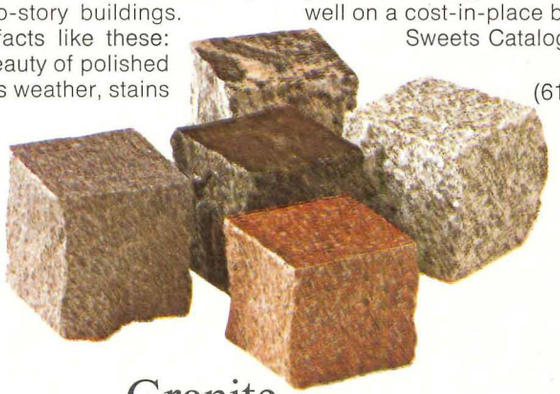

Granite
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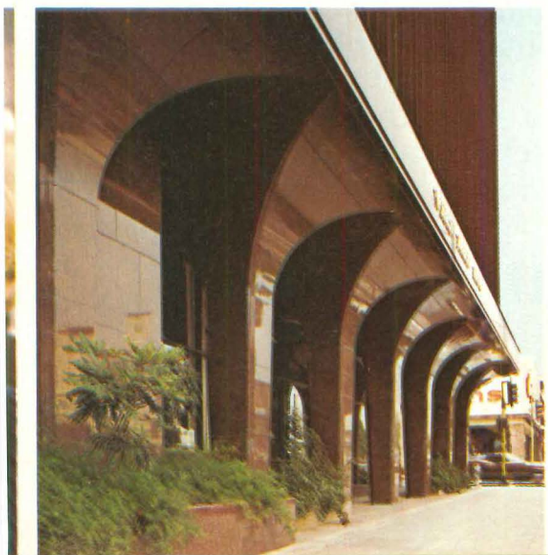
your thinking.



Wells Fargo Bank
Beverly Hills, California

Architect:
Allison Rible Robinson & Ziegler

Contractor:
C. L. Peck

Granite:
Polished Cold Spring Red

Cold Spring
Granite Company
Cold Spring, Minnesota

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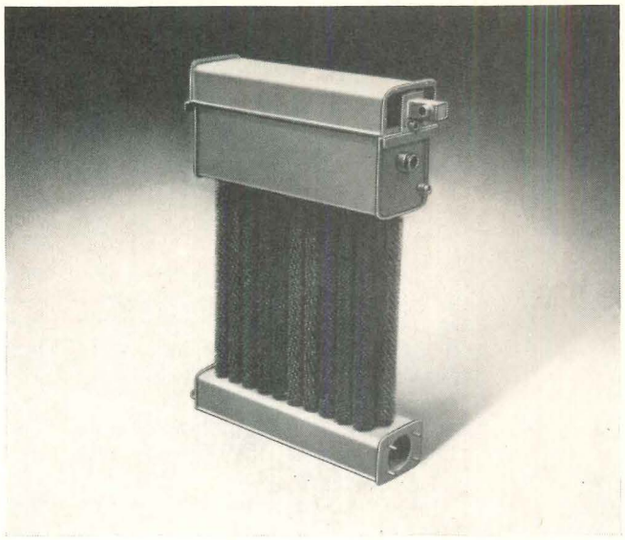
# GE's gas/electric combustion chamber withstands heat like a jet engine.



We use a super alloy metal that was developed for jet engines in the combustion chamber of our rooftop gas/electrics for the same reason—both get hot. While the jet engine runs steadily at higher temperatures, the rooftop unit is constantly being turned on and off.

Making the combustion chamber out of a very tough metal is only one of the many things we've done to make our rooftop units more competitive.

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The GE gas/electric uses a forced air combustion system for a number of reasons. It's smaller than a non-pressurized system for one thing. And we've put the burner on top. That way, nothing can fall down and clog the burner.

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# GSA advocates new financing techniques for public buildings

*By Arthur F. Sampson, Commissioner, Public Buildings Service, General Services Administration*

The General Services Administration, the Federal Government's principal owner, builder, and manager of office space has prepared legislation which would provide new financing techniques for public buildings. Basic to the scheme is a revolving fund of construction money that would be sustained by rentals from occupants.

The new legislation, backed by the Nixon Administration and introduced just prior to recess of the current session of Congress, is designed to improve the economy and efficiency of the General Services Administration's operations. Congress must take action before the legislation providing for a revolving fund, lease purchase and lease construction can go into operation. Once the legislation is passed, a rapid increase in Federal construction will follow almost immediately.

General Services Administrator R. L. Kunzig maintains that the key to a long-range stable Federal buildings program is the revolving fund which permits innovation in GSA's management of construction.

The passage of this legislation is critical to the implementation of the systems building approach to construction. The lease construction program, a measure requested for only a three-year period, is an expedient designed to clean up the 62 buildings in GSA's construction backlog.

For the long-range situation, GSA is asking for the creation of a Federal Buildings Fund. This revolving fund would be made up of the unexpended balances of GSA's appropriations and receive income from assessing charges against all Federal agencies who occupy space provided by GSA. The income from such rental charges would be sufficient to provide for GSA's operation and maintenance of all buildings, rental payments for all leased space, and also be sufficient to generate enough income to fund future construction.

This arrangement, requiring Government agencies to pay for the cost of space they occupy, is consistent with generally-accepted concept of performance budgeting wherein total programming costs of an agency are reflected in that agency's budget estimates and financial accounts. This would be a significant change in the method of funding public buildings operating capital costs, but it would certainly be a practical and business-like approach to the problem. The rates proposed to be charged for the space provided by this fund would be average commercial equivalents for the location and quality of the space provided. It would rectify the inefficiency in the decision-making process by providing for resource allocations based on the substantive needs of the Federal agencies and their related space requirements. Congress would see reflected in an agency's budget the total cost of any expended program and be better able to judge relative priorities. It would also enhance the ability of GSA to provide faster and better service with respect to the space needs of agencies.

A single fund would permit GSA to embark on innovations and improvements in the management of construction. The project manager-construction manager approach to certain projects would be made possible as would the fast construction (design-build) concept. These approaches would reduce over-all time and would be reflected in reduced costs.

That's where we want to be . . . where are we now?

At the present time, the Federal Government follows an extremely involved and circuitous route for obtaining authorization and funding of needed public buildings. For each new structure estimated to cost in excess of $100,000, the General Services Administration must first prepare a prospectus, submit it to the Office of Management and Budget, and then, if approved, submit it to the Congressional Public Works Committees in the House of Representatives and the Senate. If these prospectuses are approved by these Committees for direct Federal construction, GSA must then arrange to have funds included in a budget. But it is not that simple. First, the funds for the site acquisition must be requested, then the funds for the design of the building, and then the funds for construction and management and inspection of construction. In some rare cases, the site and design funds are requested in the same year but usually they are not. The construction funds and the management and inspection funds are only included in the budget for the year in which the General Services Administration determines that they have capability to award the construction contract. Each year then, the timing of the Budget processes becomes extremely important in order that decisions can be made as to which projects will be included. Since budget preparations start one full year before the beginning of the fiscal year in which the funds can be obligated, and decisions are made on maximum amounts that can be requested, uncertainties as to contract capability frequently cause delays of one or more years in even getting the highest priority projects included.

This process has created a backlog of needed Federal buildings valued at more than $1 billion. Federal agencies continue to operate inefficiently in leased and Government-owned space which can be described as only marginal. In the space provided in the 45 buildings in GSA's backlog which have contract capability this fiscal year, GSA could consolidate 29,000 employees operating inefficiently in approximately 500 scattered locations. This inefficiency has been estimated to cost the Federal Government approximately $50 million a year. Another $100 million a year in excess costs can be attributed to higher prices for construction because of an average 10 percent inflation in construction costs yearly. The history of Congressional appropriations for General Services Administration's direct Federal construction program shows an average appropriation of only $115 million each fiscal year. With new requirements being generated at that high a rate or even higher, there is no reasonable expectation of liquidating the backlog at any time in the near future through direct Congressional appropriations.

GSA has decided to adopt a 3-pronged approach to correct the problem and prevent the creation of situations such as this in the future. The proposed legislation will authorize the General Services Administration's Public Buildings Service, for a period of three years after enactment, to enter into either lease purchase contracts or lease construction contracts. The temporary nature of this authority will permit the Public Buildings Service to liquidate the large backlog of 62 buildings in 34 states, Puerto Rico, the Virgin Islands, and the District of Columbia without the requirement for large Congressional appropriations for construction. After three years, a new revolving fund, the Federal Buildings Fund, would assume the financing responsibility for new construction.

The lease purchase method of acquisition of Federal properties provides for construction by a private entrepreneur using his own financing. The lease purchase authority which GSA is looking for will permit purchase contracts with independent developers and builders for the purchase of buildings to be constructed on Government-owned sites in accordance with the Government's plans and specifications with payments to be made over a period of not less than 10 years, nor more than 30 years. The authority granted under this section would also expire at the end of three years, at the conclusion of which time title to the property would vest in the United States.

The lease construction method provides for construction by a private entrepreneur using his own financing and a straight leasing contract by the Government for the space for a term not to exceed 30 years. In both cases (lease purchase and lease construction) the legislation could provide for the construction to be on a Government-owned site using Government-owned plans and specifications which would be made available to the entrepreneur. In the lease construction method the Government-owned site and design would be sold to the successful contractor. The legislation further provides

that the lease purchase method would be the preferred route, but if infeasible, lease construction would be attempted. The amount that the Government would pay will be sufficient to amortize the costs of the improvements, provide a reasonable rate of interest on the outstanding principal, and reimburse the contractor for any costs assumed by him such as taxes, insurance, repair and maintenance, etc.

The above two tracks are intended to be followed only with projects already authorized for direct Federal construction. Future projects would be submitted to the Congress for authorization as in the past, and such prospectuses which indicate the method of acquisition; that is, lease purchase, lease construction or direct Federal construction.

The advantages of lease purchase and lease construction are very significant:

1. The land and building will remain on local tax rolls.
2. The Federal Government will get urgently needed new space more rapidly.
   Collocation and consolidation of agencies in this space will promote efficiency.
3. The Federal Government can invest the construction funds (as well as site and design income) in other high priority programs.
4. Costs of this new space would be reflected in agencies' and GSA's annual budgets.
5. New and up-to-date buildings would be available to the Federal Government (every 20 years, if necessary).

In recent years it has become increasingly evident that lease construction of space can be more economical than direct Federal construction, and it is even more evident that lease construction of buildings for long-term leases is certain to carry with it lower unit costs for rent than individual short-term leases. This is particularly true when other costs, such as taxes paid to state and local governments, and the current cost of money investment, are given full consideration. GSA will conduct a full-scale economic analysis of each project to determine the most favorable method to be followed in each case. Even if the calculations indicate only a slight difference in costs, a leasing method would be preferable because it would keep the property on the local tax rolls, and there would be other indirect cost benefits.

These new techniques are varied and may require much discussion before Congressional enactment. A form of revolving fund has been considered before without success. But a combination of the revolving fund and the use of leasing alternative has never been proposed.

This complete legislation package would solve the financial problem of public building construction with immediate relief to the taxpayer. GSA looks forward eagerly to its early enactment.

# The search for flexibility in hospital design:

## A perspective on the work of Clibbon and Sachs

*by Gordon Best and John Weeks; Llewelyn-Davies Weeks Forestier-Walker & Bor*

When the Bauhaus proclaimed that a building's form should "follow" its function, it is quite likely that they were speaking metaphorically. Yet many architects have apparently taken them literally. Architects specializing in the design of hospitals, for example, have what appears to be an irresistible tendency to expend enormous amounts of their design energies carefully matching the design of their buildings to detailed descriptions of the hospital's function. Such a way of behaving is in many respects most curious. A hospital *building*, after all, is a highly durable and largely static creation: hospital *functions*, on the other hand, are transient in nature and subject to constant change. How then, can a hospital building's form "follow" its function no matter how long is spent in matching one to the other?

The recognition that a building's form cannot literally follow its function has—in recent years—given rise to a number of planning strategies that emphasize building 'flexibility' as an important design parameter. Essentially, these strategies are intended to assist the architect in designing buildings that will "stay out of the way" of their functions. Such strategies, if they are to lead to genuinely flexible buildings, however, must overcome two difficulties.

1. First, it is necessary to be able to describe the hospital organization in a way that ensures that the resulting buildings will incorporate the geometrical and topological properties that are *common to* a variety of organizational forms;
2. Secondly, this description (which is often diagrammatic in nature) must be physically interpreted in a technology capable of accommodating the *actual* functional changes that may take place.

The first problem is one of producing an appropriate architectural program: a program not so detailed as to be specific to one set of activities at a point in time, but one that describes those characteristics of a hospital organization that are common to a variety of functional mutations. The second problem is one of physical design: to design a building—that in response to the program—minimizes constraint on the organization being accommodated.

Clibbon and Sachs in two recent articles* have proposed a strategy of flexible design that is one attempt to overcome these two problems. In this work, the problem of describing the hospital in a way not tied to a particular functional context (or set of assumptions), is recognized at the onset: ". . . (programming) terminology is obscure and inconsistent. A laboratory is a place, obstetrics is a health condition, records are things, outpatients are people, 'dietary' is a service. . . . Knowledge of these subdivisions is of no use to the architect in designing anything *which is not a conventionally organized institution.*" (Our italics.)

Arguing convincingly that the language used in the program can restrict the architect to designs having a limited functional relevancy, Clibbon and Sachs go on to propose an alternative way of describing the hospital. The cornerstone of their new language is the reference it makes to medical techniques and the way in which these enter into the health care process:

"The state of anaesthesia, for example, is clearly the purpose of a variety of techniques (such as the administration of gases by inhalation, injection of solutions, or the application of electrical currents to the brain). The word 'anaesthesia' then, is not only the purpose but also a collective term for a group of quite different techniques, as well as the name of a department . . ."

The utility of describing the hospital in this way lies in its reference to the *tangible*. Although purposes and administrative tags describing different activities may be subject to unpredictable change, the techniques upon which these activities depend are unlikely to undergo such erratic change:

"Purposes are intangible, techniques concrete. From the point of view of hospital design, it is the techniques that count, for they determine the kind and arrangement of spaces."

In essence, Clibbon and Sachs propose a programming language that is capable of describing *any* hospital organization in general terms. The language focuses on the *class* of organization—"hospital": it does not describe a *particular* organization of hospital activities. This is an important and subtle distinction: it is intended to direct the architect's attention to those properties

*continued on page 258*

* Health care facilities: an alternative to bailiwick planning in patient fostering spaces. *New Physician*, June, 1969.
Creating consolidated clinical techniques spaces for an expanding role in health care. *Architectural Record*, February, 1971.

# The Architect's Guide to Blinds.

**In this chapter: Introduction; how to cut costs on air conditioning; surfaces that reflect heat; how to keep heating bills down; surfaces that absorb; color; what to do to learn more.**

**Introduction.**
There are as many different blinds as there are windows. A busy architect can't be expected to know about all of them. This convenient guide should serve as an aid to specifying more creative window coverings. Reprints of this guide and additional information are available from Levolor on request.

**How to Cut Costs on Air Conditioning.**
We get quite a few letters every month asking about the problem. And the answer is quite simple: blinds are the best window covering for this purpose and the correct *choice* of blind can make a substantial difference in the air-conditioning load of a building. And contrary to what a lot of our correspondents seem to think, white is no longer the best color you can specify to keep air-conditioning bills down.

**Surfaces that Reflect Heat.**
Levolor has done a lot of research in this area. And we've come up with a bright silver blind with a shading coefficient of .14 thru ¼" clear plate (plain white blinds have a coefficient of .27). What this silver blind can do to an air-conditioning load depends, of course, on the climate, the exposure, etc. But it can make a substantial difference.

**HOW LEVOLOR RIVIERAS REDUCE HEAT LOAD**

Comparative Shading Coefficients

| | Thru ¼" Clear Plate | | Thru ¼" HA Plate | | | |
|---|---|---|---|---|---|---|
| Coating of Slat | Open | Closed | Open | Closed | Reflect. | Absorpt. |
| White | .49 | .27 | .42 | .29 | .70 | .30 |
| Sand | .52 | .38 | .45 | .28 | .53 | .47 |
| Raw Umber | .67 | .65 | .49 | .48 | .08 | .92 |
| Polished Alum. | .45 | .22 | .34 | .27 | .76 | .24 |
| Brushed Alum. | .50 | .25 | .41 | .28 | .73 | .27 |
| Polished Brass | .52 | .36 | .42 | .30 | .55 | .45 |
| High Gloss Alum. Mirror Finish | .37 | .15 | .34 | .23 | .89 | .11 |
| Low Gloss on Mirror Finish | .40 | .19 | .36 | .25 | .81 | .19 |

And don't think that, just because the side of the slats toward the outside of the building is silver, you're limited to silver for the inside. The other side of the blind can be any color you like; you'd choose it to go with the rest of the interior decor. If you wonder how the correct color is maintained for the outside, we've solved that problem with our "tiltone tilter."

**How to Keep Heating Bills Down.**
Just as you can cut air-conditioning costs with a reflecting blind, you can cut heating bills with an absorbing blind. And you don't have to pick a dull or uninteresting color, either.

**Surfaces that Absorb.**
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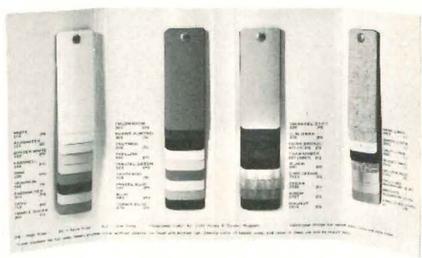

and polished aluminum all the way to raw umber and black. And they fit comfortably into areas that other window coverings just can't make use of. No other window covering can do as much.

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☐ Color chips.

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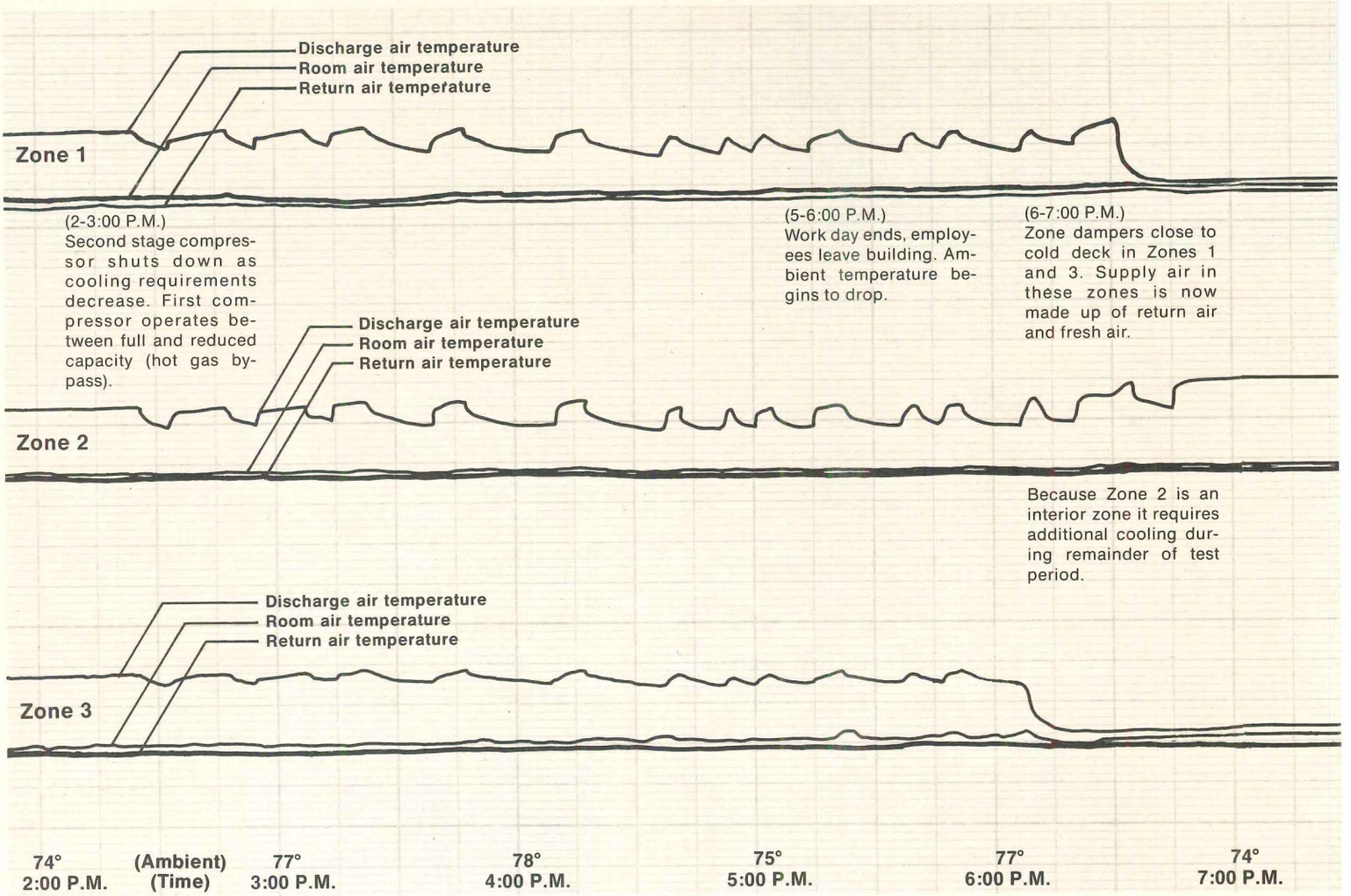



# Mammoth Innovation proves itself at Fox Meadows.

**This installation proved that Mammoth's FM system with Solid State control works better than any conventional multi-zone system ever made. And it cost less than $2.00 per sq. ft. installed!**

When Mammoth first announced the FM Fluidic Terminal System, the news created quite a stir. For here was a terminal unit that uses the principle of fluidics to control air flow using *no moving parts* and requiring *no electrical controls or mechanical linkage!*

This revolutionized the rooftop concept, allowing a virtually unlimited number of terminal zones from a single zone primary source and offering low installation costs, no terminal unit maintenance or operating costs, greater construction flexibility, reliability, and superior comfort control due to FM's full velocity/variable volume operating characteristics.

Close on the heels of Mammoth's FM system came the announcement of their new rooftop Solid State Temperature control system. This one-of-a-kind Mammoth option "thinks" like a computer as it constantly monitors and compares space and discharge temperatures with the set point, adjusting the primary HVAC source's capacity to match the space load. So it *measures* rather than simulates the load to provide consistent interior temperatures *automatically!*

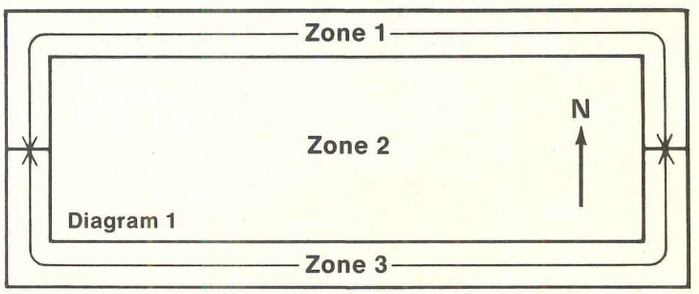
Solid State system benefits include superior temperature control in the space; improved unit efficiency for reduced energy and operating costs; maximum use of outdoor air for cooling; automatic heat/cool changeover based on space conditions; significantly reduced installation, maintenance and service costs and increased reliability because there are no moving parts!

But tests are one thing, field-tested facts another. Enter Belmar Builders, Incorporated.

### Mammoth meets Fox Meadows

Belmar builds and rents office and apartment buildings in the Upper Midwest. In late 1970 they made a decision to build the Fox Meadows Office Building, part of which was to become their new headquarters. Mammoth was invited to bid on the building, a two-story structure of 32,000 sq. ft. The building's location and uses meant constantly changing load conditions throughout the day. And Minnesota's climate is notorious for its seasonal extremes.

The specs told Mammoth that here was an installation with a combination of design demands that almost begged for the combined FM/Solid State concepts.

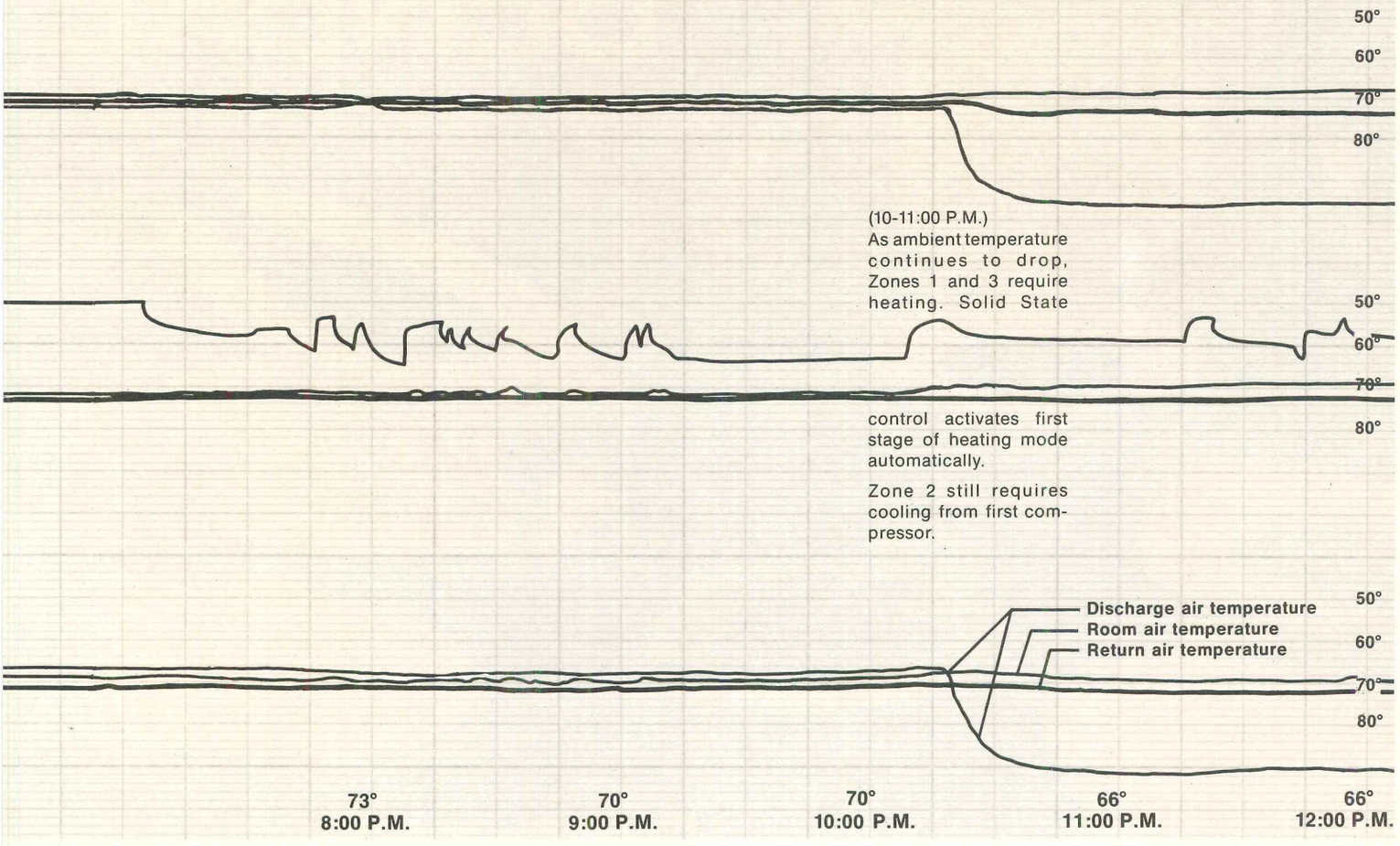



*Second story floor plan (approx. 16,000 sq. ft.).*

The building was divided into five master zones and 30 FM terminal zones. And when the figures were in, the job including installation was an amazing $1.60/sq. ft.! The other bids started at $3.25/sq. ft. for a competitive system.

Mammoth recommended their Solid State control system for each master zone which would make HVAC decisions for that zone independent of the others. The five master zones could

**Diagram 2:**
Line flow chart for zones 1, 2 and 3. All data shown recorded July 25, 1971, between 2:00 PM and Midnight.






have as many FM terminal units (secondary zones) as the builder desired. And they could be added or removed easily *after* completion, according to the degree of temperature control tenants wanted!

**The special test**

Once the building was completed and the system in operation, Mammoth engineers went to work setting up a special test for their own benefit.

The engineers gathered data from the three master zones in the second story, as these provide the greatest fluctuations in loads throughout the day. (See Diagram 1) Special recording equipment took three readings in each of the three zones: (1) Supply air temperature, (2) room air temperature (taken at a representative location), and (3) return air temperature. A simplified version of the resulting chart is shown in Diagram 2, above.

*Belmar's Fox Meadows Office Building, Plymouth, Minnesota.*

The time span shown in the diagram does not represent the total duration of the test. This portion was selected because it shows the internal and external influences that most affected interior space temperatures. The room sensor's set point for each zone was 72°F. All data shown was recorded on July 25, 1971, between 2:00 P.M. and Midnight.

**The results? Unmatched success!**

The most telling things about Diagram 2 are the lines indicating room temperature. They are nearly arrow straight in every zone. *Room temperature fluctuations were near zero* although the loads on the rooms varied considerably!

Observe, too, that at approximately 10:30 P.M. zones 1 and 3 called for heat while zone 2 still required some cooling. The Solid State system was able to sense this need and switched the primary unit to the heating mode *automatically* without upsetting supply air temperature in zones 1 and 3, allowing fine control of space temperatures.

Called out in Diagram 2 are the steps the primary unit took to comply with the signals given by the Solid State Temperature control.

One thing the diagram does not show is that throughout the test period the unit was operating at constant volume. Only the volume of air supplied to the room varied according to the individual FM room settings. Thus FM provides final, flexible terminal zone control while the Solid State-controlled primary unit enjoys energy savings and extended equipment life.

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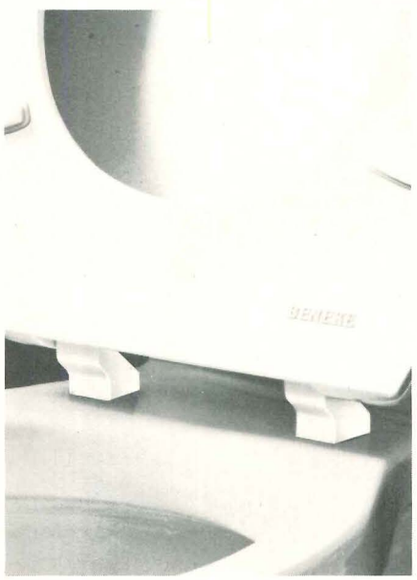
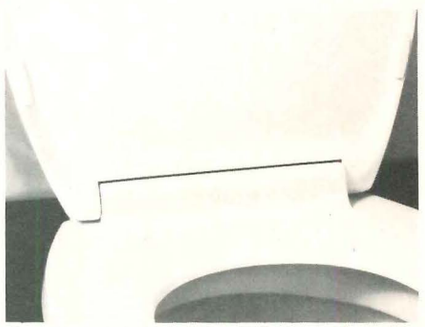
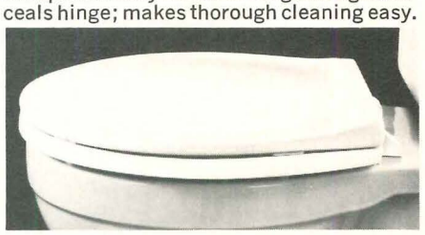




Complementary seat and hinge design conceals hinge; makes thorough cleaning easy.



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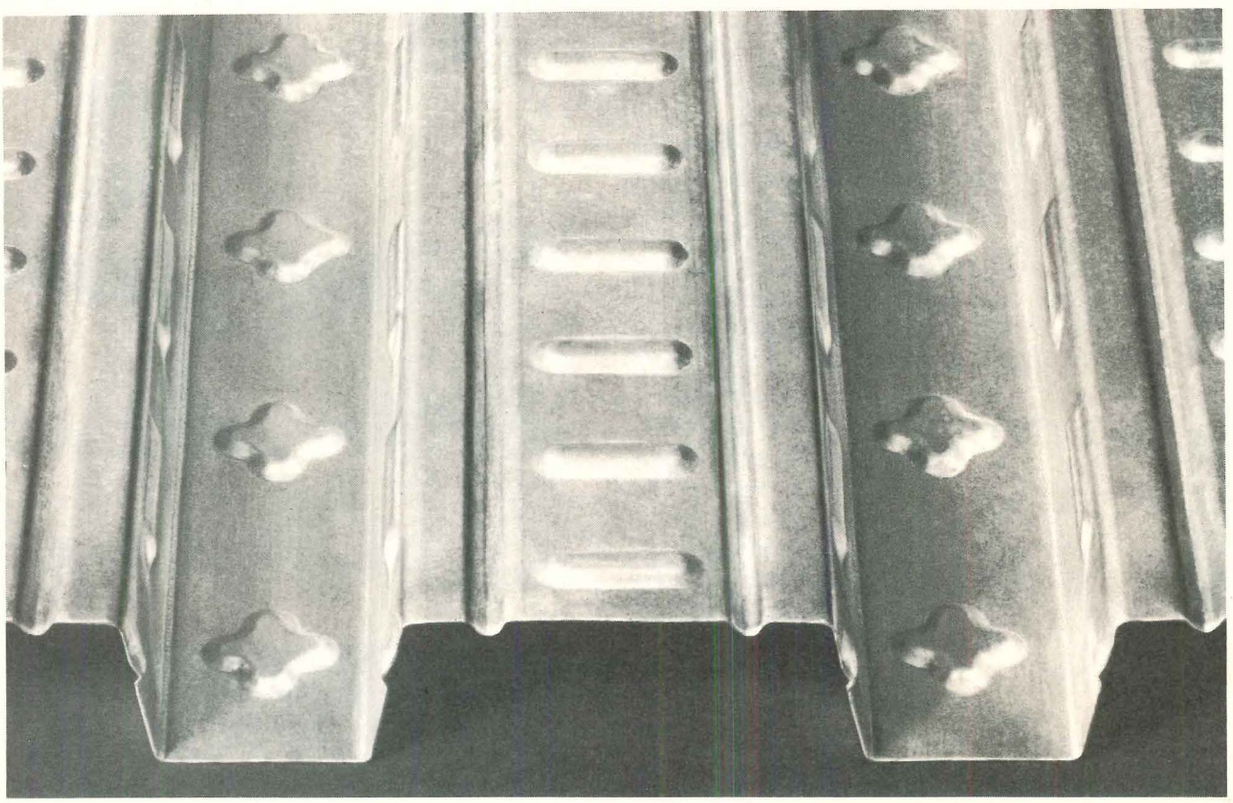

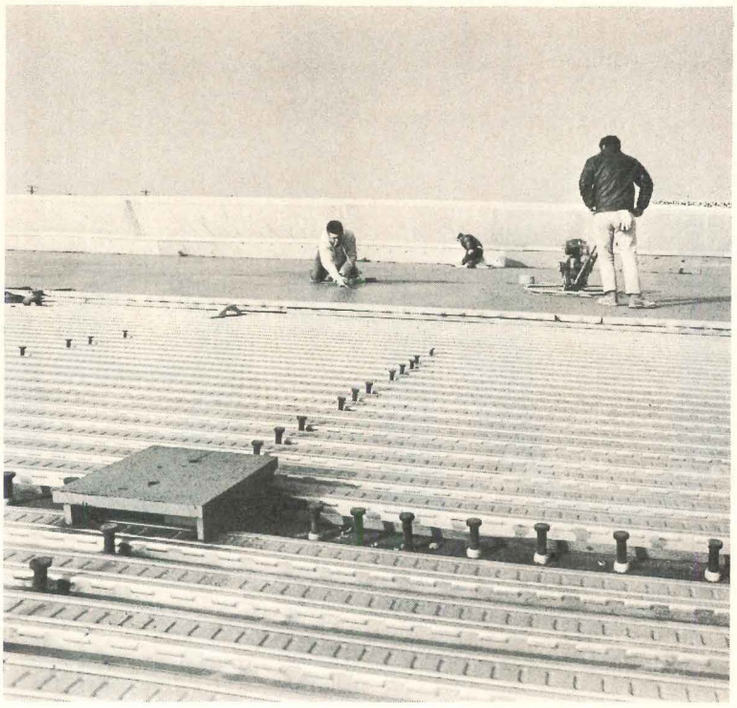

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That way, if AM&A wants to add more floors, all they have to do is take off the roofing and extend the steel framework (the square "plate" in the photo is the top of a column which will be covered by the roofing).

Our SUPERBOND BC Deck was chosen because it offers the greatest shear-bond resistance for maximum lateral strength and stability, and can easily handle the dead-weight load of the roof.

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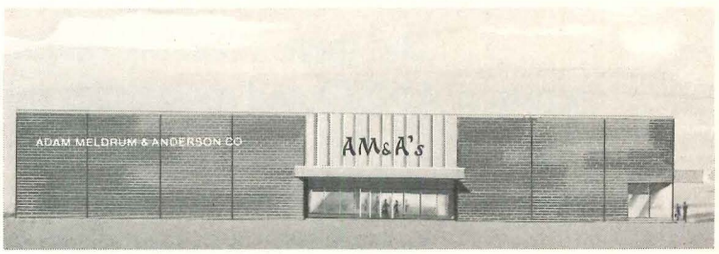


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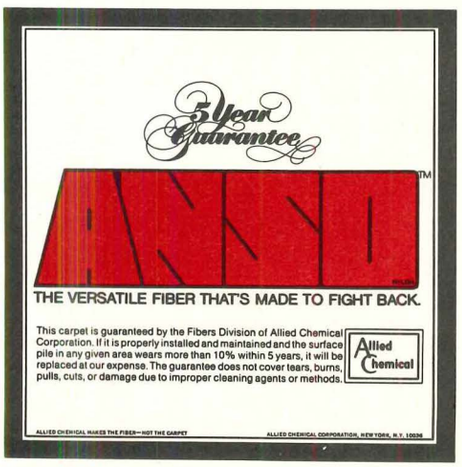


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# College construction: the emphasis is on classrooms

With tuition checks in hand, and summer vacation only a memory, almost eight and a half million students will be returning to the college campuses this month, 400,000 more than in September, 1970.

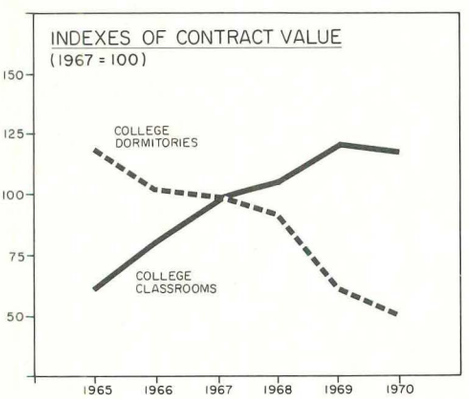
This year's increase in college enrollments is a big one by historical standards, but it is somewhat below the boom period of the mid-sixties. During the five-year-period between 1964 and 1968, when the post World War II baby boom generation was pouring onto the college campuses, the annual gain in enrollments averaged 550,000 a year. Translated into percentage terms, the 1964-1968 period saw the college population grow at an annual rate of 10 per cent, compounded. This year's 400,000 increase reflects a growth rate of only *half* that amount; an abrupt change by any standard. Traveling in the wake of the famous baby boom generation of the forties is the baby crop reared in the more prudent fifties.

College enrollment growth rates have a significant impact on all college-related construction types, but it is in the area of dormitory building that the impact is most direct. Increased enrollment has been almost immediately reflected in new dormitory construction, because, for many schools, it is the availability of living quarters, rather than of academic facilities that sets the limit on new enrollments. More students can be squeezed into existing classroom space as a temporary measure, but campus living quarters have a limited flexibility.

When enrollments began to accelerate from gains averaging 100,000 to 200,000 a year in the early sixties, to gains averaging 500,000 to 600,000 a year in the mid-sixties, dormitory construction paralleled the trend exactly. The net gain in enrollments reached a record rate of almost 650,000 in 1965. This was also the high water mark for dormitory building. It's also no coincidence that in 1969 and 1970, the two years when the net gain in enrollments was the lowest since 1961, new dormitory construction had its worst two years since 1961. Other factors, like credit conditions and replacement demand play a role here, but the primary determinant of new dormitory building is the trend in enrollments.

What about classrooms?

College classroom construction responds to enrollment growth, but with a lag. In 1965, when dormitory construction peaked out at three times the 1960 rate, new college classroom building was just beginning to make its move. Classroom contracts recorded a gain almost 50 per cent between 1964 and 1965, and ended the decade of the 1960's at *twice* the 1965 rate. In a dramatic contrast, dormitory building shrunk by *more than half* over the same period (see chart).




Much of the recent college classroom construction is the result of past shortages. Once the pressure on student housing eased up somewhat, college administrators were able to shift their scarce funds into upgrading and improving their stock of classroom facilities. A new classroom wing is easier to justify before cost conscious boards of trustees than more elaborate student housing.

While both dormitories and classrooms are expected to shown a gain for 1971, classrooms should be the dominant form of college construction through the mid-seventies.

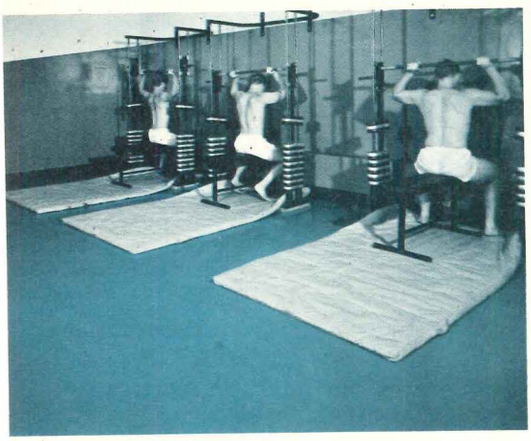
Gains in college enrollment will average around 450,000 a year out through 1975, and then taper off after that. These are large enough gains to bring renewed growth to dormitory building, but not large enough to return it to the peak rates of the mid-sixties. In additon to the lower enrollment growth rates, dormitory construction is faced with two other obstacles: Junior colleges (two year institutions) have been accounting for a progressively larger share of college enrollments recently. They amounted to around 15 per cent of total undergraduate enrollments in the mid-sixties, but are currently more than 22 per cent of that total. To the extent that a significant share of the junior college gain is accounted for by community colleges, that, by definition, do not provide housing for students, the need for dormitories is diminished.

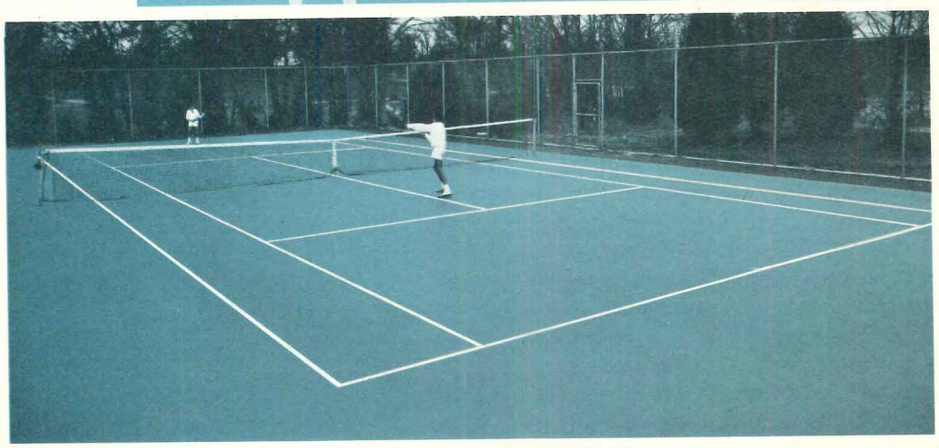
In addition, the increased affluence among the college population, and the liberalization of college rules and regulations have accelerated the trend toward off campus living.

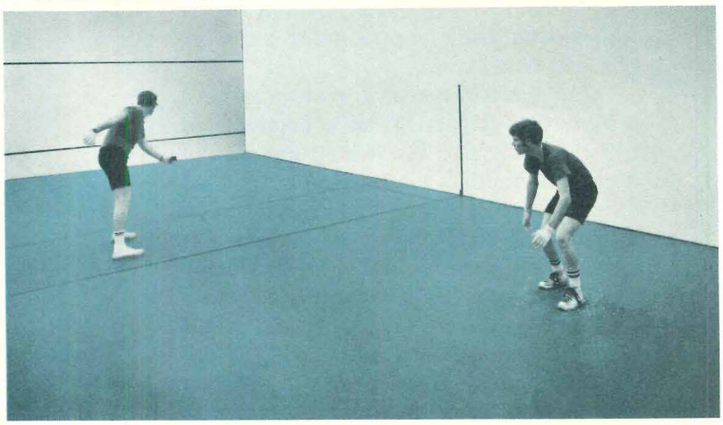
There still exists a significant backlog of demand for college classrooms, however. Despite the impressive growth in the construction of new college classrooms in the last half of the 1960's, construction for the decade as a whole just barely kept pace with the needs generated by new enrollment growth. A study of higher educational facilities done in the late fifties estimated that there was some 57 square feet of instructional space in existence per enrolled student at the time. Throughout the sixties, we built new instructional space at about the same student—square footage ratio. But, that didn't leave any slack to cover replacement demand, or the updating of the existing classroom stock.

One potential obstacle in the way of college classroom growth in the first half of the seventies is the availability of funds. Institutions of higher learning have been having a difficult time lately retaining past levels of private contributions. This, plus 1970's extremely tight credit market held classroom construction below the 1969 rate last year. (see chart.) Considering the underlying basis of demand, however, the problem of financing classroom construction will manifest itself more in slowing down the growth rate slightly, rather than stopping it altogether.

# Your new synthetic surface doesn't have to be tan or green





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# INDEXES AND INDICATORS

*William H. Edgerton*
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## PRICES FOR STAINED GLASS

Unit prices for stained glass are not readily available for estimating purposes. The following were recently compiled and may be useful.

| | $/sq. ft. |
|---|---|
| Circular rose window, leaded glass, traditional | 85 to 100 |
| Traditional, leaded with involved design | 55 to 75 |
| Traditional, leaded, simple design | 30 to 45 |
| Contemporary leaded intricate design or faceted glass set in epoxy cement | 40 to 60 |
| Faceted stained glass with 35% design and 65% background—large pieces of glass, less cutting. | 30 to 41 |
| Faceted stained glass, epoxy setting, with 40% design and 60% background—small pieces of glass, more cutting | 40 to 50 |
| Laminated glass panels, non-liturgical design | 15 to 20 |

## Building cost indexes

The information presented in the tables indicates trends of building construction costs in 33 leading cities and their suburban areas (within a 25-mile radius). The table to the right presents correct cost indexes for non-residential construction, residential construction, masonry construction and steel construction. Differences in costs between two cities can be compared by dividing the cost differential figure of one city by that of a second city.

The table below presents historical building cost indexes for non-residential construction; future costs can be projected after examining past trends.

All the indexes are based on wage rates for nine skilled trades, together with common labor, and prices of five basic building materials are included in the index for each listed city.

1941 average for each city = 100.00

**SEPTEMBER 1971**

| Metropolitan area | Cost differential | Current Indexes non-res. | residential | masonry | steel | % change year ago res. & non-res. |
|---|---|---|---|---|---|---|
| U.S. Average | 8.3 | 351.1 | 329.7 | 344.4 | 336.2 | + 8.28 |
| Atlanta | 7.9 | 452.4 | 426.6 | 441.3 | 432.7 | + 10.98 |
| Baltimore | 7.9 | 368.0 | 346.5 | 360.7 | 352.2 | + 11.11 |
| Birmingham | 7.4 | 320.3 | 298.0 | 312.1 | 306.3 | + 3.44 |
| Boston | 8.7 | 345.2 | 325.3 | 341.4 | 332.4 | + 12.52 |
| Buffalo | 9.0 | 384.3 | 361.0 | 378.7 | 367.8 | + 7.22 |
| Chicago | 8.3 | 398.6 | 379.0 | 386.2 | 380.6 | + 7.71 |
| Cincinnati | 8.8 | 379.0 | 356.7 | 371.7 | 362.5 | + 11.61 |
| Cleveland | 9.5 | 398.8 | 375.3 | 390.7 | 381.8 | + 8.47 |
| Columbus, Ohio | 8.4 | 378.8 | 355.7 | 369.3 | 362.7 | + 9.28 |
| Dallas | 7.6 | 346.3 | 335.4 | 339.7 | 332.2 | + 9.73 |
| Denver | 8.3 | 383.1 | 360.5 | 380.5 | 367.8 | + 9.52 |
| Detroit | 9.4 | 390.8 | 372.3 | 390.3 | 376.8 | + 8.54 |
| Houston | 7.7 | 342.4 | 321.6 | 334.1 | 328.0 | + 7.97 |
| Indianapolis | 8.0 | 332.1 | 311.9 | 324.4 | 317.8 | + 7.81 |
| Kansas City, Mo. | 8.2 | 335.6 | 316.2 | 327.7 | 320.2 | + 8.92 |
| Los Angeles | 8.0 | 384.4 | 351.5 | 372.6 | 366.8 | + 7.74 |
| Louisville, Ky. | 7.6 | 346.7 | 325.6 | 338.7 | 331.9 | + 8.20 |
| Memphis | 7.7 | 336.6 | 316.1 | 327.7 | 322.2 | + 8.51 |
| Miami | 8.1 | 373.2 | 355.6 | 364.9 | 356.5 | + 8.16 |
| Milwaukee | 8.6 | 405.9 | 381.2 | 401.9 | 389.1 | + 6.02 |
| Minneapolis | 8.7 | 371.9 | 349.9 | 365.4 | 355.7 | + 6.86 |
| Newark | 8.9 | 351.7 | 330.2 | 347.1 | 338.5 | + 10.14 |
| New Orleans | 7.3 | 333.8 | 315.1 | 329.6 | 321.7 | + 7.09 |
| New York | 10.0 | 389.5 | 362.2 | 377.5 | 369.5 | + 7.85 |
| Philadelphia | 8.4 | 362.2 | 345.1 | 356.5 | 348.1 | + 8.03 |
| Phoenix | 7.7 | 196.7 | 184.8 | 190.1 | 187.2 | + 8.69 |
| Pittsburgh | 8.7 | 343.7 | 323.4 | 338.7 | 329.5 | + 6.46 |
| St. Louis | 8.7 | 366.4 | 345.9 | 361.5 | 351.0 | + 7.08 |
| San Antonio | 8.0 | 144.0 | 135.3 | 141.0 | 137.4 | + 8.24 |
| San Diego | 8.1 | 141.2 | 132.6 | 138.2 | 135.6 | + 6.59 |
| San Francisco | 8.9 | 493.2 | 450.9 | 488.3 | 474.4 | + 5.33 |
| Seattle | 8.8 | 358.0 | 320.5 | 355.6 | 341.4 | + 6.41 |
| Washington, D.C. | 7.8 | 330.8 | 310.6 | 321.2 | 315.7 | + 11.04 |

Cost differentials compare current local costs, not indexes.

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

1941 average for each city = 100.00

| Metropolitan area | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 (Quarterly) 1st | 2nd | 3rd | 4th | 1971 (Quarterly) 1st | 2nd | 3rd | 4th |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Atlanta | 298.2 | 305.7 | 313.7 | 321.5 | 329.8 | 335.7 | 353.1 | 384.0 | 399.9 | 406.2 | 408.1 | 422.4 | 424.0 | 445.1 | | |
| Baltimore | 271.8 | 275.5 | 280.6 | 285.7 | 290.9 | 295.8 | 308.7 | 322.8 | 323.7 | 330.3 | 332.2 | 348.8 | 350.3 | 360.5 | | |
| Birmingham | 250.0 | 256.3 | 260.9 | 265.6 | 270.7 | 274.7 | 284.3 | 303.4 | 303.5 | 308.6 | 310.2 | 309.3 | 310.6 | 314.6 | | |
| Boston | 239.8 | 244.1 | 252.1 | 257.8 | 262.0 | 265.7 | 277.1 | 295.0 | 300.5 | 305.6 | 307.3 | 328.6 | 330.0 | 338.9 | | |
| Chicago | 292.0 | 301.0 | 306.6 | 311.7 | 320.4 | 328.4 | 339.5 | 356.1 | 362.2 | 368.6 | 370.6 | 386.1 | 387.7 | 391.0 | | |
| Cincinnati | 258.8 | 263.9 | 269.5 | 274.0 | 278.3 | 288.2 | 302.6 | 325.8 | 332.8 | 338.4 | 340.1 | 348.5 | 350.0 | 372.3 | | |
| Cleveland | 268.5 | 275.8 | 283.0 | 292.3 | 300.7 | 303.7 | 331.5 | 358.3 | 359.7 | 366.1 | 368.1 | 380.1 | 381.6 | 391.1 | | |
| Dallas | 246.9 | 253.0 | 256.4 | 260.8 | 266.9 | 270.4 | 281.7 | 308.6 | 310.4 | 314.4 | 316.1 | 327.1 | 328.6 | 341.4 | | |
| Denver | 274.9 | 282.5 | 287.3 | 294.0 | 297.5 | 305.1 | 312.5 | 339.0 | 343.4 | 348.4 | 350.3 | 368.1 | 369.7 | 377.1 | | |
| Detroit | 265.9 | 272.2 | 277.7 | 284.7 | 296.9 | 301.2 | 316.4 | 352.9 | 355.2 | 360.5 | 360.6 | 377.4 | 379.0 | 384.6 | | |
| Kansas City | 240.1 | 247.8 | 250.5 | 256.4 | 261.0 | 264.3 | 278.0 | 295.5 | 301.8 | 306.8 | 308.8 | 315.3 | 316.6 | 329.5 | | |
| Los Angeles | 276.3 | 282.5 | 288.2 | 297.1 | 302.7 | 310.1 | 320.1 | 344.1 | 346.4 | 355.3 | 357.3 | 361.9 | 363.4 | 374.2 | | |
| Miami | 260.3 | 269.3 | 274.4 | 277.5 | 284.0 | 286.1 | 305.3 | 392.3 | 338.2 | 343.5 | 345.5 | 353.2 | 354.7 | 366.8 | | |
| Minneapolis | 269.0 | 275.3 | 282.4 | 285.0 | 289.4 | 300.2 | 309.4 | 331.2 | 341.6 | 346.6 | 348.5 | 361.1 | 362.7 | 366.0 | | |
| New Orleans | 245.1 | 284.3 | 249.9 | 256.3 | 259.8 | 267.6 | 274.2 | 297.5 | 305.4 | 310.6 | 312.2 | 318.9 | 320.4 | 327.9 | | |
| New York | 276.0 | 282.3 | 289.4 | 297.1 | 304.0 | 313.6 | 321.4 | 344.5 | 351.1 | 360.5 | 361.7 | 366.0 | 367.7 | 378.9 | | |
| Philadelphia | 265.2 | 271.2 | 275.2 | 280.8 | 286.6 | 293.7 | 301.7 | 321.0 | 328.9 | 337.7 | 335.7 | 346.5 | 348.0 | 356.4 | | |
| Pittsburgh | 251.8 | 258.2 | 263.8 | 267.0 | 271.1 | 275.0 | 293.8 | 311.0 | 316.9 | 321.6 | 323.3 | 327.2 | 328.7 | 338.1 | | |
| St. Louis | 255.4 | 263.4 | 272.1 | 280.9 | 288.3 | 293.2 | 304.4 | 324.7 | 335.2 | 340.8 | 342.7 | 344.4 | 345.9 | 360.0 | | |
| San Francisco | 343.3 | 352.4 | 365.4 | 368.6 | 386.0 | 390.8 | 402.9 | 441.1 | 455.4 | 466.9 | 468.6 | 465.1 | 466.8 | 480.7 | | |
| Seattle | 252.5 | 260.6 | 266.6 | 268.9 | 275.0 | 283.5 | 292.2 | 317.8 | 325.4 | 335.1 | 336.9 | 341.8 | 343.3 | 347.1 | | |

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

# The Carrier Volumaster®

## A revolutionary apartment air-distribution system harnesses the Coanda effect.

The Volumaster starts with all the proven advantages of a central climate control system. Then adds some unique improvements of its own.

First, a Carrier exclusive: a special variable-speed fan-coil unit. Only one unit is needed for each apartment. Its motor is specifically designed to follow the heating/cooling load. This offers the owner up to 20% lower operating costs. And the unit's reliability greatly lowers maintenance costs, too.

Then, there's the new Volumaster outlet. This Carrier exclusive provides even air distribution regardless of the load.

How does it work? Instead of pouring air into a room, the damper blade automatically adjusts to the air flow. The aerodynamic design of the outlet enables the discharge air to cling to the ceiling.
The air hugs the ceiling even under low flow conditions. There are no drafts. No hot spots. No dumping of air.

That's not all that's exclusive with the Volumaster. It also features patented solid-state controls. Controls that are totally dependable, last longer, and require no field maintenance.

In addition, the factory's prepackaging reduces installation costs and provides more effective quality control.

All this gives owners and developers a much higher profit on their investment. And at the same time, it gives tenants the most comfortable, most efficient and quietest air conditioning around.

Ask Carrier how a Volumaster air distribution system can improve your new building with central air conditioning and save money.
And when you do, ask them about their big advance in gas absorption cooling machines: the 16JB.

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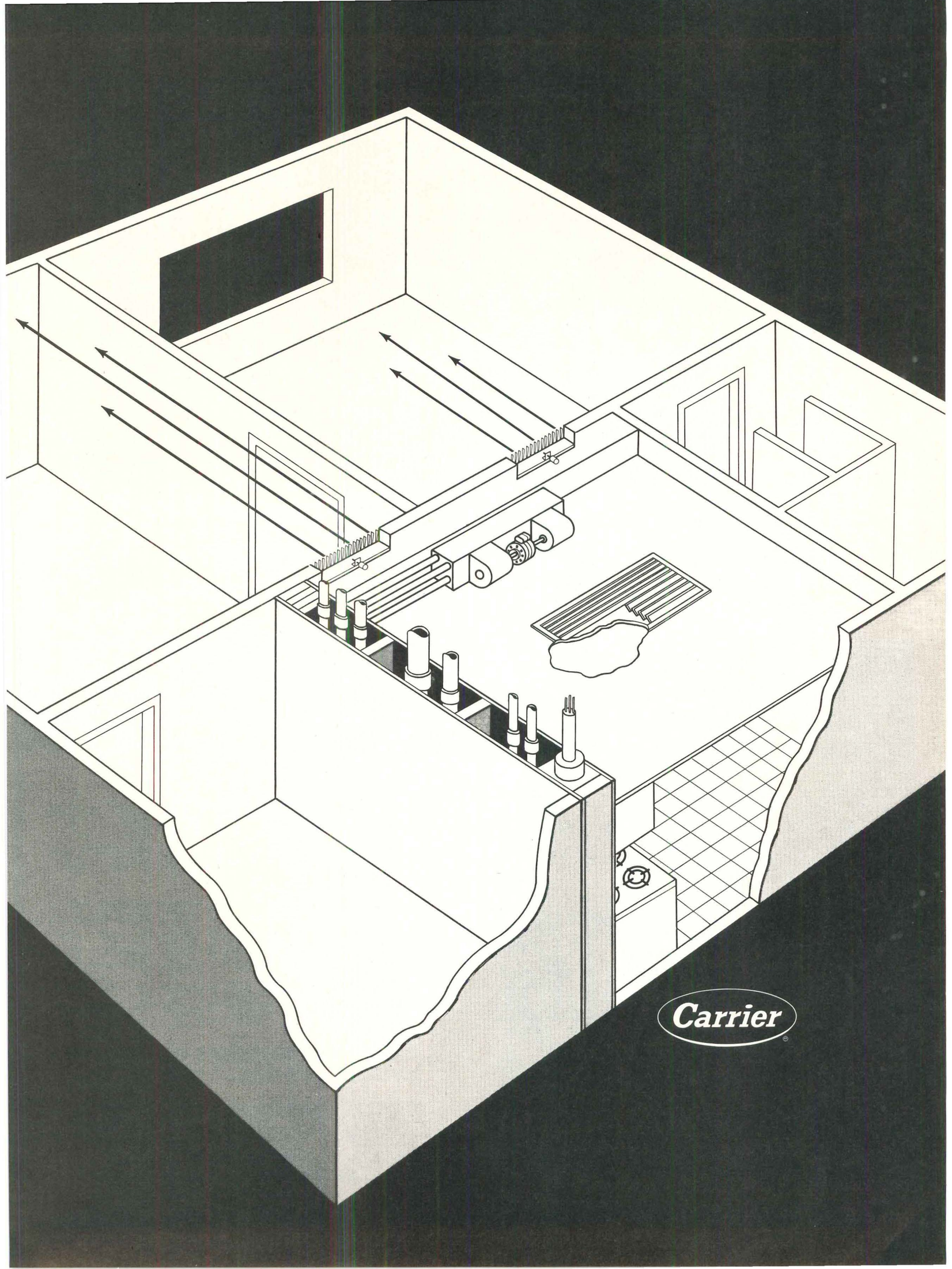
*For more data, circle 44 on inquiry card*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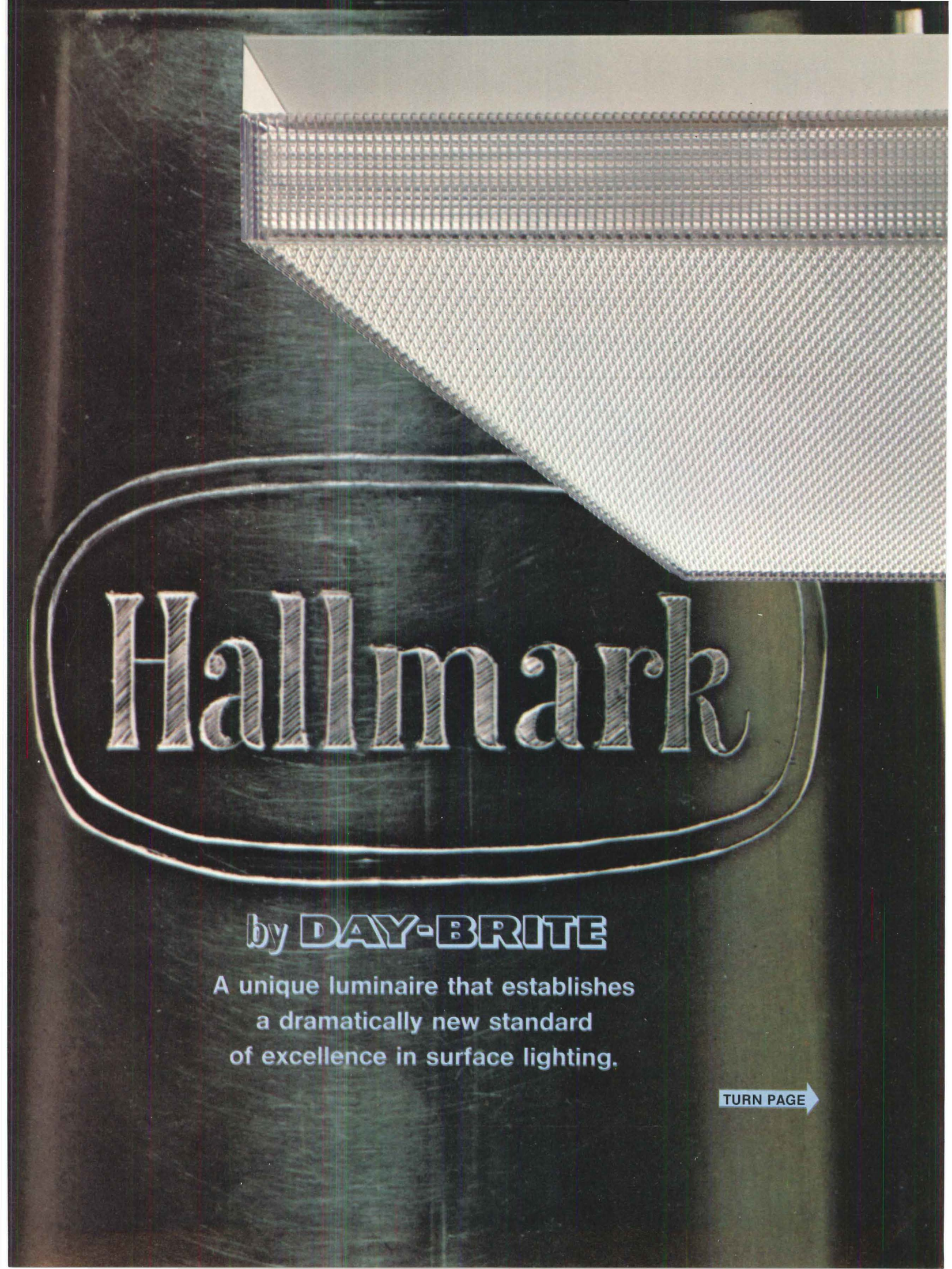
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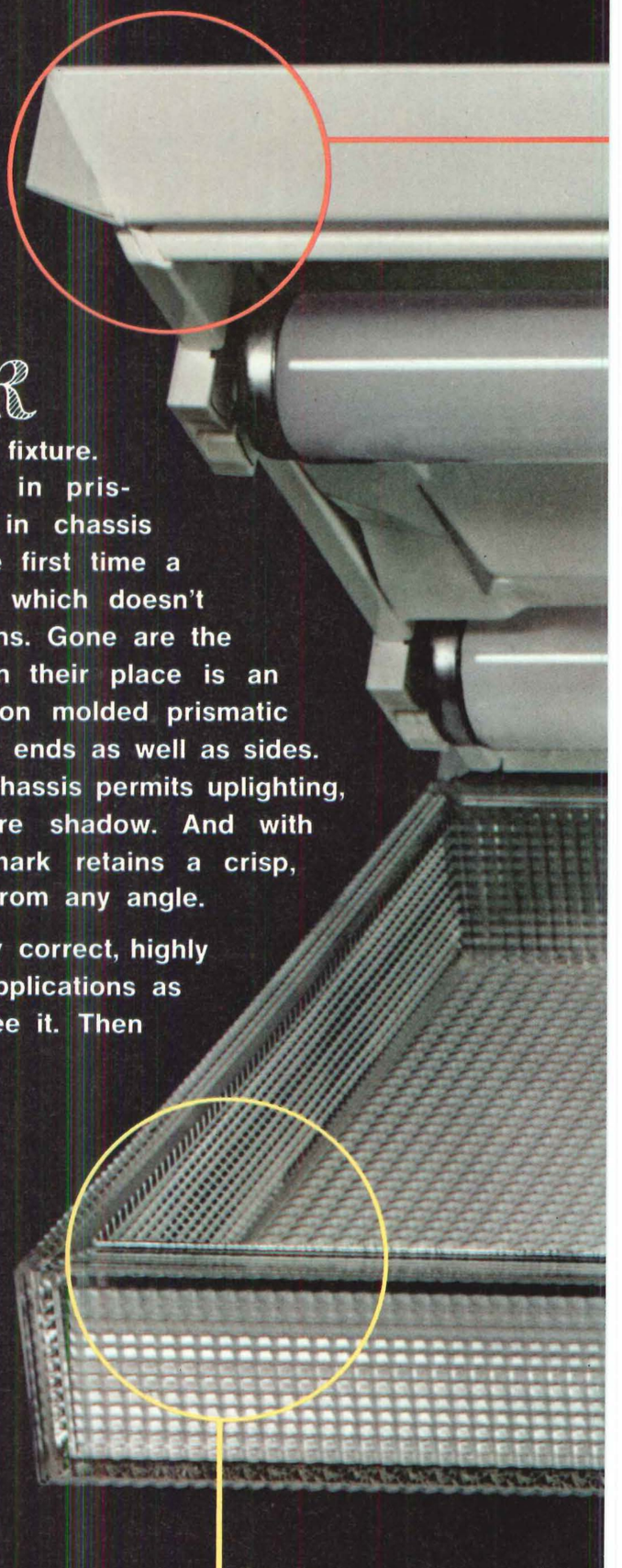
by DAY-BRITE
A unique luminaire that establishes
a dramatically new standard
of excellence in surface lighting.
TURN PAGE

# Hallmark

. . . . . is more than a new fixture. It is a creative concept in prismatic lens processing . . . in chassis design. It achieves for the first time a nonfixture, "in limbo" look which doesn't detract from interior designs. Gone are the traditional opaque ends. In their place is an exclusive one-piece injection molded prismatic lens that provides luminous ends as well as sides. A splay around the entire chassis permits uplighting, completely dispelling fixture shadow. And with unique corner "fins", Hallmark retains a crisp, square look when viewed from any angle.

HALLMARK . . . architecturally correct, highly efficient . . . with as many applications as your mind can conjure. See it. Then draw your conclusions.

DAY-BRITE®



LENS—Hallmark's high efficiency low brightness prismatic lens is the first to have a return edge around its entire periphery. Of virgin Acrylic, it is injection molded in one piece by a totally new process . . . transmits light from all four sides.

DAY-BRITE LIGHTING DIVISION
EMERSON ELECTRIC CO.
5411 BULWER
ST. LOUIS, MISSOURI 63147

EMERSON

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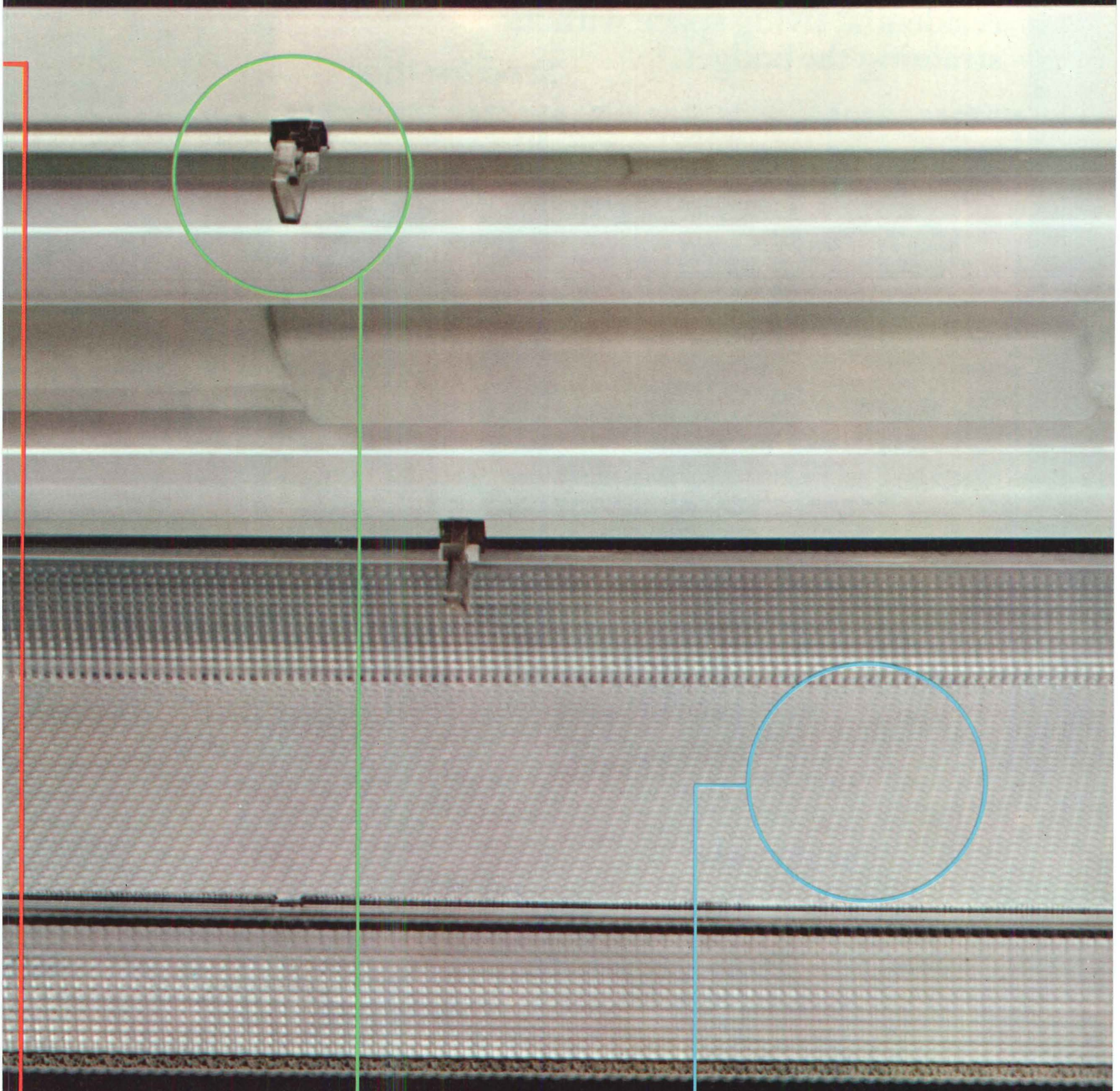


CHASSIS—Hallmark eliminates the traditional "pocket" to achieve uplighting. Instead, entire chassis fits flush-to-ceiling, angles inward to permit uplighting around entire fixture. Unique corner "fins" offset splay to retain a clean, vertical corner line when viewed from any angle.

LATCHES—Enclosure is hinged on both sides for easy access in cleaning and servicing, and remains captive when in fully open position. Positive-lock, invisible mechanical latches will not let lens get out of alignment.

SPECS—Hallmark is a slim 3" deep, 12" wide in the 2-lamp model... 16½" wide in the 4-lamp. It comes in 4' and 8' lengths, for use singly or in tandem, surface or suspended. Metal splay is available in baked white enamel finish, or matte black.

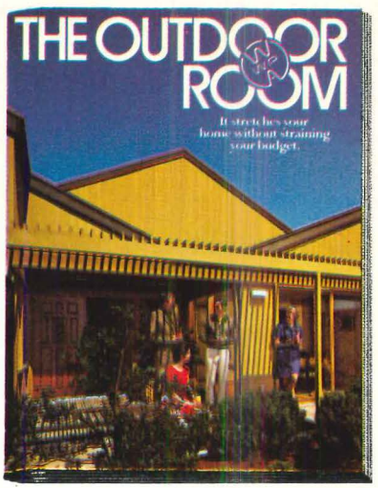
# Find out how one architect stretches residential living space without straining the budget.

## Send for this:

We asked Architect Alex Pierce, AIA, to explore the use of the "Outdoor Room" as an economical way to expand residential living space. He responded with approaches suitable for townhouses, apartments or homes, and we have gathered them together in a new 12-page, full-color "Outdoor Room" booklet.

He uses the out-of-doors and Western Wood to stretch kitchen areas, family rooms and entries—even bathrooms and bedrooms—in provocative and inexpensive ways.

Perhaps you can solve your clients' space problems, too—innovatively and economically—with outdoor rooms. And versatile Western Wood, which adapts easily to almost any site or environment. Send in the coupon for your copy of "The Outdoor Room." It's free.

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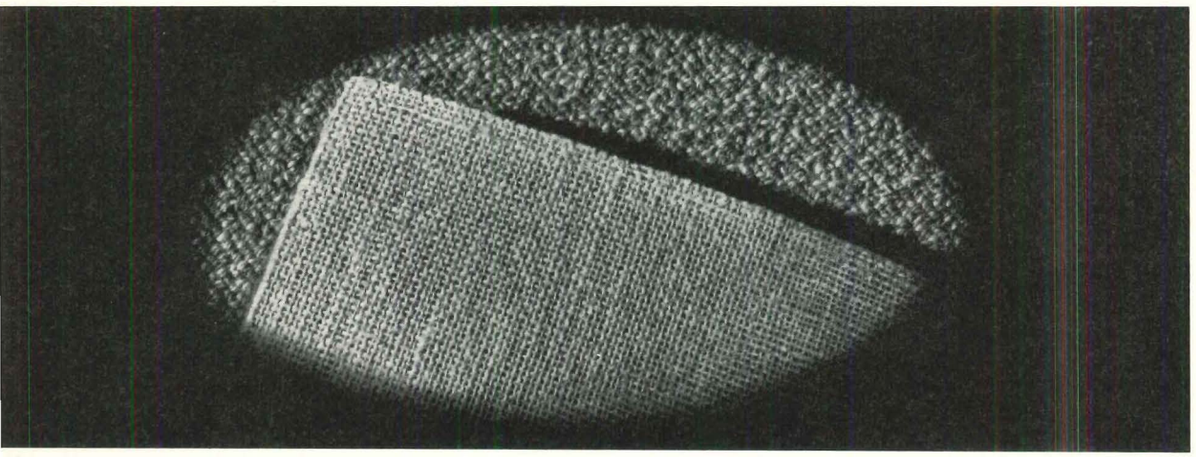
One of a series presented by members of the American Wood Council.

# Key to successful glue-down carpet installations...

# JUTE

## double carpet backing



**The benefits of this system with double jute-backed carpets are well known:**

- Easy wheel and caster mobility (no pads needed under secretarial chairs.)
- Lower cost than same carpet plus separate underlayment, or cushion-backed carpet with equal pile specifications.
- Protection against seams opening, with no lateral stress under traffic.
- Sound absorption, low-cost maintenance, aesthetics, insulation, comfort underfoot, improved morale.

**But why only jute backing? For many reasons, including:**

- Jute's interstices and fibrous qualities assure secure bond with minimum adhesive, fully absorbing compound on the surface.
- Adheres to any sub-floor, or over previously installed hard-surface flooring.
- Unmatched dimensional stability, vital with cut-outs for outlets and junction boxes.
- Jute's thickness, over double that of other non-cushion backings, provides extra area for beading with adhesive at seams.
- When pulled up, carpet is generally intact for re-installation.
- Helps meet fire safety codes, if carpet otherwise qualifies.
- When installed over padding in selected areas, jute hooks over tackless strip gripper pins without loosening up and buckling later.

**Write for Architectural Guide Specification**
*by William E. Lunt, C.S.I.*

**JUTE CARPET BACKING COUNCIL, INC.**
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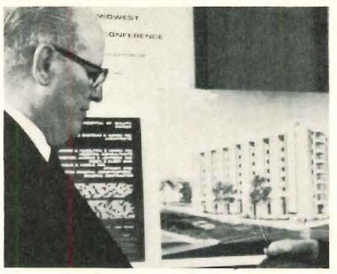
*For more data, circle 50 on inquiry card*

**Editorial reports on double jute-backed carpet glue-down**

**Jute installations proven successes**

"The only case studies documented to date have been of no-pad installations with double jute-backed carpeting — with success reported in each instance."

*—from BUILDINGS, February, 1971*



**Hospital's experience a guide for any site**

"Does direct jute glue-down really work? To get the answers . . . an earlier installation was revisited that has received grueling treatment . . . It is a large and exceptionally active general hospital — St. Luke's in Duluth, Minn. St. Luke's added a sizeable new wing and carpeted throughout all patient rooms, nursing stations, corridors, lounges and reception areas with the direct jute glue-down system.

"Richard K. Fox, administrator of the hospital reported: 'Our experience has been a satisfactory one. So much so that we are using exactly the same carpet and direct glue-down installation method in an older wing now being completely renovated. The carpet . . . has jute primary and secondary backings.

"'I have been asked many questions about cleaning problems with carpet, especially with normal hospital spillage situations. We have had no difficulties that could not be resolved with ordinary effort.

"'The direct jute glue-down system gives us practically as much wheel and caster mobility as we enjoy in our areas with hard-surface flooring. The difference is hardly noticeable . . .'"

*—from BUILDING OPERATING MANAGEMENT, November, 1970*

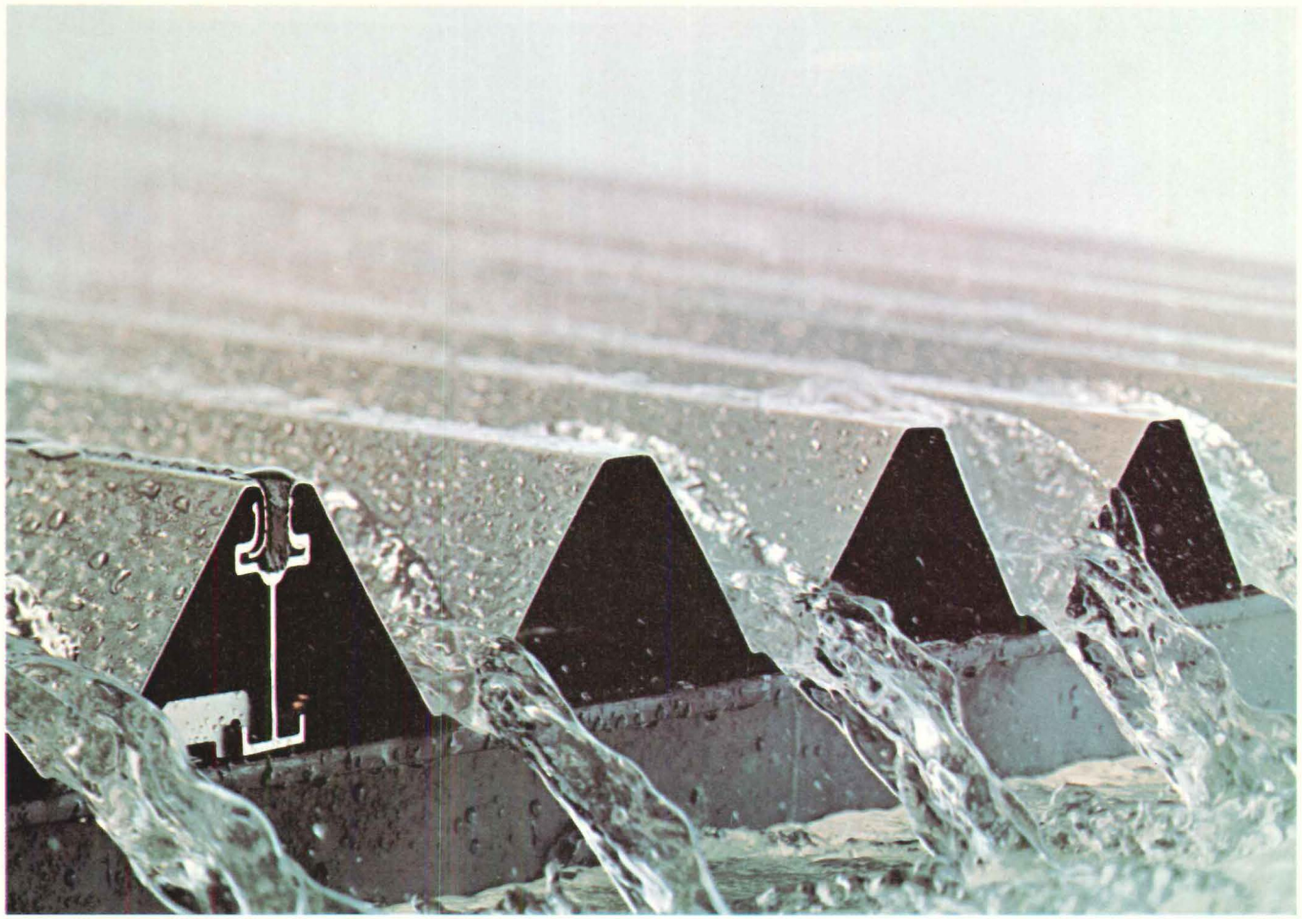
The Alcoa * Snug Rib system is a floating, weathertight, no-through-fastener roofing system. It is a combination of two proven Alcoa products—V-beam industrial sheet and the Snug Seam® joint. With no problem of water leakage, Snug Rib industrial roofing can be used on flat roofs—with a pitch as low as ¼ in. on 12 in.

In addition, a Snug Rib roofing system offers all the important benefits of low-slope roofing: a higher proportion of functional to dead space, longer spans, fewer purlins, less superstructure and metal surface area, with consequent savings in building costs and less dead space to heat.

And here's the big cost saver: *Aluminum takes care of itself.* Forms its own protective, invisible film of hard aluminum oxide that inhibits corrosion and keeps the metal looking bright and new, year after year. With never a coat of paint or tar needed.

For complete details, write Aluminum Company of America, 1640- J Alcoa Building, Pittsburgh, Pa. 15219.

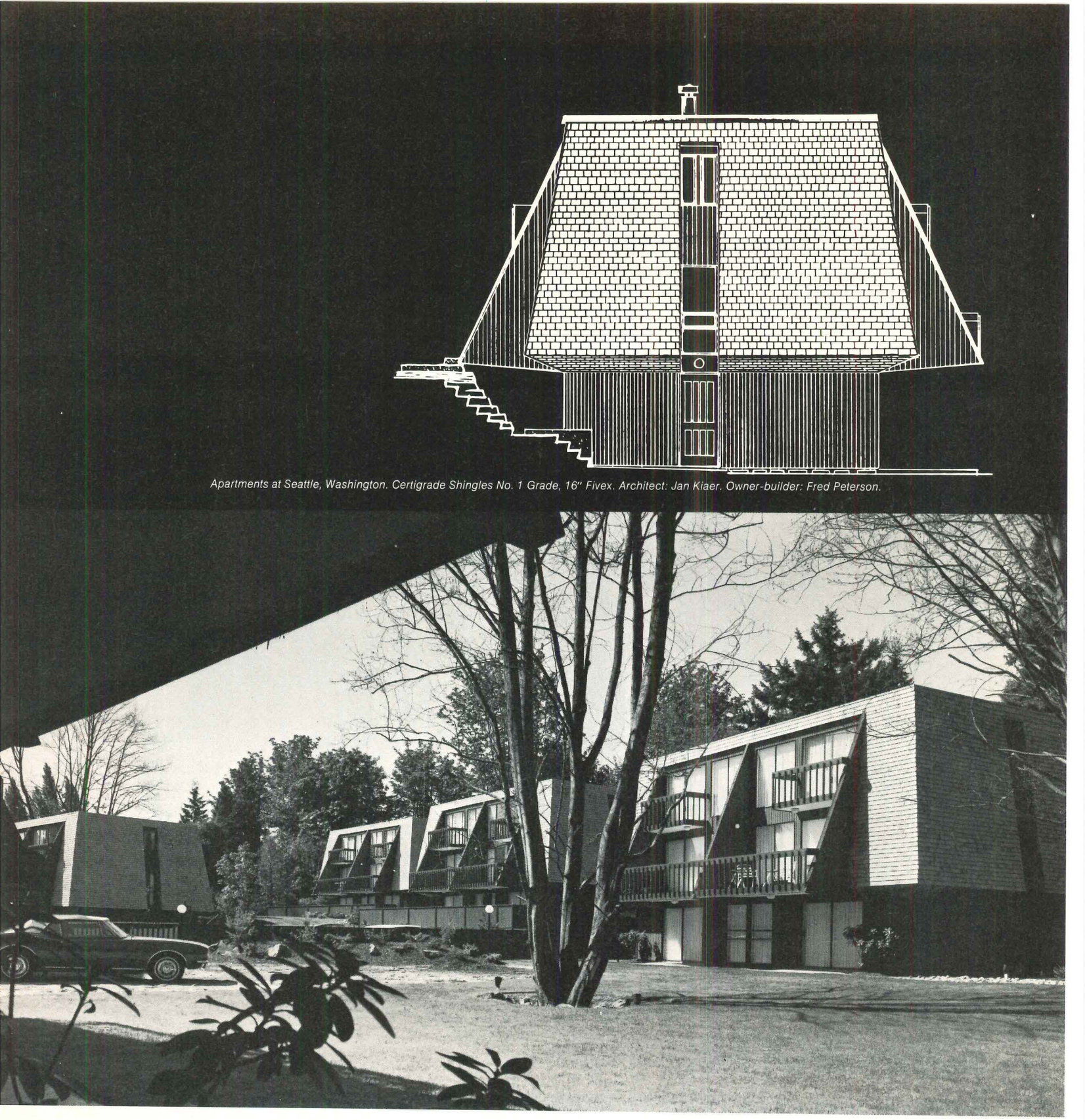
*Trademarks of Aluminum Company of America.



# How to design low-slope, low-maintenance roofing.

**Change for the better with Alcoa Aluminum**

ALCOA



*Apartments at Seattle, Washington. Certigrade Shingles No. 1 Grade, 16" Fivex. Architect: Jan Kiaer. Owner-builder: Fred Peterson.*

# Red cedar shingles outside. No vacancies inside.

An investment in beauty made a beautiful investment at these Seattle apartments. Even before construction was completed full occupancy was assured. Now there's a long waiting list. It's easy to see why.

There is individuality here. Space. Elegance. Harmony. Architect Jan Kiaer did it with low-density site development. With imaginative design. And with the native beauty of red cedar shingles.

The red cedar mansards do more than embellish. They permeate the area with warmth, creating a community instead of a complex. They blend with and extend the natural charm of the wooded environment. And they retain their beauty for decades without maintenance.

For your next apartment project, specify red cedar Certigrade shingles or Certi-Split handsplit shakes. For details and money-saving application tips, write: 5510 White Building, Seattle, Wa. 98101. (In Canada: Suite 1500, 1055 West Hastings St., Vancouver 1, B.C.)

THE CROWNING TOUCH OF QUALITY · RED CEDAR SHINGLES & HANDSPLIT SHAKES ·

**Red Cedar Shingle & Handsplit Shake Bureau**

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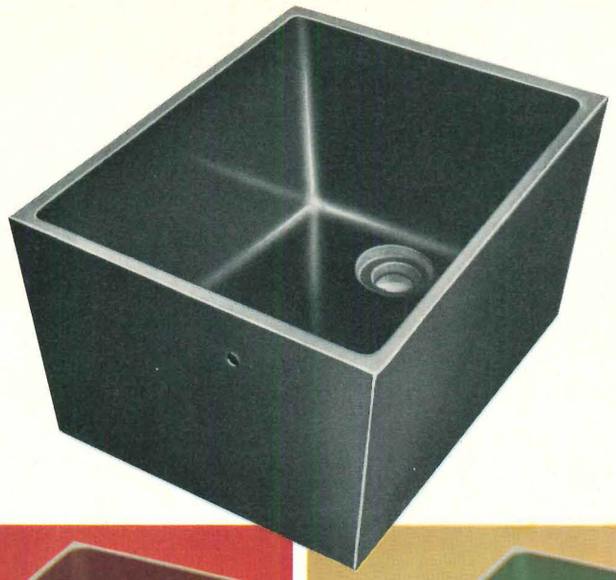
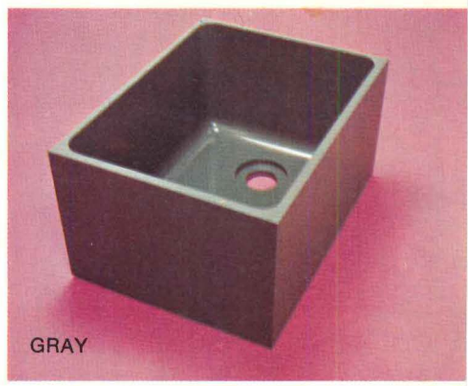
# COLORED LAB SINKS

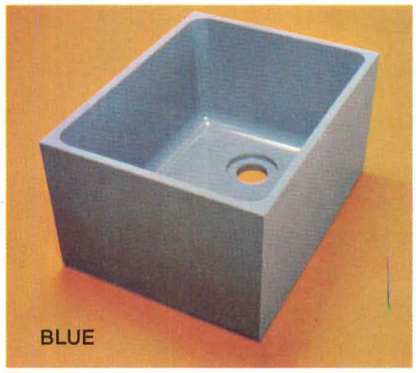


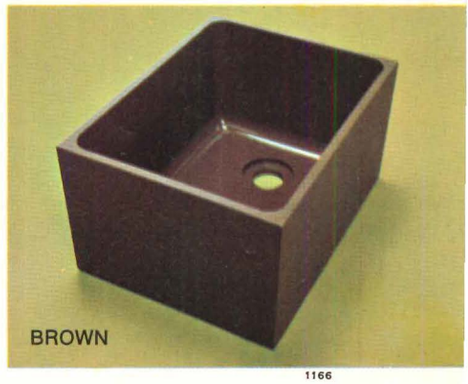
**GSR® Lab Sinks give you a choice.** Now you can color-coordinate GSR solid polypropylene laboratory sinks with today's colorful counter tops. Choose one of the six appealing colors or standard non-glare black. They are highly resistant to the corrosive action of alkalies, alcohols, acids, dilute mineral acids, salt, aqueous solutions, and solvents. Lightweight but tough, they are impervious to chipping, denting, breaking, and extreme temperature changes. Polypropylene has the least surface porosity of any sink material, particularly significant in maintaining sterile conditions.

GSR lab sinks are available in six standard sizes from 16″ x 12″ x 8″ deep to 24″ x 16″ x 12″ deep. Install them with flame-retardant GSR Fuseal® polypropylene pipe and fittings and you'll have the ultimate in corrosion-resistant laboratory waste systems. Call your GSR Fuseal representative or write for information.

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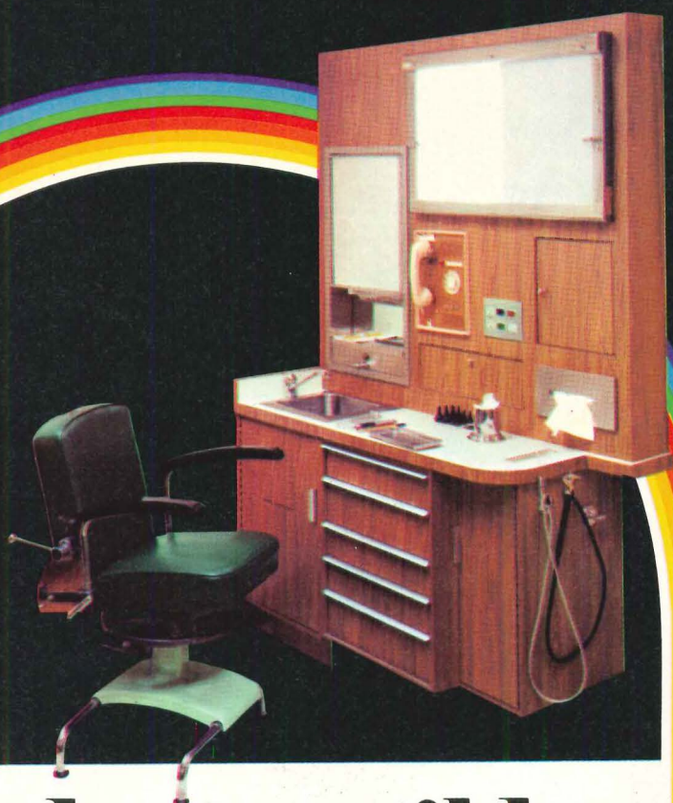
*For more data, circle 52 on inquiry card*



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If it is superb quality casework you want, that is the only kind we make. If it is stainless, enameled, or high pressure plastic laminated casework you want, we make all three. If you require custom work, we are specialists. One source. Reliable. Experienced. Anxious to be of service. Why not ask to see our catalogs?

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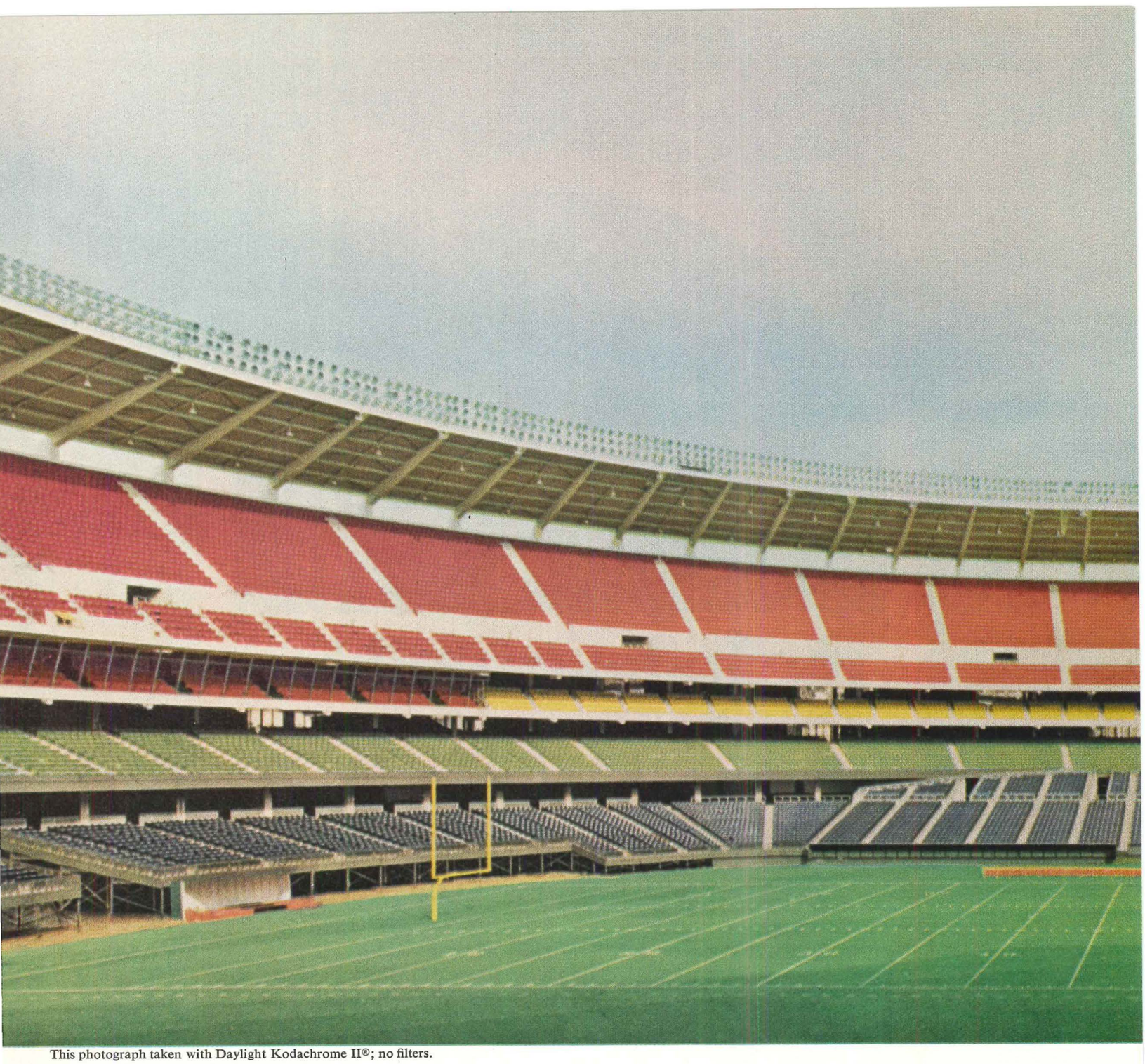


This photograph taken with Daylight Kodachrome II®; no filters.

# High noon in Cincinnati.

Even at night, it's like broad daylight in Cincinnati's new Riverfront Stadium. The field is lit up by 1,648 thousand-watt Sylvania Metalarc lamps.

It took a computer to figure out how to spread their high intensity light evenly over the field without blinding the players or fans. (Lighting levels are as high as 425 fc.) There are practically no shadows or hot spots on the field.

This uniform lighting is a necessity for color TV cameras, which aren't able to adjust to light and dark areas as they chase the players around the field.

The light is so natural that color TV cameras can operate as though they were under a sunny sky. In fact, Riverfront Stadium is the first big stadium to rely 100% on metal halide lamps. Usually, other lighting is needed to improve color rendition. Sylvania Metalarc lamps don't need any help.

They're exceptional in other ways, too: they have a rated life of 7,500 hours—about 7½ times the life of 1000-watt incandescent lamps. (That means less bulb changing—a big consideration when you're using 1,648 lamps.)

They have tremendous light output—

This photograph taken with Daylight Kodachrome II®; no filters.

# High noon in Cincinnati.

100,000 lumens per lamp compared to 19,500 lumens for 1000-watt incandescents.

They have very high efficiency—100 lumens per watt compared to 20 lumens for incandescents. So it costs about a fifth as much to run them.

The stadium also has an installation of 80 Sylvania tungsten-halogen lamps to spread plenty of light around the grandstands. They're used for low-level illumination before and after the game.

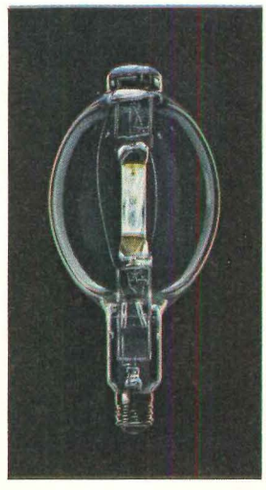
And at one end of the field, there's a huge animated scoreboard. It's 100 feet long by 20 feet high and has 32,000 Sylvania 40-watt incandescent lamps. When it's not showing the score, it can run cartoons, messages and news.

Riverfront Stadium is not only a great showcase for great sporting events.

It shows what Sylvania might be able to do for you.

*For more information see your Sylvania large lamp distributor or write to: Sylvania Lighting Center, Danvers, Mass. 01923.*

GTE SYLVANIA



# Another building built to last with glazing gaskets of Du Pont Neoprene.

They are neat . . .
for better appearance.

They are resilient . . .
to keep a tight grip.

They are Du Pont Neoprene . . .
for dependability.

Neoprene has proven resistance
to sun, weather, heat, cold, ozone,
chemicals and physical wear.

And, Neoprene won't propagate fire.

Du Pont makes Neoprene, not gaskets.

For more information on the architectural
uses of Du Pont Neoprene, write the
Du Pont Company, Room 22023, Wilmington, DE 19898.

DU PONT
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NEOPRENE

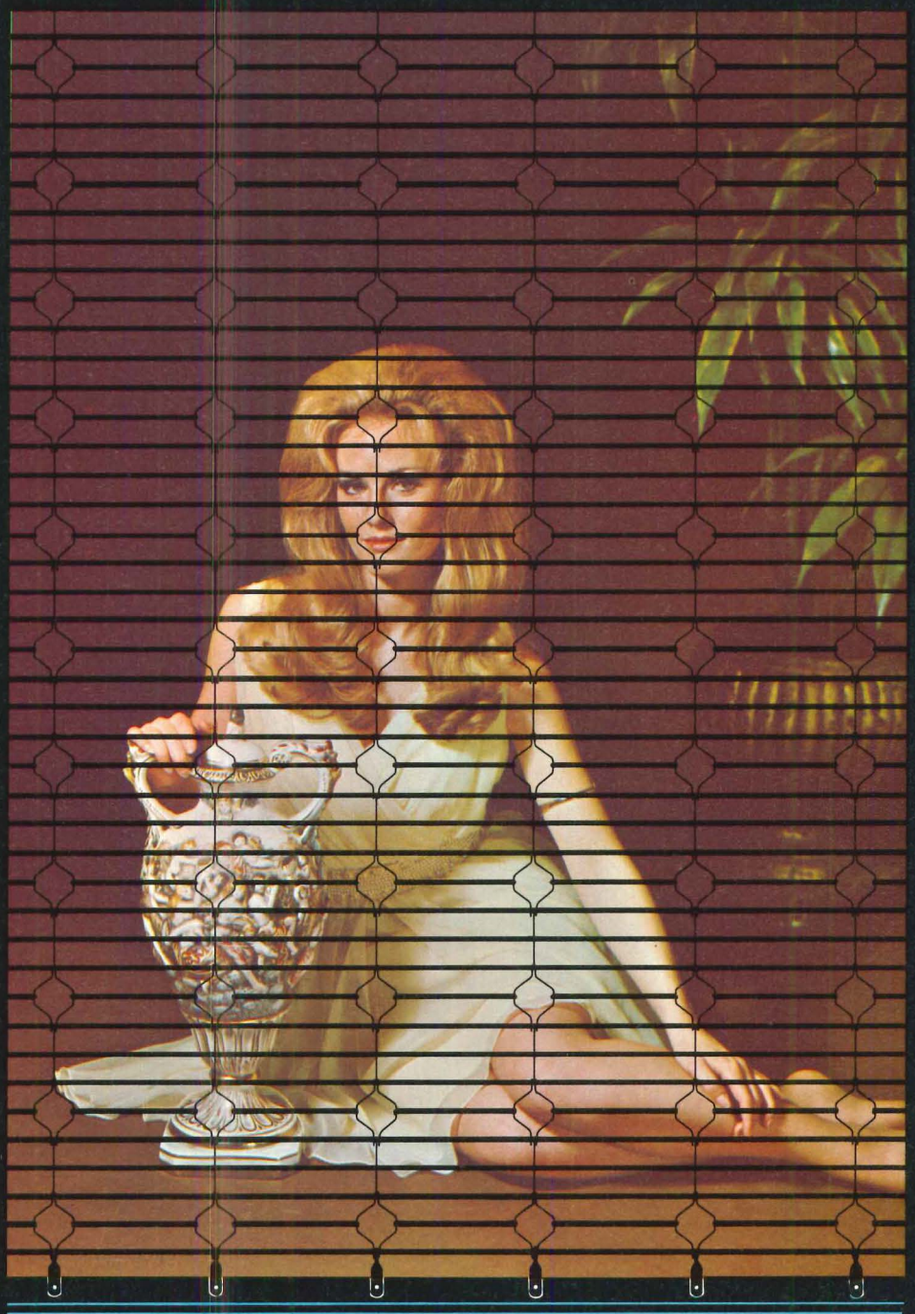
*For more data, circle 56 on inquiry card*



StanLock
Neoprene gaskets
manufactured by the
Standard Products Co.

Kentucky Lions
Eye Research Institute
University of Louisville
Joseph & Joseph,
Architects—Engineers

# Security with a touch of beauty!



# Kinnear Rolling Grilles

**The** Kinnear Rolling Grille has captured the art of delivering after-hour store-front security without sacrificing air, light, or vision. At the same time, 'round-the-clock climate control and better merchandise displays are provided for those late mall shoppers. And, the Kinnear design is so inherently efficient! The strong counterbalanced metal grille coils like a window blind . . . completely concealed above the opening, out of the way. Operates either manually or with a Kinnear power operator. In addition, with Kinnear's "Registered" life-extension plan and nationwide service organization, you're assured of the best store-front closure money can buy. Write today to get the full story. Kinnear Corporation, 1190 Fields Avenue, Columbus, Ohio . . 43216.

KINNEAR® ROLLING DOORS

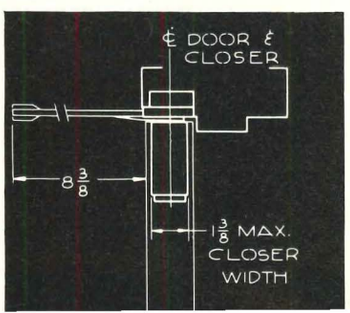
*Saving Ways in Doorways Since 1895*

*For more data, circle 57 on inquiry card*


PHOTO: Memorial Art Gallery of the University of Rochester, Rochester, New York. Waasdorp Northrup and Kaelber, Architects, Rochester, New York.

## Where should the door closer be placed?

LCN's complete line permits you and your Hardware Consultant to situate door closers where they can do the most for the looks and efficiency of the building as a whole. An excellent closer site (and one often overlooked) is within the top rail of the door itself. These closers offer superb control, simple installation, and a neat and uncluttered look. Consider them on your next specification. LCN Closers, Princeton, Illinois 61356.






*For more data, circle 58 on inquiry card*

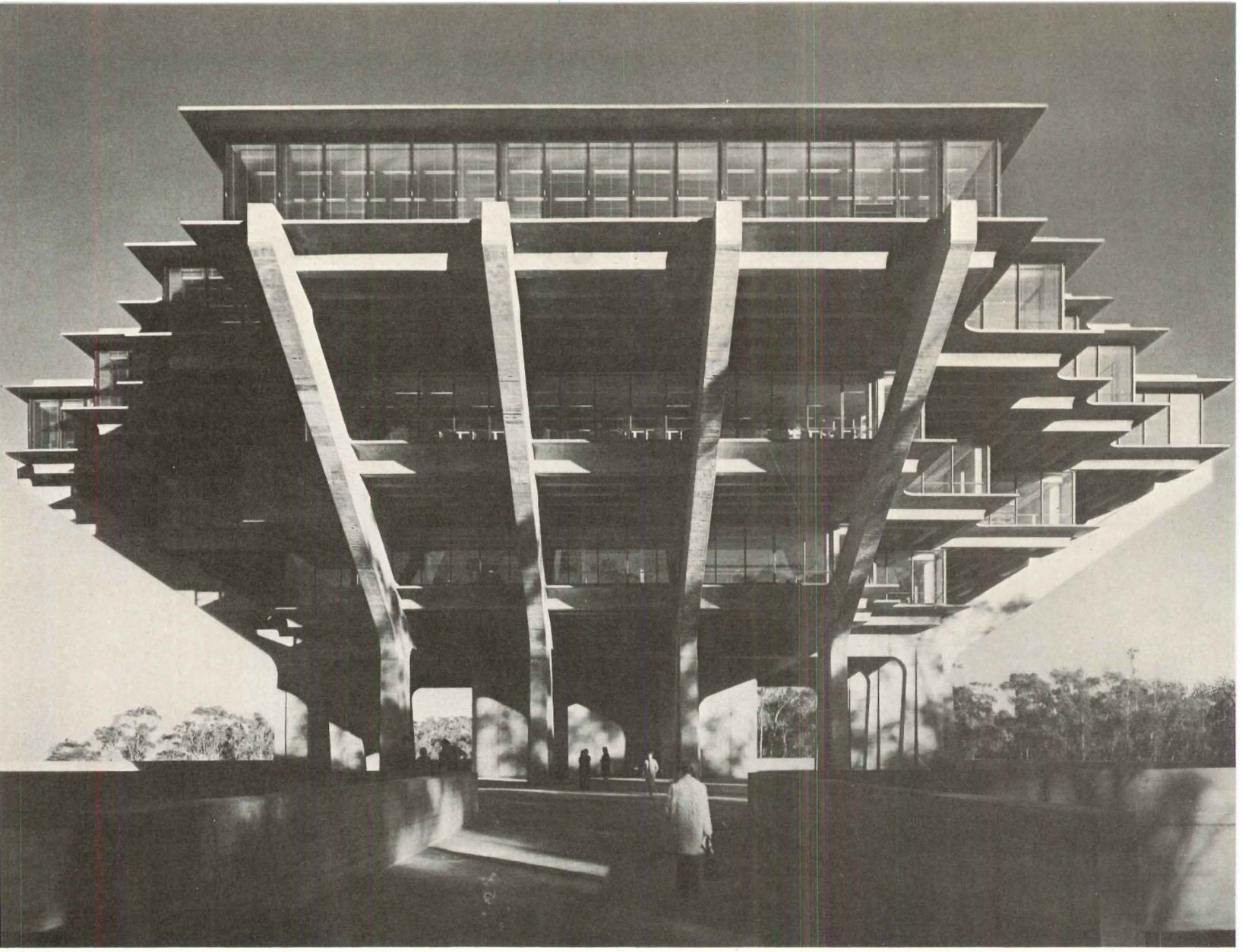
# City-escape: Glaverbel Bronze

**Keeps the outside out. Makes the inside in.**
**Glaverbel makes the city a great place to live.**

The difference in glass is Glaverbel—
whether you look through it, or at it!

**Glaverbel**

Glaverbel (USA) Inc., 75 Plandome Road, Manhasset, New York 11030
Glaverbel Canada Ltd., 1550 Maisonneuve Blvd. W., Montreal 107, P.Q.
*For more data, circle 60 on inquiry card*



Venette blinds installed in the new Central University Library, University of California, San Diego. Architects: William J. Pereira and Associates. General Contractor: Nielsen Construction Co.

## Gifted architects appreciate how much we add to their designs. Nothing.

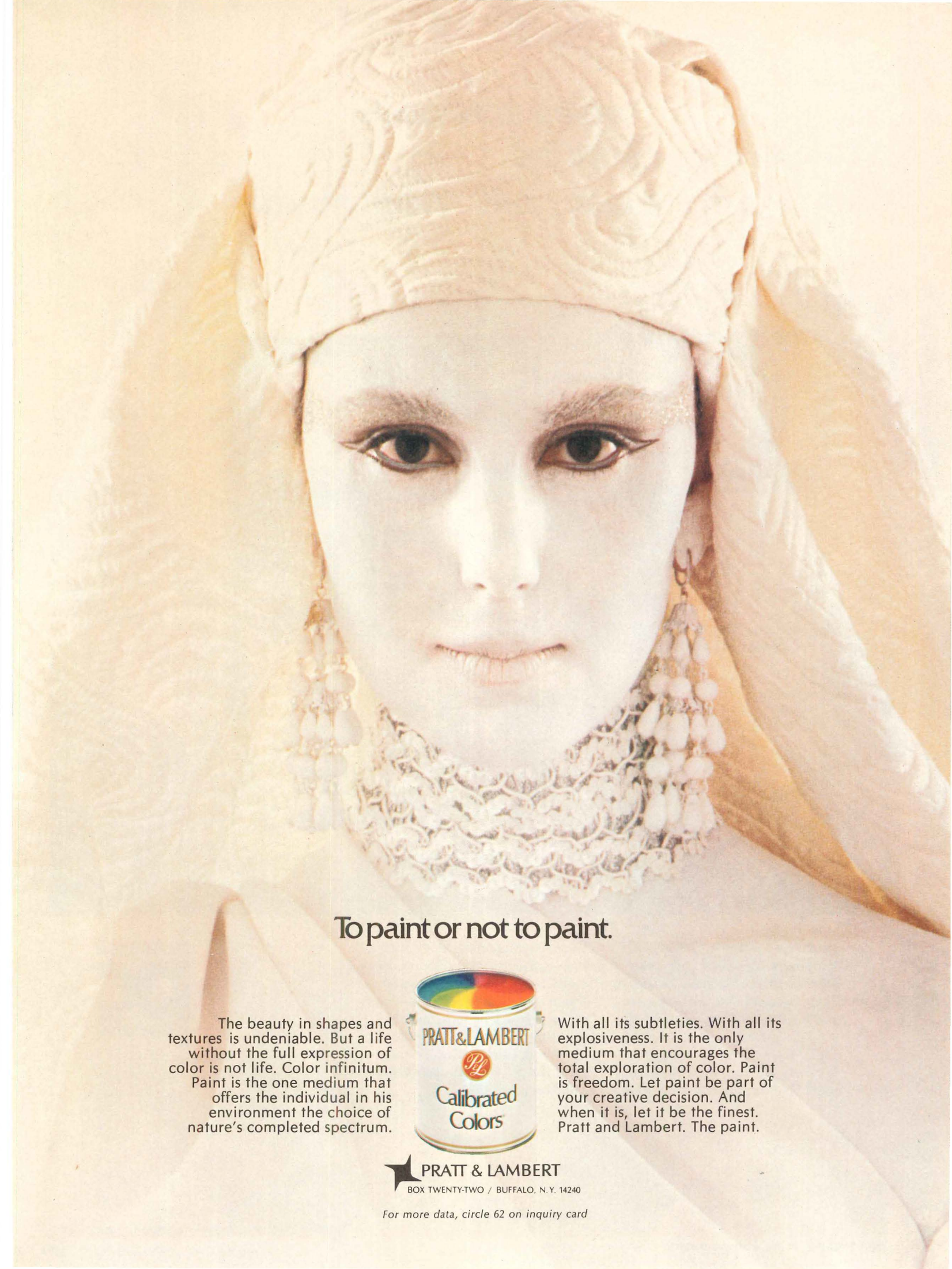
The impact of Flexalum Venette® blinds on visionary architecture is virtually zero. Which is exactly what it should be.
Venette's ultra-slim 1-inch louvers practically vanish when open. Canted, they provide beautifully suffused interior light balance, and effective control of solar heat. They're made from Alcan spring-tempered aluminum, with the resilience to remain crisply parallel. And Venette's advanced torque-tube head and tilt mechanism are unduplicated.
We invite you to look into the Venette, especially when you want blinds with a "transparent" quality that makes rooms look big as all outdoors. Without changing the outdoors.

ALCAN ALUMINUM

ALCAN

Listed in Sweets, Spec-Data, IDAC, or write Building Products Division, Alcan Aluminum Corporation, 100 Erieview Plaza, Cleveland, Ohio 44114

*For more data, circle 61 on inquiry card*



# To paint or not to paint.

The beauty in shapes and textures is undeniable. But a life without the full expression of color is not life. Color infinitum. Paint is the one medium that offers the individual in his environment the choice of nature's completed spectrum.

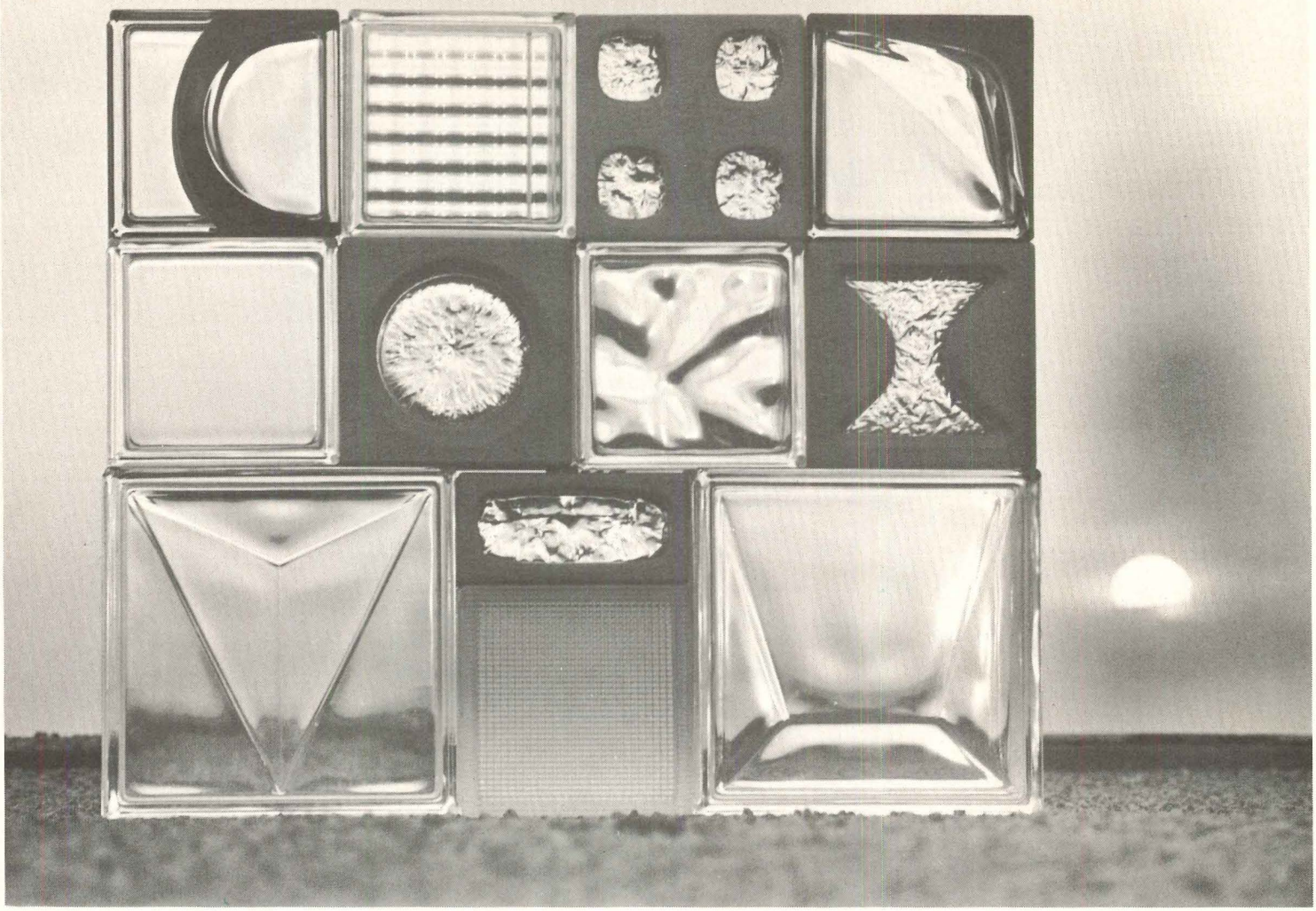



With all its subtleties. With all its explosiveness. It is the only medium that encourages the total exploration of color. Paint is freedom. Let paint be part of your creative decision. And when it is, let it be the finest. Pratt and Lambert. The paint.

PRATT & LAMBERT
BOX TWENTY-TWO / BUFFALO, N.Y. 14240

*For more data, circle 62 on inquiry card*

# Pittsburgh Corning announces twelve beautiful ways to accent concrete, steel or aluminum.



It's the new look of glass blocks. Patterns, textures and sculptured effects with the emphasis on accent. Skyscraping designs with long, narrow lines of light and texture. Low, solid designs with patterns and relief. Light, shape, harmony or contrast. It's the new look of glass blocks to spark your imagination for new uses.

But still with functional advantages like control of light, noise, insulation and solar heat. Without maintenance. For more information on the many different styles, patterns and characteristics of glass blocks, write Pittsburgh Corning Corporation, Dept. AR-91, One Gateway Center, Pittsburgh, Pa. 15222.

PITTSBURGH PC® CORNING

*For more data, circle 63 on inquiry card*



*For more data, circle 64 on inquiry card*


The close
Surprisingly sleek, startlingly smooth, truly universal . . . #2800 Series door closer gives sustained high performance in any traffic. Unmistakably Russwin.
Russwin, Division of Emhart Corporation, Berlin, Connecticut 06037.
In Canada—Russwin, Division of International Hardware.
RUSSWIN

# When you specify concrete, specify Hillyard treatments and finishes.

**This gleaming concrete floor was cured, sealed and finished according to specifications in the Hillyard Uniform Numbered File - Division 3. To insure that any floor will continue to live up to the standards you specify, call on a trained Hillyard "Maintaineer" to recommend the correct maintenance program.**

**Write for Uniform Numbered Files for every type of floor.**

*San Antonio Convention Center*

*Architects: Noonan, Krocker and Dockery, San Antonio, Texas*

**HILLYARD**
FLOOR TREATMENTS

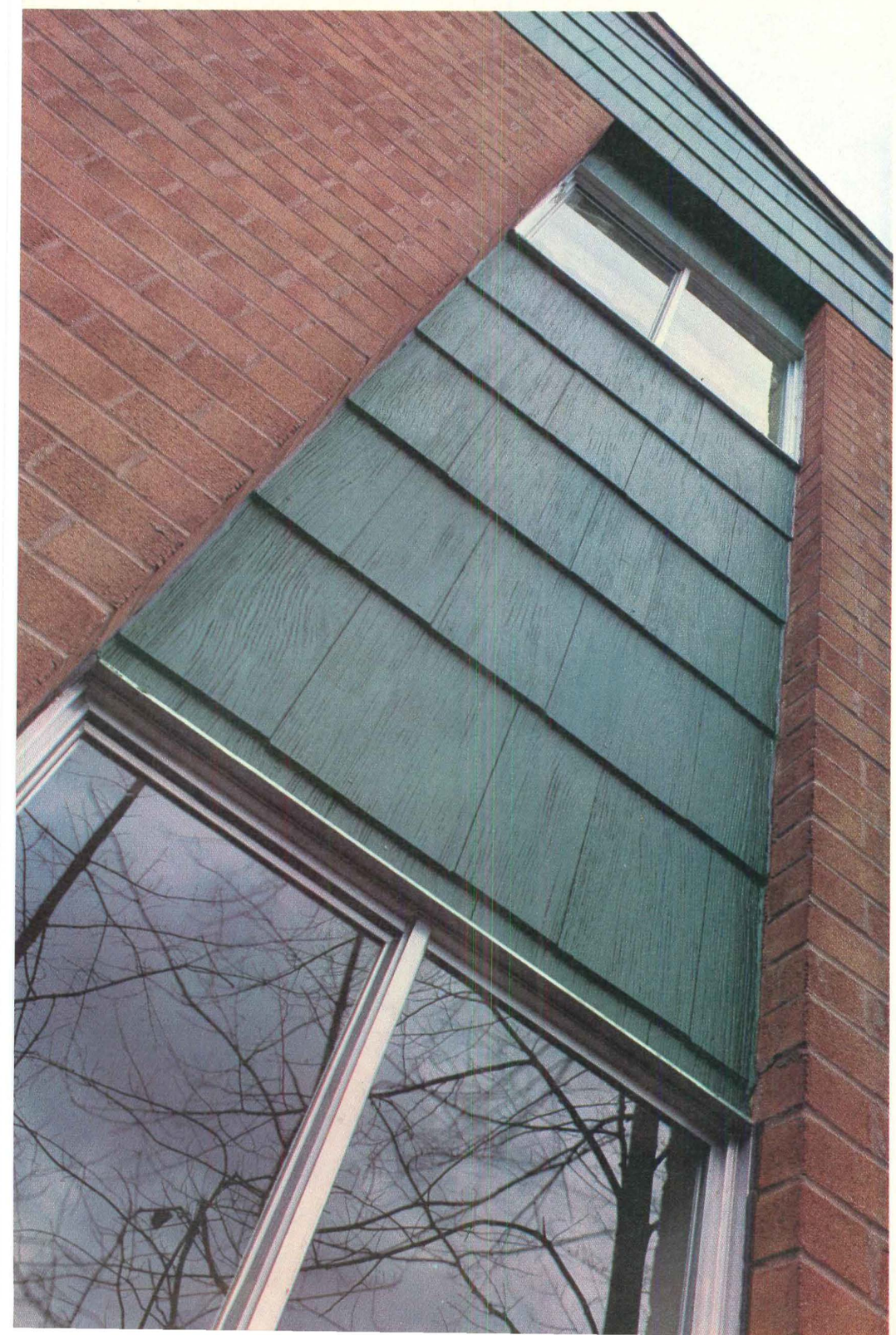
**ST. JOSEPH, MISSOURI U.S.A.**
Totowa, N.J. San Jose, Calif.
Minneapolis, Minn. Dallas, Tex.
Boston, Mass.
**IN CANADA:** Calgary, Alberta
London, Ontario

**SINCE 1907**

*The most widely recommended and approved treatments for every surface*

*For more data, circle 65 on inquiry card*

# GAF Stratalite™ siding. It looks like wood. But it wears like brick.



Stratalite is a permanently finished mineral siding material with all the beauty of wood shingles.

But none of the problems of wood.

It doesn't need periodic repainting.

It's fire-resistant and termite-proof.

It won't rot, warp, shrink, split or curl like wood. (Nor will it dent, buckle, rust or conduct electricity like metal.) Yet Stratalite has the deep-textured grain and substantial thickness of wood shake shingles. It comes in eleven distinctive sealed-in wood shingle colors. And its wood shingle shadowline can be dramatically enhanced with GAF Kick-Strip Undercoursing. Stratalite siding combines beautifully with brick and other permanent building materials. It can be used on all four walls or for that special touch, as shown here.

Lightweight, pre-punched 14⅝" x 24" and 12⅛" x 48" panels are fast and easy to apply, with very little waste. (48" Type S-120 pre-punched for 16" o.c. stud nailing.) Warranted for 20 years by GAF, one of America's leading manufacturers of building materials. For further details, call your GAF Building Products dealer or send the coupon below. In Sweet's see GAF Building Materials insert.

gaf® Stratalite™
THATCH SIDING

GAF Corporation
Building Products Division, Dept. AR9
140 West 51 Street
New York, N.Y. 10020

Yes, I'd like more information on GAF Stratalite Thatch Siding.

☐ Please send further details, including specifications and application data.

☐ Please have your representative call.

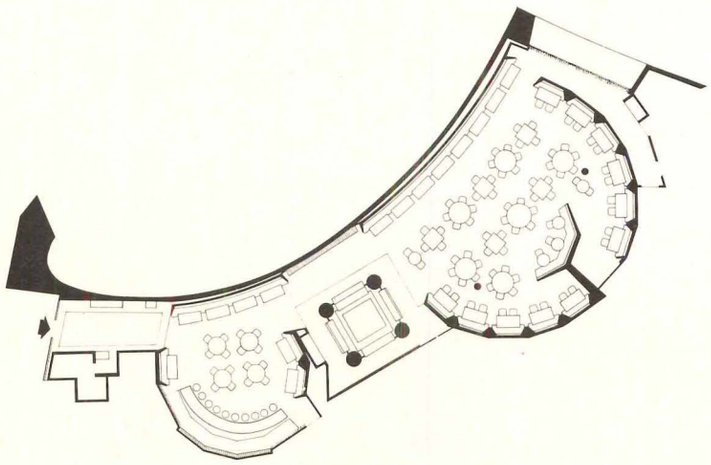
Name_____

Address_____

City_____ State_____ Zip___

*For more data, circle 66 on inquiry card*

(Top left) Apartment of Richard Banks, New York, N.Y. Architect and Photographer: Richard Banks. (Top right) Dental Office, Brooklyn, N.Y. Architects: Smith & Munter. Photographer: James Brett. (Bottom) Office of N.Y. State Urban Development Corp., New York, N.Y. Architects: Smotrich & Platt. Photographer: Norman McGrath.



(Top) Valley General Hospital, Renton, Wash. Architect: Edward Durell Stone. Photographer: Morley Baer. (Bottom) "Le Monde" Restaurant. New York, N.Y. Architect: Warren Platner. Photographer: Alexandre Georges.

*THE EDITORS OF ARCHITECTURAL RECORD INVITE SUBMISSIONS FOR*

# RECORD INTERIORS

## to be featured in the January 1972 issue

. . . a program to recognize outstanding interiors designed by architects.

In 1970, in response to the upsurge of activity and interest in design of interiors by architects, Architectural Record established a new editorial program—RECORD INTERIORS.

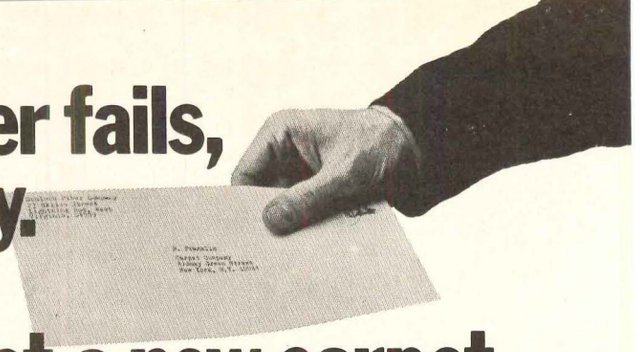
It is clear that the interest of the profession in interiors is growing and strengthening. And thus the interiors program—with citations to document and stimulate this significant area of expanded practice—will be continued. Recently completed architect-designed interiors of all building types will be considered—remodelings and renovations as well as new structures—anywhere in the United States. Selections will be made by the editors on the basis of the excellence of the design solution for the particular client's individual program. Submissions from architects of new, unpublished work will be welcomed through November 1, 1971. No formal presentations are required, though materials submitted should include plan, photographs or snapshots, and brief description and program.

RECORD INTERIORS of 1972 will be published in the January 1972 issue of Architectural Record.

Write or telephone:

Barclay Gordon, Editor in Charge
Interior Design Awards Program
Architectural Record

# If any other anti-static fiber fails, you can expect an apology.



# If ours fails, you can expect a new carpet.

Saying you're sorry isn't going to make a customer any less sorry he bought an anti-static carpet that doesn't perform.

Unless he's been promised a new carpet.

And the only one to do that is Dow Badische.

We guarantee that a nylon or acrylic-mod-acrylic carpet blended with as little as 2% Zefstat® anti-static metallic yarn will reduce static below the level of human sensitivity for the useful life of the carpet or five years.

Or else we replace the entire carpet, free of all charges.

Of course, we're willing to give you this strong a guarantee because we're absolutely certain not only that Zefstat works, but that it's better than anybody else's answer to the static problem.

The only thing we'll apologize for is hurting our competitors' feelings.

For more information, write Dow Badische Company, 350 Fifth Avenue, New York, N.Y. 10001.

Zefstat is a registered trademark of Dow Badische Company.

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Dow Badische Company guarantees to the original purchaser that a carpet made with Zefstat will not generate static in excess of 2,500 volts down to a relative humidity of 20% at 70°F. (The threshold of average human sensitivity is considered to be 3,000 volts.) This anti-shock feature is guaranteed for the useful life of the carpet or five years, whichever is sooner.

If the anti-shock performance fails to meet the above standard and if human comfort is adversely affected by static generation, the purchaser must notify the manufacturer and make the carpet available for testing by Dow Badische Company. If failure is verified by our tests, the carpet will be replaced, free of all charges, including the cost of installation.

ZEFSTAT DOW BADISCHE

**THE ONLY ANTI-STATIC YARN GUARANTEED FOR 5 YEARS**

*For more data, circle 67 on inquiry card*

*Twin Towers office building, Dallas, Texas. Owner: Sanders Campbell Development Company. Architect: Neuhaus & Taylor, Houston, Texas. Mechanical Designer: Chenault & Brady, Houston, Texas. Glazing Contractor: Nichols Engineering, Dallas, Texas.*

**For the Twin Towers in Dallas, the glass that cuts building costs.**

LOF GLASS

**Vari-Tran® coated insulating glass provides twin benefits for Twin Towers: lower construction costs, lower operating costs.**

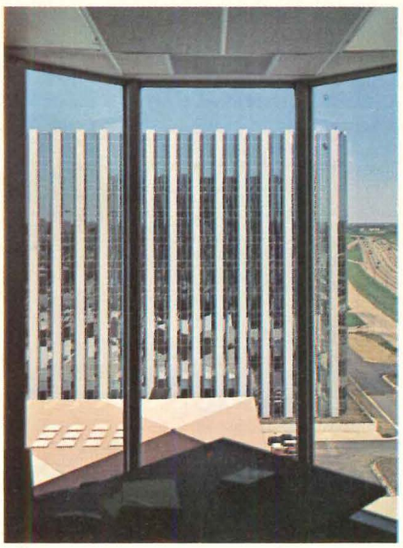
## How Vari-Tran reduced air conditioning equipment.

Chenault & Brady of Houston, who did the mechanical design for Twin Towers, studied glass cost analyses made for similar buildings with this result. Said Charles Chenault, "We had enough faith in the efficiency of Vari-Tran 108 Thermopane to design the building's mechanical system from the beginning based on that glass."

Chenault & Brady specified Thermopane® insulating glass having an outboard light with Vari-Tran 108 silvery coating on its airspace surface. Using L-O-F's heat gain calculator, this glass reduced the computed cooling load by 349 tons compared with Parallel-O-Grey®. At Mr. Chenault's figure of $600/ton, this is a saving of $209,400. Deducting $150,000, the approximate additional cost of Thermopane made with Vari-Tran, an initial saving of $59,400 was achieved.

## Vari-Tran justified on construction cost savings alone.

As you can see, Thermopane with Vari-Tran saved on initial air conditioning costs—more than enough to justify its additional cost. But there's more. Vari-Tran's superior heat-reflecting qualities made it economically feasible to design an all-electric building. This, Mr. Chenault estimates, will provide the owners with an additional annual saving of $15,000 in operating costs.



## How Vari-Tran increased rentable area.

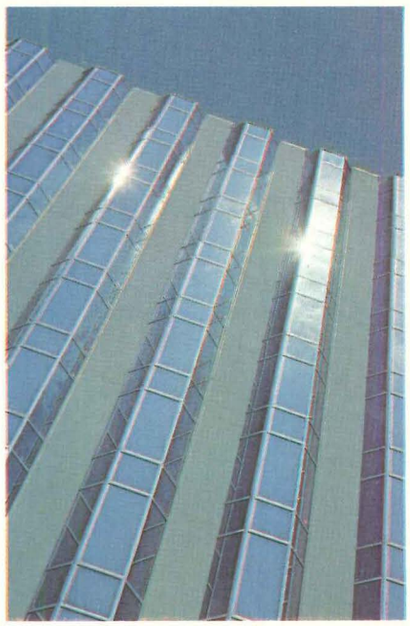
The "U" value of this hi-performance glass actually increased the amount of rentable square feet by decreasing space devoted to such things as fan-coil machinery, ductwork, etc. And, of course, with an all-electric building, no boilers. Specific figures are not available yet on Twin Towers, but a similar building enjoyed a 3% increase of rentable space.

## The glass that cuts building costs makes a very beautiful building.

Notice how the silvery Vari-Tran units combine with spandrels of Vari-Tran coated Tuf-flex® tempered glass to form continuous strips of reflective glass from ground level to rooftop. In Twin Towers, they contrast with extruded cement-asbestos panels and are designed with a bay window effect to give each office a "balcony" view.

## Broad range of reflectivities and aesthetic effects available.

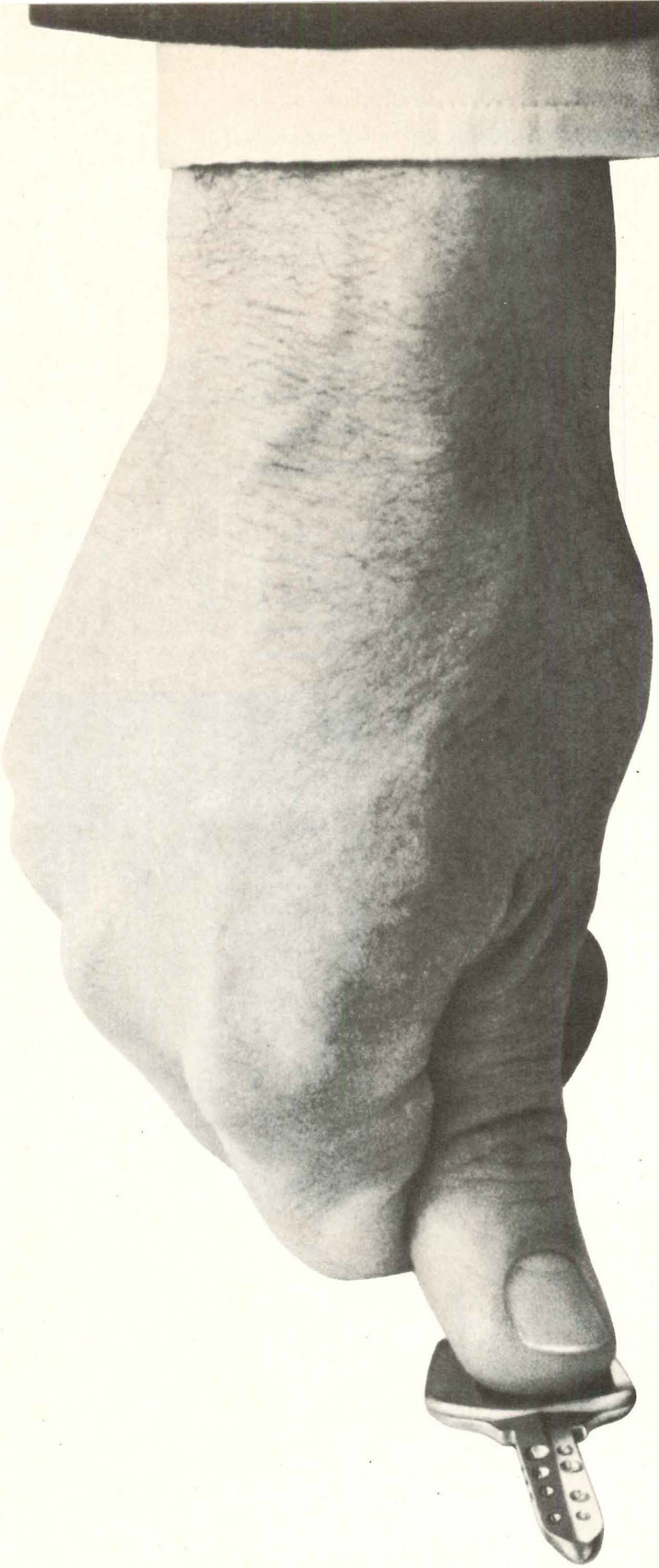
Vari-Tran is available in golden as well as silvery coatings in light transmissions of 8, 14 and 20 percent. Each provides significant reduction in solar heat and glare, as well as the beauty inherent in reflectivity.



If you would like a computerized cost analysis of the glass wall of a building you're planning, contact your L-O-F Architectural Representative or Architectural Department, Libbey-Owens-Ford Company, Toledo, Ohio 43624.

**Hi-Performance Glass**
*The glass that cuts building costs*

*For more data, circle 68 on inquiry card*



At the heart of it, you hold a revolutionary key with precision-milled indentations that cannot be duplicated on conventional key cutting machines. Result: Key Control.

That's just the beginning of the Sargent Maximum Security System story. Its lock cylinders are singularly pick-resistant . . . and three rows of pins converge on the key from different angles, making the cylinder all but invulnerable to the usual picking or raking techniques.

A total of seven levels of masterkeying are available, four more than conventional systems. And since the system does not utilize the split pin method of masterkeying, the security of these lock cylinders remains unimpaired even at the highest master key level.

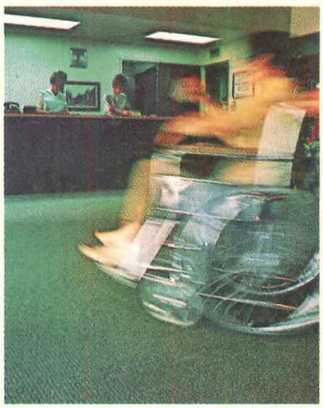
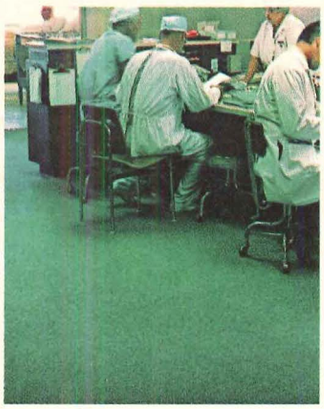
For full information on the Sargent Maximum Security System, write to Sargent & Company, 100 Sargent Drive, New Haven, Conn. 06509 • Ontario, Canada • Member Producers' Council.

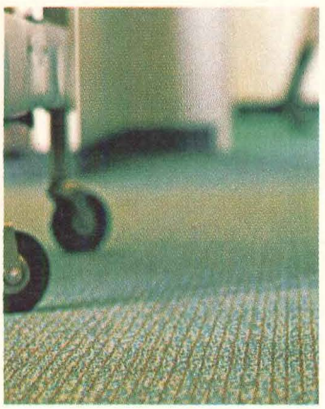
# Key control under your thumb

# The Sargent Maximum Security System

*For more data, circle 69 on inquiry card*

Sunrise Medical Center in Las Vegas, Nevada, refused to gamble.
They chose carpet of Antron®.



Hospitals have to look immaculate, no matter how complex their cleaning problems. Carpet in the Sunrise Medical Center had to withstand spills and stains, people on the go day and night, carts and wheelchairs, and even seepage of desert sand during storms.

They chose carpet with pile of Antron* nylon because of its unmatched ability to hide spots and soil. Through heavy traffic and repeated clean-ups, "Antron" stays looking like new. "Antron" hides soil between cleanings, and the spots which do show can be easily removed. With proper care, "Antron" can cut maintenance costs up to 50% over hard-surface floors; Sunrise has reduced its maintenance staff and equipment, after changing from hard-surface.

Morale soared with the clean, luxurious surroundings. Patients' complaints dropped, and nurses reported less fatigue.

Because it's nylon, "Antron" is tough, durable, and crush resistant. It resists abrasion, controls noise, and creates a pleasant atmosphere.

Sunrise was so pleased with "Antron", they doubled the original carpet order. With success like this, shouldn't you consider "Antron"?

Contact your mill, or Contract Specialist, Room 206, Du Pont, Centre Road Bldg., Wilmington, Del. 19898.

DU PONT
REG. U. S. PAT. OFF.

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

# WHEN CARPET DOES IT, CARPET OF ANTRON® DOES IT BEST.

*For more data, circle 70 on inquiry card*

# Risk-free automation.

**When Honeywell hands you the keys to Delta 2000... you know your client's building automation system will work. Perfectly.**

We stake our reputation on it.

Because, system after system, every Delta 2000 being delivered is duplicated from a computerized perfect model!

With *identical* quality of every component, every module. And with functional tests every step of the way to make *sure* Delta delivers the results specified.

Delta dependability starts with a 100% test and sort of every solid-state component. And each assembled circuit board goes through a battery of computerized tests to make sure it measures up to original standards.

Computer programmed wire-wrap machines make all connections in the central processor backplate. Again, a computer checks them out . . . *individually.*

Once the circuit boards and backplate are mated, we make a complete systems checkout . . . against the operator's manual.

Good enough? Not yet. Next, a grueling heat test. Screening out any possible infantile failures in electronic components.

All this factory testing still doesn't satisfy Honeywell's installation technician.

At the job site, he isolates each remote panel. Runs individual tests, using a miniature "Delta-in-a-suitcase" monitor. Makes sure panel electronics and remote equipment work perfectly, as *installed.*

Then, he tests the transmission line by reconnecting the panels, one at a time, to the central processor. Checks out each addition. And proves out the total system again, against the operator's manual.

Only then does he hand you the keys to the Delta 2000 console. And says . . . *"It's ready".*

Overtested? No. We think that's the way you and your client want it. Reliable. And *exactly* right, as specified.

Honeywell, Commercial Div., G2118, Minneapolis, Minn. 55408

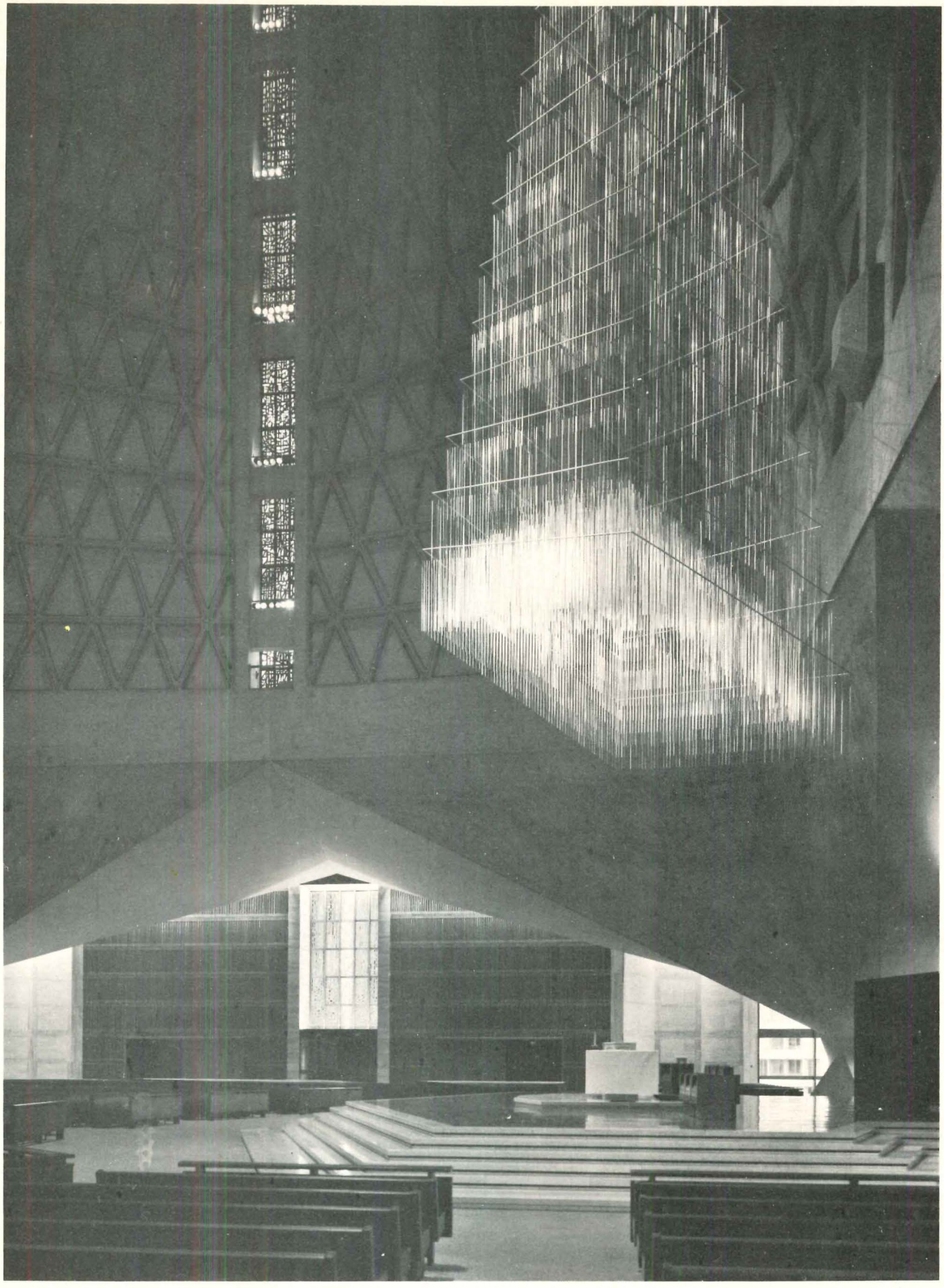
**Honeywell**

The Automation Company

*For more data, circle 71 on inquiry card*

Here's all that's needed for a smooth start-up, smooth performance: The keys. And the standard operator's manual.

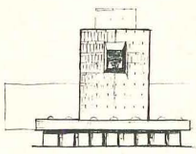
Morley Baer photos



# Saint Mary's Cathedral, San Francisco

Designing a cathedral is the most coveted—and rarest—of architectural experiences. In the past decade only a handful of cathedrals have been built in the world. Of these the first to base its concept in the new liturgy of the Catholic church is St. Mary's, San Francisco, a cathedral as surely of its time as the great medieval cathedrals were of theirs.

The new cathedral of San Francisco takes the place of the red brick Victorian Gothic building, built in 1887, which burned to the ground in September 1962. Hardly had the ashes of the old cathedral cooled when speculation began as to who would design the new: surely only a world-famous architect would be chosen for so prestigious a job in such a city as San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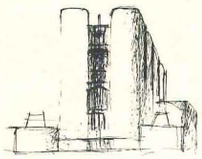

2

Francisco. Announcement made in the following April that the little-known firms of Angus McSweeney and Ryan and Lee had been appointed, caught the whole community unawares. There was first amazement, then consternation, then strong —and vocal—pressure (especially from wealthy and influential donors) for a change of architects. The archdiocese maintained its commitment to the local firms, but it did acquiesce to their suggestion that an architect of world renown be appointed to work with them on the design.

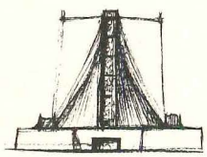
The man on whom all agreed was Pietro Belluschi of Boston, Italian by birth, engineer by training, architect by choice and long experience, Catholic by upbringing, and the designer of some of this country's most distinguished churches. At first Belluschi did not want the job; he knew what agony of spirit such a job would entail, and how long it would take. Besides, in his innate modesty, he felt that he could not do it justice. "My talents had been nourished on less ambitious projects," he says. "But like the reluctant bride, in the end I could not resist the seduction."


3


4

His modesty and his reluctance were unjustified. No more fortunate choice could have been made. Belluschi's extensive experience as consultant on projects of great variety and scope, his work with a diversity of minds and temperaments, and the restraint and elegance of his taste, were exactly the ingredients needed. His appointment was announced in September, although he had been working through the summer with the


5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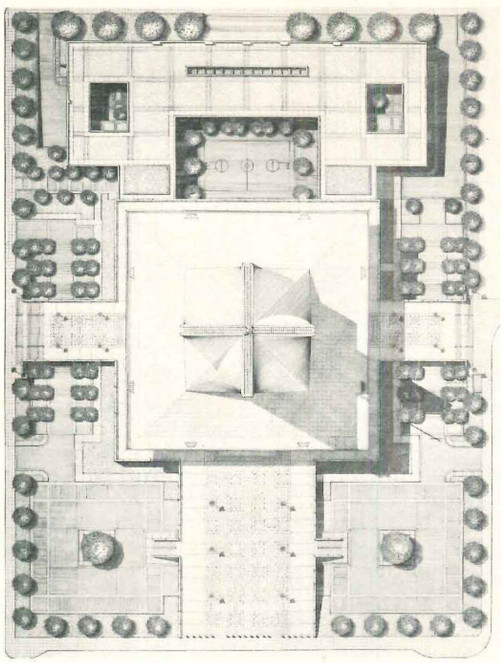
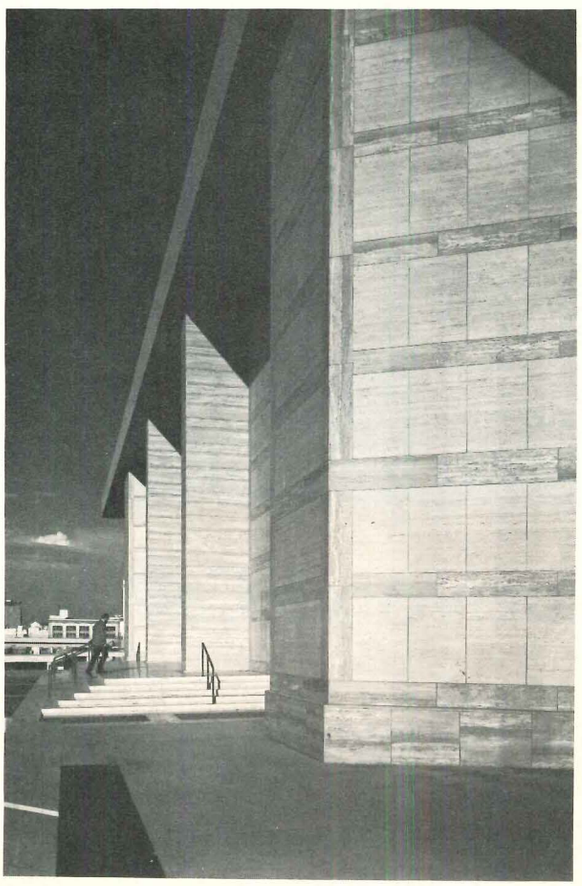
local architects and he had already formed the concept which later became the design of the new cathedral. Because of the engineering inherent in the concept, he had asked that Pier Luigi Nervi be retained as consultant

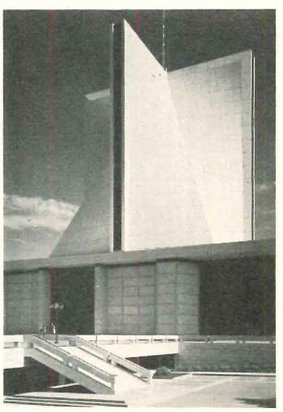
ELLIS STREET




GEARY STREET

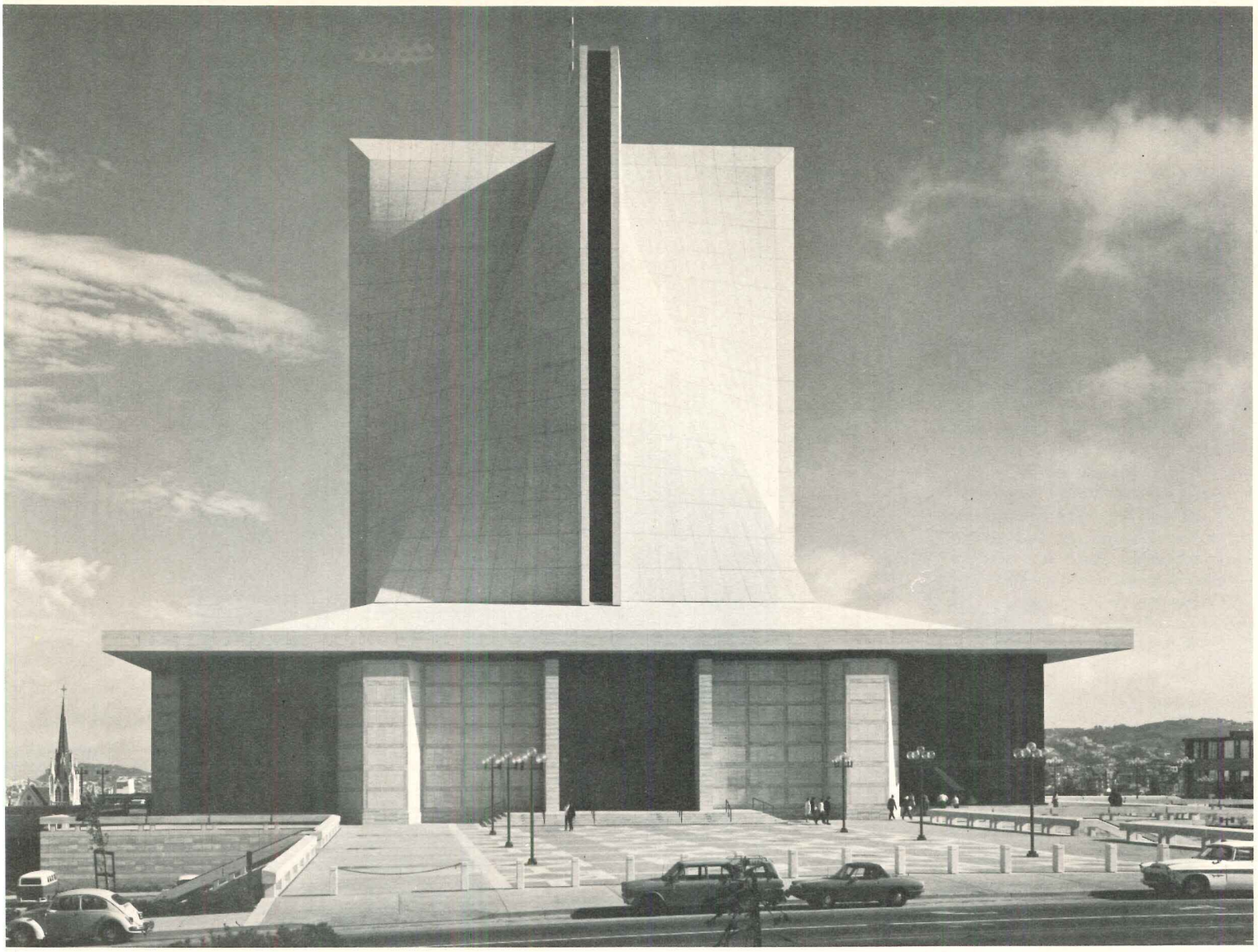
"The essence of contemporary architecture is not the avoidance of style, or the creating of a new one, but an insistence on integrity of thought," wrote Pietro Belluschi to the Archbishop. Integrity, proportion and clarity—Thomas Aquinas' guiding principles for greatness—are the essence of the design so majestically achieved in St. Mary's. The cathedral stands free on the crest of Cathedral Hill, the highest eminence in that part of the city, the Western Addition redevelopment area. The principal entrance is on the north instead of the west (as in most European cathedrals.) It is approached from Geary Street, on the high side of the site, across a great plaza or forecourt, 200 feet wide and 150 feet deep. From this plaza the scale of the building and the full sweep of the 190-foot-height of the cupola can be seen. The entire structure is covered with travertine marble, the utter simplicity of its use a subtle foil for the richness of the material. Stairs

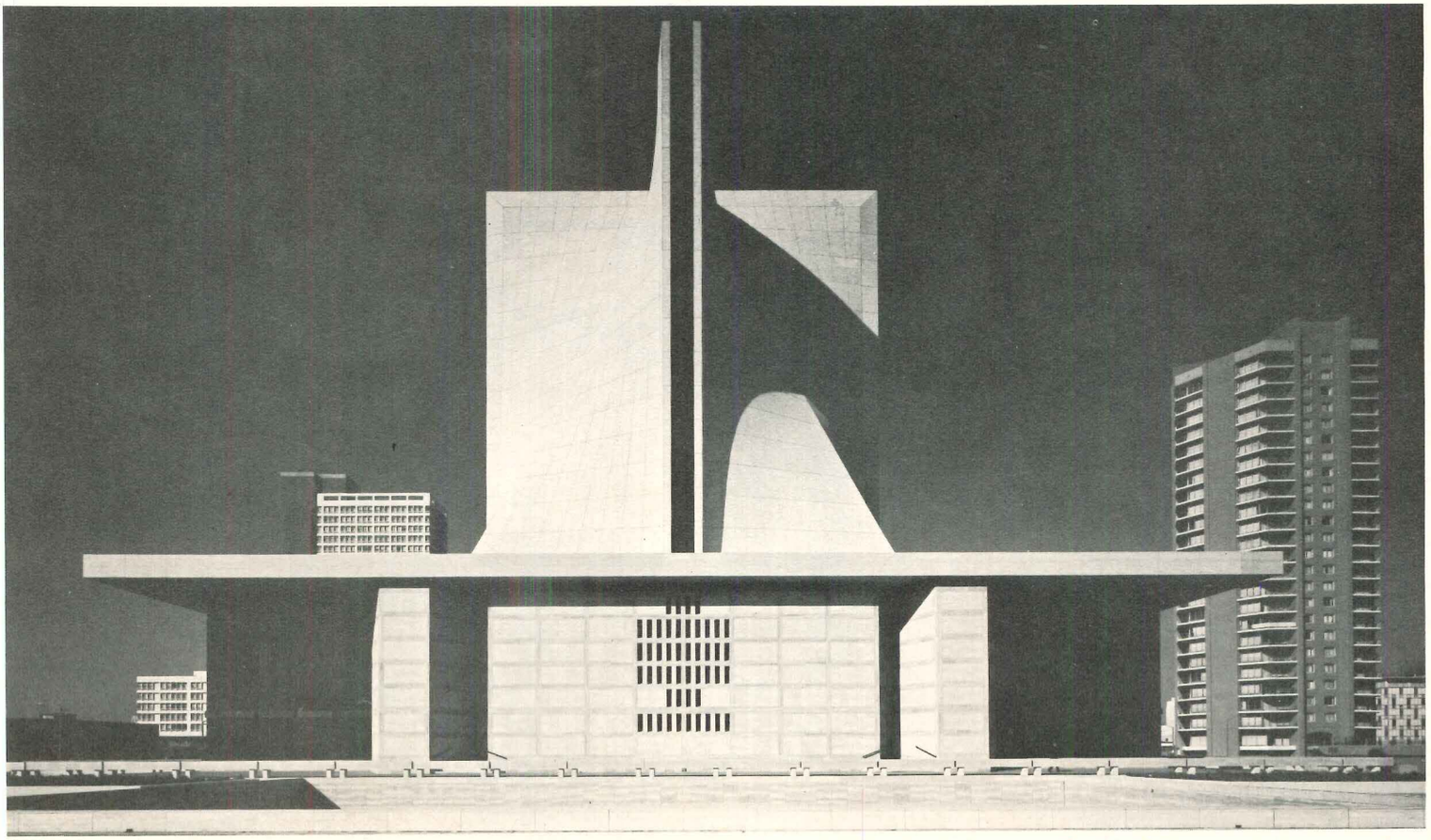




from the plaza lead to the parking area and to the entrance to the 1,200-seat cathedral hall and other meeting rooms, sacristy and kitchen. The rectory, a convent and a high school are on the south side of the site.

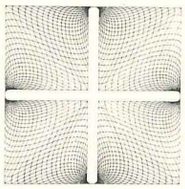
"What would Michelangelo have thought of this cathedral?" the designers were asked at the unveiling of the final design. Nervi answered for all: "He could not have thought of it. This design comes from geometric theories not then proven. It could only have been conceived today."





on engineering design, and Nervi's appointment was announced simultaneously with Belluschi's.

The early Belluschi design proposals (1, 2, 3, 4) show a more or less traditional approach, following the direction taken by McSweeney, Ryan and Lee who were striving to meet both



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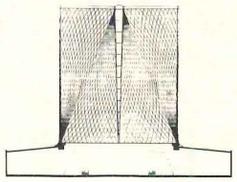

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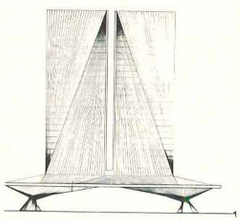
the program and the wishes of Archbishop Joseph T. McGucken and Monsignor Thomas J. Bowe, pastor of St. Mary's, whose first inclination had been toward a design developed from the historic Mission Dolores in San Francisco. But Belluschi's search for form did not stop with the conventional even though any one of his early approaches would have made a beautiful building. His conviction was strong that the design of a cathedral for today, if it was to "endure as a symbol of our faith and of our seriousness as builders" must consist of elemental forms, handled with the "kind of simplicity that becomes both structure and symbol, to be looked at and remembered." The more he struggled with the problem, the more certain he became that "here was a need for a strong structural concept—an engineering form as an expression of the modern age, comparable in scale and size to the cathedrals of the past, a form that could only be done now. And I knew that it was necessary to have someone like Nervi to help in its fulfillment.



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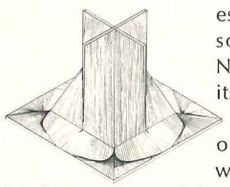

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"The idea of using a warped surface for the envelope of the cathedral came to me from the studies and drawings of the Catalanos, close friends and associates at M.I.T., which had been published in 1960 in the student publication of the North Carolina School of Design. My first tentative sketches (5, 6) were made in September 1963. In hundreds of other sketches I explored

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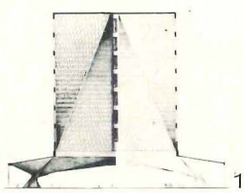

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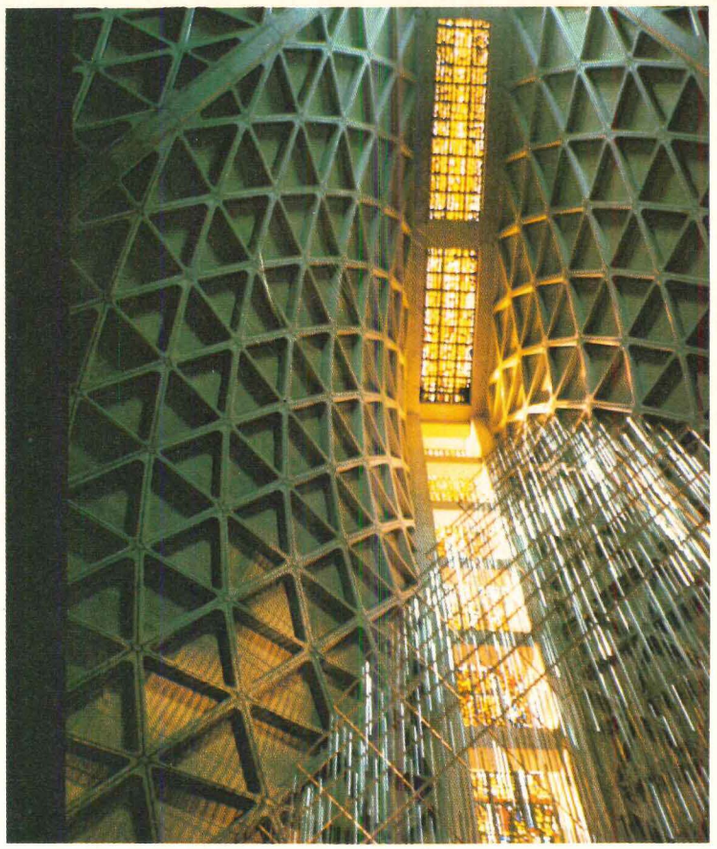
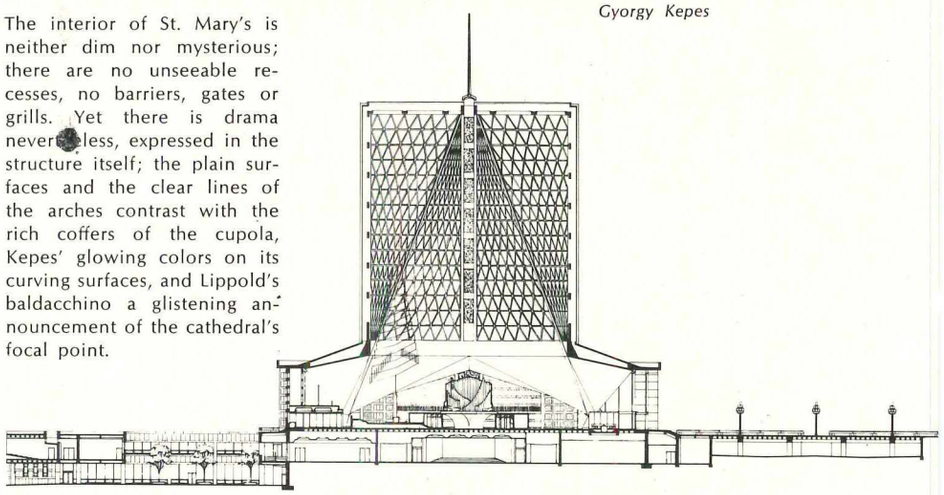
all aspects of the design, but these have the essence of the idea."

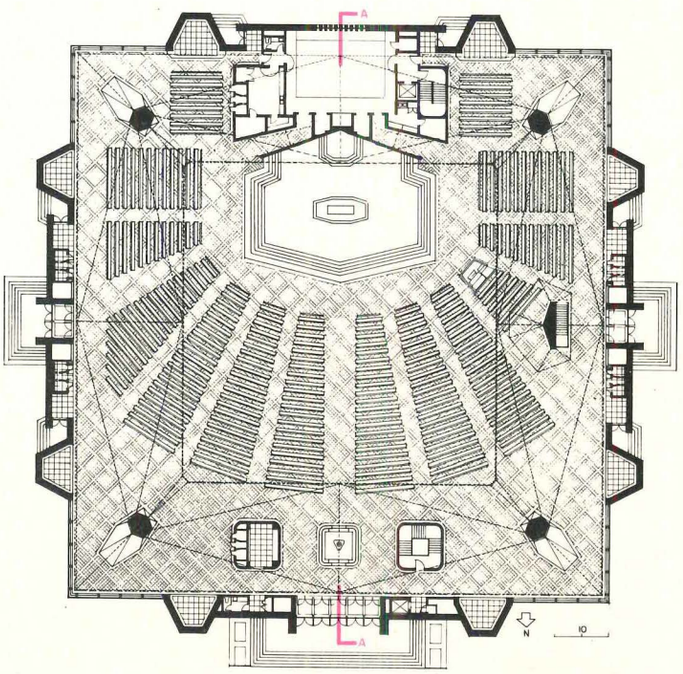
Coincident with this breakthrough in design was the announcement by the Second Vatican Council of a new constitution of sacred liturgy. The new design concept had, fortuitously, pre-

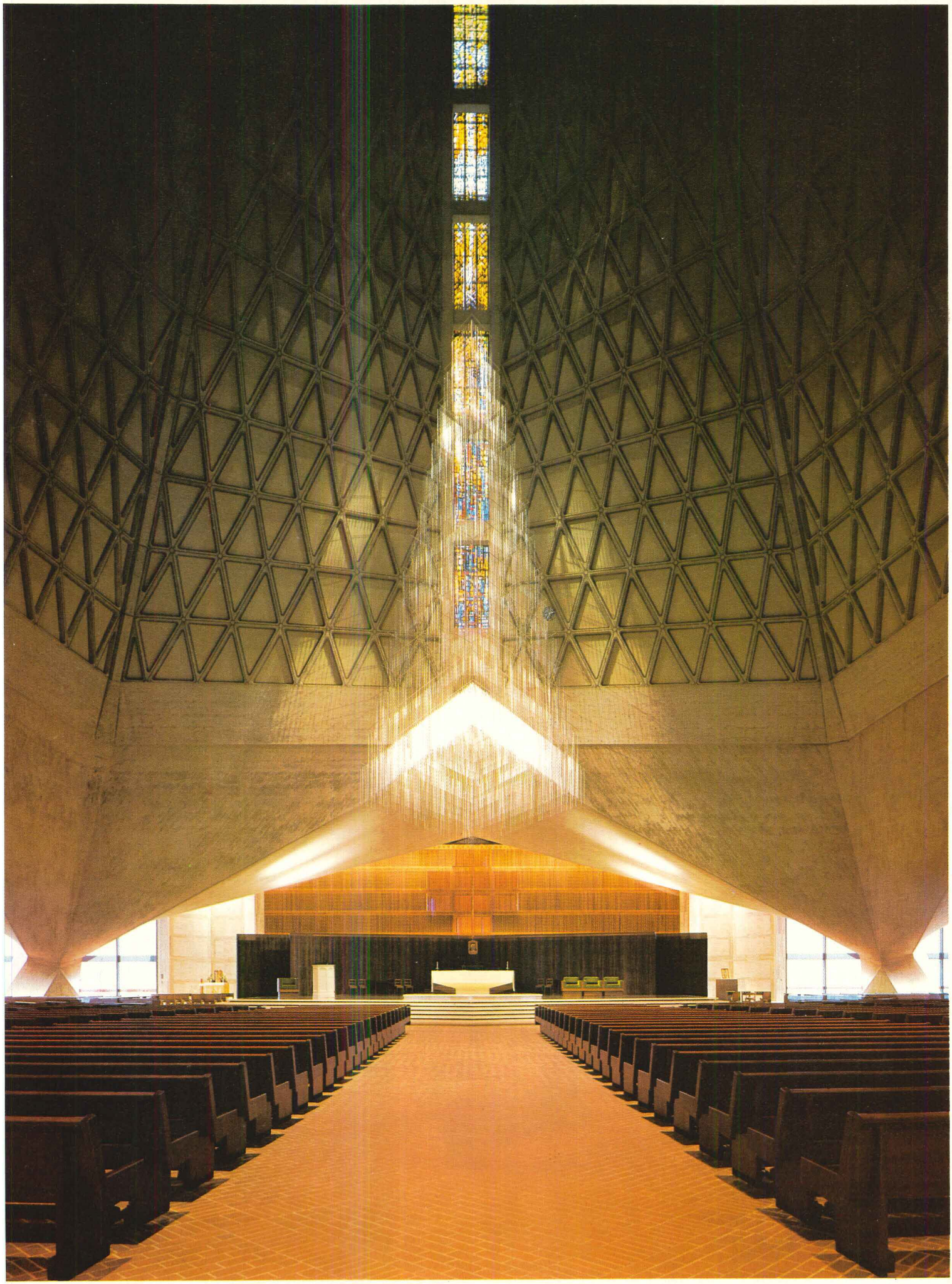


*Gyorgy Kepes*

The interior of St. Mary's is neither dim nor mysterious; there are no unseeable recesses, no barriers, gates or grills. Yet there is drama nevertheless, expressed in the structure itself; the plain surfaces and the clear lines of the arches contrast with the rich coffers of the cupola, Kepes' glowing colors on its curving surfaces, and Lippold's baldacchino a glistening announcement of the cathedral's focal point.





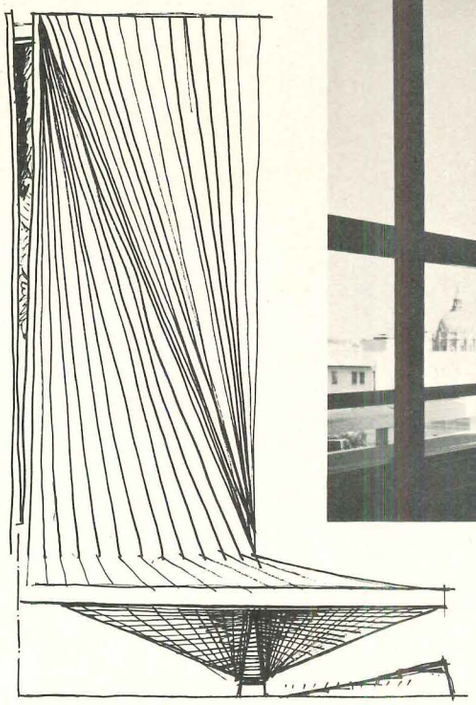


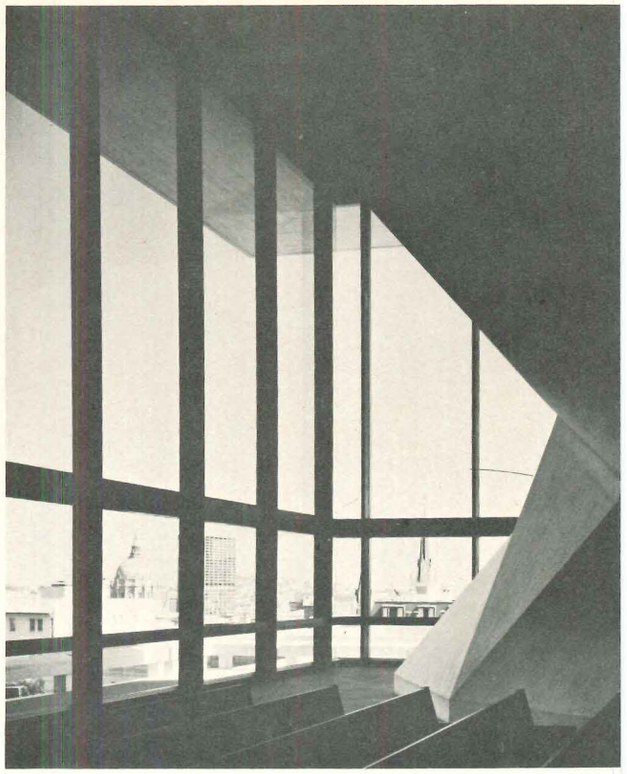
figured the architectural implications of the Council's directive that priest and people should be united with the altar as their focus. Under the great cupola of Belluschi's scheme, in a single unobstructed space, were sanctuary, nave, baptistery and narthex.

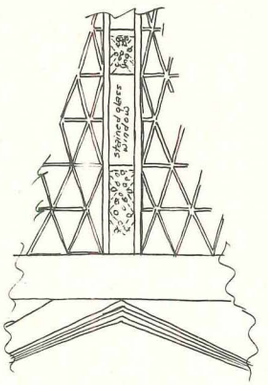
Although Nervi had had no previous direct experience with hyperbolic paraboloids, he set to work immediately and enthusiastically to find the structural solution (7, 8, preliminary; 11, 12 final) for the concept. In his usual way, he had models made and tested at the Instituto Sperimentale Modelli Structure in Bergamo. The first results were discouraging, but a modified design and new, larger models brought ultimate success. Belluschi continued to study structure, function and esthetics (9, 10), with particular concern for the relation of the lower part to the cupola (never resolved to the full satisfaction of architects and consultants). The idea of a pure form resting on the ground was not possible here because to house 2,500 seated persons would have meant too large a building, overwhelming in the city and on the skyline. Belluschi paced off gas tanks and reservoirs to see how so large a structure would look and decided on the base as a necessary compromise. (Another cathedral, Kenzo Tange's St. Mary's in Tokyo, uses a warped surface "dome" without a base but this is a much smaller building, seating only 800 with standing room for 1,000 more, with traditional nave and sanctuary—as different from St. Mary's San Francisco as any two Gothic cathedrals are from each other.)

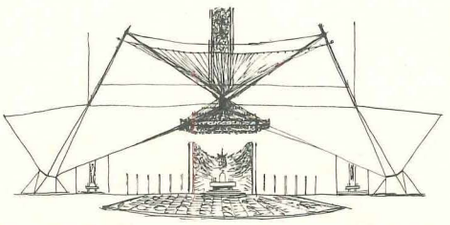
The final design—St. Mary's today—is both dramatic and serene. It is "no mere neutral design," nor does it depend on "engineering tricks" or on "archaic architectural terminology," all of which the Archbishop proscribed. The shells of the cupola, unique on the skyline, announce a building whose purpose is distinct from that of other buildings, as he asked. But the interior is the true glory of the cathedral, the justification of the exterior. All the effort and agony of creation in an age of technological and sociological complexity find their recompense here, where the clarity of the idea is fulfilled. In the single space created by the cupola, rising 190 feet from the floor, is the message of today's church: oneness, integrality, unity; of sanctuary and nave, of priest and people, of all men with each other.

The two great works of art which are themselves at one with the building are the brilliant stained glass windows 6 feet wide by 130 feet long, designed by Gyorgy Kepes for the junctures of the hyperbolic paraboloids along the sides and overhead; and Richard Lippold's shimmering baldacchino of aluminum rods, suspended from the cupola by slender gold wires, with a simple gold cross at its center. No lesser quality of design in whatever works of art are yet to come will be worthy of the building.—*E.K.T.*

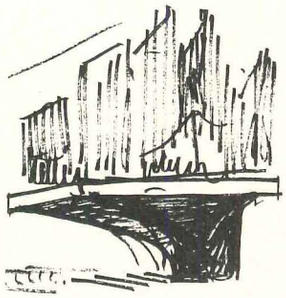


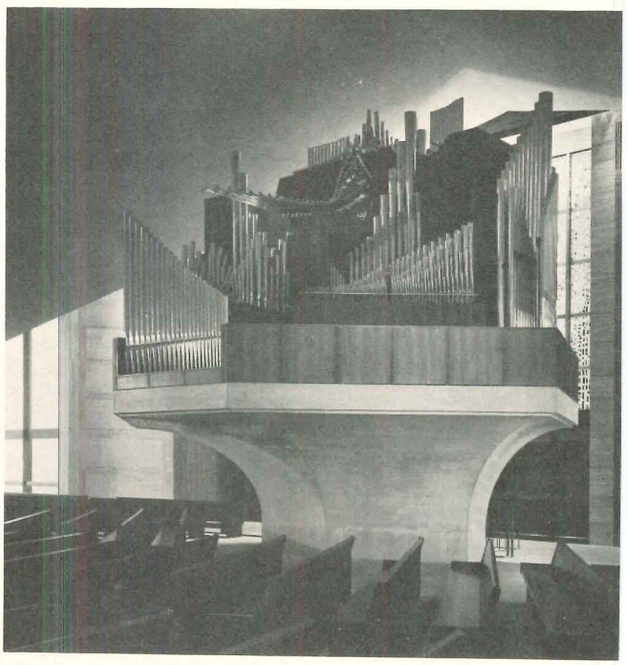


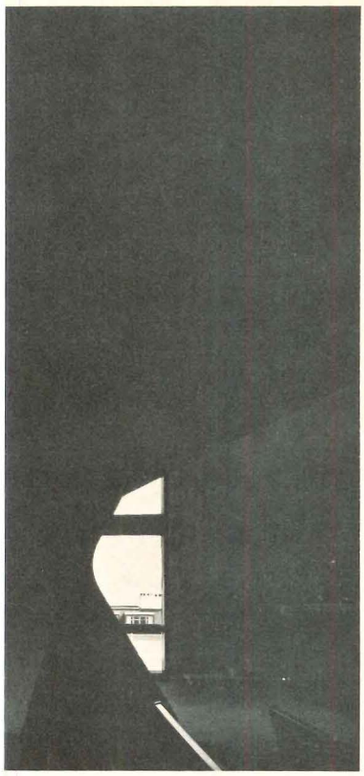


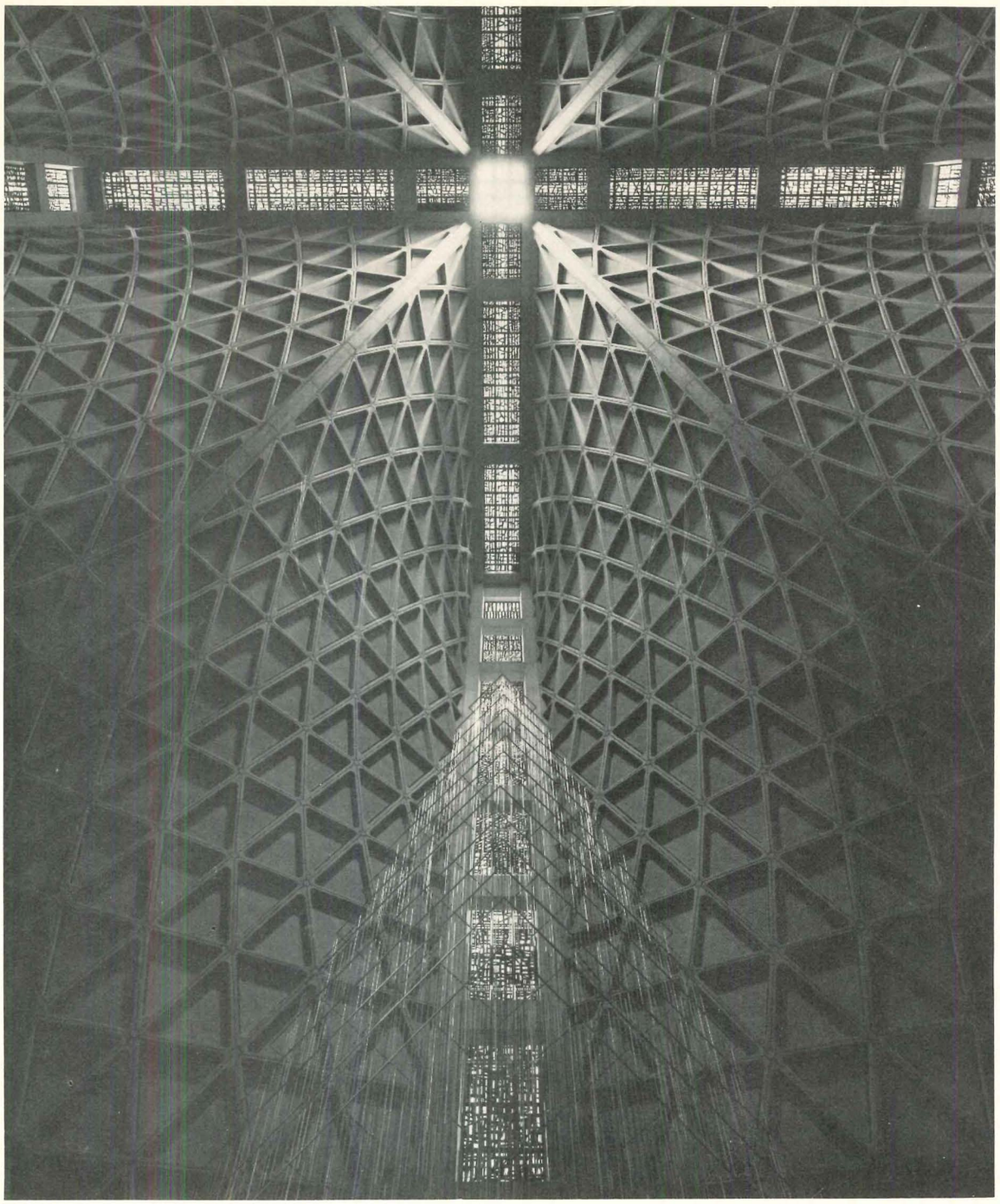


Cost brought the final design of the cupola to one-third less height than in the original design (above left and *Figure 9*). But the concept remained intact: the interior surface of the cupola enriched by the triangular panels so familiar in Nervi's work, and the means here to feasibility of construction; narrow stained glass windows at the edge joints of the hyperbolic paraboloids; structural forms in the very structure. Every detail was studied as a part of the whole and yet for itself: the massive piers support 140-foot arches which define "the square within a square" from which the cupola rises; the organ and its pedestal accent one side of the square, and locate the choir within the congregation; the ethereal baldacchino, supported almost invisibly, hovers over the altar.



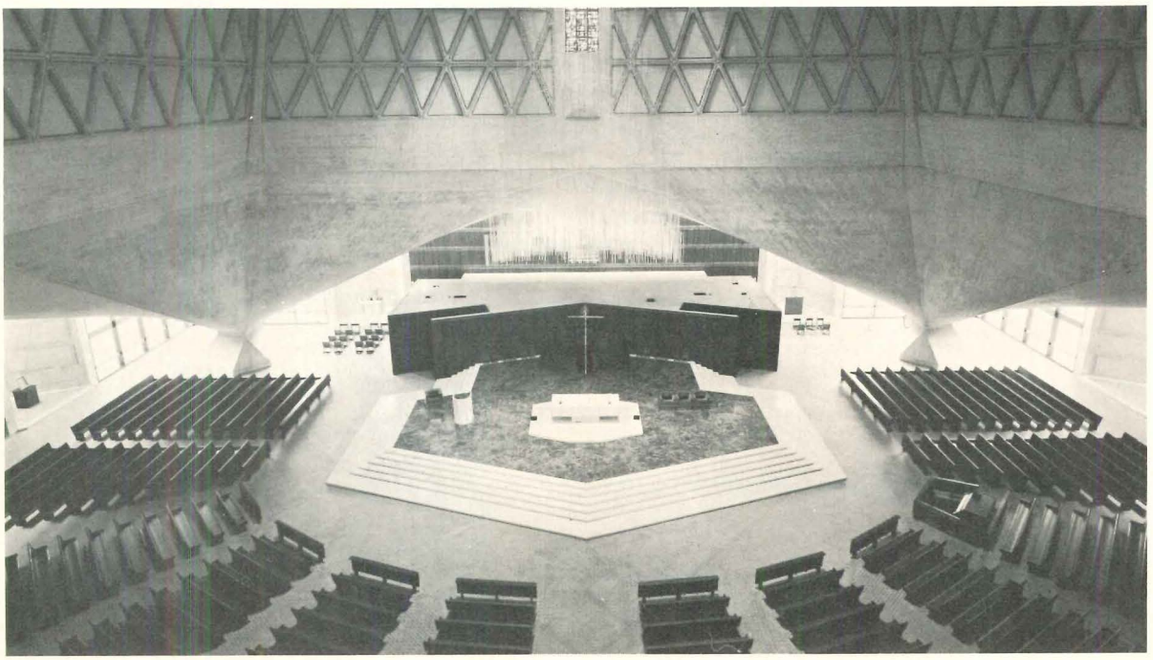


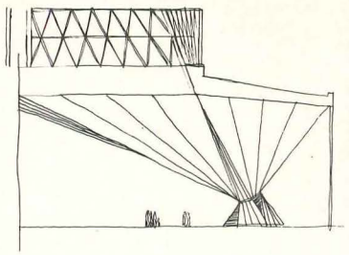


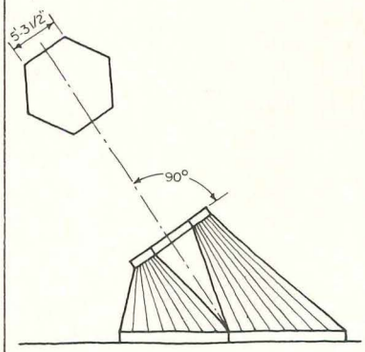


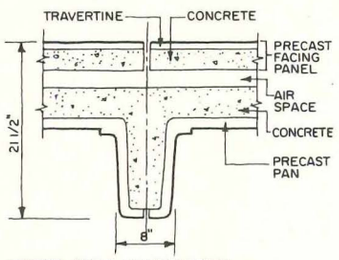
Predella, altar and pulpit, with the simple rosewood reredos, are surrounded on three sides by seats, none of which is farther than 100 feet away.

SAINT MARY'S CATHEDRAL, San Francisco, California. Architects: *McSweeney, Ryan & Lee—William Schuppel*, project architect; *Michael Kelly*, project coordinator. *Pietro Belluschi*, consulting architect, design. Engineers: *Leonard F. Robinson & Associates*, structural; *Woodward-Clyde-Sherard*, soils; *Keller & Gannon*, mechanical/electrical; *Dariel Fitzroy*, acoustics; *Seymour Evans & Associates*, lighting. *Pier Luigi Nervi*, consulting engineer, design. *Auguste Raes*, acoustical consultant. Landscape architects: *John H. Staley & Associates*. Artists: *Gyorgy Kepes*, stained glass; *Richard Lippold*, baldacchino. Contractor: *Cahill Construction Co.*

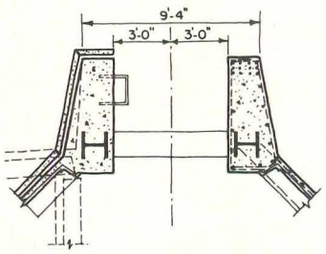




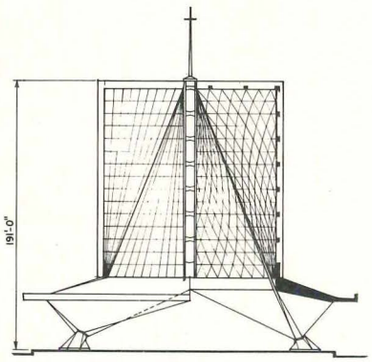


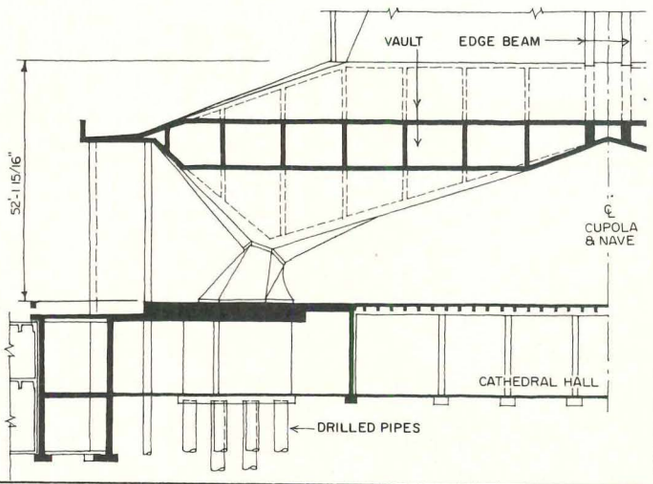



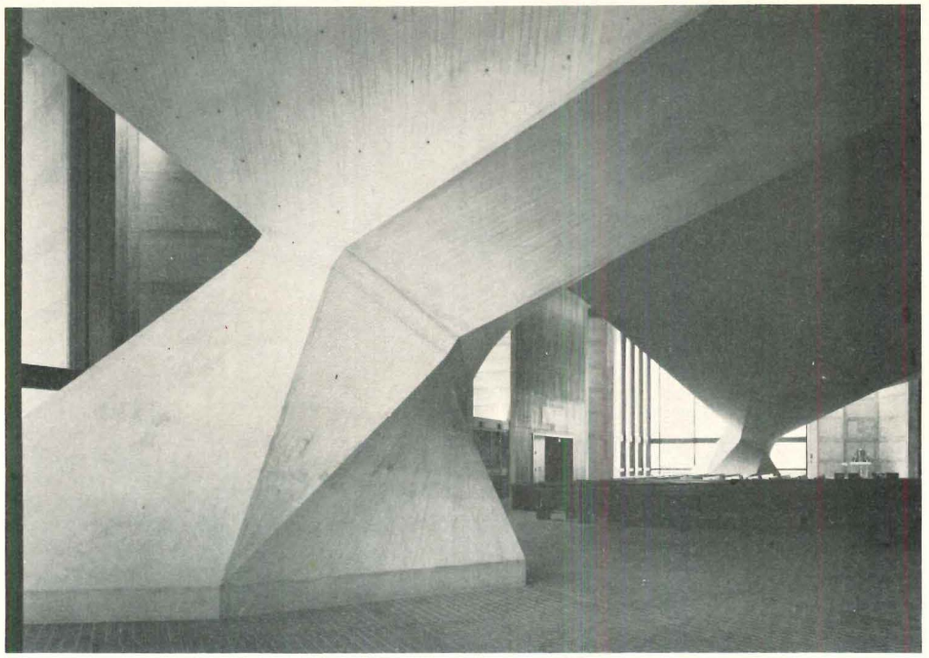

TYPICAL SHELL AND RIB DETAIL



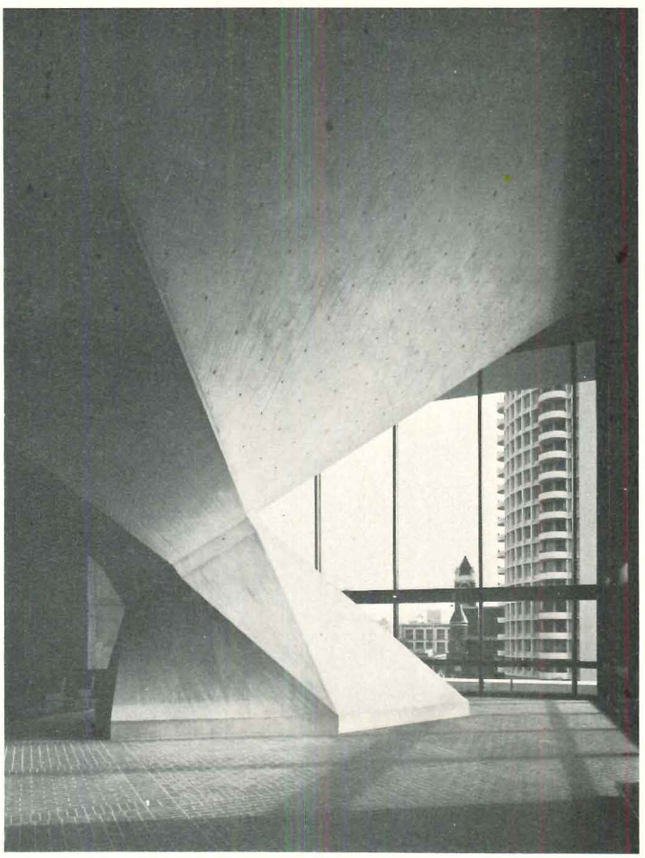

TYPICAL PLAN SECTION VERTICAL EDGE BEAM



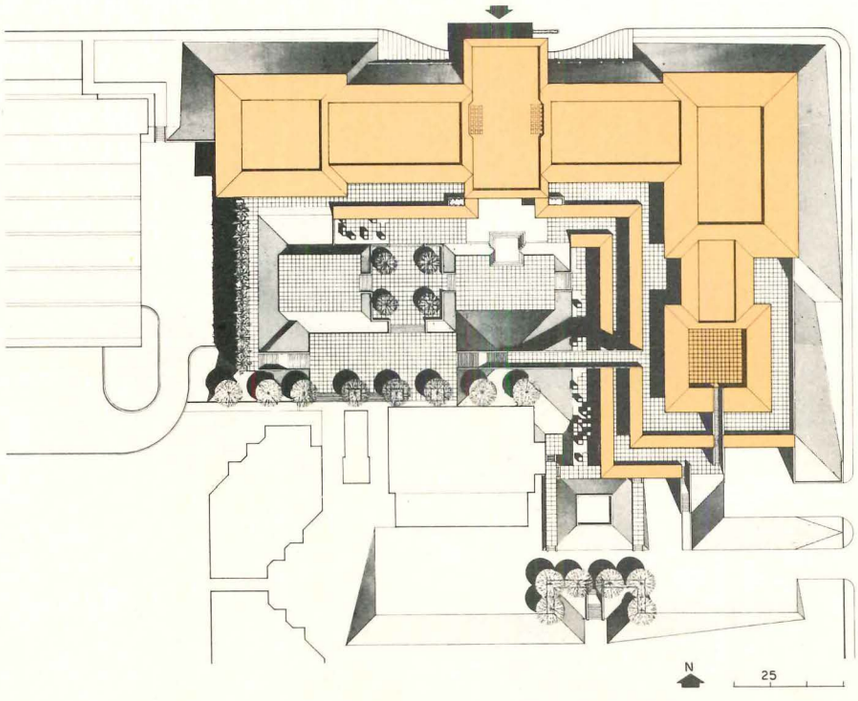



The unique structure required a variance from the city's 160-foot height limit for concrete structures, and was put through a number of conservative reviews for its engineering design. The Nervi panels, precast with the stiffening ribs (half a rib for each panel; see detail at left, *center*) for the shells, and his shear connector for the travertine facing tiles, were key parts of the whole innovative design. Panels (with acoustical tile infill) form the interior surfaces of the cupola. Leonard Robinson's mathematical model—an equivalent three-dimensional space truss—made possible computer analysis of the whole structure. The massive piers, silhouetted against the cornor windows, support the hollow arches which enclose steel trusses, and are supported at ground level by reinforced concrete bases 15- by 24-feet, each resting on six piles 85- to 100-feet long. Piers are tied by prestressed cable at the floor. The photos at lower right show the steel frame for the cupola—roof, diagonal and edge beams (typical section, left center), and all phases of the construction.

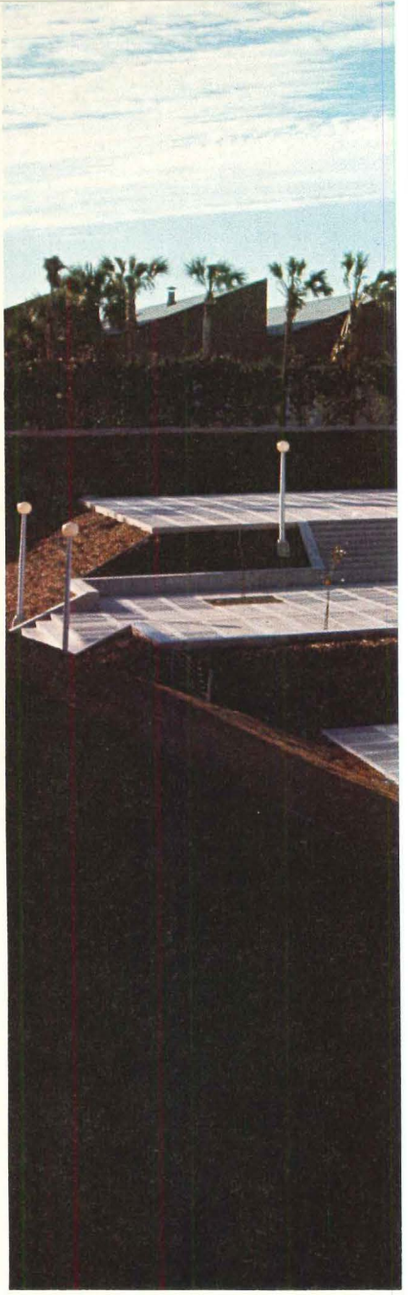


# FflorIda Museum uses earth forms boldly




Earth berms, concrete sun canopies and landscaped courts are the visual vocabulary that architect William Morgan has so effectively employed in designing the new Florida State Museum in Gainesville. The museum's fine natural history collection had previously been housed in a cramped office building downtown. The new site is a natural hillside on the northeast fringe of the University of Florida. Surrounding buildings, part of a biological research complex, defined the site but posed no problem of architectural etiquette. Morgan has treated the north and east elevations as simple but powerful earth forms crowned in concrete but giving little hint of what is within. The berm is sectioned only on the north side by a projecting entrance canopy (photo page 122). On entering, the visitor finds himself on the building's upper level overlooking an exciting sequence of interlocking sculpture courts and earth mounds.

The museum's functional relationships are clearly defined. The lowest two levels contain research and storage space for the departments of

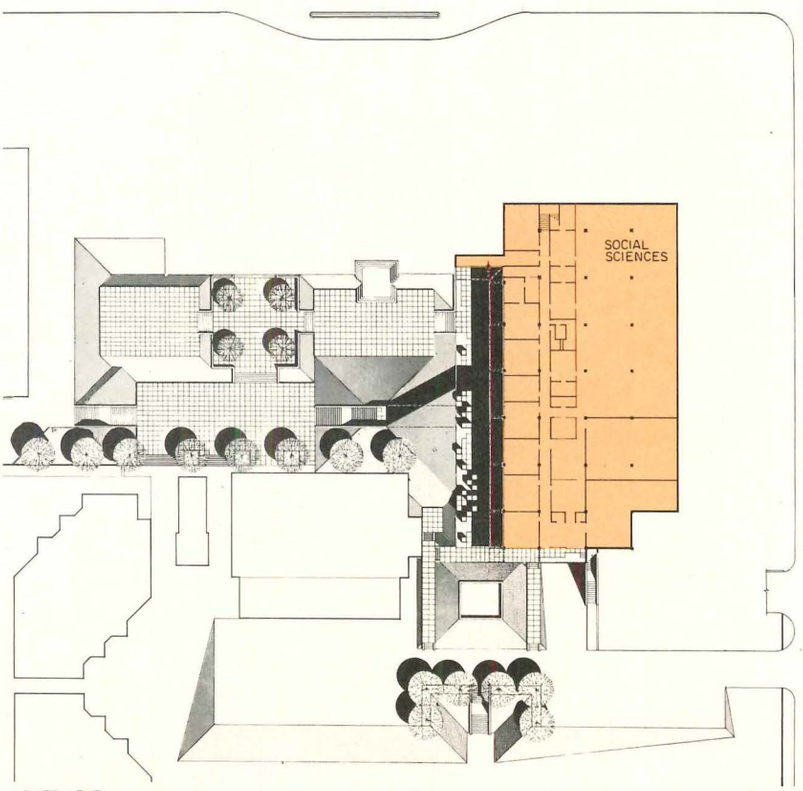


*Alexandre Georges photos*

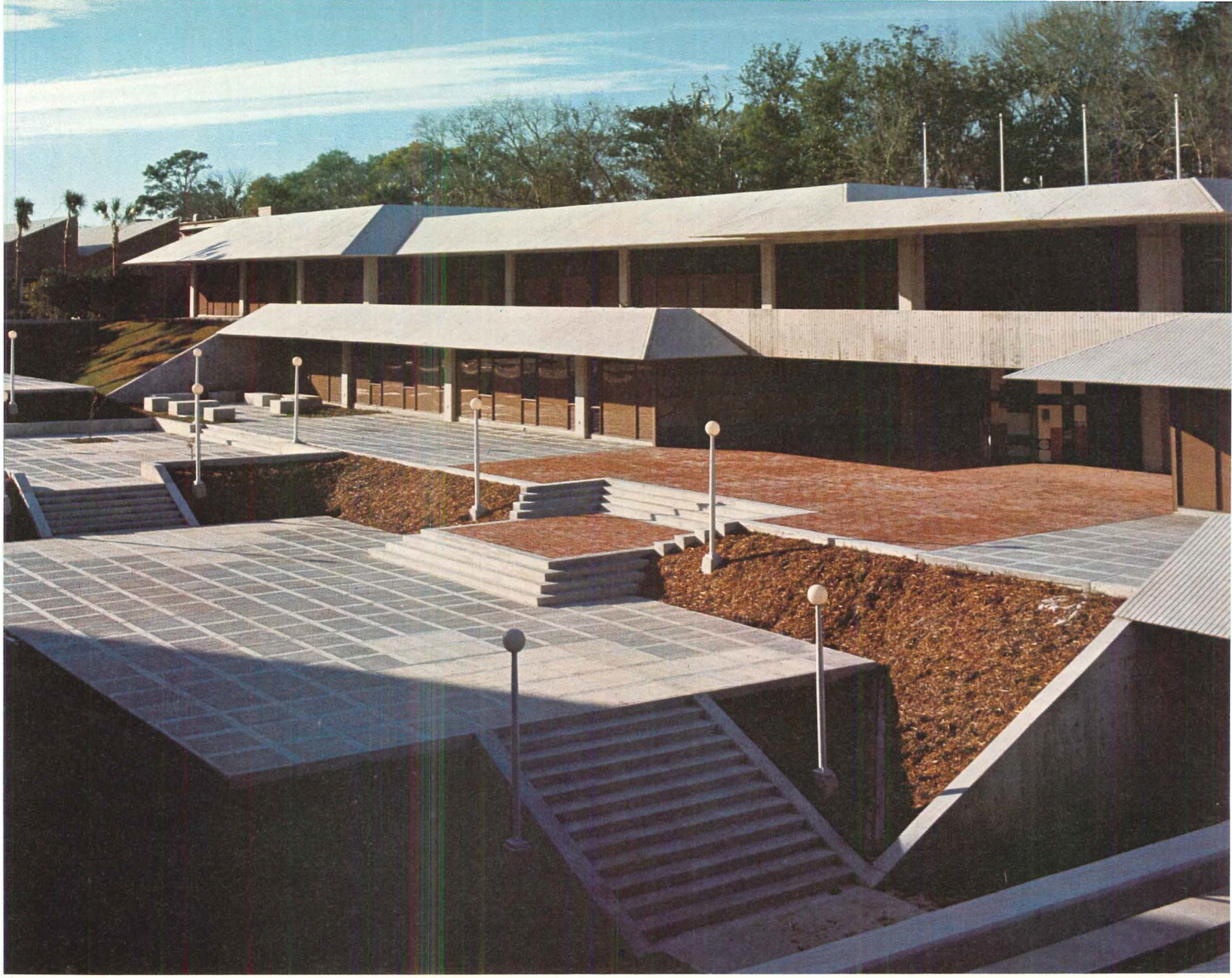
## FLORIDA STATE MUSEUM

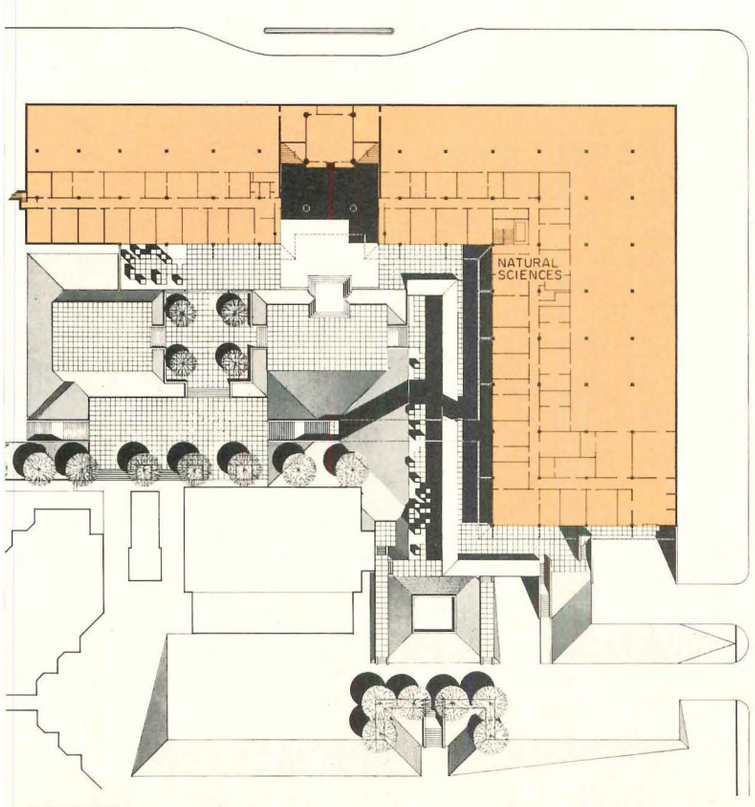
natural and social sciences. Offices line the wall facing the sculpture courts and generous precast overhangs protect the view windows. Small labs link the offices with storage ranges which are buried in the berm. By these simple juxtapositions, the three kinds of staff spaces can be concentrated for maximum convenience and flexibility. Loading docks at both levels lead to spaces where newly arrived materials can be cleaned, sorted, fumigated and catalogued before being put on display or into the research collections.

The upper level, in addition to a reception area, contains guides' offices and a large multi-media exhibition hall for the display of a collection that includes brightly-colored Indian potlatch and totems as well as the skeleton of a prehistoric mammoth recently recovered from under nearly forty feet of water in a swamp near Tallahassee. "Bertha," as the ancient fossil is called, was almost 85 per cent complete when recovered and is reported to be the best preserved lady of her kind ever found in the Southeastern United States.

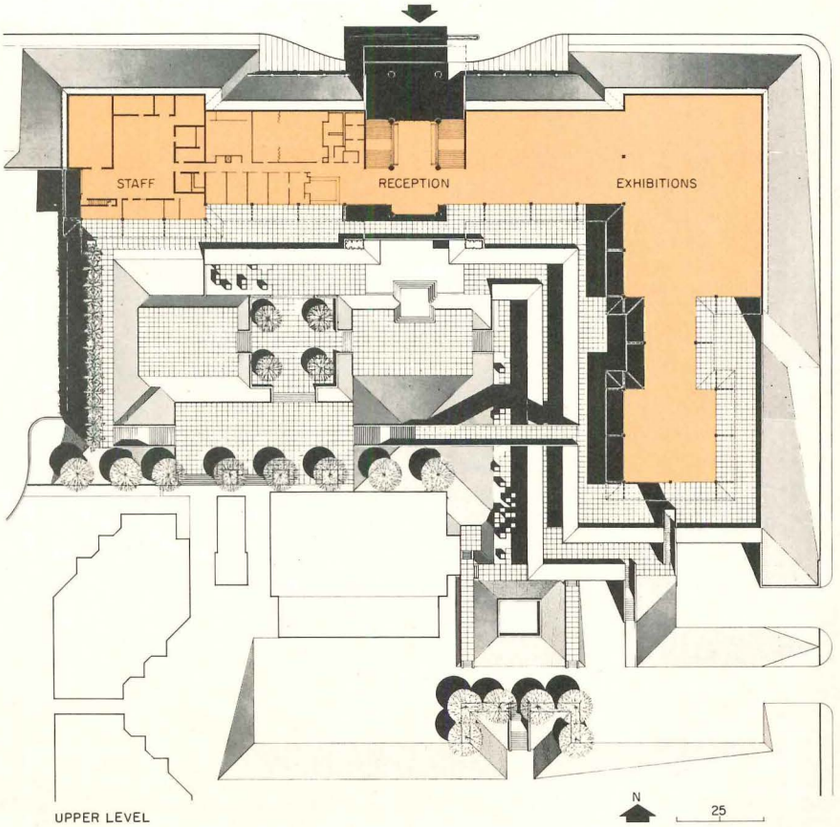



LOWER LEVEL

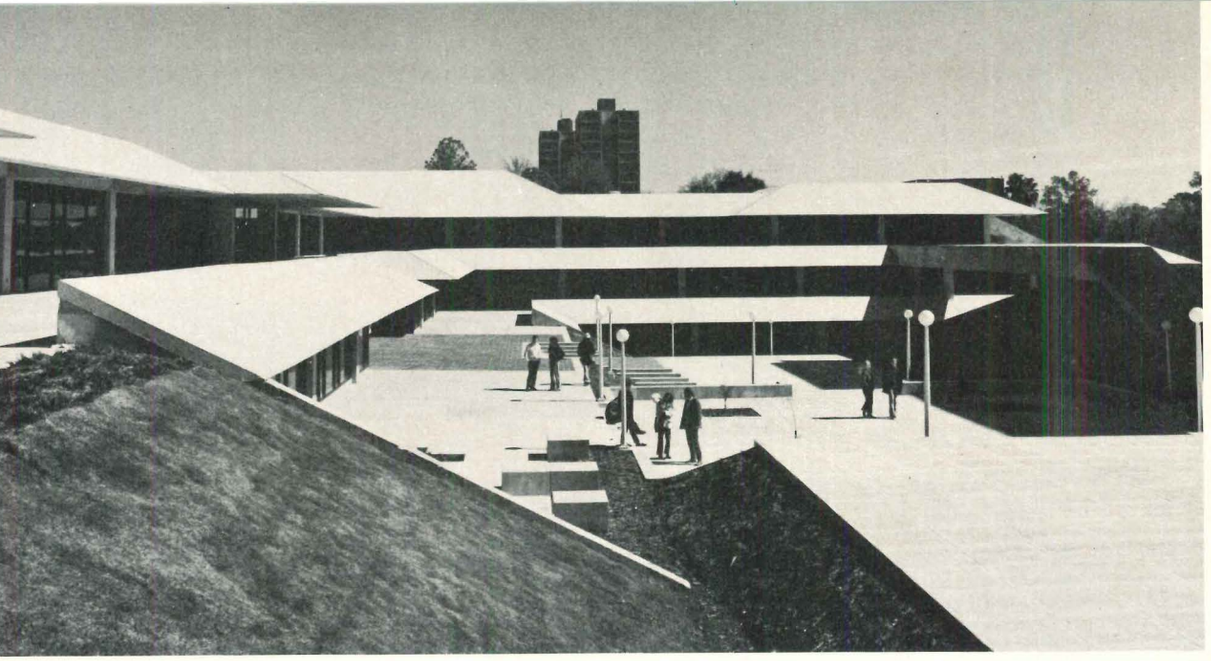


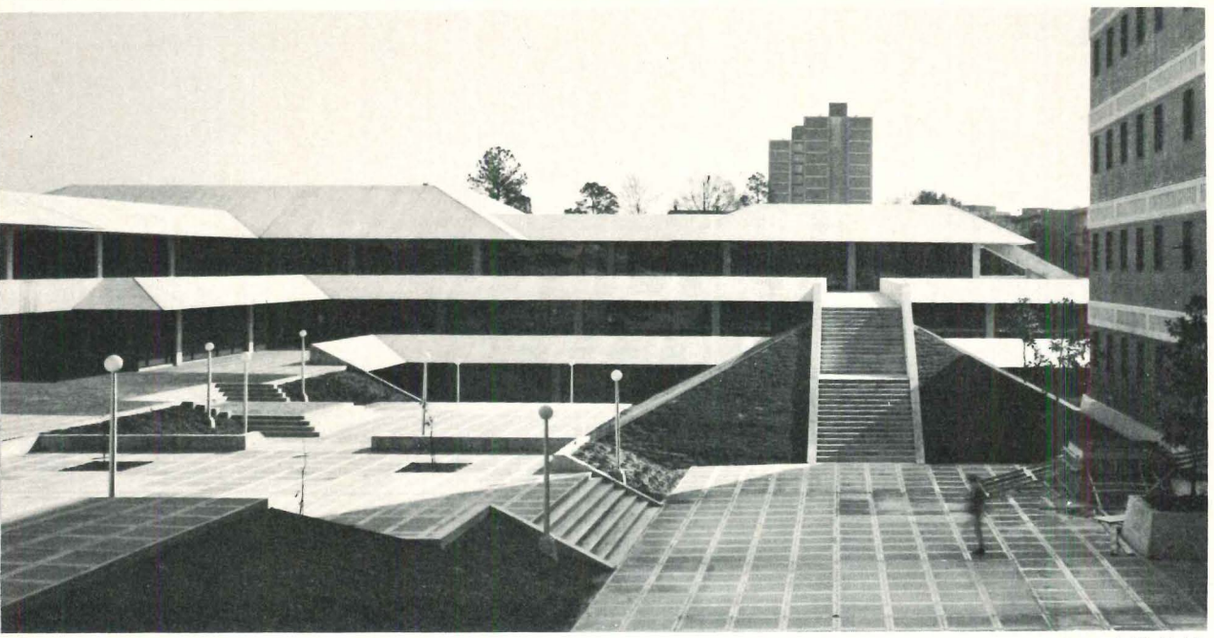


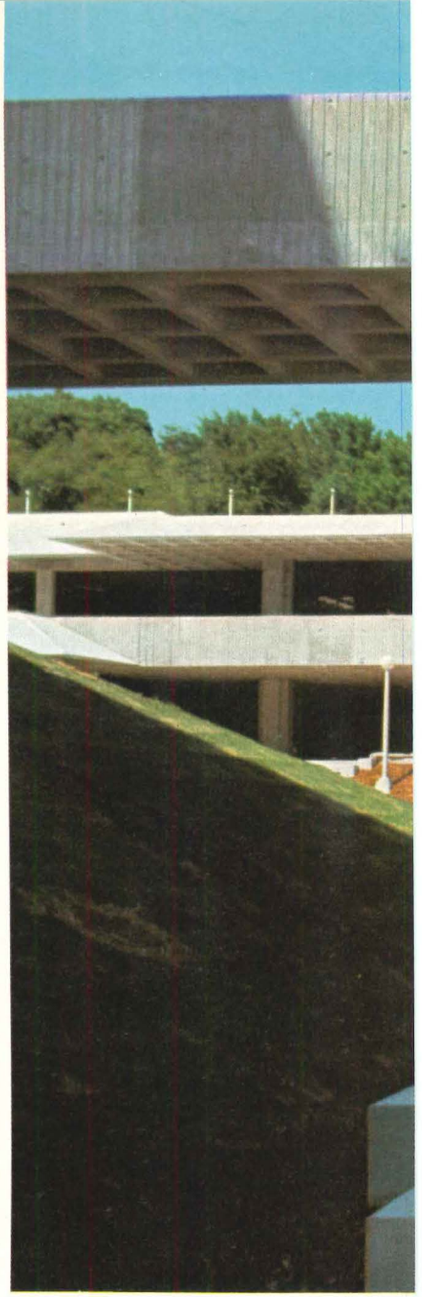

MIDDLE LEVEL




UPPER LEVEL





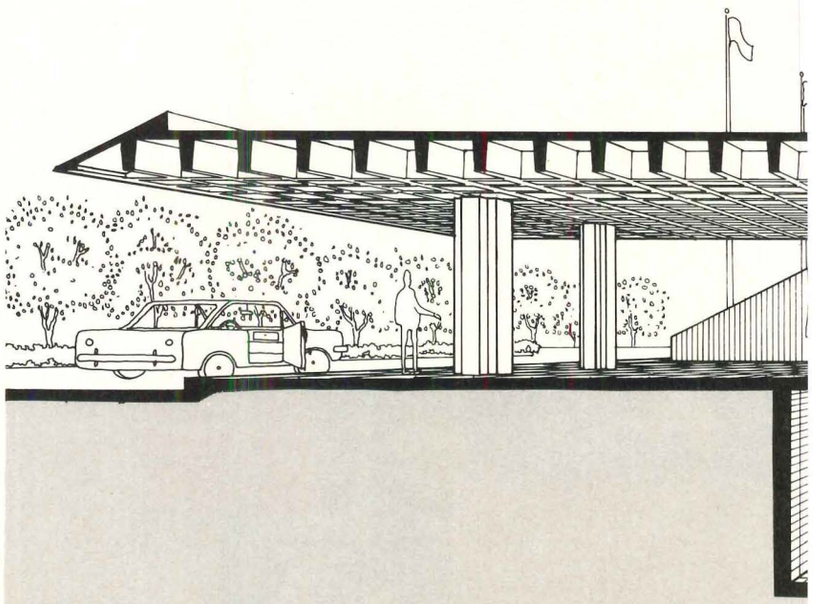


*J. W. Hobbs*

## FLORIDA STATE MUSEUM

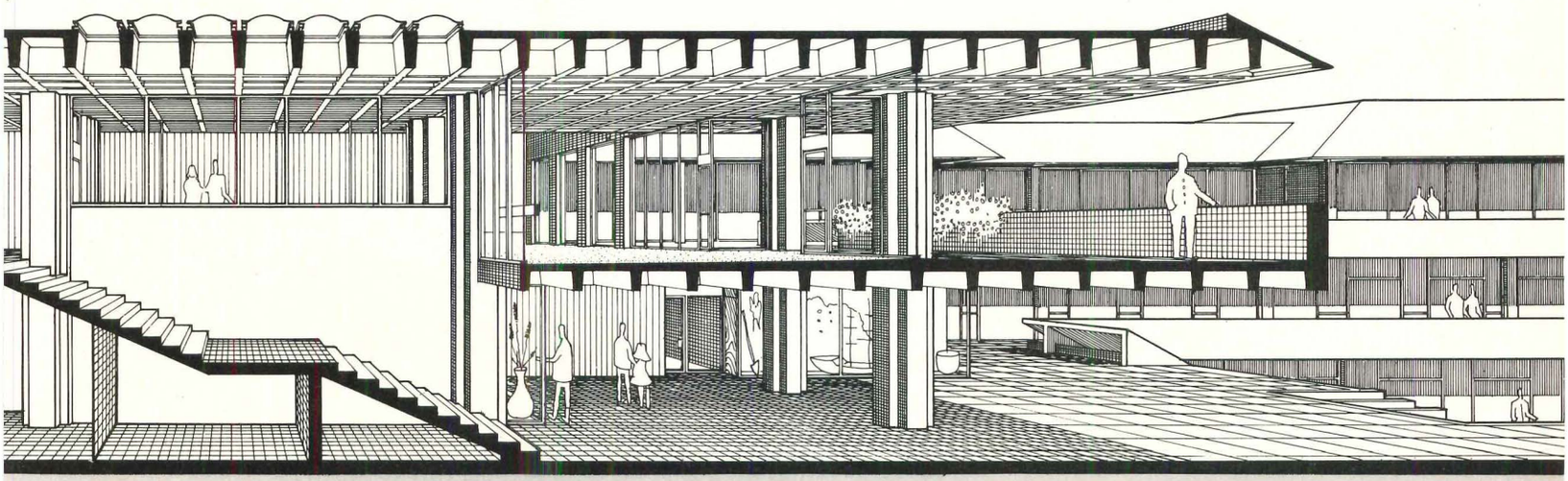
At the south end of the exhibition gallery, a bridge (photo page 125) leads to the top of an earth pyramid and down into the sculpture courts where the earth-form motif reaches its climax. This two-acre sequence of staged platforms provides more than a splendid and appropriate setting for archaeological display. It also serves as connective tissue between other adjoining but functionally disassociated portions of the campus. The museum's future expansion to the south will continue this process of unification.

Morgan has long been interested in earth-form architecture, and feels that contemporary architects have too long ignored its design potential. This exceptionally handsome museum, funded jointly by the Florida Board of Regents, private donors and the National Science Foundation, pleads the case for earth forms potently and persuasively.



FLORIDA STATE MUSEUM, University of Florida, Gainesville, Florida. *Joshua C. Dickinson, Jr.*, Director. Architect: *William Morgan;* structural engineer: *Haley Keister;* mechanical and electrical engineers: *Evans & Hammond, Inc.;* general contractor: *The Auchter Company.*

William Morgan

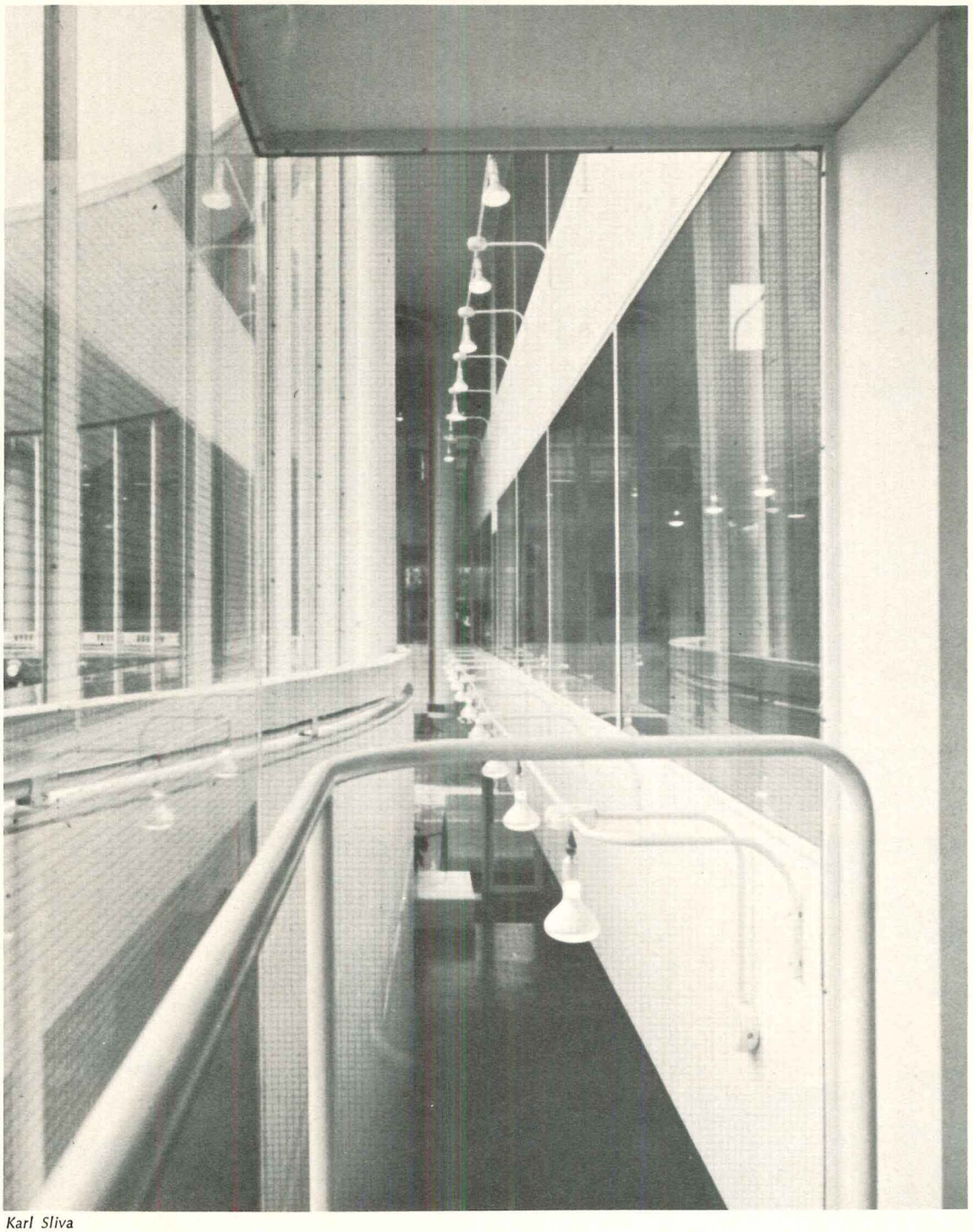


FLORIDA STATE MUSEUM

The museum's interiors are direct and appealing. In the reception area, photo above, concrete is left natural and carpeting is soft brown. Bright color accents are provided by graphics and posters advertising exhibits within. Waffle slabs are exposed in most of the spaces. In the 35,000 square foot exhibition area, the steel truss ceiling is painted black and equipped with flexible lighting.

Glass walls facing the court are protected by wide, canted overhangs that double as parapets for terraces above. Detailing has been kept simple both inside and out. All parking lots for staff and public are located at the site's perimeter where they are largely concealed by berms and planting.

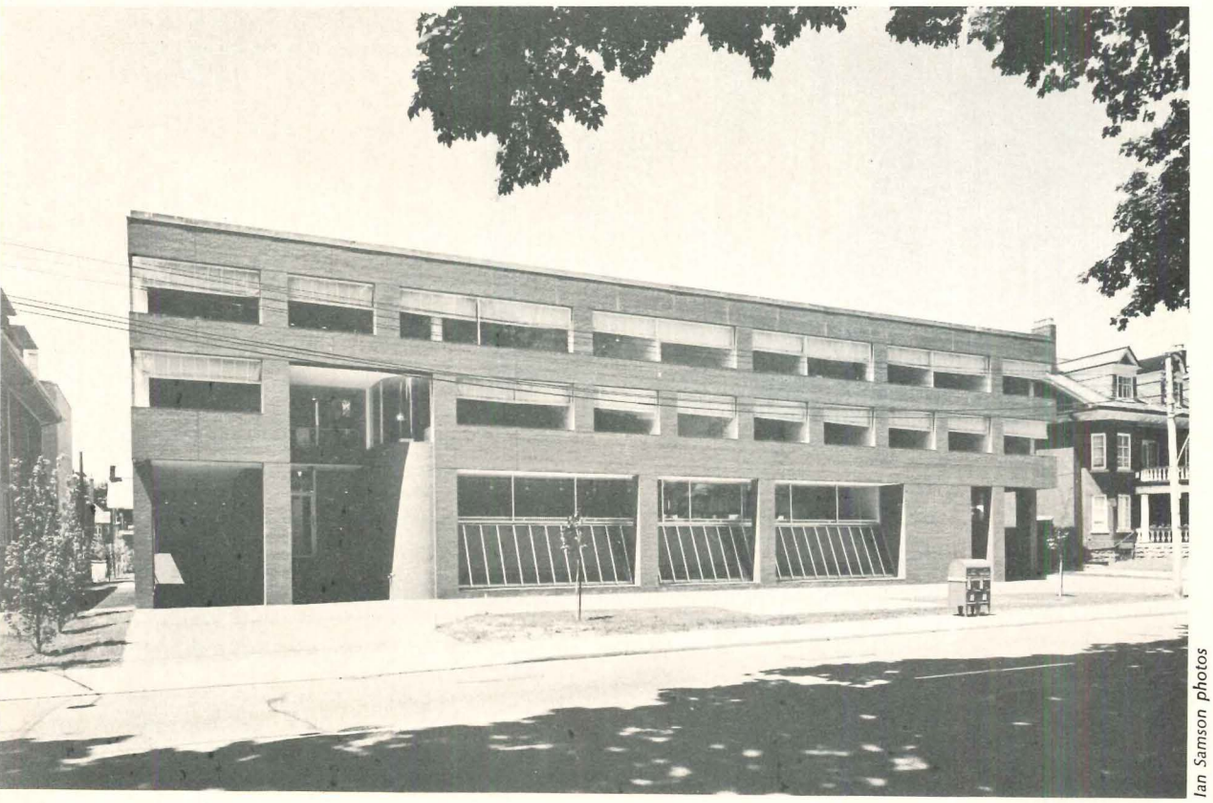
# COMMON PARTS AND LEGIBLE SPACES IN TORONTO'S O.M.A. BUILDING

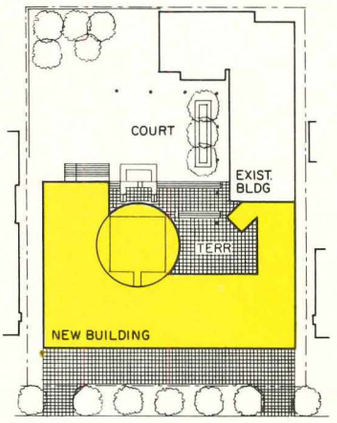


*Karl Sliva*

A quiet Toronto street in one of the city's older residential sections has a new office building on it, housing the headquarters facilities for the Ontario Medical Association, and the building may be a little puzzling to any of the neighborhood people who have seen it both inside and out. The street facade is simple, almost conservative and haphazard in its flatness, with its simple punched holes for large windows that are in nearly the same plane as the brick, and with two large openings at either end of the building that obviously lead up from and down to a parking garage below. Though there are details around the entrance that tell a trained eye (or an architect) that the intentions of the designers here were serious, complex, and probably meant as a challenge, still the effect of the street facade is quite unremarkable. But the effect of the inside spaces, as in the photo at left, is not. Walls rise through three floors with clerestory lighting at the top, exterior light is brought through two separated planes of glass causing the darker interior glass to reflect the image of the lighter exterior walls, and common electrical ducts are exposed on the wall surfaces along with their outlet boxes and warm and cold air piping. It is the combination of "averageness" on the facade, the spectacular display of spatial gymnastics inside, and the use of usually concealed ducts as decoration that would be surprising to any layman.

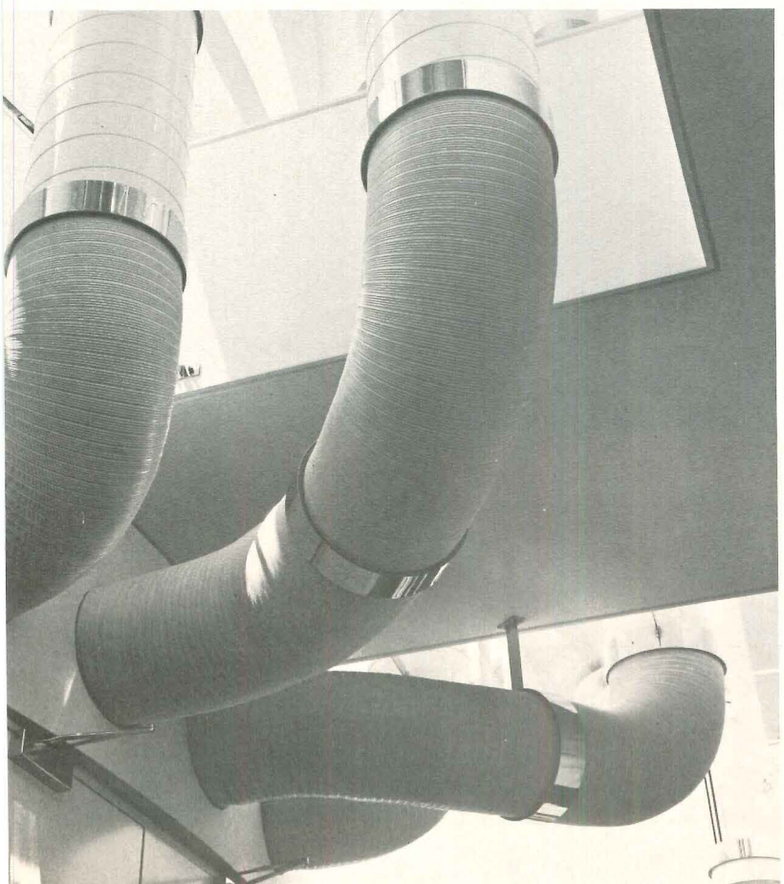
To the architects A. J. Diamond and Barton Myers, of course, it is an expression of their convictions regarding architecture, and what they believe should be made important in their buildings. Both architects worked in the office of Louis Kahn, and they both acknowledge the influence on them of Robert Venturi's ideas. They have not been interested in elaborated structure—in exposing the bones of their buildings—but they have been concerned with expressing the activities of people. They say about the O.M.A. Building: "Instead of expending funds and energy on 'architecture' which in truth often means structural exhibitionism, or conspicuously expensive finishes, or excessive 'articulation' judgments made were in reference to the importance of activities, and user work requirements." The three principal activities within the O.M.A. are the administrative functions of the permanent staff, the executive function, which is carried out periodically (at least once every month) by meetings of the board of representatives, and the entertainment, dining and social functions of the association.






*Ian Samson photos*

Karl Sliva



It is easy to see from the plans (page 131) which of these functions has been given symbolic emphasis over the others, and to understand why. The board meetings, at which decisions are made regarding the daily operations and ultimate public values of the Ontario medical profession, are the raison d'etre of the O.M.A. itself, and the board room has thus been made the center of attention of the whole design. It is circular where the rest of the spaces are rectalinear, and it is one of the largest spaces in plan, much larger than its programmed 40-person seating capacity might require. It exudes a kind of elegance (page 132) that the rest of the building has tried to avoid.

The other two activities interlock spatially throughout the rest of the building: the areas available for entertainment and public functions are on the ground floor, and executive or administrative functions occur on the upper two floors. The main lounge on the first floor (color photo, left) is near the entrance for large public dinners or receptions, the employees may use it during the working day and at lunch, and it is immediately available before board meetings. The major space of the administrative area is the secretarial pool on the second floor (photo, page 130). It rises through two floors, acknowledging its use by the largest daily concentrations of people, and the low-ceilinged one- and two-man offices surround the secretarial area on two floors. Finally, these activities are linked through three floors by the interior open space around the board room; the curved wall of the board room is visible from all floors and is the architectural event by which visual orientation is possible from any other place in the building.

The interior feeling of most of the O.M.A. Building is one of casualness. Except for the board room there is a kind of studied devaluation of hierarchies which is implied by the spatial interlocking of activities just described. But it is easy to notice Diamond's and Myers' other efforts to make the building unpretentious and to relax it: such information is supplied most clearly by the detailing; the selection of fixtures and finishes, and the small parts of the building chosen for emphasis. The cold and warm air ducts of the mechanical system are directly exposed to view, and sometimes used as sculpture in space, as with the ductwork (below, left) leading from the entrance foyer to the conference room. The ducts are common spiral tubing of galvanized steel with the usual flexible elbows of aluminum, all with a white enamel finish baked on before installation. There are chromed splicing straps at each joint and chromed hangers. Their impact lies in their obvious commonness—even laymen know these things are usually hidden in basements or ceilings—and in their formal organization. The same judgments apply to the common tubing used as handrails, and to the lighting—ordinary flexible conduit and four-way outlet boxes have been exposed throughout the building in expressive, decorative ways (see photo, page 130).

The O.M.A. building's emphasis on the expression of human activities, and the architects' lack of commitment to any basic structural clarity certainly add up to a kind of devaluation of technological issues; the architecture doesn't much exhibit a concern for technical expression or even of rationalism, with its usual scientific emphasis. A kind of technical rationalism has always been one of the firmest foundations of modern architecture, and the attack on it here is refreshing to see. This building seems to say that of course technology is with us, but it need not be quite so revered: there are more important things to think about.

Even the exposure of mechanical and electrical parts says this; or more correctly, they especially say this. The electrical tubing, the outlet boxes, and the air ducts chosen are mass-produced in thousands of shapes and sizes; they are not specialized forms like LeCorbusier's "object-types," and they are utterly devalued artistically. In the construction industry, they are akin to consumer parts; purchased in quantity, nearly disposable. We have no reverence for these forms; they give us a light feeling of shock, of restraints removed, of casualness and wit.

The architects of this small office building have succeeded in expressing the human values and institutional organizational patterns which sponsored the building in the first place, as they intended to do. It is a successful building on that level, and at the same time it manages to impart new meaning to some of the inexpensive materials of our building industry.

*—Robert Jensen*

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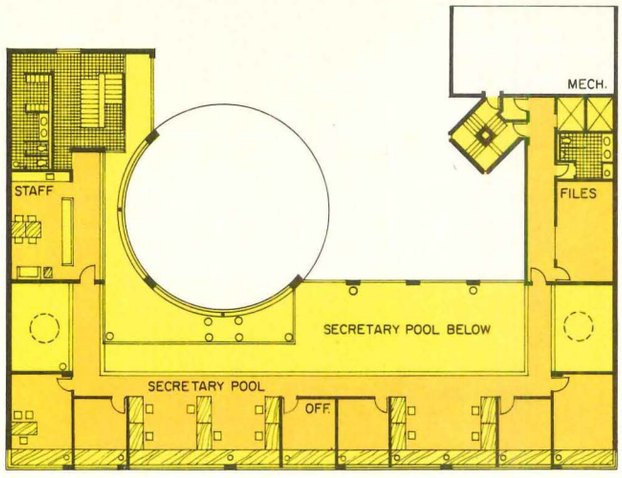
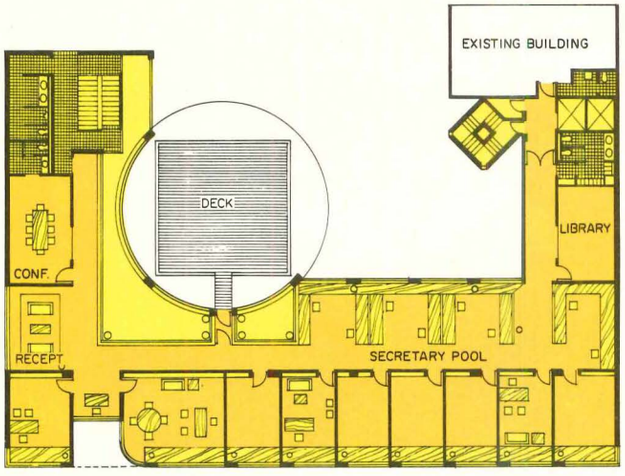
ONTARIO MEDICAL ASSOCIATION OFFICE BUILDING, Toronto, Canada. Architects: *A. J. Diamond & Barton Myers—Ken Viljoen,* project architect; cost control: *Helyar, Vermeulen, Rae, & Mauchan;* structural engineers: *M. S. Yolles & Assoc.;* mechanical engineers: *G. Granek & Assoc.;* electrical engineers: *J. Chisvin & Assoc.;* general contractor: *Richard & B. A. Ryan Limited.*

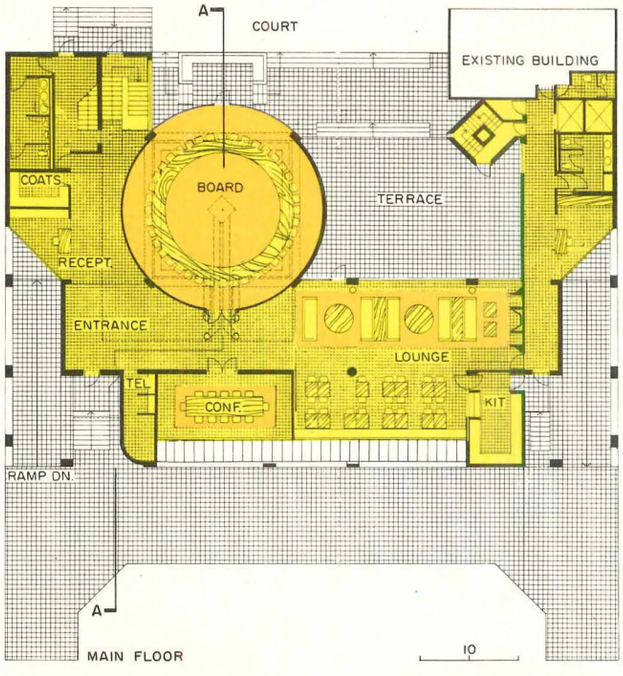
*Ian Samson photos*

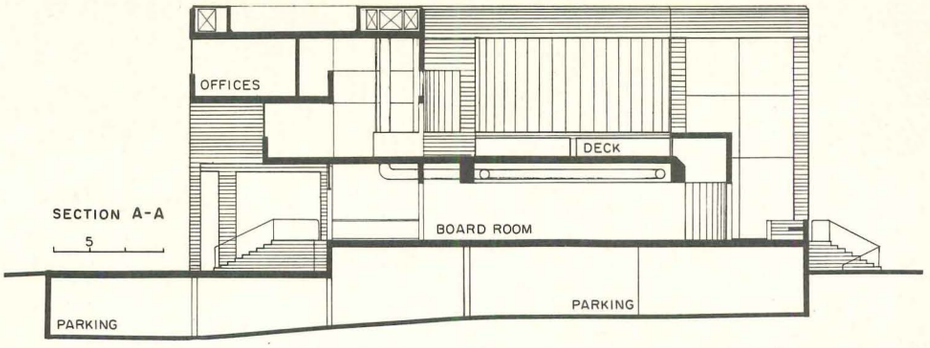



MEZZANINE




SECOND FLOOR

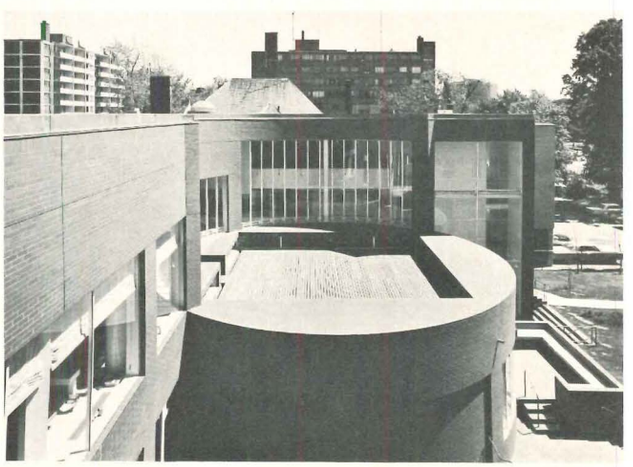



*The new O.M.A. Building replaces an older residential structure on the same site that was previously used as the headquarters. The parts of the plans at left labeled "existing building" were a recent addition to that older residence that was allowed to remain. Together, the new O.M.A. headquarters and the existing building form two sides of a new court that will be the focus for any future expansions that may take place. The additions will be sited on the two remaining sides of the court, forming, eventually, an interior plaza. This focus toward the back of the building in the expansion plans and in the present bricked terrace, plus the existence of the large underground parking facilities (see section, above) keep the O.M.A. headquarters from encroaching into the street and neighborhood with its present and planned activities.*

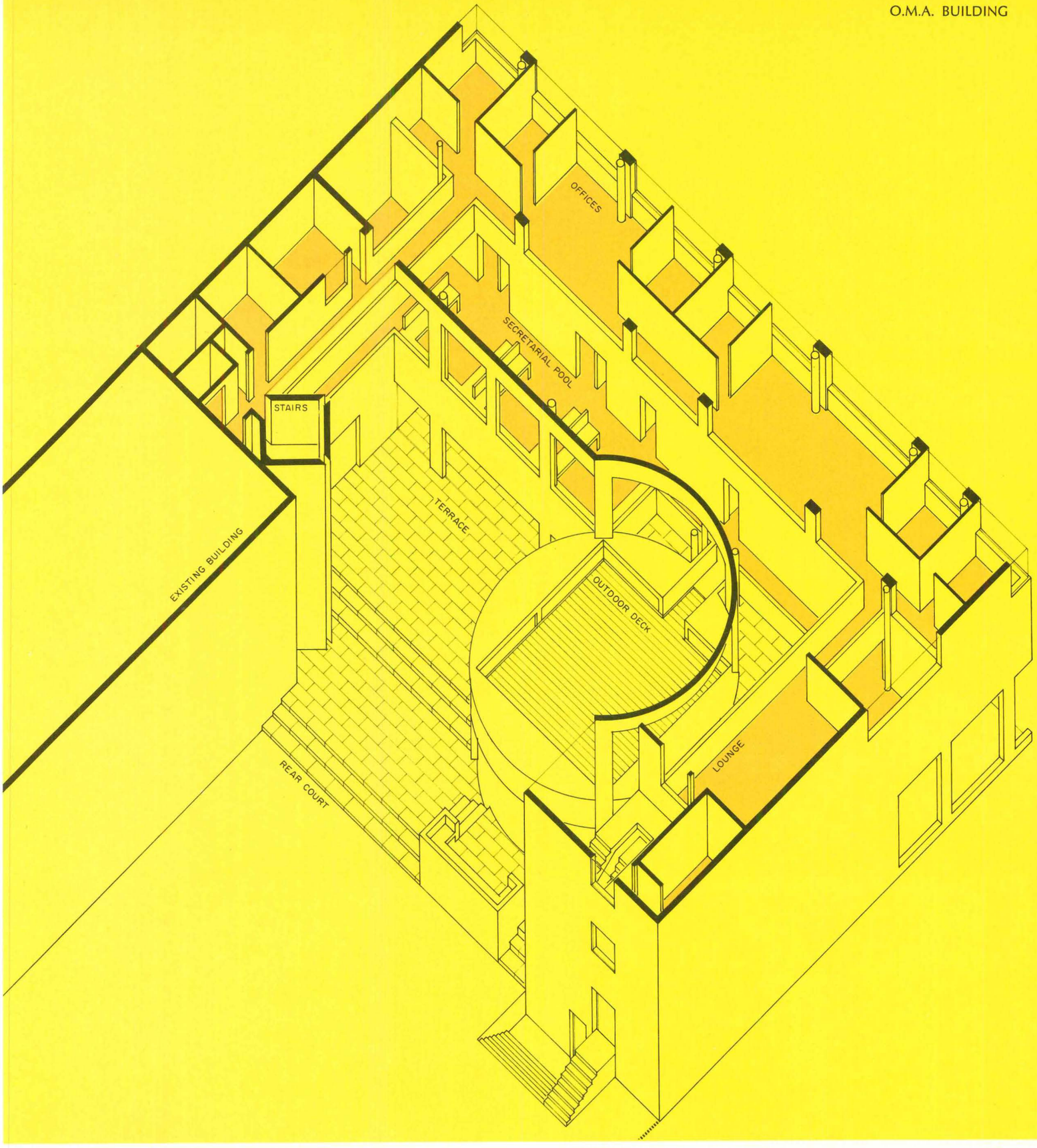
*The main secretarial pool (photo, far left) faces out onto the rear court and is surrounded by two levels of offices. By exposing the mechanical ducts and eliminating hung ceilings, floor-to-floor heights were reduced to 8 ft-6 in. in most areas.*

*The board room of the O.M.A. Building (photo, above) is prominent from any point of view around the building and its roof has been employed as a deck for lounging; placing a square within a circle allows seating on the parapet, because any seat is usually a safe distance from the edge.*

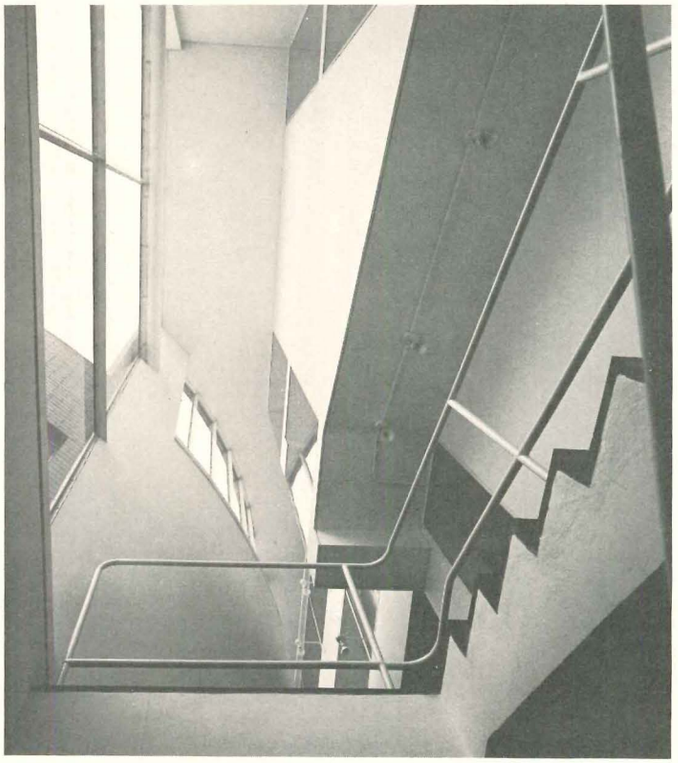


*The standard spiral metal ducts in the building, like those in the photo at left, were cut to fit from shop drawings in a factory, rather than formed at the site. Each section of duct received an inexpensive white baked enamel finish which could not have been applied using site fabrication. The isometric at right is the clearest representation of the new O.M.A. building, and indicates the architects' de-emphasis of exterior facades; the major significance lies in the spaces (both exterior and interior) and with the interior parts.*

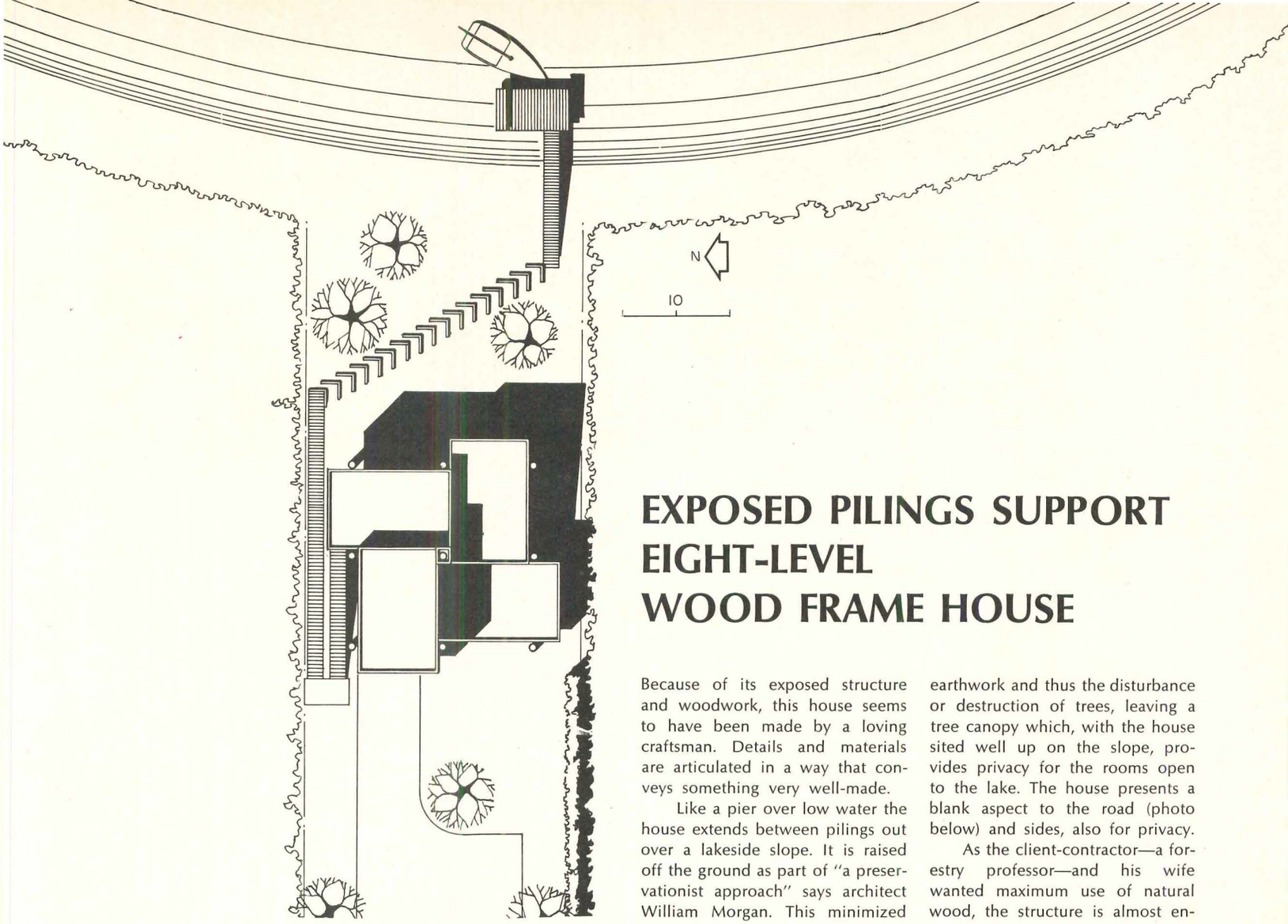
*Ian Samson photos*


OFFICES
SECRETARIAL POOL
STAIRS
TERRACE
EXISTING BUILDING
OUTDOOR DECK
LOUNGE
REAR COURT

Ian Samson photos



*The principal stairway of the O.M.A. Building rises from the parking garage to the third floor. The open doorway of the photo above looks through to the second floor level, and the picture at left was taken below the first floor, looking straight up. The very simple but effective detailing of the building is especially evident here, along with the absence of expensive materials or finishes.*



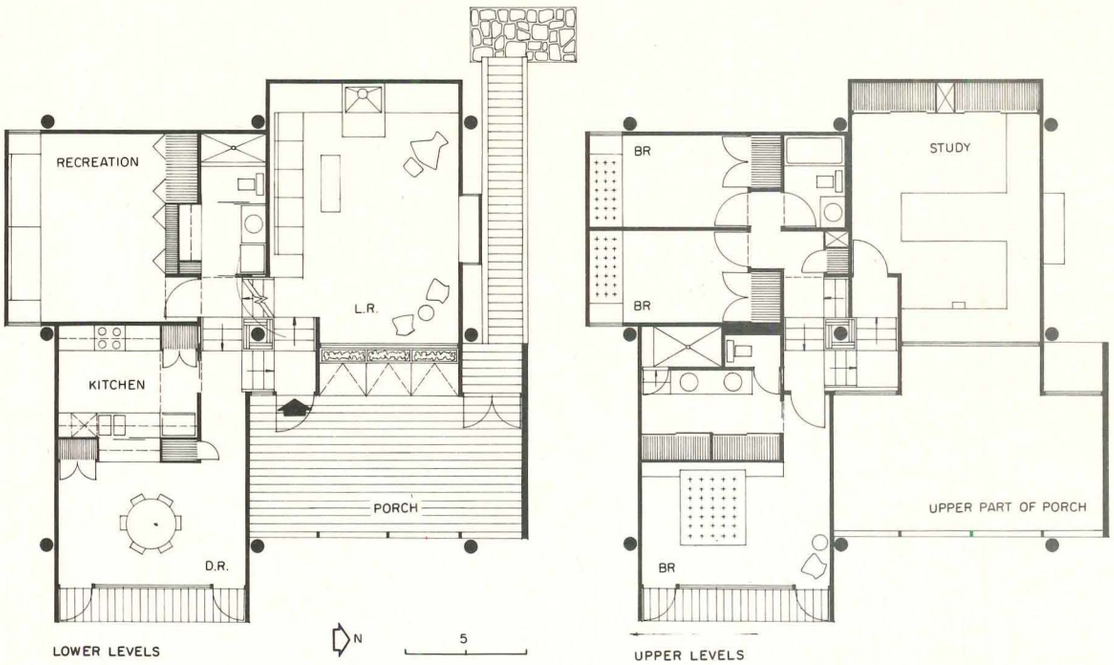

# EXPOSED PILINGS SUPPORT EIGHT-LEVEL WOOD FRAME HOUSE

Because of its exposed structure and woodwork, this house seems to have been made by a loving craftsman. Details and materials are articulated in a way that conveys something very well-made.

Like a pier over low water the house extends between pilings out over a lakeside slope. It is raised off the ground as part of "a preservationist approach" says architect William Morgan. This minimized earthwork and thus the disturbance or destruction of trees, leaving a tree canopy which, with the house sited well up on the slope, provides privacy for the rooms open to the lake. The house presents a blank aspect to the road (photo below) and sides, also for privacy.

As the client-contractor—a forestry professor—and his wife wanted maximum use of natural wood, the structure is almost en-

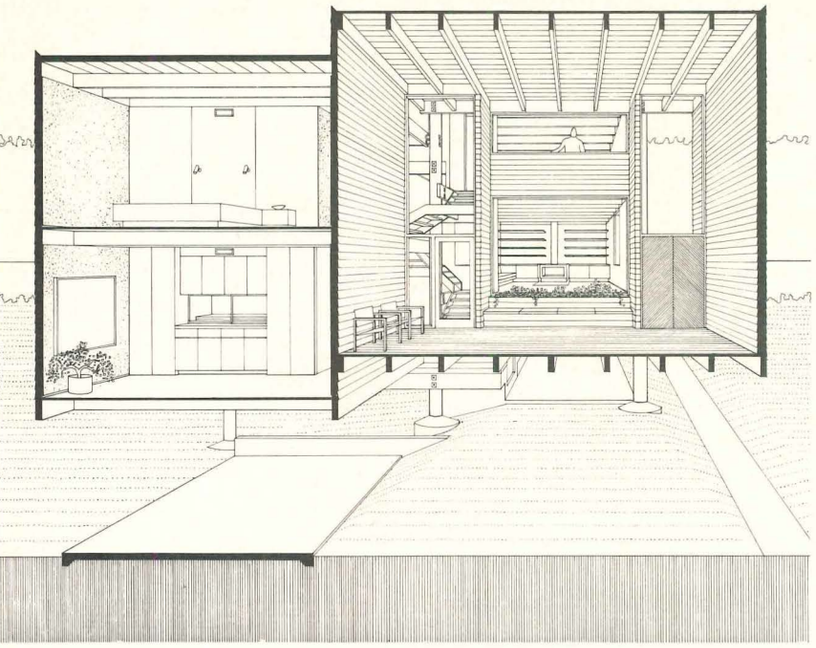
G. Wade Swicord photo

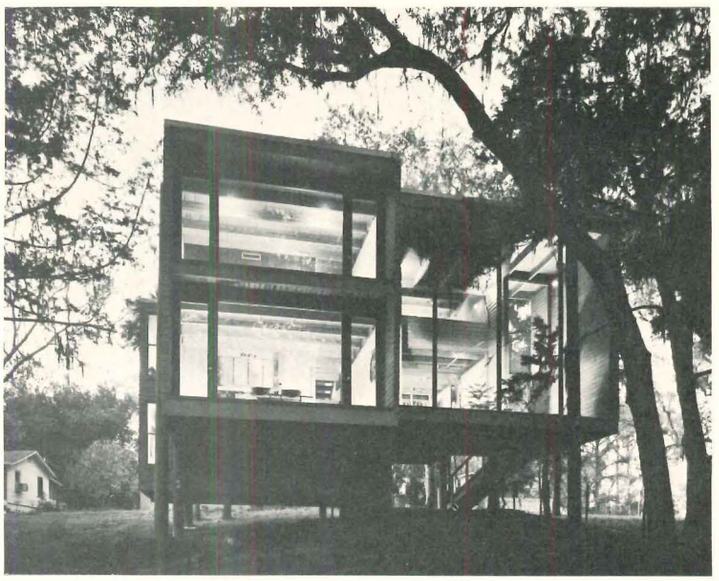



tirely of wood. Nine southern yellow pine pilings are embedded to a depth of 10 feet in cylinders of poured-in-place concrete. The carport-entry slab (under living room) is anchored to the pilings which are exposed inside and out. As they taper irregularly, they are fastened with special adjustable bolts (permitting a 2-inch variation in piling diameter) to laminated beams supporting exposed floor and ceiling joists, all of southern yellow pine. The darkness of the treated pilings and their natural shape contrast with the crisp, machine-cut lines and light tones of rough-sawn cedar plywood siding applied like clapboards and chosen for its dimensional stability.

The house consists of eight levels within four rectangular volumes spiraling in a pinwheel configuration around the central piling. Entry is from the carport at the base of the stair or by ramp up to the two-story porch. From the porch one may go up to the living room, children's rooms, master bedroom and studio; or down to kitchen and dining room and guest-recreation room.

The plan is very compact and neatly accommodates all program requirements including "separate dining room; screened porch overlooking lake; guest suite independent of main house; studio for writing and print framing; covered parking accessible to kitchen; living room suitable for displaying rare maps, prints and paintings." The last item, along with a need for privacy, resulted in a set-back wall with windows at either end. There is no hall except on the two-bedroom level as all other rooms are entered directly from





the stairwell. Every major space has a view of the lake.

Luan mahogany was used in the master bedroom paneling, interior doors and cabinet work. Southern yellow pine is also used in the door frames and the laminated, edge-grain ceilings and floors which are made of 12-inch wide tongued-and-grooved sections that are cut to the specified length—a type of flooring used in bowling alleys and vans.

As in previous houses by the same architect, simple, rectilinear volumes, expressed inside and out, combine to provide a strong sense of spatial liveliness.

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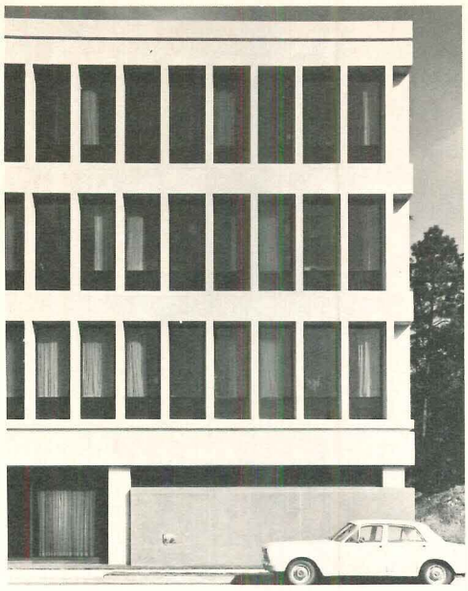
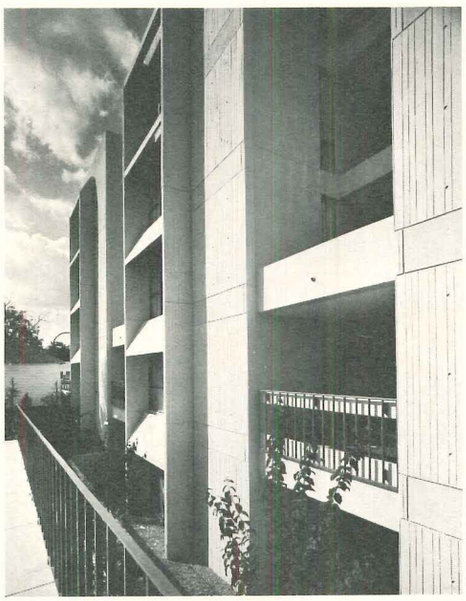
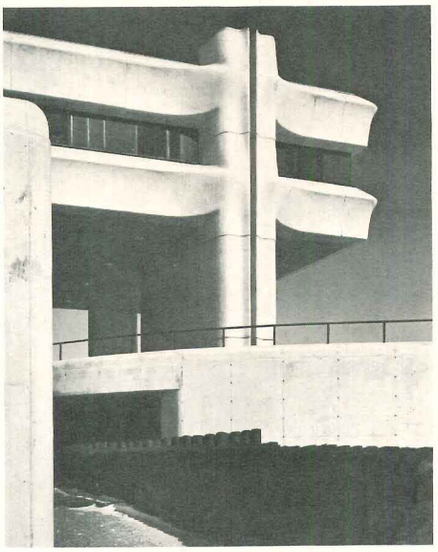
PRIVATE RESIDENCE, central Florida. Architect: *William Morgan;* structural engineer: *Haley W. Keister;* interiors: *Edward Heist, Jr.*







# HOSPITALS

Three trends emerge in the current stream of hospital events. First—as the four, moderate-size hospitals shown here and on following pages demonstrate—the quality of architectural massing and detail is substantially better than has been common in the past. Second, interior designs for hospitals have progressed from the norm of utilitarian austerity to a new norm of good contemporary design, without the lavish overstatement that has occurred occasionally in the recent past. Third, architectural and planning techniques for nursing care spaces and bedrooms provide new approaches to efficiency of the nursing task.

The four hospitals shown in the photos on this page are (top to bottom at left) the Mary Imogene Bassett Hospital at Cooperstown, N.Y., designed by Skidmore, Owings & Merrill; the Dameron Hospital Addition No. 4 at Stockton, Calif., designed by Rex Whittaker Allen & Associates; the Lakes Region General Hospital in Laconia, N.H., designed by the Office of Bruce Porter Arneill Architects; and (above) the Dr. Joseph O. Ruddy General Hospital in Whitby, Ontario, designed by Craig, Zeidler, and Strong. These hospitals are shown in some detail on the following pages.

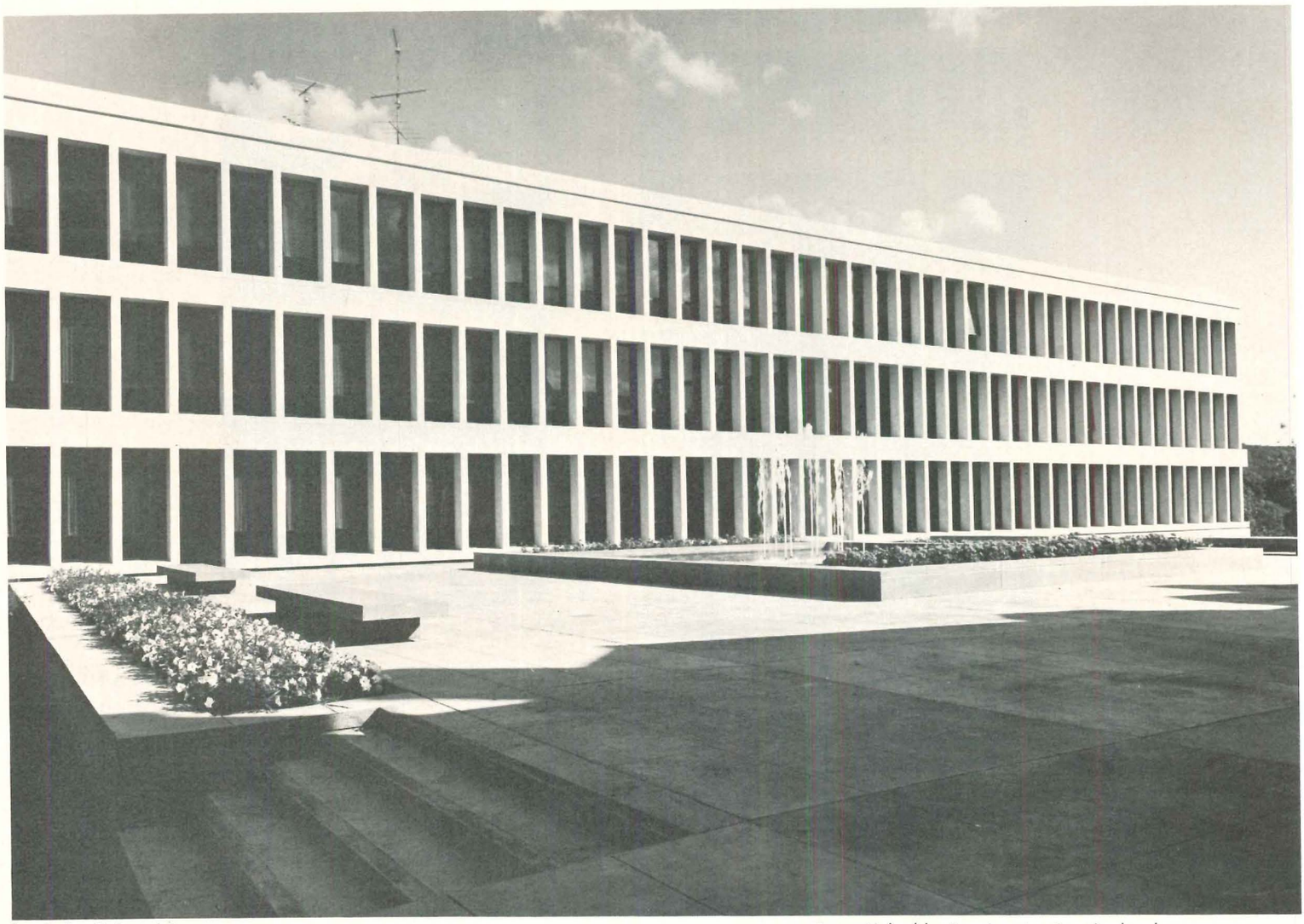
A study of the evolution of nursing care spaces by Michael L. Bobrow, architect and planning associate of Medical Planning Associates, reviews efficiency studies of the past and introduces a simplified, practical method of evaluation developed at MPA. (See page 151.)

*—William B. Foxhall*

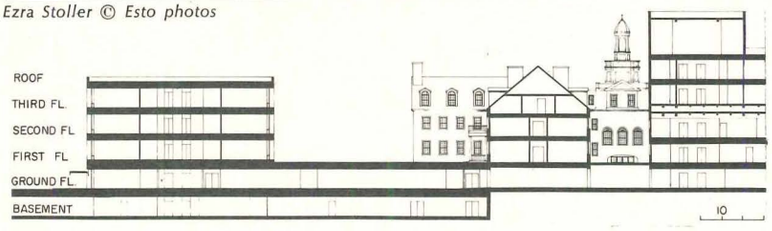
BUILDING TYPES STUDY 426

®

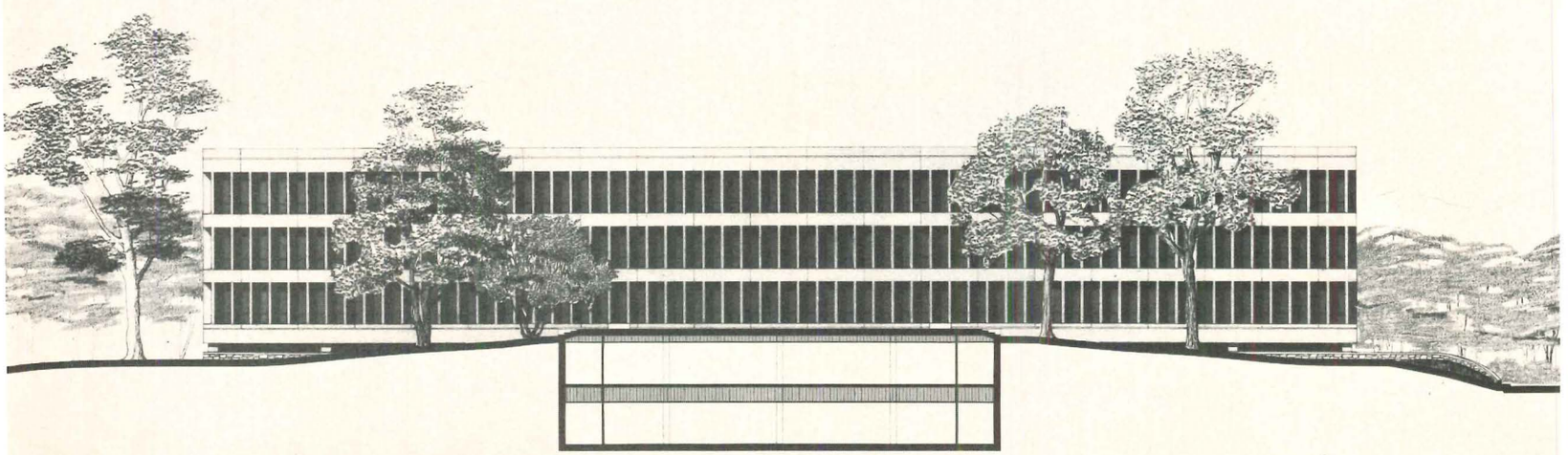
# The Mary Imogene Bassett Hospital is a mini-medical center for Cooperstown, New York, designed by Skidmore, Owings & Merrill



Ezra Stoller © Esto photos



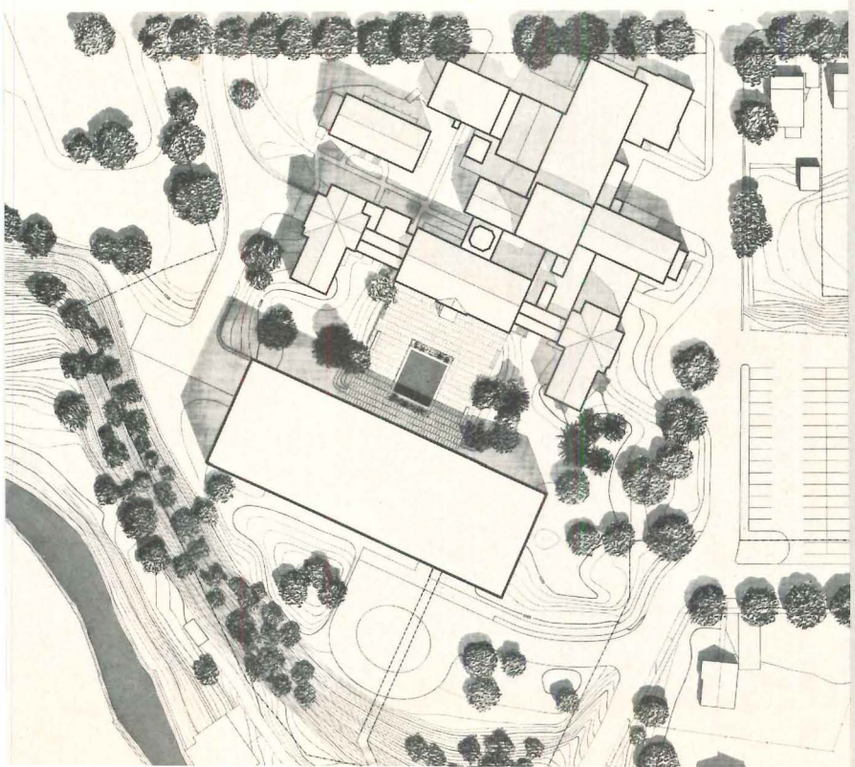

*Precast, double-stem tee structure is cleanly expressed in a three-level facade overlooking a plaza atop the ground-floor connection between Bassett Hospital's new wing and the original complex (See section). Radiology and pharmacy are relocated under the plaza, with passages connecting the new main entrance, administration, dining and supply areas to the older section. At basement level is a tunnel to remote parking areas.*

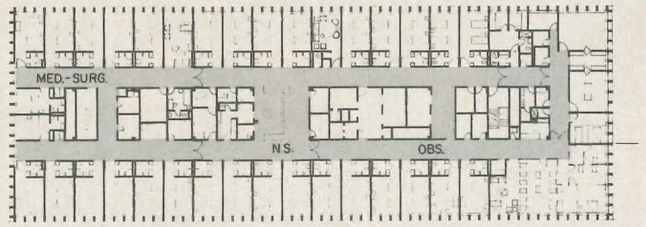


This four-level addition to a 40-year old general acute hospital in Cooperstown, New York, provides 175 beds for a rural community medical center that is unusual in the scope of its service and the organization by which it operates. Community hospitals in rural areas (Cooperstown is a dairy and poultry farming community 200 miles from New York City) tend to lose highly skilled full-time medical staff to the urban areas when they operate, as most such hospitals do, by extending part-time staff privileges to private physicians, who may then admit their own patients or refer them to other private specialists on the staff. The Bassett Hospital (named for its first chief of staff) operates under a principle of group medical practice whereby the whole staff acts as a unit to provide full medical care for the entire community.

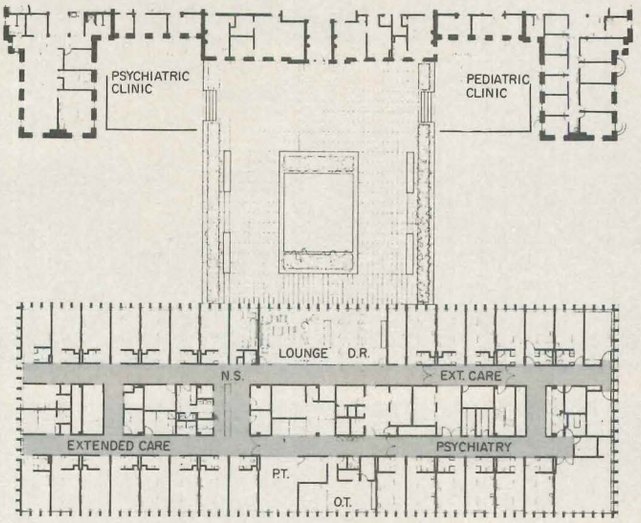
The current mode of operation is to put medical staff members on payroll so that patients seeking attention can go directly to one of the hospital's seven specialty clinics. Doctors treating patients in one department can simply refer them to another without fear of losing their business. No longer forced to compete for patients, local doctors share their skills for the benefit of the whole community, according to Dr. Charles Ashley, the hospital director. Because there are no unaffiliated physicians in Cooperstown and few in surrounding communities, most residents see themselves as the personal patients of Bassett's 32 full-time physicians.

The new addition, completed in the summer of 1970, was constructed with three floor levels facing a plaza connecting the new wing with the existing complex. The connecting structure at ground level under the plaza houses radiology and pharmacy between passages leading from the new main entrance, administration and dining areas to clinical and other areas in the old section. A basement tunnel under the new wing goes to a parking area.

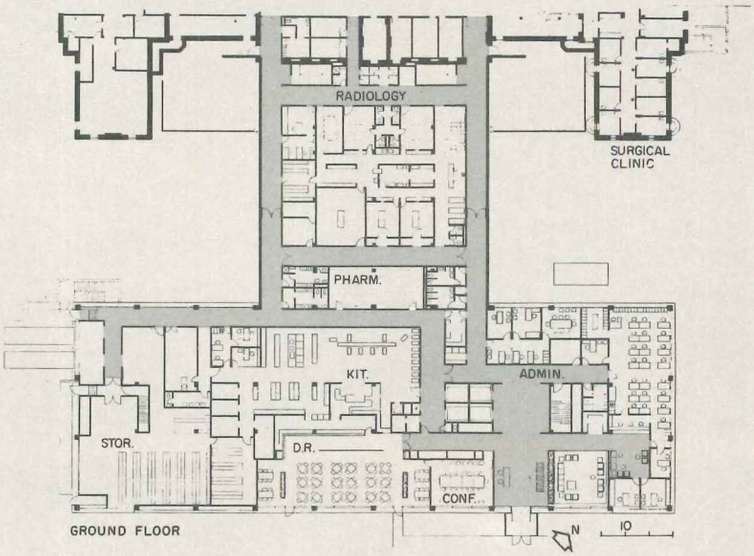




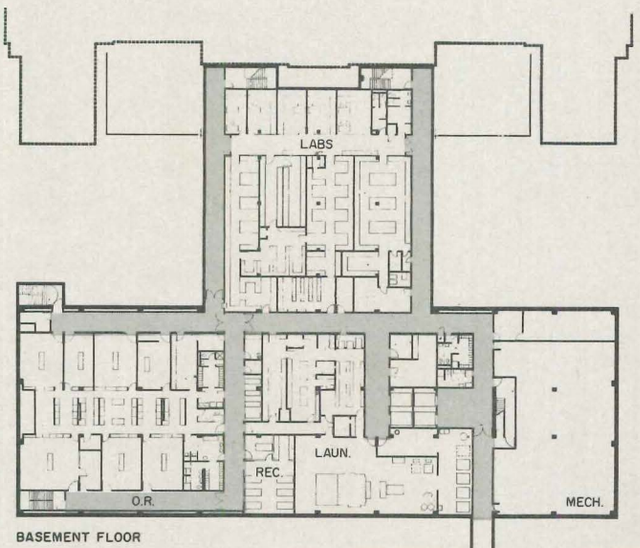
SECOND FLOOR



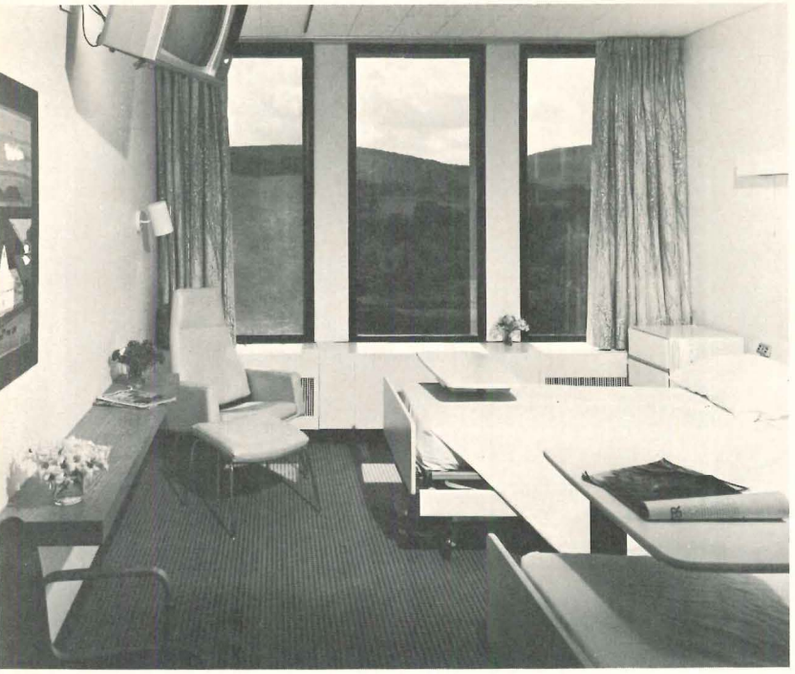
FIRST FLOOR



GROUND FLOOR



BASEMENT FLOOR



Interiors at the Bassett Hospital relate to the culture of the town and to the group practice mode of operation. The hospital has an endowment income of $1 million a year so that interiors, while not lavish, are not constrained by the struggle for money that besets many community hospitals. The reception area is semi-formal and comparatively small, since it does not have to serve as a waiting area. The hospital is nylon carpeted throughout except in technical areas. A color-coded graphics system provides red, black, and green arrows for traffic direction and the carpeting is a different color for each floor. Draperies are hand-printed white canvas. Wall panels in lobby and lounges are wood. In other areas, they are vinyl. There are seragraph silk-screen blow-ups at random throughout the hospital. Furnishings, including china and menus, were designed by the architects.

Nurses' stations are divided in two sections to accommodate doctors on one side of a low storage partition and to facilitate the teaching process. There are about 20 graduate medical students at the hospital and a training program for young doctors which is based on an agreement that gives many members of the staff a faculty appointment at Columbia University.

The 137,000 gross sq ft of the wing cost about $7 million, and the cost index of $53 per sq ft includes Group I equipment. Patients' rooms are 12.5- by 16-ft with a mix of single and double bedrooms that averages out to about 790 sq ft per bed.

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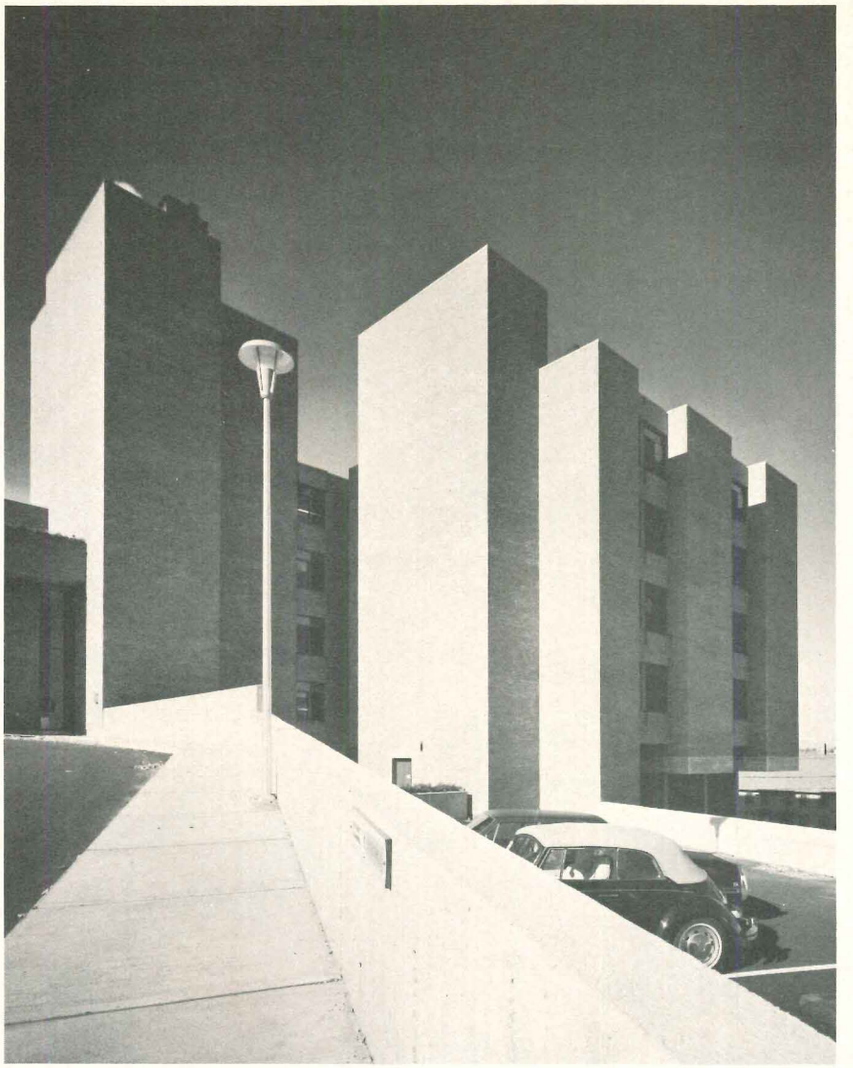
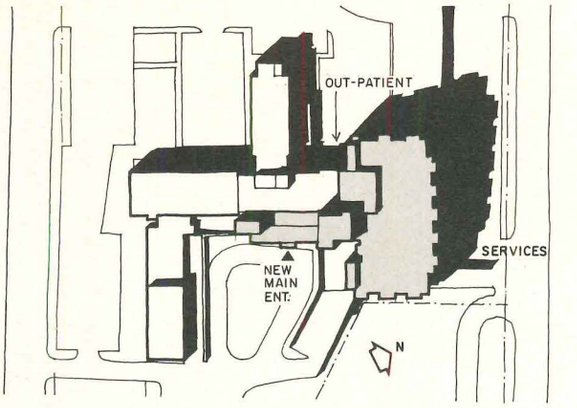
MARY IMOGENE BASSETT HOSPITAL, Cooperstown, New York. Architects: *Skidmore, Owings & Merrill*—partner-in-charge: *Robert W. Cutler;* partner-in-charge of design: *Roy O. Allen;* project manager: *Harold J. Olson;* designer: *Jacques E. Guiton;* job captain: *Paul H. Baren;* interior designer: *Jack G. Dunbar;* structural engineers: *Severud-Perrone-Sturm-Conlin-Bandel;* mechanical and electrical engineers: *Campbell & Friedland;* general contractor: *Humphreys & Harding;* hospital consultant: *Anthony J. J. Rourke.*

*Rather formal waiting and reception areas reflect the group-practice mode of Bassett Hospital's operation. In addition to main cafeteria at ground level, below, there are separate dining and social areas in the open-floor psychiatric section, bottom left, opposite, and in the second-level extended care section overlooking the plaza. Psychiatric single rooms, bottom right, avoid clinical aspect in furnishings.*

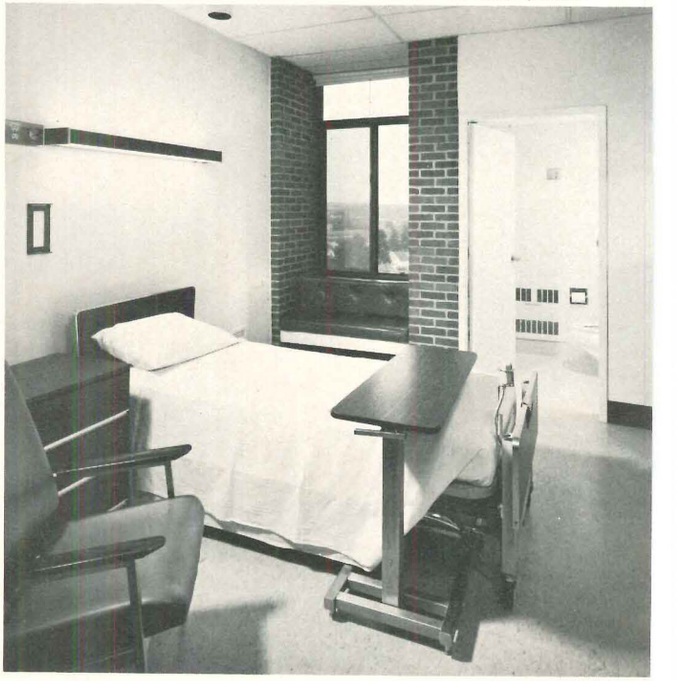


## Lakes Region General Hospital makes virtue of necessity in expansion on a hilltop near Laconia, New Hampshire. Bruce Porter Arneill is the architect




*Towers of brick over roughly formed concrete regenerate a 65-year-old New Hampshire hospital and greatly increase its capacity to handle both skiing and summer tourist peaks. A seven-layer addition on the steep north side of the site (section, far right) kept traffic sorted out while remodeling and regular patient services proceeded. Convertible single and double rooms have exterior plumbing in brick towers.*

*Bill Maris photos*



The renovations and additions to the Lakes Region General Hospital presented architects with a double problem. First, the rather undistinguished vocabulary of the existing hospital was nonetheless rigorously New England in its tone and rugged in character. Second, the hilltop site imposed constraints on simple horizontal expansion at levels that would simply extend the original three floors. The architects exploited both of these seeming disadvantages. The exterior of the new addition sustains the character of towering brick and roughly formed concrete well within the regional mode, and the sloping hillside serves as an access ramp to service and mechanical areas at lower levels.

The new addition adds space for 82 beds and relocated X-ray, surgery, obstetrics, administration, kitchen and dining areas. The task was to recreate and enlarge the hospital and keep it operational while the additional work was going on. A complicating factor was the seasonal pattern which imposes two tourist peaks (one during the winter skiing season and the other during the summer resort season) on an otherwise stable population.

The solution was to place a seven-level vertical element on the downhill side of the main service units. This solved some of the traffic pattern confusion while the upper medical levels were tied into the remodeled older building in logical sequence. Remodeling of the central existing hospital provides a new main entrance serving the new wing as well as the older.

The basic architectural approach was to restate the brick tower masses surrounding the existing building and use them functionally as vertical passages for stairs, flues, elevators and mechanical equipment.

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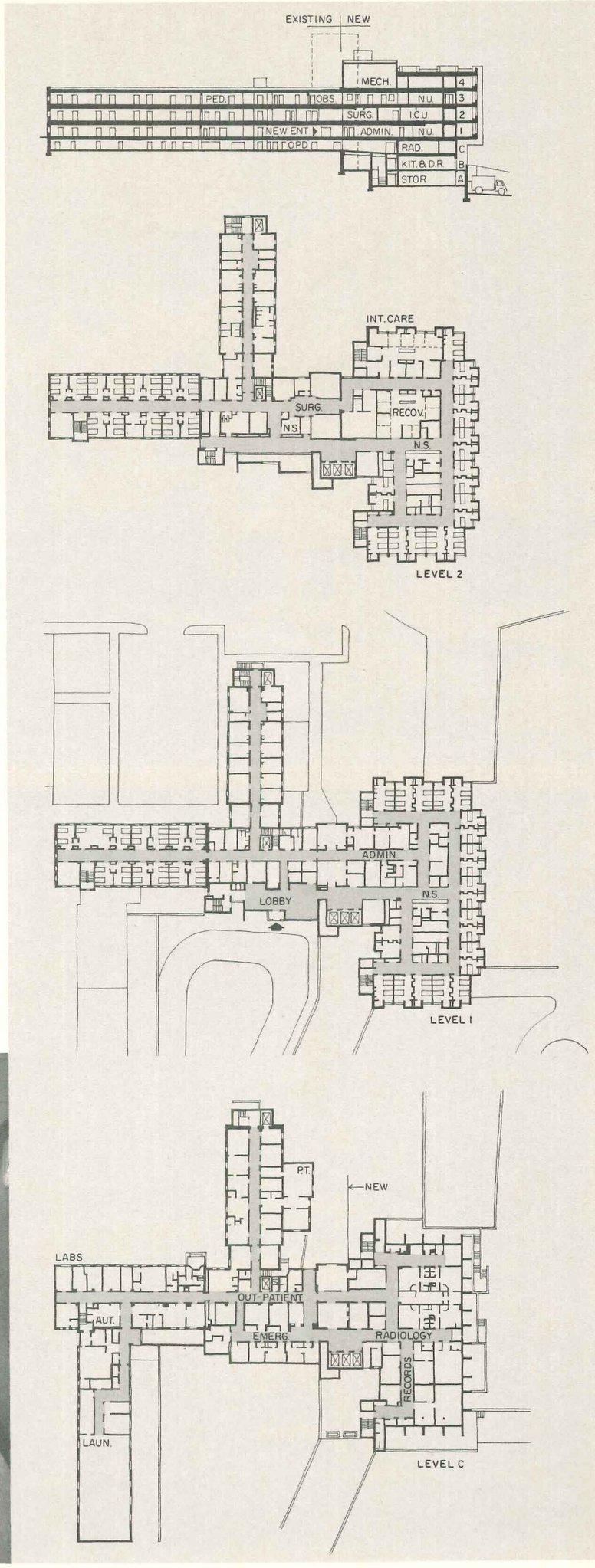
LAKES REGION GENERAL HOSPITAL, Laconia, New Hampshire. Architects: *Office of Bruce Porter Arneill;* structural engineers: *Rudolph Beiser;* mechanical and electrical engineers: *Francis Associates;* interiors: *Raymond Doernberg;* general contractor: *Harvey Construction Co.*



Gerald Ratto photos


## Dameron Hospital Addition No. 4 advances a replacement program at Stockton, California, in an inventive design for nursing areas by Rex Whitaker Allen and Associates

A new five-story addition of reinforced concrete and stucco containing 102 beds replaces some of the older existing buildings at Dameron Hospital in Stockton, California. The new addition and remodeled areas in the older buildings will include pharmacy, outpatient, emergency, intensive care, administration, central supply, general storage and housekeeping.

The problem at Dameron was to provide up-to-date replacement facilities in keeping with the character of the existing structure and its residential neighborhood and to maintain continuous operation on a rather tight site. The solution is a building of strong simple lines with bedrooms arranged in innovative clusters around indented courtyards serving to relieve the massiveness imposed by older buildings. The resulting crenelated plan expresses the bedroom cluster arrangement and also provides sun control, augmented in this hospital's climatic situation by minimum glass area and architecturally integrated vertical and horizontal sun shade panels arranged as shown at left, to shelter windows on exposed sides of the building.

The cluster plan for patient rooms provides an irregular corridor configuration with a series of vestibules that perform as work centers. This plan allows a higher concentration of beds on a shorter corridor while keeping general services centralized. Each nurses' station serves 34 beds. The bedrooms are about equally divided between single and two-bed rooms.

Cost of the new addition was $2.3 million for 55,825 sq ft.

Site plan for the new addition was constrained by the need to work around existing buildings. The new wing consists of a ground floor with below-grade courts, plus three stories above grade south of the existing buildings. A new main entrance is provided on the south side and an emergency entrance on the east side. Floors and departments are tied into remodeled areas of existing buildings.

Sunken courts at the south and east provide light and access to below grade areas and to possible future outdoor dining facilities. Future expansion will extend the new wing to the east. No additional floors will be built atop this new wing.

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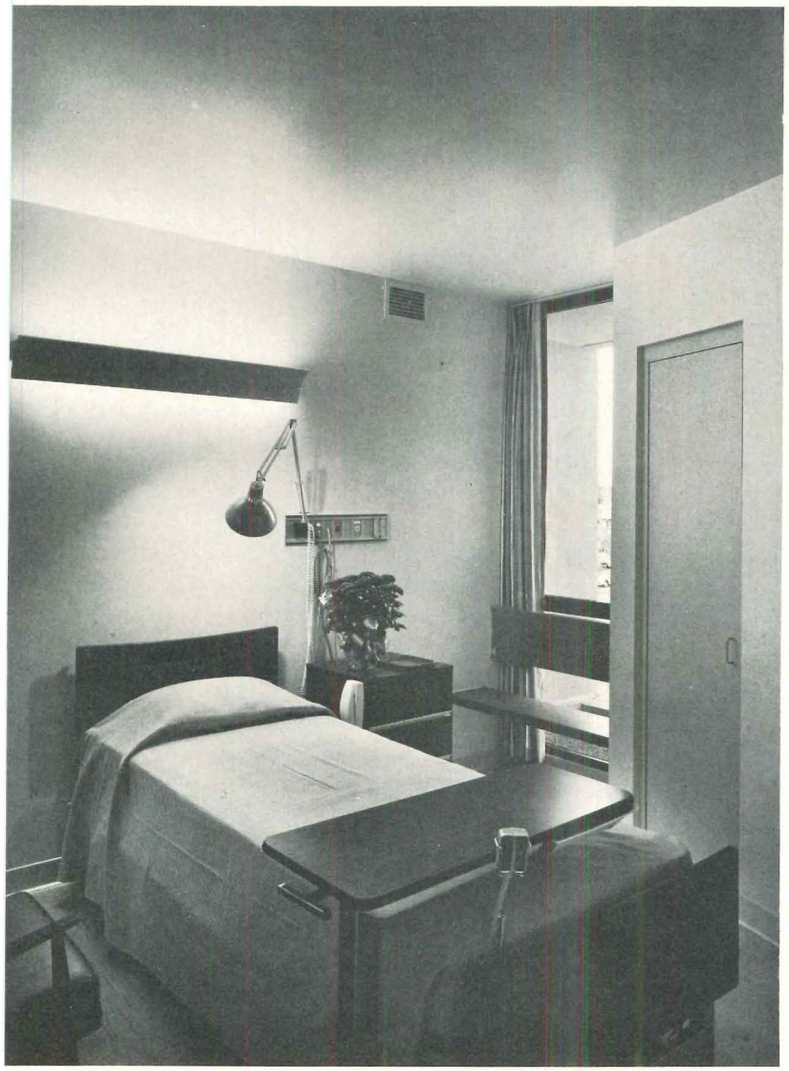
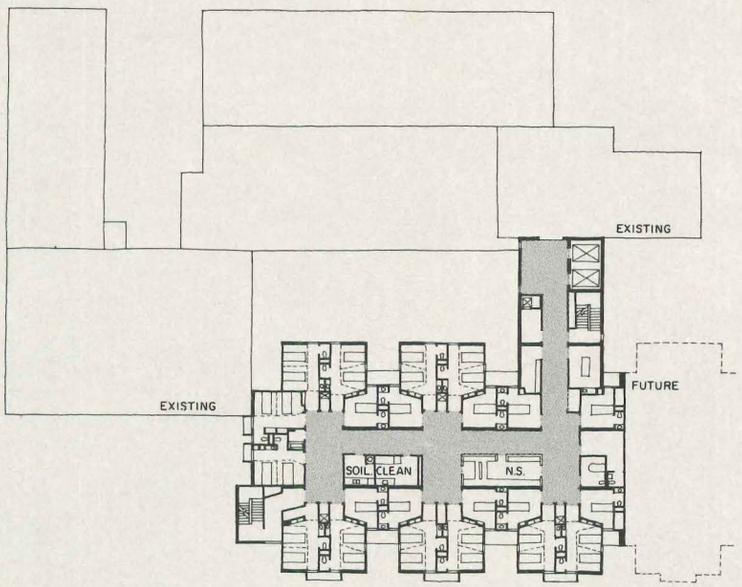
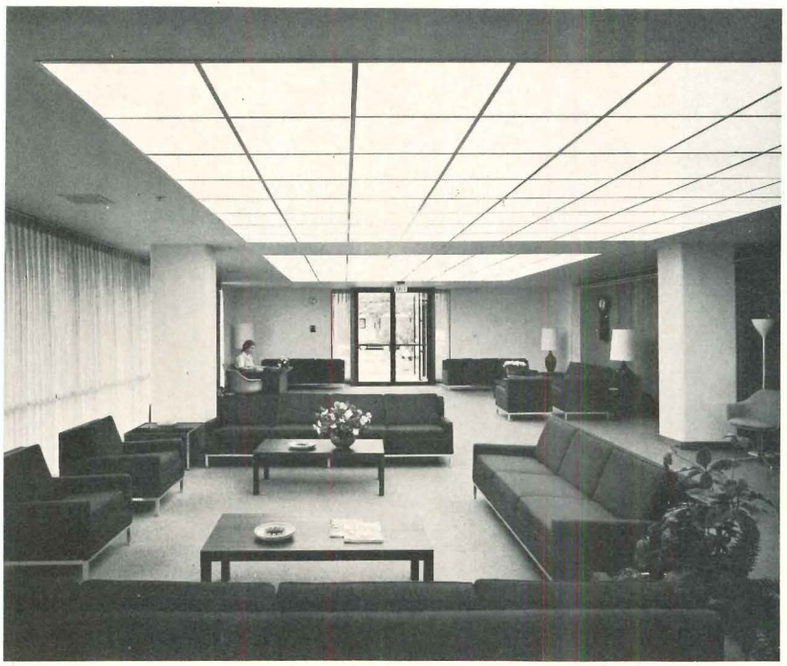
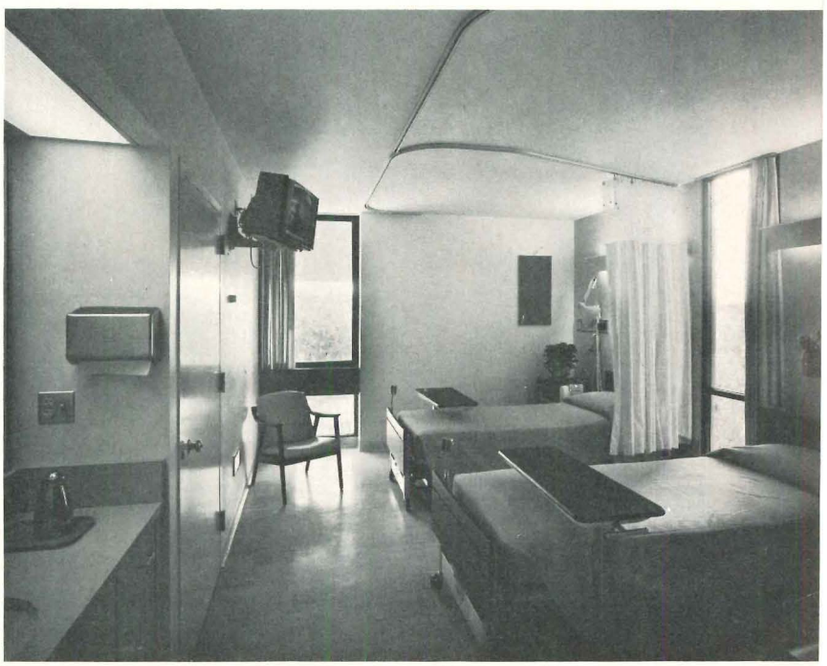
DAMERON HOSPITAL ADDITION No. 4, Stockton, Calif. Architects: *Rex Whitaker Allen and Associates*—project architect: *Roger A. Youngs;* director of design: *Mark A. Lechowski;* structural engineers: *Gilbert, Forsberg, Diekmann, Schmidt;* mechanical engineers: *Kasin, Guttman & Associates;* electrical engineers: *Mel Cammisa;* landscape architect: *Royston, Hanamoto, Beck & Abey;* general contractor: *Craft Construction Company.*



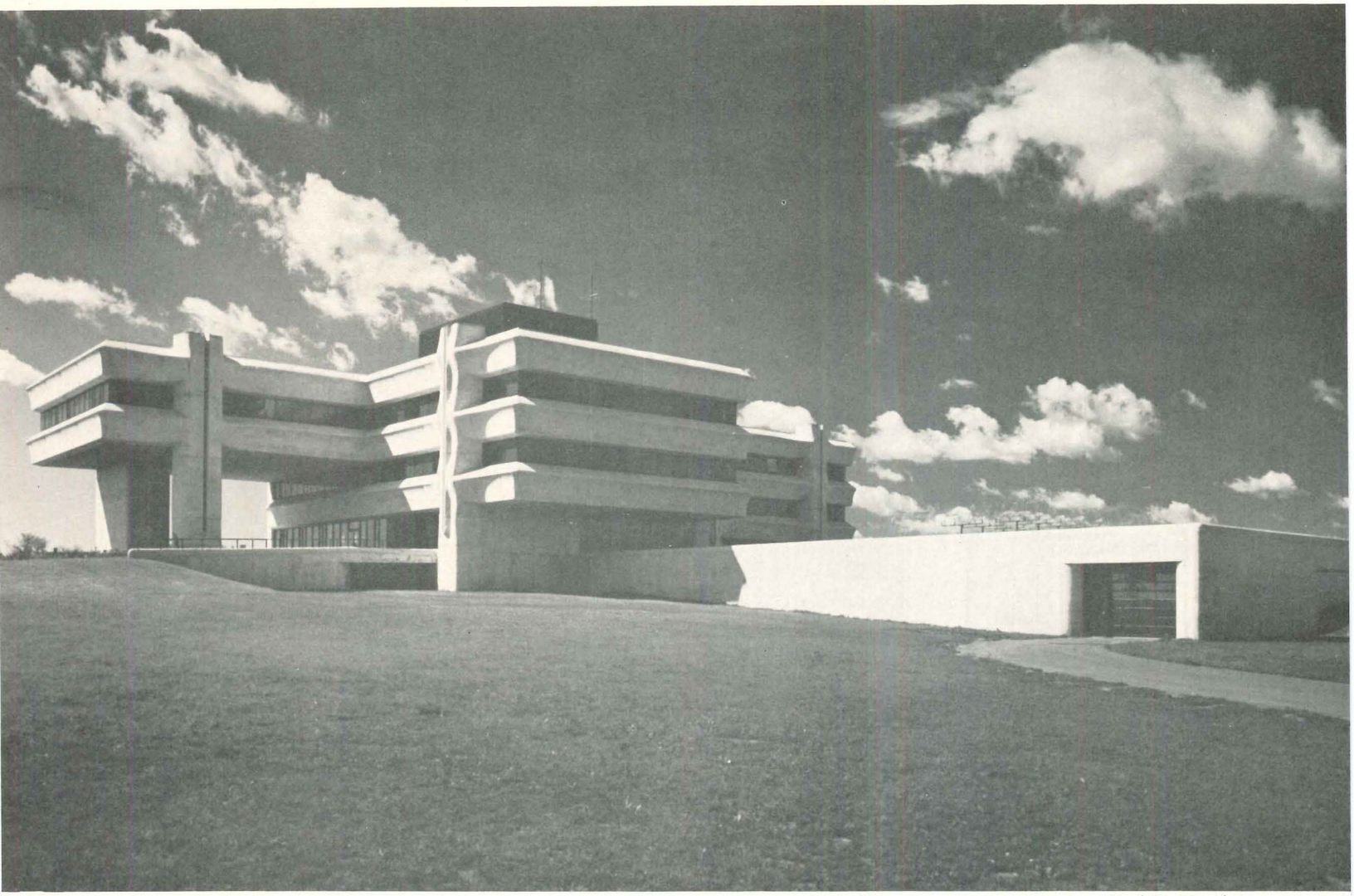
*Tied in to remodeled working areas of existing buildings, this compact interlocking arrangement of bedrooms foreshortens corridors and provides operational vestibules with good visibility and convenience of service to each cluster. Space per bed (547 sq ft) is not generous, but layout and furnishings promote efficiency and a sense of space.*



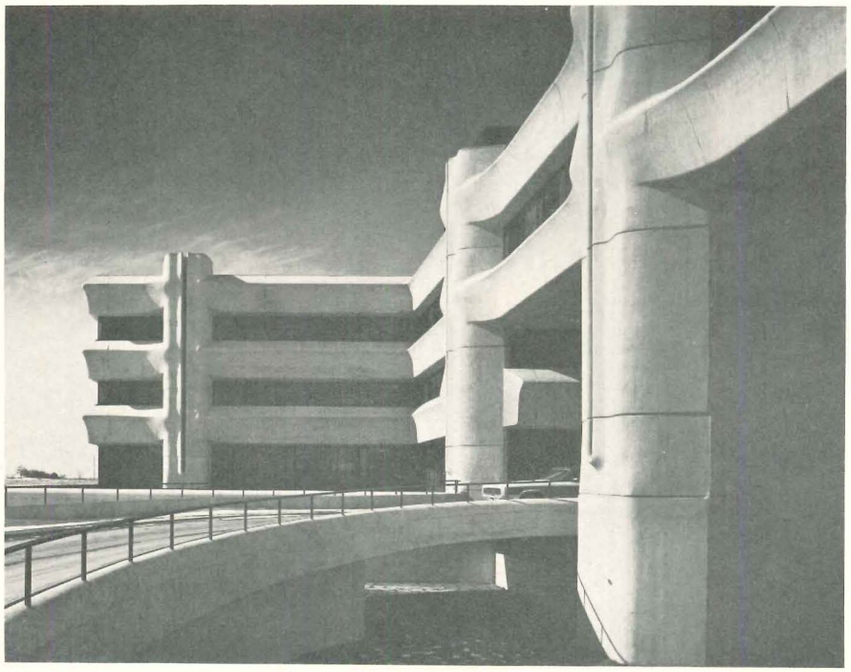



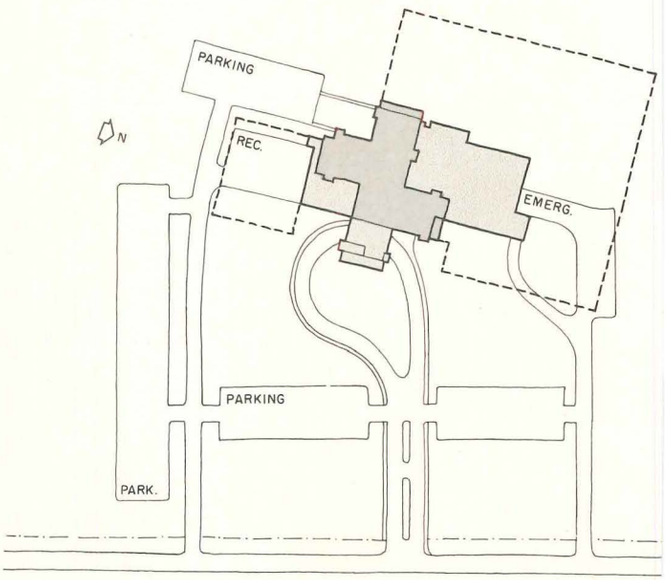


**Dr. Joseph O. Ruddy General Hospital expresses the rugged climate and terrain of Whitby, Ontario, in a molded precast concrete system designed by Craig, Zeidler & Strong**



*Panda/Croydon Photos*





"Whitby Hospital has been called a sculpture; and at a superficial glance, this may be thought to be correct; yet a building can only be a sculpture in the same way that a spoon could be called a sculpture." So says Eberhard H. Zeidler in a review of the origins of the form of the Dr. Joseph O. Ruddy Hospital in Whitby, Ontario. In a search for fluidity of form corresponding to the combined requirements of flexible program and the character of the surrounding countryside, advantage was taken of the emerging techniques of fiberglass formwork and the adaptability of repeated precast concrete components. In the use of these techniques, the architects found that the wall, the framework and the mechanical enclosures could be incorporated in one continuous skin in an expression of fluid form that would not have been possible with conventional form work.

Since this is Whitby's first general hospital, it was designed to be expanded with the least possible expense and disturbance to operation. The first stage provides beds for 100 patients with service areas designed to accommodate 150. This will permit a 50 per cent increase in beds without substantial alteration of service areas. Foundations and construction techniques were designed to accommodate an ultimate capacity of about 600 beds by vertical additions of nursing units at 64 beds per floor to a height of 10 floors. Service and outpatient areas are designed for horizontal expansion. This over-all design permits the hospital to accept the treatment and expansion demands as they occur. For example, should medical techniques so direct, the expansion of the outpatient services could be accomplished horizontally without distortion of the over-all appearance or plan of the hospital.

The hospital's lowest floor level, partially below grade, contains all service functions, including emergency, radiology and laboratory, outpatient, surgical suite, physiotherapy, pharmacy, central processing and supply. Any one of these areas can expand independently of other areas on the same floor or on floors above.

Social facilities such as cafeteria, reading rooms, shops, lounges for public and staff are grouped about and become part of the main entrance, imbuing this space with life and activity.

The roof of the ground floor extends beyond the main building core, and its surface holds a 6-in. deep reflecting pond with a fountain, both essential components of the air conditioning system. It is estimated that the pond reduces the roof's temperature in summer by 50 degrees.

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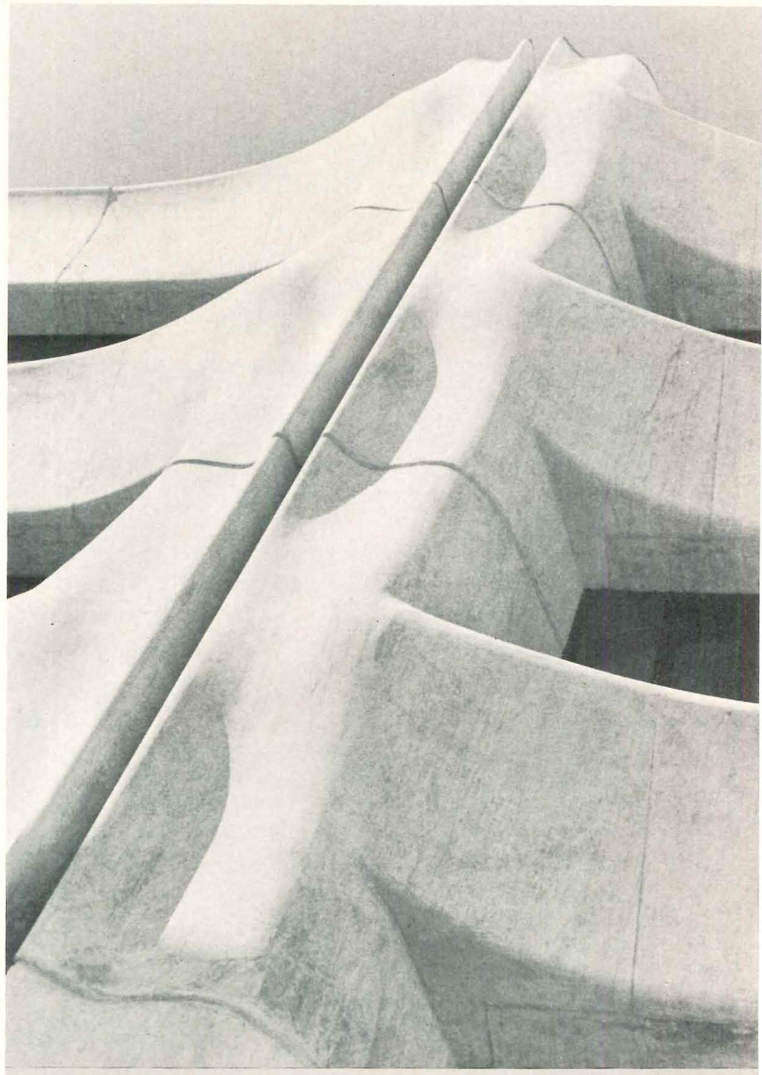
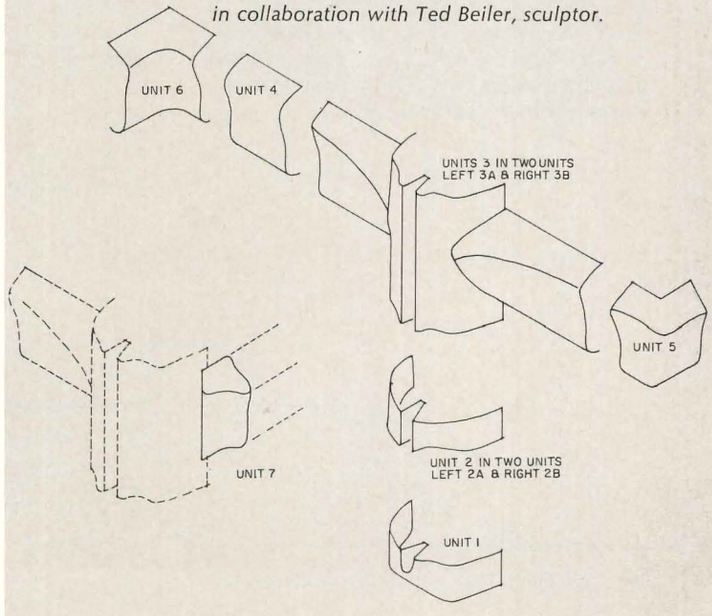
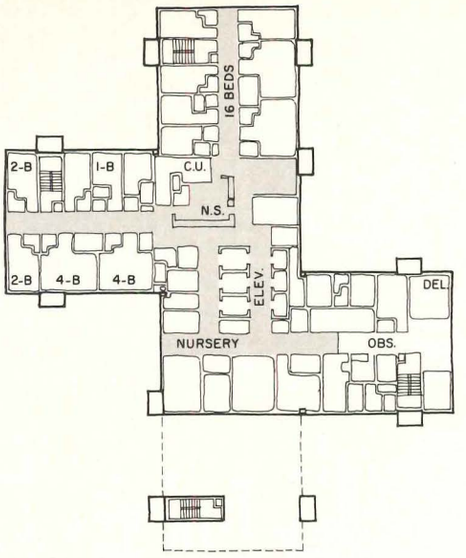
THE DOCTOR JOSEPH O. RUDDY GENERAL HOSPITAL, Whitby, Ontario. Architects: *Craig, Zeidler and Strong—partner-in-charge: James S. Craig;* structural engineers: *Gordon Dowdell & Associates;* mechanical and electrical engineers: *W. Hardy Craig & Associates Ltd.;* hospital consultants: *Agnew Peckham & Associates Ltd.;* sculptural consultant: *Ted Bieler;* general contractor: *Hurley Gregoris Construction.*

*The sculptured effect of precast concrete work at the Joseph O. Ruddy Hospital is achieved through a system of precast concrete modules formed in fiberglass-reinforced plastic molds. The structure above the main entrance level consists of a tower with 10 piers supporting perimeter beams at each floor level. The fiberglass forms for nine basic shapes will be saved for use on future additions.*

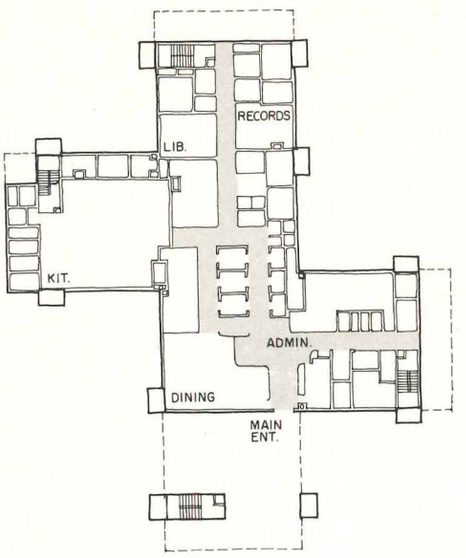


*The sketches below show approximate shapes and articulation of formed units. The curved surfaces of the fiberglass forms were manufactured by George Krier, Jr., Inc., from models prepared by the architects in collaboration with Ted Beiler, sculptor.*



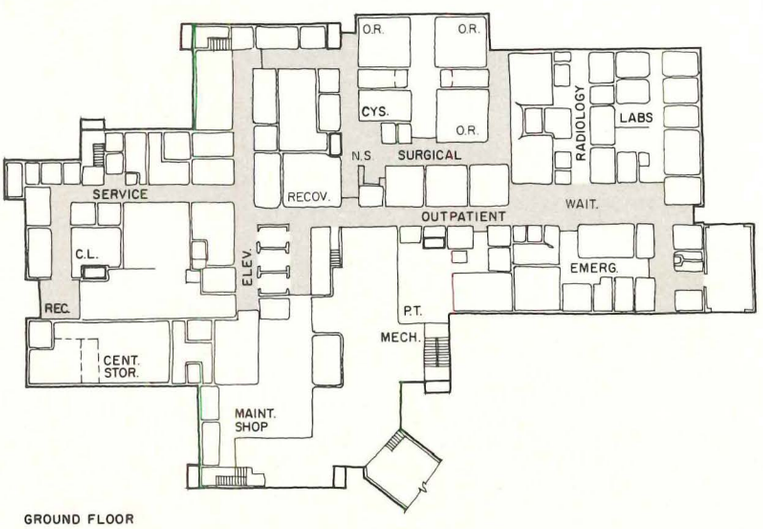



SECOND FLOOR

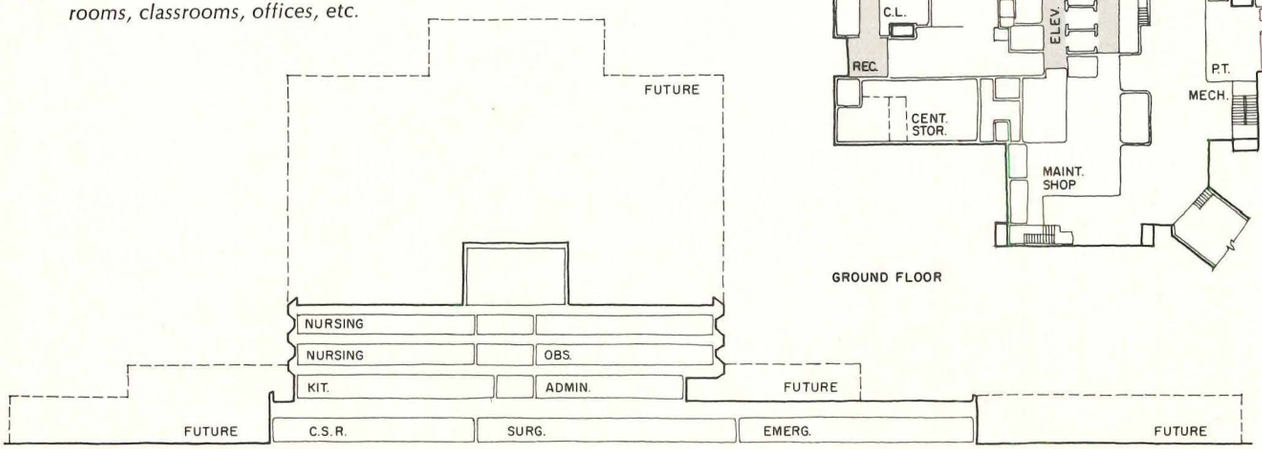



FIRST FLOOR

*The modified pinwheel shape of nursing floors reflects the same search for flexibility that is expressed in the sculptured exterior. Nursing floors are arranged with wings containing 16 to 20 beds per wing. Each pair of wings forms a nursing unit of 32 beds with a central nursing station, and an entire floor of 64 beds can be administered as one unit and serviced by mutual common rooms, classrooms, offices, etc.*




GROUND FLOOR



# THE EVOLUTION OF NURSING SPACE PLANNING FOR EFFICIENT OPERATION

*By Michael L. Bobrow, director of architectural planning, Medical Planning Associates*

Although hospital design is currently reflecting a greater emphasis on outpatient services, the inpatient care unit remains a basic element. Radical changes in the design of this unit have occurred only in the past several years, responding to new capabilities in technology, improvements in nursing care procedures, and a reevaluation of the health care delivery system.

Layout of the hospital nursing unit underwent few changes in basic plan from the 13th through the 19th centuries. It was essentially a long, open space with beds located on the exterior walls. In 1875 at the hospital for the Johns Hopkins University of Baltimore School of Medicine, some bold new concepts were studied. Compact, square and octagonal designs were developed with the beds on the exterior walls, all focusing toward the nursing station. Although the ideas and insights of these early studies did not have a general effect on nursing unit design until three-quarters of a century later, some progress was slowly made. Large open wards were looked upon with increasing disfavor. They were noisy and allowed patients little or no privacy; and it was virtually impossible to isolate infected patients.

The open ward was gradually replaced by smaller rooms off a central corridor, and nurses reconciled themselves to miles of daily walking as they went about their duties.

**Evaluation of the functional plan**

The increase in nurses' travel raised an important design question: At what point does the need for individual privacy or for added support space create too large a unit (which in turn negates the goal of a close nurse-patient link)?

At the first AHA Institute on Hospital Planning held in Chicago in 1947, architect Lewis J. Sarvis stated: "Investigation indicates that nurses spend at least 40 per cent of their time walking." A major goal in planning became that of reducing nurses' travel in order to increase direct nurse-patient contact.

In the late 1950's Thompson and Pelletier developed the Yale Traffic index, which studied traffic patterns in existing hospitals. The researchers identified 14 traffic links that made up 91 per cent of ward traffic, and they evaluated units in the light of these patterns. The limitations of that survey were recognized and well described in another study in the mid-1960's: Jan Koumans of the Netherlands pointed out as an example that, "The distance from patient room to service room is important only when this service room will be used with a constant frequency. A change of organization could make this service room disappear altogether, which will make any comparison with another nursing unit *organized along different lines* impossible. The points of contact should be chosen at the beginning and at the end of a certain kind of activity, which must be performed regardless of any change in the organization of the unit."

A more recent study of nursing unit efficiency was made by Delon and Smalley at the Georgia Institute of Technology and the Medical College of Georgia. The investigators have compiled not only frequency of travel in a typical hospital, but have interpolated a factor representing cost of employee travel time and another financial factor: the pro-rated cost of construction.

At Medical Planning Associates, (MPA), a method has been developed which does not require advanced mathematical analyses, although its results closely approximate those of the other methods mentioned. Its great advantage lies in its simplicity and convenience. It produces a useful indicator of the travel characteristics of nursing unit design. That is the distance-to-bed factor, which is simply an average of distances from work centers to beds divided by the number of beds. Centers are marked with quadranted circles in the sketches.

The method is based on the recognition of one or more "nursing work cores" as centers of nursing activity, containing the elements most frequently used and most critically needed by the nurse. Measurements from these centers of nursing activity to each bedside are tallied and averaged for comparison. In previous years a single work core often served an entire floor of beds. More recently the work core has been subdivided so as to be located closer to patient clusters and to be convenient to each nursing team. Most recent figures indicate a range of 12 to 16 patients per individual team. Indeed, in some plans currently in operation much of the support space is located adjacent to each individual patient space.

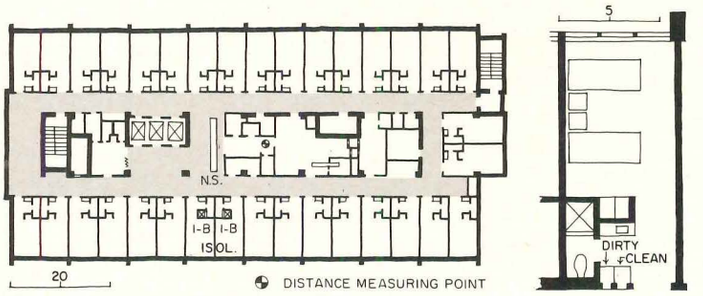
Obviously a clear recognition of each unit's organizational pattern is necessary before the evaluation can be accomplished. One of the most critical aspects is the variation in size, location, and make-up of the staff during *all* shifts. A plan with support space fully dispersed with a close patient-nurse link during the day shift might be very inefficient to operate when the night shift forces a reduction in the staff and a consequent repositioning of the nurses to a location more central to a larger number of beds.

It should be noted as well that maximum and minimum travel distances from the center of activity are as important as the average distance, because with great distance variations, patients may receive unequal nursing observation. Additionally, analysis is needed of the maximum distance between patient rooms. Therefore, the evolving goal generated from these analyses is to minimize distance—the average distance of travel, the range of distance between the nearest and farthest patient rooms and the nurse work core, and the distance between all patient rooms. Finally, there must be a recognition that these distances must be tempered by a factor relating to the number of beds per unit.

Although each of the cited unit analyses related originally to different hospitals with varying parameters, the rankings of general plan types are surprisingly consistent. The compact plan is recognized as generally superior, with one qualification: the exterior shape is far less an indicator than the internal core organization and layout. Planners have attempted many approaches in satisfaction of the goal of efficient activity patterns; the following illustrations show key points in the evolution of the concept of the compact inpatient care unit. Those for which we were consultants are indicated by (MPA) in the captions. Not shown is the typical double-loaded corridor, a standard for many years because of the need for cross-ventilation and natural lighting, but with excessively long distances between the nurses' station and the end rooms of the unit.

*Holy Cross Hospital* in Los Angeles (Fig. 1), reflecting the freedom possible with economical air conditioning and changing codes, demonstrates a far more efficient unit than the single-corridor plan created by placing the nursing support area between two corridors in what has been called the "double corridor" plan. However, the core contains a certain amount of space that is not related to nursing (in elevator space), and thus the unit is less compact than it could be. This unit shows a combination of one central work core with dispersal of some support items to each patient room to minimize traffic.

In its first phase of construction, *Valley Presbyterian Hospital* (Fig. 2) in Van Nuys, California, developed a very compact circular unit with elevators pulled out of the center and located where they could also serve additional nursing towers in the future. All 34 beds were arrayed around the nursing support space, and both the average distance and the range of distance to work core were minimized. Another means of reducing nurse travel distance was achieved by providing redundant circulation, i.e., more than one possible route from point to point.

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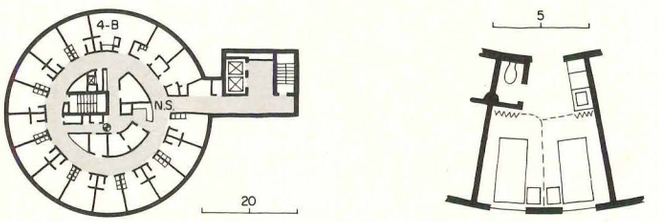
|---|---|---|---|
| BED COUNT: | 1 BED ROOM— 2 = 2 BD. | PATIENT ROOM NET AREA: | 169 S.F. |
| | 2 BED ROOM— 32 = 64 BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING SERVICES TO PATIENT BED: | 85.4 L.F. |
| | 3 BED ROOM— 0 = 0 BD. | MAXIMUM DISTANCE TO PATIENT BED: | 148 L.F. |
| | 4 BED ROOM— 0 = 0 BD. | MINIMUM DISTANCE TO PATIENT BED: | 52 L.F. |
| TOTAL: | 66 BD. | DISTANCE TO BED FACTOR: | 1.29 |
| GROSS AREA: | 17,250 S.F. | | |
| GROSS AREA PER BED: | 262 S.F. | | |
| SUPPORTING SERVICES AREA: | 2,650 S.F. | | |
| CIRCULATION AREA: | 4,605 S.F. | | |

1. Holy Cross, Los Angeles (1961). Architects: Verge & R.N. Clatworth.

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|---|---|---|---|
| BED COUNT: | 1 BED ROOM— 0 = 0 BD. | PATIENT ROOM NET AREA: | 170 S.F. |
| | 2 BED ROOM— 15 = 30 BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING SERVICES TO PATIENT BED: | 49.5 L.F. |
| | 3 BED ROOM— 0 = 0 BD. | MAXIMUM DISTANCE TO PATIENT BED: | 60 L.F. |
| | 4 BED ROOM— 1 = 4 BD. | MINIMUM DISTANCE TO PATIENT BED: | 44 L.F. |
| TOTAL: | 34 BD. | DISTANCE TO BED FACTOR: | 1.43 |
| GROSS AREA: | 7,068 S.F. | | |
| GROSS AREA PER BED: | 2078 S.F. | | |
| SUPPORTING SERVICES AREA: | 954 S.F. | | |
| CIRCULATION AREA: | 1,958 S.F. | | |

2. Valley Presbyterian Phase 1, Van Nuys, Cal. (1955). Pereira & Luckman.

A problem of working within a circle is posed by the fact that the number of patient rooms dictated by program requirements controls the diameter of the circle. It is purely coincidental when the space in the center provides the necessary square footage programmed for nursing support. However, when the bed count and the support area are in balance (as in *Valley Presbyterian's Phase 2* tower), the circular unit appears to be most efficient. In this second tower the diameter was increased from 88 to 96 feet to provide balanced support space for 19 two-bed rooms. A third tower of a larger diameter with 32 single-bed rooms (Fig. 3) has been most recently added, and all towers are served off the same expanded elevator core. No compromise in the nursing activities is caused by the removal of the elevators from the nursing core. On the contrary, efficiency in the whole hospital's operation has been maintained by means of the clear, simple circulation system while the hospital has grown from 63 beds to 360 beds in 15 years.

A rectilinear unit, such as that of *Providence Hospital* in Anchorage (Fig. 4) is much more flexible than the circular unit in terms of the ratio of patient rooms to amount of support space, because of the ease of changing the exterior dimensions on each side while maintaining the same bed count. Most compact rectilinear plans of the same period (1962) compare quite favorably in measurement analysis with the circular plans.

### The single-care room

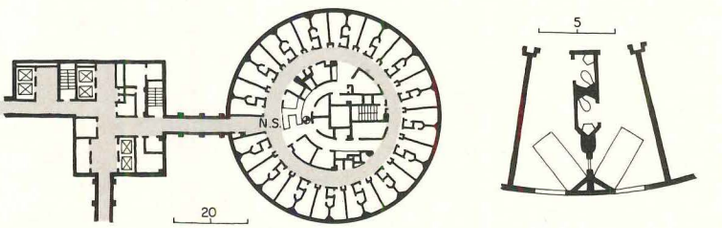
In 1920 Asa S. Bacon, then superintendent of Chicago's Presbyterian Hospital, published an article entitled "Efficient Hospitals" in the *Journal of the American Medical Association*. Bacon made a strong plea for the private room—both from the standpoint of the patient's privacy and comfort, and the hospital's objective of maximum occupancy. The serious problem of contagion, he noted, is greatly simplified, and the physician or nurse can give better examinations and take more complete histories in the single room.

Although Bacon's ideas were virtually ignored for almost half a century, the concept of the all single-bed room hospital is now becoming widely accepted. In fact, thirty-three of MPA's thirty-five current projects are being planned with all single-bed rooms for the medical/surgical units.

In addition to the advantages posited by Bacon, there are other advantages. Patients can become ambulatory earlier when toilet and shower are near at hand in the room. Any room can be used for isolation. Medication errors are reduced. Finally, the hospital realizes some very considerable economies as a result of eliminating patient moves. We have been told by hospital clients that in units with multi-bed rooms the number of daily moves averages 6-9 per day at a cost of $25 to $40 per move (in added paperwork, housekeeping, etc.).

Design of a hospital with all single rooms is not without its problems, however. If we design the single room along the lines of the conventional patient room (corridor run per room of approximately 12 feet), corridor lengths become too great, increasing both construction cost and nurses' travel distances. To overcome this, there have been various plans to overlap or stagger groups of three or four rooms around open spaces.

In planning the single room as an alternative to the semi-private room, it is possible and necessary to design a highly compact room, adequate for care but not "deluxe." Early studies showed that the room could be effectively compressed if the bed were located in a diagonal position instead of parallel to the corridor. This reduces the corridor run per room by more than 25 per cent, without compromising the function of the space. We found early that the best way of testing minimum dimensions and spatial effects was to construct a full-size mockup with movable partitions, and then conduct a trial of the equipment, personnel and procedures to be used in the actual room. In some hospitals, mockups were built as part of older nursing units to test them under working conditions over extended periods of time.

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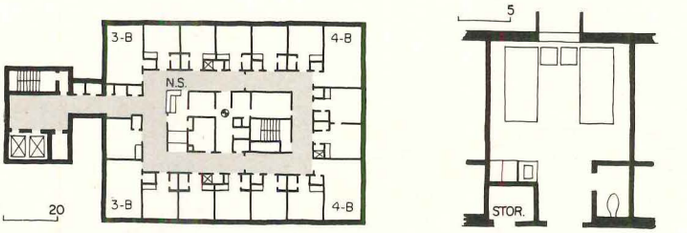
|---|---|---|---|
| BED COUNT: | 1 BED ROOM— 32 = 32 BD. | PATIENT ROOM NET AREA | 110.8 S.F. |
| | 2 BED ROOM— 0 = 0 BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING SERVICES TO PATIENT BED: | 65 L.F. |
| | 3 BED ROOM— 0 = 0 BD. | MAXIMUM DISTANCE TO PATIENT BED: | 84 L.F. |
| | 4 BED ROOM— 0 = 0 BD. | MINIMUM DISTANCE TO PATIENT BED: | 32 L.F. |
| TOTAL: | 32 BD. | DISTANCE TO BED FACTOR: | 2.03 |
| GROSS AREA: | 10,607 S.F. | | |
| GROSS AREA PER BED: | 3211 S.F. | | |
| SUPPORTING SERVICES AREA: | 1,797 S.F. | | |
| CIRCULATION AREA: | 3,146 S.F. | | |

3. Valley Presbyterian Phase 3, (1971). Charles Luckman Associates (MPA).




| | | | |
|---|---|---|---|
| BED COUNT: | 1 BED ROOM— 0 = 0 BD. | PATIENT ROOM NET AREA: | 143 S.F. |
| | 2 BED ROOM— 13 = 26 BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING SERVICES TO PATIENT BED: | 53.6 L.F. |
| | 3 BED ROOM— 2 = 6 BD. | MAXIMUM DISTANCE TO PATIENT BED: | 68 L.F. |
| | 4 BED ROOM— 2 = 8 BD. | MINIMUM DISTANCE TO PATIENT BED: | 32 L.F. |
| TOTAL: | 40 BD. | DISTANCE TO BED FACTOR: | 1.34 |
| GROSS AREA: | 8,360 S.F. | | |
| GROSS AREA PER BED: | 209 S.F. | | |
| SUPPORTING SERVICES AREA: | 1,230 S.F. | | |
| CIRCULATION AREA: | 2,384 S.F. | | |

4. Providence, Anchorage (1962). Charles Luckman Associates.

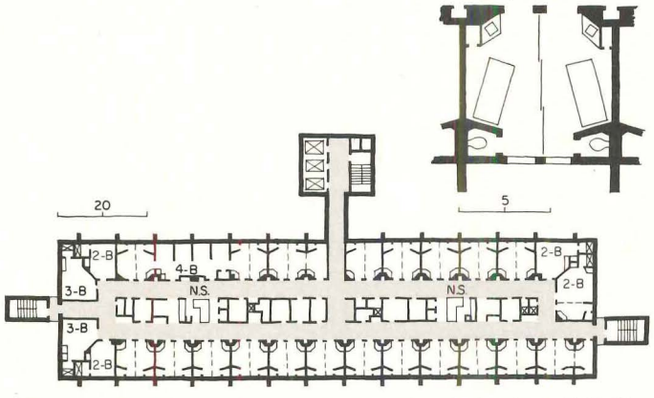
Originally some hospital people, as well as architects, felt unsure whether the public (and the insurance companies) would accept these rooms. A compromise solution, two-bed rooms divided by a movable partition, was tried at a number of hospitals, including *Paradise Valley Hospital* in National City, California (Fig. 5). Administrators now report that partitions are invariably closed (at patients' preference), and some plan to replace the movable partitions with fixed walls for acoustical reasons.

The preference for privacy was borne out by several surveys of patients. A case in point is *Providence Hospital* in Medford, Oregon (Fig. 6), one of the first all single-bed room hospitals—built in 1965. A survey was made by the religious order that operates Medford and a number of other hospitals. Ninety-two per cent of the doctors and hospital employees surveyed felt that their work was easier when patients were housed in single rooms, and 95 per cent of the patients indicated that if costs were equal, they would select a single room for any future hospitalization.

Hospitals can realize cost benefits from single rooms, and, in several, single-bed room rates are identical to two-bed room rates. A 1968 study by architect Herbert McLaughlin compared hospitals with single and two-bed rooms on the basis of the following costs: construction, furniture, maintenance, housekeeping, heating and ventilation, linen changes, and nursing. Despite higher construction costs, the unit with single rooms showed an over-all savings of $1.38 per day, assuming the very high occupancy factors possible in units with all single rooms.

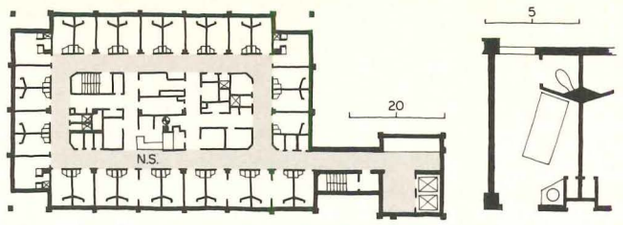
The following units show a variety of more recent solutions to some of the problems of compact nursing unit design with single-bed rooms. *Kaweah Delta District Hospital* in Visalia, California (Fig. 7), shows a successful attempt to cluster rooms and thereby reduce corridor length. This hospital has been able to create a far more open space than could normally be achieved by using movable carts in lieu of built-in cabinets. At *Centinela Valley Community Hospital* in Inglewood (Fig. 8), California, the angles of the bed and the wall are such that the patient does have a direct view out of the window.

Although it provides two-bed rather than single-bed rooms, the *Kaiser Foundation Hospital* (Fig. 9) at Panorama City is notable for several developments in the evolution of the compact unit. This design shows an attempt to remove from the center of the unit all spaces and equipment not required for direct patient care. These spaces have been relocated in the link connecting the two 23-bed units on each floor. Thus the nurses' station can be completely open, in the center of the unit, for optimum visibility between the station and the patient rooms. Although a landmark in hospital planning, it does not realize all of the benefits of the open plan, because many of the beds are hidden behind the toilet rooms.



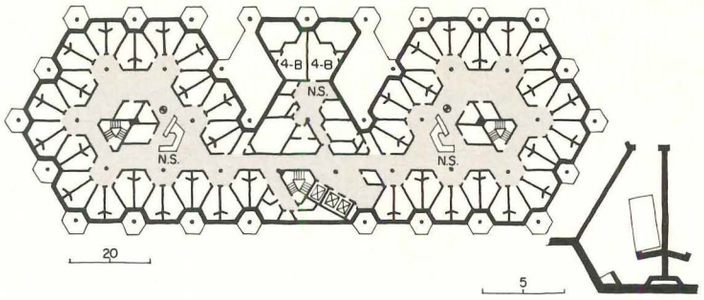

| | | | |
|---|---|---|---|
| BED COUNT: | 1 BED ROOM— 43 = 43 BD. | PATIENT ROOM NET AREA: (PER BED) | 113 S.F. |
| | 2 BED ROOM— 4 = 8 BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING | |
| | 3 BED ROOM— 2 = 6 BD. | SERVICES TO PATIENT BED | 56 L.F. |
| | 4 BED ROOM— 1 = 4 BD. | MAXIMUM DISTANCE TO PATIENT BED | 88 L.F. |
| TOTAL | 61 BD. | MINIMUM DISTANCE TO PATIENT BED | 20 L.F. |
| GROSS AREA | 16,432 S.F. | DISTANCE TO BED FACTOR | 0.92 |
| GROSS AREA PER BED | 269.4 S.F. | | |
| SUPPORTING SERVICES AREA | 2,101 S.F. | | |
| CIRCULATION AREA | 5,247 S.F. | | |

5. Paradise Valley, National City, Cal. (1966). Richard George Wheeler & Associates (MPA).



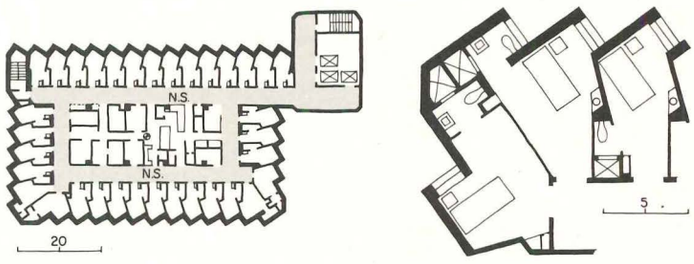

| | | | |
|---|---|---|---|
| BED COUNT: | 1 BED ROOM— 32 = 32 BD. | PATIENT ROOM NET AREA | 115.5 S.F. |
| | 2 BED ROOM— 0 = 0 BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING | |
| | 3 BED ROOM— 0 = 0 BD. | SERVICES TO PATIENT BED | 70 L.F. |
| | 4 BED ROOM— 0 = 0 BD. | MAXIMUM DISTANCE TO PATIENT BED | 100 L.F. |
| TOTAL | 32 BD. | MINIMUM DISTANCE TO PATIENT BED | 36 L.F. |
| GROSS AREA | 12,153 S.F. | DISTANCE TO BED FACTOR | 2.19 |
| GROSS AREA PER BED | 380 S.F. | | |
| SUPPORTING SERVICES AREA | 1,848 S.F. | | |
| CIRCULATION AREA | 4,470 S.F. | | |

6. Providence, Medford, Oregon (1965). Edson & Pappas (MPA).



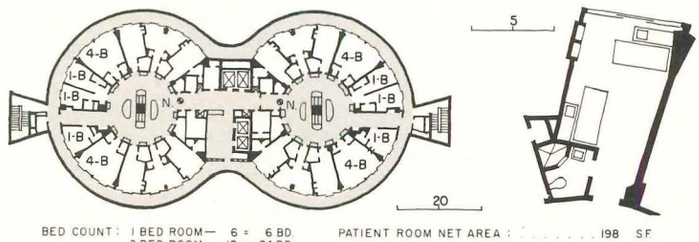

| | | | |
|---|---|---|---|
| BED COUNT: | 1 BED ROOM— 36 = 36 BD. | PATIENT ROOM NET AREA | 126 S.F. |
| | 2 BED ROOM— 0 = 0 BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING | |
| | 3 BED ROOM— 0 = 0 BD. | SERVICES TO PATIENT BED | 53.9 L.F. |
| | 4 BED ROOM— 2 = 8 BD. | MAXIMUM DISTANCE TO PATIENT BED | 80 L.F. |
| TOTAL | 44 BD. | MINIMUM DISTANCE TO PATIENT BED | 24 L.F. |
| GROSS AREA | 18,500 S.F. | DISTANCE TO BED FACTOR | 1.23 |
| GROSS AREA PER BED | 210 S.F. | | |
| SUPPORTING SERVICES AREA | 1,201 S.F. | | |
| CIRCULATION AREA | 5,349 S.F. | | |
| | | EVALUATION FOR LEFT UNIT ONLY | |

7. Kaweah Delta, Visalia, Cal. (1969). James P. Locket (MPA).




| | | | |
|---|---|---|---|
| BED COUNT: | 1 BED ROOM— 34 = 34 BD. | PATIENT ROOM NET AREA: (TYPICAL ROOM) | 117 S.F. |
| | 2 BED ROOM— 0 = 0 BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING | |
| | 3 BED ROOM— 0 = 0 BD. | SERVICES TO PATIENT BED | 62 L.F. |
| | 4 BED ROOM— 0 = 0 BD. | MAXIMUM DISTANCE TO PATIENT BED | 92 L.F. |
| TOTAL | 34 BD. | MINIMUM DISTANCE TO PATIENT BED | 40 L.F. |
| GROSS AREA | 12,342 S.F. | DISTANCE TO BED FACTOR | 1.82 |
| GROSS AREA PER BED | 363 S.F. | | |
| SUPPORTING SERVICES AREA | 1,352 S.F. | | |
| CIRCULATION AREA | 3,733 S.F. | | |
| PATIENT ROOM NET AREA (DELUXE ROOM) | 141 S.F. | | |

8. Centinella Valley, Inglewood, Cal. (1969). Welton Becket and Associates (MPA).




| | | | |
|---|---|---|---|
| BED COUNT: | 1 BED ROOM— 6 = 6 BD. | PATIENT ROOM NET AREA | 198 S.F. |
| | 2 BED ROOM— 12 = 24 BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING | |
| | 3 BED ROOM— 0 = 0 BD. | SERVICES TO PATIENT BED | 47.5 L.F. |
| | 4 BED ROOM— 4 = 16 BD. | MAXIMUM DISTANCE TO PATIENT BED | 60 L.F. |
| TOTAL | 46 BD. | MINIMUM DISTANCE TO PATIENT BED | 24 L.F. |
| GROSS AREA | 15,850 S.F. | DISTANCE TO BED FACTOR | 1.03 |
| GROSS AREA PER BED | 345 S.F. | | |
| SUPPORTING SERVICES AREA | 1,811 S.F. | | |
| CIRCULATION AREA | 7,246 S.F. | | |

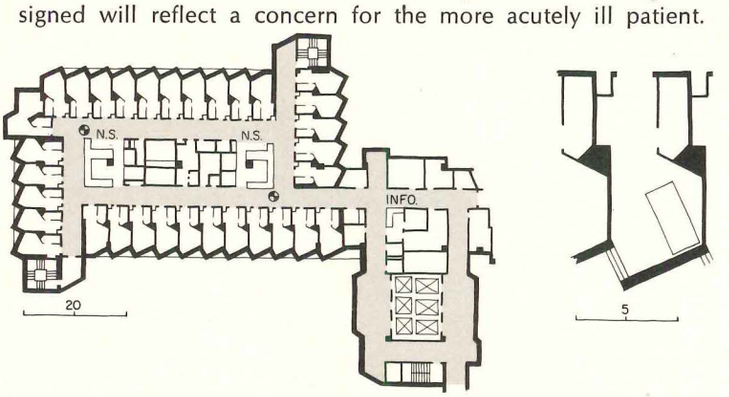
9. Kaiser Foundation, Panorama City, Cal. (1962). Clarence W. Mayhew.

A significant feature is the separation of visitor and staff traffic, with visitors routed from a control point near the elevators, around balconies on the outside of the nursing towers.

The Greater Baltimore Medical Center (not shown) is similar in its traffic separation; there the peripheral corridor is enclosed. This would not be permitted by code in most jurisdictions. Indeed, it would be hard to find areas in the country that would allow the construction again of these highly successful units. The basic argument against the open work core comes from the fire marshals, who want to minimize fire spread by removing combustible material from exit corridors. This conflict between openness for nursing-patient contact and closure for fire protection is yet to be resolved. Alternate solutions have been tried in some areas, by exiting all patient rooms to the exterior corridor and treating the nursing work core as a room, with its own means of egress. Unfortunately, we then find conflicts in the enclosure of the exterior corridor, because of the requirements for patient room windows to the exterior, or in the problem of weather in most parts of the country preventing the open corridor approach.

Modified approaches have been more successful in acceptance. Recognizing the advantages of openness, we now plan to remove from the nursing work core all items which do not need to be immediately accessible to the nursing team.

Thus we are able to improve the patient-nurse link, as was done at *St. Vincent's Hospital* in Los Angeles (Fig. 10) by placing at the center of the unit only those items which are essential to direct patient care. For a module of 16 beds—the number which St. Vincent's has established as the number which can effectively be served by one nursing team—those items include: doctors' and nurses' charting, dictation, medications, clean/sterile supply, and linen (the last three items on carts). The following items are shared between two 16-bed modules: nurses' lounge and toilet, clean/sterile supply backup, soiled utility, and a nourishment unit. And, finally, the following items are centralized to serve a 64-bed nursing floor (four modules): space for unit manager (with computer terminal), reception, nursing service office, floor pharmacy, visitors' lounge, consultation, examination and conference rooms, and tub rooms. As diagnostic and convalescent patients are siphoned away from the acute hospital to other types of facilities, the level of acuity of illness in general hospital patients rises. Therefore, it is logical that some of the more advanced nursing units now being designed will reflect a concern for the more acutely ill patient.

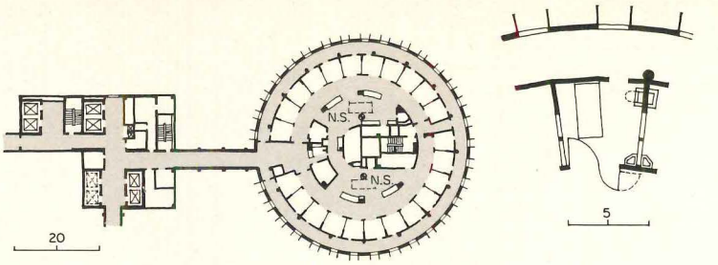



| | | | |
|---|---|---|---|
| BED COUNT: 1 BED ROOM— | 32 = 32 BD. | PATIENT ROOM NET AREA: | 120 |
| 2 BED ROOM— | 0 = 0 BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING SERVICES TO PATIENT BED: | 45.5 L.F. |
| 3 BED ROOM— | 0 = 0 BD. | MAXIMUM DISTANCE TO PATIENT BED: | 60 L.F. |
| 4 BED ROOM— | 0 = 0 BD. | MINIMUM DISTANCE TO PATIENT BED: | 24 L.F. |
| TOTAL: | 32 BD. | DISTANCE TO BED FACTOR: | 1.42 |
| GROSS AREA: | 10,643 S.F. | | |
| GROSS AREA PER BED: | 332 S.F. | | |
| SUPPORTING SERVICES AREA: | 3,128 S.F. | | |
| CIRCULATION AREA: | 2,688 S.F. | | |

10. St. Vincent's, Los Angeles (1970). Daniel, Mann, Johnson & Mendenhall (MPA).

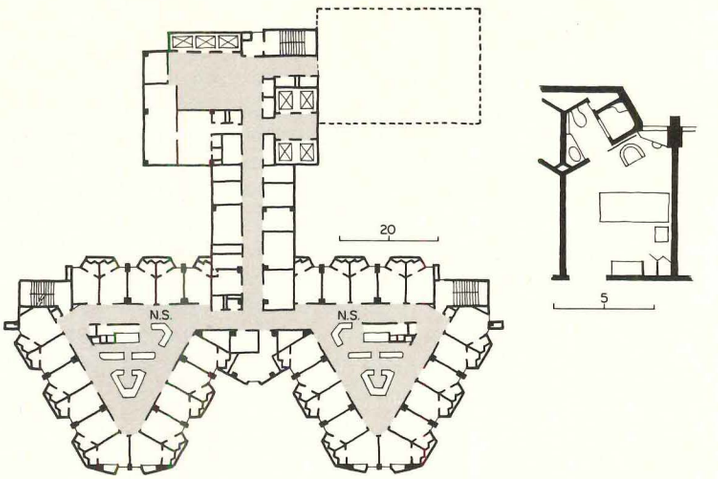
### Intensive and coronary care units

Early intensive care and coronary care units closely resembled the post-anesthesia recovery areas from which they evolved. Beds were lined up in open wards with little space between, and no provision for patient privacy other than cubicle curtains. More recent studies indicate, however, a great need for privacy while maintaining maximum visibility from the nursing station.




| | | | |
|---|---|---|---|
| BED COUNT: 1 BED ROOM— | 23 = 23 BD. | PATIENT ROOM NET AREA: | 110.5 S.F. |
| 2 BED ROOM— | = BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING SERVICES TO PATIENT BED: | 38.8 L.F. |
| 3 BED ROOM— | = BD. | MAXIMUM DISTANCE TO PATIENT BED: | 52 L.F. |
| 4 BED ROOM— | = BD. | MINIMUM DISTANCE TO PATIENT BED: | 32 L.F. |
| TOTAL: | 23 BD. | DISTANCE TO BED FACTOR | 1.69 |
| GROSS AREA: | 10,607 S.F. | | |
| GROSS AREA PER BED: | 461.2 S.F. | | |
| SUPPORTING SERVICES AREA: | 1,346 S.F. | | |
| CIRCULATION AREA: | 4,497 S.F. | | |

11. Valley Presbyterian Phase 3, ICU (1971). Charles Luckman Associates (MPA).




| | | | |
|---|---|---|---|
| BED COUNT: 1 BED ROOM— | = 32 BD. | PATIENT ROOM NET AREA: | 147 S.F. |
| 2 BED ROOM— | = BD. | AVERAGE DISTANCE FROM CENTER OF SUPPORTING SERVICES TO PATIENT BED: | 43 L.F. |
| 3 BED ROOM— | = BD. | MAXIMUM DISTANCE TO PATIENT BED: | 54 L.F. |
| 4 BED ROOM— | = BD. | MINIMUM DISTANCE TO PATIENT BED: | 32 L.F. |
| TOTAL: | 32 BD. | DISTANCE TO BED FACTOR | 1.34 |
| GROSS AREA: | 17,150 S.F. | | |
| GROSS AREA PER BED: | 536 S.F. | | |
| SUPPORTING SERVICES AREA: | 4,027 S.F. | | |
| CIRCULATION AREA: | 7,105 S.F. | | |

12. M. D. Anderson, Houston (1971). MacKie and Kamrath, with Koelter, Tharp & Cowell (MPA).

Visitors pose different problems in ICU and CCU from those in other types of nursing units. Although visitors to ICU and CCU are generally restricted to close family members, they may visit patients for a few minutes at a time, at any hour. Because of the critical nature of nursing care in these units, visitors can be a distraction to the staff. One solution is a plan that has a unit of semi-circular configuration within a rectangle. Visitor traffic and waiting areas are accommodated in the peripheral space between the curved wall of the unit and the rectilinear exterior wall.

The combined ICU-CCU in the third-phase nursing tower at *Valley Presbyterian Hospital* in Van Nuys (Fig. 11) incorporates many of the features we have discussed, including maximum visibility of all patient rooms from the central nurses' station and a separate peripheral visitor's corridor. The unit also employs plumbed, fold-down toilet fixtures next to each bed, enabling the patient to use those facilities with relative ease.

It is interesting to note that the forces which are currently coming to bear on the design of intermediate medical/surgical inpatient care units have influenced the evolution of the intermediate care unit to the point where there might be little, if any, distinction between that and the evolving intensive care unit. Indeed, the new wing at the *M.D. Anderson Tumor Research Institute* hospital (Fig. 12), as well as several other facilities currently being planned at MPA, shows this striking similarity. In summary, we see today a trend toward groupings of small, open work cores in compact form to provide close contact. A method for replacement as well as expansion of patient beds must be provided if the hospital is to be as efficient as the times demand.

# Dampers blunt the wind's force on tall buildings

**Doors have dampers to slow their closing. Cars have shock absorbers to smooth out the ride. But until now, buildings have not had engineered dampers, as such, to take out the energy that the wind pumps into a tall building. The building in point is the World Trade Center whose two twin towers each have 10,000 dampers at the ends of floor trusses.**

Today's buildings are taller, have longer spans, and are more flexible—thus they are affected more than before by the vagaries of the wind. When wind blows on a tall building it puts energy into it that, in one way or another, must be dissipated to avoid distress to the building structure and discomfort to the occupants.

The earlier skyscrapers had heavy walls and partitions that added mass and damping to the structure. Further, their facades usually had strong texture which served to create turbulence, and thus acted as a natural means of damping. The exterior walls and partitions sliding across contiguous parts used up energy by means of friction. Of course, it is still possible to utilize textural devices. For example, the U. S. Steel Building in Pittsburgh is a triangle in plan, but it has notches cut out of the corners which create turbulence when the wind blows.

But buildings have reached such heights and sizes that occasionally natural damping may not be enough. The structural engineers for New York's World Trade Center, Skilling, Helle, Christiansen, Robertson, elected to find ways to diminish not only the swaying motion from the strongest winds, but also the more average oscillations that could make maintenance costly—cracked partitions, perhaps broken glass, etc. The simple geometrical shape of the two 110-story towers was not ideal from the standpoint of creating air flows that would tend to break up vibration patterns.

First, the strong architectural expression found in the chamfered corners of the tower structures modified the generation of vortex excitation thus reducing structure motions. Next, the structural engineers found that an economical and reliable method to use up the wind's energy would be to install non-structural energy absorbers at the ends of the bottom chords of the floor trusses. The idea of hydraulic dampers (similar in a way to a door closer) was considered, but these would have had to be excessively large, and they would have been expensive. A lot of liquid would have to be moved to absorb the requisite energy.

The most promising approach seemed to be that of viscoelastic damping. As the name implies, viscoelastic materials are both viscous and elastic; they are both liquid-like and spring-like. A viscoelastic material is elastic to the extent that it will return to its original shape when deformed at moderate rates. Viscoelastic materials use up energy by resisting forces in shear. Very thin layers of these materials are very effective energy absorbers. In optimum damper design, after the viscoelastic material has been strained in one direction, the return is just slow enough to oppose the next cycle of oscillation. Most of the energy input to the viscoelastic material is not stored, but is used up, being converted to heat. A "perfect" spring, in contrast, stores all the energy and puts it right back into the object which applied the force to it in the first place.

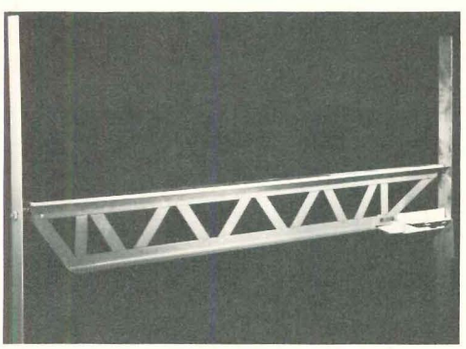
In developing a damper design for the World Trade Center, the structural engineers worked with a technical research team from the 3M Company which proposed the use of an acrylic copolymer for the viscoelastic component of the damper.

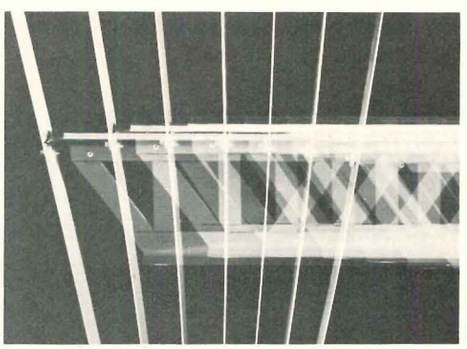
Approximately 10,000 dampers are being installed in each 110-story tower. About 100 dampers are being installed at each floor, from the seventh through the 107th.

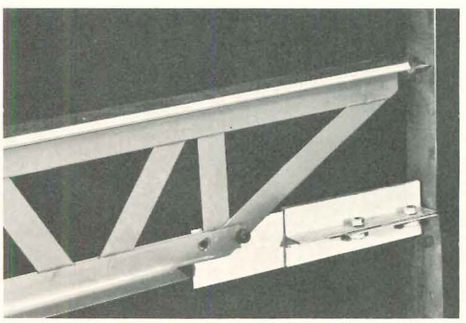
The damper is composed of three steel elements, two 4-by 4-in. tee and one ½-in. by 4-in. bar between which are sandwiched two viscoelastic layers—0.050 in. thick by 4 in. by 10 in. These layers are epoxy bonded to the steel. One end of the bar extends beyond the bonded area for attachment to the bottom chord of the truss, while the coped ends of the two tees extend in the opposite direction for bolting to a seat on the column.

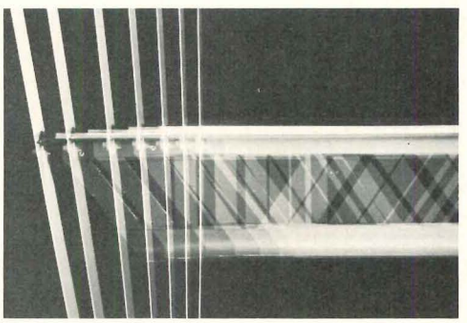
When the building is "excited" by a gust of wind the dampers either extend or shorten. The dampers move only a few thousandths of an inch, but are designed for as much as 0.02 in. movement. The dampers must dissipate at least 300 in. lb of energy per cycle at maximum deflection.

The structural engineers chose the bottom chord location for the dampers because it offered a "large" (relatively speaking) available displacement. Further, it caused no physical interference with any of the other building components. The dampers could not be too stiff, or the wind forces would have resulted in undesirable flexural stresses. On the other hand, if the dampers were too weak, the energy absorbing properties of the dampers would have been considerably reduced.





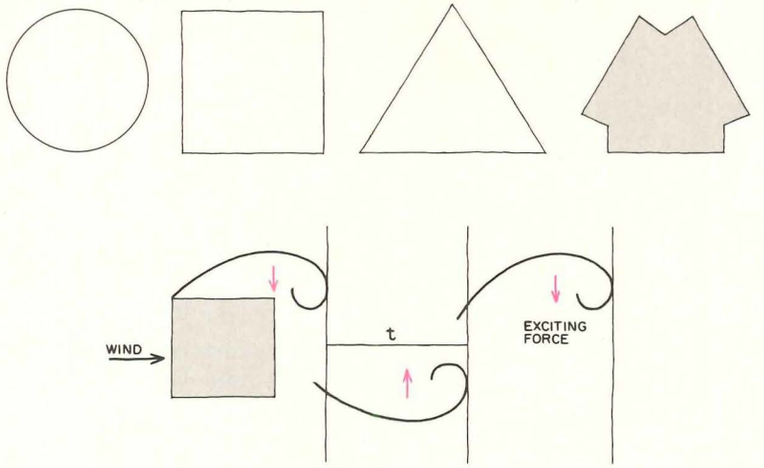


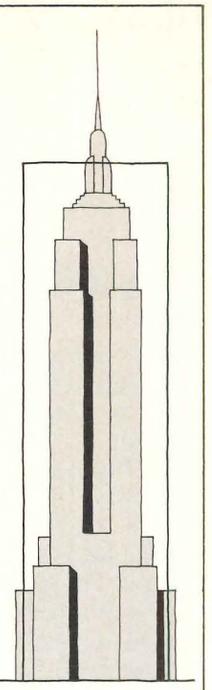


This model simulates the effect a damper has on diminishing the oscillation of a structure that has been set in motion by the force of the wind.

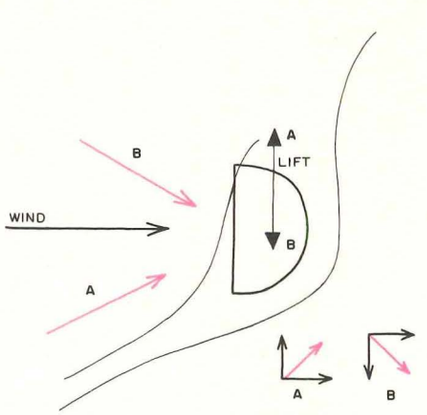
When the frame is undamped (top), the energy is only slowly dissipated, so the frame swings farther to the right than when it is damped (bottom).

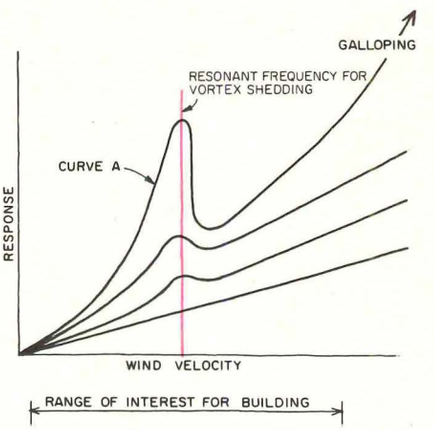
## Wind effects: the one-two punch



Regular building shapes, in plan, are subject to vortex excitation which tends to move the building transversely to the direction of the wind. This tendency is minimized by making the building irregular in shape or by giving it a highly textured façade (of some scale).



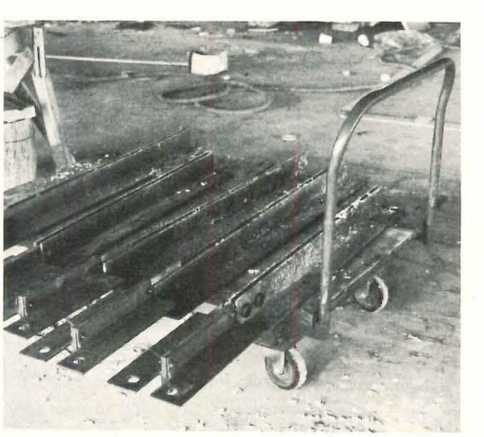

The galloping phenomenon is generally associated with transmission lines coated with ice. The wind creates both lift and drag. Because of lift, the body first sees the wind from direction "A" and then from direction "B".
The graph, right, plots building response versus wind velocity. Without any damping the plot would be like curve A. With damping added, the effect of vortex shedding is decreased with each increment of damping. At a certain wind velocity (generally not a condition experienced by buildings) galloping starts.

The elastic restoring force of a strained viscoelastic material results from the distortion of chemical bonds and the decrease in the number of possible conformations due to uncoiling of polymer chains. The viscous resistance to deformation is due to the liquid-like drag which the chain segments encounter as they move relative to each other. The type of viscoelastic material used in the World Trade Center dampers lends itself best to constrained layer or interlayer damping because it has more damping per unit volume than other damping materials, and because of its bonding capabilities, either through inherent tackiness or through ease of bonding with epoxy adhesives. The materials are somewhat temperature-sensitive in terms of efficiency of energy dissipation. Exhaustive tests were run on sample dampers and on production dampers at the 3M Company and at the Massachusetts Institute of Technology to find out what happened to the heat. Actually only a minute temperature rise (measured using thermocouples) took place in the material as it was strained in the testing machine. The heat was quickly dissipated by the steel plate and the tees. Further, in actual use, the dampers will be in a controlled temperature environment within the building—they won't get the hot summer sun, nor the cold winter wind.

For measurement of the physical performance of the dampers—i.e., their efficacy in dissipating energy—a graphical plotter was used to draw the graph of load versus extension. The plot is in the form of a hysteresis loop, the area of the loop being a measure of the energy dissipated (see picture of actual graph page 158).

### Four kinds of damping wind down the wind's energy in buildings

There are four major kinds of damping associated with building structures: 1) material damping from the structural frame, 2) damping from partitions, exterior walls,



Approximately 10,000 dampers are being installed in each 110-story tower of the World Trade Center. A damping unit is comprised of two tees and a plate between which are bonded two layers of 0.05-in. viscoelastic material. One end of the bar is attached to the bottom chord of the truss; the ends of the tees are bolted to a seat fastened to the column. Dampers were custom designed and fabricated to the structural engineers specifications.

etc., 3) aerodynamic damping, and 4) added damping.

Material damping intrinsic in the structure itself is usually very small; perhaps a fraction of one per cent of critical damping because structures, basically, are very elastic. (See drawing, page 158).

Damping found in non-structural elements results from sliding of materials, one past the other, as buildings move. Examples are: the movement of the glass wall in its rubber edge; the friction of partitions as they slide; the cracking of non-structural parts, such as masonry shaft encolsures.

Aerodynamic damping is very much associated with the shape of the building. Irregularly shaped buildings have higher aerodynamic damping than smooth, uniform shapes. Some have negative aerodynamic damping; that is, they not only do not damp oscillations, they enhance the tendency to oscillate.

Excitation results from various phenomena, one of these being vortex shedding. Excitation also is manifested in the galloping phenomenon which commonly occurs with conductor lines. Because of drag and lift, oscillation is increased.

A wind force on a body (particularly one of oblong shape) moving in a given direction may produce a lift force, just as a lift force is created on an airplane wing or a boat sail. If the wind tends to push the body in the direction it is already moving, then the body travels farther and faster. And if the lift force further increases, the body tends to move still faster. Then if the process is reversed it will oscillate, or gallop, as high-voltage lines do.

Vortex excitation is different. Vortex excitation results from the shedding of vortices in a periodic relationship—with the shedding frequency being dependent on the shape and size of the building. If this frequency happens to be near the natural frequency of the structure, then it will oscillate back and forth transverse to the wind flow.

The fourth kind of damping is induced or added damping. This is utilized sometimes in aircraft and other kinds of structures. It is used all the time for door closers and automobile shock absorbers, These are basically added damping systems. You could let the door slam, relying on the intrinsic damping that comes from the hinge and various other things, or you could add something in. This is what is being done in the World Trade Center.

The damping system involves a structure which is separate from the basic structure of the building. All the dampers could be taken out and the building would stand there; people could live in it and work in it without difficulty. But without dampers, some people would perceive building motion during periods of high wind.

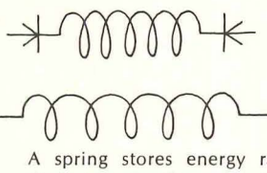
### High buildings need damping so the wind won't bother structures or people

Why damping in the first place? The reason is, if you make a plot of the dynamic component of structure response (not the steady state component, which damping does not influence at all) on the vertical axis against the velocity of the wind on the horizontal axis, you get a kind of monotonic increase that corresponds to velocity—generally not logarithmic but monotonic (see page 156). And the slope of this curve is related to the amount of damping. The more damping, the flatter the curve. The less damping, the higher the curve. This dynamic motion is a sum of phenomena mentioned earlier, galloping, vortex shedding, and so forth.

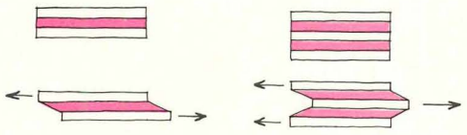
The picture is confused by the fact that over the height of the building, the wind velocity changes. So, the excitation comes at many frequencies, at many levels. And, further, if the building is irregular in shape, you get an additional complication of these exciting frequencies.

There is not any single velocity that a building sees. It's a jumble of excitations—

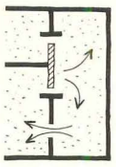
## The principles of damping devices



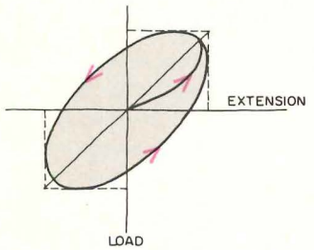
A spring stores energy rather than dissipating it; thus, a spring cannot act as a damper. Once a restraining force is removed, the spring pushes out with the same force.



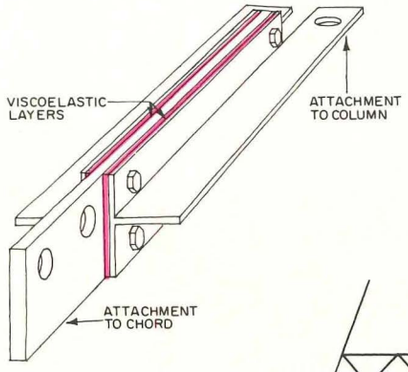
Viscoelastic materials work well as damping media because energy is dissipated as the materials are strained in shear. Because of their elastic nature, they will return to their original shape in time.



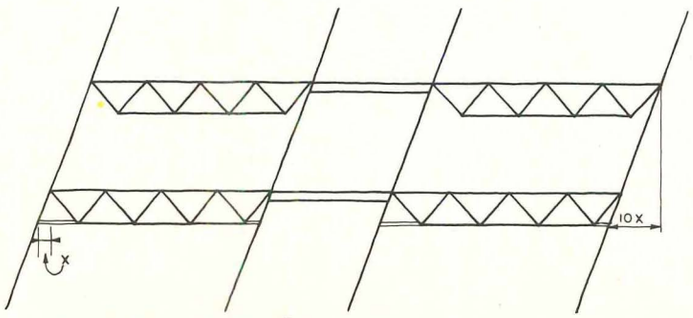
A dashpot often is used as a damping device, but the liquid obviously has to be confined by a container. Further, it is less efficient for its size than a viscoelastic damper.

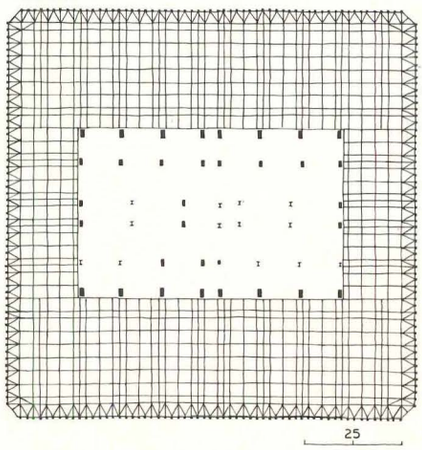



This is one form of the classical hysteresis loop. A spring would have followed the straight line. But the viscoelastic material uses up energy. The measure of the dissipated energy is the area of the loop.




The sketch below illustrates the action of the dampers. When the wind blows on the building in one direction, the dampers extend on one side and shorten on the other. Ordinarily the damper elements move only a few thousandths of an inch. In doing so the viscoelastic material absorbs the energy input of the wind, and dissipates it as heat. The dampers are a part of the secondary structure rather than the primary structure, to avoid the problem of "plastic" hinges.



turbulence induced, galloping induced and vortex induced—which generally prevents the "pure" response shown in curve A of the graph on page 156.

There is a critical wind velocity which, blowing uniformly, would produce the greatest dynamic excitation and tend to produce a peak response. Damping tends to level that peak out. Damping of all kinds tends to level it out. Aerodynamic damping, particularly, tends to make it very broad because of the fact that aerodynamic damping comes also where the velocities are highest.

If a building does not have enough damping, a high dynamic response may result. High dynamic response can mean several problems; it can mean the total response (deflection, acceleration, stress, etc.) is high. If the total response is high, the building must be designed for a greater excursion and, consequently, higher stresses in all the pieces. Further, all the architectural finishes (cladding, partitions, etc.) have to be detailed to accommodate the greater extreme. So, one aspect of damping is that excursion is reduced.

The other is that the perception of people to that motion is reduced. It is interesting that for a given shape of building, given size, and given wind environment, there is almost nothing that will reduce acceleration except to add damping or to add mass. Increasing the stiffness reduces the excursion, but you have the same level of acceleration along with the lower excursion because the frequency goes up. And also as the frequency goes up, people are, at least marginally, more sensitive to that motion. People are more susceptible to the higher frequency motion than the lower frequency motion. Why? Because higher frequency motion has a higher rate of change of acceleration. The rate of change of acceleration is perhaps more of a factor in perceiving motion than acceleration itself.

When the stiffness of a building is increased people become more sensitive to the acceleration. So you come back to only two things that are really available—damping and mass. But mass is very expensive. The logical vehicle the designer should search for is the kind of damping that is free. And the best kind that is around is aerodynamic damping. Considerable aerodynamic damping can be achieved by doing many things that architects like to do. For example, you can cut out the corners and get increased aerodynamic damping. Building shapes can be compared for their relative response.

Partitions add stiffness and they add damping. This is not a linear kind of stiffness however. Non-linear stiffness means damping. On the older buildings a lot of stiffness was available from partition systems as well as mass and damping.

The adding of damping, which is measurable, reliable and which, so to speak, can be designed into the structural system has obvious advantages. The ways available for adding damping are not very many.

Damping devices can be used in trusses, or girders, or beams, or almost anywhere there is relative motion between pieces.

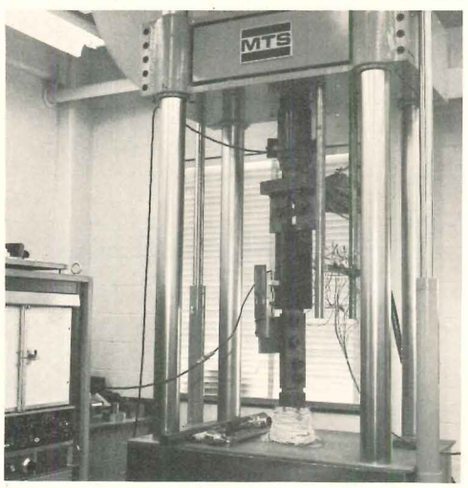
The wind can blow and blow at a given velocity for hours—not for seconds, portions of minutes, but for hours. Energy just keeps pumping into a building like soldiers walking across a bridge—they just keep pumping energy into it. But if the wind keeps putting energy into a building with insufficient damping, eventually the point is reached where it is oscillating too much.

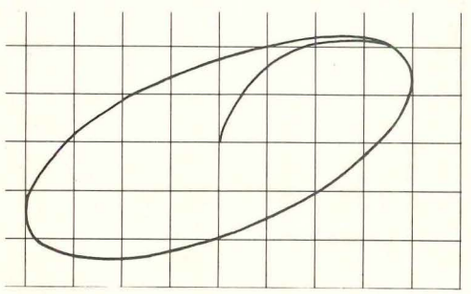
The amount of energy that goes out (i.e., dissipated) has only to do with the amount of damping in a building—that is what damping is. It is the using up of energy of oscillation. If there is not enough damping, then the building sway will be out of bounds and the structure will start moving to the yield point. Then damping will come not from controlled sources but from uncontrolled sources, and fatigue, bent structures or other permanent damage will result.

### Floor vibration can be damped using engineered materials

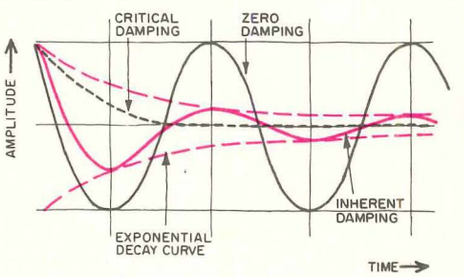
Another promising use for dampers is for floor vibration. There are three parameters to work with. First is the mass of the floor. It can be designed heavier. Second; it can be made stiffer—usually by deepening the floor to get the desired stiffness. When the floor is stiff, vibrations still exist, but they are of sufficiently low magnitude. Third, damping can be added.

If the designer is dealing with, say, a mezzanine in a store, the addition of depth could be very very costly because it would influence the whole building, not just the mezzanine. So the designer might very well find it economical to put damping into the floor. Damping doesn't prevent vibration. But, importantly, what it does is reduce its amplitude as quickly as possible.

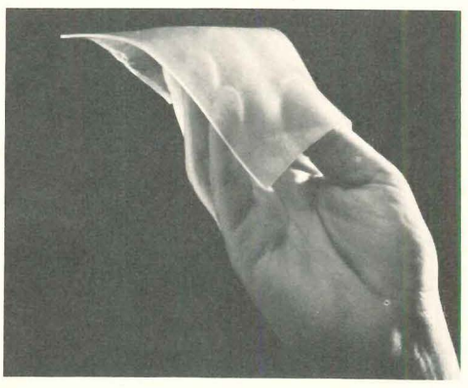


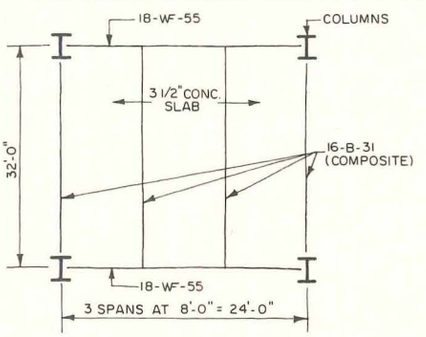
A trace of an actual "hysteresis-loop" plot made by the graphical plotter connected electrically to the testing machine shown at top.



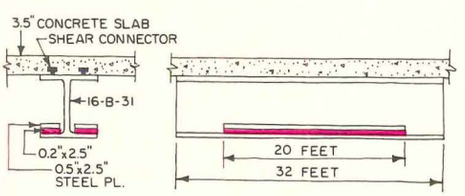

**FREE OSCILLATION WITH VARIOUS DAMPING RATIOS**
With no damping a body will continue to oscillate at the same amplitude. Increased damping decreases the amplitude. With critical damping, the structure stops before one cycle.



Sample of the viscoelastic material used in the World Trade Center dampers. Note how limp it is, conforming to the shape of the person's hand.




This is an example of viscoelastic material being used to control the vibration of a light structure used for a mezzanine in a store. It was applied to the bottom flange of the steel beam, and then a constraining layer of steel was put over it to make the material work more efficiently in shear. Dampers *do not prevent* vibration, but they do reduce its amplitude.

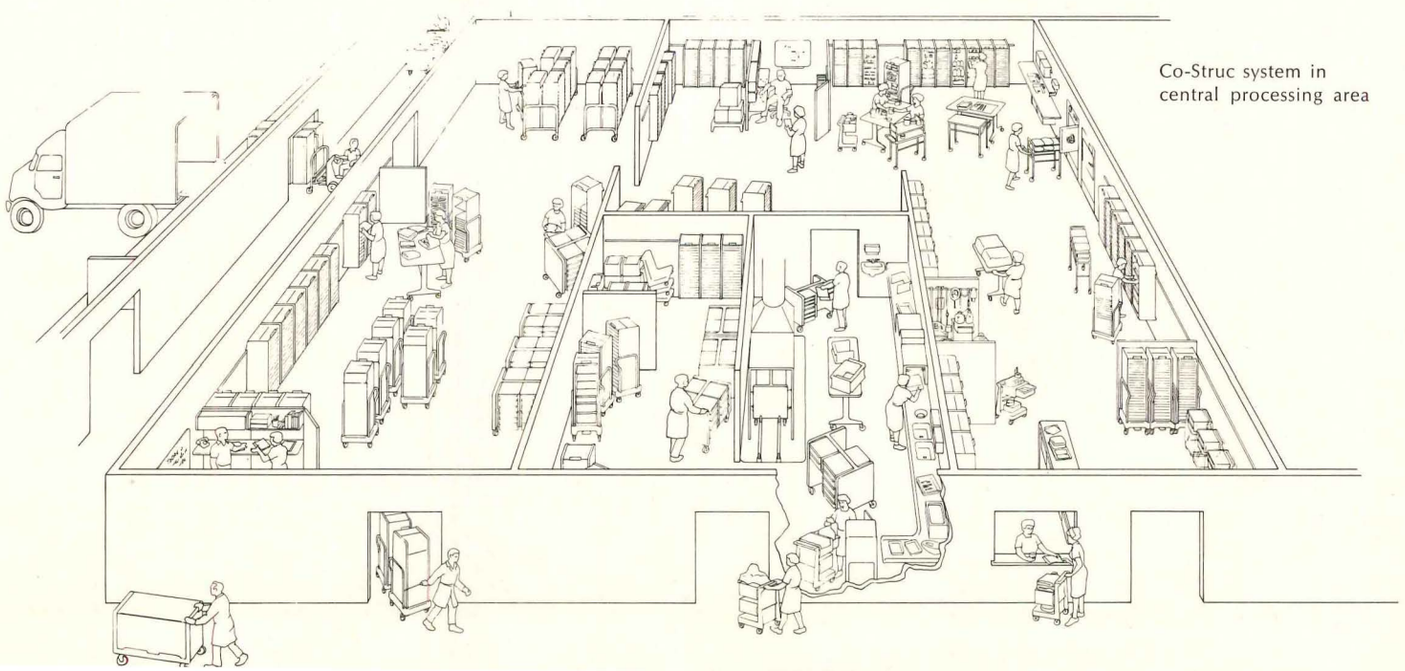


# A system of coordinated containers, frames and carts for hospitals

An integrated system of components has been designed to solve some of the most aggravating problems of hospital furnishings and maintenance. These problems include the increasing danger of cross-infection as employee/patient ratios and the general level of personnel training have declined. Obsolescence of furnishings and equipment also compound the problems of clutter and inefficiency so apparent in many older hospitals.

If hospital furnishings were designed to be readily removable, renewable and cleanable, with interchangeable modules of various characteristics for adaptation to the multiple uses to which hospital equipment must respond, the general level of appearance, utility and cleanliness in hospitals could be raised and continuously renewed. That was part of the reasoning of Robert L. Propst when, as director of research for Herman Miller, Inc., he began 10 years ago thinking about the basic characteristics of a system of furnishings that could combine all those desirable characteristics at an economical cost.

It was not enough, Propst reasoned, to think of individual pieces of specialized equipment, however well-designed and efficient they might be in their particular roles. In order to attack the central requirements of sanitation and easy adaptability, the research of hospital functions and procedures had to find common

Co-Struc system in central processing area

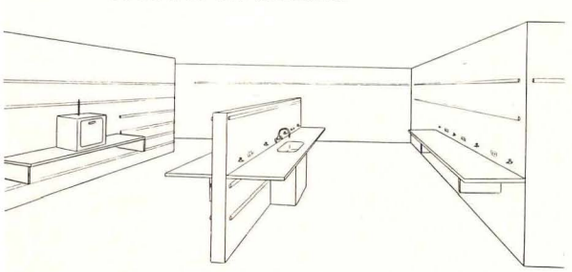
grounds of scope and utility that could be translated into a system of sterilizable and durable components. Such a system would also need acceptable esthetic qualities of color and finish. The result of this research, having been tested in the field, is now ready for introduction to the national market. It is called the Herman Miller Co-Struc System.

The name of the system reflects the idea of coherent structures for various but interrelated uses, producing improved overall results by their effective presence throughout the institution. Physically, it is a system of containers, frames, carts and wall-mounted rails that coordinate the architectural and service functions of the hospital. Basically, components of the system come in three general orders of size and usage. One is a cabinet of closet size (shown at right), another is a transportable container sized suitably for laundry or waste disposal. The third is of bedside-table size that is adaptable for drawers of various depths and can be readily disassembled and removed from its supporting rail for processing in the sterilizing center or through commercial dishwashers. (See opposite page).

To prevent the deterioration of appearance in marred or damaged components, those parts which are subject to the greatest risk—such as tops of bedside units —are removable and replaceable from stored stock. This is designed to control the cost of maintaining attractive and serviceable equipment.

Adaptability to the individual needs of patients and hospital procedures is also part of the objective of the interchangeability of components of various sizes and depths. Rails mounted at various heights allow cabinets to be placed for a variety of services.

One of the objectives of the design research was to create a system that can be installed in existing hospitals without extensive remodeling. For such areas as nurses' stations or interview rooms, the system is made compatible with Herman Miller's Action Office furniture line. It is also designed for compact storage with both components and carts formed for easy stacking. The system is also adaptable for laboratory spaces and simplifies the basic construction of the laboratory as shown in the sketches.

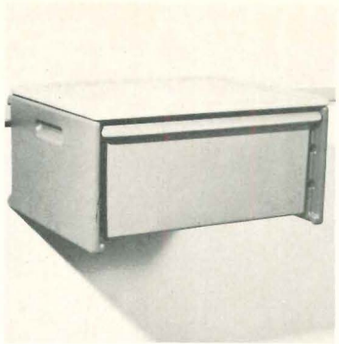


Typical lab before (above) and after (right) installation of Co-Struc system

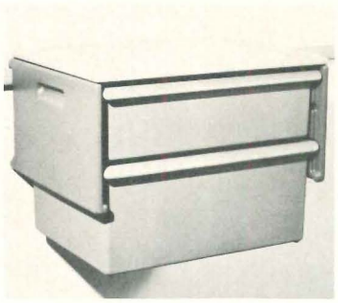
Special carts to transport the system components can also be used as a means of transporting medical supplies and meals, or as portable room service units that can be moved out while the room is being cleaned.

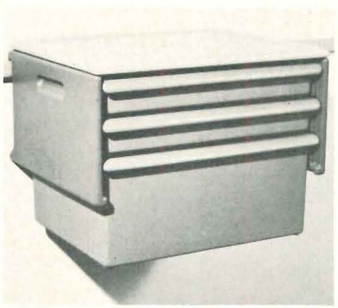
Carts for the closet-size containers can be hitched together in trains that track around corners and permit moving groups of storage spaces. Carts also have a pedal-operated lifter for installing and removing.

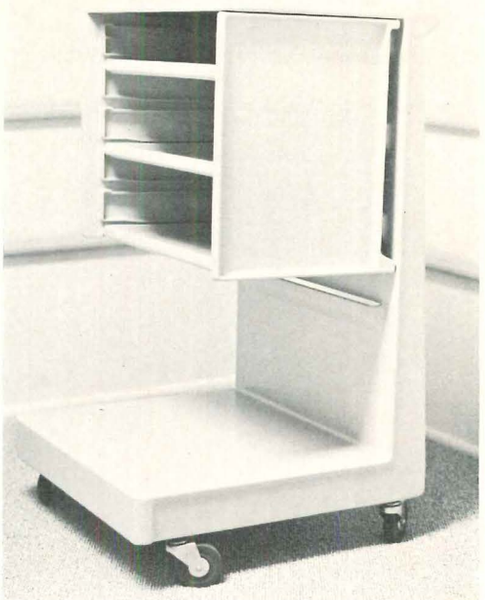
Waste and soiled linen handling is accomplished by the system through a special series of components that allow collection in disposable bags attached to special frames. (See at left of laboratory sketch below and at bedside, page 163). For large capacity waste collection and handling, special carts with pivot bosses permit manual dumping of containers. Bottom-opening bag liners are available for waste handling.

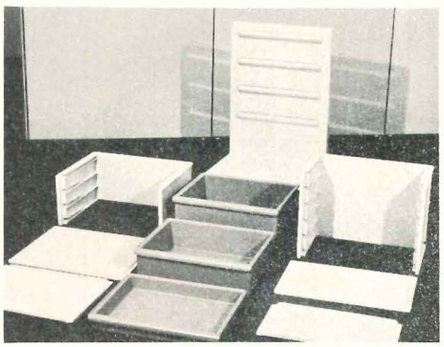


All components of the system are seamless plastic without sharp corners and with completely drainable surfaces accessible to dishwashing jets. All disassembled parts will tolerate commercial dishwashing temperatures and chemical cleaning. Components are either hung from wall hangers or from hangers on L-Cart transports which can be wheeled out of a room for floor cleaning purposes. The closet size components have flexible, roll-up closures in front and one suspended from



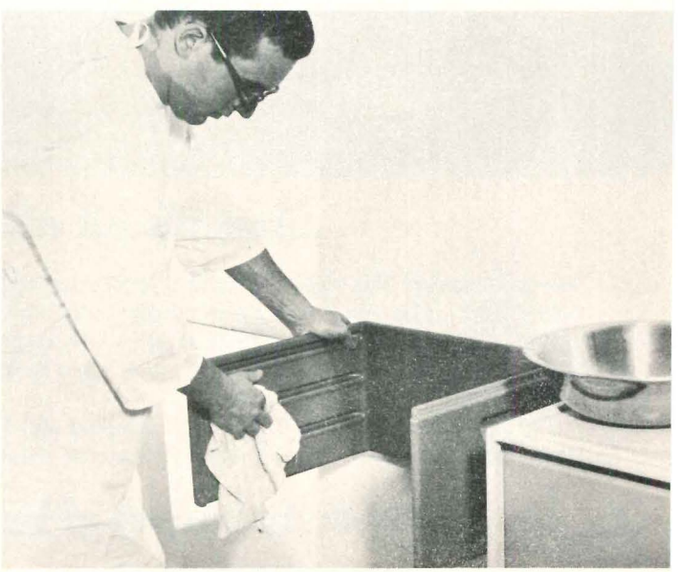






head rails with about a foot clearance from the floor for easy access of cleaning tools. All components of the system reduce the number of leg support in any area so that floor cleaning is simplified.

A new sanitation approach using a "skin and bones" design is applied to the locker handling carts. A mechanical "bones" frame which can be steam cleaned supports a cover skin providing a platform and bumper. This skin cover is removable for cleaning.



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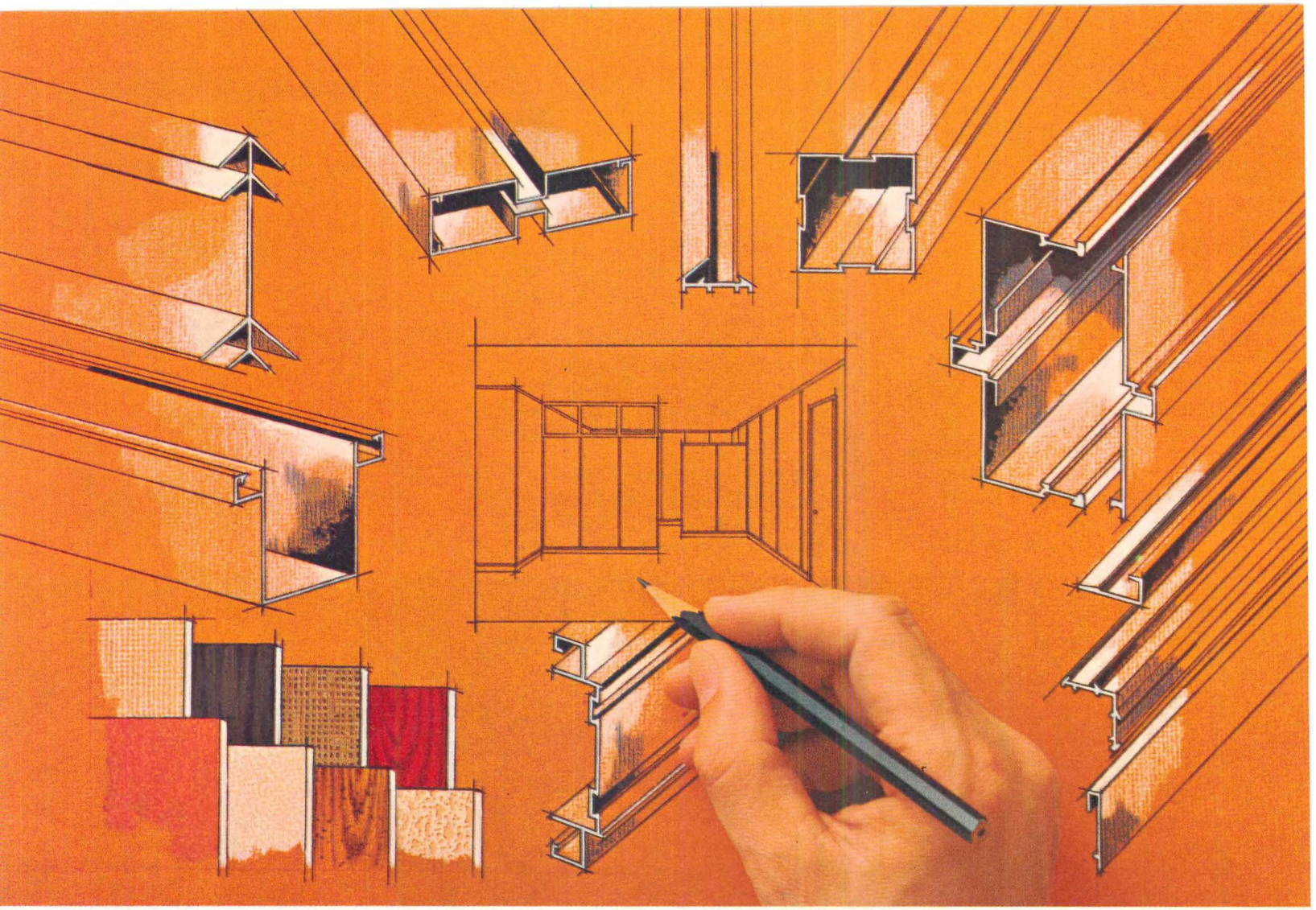

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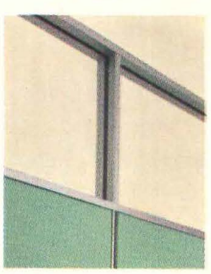

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## Designer's Saturday announces open house dates to introduce contemporary contract designs

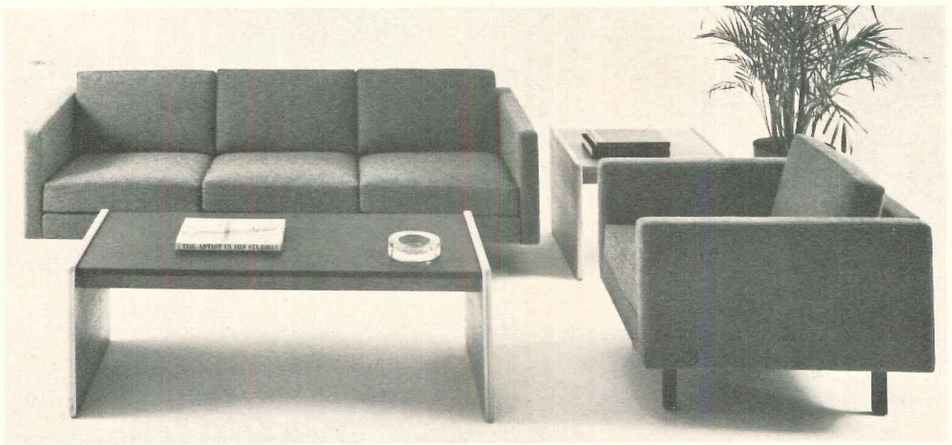
Designer's Saturday is a group of New York contract furniture manufacturers who periodically appoint a special, convenient day to open their showrooms to out-of-town architects and designers.

This year, because of the great number of designers expected to attend, Designer's Saturday is extended to a two-day event—Friday, October 15 and Saturday, October 16—with 20 present members participating in the open house. In addition, each firm plans to introduce its new lines and products. More than 2,500 are expected to register and attend the various showrooms and reception held at the General Library & Museum of the Performing Arts at Lincoln Center Saturday night.

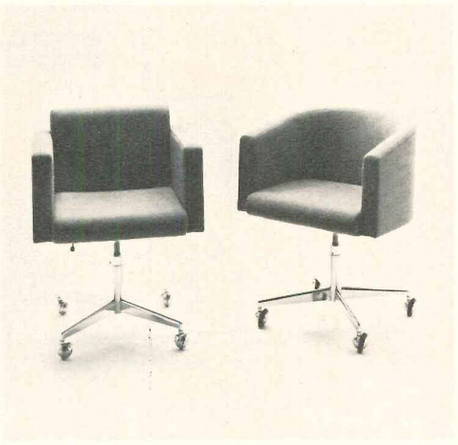
For additional information on Designer's Saturday, contact Judson H. Spencer, Designer's Saturday, 825 Third Avenue, New York City, 10022.

Shown below are some new designs.

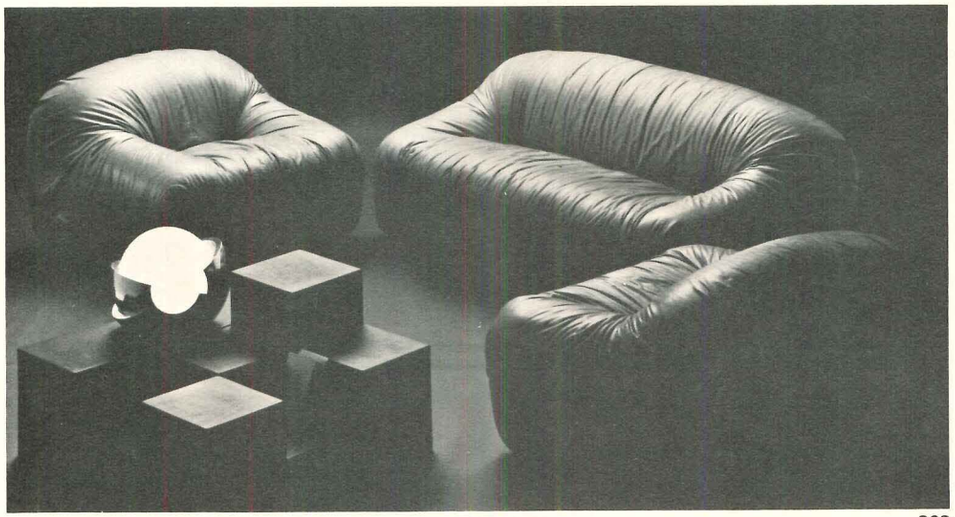
Member firms: Atelier International, Brickel Associates Inc., CI Designs, Cumberland Furniture, Directional Contract Furniture Co., Dunbar Furniture Co., Eppinger Furniture Inc., Fritz Hansen, Helikon, I.C.F., JG Furniture Co., Knoll International, Lehigh-Leopold, Pace Associates, Harvey Probber Inc., Jens Risom Design Inc., Edward Axel Roffman Associates Inc., Janet Rosenblum Inc., Stendig Inc., and John Stuart Inc.



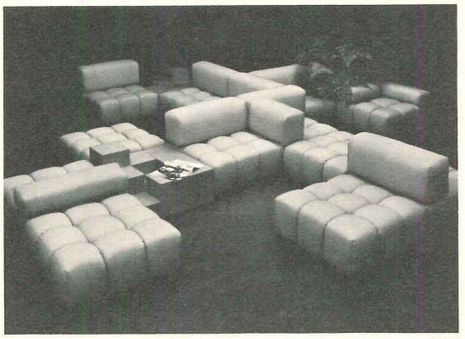
**300**



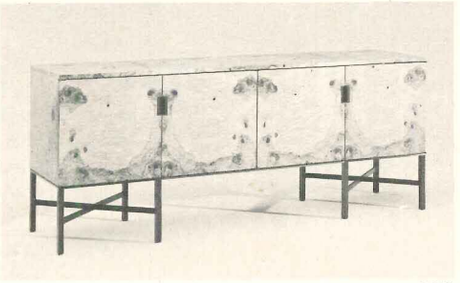
**301**



**302**



**303**

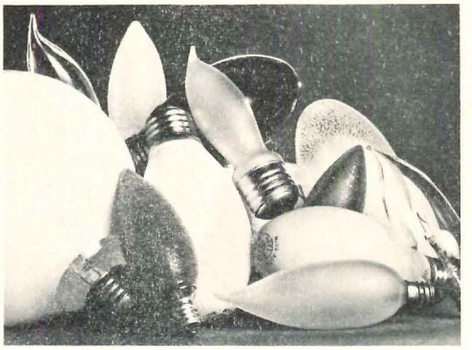


**304**

Circle bracketed numbers on inquiry card. Sofa and chair with low tables, Jens Risom Design Inc. **(300).** Upholstered, swivel-tilt armchairs, Stendig Inc. **(301).** Chair, two-position and three-position sofa, Atelier International. **(302).** Modular component system producing a variety of lounge seating configurations, Atelier International. **(303).** Olive burl, four-door cabinet, Dunbar Furniture Co. **(304).**

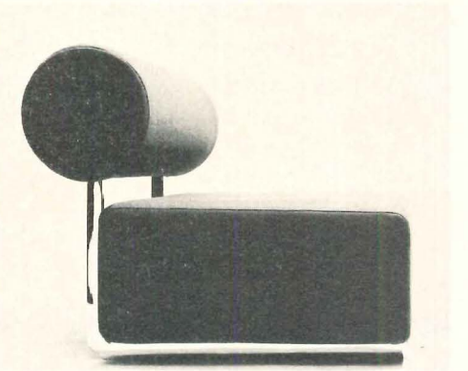
More products on page 168.

continued from page 167



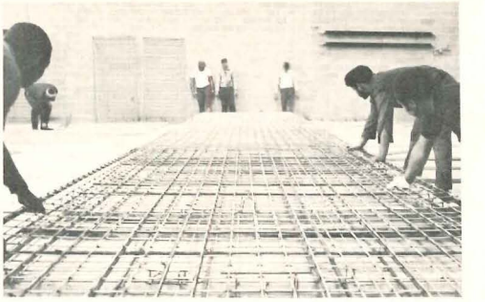
**DECORATIVE BULBS** / Twenty-three new sizes, shapes and finishes are available in exposed-bulb fixtures for both indoor and outdoor use. ■ General Electric Co., Cleveland.

*Circle 305 on inquiry card*



**CHAIR** / Chrome steel supports the cylindrical backrest and rectangular seat. This unit can be assembled on site. ■ The Slater Co., Chicago.

*Circle 306 on inquiry card*



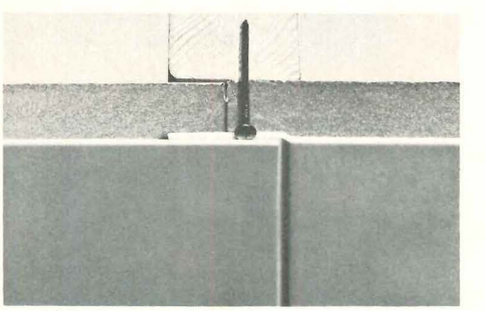
**GALVANIZED WELDED ROD FABRIC** / Designed primarily for use in precast-concrete applications, this reinforcing material is said to offer good crack control and rust resistance if exposed to moisture. Also, rust streaking is minimized. ■ U.S. Steel, Pittsburgh.

*Circle 307 on inquiry card*



**MANSARD ROOFING MATERIALS** / Mineral-fiber clapboard, panels and shingles available in a wide range of sizes and colors to accommodate mansard roofing designs are offered by the manufacturer. Lightweight panels with plastic finish reportedly provide a high degree of weather resistance. ■ National Gypsum Co., Buffalo.

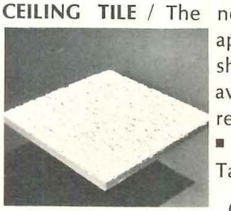
*Circle 308 on inquiry card*



**PANEL SYSTEM** / Laminated sandwich construction consists of a fiberglass facing panel bonded to a polyurethane core and a foil vapor barrier. Facing panels overlap to provide a seal against moisture and bacterial growth. Applications include food processing plants and cold storage facilities. ■ W.H. Porter, Inc., Holland, Mich.

*Circle 309 on inquiry card*

**CEILING TILE** / The non-directional, textured appearance of the tile is shown here. It is also available in a 2- by 2-ft reveal-edge lay-in panel. ■ The Celotex Corp., Tampa.



*Circle 310 on inquiry card*

more products on page 194

# OFFICE LITERATURE

*For more information circle selected item numbers on Reader Service Inquiry card, pages 267-268*

**FIRE-RESISTANCE** / A 100-page manual provides fire test data for 262 wall, ceiling, column, beam and roof deck assemblies using gypsum board or gypsum plaster. Walls, partitions and floor-ceilings are further classified by sound transmission ratings. Single copies are free. ■ Gypsum Assn., Chicago.

*Circle 400 on inquiry card*

**INTRUSION DETECTION SYSTEM** / Basic installation photos and information on electrical and mechanical characteristics are given in a 4-page bulletin. The system consists of a transmitter that directs a narrow, infrared beam over distances up to 500 ft or more to a receiver. An intruder breaking the invisible beam would automatically trigger an alarm system. ■ Westinghouse Electric Corp., Pittsburgh.

*Circle 401 on inquiry card*

**SILICONE WATER REPELLENTS** / Applications for construction materials are discussed in a 14-page booklet. Suitable repellents for various types of masonry, unpainted wood and fibrous insulation are described. Eight of the manufacturer's products are discussed. ■ Union Carbide Corp., New York City.*

*Circle 402 on inquiry card*

**STRUCTURAL FRAMING SYSTEMS** / Extensive application data is included in a 24-page catalog. Structural assembly details, allowable clear-span heights and specifications are given. ■ Keene Corp., Parkersburg, W. Va.*

*Circle 403 on inquiry card*

**CEILING SYSTEM** / Detailed descriptions of an integrated, electrical, suspended ceiling are included in a catalog. Standard ceiling tiles may be used with the system. Display lights can be attached at any point, or removed quickly and easily. ■ McGraw-Edison Co., Halo Lighting Div., Rosemond, Ill.*

*Circle 404 on inquiry card*

**HARDWOOD SCREENS / PANELING** / More than 20 see-through patterns in a variety of woods are illustrated in an 8-page catalog. Commercial and residential applications include dividers, walls and doors. Solid designs are also available. ■ Penberthy Architectural Products, Los Angeles.

*Circle 405 on inquiry card*

**COMPACT HEATING PACKAGE** / A heater especially designed for limited space areas is described in a 4-page catalog. The unit, with an output of 16,000 BTUs, is factory-wired and ready for wall mounting and hook-up to existing hot water or steam systems. ■ Beacon-Morris Corp., Boston.

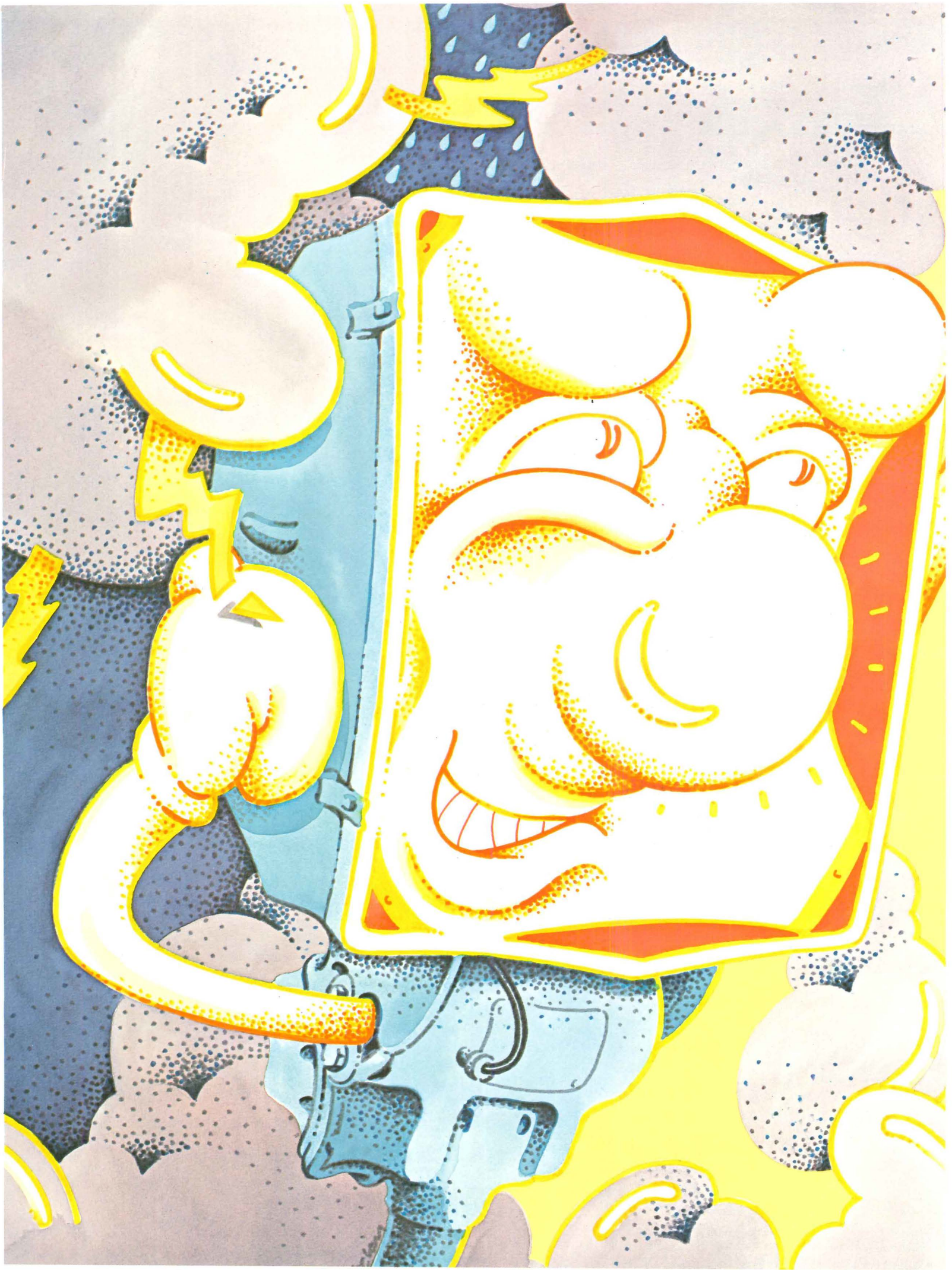
*Circle 406 on inquiry card*

**OUTDOOR LIGHTING EQUIPMENT** / Product descriptions, retail prices and photometric information for key specification items are included in a 96-page catalog illustrating 1500 items. ■ Stonco Lighting Div., Keene Corp., Kenilworth, N.J.*

*Circle 407 on inquiry card*

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

*more literature on page 238*

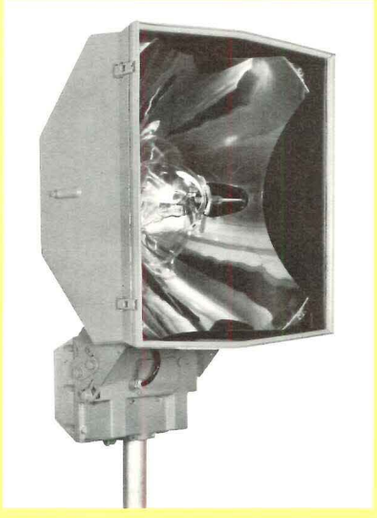


[Wide-Lite proudly presents]

# The Beast & The Beauty

OUR NEW "TITE-LITE"

Some people may call it a beast the way it stands up to the elements.



Others may call it a beauty the way it works so efficiently.

We call it both.

Because Tite-Lite illuminates stadiums, skyscrapers, large outdoor work and storage areas and similar installations better than any other tight-beam floodlight around.

The secret?

Better beam control.

You actually get the coverage of a floodlight with the preciseness of a spotlight—all in a tough, climate-tested housing.

As a result, Tite-Lite can save you a lot of bucks.

For one thing, you need fewer fixtures because there's more lumen output per Tite-Lite fixture.

And with fewer fixtures, installation costs go down.

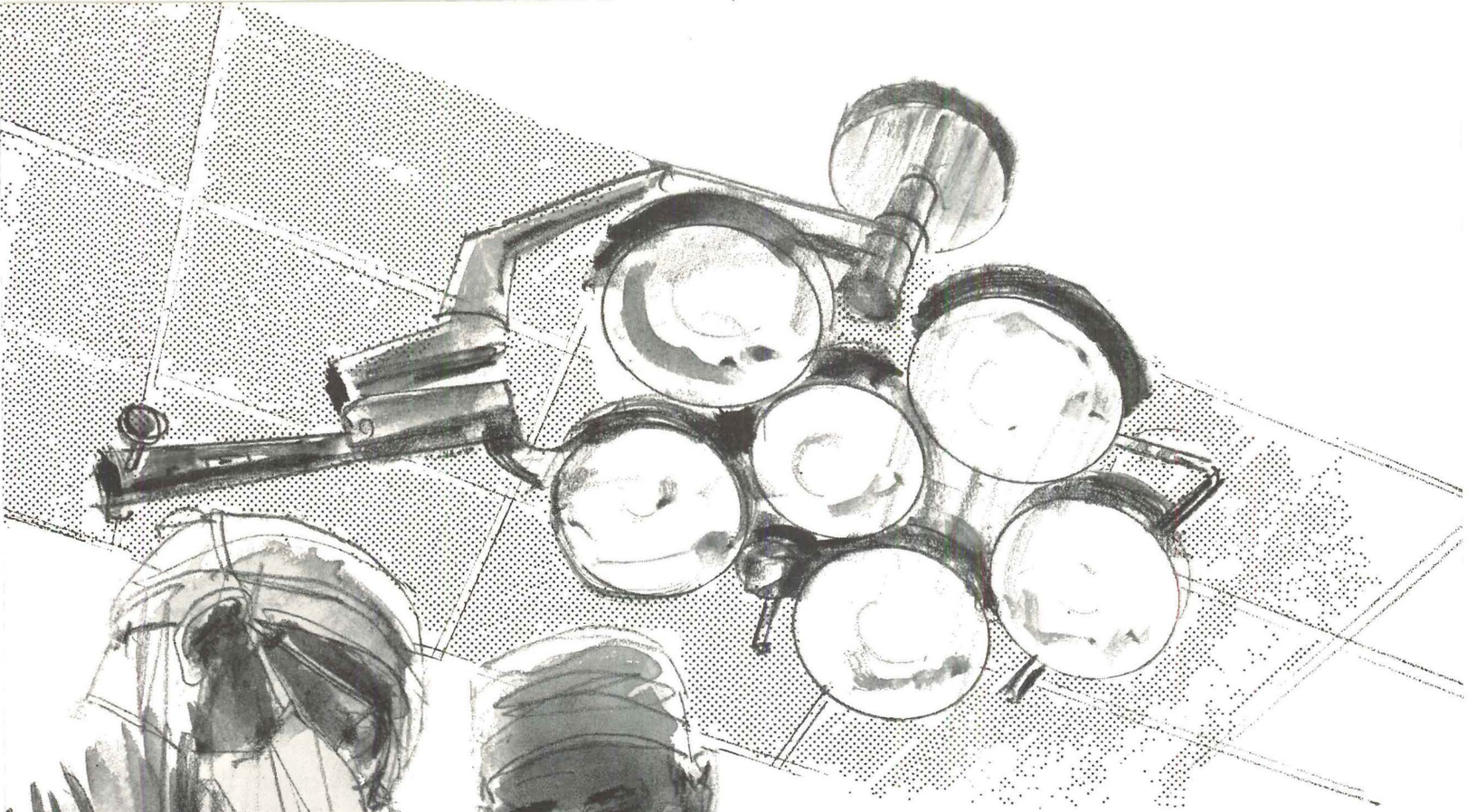
Then, too, with Tite-Lite you get lower maintenance; longer lamp life; and greater efficiency with the larger lamps (including the 1000-watt high pressure sodium, 1500-watt metal halide and 2000-watt European lamps). These Tite-Lite features add dramatically to your savings.

Find out how dramatically by calling your Wide-Lite* representative, listed in the Yellow Pages under "Lighting Fixtures." Or write for our free brochure.

The more you know about Tite-Lite, the more you'll know how a beast can be so beautiful.

**Wide-Lite**®

P.O. Box 191, Dept. AR-1064-9/71, Houston, Texas 77001
Also manufactured in Australia, Canada, Mexico and Great Britain
A division of Esquire, Inc. *Trademark of Wide-Lite Corporation.



# When environmental control calls for surgical team comfort and minimal infection rates

you need MULTI-VENT engineered air diffusion

Whether the situation is one of intense concentration to save a life . . . or is critical parts assembly in a clean room environment, you can count on the engineered air distribution afforded by Multi-Vent Unitary Panels.

**Laminar air flow assures environmental control.**

These panels provide a controlled velocity laminar air flow that results in uniform temperature control from ceiling to floor. Other environmental aspects such as humidity or the establishment of sterile zones through the creation of positive air blanketing are easily accomplished.

**Air volume adjustable from room-side.**

In clean rooms or environmental chambers where air volume variances may be required at specific points within the space, Unitary Panels are ideal. Individual panels may be flow-adjusted from room-side without dropping the panel face.

Because of their design, Unitary Panels permit placement of absolute filters in a remotely located equipment room, thereby allowing them to perform at the filter manufacturer's ratings. Remote filter location also eliminates contamination at time of replacement.

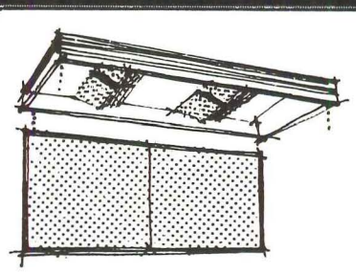
**Many sizes, capacities.**

Multi-Vent Unitary Panels are available in a comprehensive array of dimensions and capacities for installations in conjunction with fixed or flexible sub-ducting.

Multi-Vent Unitary Panels are being used in hospital operating suites, intensive care areas, delivery rooms and nurseries. They provide similar environmental air control for veterinary facilities and are used extensively in pharmaceutical and environmental laboratories as well as ultra-clean rooms.

**Assistance available.**

To learn more about Unitary Panels, send for Bulletins 685 and 691. When you're ready to start designing, we'll be glad to share with you our experience as the pioneers in the manufacture and application of this laminar air flow distribution device.



Air emission from Multi-Vent Unitary Panels is uniform across the entire perforated exterior plate. This is accomplished by the interior air metering devices which pass air along the entire length of the panel. Multi-Vent Unitary Panels are accepted components for clean rooms or environmental chambers designed to Federal Standards 209 or Air Force T.O. 00-25-203.

Write:

MULTI-VENT PRODUCTS DIVISION
Dynamics Corporation of America
1400 North Kostner Avenue
Chicago, Illinois 60651

DCA

*For more data, circle 79 on inquiry card*

*For more data, circle 80 on inquiry card*

# The vinyl wall meets the painted wall.

## Presenting the first fully coordinated walls in Color, Design and Texture.

On the right, Devoe Green Brass, in paint. On the left, color-coordinated Corbu Roca, from the new Devoe line of contract vinyl wallcoverings. A new, easier way to coordinate all the colors of a commercial interior.

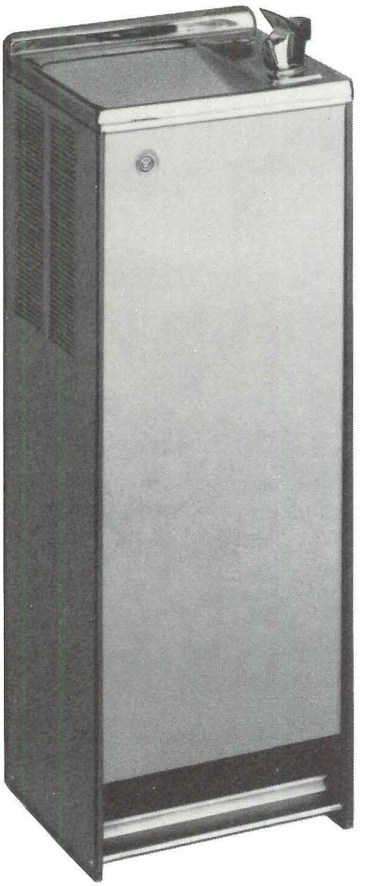
These new Devoe CDT© vinyl wallcoverings are all cross-referenced to Devoe Paint's new collection of fashion colors of the 70's. And they're available in a full assortment of designs and textures, in the complete commercial weight range. So if you want a Burnt Orange wallcovering in a 25-ounce grass cloth — and the same shade in an enamel trim or a vinyl wall paint — you can order both at once . . . from one supplier.

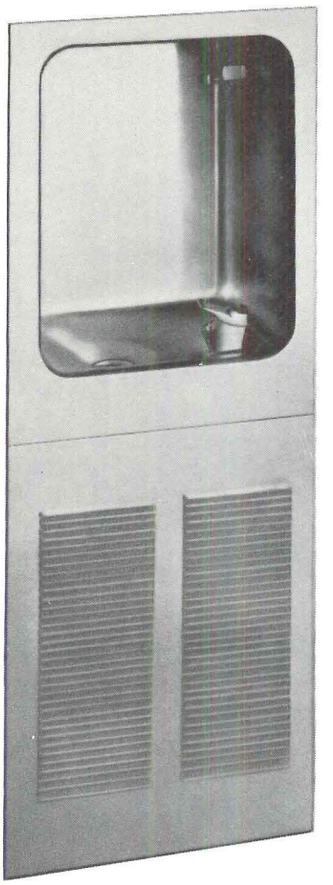
A note on your letterhead will bring samples. Write: Mr. H. J. Smith, Devoe Paint, 224 East Broadway, Louisville, Kentucky 40202.

CDT© Vinyl Wallcoverings by Devoe® A Division of Celanese Coatings Co.

# The Water Works.

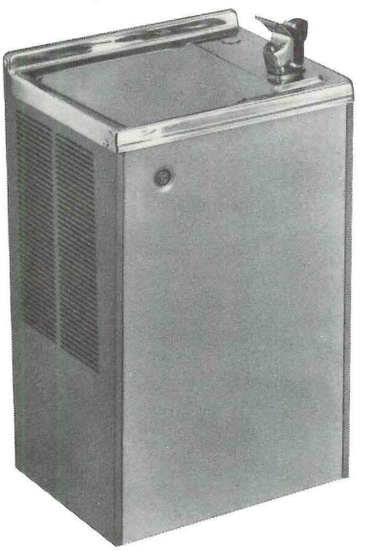
**Heavy-duty floor model coolers**
Instant cold water every time. Also instant hot water available on all models . . . factory-installed. Vandal-proof push-button bubbler. Foot pedal fully recessed.





**Totally recessed Water Cooler**
No bumping in the aisles. Ideal for hospitals, schools or public buildings. Stainless-steel or bronze-finish basin, bubbler and grille. Exclusive mounting box lets you reverse the cooling system so the grille doesn't show.

**Wall Mount Water Coolers**
Come in six colorful ways. Frost White, Platinum Beige, Metallic Bronze, Nugget Gold, Dusty Olive, and Coral Red vinyl . . . plus stainless-steel or two-tone olive-beige enamel. Mount easily with our time saving full-size installation template.



**Semi-recessed coolers**
Extend only 9½ inches from wall. Brushed stainless-steel basin and one-piece cabinet finished in beige vinyl, beige enamel or brushed stainless-steel. Also available in over-all bronze finish.

All these Water Coolers are backed by Westinghouse Nationwide Sure Service. For complete details, see Sweet's Files. Or refer to "Water Coolers" in the Yellow Pages. Westinghouse Water Cooler Dept., Columbus, Ohio 43228.

You can be sure...if it's
**Westinghouse**

*For more data, circle 81 on inquiry card*

# 65,000 square feet under foot. And no problems.

The new Student Center at Rider College, Lawrenceville, New Jersey, hums till midnight. By 6 AM, when it starts to hum again, everything has to be spotless.

It is. One reason is the Murray quarry tile all over the place. A fast damp-mopping and those 65,000 square feet look like new.

And the architect had other good reasons for picking Murray.

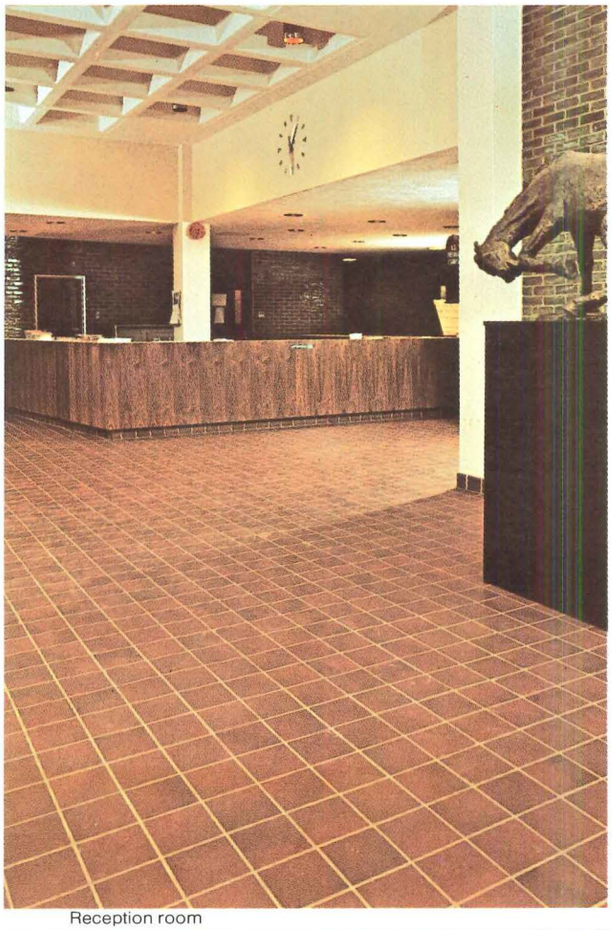
Like durability. Knowing Murray can take years of stomping traffic in its stride.

And good looks. The tile adds a natural warmth to this new $29-a-square-foot building that students like.

It fitted the college's needs so well that now Rider's Dining Hall is getting new floors. Of Murray quarry tile.

How about *your* next floor? Write American Olean Tile Company, 1544 Cannon Avenue, Lansdale, Pa. 19446.

CERAMIC TILE
American Olean
A Division of National Gypsum Company



Reception room

Snack bar

Telephone area

Study hall

Architect: Ronald Vaughn Associates

## Murray® quarry tile. It's the natural thing to use.™

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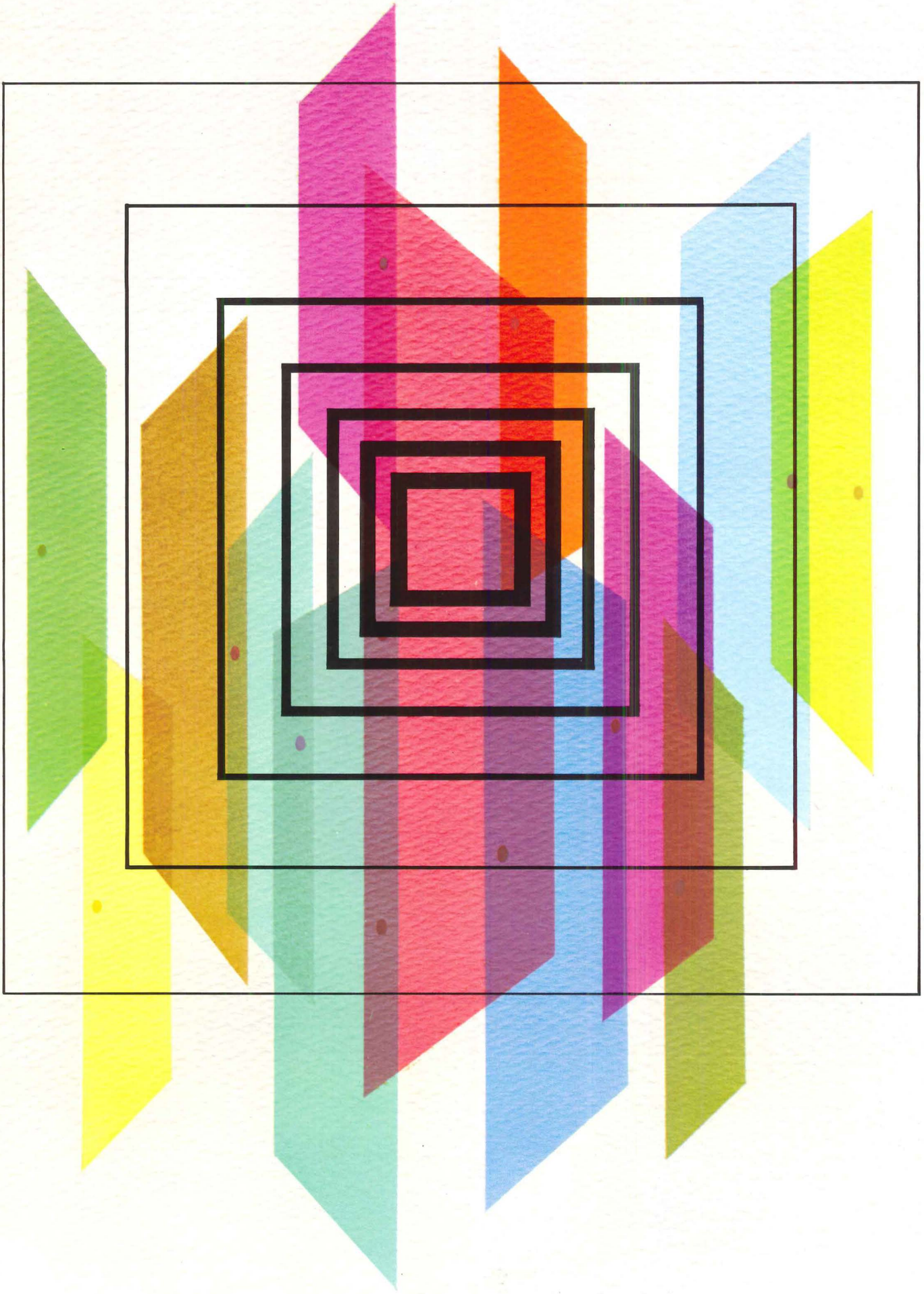


Printed in U.S.A.

# FRONTIERS IN SPACE CONTROL

## HOSPITAL HARDWARE by HAGER

Doing new things with door hardware includes discoveries obviously most suited to hospital application.

The new Hospital 600 Package for example. A combination concealed pivot hinge and a two-way door stop lets a door swing both ways . . . or just one way if desired. The instant conversion is made by the mere flip of Hager's new-type tilt stop.

It's really unobtrusive rescue hardware. The hinges are completely concealed and the door stop is hardly visible.

In emergency, the door stop can be recessed by finger pressure for outward swing that gives access to any obstruction inside that is preventing normal opening.

This pivot-hinge-tilt-stop combination invites consideration by hospital planners. It is another contribution from Hager research that advances frontiers in space control.

HAGER
600
HOSPITAL
DOOR
PACKAGE

Patent Pending

Hager

HAGER HINGE COMPANY
139 Victor St., St. Louis, Mo. 63104
In Canada: HAGER HINGE CANADA, LTD.

*"Everything Hinges on Hager!"*

Architect: Barbitta-James & Associates, Inc., Akron, Ohio.
Skylight manufacturer: Naturalite, Inc., Garland, Texas.
Client: Mayflower Realty, Inc., Akron, Ohio.

# 16-foot spans of Swedcast acrylic keep a tropical garden growing in Ohio.

Mayflower Realty's office garden simulates the lush, tropical atmosphere of their Florida condominium community.

The skylight is made of bronze Swedcast, the world's first continuous cast acrylic. Swedcast was specified for several reasons.

Its unique formula and continuous casting give greater strength and more resistance to ultraviolet degradation. (That'll keep the plants looking great.)

Swedcast comes in almost unlimited lengths, so there are no welded seams to leak or collect dirt. (That'll keep the architects looking great.)

Just imagine what you can do with Swedcast, the continuous cast acrylic sheet. For more information, write to Swedlow, Inc., Acrylic Sheet Division, 7350 Empire Drive, Florence, Kentucky 41042.

**SWEDLOW, INC.**
*New dimensions in acrylic technology.*

*For more data, circle 85 on inquiry card*

*For more data, circle 84 on inquiry card*

*For more data, circle 86 on inquiry card*

# Which sealants give you more of what you're looking for?

# Here are the facts:

**Some Sealant Performance Characteristics**

| | Thiokol's Polysulfide | Competition A (1-part Silicone) | Competition B (1-part Acrylic Solvent Release) |
|---|---|---|---|
| Sealant movement capability | 25% | 20% | 5% |
| Adhesion after water immersion to:<br>Concrete<br>Glass<br>Aluminum | <br>Excellent<br>Excellent<br>Excellent | <br>Questionable<br>Fair<br>Questionable | <br>Questionable<br>Fair<br>Questionable |
| Aging characteristics | None | None | Toughens |
| History of use in buildings | 24 years | 7 years | 10 years |
| High temperature | Good | Excellent | Flows |
| Low temperature | Good | Excellent | Embrittles |
| Use where immersed in water | Yes | No | No |
| Dirt pickup after cure | None | Very bad | Very bad |
| Tear resistance | Good | Poor | Good |

Compared with two leading competitive types of sealants, the Thiokol polysulfide entry wins in a breeze.

It's not surprising. Besides having a track record which includes the longest period of successful use, sealants based on Thiokol's LP polysulfide polymer are constantly tested to assure topnotch performance.

Under our exclusive Seal of Security program, polysulfide-based sealants are regularly checked to meet rigid specifications. In fact, our technicians and chemists check more than 200 samples every year.

The check consists of a series of tough tests, ranging from four to six weeks. Samples are tortured, twisted, stretched, heated and frozen to make sure they can survive what the elements dish out over long periods of time.

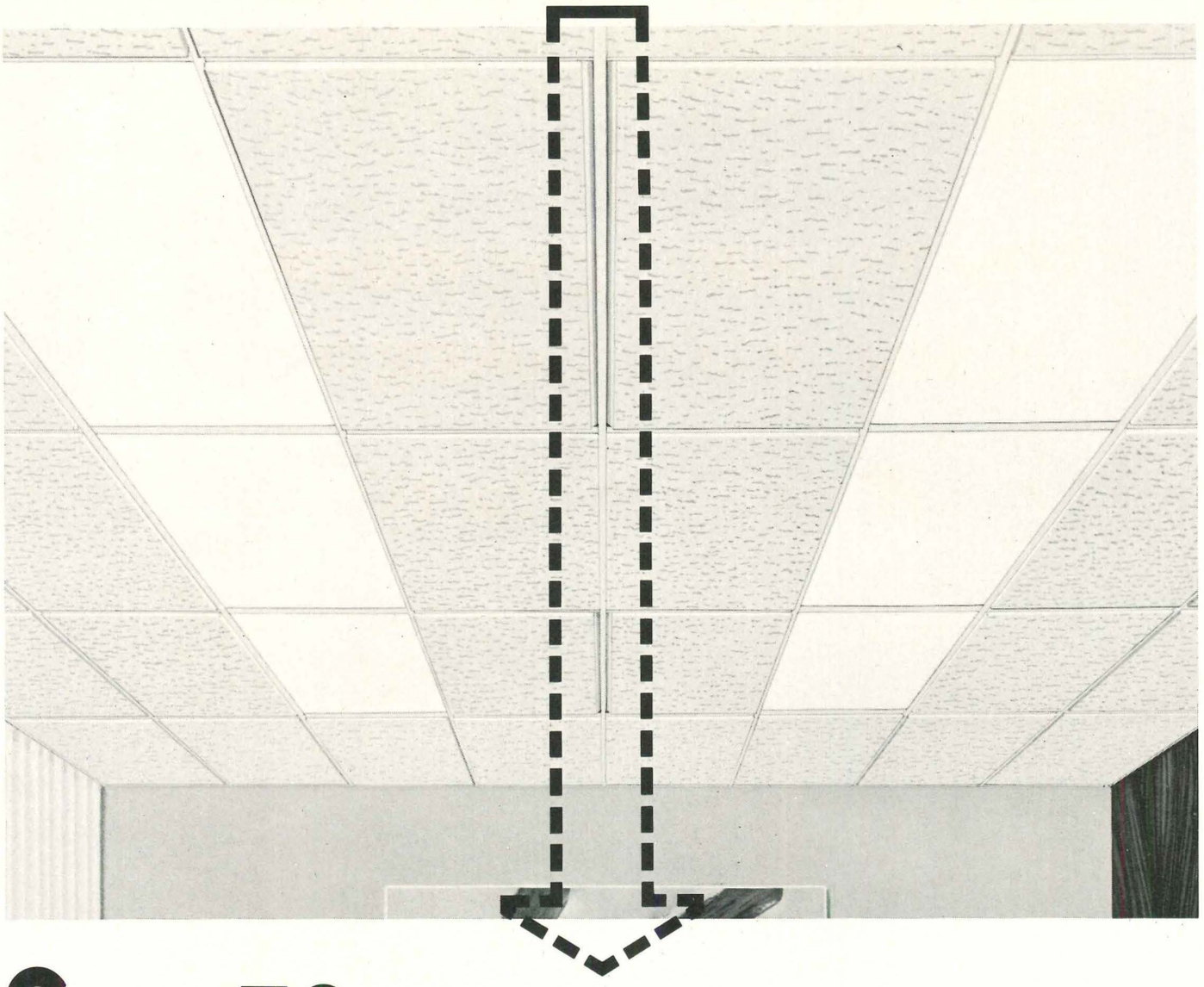
If the sealant passes each and every test, then it's entitled to bear Thiokol's Seal of Security. We're proud of this program. It's the first of its kind in the United States. And, since its inception in 1965, more than 300 sealants, produced by 20 manufacturers, have earned the right to carry the seal.

Insist on sealants with the Thiokol Seal of Security and you can't go wrong. For a more detailed comparison between polysulfide-based sealants and eight other types write: Thiokol Chemical Corporation, P.O. Box 1296, Trenton, N.J. 08607.


Thiokol

For more data, circle 87 on inquiry card

For more data, circle 86 on inquiry card



# Save 50 cents a square foot on first cost.

# Save 50 percent on operating cost with new VariTrane Variable Air Volume System

## New VariTrane Variable Air Volume System

Trane announces VariTrane, a new variable air volume system which controls temperature by varying the volume of air flowing into a room. Primary applications are in office buildings, schools and institutional buildings of any size, from single-story to high-rise.

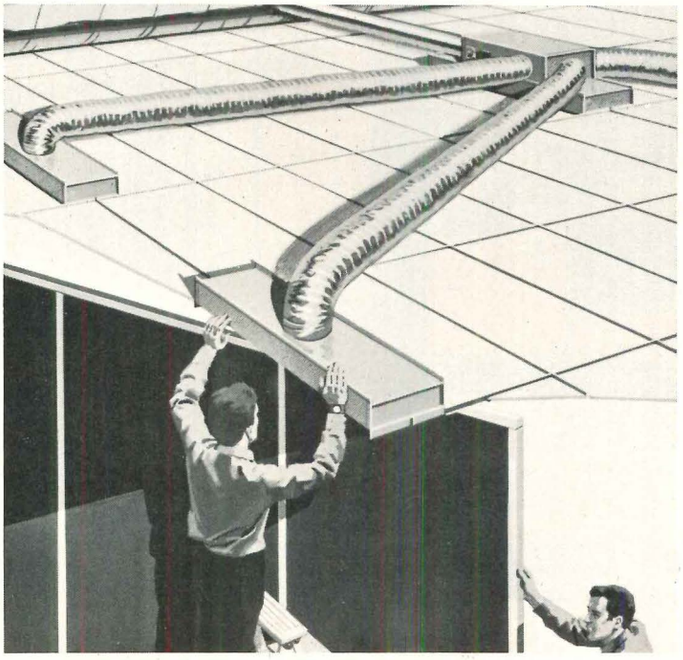
## Cuts first cost up to 50 cents/sq. ft. (20%)

Double duct and terminal reheat systems,which are frequently used for commercial building air conditioning,cool air only to heat it up again. A VariTrane System can reduce equipment cost up to 20% by cutting out the expense of the larger equipment and additional ductwork or piping required by these systems.

## Cuts operating costs up to 50%

With a variable air volume system, the cost of extra refrigeration and heat energy needed to cool and reheat the air is avoided. Also, it can provide significant savings in fan horsepower for larger buildings. The result is a saving on the total building operating cost of up to 50% which produces an increase of up to 25% in owners' cash flow.

When compared to other variable air volume systems, VariTrane provides additional cost savings because it requires 10-15% even less total fan pressure. This further reduces annual operating costs by about $4.50 per ton, equivalent to an added yearly saving of $2,250 on a 500-ton system.



## Control flexibility

VariTrane controls are actuated by individual wall-mounted thermostats which provide for ease of adjustment and closer control of room temperature at low air flow than may be possible with unit mounted thermostats.

## Installation and relocation flexibility

VariTrane offers true modular flexibility. With the popular T-bar ceiling system, units and thermostats are easily relocated to meet new tenant needs, and at small cost, because no alterations to ducts, chilled water or drain lines are involved. It can also be utilized with most other popular ceiling systems.

## Attractive appearance

VariTrane diffusers are narrow and unobtrusive. It's unlikely that most people will even notice them. They do not have to be set in a straight line but can be positioned anywhere to suit the design of the ceiling. And they can be painted to blend with any finish.

## Quiet

The VariTrane terminal unit is designed to absorb most air noises. This results in sound levels up to 5 decibels lower than other variable air volume systems for the same volume of air provided to the space.

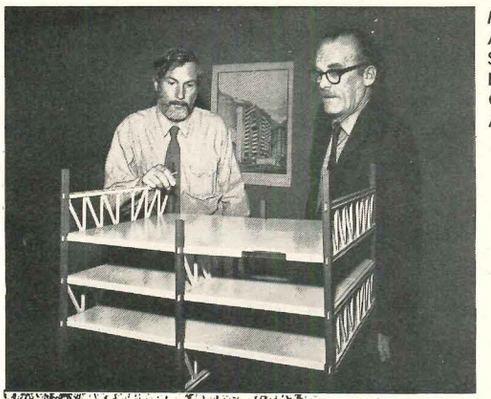
## Single-source responsibility

The Trane Company can supply all major products for your building air conditioning system—including water chillers, air handling equipment, terminal units and diffusers. This allows a building owner to look to only one supplier, instead of several, for any service required on the major components of his air conditioning system.

For complete information on VariTrane Systems—call your local Trane office or write: Mr. R. L. McLain, The Trane Company, La Crosse, Wisconsin 54601.

TRANE®
AIR CONDITIONING

*For more data, circle 88 on inquiry card*



Morton Rader (l) of Chan Rader and Associates, Architects & Planning Consultants; and Harold Stockstad (r) of Chin & Hensolt, Inc., Structural Engineers. Jannan Construction, Inc. was the General Contractor. Dublin Steel Co. the Steel Fabricator and Ashby Metal Products, Inc., the Erector.

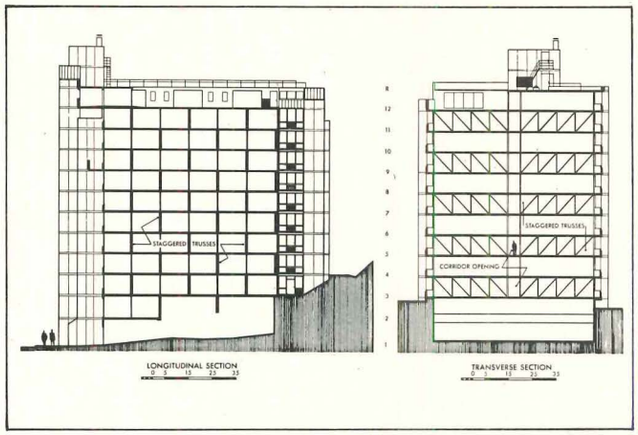
# At 7 lbs. psf, staggered truss delivers a 1971 apartment house for 1968 costs.

A new 12-story apartment house for the elderly in San Francisco is the first application of a staggered steel truss design in the West. And the cost savings that resulted were considerable.

In size and accommodations, the new building is practically a duplicate of a conventional concrete framed building which was designed two years ago for the same site. Thanks to the economies of staggered truss, the new building—despite substantial increases in material and labor costs over the past few years—costs no more than the 1968 structure.

It costs no more because its structural system costs less. The structural steel weight for the staggered truss was only 7 psf for a typical bay. The fireproofing, intermediate stud walls and ceilings added only 15 psf for a total of 22 psf. This compares to 65 psf for the concrete structure. An additional savings of 27 psf was achieved by the use of the composite steel and concrete floor system. At about half the weight of a concrete structure, the staggered truss system significantly reduces foundation requirements and costs.

But cost wasn't the only advantage of the staggered truss design. It provided an indispensable 70'1"




x 60'0" column free garage which increased usable space by 50 percent. There is little or no on-street parking available in this section of San Francisco, and adequate garage accommodations are mandatory legal requirements.

This building is the first application of staggered truss in a seismic design area in this country.

## Structural Report

If you're planning a new apartment house or similar structure, you should investigate the staggered truss system. We'll be happy to send you a copy of our "Structural Report—ADUSS 27-5111-01," which details its use in this building. Call our nearest sales office and ask for a USS Construction Marketing Representative or write U.S. Steel, Box 86, Pittsburgh, Pa. 15230.

## Construction Details

Description: 12-story apartment with clear-span integral 14-car garage, with a one-story recreation building attached. Steeply sloped site, with closely adjoining buildings on east and west sites. Typical floor contains 10 studio apartments, 2 one-bedroom apartments, two elevators (one large enough to handle stretchers), lobby, corridor and stairway.

Erection: Floor-by-floor due to steep, cramped site.

| Design Live Loads: | | Wind: |
|---|---|---|
| Floors | 40# psf | 0'—29'—15 psf |
| Roof | 20# psf | 30'—49'—20 psf |
| Stairways | 100# psf | 50'—99'—25 psf |
| Roof Terrace | 50# psf | 100'—up—30 psf |

Building Code: City of San Francisco

Structural Steel: 120 tons of A-36 steel 7# psf of structure.

Floor Deck: 3" metal deck, H.H. Robertson (Q L-21)

Shear Walls: Concrete service cores at north and south ends.

Foundations: Square Footings and Belled Caissons.

Curtain Wall: Exposed formed concrete and 3-⅝" precast wall panels.

Interior Walls: At trusses: ⅞" insulating plaster on metal lath and steel channel furring. At stud walls: ½" gypsum board on each side and 1½" batt insulation with 2½" and 6" steel studs.

Ceiling: ½" gypsum board on ¾" steel furring channels. ½" sprayed fireproofing.

Elevators: Two at 200 fpm (one accommodates stretcher).

Fire Resistance: Trusses—3 hours @ interior walls. Trusses—4 hours @ exterior walls. Columns—4 hours. Floor and Ceilings—2 hours/Inner Walls—1 hour.

Construction Costs: Total—$2,057,500 (includes site development) Steel (erected)—$82,800.

Construction Time: 510 days (due to adverse site conditions).

Gross Area: 77,505 sq. ft.

Floor-to-floor height: 8'6-¾"

Floor-to-ceiling height: 8'

USS TRADEMARK **United States Steel**

# The Lighting Professionals by KSH.

The professionals we're talking about are lined up at right. THEY'RE THE SPECIFICATION-QUALITY PRISMATIC LIGHTING PANELS THAT GUARANTEE PROFESSIONAL RESULTS.

They never let you down with a client. Here's why:

The variety of prismatic patterns lets you put more imagination into your lighting designs.

They're optically correct. Designed right. Produced right. They give you lighting that's right. And they stay like-new year after year.

Remember. Other panels may look like K-Lite because they're KOPIES. But they don't perform like K-Lite.

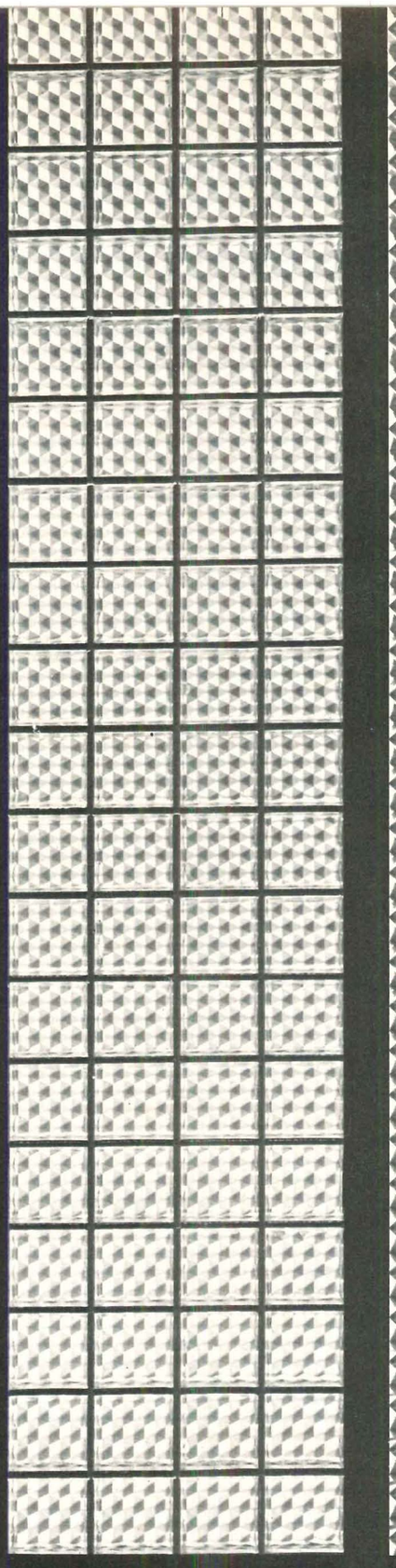
To get the real thing . . . SPECIFY "THE PROFESSIONALS" BY THE NUMBERS.

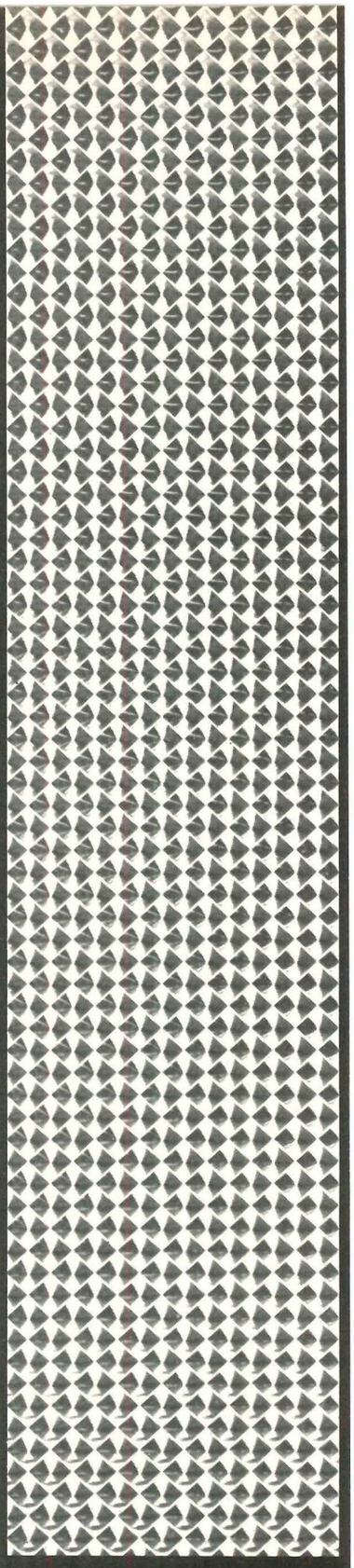
**Write for the KSH Catalog. It shows many more types of K-Lite Panels.**

K-LITE®

KSH, Inc. • 10091 Manchester • St. Louis, Mo. 63122

*For more data, circle 89 on inquiry card*



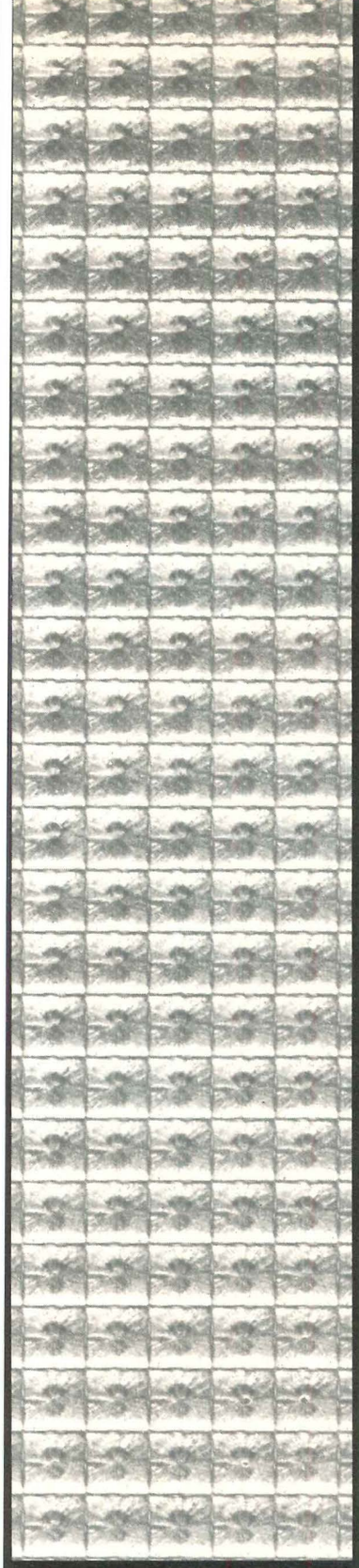


## KSH-11

Unique design. Crystal-sharp prisms in a lattice-like pattern of aluminum accents. Elegance plus superior lamp shielding. Very contemporary. Clear and silvertint. 2 x 4 or smaller.

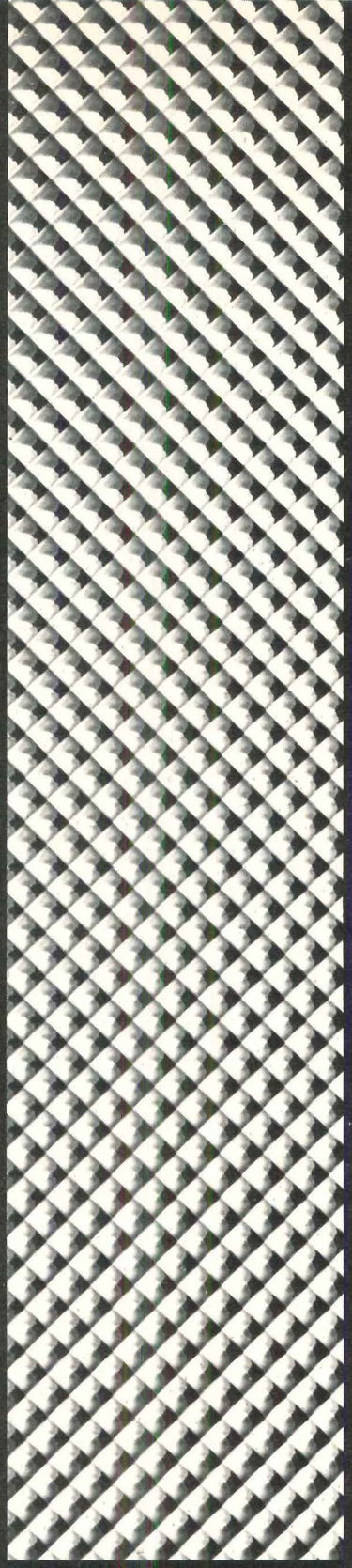
## KSH-12

The standard that has been copied many times. A basic with square prisms on a diagonal axis. Low brightness. Glare-free at luminaire and working surface. Clear, silvertint or white. Up to 4 x 4 in 3/16. 2 x 4 or smaller in 1/8.



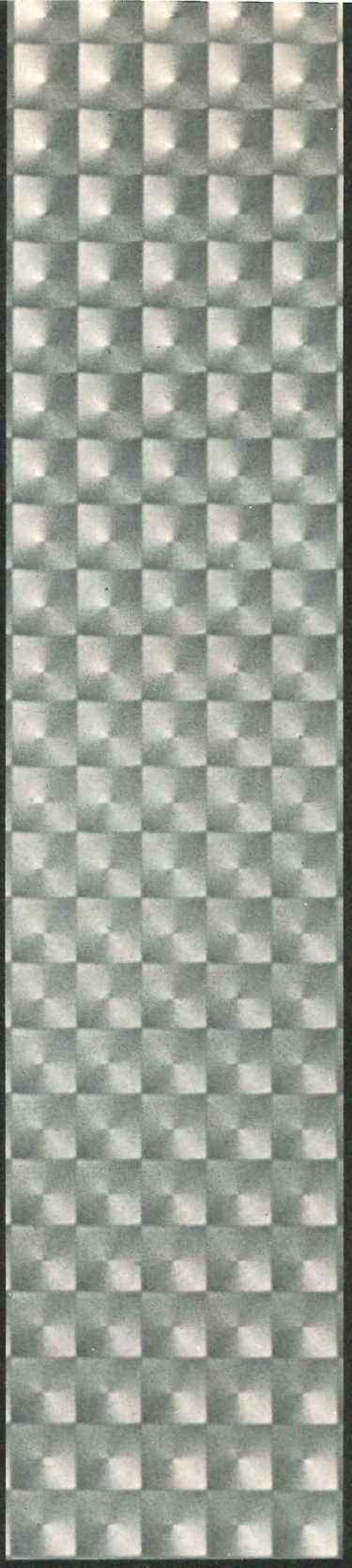
## KSH-15

Bold and beautiful. Distinctive 3/8" square prisms create a new modern look. Clear, silvertints or white. Sizes up to 4 x 4. Thickness is .200.



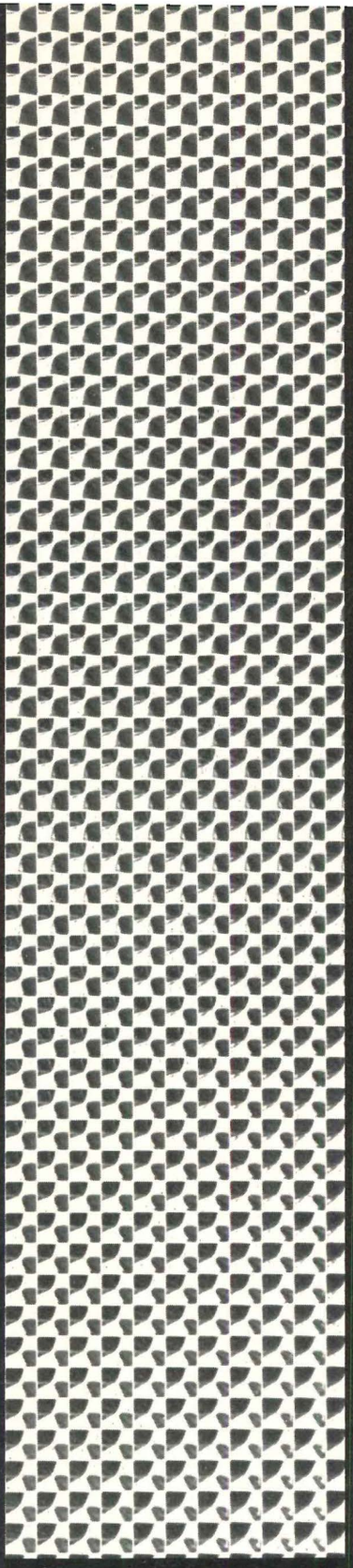
## KSH-16

The first prismatic designed to control both direct and reflected glare for new visual efficiency. Lamp hiding equal to opal panels. A thin sheet of acrylic covers the prismatic. Clear and silvertints. 2 x 4 or smaller in .165 O/A. 3 x 3, 2 x 4 or smaller in .225 O/A.



## KSH-17

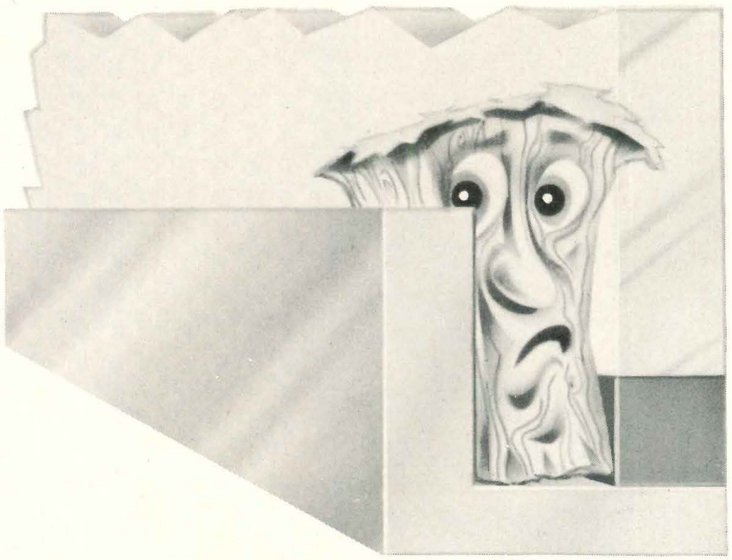
The panel that has everything. A bold modern pattern with thin sheet of acrylic on top. Direct and reflected glare control. High VCP ratings. Clear and silvertints. Sizes up to 4 x 4 in .240.



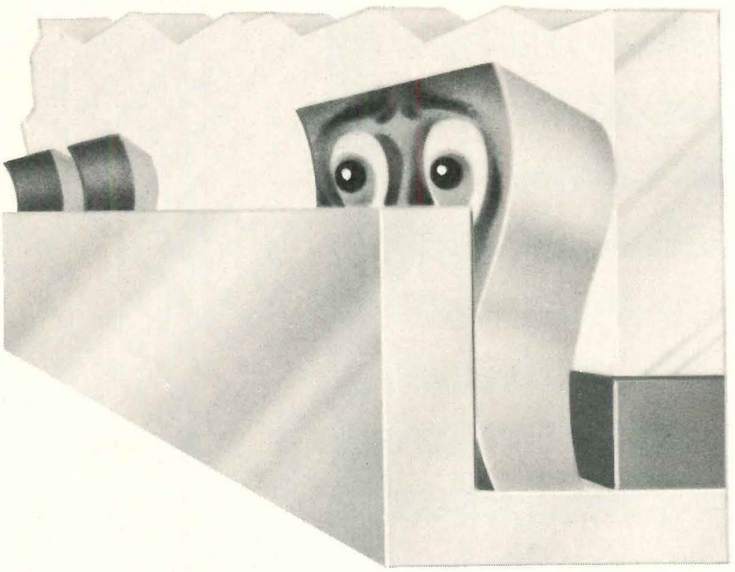
## KSH-19

Another basic with just about everything a panel can offer. Male conical prisms. Excellent lamp hiding. Exceptionally low brightness in 60° to 80° zones. Clear and silvertint. 5/32 or 3/16. Sizes 3 x 3, 2 x 4 or smaller.

# To avoid glazing problems caused by faulty shimming, avoid three of these shims.



**The makeshift shim.** It might do the job for a while.



**The misplaced shim.** It can't do the right job when it is in the wrong place.

All but the Pre-shimmed Tremco 440 Tape can cause problems that might crack or break glass, or cause sealant pump-out or failure.

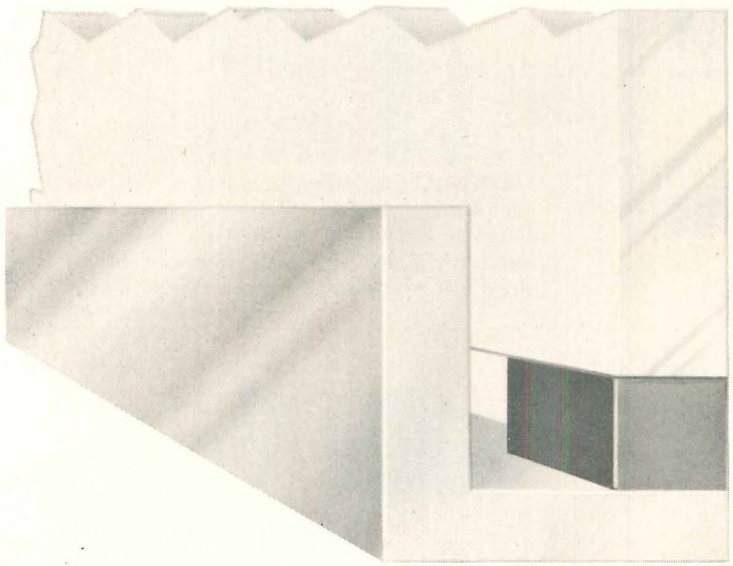
If a shim is unevenly spaced it creates pressure points which could cause glass breakage. A makeshift shim, like a splinter of wood or piece of floor tile, could cause sealant adhesive failure resulting from improper wind load transfer from glass to seal. And if there is no shim at all, the pumping action of the glass will soon squeeze out the sealant.

That's why you should specify Pre-shimmed Tremco 440 Tape. It's a highly adhesive, preformed, shrinkproof sealant with a built-in shim running through the center.

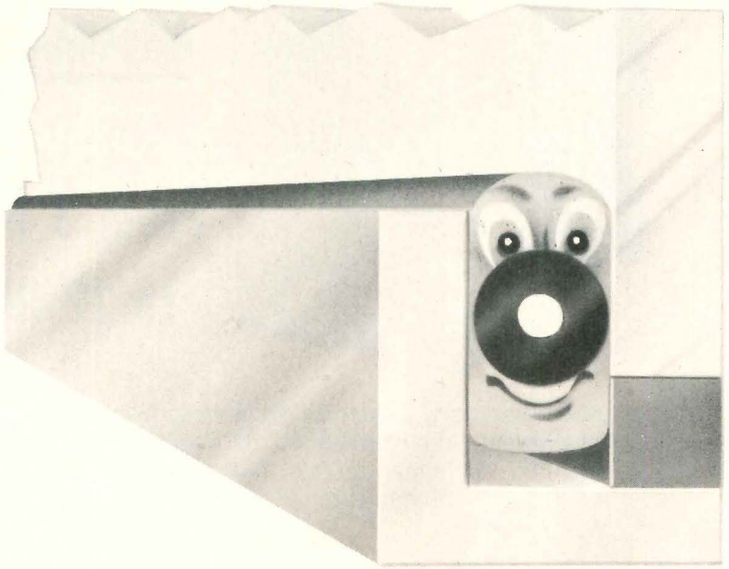
This shim — a continuous elastomeric rod reinforced by a fiberglass core — distributes loading stress uniformly around the perimeter of the frame.

So you don't get pressure points. Or sealant squeeze-out. Or adhesive or cohesive failure.

And with the trend to larger, heavier, more



**The forgotten shim.** Whoops. Someone forgot to put it in.



**The Pre-shimmed Tremco Tape.** It puts a continuous spacer-cushion all the way around the perimeter.

versatile glass, Tremco's ability to provide a leakproof glazing system from a variety of compatible components is more critical than ever.

For all the details on Pre-shimmed Tremco 440 Tape, see your Tremco man. In fact, your Tremco man has the answer to any sealant problem. Because for over 40 years now, solving sealant problems has been our primary business. In addition to our exclusive glazing systems, we have over 15 basic sealant formulations for construction joints . . . including such familiar names as MONO (our job-proven acrylic terpolymer), DYmeric (the Tremco-developed polymer), and Lasto-Meric (our polysulfide).

Contact your local Tremco representative, or write: The Tremco Manufacturing Company, Cleveland, Ohio 44104, Toronto 17, Ontario.

**TREMCO**
**The water stoppers**

*For more data, circle 90 on inquiry card*

*For more data, circle 91 on inquiry card*



*continued from page 168*

**PANELING** / Designed for commercial interiors, this plastic-finished hardboard resists heat, moisture and stains. A damp wiping is the only maintenance required. The panels can be coordinated with a wide range of accessories. ■ Marlite Paneling, Dover, Ohio.

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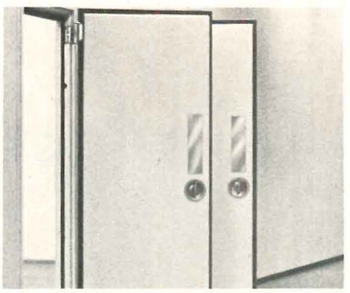

**ACOUSTICAL DOORS** / A continuous compression-silencer seal and two sets of permanent magnets eliminating the need for noisy latch mechanisms deliver acoustical performance. ■ Industrial Acoustics Co., Inc., New York City.

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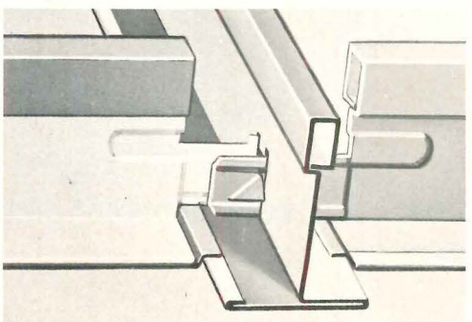
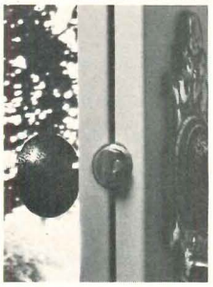


**STEEL CEILING SUSPENSION SYSTEM** / Up to three hours of fire protection under bar joist and concrete floor construction are provided by this exposed grid system. Single thickness, cross-tee offsets are said to provide superior board alignment at all intersections of mains and cross tees. ■ Flangeklamp Corp., Buffalo.

*Circle 313 on inquiry card*

**FOAM-CORE STEEL DOOR** / Interior and exterior steel "skins" bonderized to the core are separated by a "thermal break," a built-in slot which reportedly prevents thermal transfer from one face of the door to the other. ■ Pease Co., Hamilton, Ohio.



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*more products on page 209*

# Who keeps your building high and dry when it's six floors underground?

# Philip Carey.

With today's buildings going deeper and deeper underground, it's more important than ever to provide effective waterproofing and dampproofing protection.

And more difficult.

That's why Philip Carey has engineered waterproofing and dampproofing systems that assure you *maximum* protection against moisture penetration. And, only Philip Carey offers a combination of products — primers, adhesives, asbestos felts, glass and fabric membranes, and protection courses — that make the systems work.

Because conditions vary with job sites and structures, the problems are not always the same. So it's important to discuss your requirements with us — during the planning stage.

One of our Architectural Relations Managers is ready to assist you in determining the best system for your building, wherever you plan to put it. See our catalog in Sweet's Architectural File—7.9/Ca. Or return the coupon and it's yours. Philip Carey Company, Division of Panacon Corporation, Cincinnati, Ohio 45215.

☐ Please send me your Waterproofing/ Dampproofing catalog.
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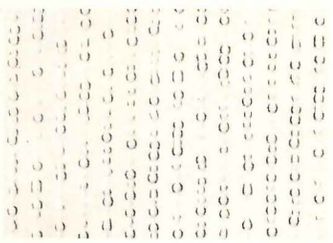
# It takes all kinds.

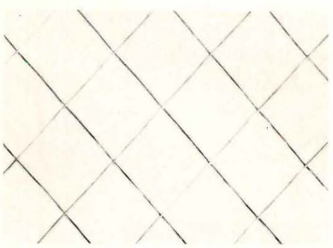
## and all kinds of patterned and wired glass are made by ASG

### over 40 varieties, all from a single source.

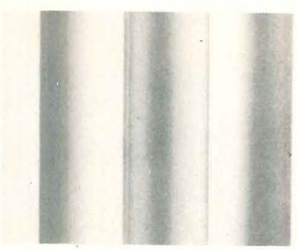
**For businessmen:** Here's a place to swing free with elegant walls of shimmering Beadex® and its raindrop surface, or Randex® with its random linear pattern. Both obviously creative material.



**For schools:** For beauty and safety select Tru-Temp® tempered glass from a wide choice of patterns. These and polished wired glasses, qualify as Safety glass under USAS Z97.1—1966. Nuweld® wired glasses are approved by the National Board of Fire Underwriters as fire retardant.

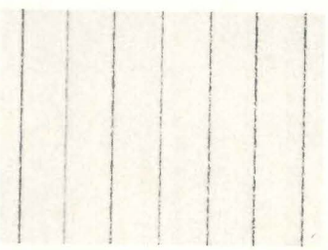


**For homes:** Bring new light and freedom to any architectural style, and do it safely. Use tempered Flutex as entrance side lights. Or select finely textured Muralex® to provide both light and privacy. ASG patterned glasses are ideal for privacy panels, room dividers, or clerestories.



**For doctors:** Nothing somber here. Brighten the patient's visit with Flax.® Or give maximum privacy in the examining room with softly translucent Huewhite,® the most obscure of patterned glasses and exclusive with ASG. Just what the doctor ordered.

**For lawyers:** It's a pinstripe world and ASG gives you full power of attorney. Make it a clear case with Pinstripe® Polished. Or obscure the issue with Pinstripe Finetex® and its subtly muted lines. The Pinstripe family is another ASG exclusive. Write today for complete information about our wide line of wired and patterned glass.



**ASG Industries Inc.**
*P.O. Box 929, Kingsport, Tennessee 37662*

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All-Steel®

Who said all contemporary office furniture looks alike? All-Steel design versatility and depth of line individualizes small, private work stations and dignifies an executive wing. All-Steel Equipment Inc., Aurora, Illinois 60507. Showrooms: New York, Chicago, Los Angeles, Aurora. In Canada: B. K. Johl, Inc., Montreal, Toronto, Vancouver. One of the C.I.T. Companies.

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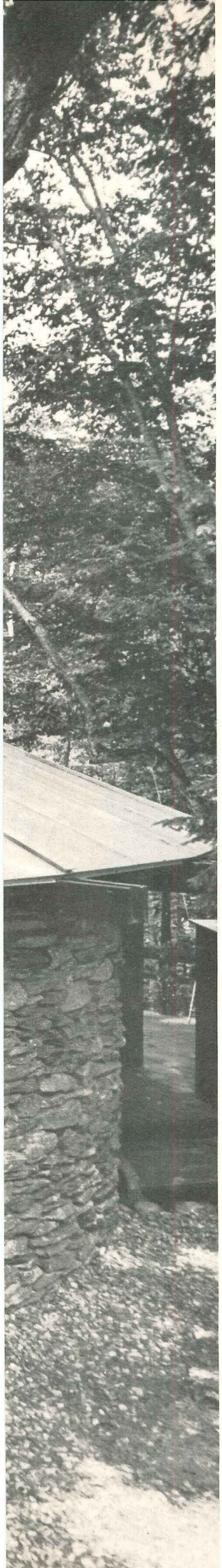


# Happy marriage.

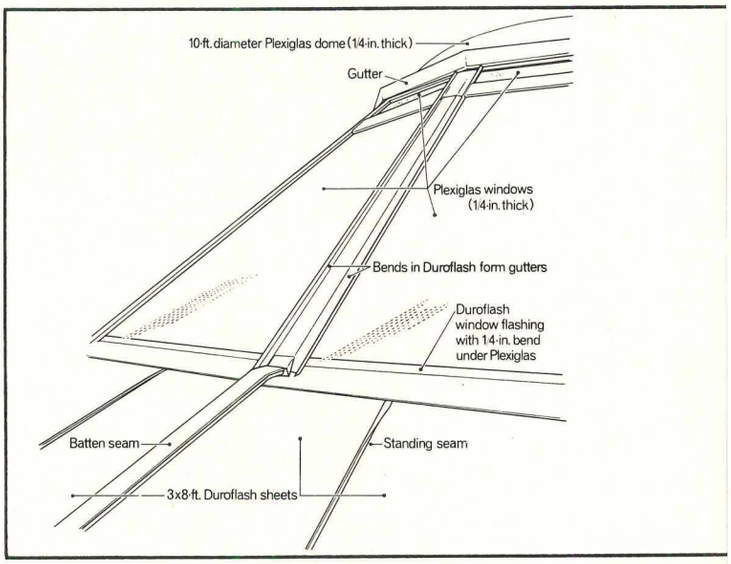
## Republic stainless steel and Plexiglas joined in construction of space-age ski lodge.

Republic's DUROFLASH® stainless steel roofing was chosen as the ideal material for this most unusual weekend retreat . . . built in the foothills of Vermont's Green Mountains by architect Aaron Cohen, A.I.A., of New York City, for investment counselor Henry Schneider. The dodecahedron roof features DUROFLASH stainless steel in 24 planes, married to 12 trapezoidal Plexiglas* windows.

Though DUROFLASH is stronger and tougher than copper and aluminum, it can easily be joined by soldering or welding. Rated as "dead soft," DUROFLASH shows little or no springback when bent for forming. It offers important advantages, too, in stability — both in appearance and price. DUROFLASH will not change color and never needs cleaning or maintenance. Nor is its cost affected by fluctuating availability. In fact, dollar for dollar, DUROFLASH covers more roof for less money.

More than 1200 pounds of DUROFLASH in three-foot by eight-foot sheets were used on the job. The stainless portion of the roof was formed by nailing the DUROFLASH to two-inch by six-inch sheathing. The sheets were precut to size and joined by standing seams.

The area under each large window was flashed with four trapezoidal pieces of DUROFLASH, interlocked with standing seams. Flashing over each beam has longitudinal bends, both for rigidity and to form a gutter.




DUROFLASH is a "creative" material — easily adaptable to enhance your best ideas and readily available from your Steel Service Center. We'll be glad to send


useful reference literature describing this application and perhaps suggesting some for you. Write Republic Steel Corporation, Cleveland OH 44101.

*Plexiglas is a trademark of Rohm and Haas Company.

**Republic steel**

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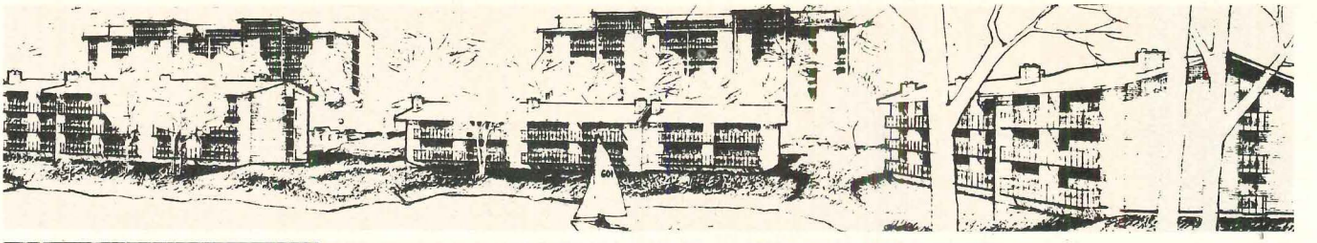
Member Steel Service Center Institute



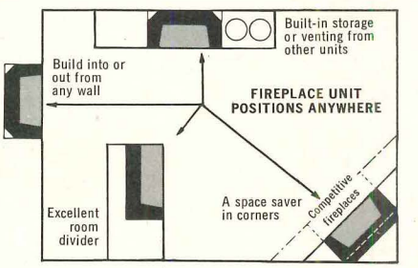
Typical apartment in recreation-oriented Four Lakes Village Apartment Complex, Lisle, Illinois. (Chicago Suburb)
Aubrey J. Greenberg, A.I.A. Architects and Planners

# For so many volume developers this Heatilator fireplace is it!

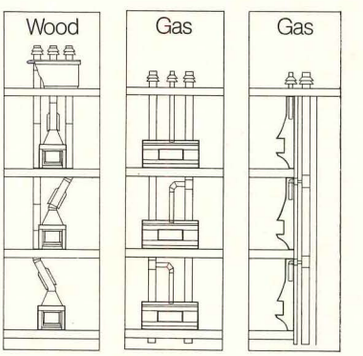
**Mark 123 is the name to remember.** Here, as builders nationwide are discovering, is fireplacing simplified. Mark 123 is so simple that it installs quickly, adapts to any architectural plan, delivers lower operating costs. Here, also, is the lure of relaxing escape—proven a strong selling feature with renters.

**Forget any set ideas about fireplaces.** The representative diagrams shown detail the versatility, adaptability and stacking features. Support and surround the Mark 123 with combustible materials. Heatilator Mark 123 systems (fireplace, flue and roof termination) arrive jobsite for under $300. Twist-lock feature secures components in seconds. Full-pack insulation eliminates condensation and noise transmission.

**Renters willingly spend up to $15 more per month to enjoy a Mark 123.** That means more cash flow, rental profit, loan and sales value for builders and investors.

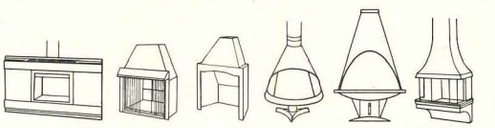



**See your Heatilator distributor.** Or send for free "Fireplace Idea Kit," detailing a full line of wood and gas burning models. Write: Vega Industries, Inc., 3391 W. Saunders St., Mt. Pleasant, Iowa 52641. Also available in Canada.




Multi-level venting for Wood or Gas systems. Choice of manufactured or job-built roof termination.

heatilator®
America's Leading Fireplace Systems



Built-in/Free-standing/Wall-hung

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*For more data, circle 97 on inquiry card*

# Keene movable partitions.

Keene movable partition systems enable you to divide and redivide your interiors quickly and inexpensively, to meet changing building needs.

The complete Keene line of five basic systems includes soundproof, all-steel Penciline with flush joint treatment, and Kwik-Zip—the only movable partition system with no exposed seams. Keene partitions are available in ceiling, cornice and railing heights.

Assembly and relocation is quick and economical because the panels snap easily and securely into our Perma Lock stud, and the entire system can be moved without damage.

Keene movable partitions offer you attractive styling options, too, like recessed base and ceiling trim. And you have an unlimited choice of panel materials from gypsum board to sophisticated wood veneers.

For details on the movable partitions that let you handle interior space with flexibility, write to:

Keene Corporation
Partition Division
2319 Grissom Drive
St. Louis, Missouri 63141

# Keene Interior Systems.

In addition to manufacturing key interior components, we have a concept that puts it all together: the Keene interior systems approach.

We apply systems engineering techniques to interior design and construction, integrating over 8,000 possible combinations of Keene building products to meet every interior need. All are interdesigned and installed under the supervision of the Keene Interior Systems Division.

All Keene interior systems are completely modular. Each module contains its own lighting, air distribution and acoustical control, and provides interlock channel tracks for the movable partitions. And because versatile Keene interior components are used, Keene system-built interiors can be rearranged easily, quickly and frequently, without damage to wall panels or ceiling tiles.

For integrated flexible interiors—constructed under a single-source responsibility for total job performance—discuss your future building plans early with:

Keene Corporation
Interior Systems Division
Route 206 Center
Princeton, New Jersey 08540

Whenever you need key interior building components and materials—or total interior systems—work with the people who have the products, facilities, experience and determination to please architects, builders and owners. Call in the Interiors People from Keene.

KEENE
CORPORATION

**We've just begun to grow.**

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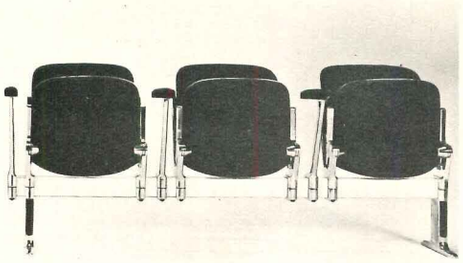

**SEATING UNITS** / Base sections are made of cast aluminum. As many as six seats and/or plastic-surfaced tables can be used per horizontal beam. ■ Krueger Metal Products Co., Green Bay, Wis.

*Circle 315 on inquiry card*

**MOVABLE PARTITIONS** / Four stud systems allow independent erection of each side and individually removable panels. Partitions fit all standard ceiling grid modules, and are available in ceiling, cornice or bank-rail height. ■ United States Gypsum Co., Chicago.

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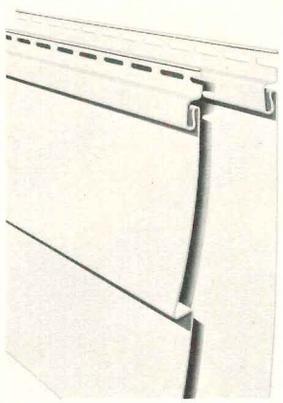
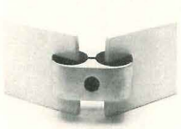


**SOLID-VINYL SIDING PANELS** / In the manufacturing process, vinyl is first extruded in flat sheets of uniform thickness, then formed into actual panels. This method is said to eliminate uneven surfaces which might create weak areas. ■ Mastic Corp., South Bend, Ind.

*Circle 317 on inquiry card*

**PANEL-LINK-DEVICE**/Panels in free-standing displays can be connected without using screws. Rubber sleeves inserted in a metal clamp hold panels. ■ Aero-Lite Corporation, Horsham, Pa.



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*more products on page 216*

# Stanley figures in the best of plans


It's no wonder. After all, we do make the broadest line of architectural cabinet hardware on the market. The latest addition to the line is the new extruded aluminum pulls. There are lots of other things too: pulls, hinges, pivots, catches and knobs. They come in all styles, sizes, metals and finishes. You'll find information on the whole line in our new cabinet hardware brochure. Write for it today. We think you'll be glad you've included Stanley. No matter how your plans shape up. Stanley Hardware, Division of The Stanley Works, 195 Lake St., New Britain, Conn. 06050. In Canada: The Stanley Works of Canada, Ltd.

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BUILDERS HARDWARE MANUFACTURERS ASSOCIATION MEMBER bhma

*For more data, circle 99 on inquiry card*

Beauty is a great deal more than skin deep in the new First National Center in Portland, Oregon. To keep warpage of the exterior precast panels within allowable tolerances, shrinkage-compensating ChemComp® Cement concrete was used in casting these marble-faced units. ChemComp Cement also provided extraordinary workability without sacrificing strength. The result: an impressive structure to render better banking services while adding an important element of charm and interest to downtown Portland. First National Center is, indeed, as soundly built as it is beautiful to see! ChemComp Cement REDUCES size and incidence of drying shrinkage cracks ■ AFFORDS DIMENSIONAL STABILITY ■ SUBSTANTIALLY FEWER JOINTS REQUIRED ■ NO SPECIAL PLACING PROCEDURES NEEDED ■ LESS SEALING AND CAULKING ■ MUCH LESS LONG TERM MAINTENANCE for the owner.

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*the shrinkage-compensating cement*

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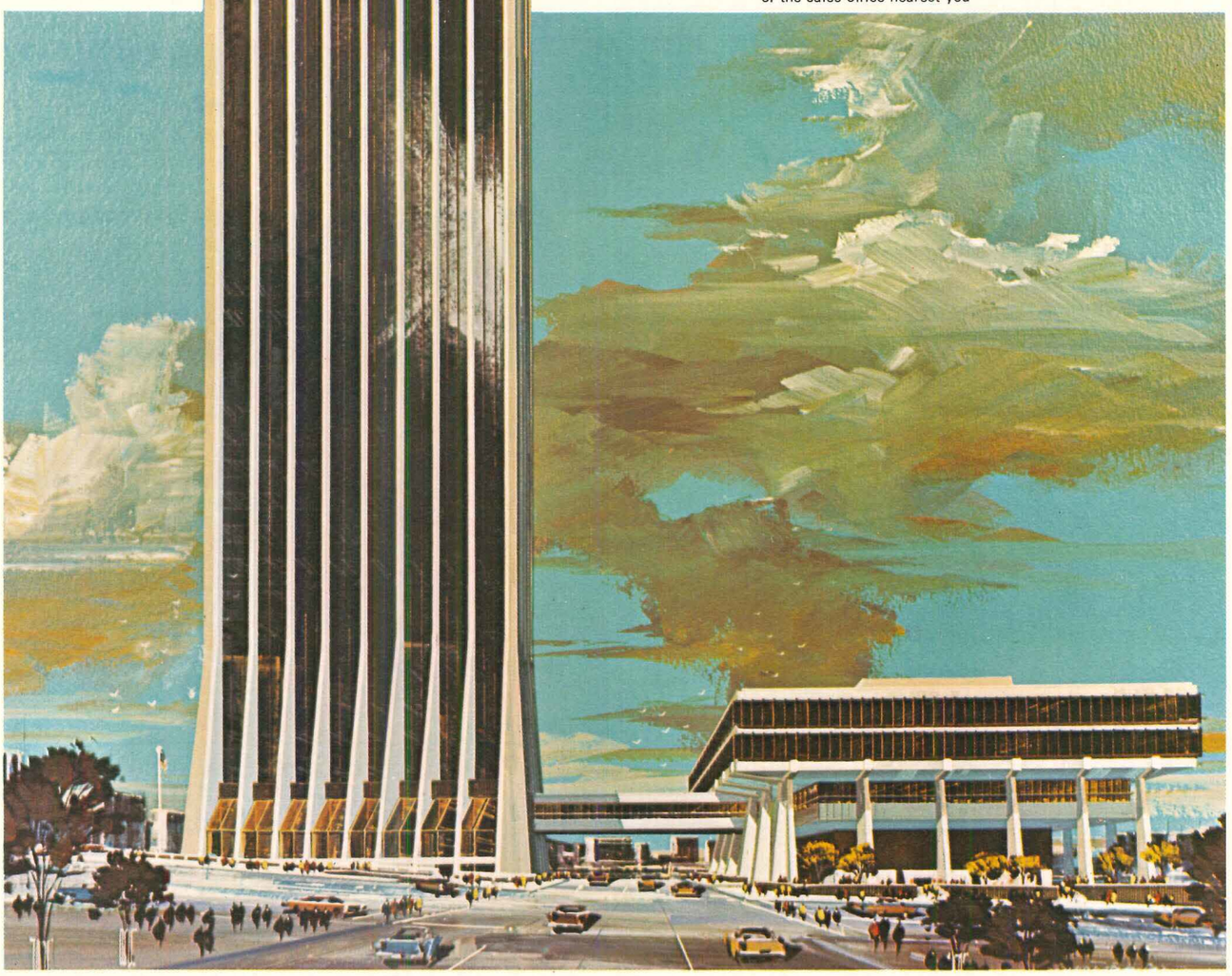
**TXI**
Texas Industries, Inc.
P. O. Box 400
Arlington, Texas 76010

**SOUTHWESTERN**
Portland Cement Company
1034 Wilshire Boulevard
Los Angeles, California 90017

**MEDUSA**
Portland Cement Co.
P. O. Box 5668
Cleveland, Ohio 44101

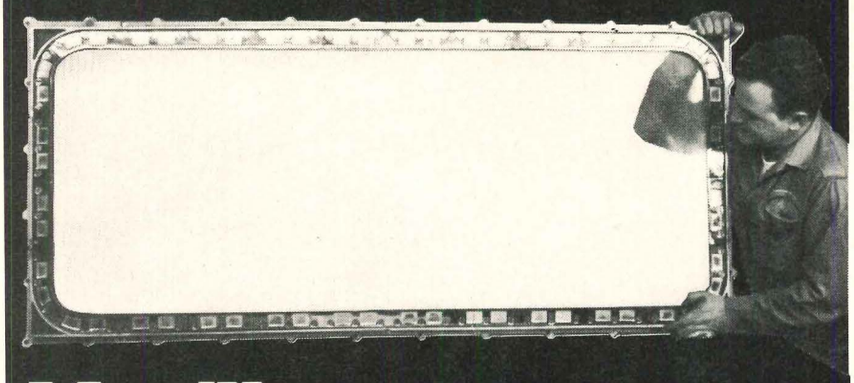
For further information contact:
**Chemically Prestressed Concrete Corp.,**
**14656 Oxnard Street, Van Nuys, California 91401**
or the sales office nearest you



■ *ARCHITECTS:* Chas. Luckman Assoc., Los Angeles, Calif. ■ *General Contractor:* Hoffman Const. Co., Portland, Oregon ■ Empire Prestress, Inc. Manufacturers

*For more data, circle 100 on inquiry card*

# Design your next pool with a KDI Paragon underwater window.



# You'll see the difference.

No other single piece of equipment multiplies the use of a pool like an underwater observation window. It is coveted by Coaches of swimming and diving; an invaluable aid for ballet and syncronized swimming instruction; a dramatic aid for photographers and a delight for audiences.

KDI Paragon underwater windows are precision-engineered of cast bronze with a polished chrome surface. Available with ¾" tempered polished plate glass or 1⅛" safety glass. They fit flush in any plain or tiled concrete wall pool. Shipped fully assembled to the job site ready to install. Rectangular windows 2' x 2' to 3' x 5'. Also 18" round windows.

**Detailed Engineering Specification Sheet on Request**

**KDI Paragon Inc.**
**Mfrs. of Quality Deck & Underwater Equipment**
**12 Paulding St.**
**Pleasantville, N.Y. 10570**
**914-769-6221**

**See Our Catalog in Sweets Architectural File**

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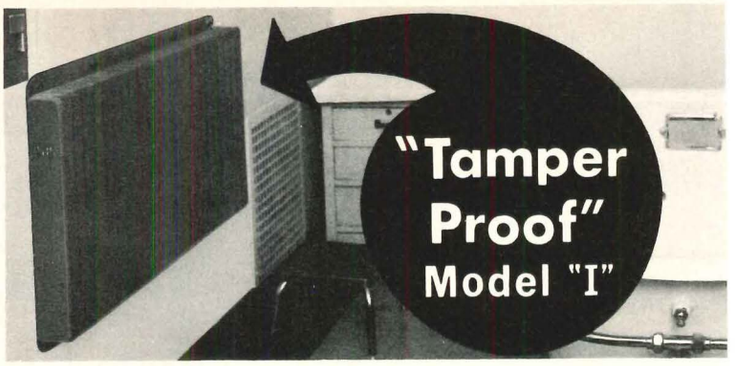


## Ultimate Security Designed specifically for general and mental hospitals and penal institutions

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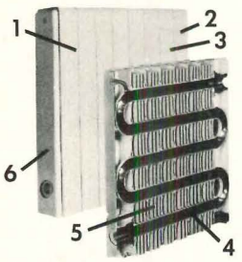


1. Strong cover. 2. Flat surfaces—round corners. 3. Safe to touch. 4. Heavy copper coil. 5. Easy to clean. 6. Neat appearance.

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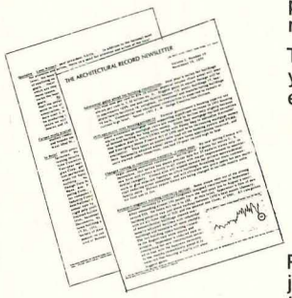

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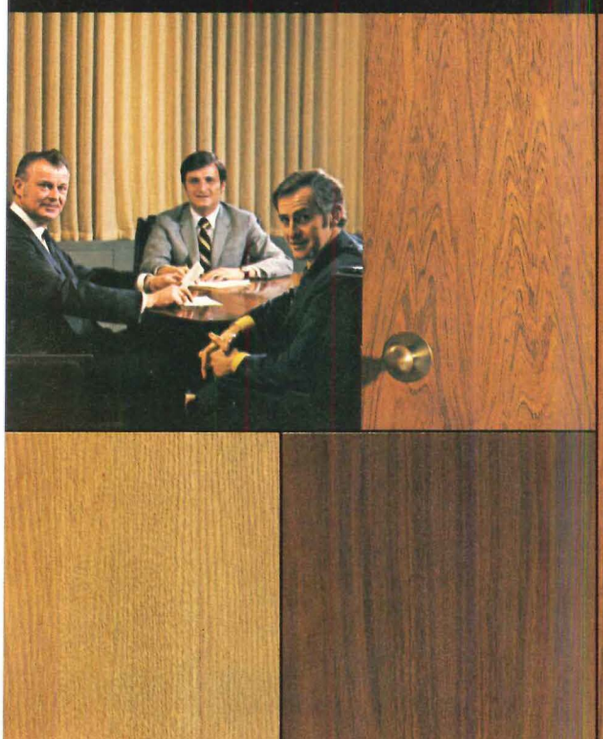
# Make a grand entrance with G-P Curtis® doors



You take such pains with the rest of the building, why take chances with the doors? For years, Georgia-Pacific's Curtis® doors have been famous for quality. They're sturdy doors. Tough. With a look and feel that says fine craftsmanship. What's more, all Curtis doors are color matched and can be ordered in specific colors. So they add to the decor of a building. Curtis doors are pre-machined and pre-fitted, cutting labor costs at the site. And they come with harmonizing or matching edge strips, practically eliminating on-site finishing. In addition, most Curtis doors have hardwood cores which means greater stability and longer life. Today, ask your G-P representative about Curtis doors—the grand entrance.

GEORGIA-PACIFIC

PORTLAND, OREGON 97204

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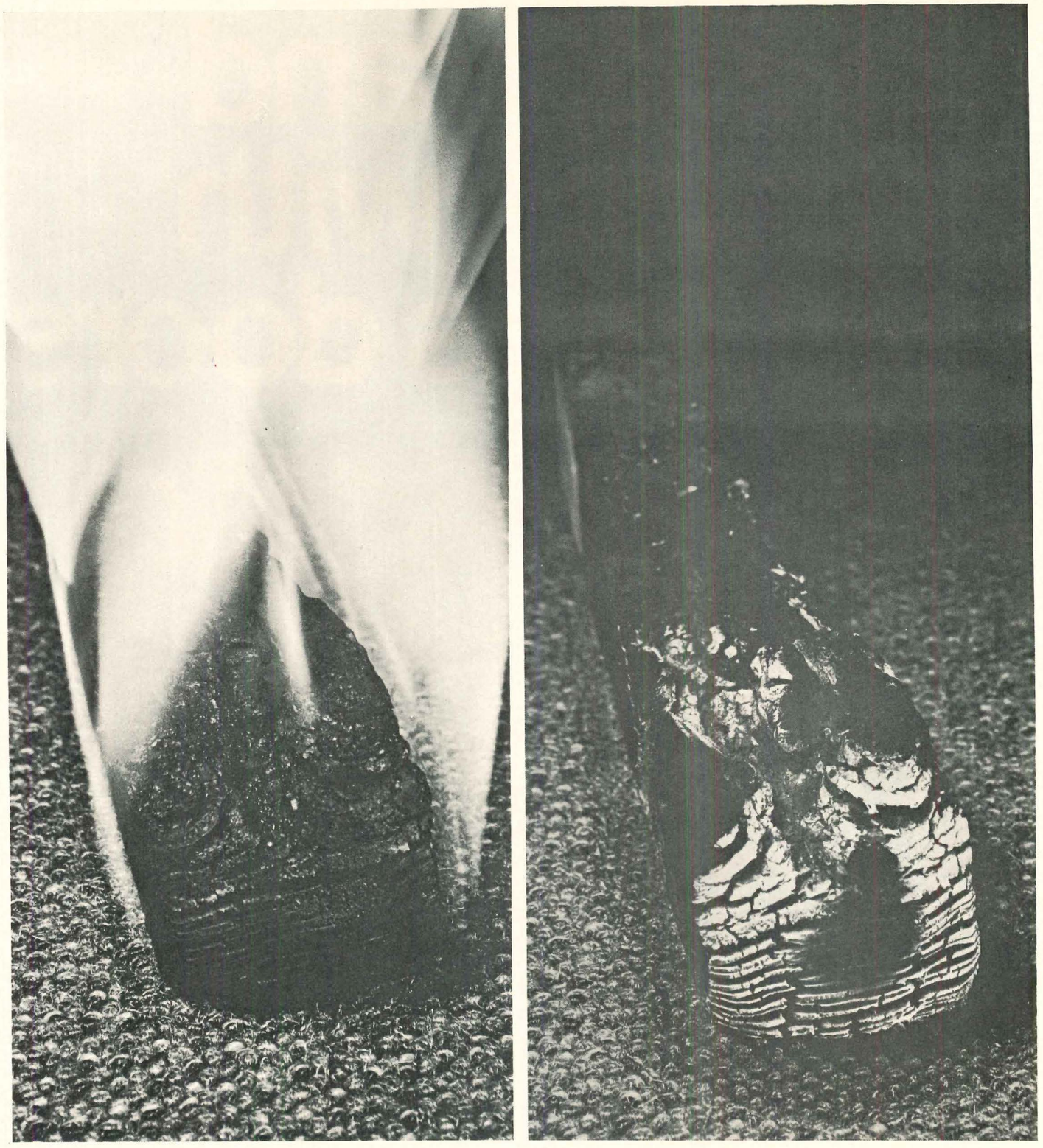

# Introducing flame resistant carpet of NOMEX®.

Two reasons for carpet of NOMEX high-temperature-resistant nylon: fire and smoke. NOMEX* fiber is permanently flame-resistant. Properly constructed carpet of NOMEX is rated Class A under the NFPA's Life Safety Code and exceeds all known and currently proposed flammability requirements. Carpet construction combining NOMEX fiber with fire-resistant backings provides maximum protection against flame spread and smoke.

NOMEX has the lowest smoke generation of any carpet fiber on the market. And that protection is permanent. Both the flame and smoke resistance of NOMEX are inherent in the fiber. They'll last the life of the carpet.

And that'll be a long life, because NOMEX is nylon-tough and long-wearing. It's highly resistant to stains and soiling – yet easy to clean. For more information, write: Du Pont Company, Room CRB 3156, Wilmington, Delaware 19898.

*Du Pont registered trademark.

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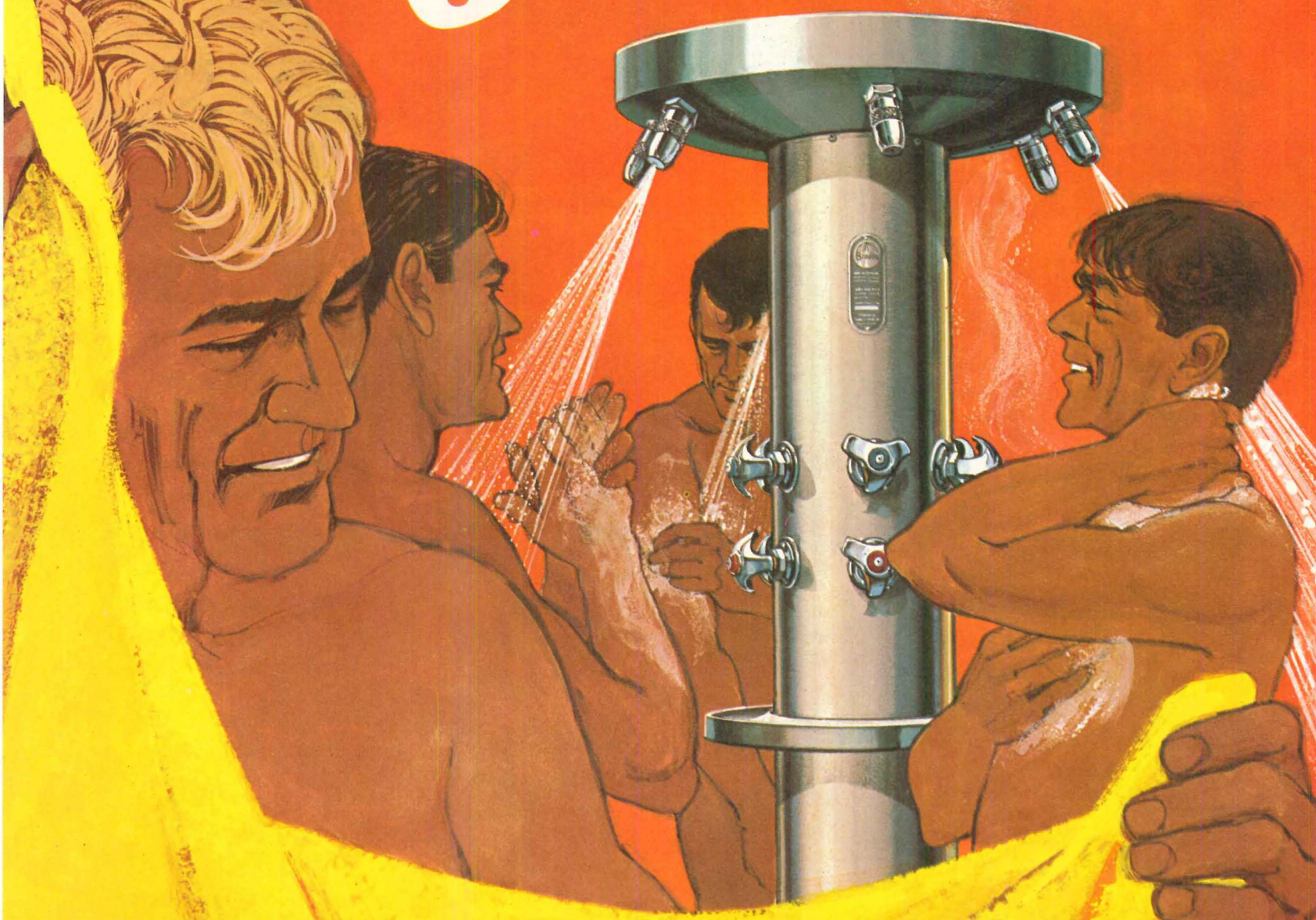
# Bright idea



**Space-saving showers that never squeeze people!**

Bradley Column Showers serve more people in less space than ordinary showers. They squeeze maximum use from every inch of available floor space. But Bradley Columns never squeeze people. Shower patterns leave *plenty* of room between bathers. Bradley Columns offer other important savings. They serve up to 6 people with one set of plumbing connections, cutting installation costs as much as 80%! Bright idea: put the squeeze on building costs. Put Bradley Column Showers into your shower room plans. See your Bradley representative. And write for literature. Bradley Washfountain Co., 9109 Fountain Blvd., Menomonee Falls, Wis. 53051.

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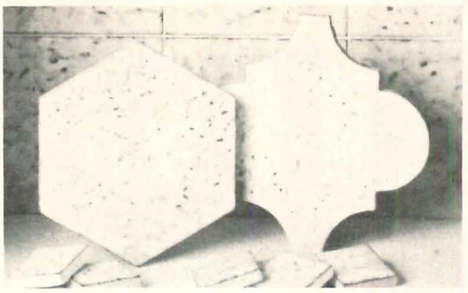
# from Bradley!

BRADLEY

continued from page 209



**CERAMIC TILE** / Three new shapes—a 5-in. hexagon, 5-in. curved tile reminiscent of Spanish tile, and 1⅜-in. by 1⅜-in. square—are offered in the manufacturer's line for wall surfaces and floors. ■ American Olean Tile Co., Lansdale, Pa.

*Circle 319 on inquiry card*

**CEILING SYSTEM** / Lighting, acoustical and air conditioning control are provided. Acoustical control on coffered sides is provided by the manufacturer's ceiling panels. ■ The Celotex Corp., Tampa, Fla.

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**WALL TILE** / This sculptured tile for both commercial and residential applications is available in bright or matte glaze and in six colors. ■ United States Ceramic Tile Co., Canton, Ohio.

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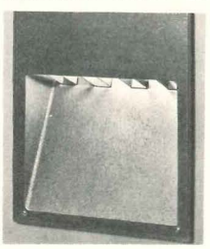
**RECESSED AISLE LIGHT** / High light output with low visible light source is provided by this fixture for both interior and exterior applications. An integral ballast maintains low-heat operations. ■ Prescolite, San Leandro, Calif.



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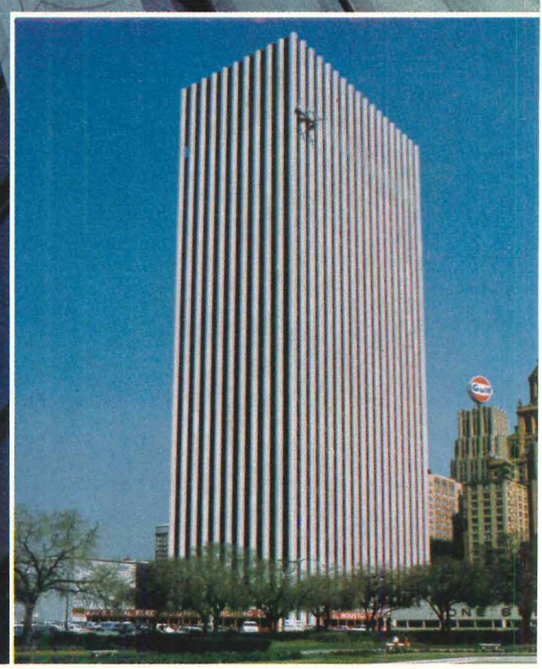
more products on page 238

# LOOKING UP... IT'S MO-SAI



Houston Lighting and Power Building, Houston, Texas. Architects: Wilson, Morris, Crain & Anderson. General Contractor: Bellows Construction Company

Vertical lines of Mo-Sai column covers running 27 stories tall become the dominant feature on the Houston Lighting and Power Building. The Mo-Sai units are 5 feet wide, 2½ feet deep, and range from 4 to 18 feet high, with typical units 14 feet high. An exposed white and black granite provides a distinctive color and texture to the building. A connecting "special functions" building is faced with Mo-Sai panels approximately 5 feet wide by 41½ feet high, with the same exposed granite aggregates. Exposed granite aggregates in the walkways coordinate the surround.

The plasticity of Mo-Sai makes it an ideal material to reproduce imaginative architectural designs. The distinctive colors and textures combined with lasting durability provide pleasant appearance and easy maintenance for years to come.

Look up your nearest Mo-Sai manufacturer on the attached list for your next project.

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# CUSTOM MADE STEEL WINDOWS

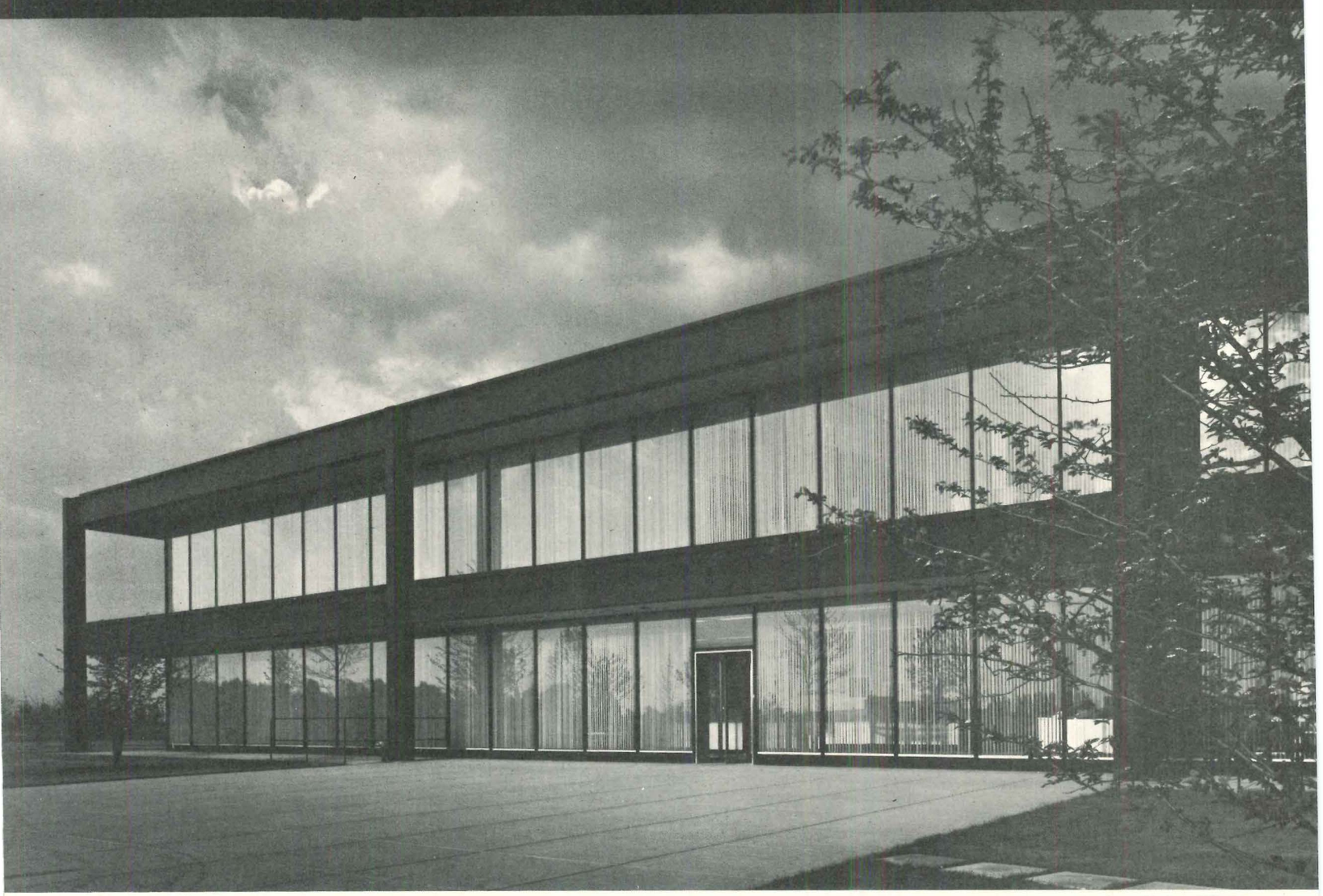

*Photo by Ezra Stoller (ESTO)*

Inland Steel Company Research & Development Laboratories, East Chicago, Indiana
Skidmore, Owings & Merrill, *Architects/Engineers* • Power Construction Inc., *General Contractor*

The large fixed windows comprising the window walls in this extensive laboratory complex were carefully engineered in close cooperation with the architectural designers. Special attention was given to windload, glazing and installation. All window frame components (head, jamb and sill members) were machined from light structural steel beams and hot-dip galvanized before assembly. From the outset all Hope's efforts in engineering, fabrication and erection were directed towards producing an installation of custom steel windows which would require minimal future maintenance.

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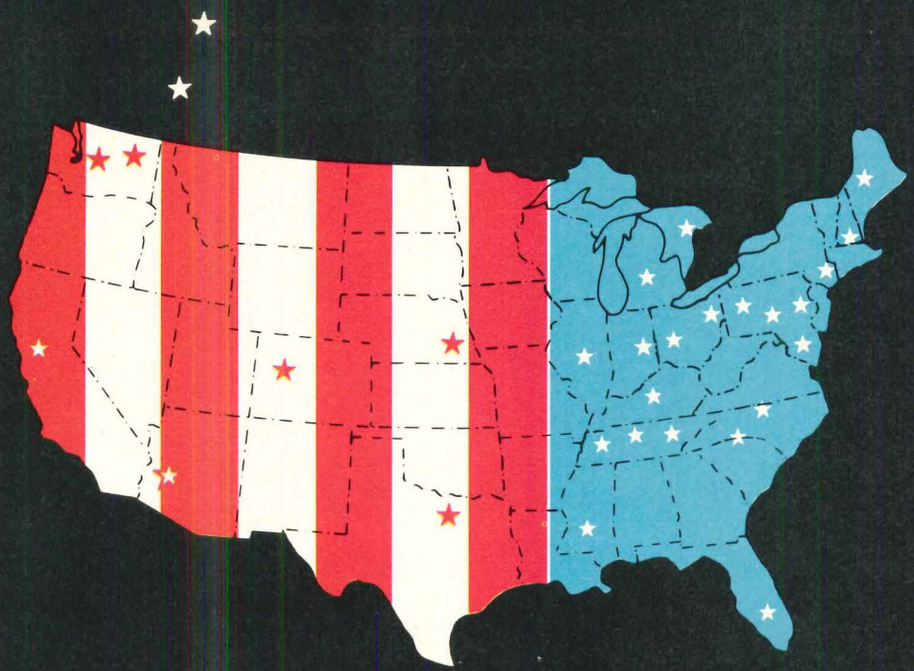

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Span-Deck, Inc., P. O. Box 99, Franklin, Tennessee 37064

P. S. We're international, too. Canada, Puerto Rico and Venezuela — so far.

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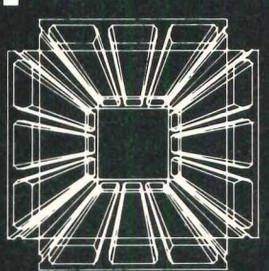

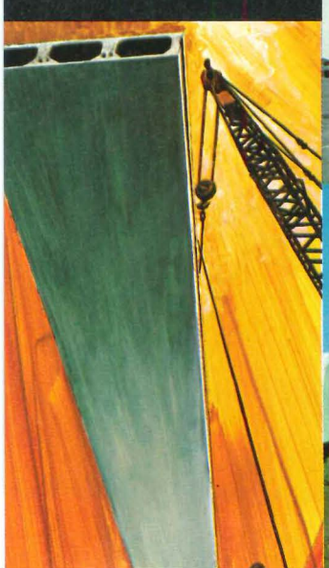

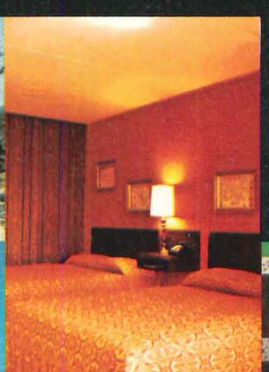

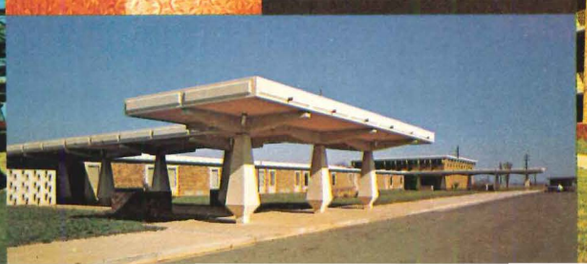

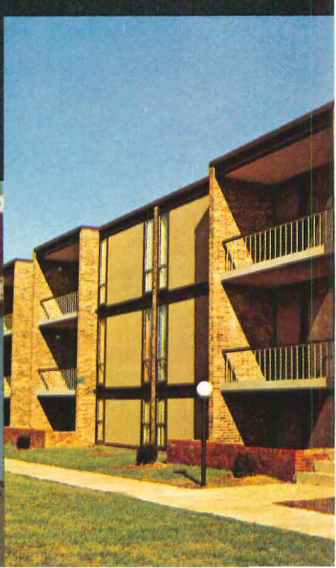

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Model 2300-RC6 or 12 illustrated in Antique White finish.

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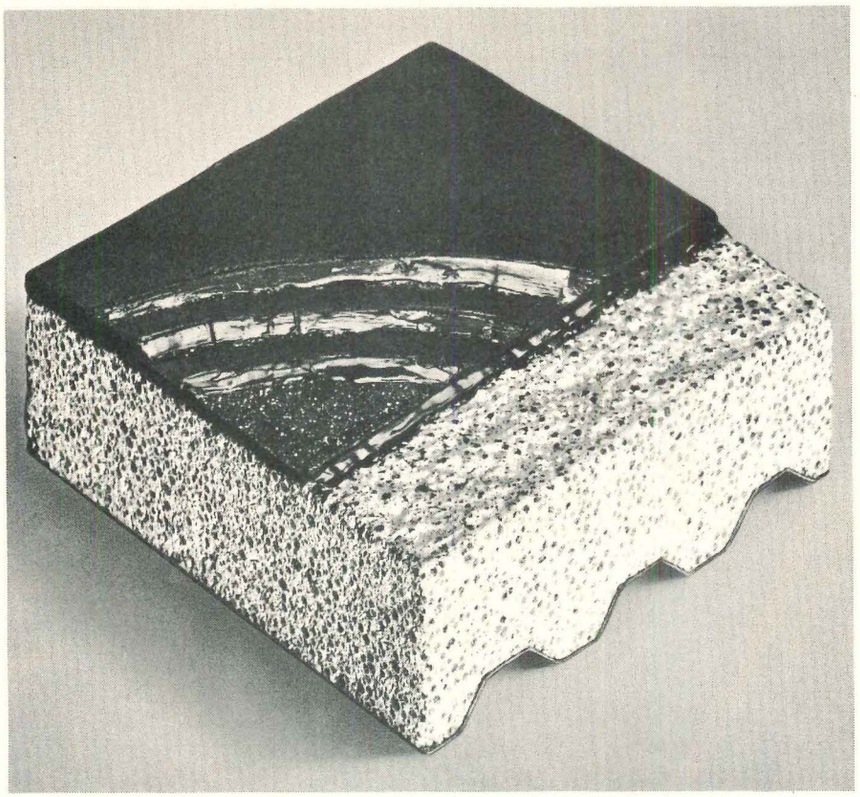
# CELRAMIC® ROOF DECK:



# Keeps built-up roofing from wrinkling, splitting, and leaking.

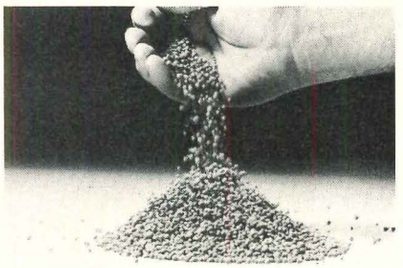
The main cause of premature roof failure is weak substrate. The kind you get with most roof fills, most insulation boards, and many other deck materials. But not with ours.

CELRAMIC insulating concrete fill gives a superior base for built-up roofing, by *any* standards. Used with light-gauge steel formwork, it makes a rigid, monolithic concrete roof system.

We've eliminated the runaway water-cement ratio that gives other roof fills a weak, powdery surface. Our fill uses only six or seven gallons of water per sack of cement. So there's no shrinkage or residual moisture problems, no long curing time (48 hours is typical).

Our "engineered" CELRAMIC aggregate can't drink up water because it's closed-cell glass. Can't burn either —CELRAMIC deck has a two-hour rating under ASTM E-119.

Other advantages are good insulating value and slope for drainage. To sum it all up, CELRAMIC deck is a completely integrated system. Write for a bulletin. Pittsburgh Corning Corporation, Dept. AR-91, One Gateway Center, Pittsburgh, Pa. 15222.



PITTSBURGH pc® CORNING

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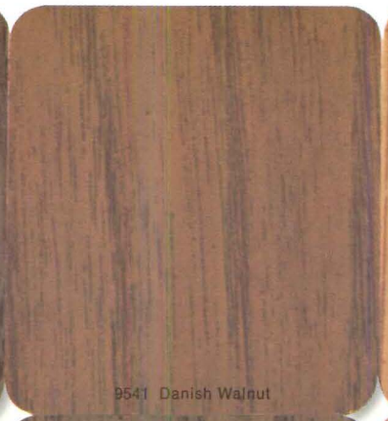
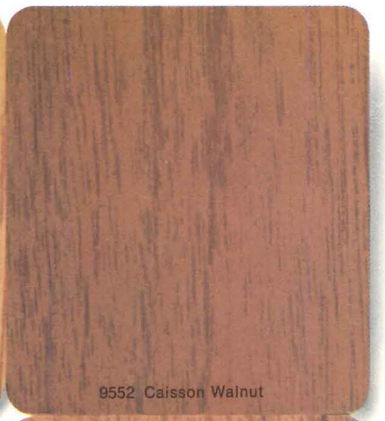
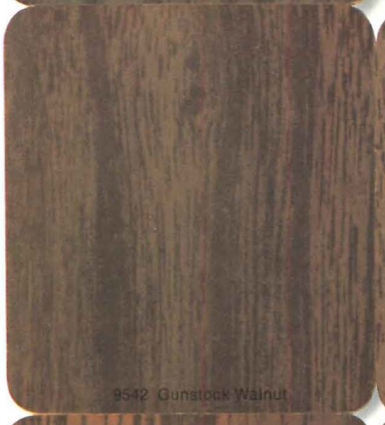
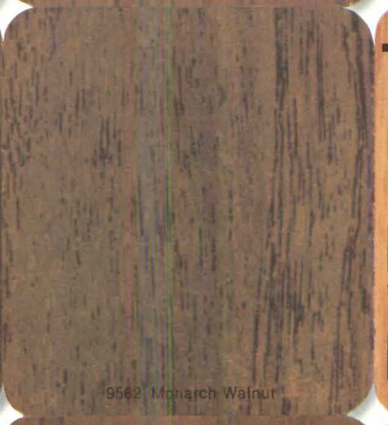


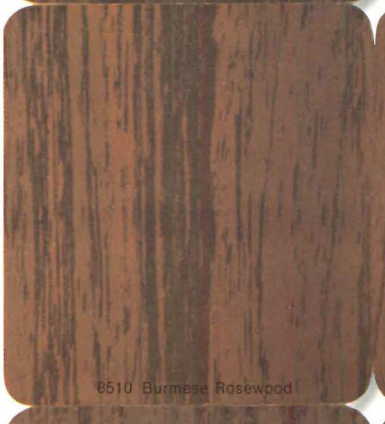


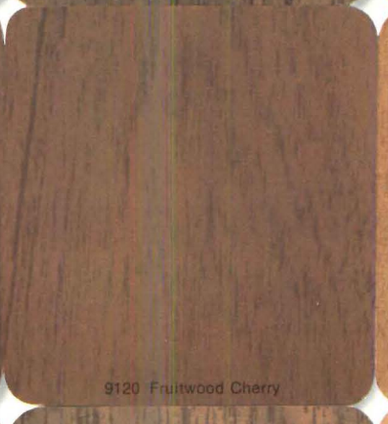


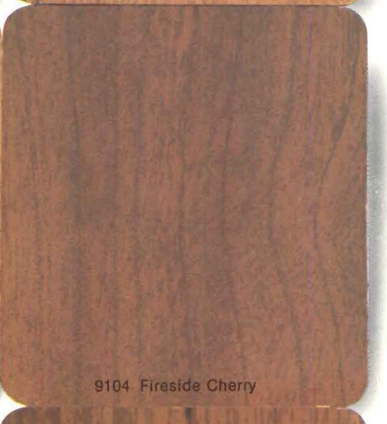

# The one perfect woodgrain pattern you've been looking for.

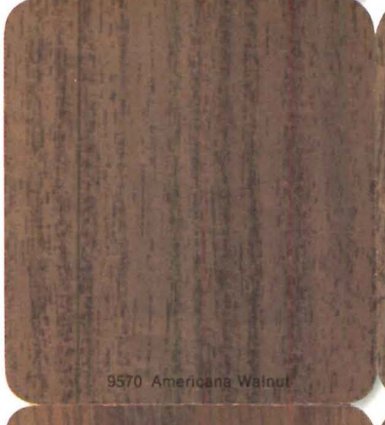



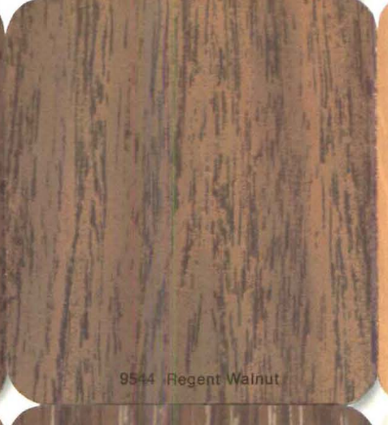




When you're the leader in plastic laminate design, you know everyone's taste is different.

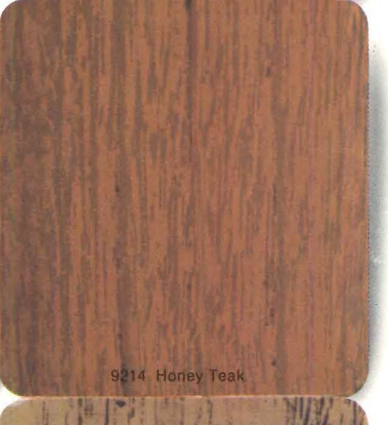
That's why we've created 20 woodgrain patterns that are each perfect in their own ways. Which is why we're sure you'll find the one and only woodgrain pattern you've been looking for when you look at our beautiful twenty. Including six new ones for 1971 that offer even more exact and subtle varieties of light, medium and dark tones.




Whether it's a forest of beautiful woodgrains, a rainbow of solids or exciting abstracts, Textolite knows that the way to give you one perfect laminate design is to give you more than 120 that are perfect. And you can see them all by sending for our full line catalogue. General Electric Company, Laminated Products Dept. Coshocton, Ohio 43182.

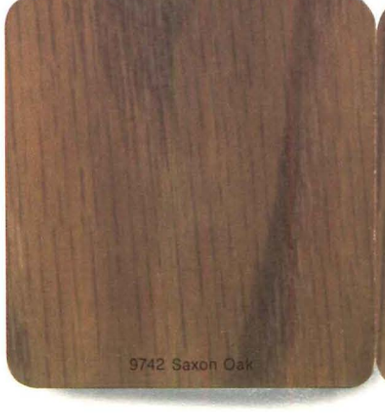


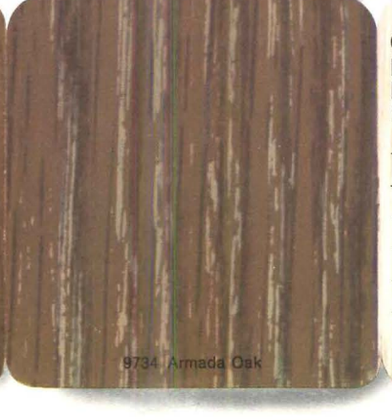

**TEXTOLITE®**
DECORATIVE SURFACING

Gentlemen:
☐ Send full-line catalog.
☐ Send complete set of samples
☐ Have your salesman call. A-3

Name _____
Firm _____
Address _____
City _____
State _____ Zip _____
Position _____

GENERAL ELECTRIC




For more data, circle 118 on inquiry card

# Accent adds the spice of light

Accent—by McGraw-Edison. Quality, outdoor Accent lighting in a variety of contemporary shapes. Spheres, cylinders, cubes, ellipses. With crisp, geometric edges or soft, rounded curves on cubical and cylindrical designs. A variety of sizes and shapes to Accent pools and plantings at heights as low as four feet; sizes to Accent building lines on ten-, fifteen-, twenty-foot poles or even higher.

There are designs for just about every Accent application you're planning. But we'll go even further. If you're thinking about a particular effect that we haven't considered, tell us. We'll be happy to work with you. And we'll thank you for the suggestion.

All are made of quality materials, such as molded acrylic globes. Accent reflects good design, so that globes go on the pole in minutes with an internal-locking pole adapter and base. You can mount single luminaires, or use multiple-configuration on either metal or wood poles. Or you can wall-mount them with an easy-to-install bracket.

Accent, by McGraw-Edison. Your McGraw-Edison sales engineer, manufacturer's representative or authorized distributor has a complete portfolio to show to you. Or, for an application booklet in full color on these new designs, write:

McGraw-Edison Power Systems Division,
Post Office Box 440,
Canonsburg, Pa. 15317.
In Canada: Ontario.

McGRAW EDISON

# McGraw-Edison

7112

*For more data, circle 119 on inquiry card*

No need to have one color in mind
and another on the floor.
Show us exactly what you want.
And we'll duplicate it. Exactly. Any color,
any texture, any pattern you call for. In as little
as 350 yards. At no extra charge.

## Want us to match a pebble? Please specify wet or dry.

Our unique Contract 350 program
offers 15 of the finest carpet grades,
engineered to meet any set of specifications.
All bear the wool mark label . . . mark of
the world's best . . . pure wool pile.
Ask about Contract 350. Another way
we do things with carpet nobody's done before.

# Carpet by Roxbury

Framingham, Massachusetts

*For more data, circle 121 on inquiry card*

## OFFICE LITERATURE

*continued from page 173*

**TURNSTILE DESIGN** / Problems dealing with diner traffic flow are discussed in a 4-page brochure. Solutions are proposed using the proper turnstile system. The company's line is featured. ■ Perey Turnstiles, New York City.
*Circle 408 on inquiry card*

**METAL BUILDING SYSTEMS** / A complete range of buildings accommodating both large and small business operations is presented in a 12-page catalog. Sections are devoted to framing, wall and roof systems. Bulletins on specific systems are available. ■ Armco Steel Corp., Middletown, Ohio.
*Circle 409 on inquiry card*

**PARTITION SYSTEMS** / Two movable systems are described in a 12-page catalog. Four standard heights are available. Construction details are shown. ■ Masonite Corp., Chicago.*
*Circle 410 on inquiry card*

**FIXED FURNITURE** / A complete line designed for schools is presented in an 8-page brochure. The collection includes swivel chairs, folding tablet-arm chairs and pedestal tables. ■ Peabody Seating Co., North Manchester, Ind.
*Circle 411 on inquiry card*

**FIBERGLASS PANELS** / Light and solar heat transmission data on each of eight colors available is given in a 4-page brochure. Panels can be used individually or with brick, stone, concrete or metal. ■ Johns-Manville, New York City.*
*Circle 412 on inquiry card*

**MAIL BOXES** / Vertical units designed for high- and low-rise apartments are described in a 12-page catalog. Specifications for two models are given. Directory panel, magazine rack and doorbell button components are also described. ■ American Device Mfg. Co., Steeleville, Ill.*
*Circle 413 on inquiry card*

**GLUED FLOOR SYSTEM** / An information package includes an application sequence manual and detailed information on this plywood floor. ■ American Plywood Assn., Tacoma, Wash.*
*Circle 414 on inquiry card*

**STEEL EQUIPMENT** / A complete line of over 1600 items including steel shelving, lockers, and office desks, tables and files, is described in a 68-page guide. ■ Lyon Metal Products, Inc., Aurora, Ill.*
*Circle 415 on inquiry card*

**MEMBRANE SYSTEM** / A 4-page booklet describes a reinforced vinyl-elastomer roll-goods product designed for use on decks, ramps, roofs and walkways. ■ American Corrosion Control Div., Brea, Calif.
*Circle 416 on inquiry card*

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

*more literature on page 248*

# Quieter design by Lyon says you care!

People respond to the rich serenity of Lyon steel office furniture. Just thump any flat surface. Hear the muffled sound of double-wall construction, lavish use of honeycomb filler. See how desk drawers float soundlessly on smooth, DuPont Delrin™ glides. See how softly they close against cushiony rubber bumpers. Here too, is *personalized* comfort. With Lyon modular design, you join basic components to suit the *individual*. And whatever your choice, fresh clean lines express beautiful taste. What's more, the exclusive Lyon "lock-in-top" controls *all* desk drawers. And the smooth, lustrous finish is 100% acrylic enamel. See your Lyon dealer. Hear the sound of elegance!

Showrooms: New York, Los Angeles, Boston, Aurora, Ill.

LYON® OFFICE FURNITURE

**Look for us in the Yellow Pages under "LYON OFFICE FURNITURE"**

Lyon Metal Products, Inc.
951 Monroe Ave., Aurora, Ill. 60507

☐ I'd like the name of my nearest dealer
☐ Send my free copy of your full color brochure

Name_____

Address_____

City_____ State_____ Zip_____

*For more data, circle 123 on inquiry card*

# Unatap: Turns water into money.

Come in low with a hand washing system that offers important operating savings in the bargain.

A system incorporating the Unatap spray mixing faucet.

This clever flow-governing faucet maintains an economical yet hygienic spray of water, while allowing personal control over temperature. Actually saves on hot water to the tune of two-thirds (in an independently-supervised test).

Which means a slimmed-down hot water system. Which means a lower installation cost. And lower running cost too.

Specify Unatap. You'll come in low.

## Richard Fife, Inc.

**1140 Broadway, New York, N.Y. 10001**
**Phone: (212) 683-0745**

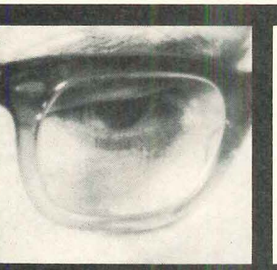
*For more data, circle 124 on inquiry card*

# Does the sign Medical Records say more than the words?

It can. With engraved signs offered in the GRAPHICS 1000 SYSTEM, interior signing can reflect your design concept of hospitals, office buildings and schools with beauty and permanence.
Choose new sign colors in any of the high pressure laminated plastics.
Choose from handsome new type faces...new letter colors (achieved by filling the routed-out letters).
Our catalog says it all.

**KNIGHT MANUFACTURING COMPANY**
5975 Armour Drive P.O. Box 15282 Houston, Texas 77020

*For more data, circle 125 on inquiry card*

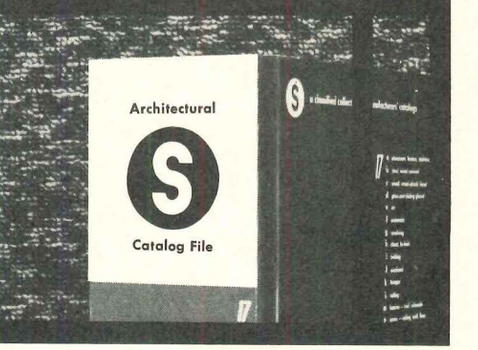


**pondering carpet**
for
BOARD ROOM, CHALET,
HOSPITAL, SCHOOL,
BANK, MOTEL...?

see us in

**SWEET'S**

**ARCHITECTURAL OR INTERIOR DESIGN FILES**




BERVEN OF CALIFORNIA

discover
*the beautiful way to be practical*

2600 Ventura Ave., Fresno, CA 93717
SHOWROOMS PRINCIPAL CITIES OF U.S.

*For more data, circle 126 on inquiry card*

# The only thing Hetron® and Hetrofoam® spark is your imagination.

The built-in fire retardancy of Hetron polyester resins and Hetrofoam urethane foams is a safety influence for greater design freedom to meet required flame-spread ratings. A wide range of UL classifications is assured with the use of Hetron polyester resin and Hetrofoam systems. From slow burning, to self-extinguishing, to non-burning.

Structurally safe and strong, fire-retardant Hetron and Hetrofoam-based modular building units and sectional components belong in the nicest places. From recreation homes to multi-story buildings. Simulated brick and stone-like panels. Shatterproof windows. See-through roofs. Fire-resistant bath and shower units. Featherweight and fire-retardant, Hetron and Hetrofoam help to make strong sandwich panels for walls, floors, and ceilings.

For construction designs requiring imagination and fire-retardant safety, specify Hetron polyester resins and Hetrofoam urethane foams.

Mail the coupon or phone Tony Fusco at 716/695-1600. He has the information you need to keep your imaginative designs from going up in flames or anything else.

**Durez Division, Hooker Chemical Corp., 8001 Walck Rd., North Tonawanda, New York 14120.**

☐ Please send literature on how my application of .....

.....

with Hetron or Hetrofoam will stand up under fire.

☐ Please call me at .....

name

title

company

address

city state zip

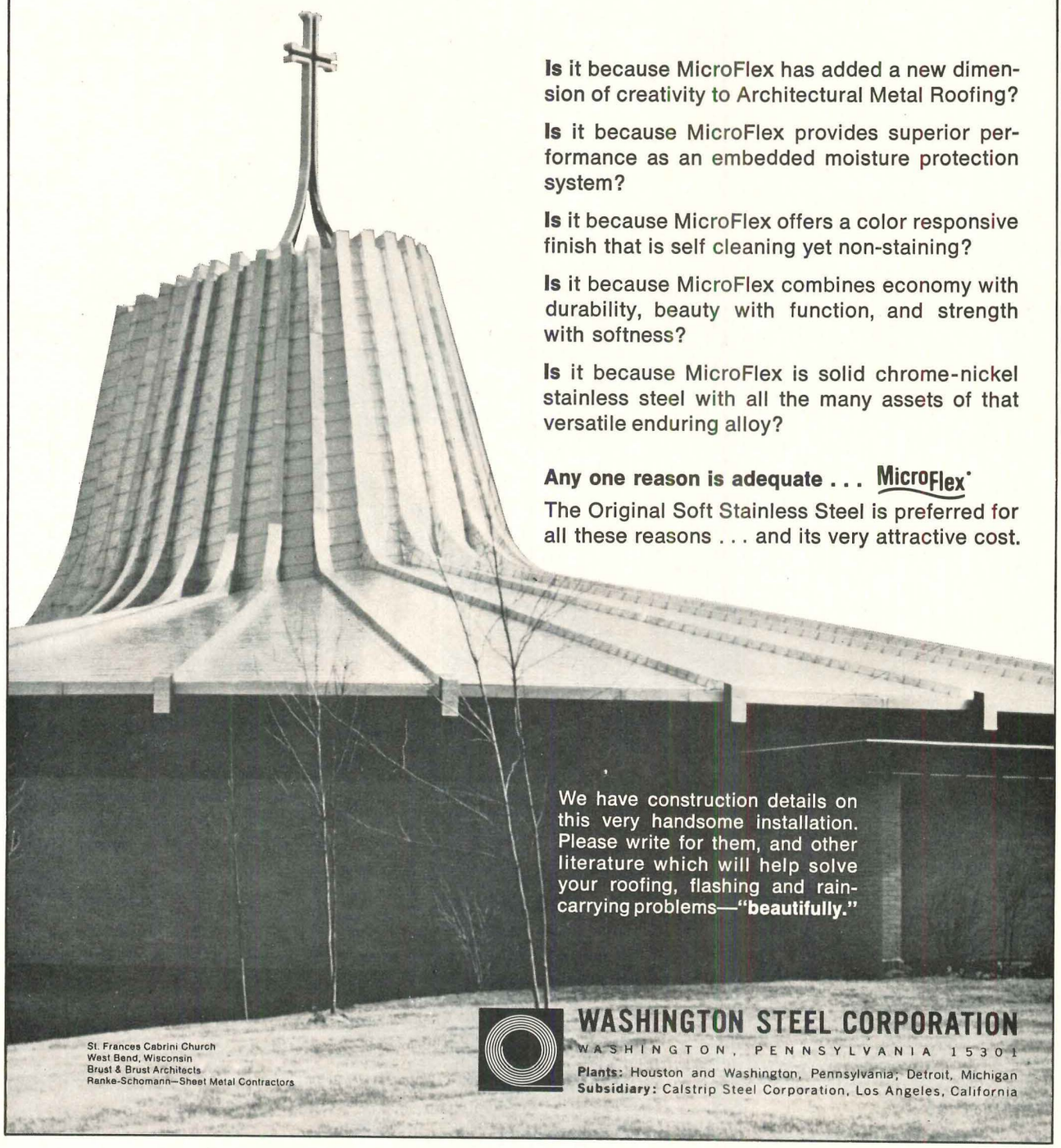
hooker

DUREZ DIVISION

Subsidiary of Occidental Petroleum Corporation

*For more data, circle 127 on inquiry card*

# Why is MicroFlex® the PREFERRED STAINLESS STEEL SPECIFIED BY ARCHITECTS?



**Is** it because MicroFlex has added a new dimension of creativity to Architectural Metal Roofing?

**Is** it because MicroFlex provides superior performance as an embedded moisture protection system?

**Is** it because MicroFlex offers a color responsive finish that is self cleaning yet non-staining?

**Is** it because MicroFlex combines economy with durability, beauty with function, and strength with softness?

**Is** it because MicroFlex is solid chrome-nickel stainless steel with all the many assets of that versatile enduring alloy?

**Any one reason is adequate . . . MicroFlex®**
The Original Soft Stainless Steel is preferred for all these reasons . . . and its very attractive cost.

We have construction details on this very handsome installation. Please write for them, and other literature which will help solve your roofing, flashing and rain-carrying problems—**"beautifully."**

St. Frances Cabrini Church
West Bend, Wisconsin
Brust & Brust Architects
Ranke-Schomann—Sheet Metal Contractors

**WASHINGTON STEEL CORPORATION**
WASHINGTON, PENNSYLVANIA 15301
**Plants:** Houston and Washington, Pennsylvania; Detroit, Michigan
**Subsidiary:** Calstrip Steel Corporation, Los Angeles, California

*For more data, circle 128 on inquiry card*


# There's only one fence that gives you quality and features like these.

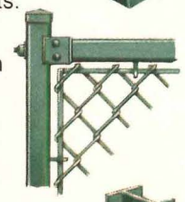
Only Anchor® Fence gives you Anchor quality—plus all these famous Anchor features.

Take Anchor Permafused® vinyl-coated chain link fence, shown above. Many coated chain link fabrics are made with extruded vinyl. It's like slipping wire into a soda straw. Not Anchor.

The tough plastic coating on Anchor Permafused is permanently *fused* to heavy steel wire in a special Anchor process. There's no room for moisture to form and corrosion to start between the wire and the coating. It's virtually unaffected by extremes of weather or corrosive atmospheres.

The vinyl-coated square corner posts, gate posts, and end posts are an Anchor exclusive. They're stronger than round posts of the same size, present a better appearance, and eliminate the need for ladder-forming bands used with round posts.

Another Anchor exclusive is the vinyl-coated gate. It opens a full 180° with a latch that works easily and efficiently yet can be locked quickly and positively. The rugged square-member construction provides rigidity and freedom from sagging, as well as a more handsome appearance.



Anchor vinyl-coated H-beam line posts are self-draining. Unlike pipe posts, condensed moisture drains away to stop interior corrosion before it starts.

And only Anchor gives you such a wide selection of fences. Permafused is available with or without barbed wire, with or without top rail. (The model illustrated above provides an extra measure of security because there is no top rail to be used as a climbing handhold.) Other Anchor Fences include galvanized steel chain link, aluminum chain link, Anchorweave, all-aluminum Privacy Fence, and many others.

Now then. If those aren't reasons enough to buy Anchor Fence, they should at least be enough for you to call your local Anchor man. He can tell you more.

(If you don't do *anything* else, send the coupon for a FREE color booklet full of exciting fence ideas.)

ANCHOR FENCE

BEST SELECTION BEST PROTECTION

Send for FREE 16-page color booklet containing fence specifications and money-saving fence suggestions.

**Mail coupon to:** Anchor Fence, Dept. C-09
6500 Eastern Avenue, Balto., Md. 21224

Name_____ Title_____

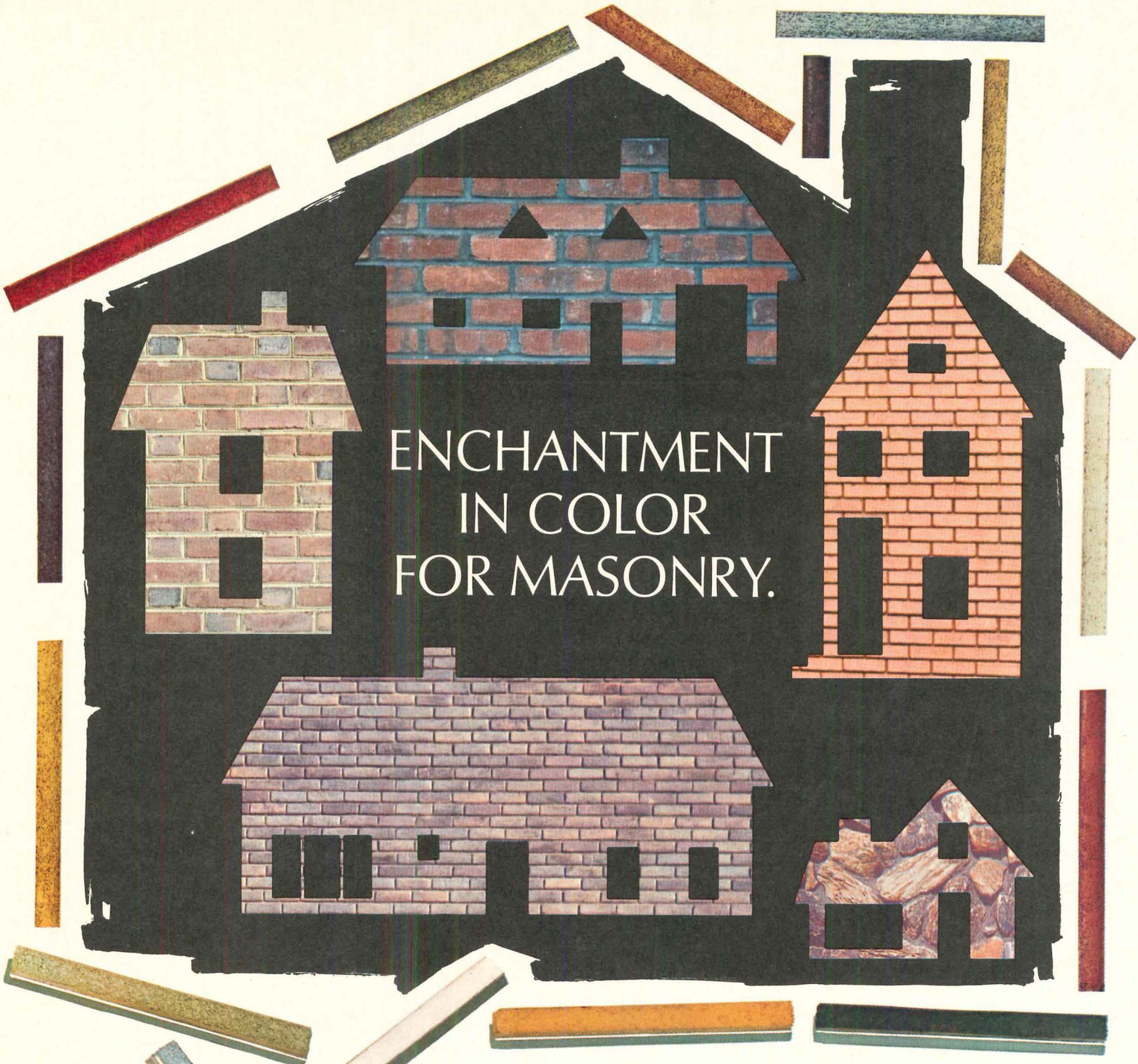
Firm_____

Street_____

City_____ State_____ Zip_____

**Anchor Fence, a division of Anchor Post Products, Inc.**
**Plants in Baltimore, Houston, Los Angeles; 48 branch offices**

*For more data, circle 129 on inquiry card*





# MEDUSA CUSTOM COLOR

Add elegance to new homes with the use of Medusa Custom Colored Masonry Cement for colored mortar.

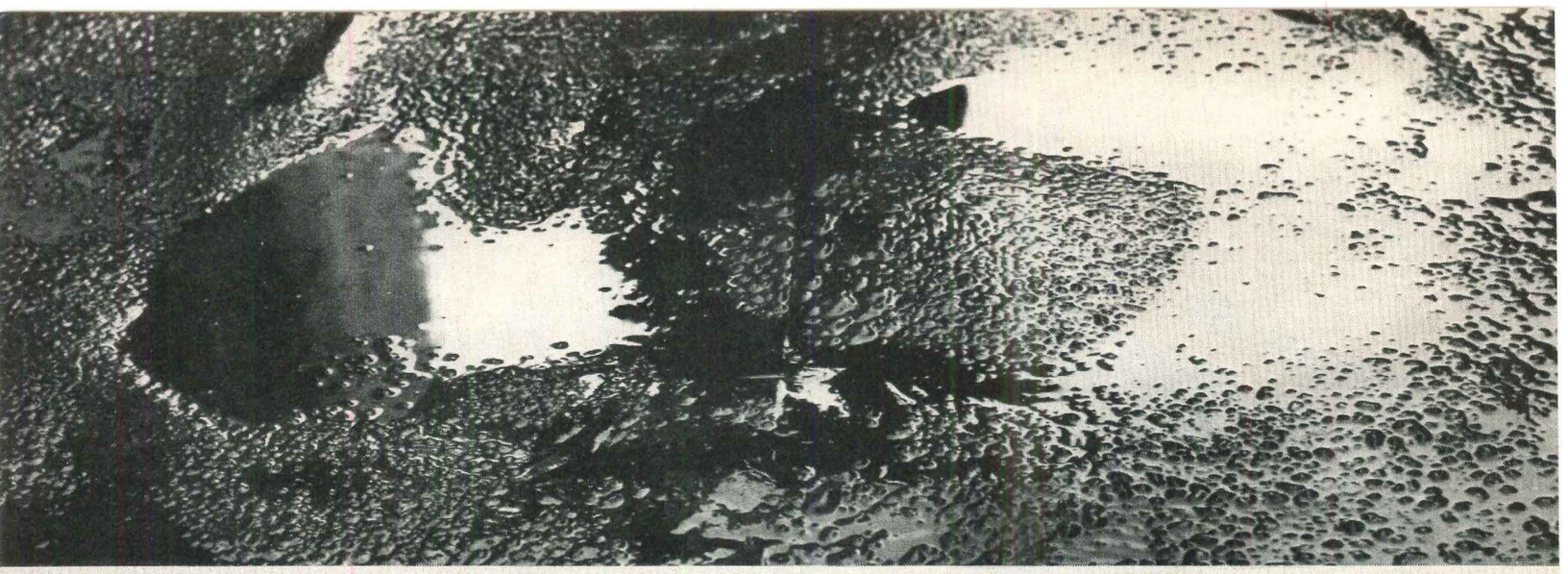
By specifying a colored mortar for your Home, Town House, or Apartment, you customize and personalize its architectural splendor. With little additional cost, you will appreciate your investment to its fullest.

Offer your clients new enchantment in color. Choose from a multitude of colors available in sample kits. Write for color brochure—Medusa Portland Cement Co., P. O. Box 5668, Cleveland, Ohio 44101.

Write for free sample kit containing six popular MCCMC colors.

MEDUSA

*For more data, circle 133 on inquiry card*



# Ponding causes a whole deluge of problems. Zonolite roof deck systems turn them off.

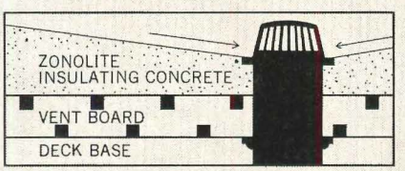
Zonolite® has roof decks for everything. For the slope-to-drains. For hurricanes. For protection against fire. And for insulation.

Roof deck systems certified by Grace-Zonolite. Available everywhere in the U.S. and Canada. Installed by approved applicators each and every month of the year.

Just talk to your local Zonolite representative. He'll be pleased to consult with you and come up with a recommendation that will satisfy all your design requirements.

Want to correct a roof deck problem. Or better yet, prevent one in the first place?

Say the word!

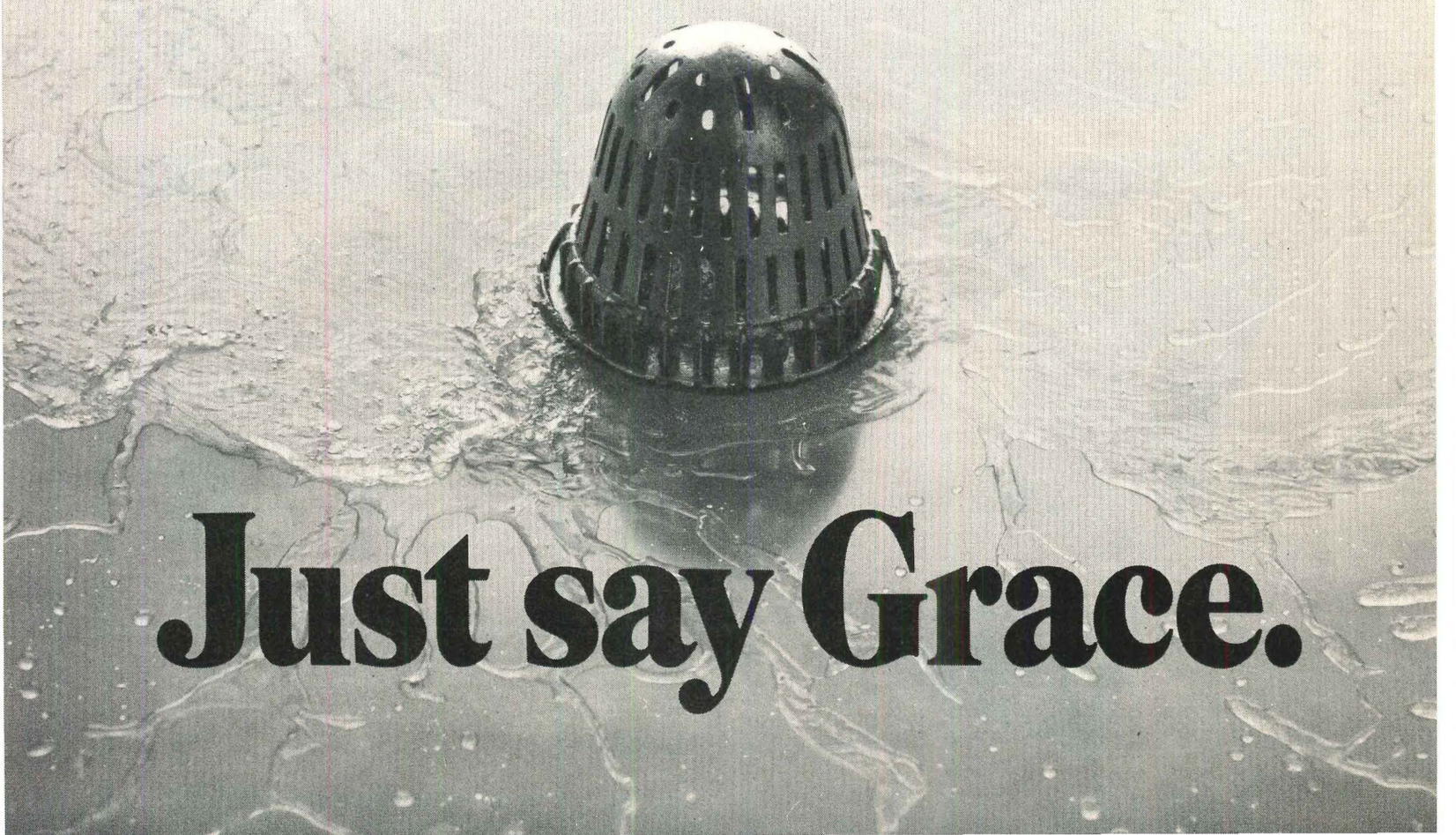



**ZONOLITE**

W. R. GRACE & CO.
62 Whittemore Avenue
Cambridge, Mass. 02140

GRACE

*For more data, circle 134 on inquiry card*

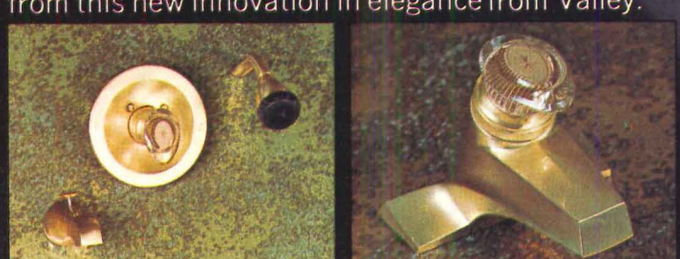


# Just say Grace.

# Valley's new Starburst series

## a new elegance at your fingertip

Something really new has burst upon the horizon of functional beauty in the bath. It's Valley's Starburst lavatory series that features a completely new shape in acrylic handles... a shape that combines the lever type flow control and temperature control in a unique configuration. All the other Valley features are here too, five-year parts warranty, one year no-call-back guarantee with $10 labor allowance*, the durability of Triplate finish, and trouble-free Hydroseal control action with the Feather Touch. See your Valley distributor for all the good news about Starburst, and how you can profit from this new innovation in elegance from Valley.



Decorator coordinated Starburst Series in brushed brass. See other styles and models on the reverse side of this bulletin.

EASTMAN CENTRAL D
a division of
UNITED STATES BRASS CORPORATION
SUBSIDIARY OF HYDROMETALS, INC.
801 TENTH STREET, PLANO, TEXAS 75074

VALLEY TRIMWARE • SPEEDFLEX SUPPLIES • DURO FITTINGS • CONNECTORS
LOOK FOR THESE MARKS FOR SUPERIOR PLUMBING QUALITY

*as detailed in the Valley warranty included with each unit sold.

## OFFICE LITERATURE

*continued from page 238*

**MOBILE FILING SYSTEM** / A 4-page brochure describes a line of individual storage units mounted on tracks. The units glide laterally to expose only one walk-in aisle at a time, so an entire floor area may be filled with information. ■ General Electric Co., Milwaukee.

*Circle 417 on inquiry card*

**WATER COOLERS / FOUNTAINS** / A complete line is described in a 20-page catalog. New additions to the line include wall-mount and pedestal fountains constructed of metal, aggregate and polyester. Specifications are included. ■ Cordley Products, Dispenser Div., Eaton, Yale & Towne, Inc., Glen Ellyn, Ill.

*Circle 418 on inquiry card*

**STRUCTURAL SANDWICH DESIGN** / Background material on structural sandwich construction, detailed design procedures and formulas, and a discussion of test methods for evaluating certain material properties are discussed in a 16-page booklet. ■ The Verticel Co., Englewood, Colo.

*Circle 419 on inquiry card*

**REFLECTIVE INSULATING GLASS UNITS** / Performance and appearance characteristics of 16 tinted and clear glass products are given in a 12-page brochure. The double-glazed units have a reflective metallic coating on one airspace surface which reportedly reduces indoor brightness and provides insulation to help maintain comfortable indoor temperatures. ■ PPG Industries, Pittsburgh.*

*Circle 420 on inquiry card*

**GREENHOUSES** / "Design-Oriented Greenhouse Structural Systems and Controls," a 16-page brochure, describes a structural system which reportedly provides more freedom in greenhouse design. ■ IBG, Deerfield, Ill.

*Circle 421 on inquiry card*

**LIGHTING** / "Shopping Center Lighting Concepts," a new booklet, features a line of luminaires designed for indoor and outdoor areas. ■ General Electric Co., Hendersonville, N.C.*

*Circle 422 on inquiry card*

**CONCRETE FINISH** / Descriptive literature introduces a heavy-duty coating using epoxy resin to support heavier aggregates. It is available in three grades: regular, heavy duty and extra heavy duty. ■ Kemiko, Inc., Burbank, Calif.

*Circle 423 on inquiry card*

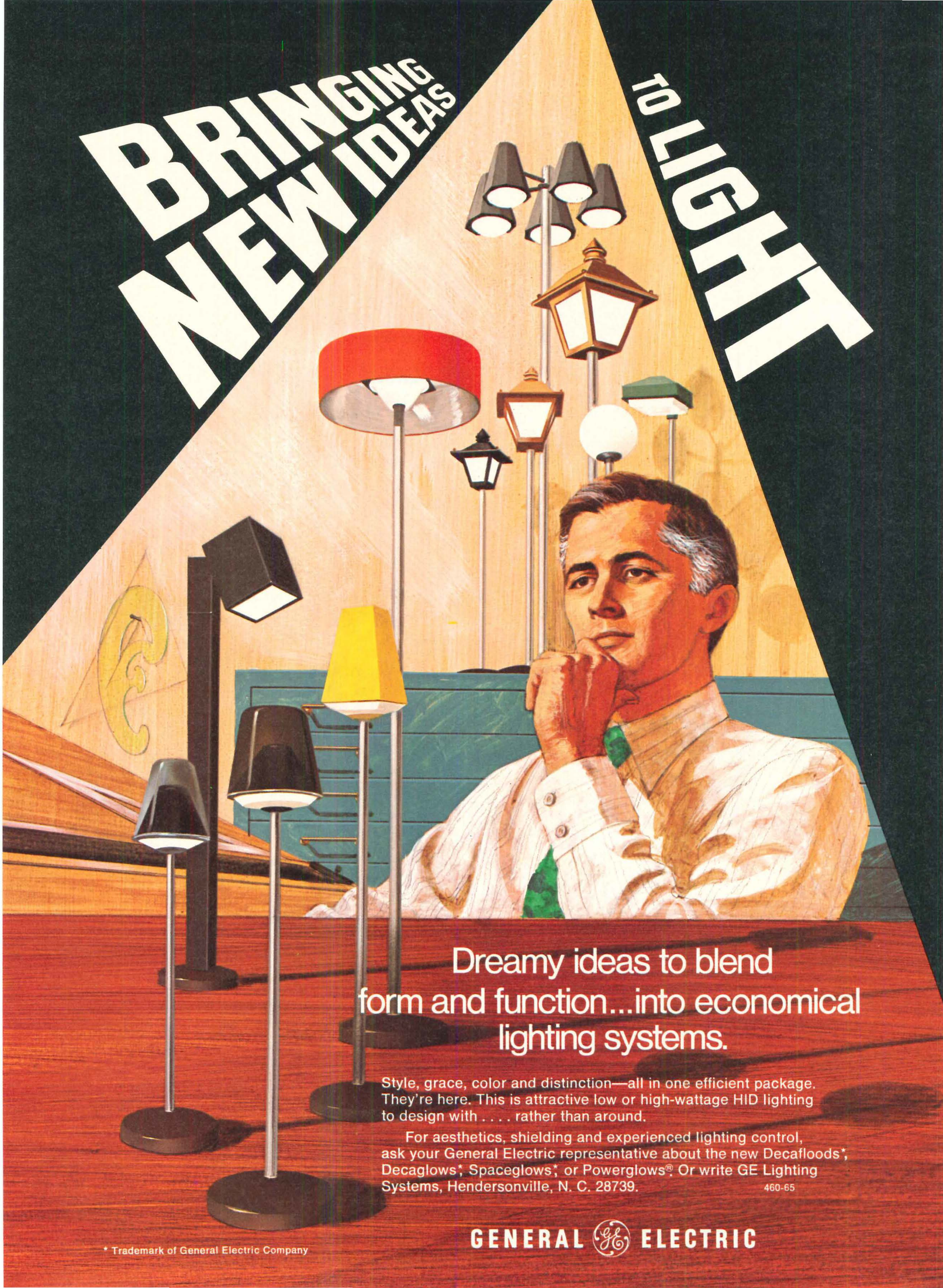
**WASHROOM ACCESSORIES** / Over 300 items including soap dispensers, waste receptacles, shelving and mirrors are presented in a 24-page catalog. ■ American Dispenser Co., Inc., Carlstadt, N.J.*

*Circle 424 on inquiry card*

**ROOFING AND SIDING** / An aluminum, deep-ribbed beam designed for large structures is described in a 4-page brochure. Features include a high strength-to-weight ratio and good water-carrying capacity for low-profile roofs. ■ Reynolds Metals Co., Park Ridge, Ill.*

*Circle 425 on inquiry card*

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




## Dreamy ideas to blend form and function...into economical lighting systems.

Style, grace, color and distinction—all in one efficient package. They're here. This is attractive low or high-wattage HID lighting to design with . . . . rather than around.

For aesthetics, shielding and experienced lighting control, ask your General Electric representative about the new Decafloods*, Decaglows*, Spaceglows*, or Powerglows®. Or write GE Lighting Systems, Hendersonville, N. C. 28739. 460-65

GENERAL ELECTRIC

* Trademark of General Electric Company

# COLOR DYNAMICS® adds functional color to the interior of a plant...

# for better employee morale.

**All too often, no more thought is given to painting the inside of a plant than to painting the inside of a cardboard box . . .**

Yet frequently, the difference between profit and loss is represented in the efficiency of the employees. Color can produce tension or relaxation depending upon how it is used. The *Color Dynamics* system creates the right mood to keep employee morale at a consistently high level for greater efficiency in the production, and related plant areas.

*Color Dynamics* enables you, the architect, to specify color arrangements that could result in fewer accidents, less absenteeism, greater efficiency, improved production both in quality and quantity, and reduced eye fatigue. It's a valuable aid in servicing your clients.

When you specify *Pittsburgh Paints* for new construction or renovation, you provide economical long-lasting paint protection. Write for free 16-page booklet on *Color Dynamics.* PPG Industries, One Gateway Center, 3W, Pittsburgh, Pa. 15222.

**PPG: *a Concern for the Future***

PITTSBURGH® PAINTS

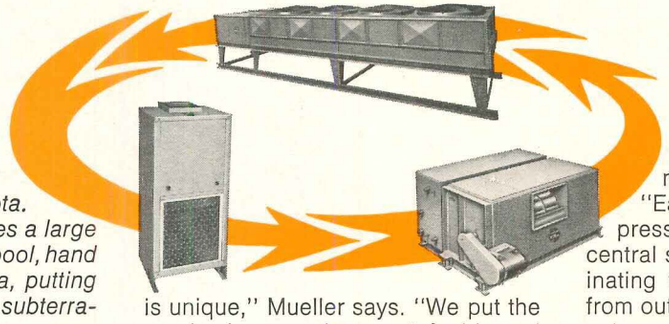
# COLOR DYNAMICS® the inside story

PPG INDUSTRIES

*For more data, circle 138 on inquiry card*

Midland Grove Apartment Complex / Owner/Builder: A. G. Mueller / Architect: Cottle-Herman Architects Inc.
Mechanical Engineers: Yale Inc. / McQuay Representative: Schwab & Vollhaber Inc.

# "This McQuay® Environment puts us in a luxury class by ourselves."



*So says owner/builder A. G. Mueller of his ultra-modern Midland Grove apartment complex in St. Paul, Minnesota. The 174-unit complex features a large recreation center, enclosed pool, hand ball and tennis courts, sauna, putting green, and 250-car heated subterranean garage.*

Six 100-ton capacity McQuay® Seasoncon® Type AHP air-cooled condensing units work in conjunction with three McQuay Seasonmaster® central station air conditioners and 174 AVD Apartment Seasonmaker® fan coil units to provide tenants with unparalleled indoor environmental control.

"Our approach to apartment design is unique," Mueller says. "We put the emphasis on environment, inside and outside. Our McQuay system does more things better than any other system I know of. The Seasonmaker units give individual tenants complete control over their indoor climate. For instance, one apartment can be cooled while another is being heated. Cold drafts usually felt near windows during the winter are unknown and cooking odors do not creep out into the halls or into other apartments.

"Each of our main buildings is pressurized by the Seasonmaster central station air handler units, eliminating temperature loss or build-up from outside doors. And the system is extremely quiet in operation."

Whether you need an entire system or a single unit, look to the leader, McQuay. For complete information contact the man for all seasons, your McQuay representative. Or write McQuay, Inc., Box 1551, 13600 Industrial Park Blvd., Minneapolis, Minn. 55440.

**Look to the systems leader . . . McQuay®**

MAKE THE SEASONS COME TO YOU®

*For more data, circle 139 on inquiry card*

## *HIGH-RISE REFUSE DISPOSAL*

# Dempster's Low-Investment Packer Solves the Burning Problem.

Why go to the costly expense of upgrading obsolete incinerators? Dempster has a cleaner and less expensive idea—the small, low-investment PowerMite stationary packer.

It's ideal for compacting waste in limited space and powerful enough to handle large volumes of waste from a high-rise building—cleanly, efficiently, with a minimum investment.

**Saves Space. Costs under $3,500**

The PowerMite packing unit takes a mere 29 square feet of space and fits easily into cramped basements, boiler rooms, under an incinerator chute or anywhere space is tight.

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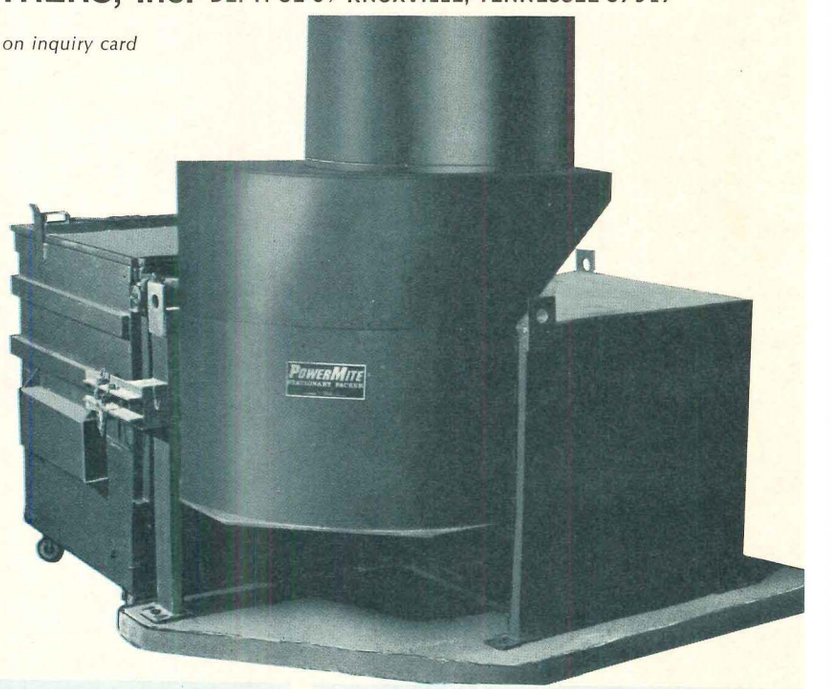


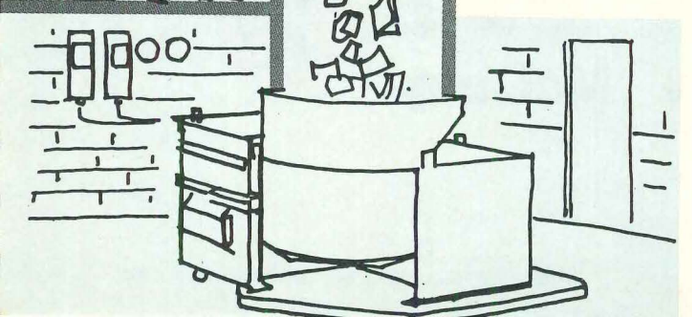

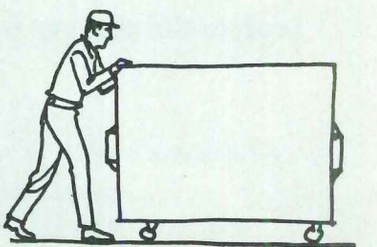

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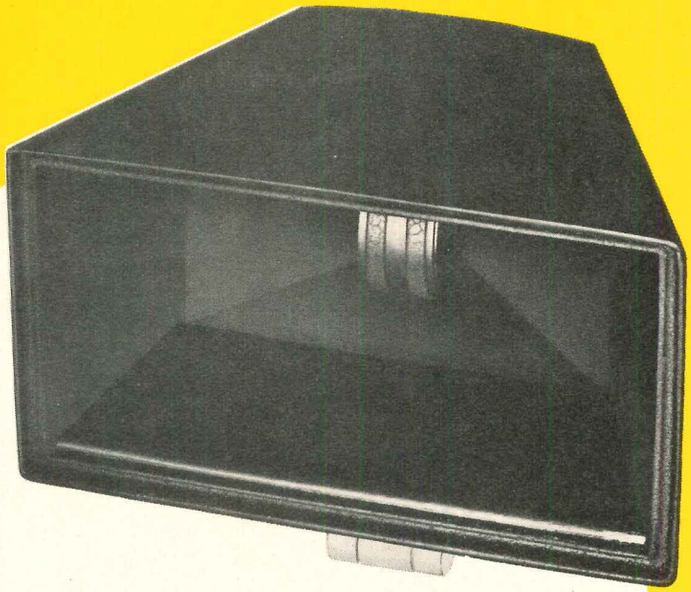

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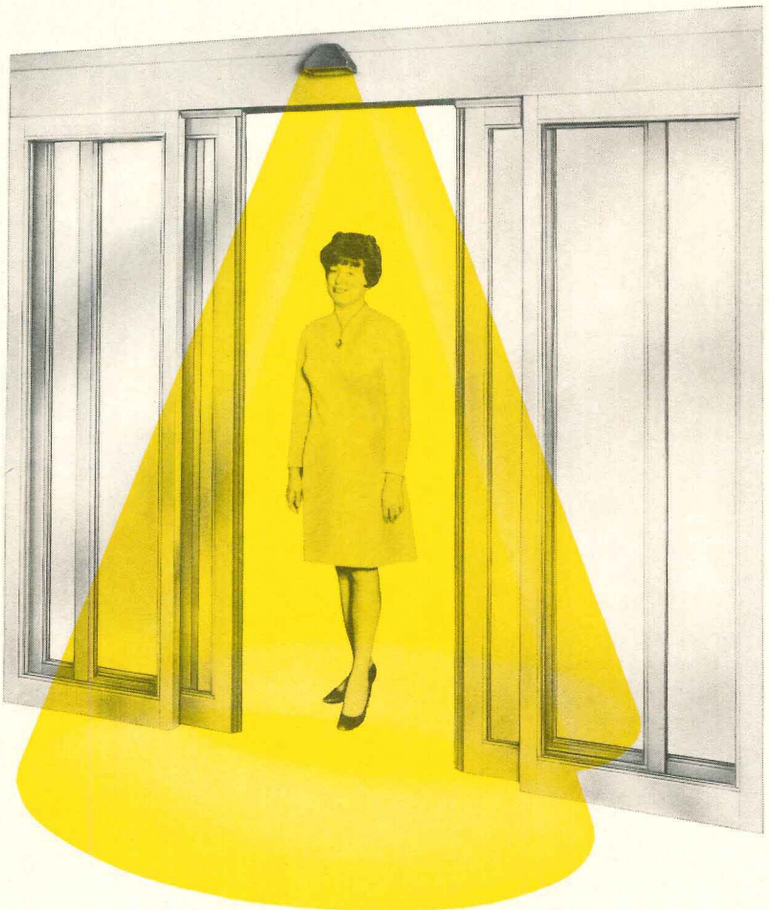

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*Division of Republic Industries, Inc.*

7360 West Wilson Avenue, Chicago, Illinois 60656 (312) 867-7400

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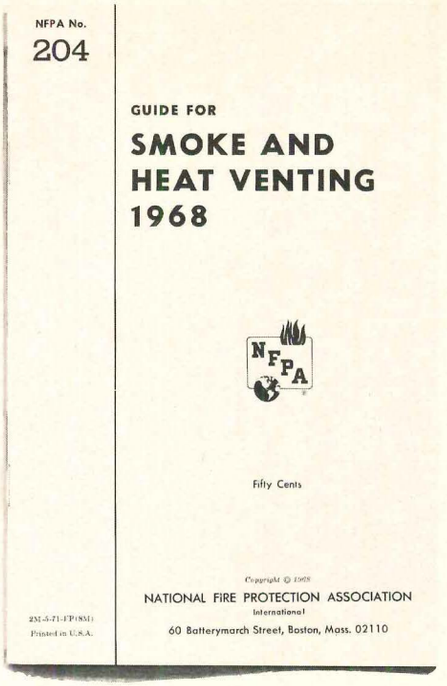


The National Fire Protection Association has long since made the case for automatic heat and smoke venting in large, single-area industrial buildings.

Now, Plasteco has introduced two types of automatic heat and smoke vents for dependable and economical compliance with NFPA recommendations. One is FM-approved Melt-Out Model 411, the other is UL-listed, FM-approved Fusible-Link Model 420.

If you are involved with industrial buildings, you should have copies of both the NFPA booklet and the Plasteco catalog. Please write:

Plasteco, Inc., PO Box 9485,
Houston, Texas 77011

Plasteco also manufactures acrylic dome and pyramid skylights, continuous skylight systems, and custom skylight assemblies. Please see Sweet's Architectural File 7.5/PL or Sweet's Industrial Construction File 7.5/PL.

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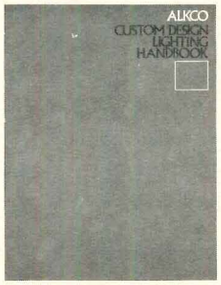
*A classified advertising section devoted to helping architects and engineers keep up to date on building product manufacturers.*




ALKCO CUSTOM DESIGN LIGHTING HANDBOOK. Latest release of 24 page handbook on custom lighting design, contains an outstanding collection of architect-designed lighting fixtures and systems by Alkco Manufacturing. Each of these lighting ideas are presented in an architectural drawing format which includes large-scale cross-sections, details and complete specifications. The innovative designs were created for a number of prestigious buildings thru-out the county including Hospitals, Schools, Universities, Dormitories, and Institutions. Write: Alkco Manufacturing Company, 4224 N. Lincoln Ave., Chicago, Illinois 60618.

*For more data, circle 143 on inquiry card*

CHROMCRAFT'S CONTRACT FURNITURE DIVISION announces the opening of a permanent show-room at space 1124 in the Chicago Merchandising Mart. A leader in plastic development, Chromcraft will feature many of its newest plastic innovations in the space, including its Rotational and Pacemaker series. In addition, a new nonplastic grouping, Guardsman, will be unveiled. A modular mass seating group, it features separated seats and backs. Besides the furniture displays, an audio visual mini theatre tells the full Chromcraft story. The showroom will be manned full time, according to showroom manager Tom Zimmer. Contract Furniture Division, No. 1 Quality Lane, Senatobia, Miss. 38668.

*For more data, circle 145 on inquiry card*

MAYTAG ELECTRONIC TICKET CONTROL SYSTEM for self-service laundry facilities eliminates many problems prevalent with coin slides. It takes money out of the washer thus increasing security potential by containing all monies in a central vault which doubles as a ticket dispenser; reduces risk of machine damage from break-ins; simplifies collection and discourages thievery. The ticket is difficult and relatively impractical to duplicate. The ticket receiver mechanism on the washer can be adjusted to totally destroy the ticket and prevent any possibility of reuse. Additional information is available from The Maytag Company, Commercial Laundry Division, Department ARU, Newton, Iowa 50208.

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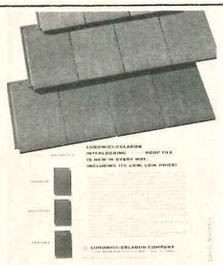

REDUCED PRICES ON LUDOWICI ROOFING TILE! Prices reduced as much as ⅓ on LANAI, SPANISH and EARLY AMERICAN roofing tile. Now comparable to the cost of slate, asbestos shingle and cedar shakes. All three patterns are in stock, available for immediate shipment. Send for full-color literature and prices. Ludowici-Celadon Company, 111 East Wacker Drive, Chicago, Illinois 60601. See Sweet's Catalog No. 7.4/Lu for additional information on Ludowici roof and floor tiles.

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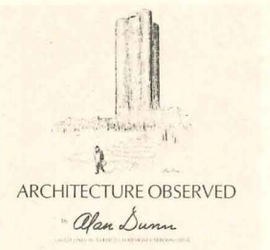


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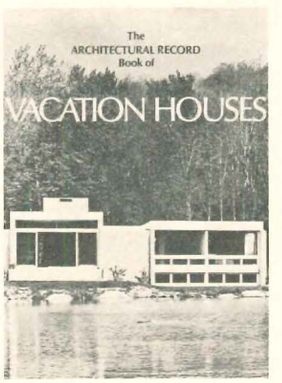


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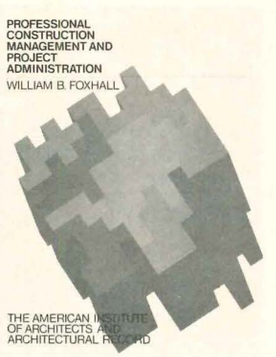


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A Division of Millmaster Onyx Corporation

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*continued from page 66*

of a hospital's organization that are common to a range of functional mutations. As such, the programming language *actively discourages building designs that restrict the way in which the details of a hospital's functions might be realized in a given situation or at a given point in time.*

Formally (and at the most general level), the language makes reference to three different types of hospital space. These are distinguished according to the way in which different classes of medical techniques enter into the care process:

". . . the hospital may be logically composed of three major systems of like-spaces, each horizontally contiguous and in one layer: on the top are the *patient fostering spaces* (PFS), where residential patients are based and dispersed clinical techniques carried out; on the bottom *consolidated clinical technique spaces* (CCTS), to which both residential and non-residential patients go for the techniques centralized there; and in the middle the *industrial technique spaces* (ITS), which serve the other two but to which patients never go."

In the most recent of their articles Clibbon and Sachs describe a number of ways in which the clinical technique spaces might be organized given different organizational constraints and different rates of growth. At the descriptive level their illustrations are most convincing. Almost any known or hypothetical way of organizing the surgical suite, for example, would seem to be capable of being interpreted as one variation on the theme of relating activities to the techniques they depend on. In so illustrating the breadth of their new language, the authors also show how a clarity is introduced into the architectural program that will direct the architect's attention to those aspects of the organization that are critically affected by differential rates of growth and change. One of their illustrations, for instance, shows how the surgical suite can evolve (in terms of its absolute size) without disruption of the delicate balance between the spaces devoted to surgical, recovery, anaesthetic, etc.

All of this, however, is illustrated in purely diagrammatic terms. It is not until one tries to imagine (and one is put in the position of having to imagine) what all this implies for the actual design of the building, that doubts arise. The diagrams—in order to illustrate the generality of the programming principles—are 'context-free'. That is, they take no account of an *actual* site or other physical constraint that might well generate distortions of the essential relationships. As such, one is left distinctly uncomfortable about the whole question of how such diagrams (and consequently the components of the programming language) relate to the technology required.

In another recent study of these same problems (1), an attempt is made to relate a generalized programming language to an appropriate building technology. In this work, the hospital organization is described in terms of the way in which its individual parts change over time. Essentially, this work suggests that any hospital can be described in terms of its "organizational variants" (i.e., those parts which tend to mutate over time). This distinction is then reflected in a "hard" technology used in the construction of the basic building shell, and a "soft" technology used to adapt the shell to changes over time. The practical outcome of this is that organizational variations—because they have explicit technological implications—can be accommodated despite widely differing physical constraints.

The diagrammatic presentation used by Clibbon and Sachs may well do their ideas an injustice. None of the diagrams in either article appears to take account of the technological distinction above nor is suggestive of alternative building strategies. It is unclear, in fact, just what technological implications—if any—their ideas have. At the conceptual level their work is seductively attractive, introducing an admirable clarity into an area that is all too often treated in a confused way. Without some evidence of the technological implications of these ideas, however, it would be a further injustice to call them practical.

(1) Best, G. & Weeks, J., Design strategy for flexible health science facilities, Health Services Research, Fall, 1970.

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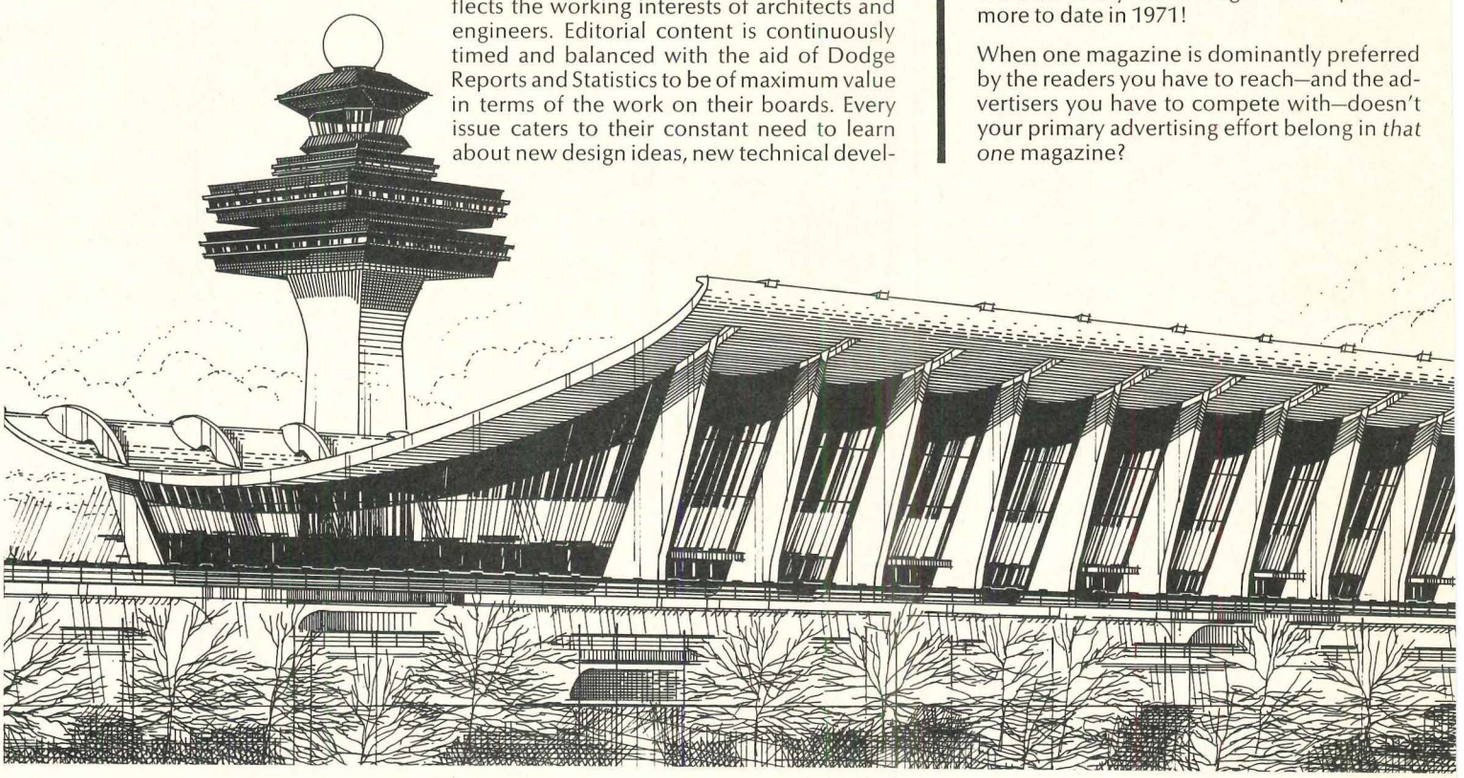

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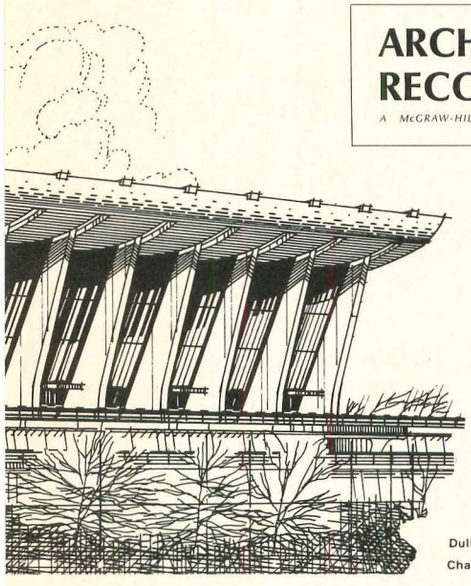

Dulles International Airport Terminal Building,
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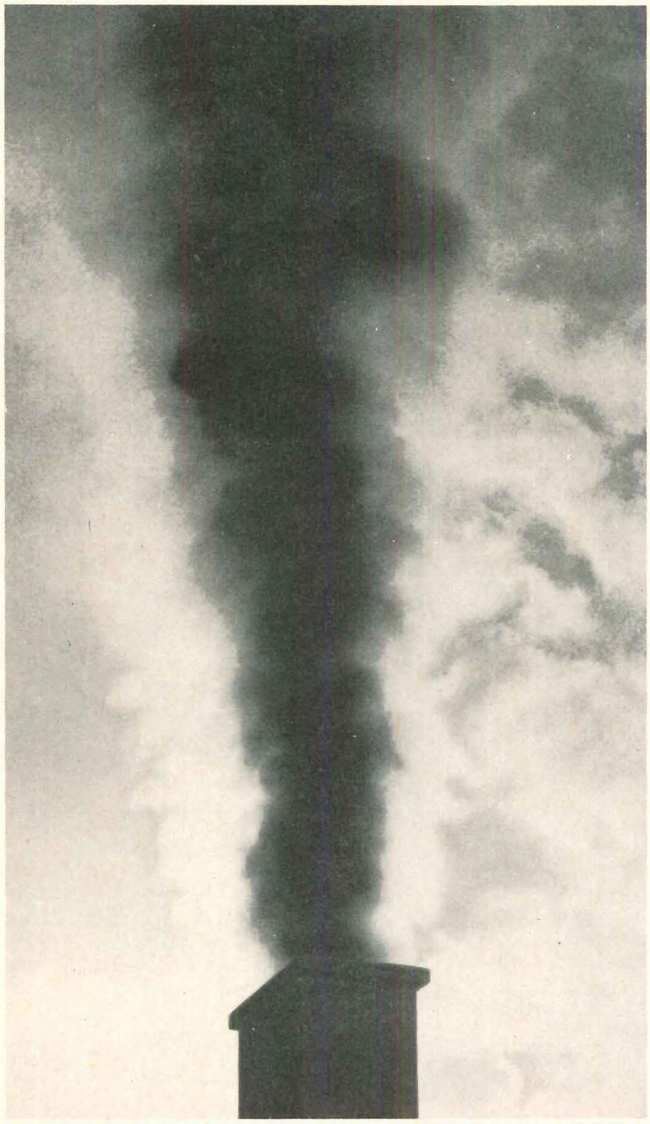

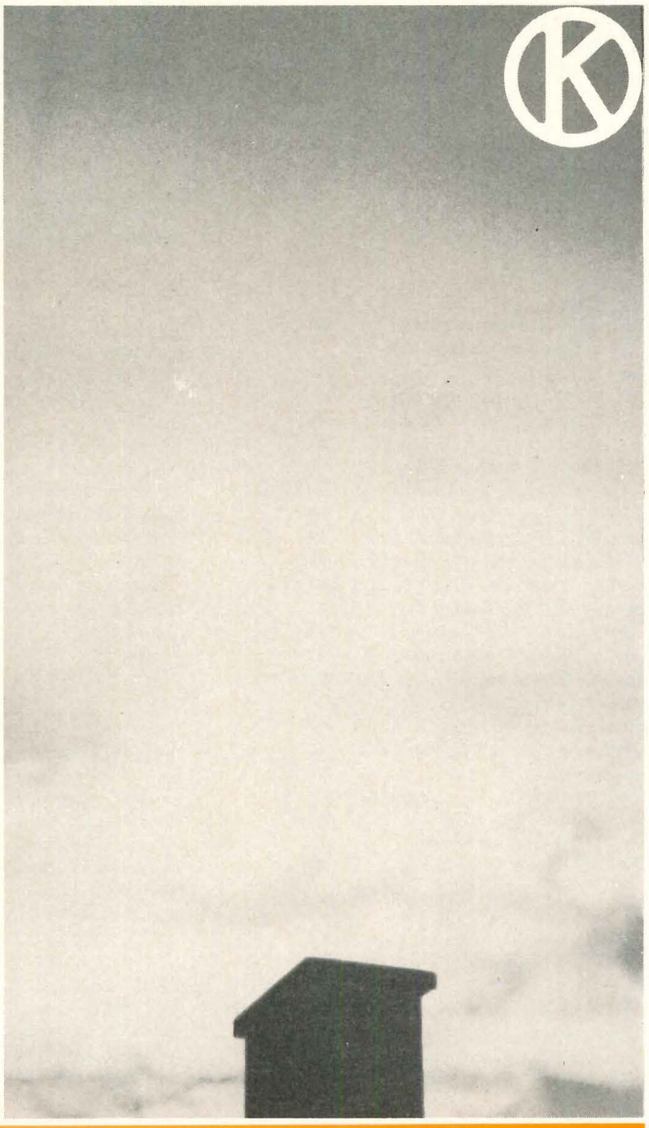

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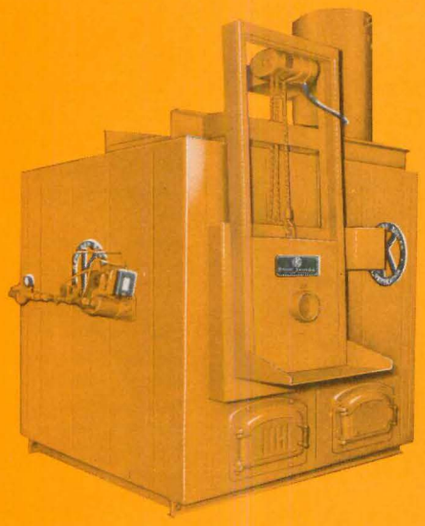

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A Architectural File (green)
I Industrial Construction File (blue)
L Light Construction File (yellow)
D Interior Design File (black)

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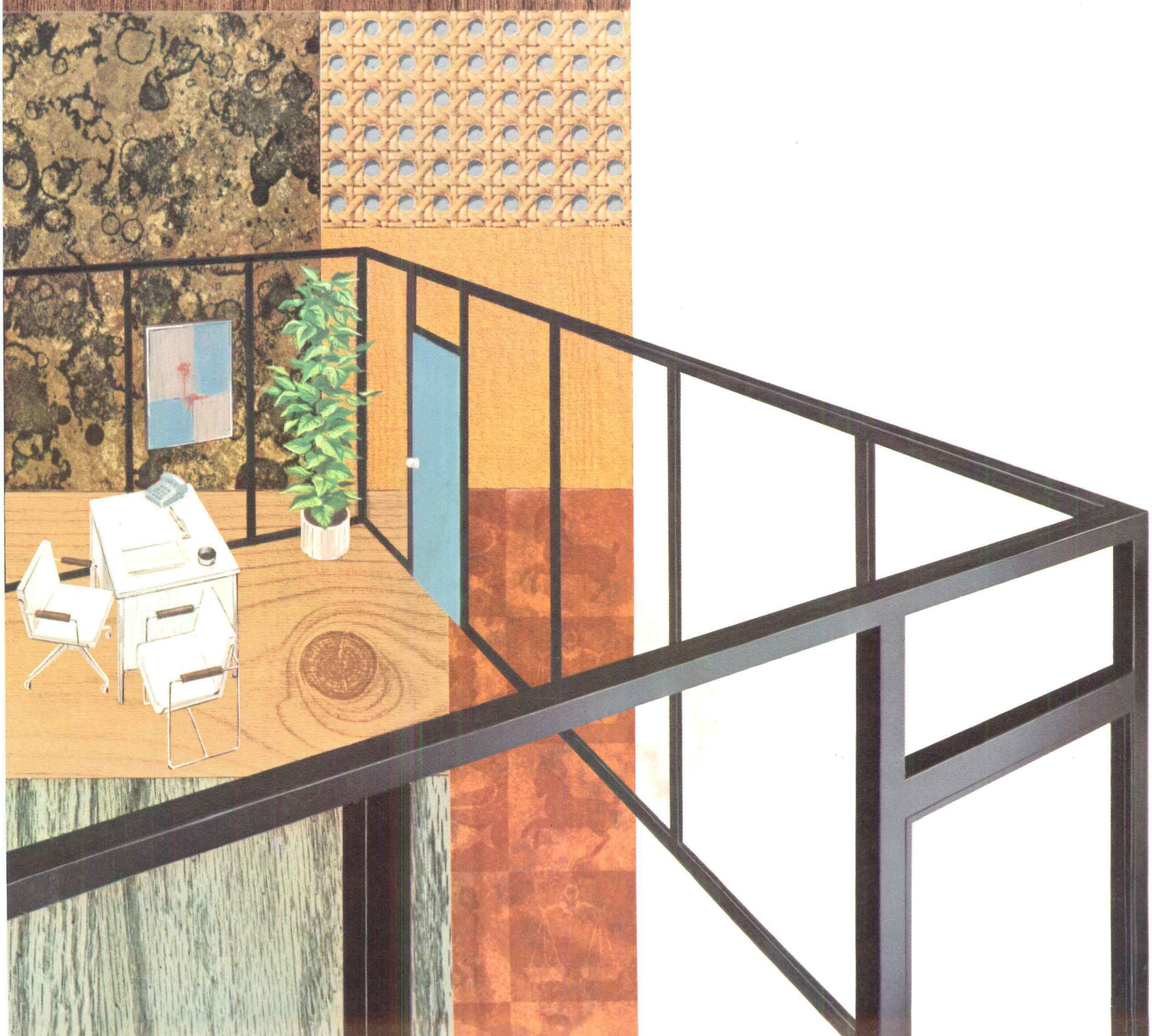


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