

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

SEPTEMBER 1971

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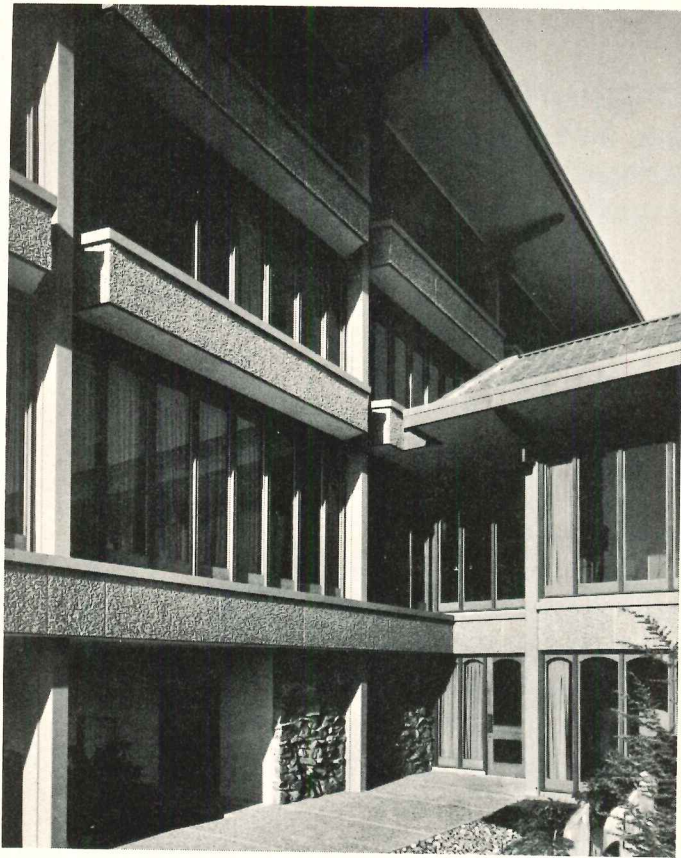
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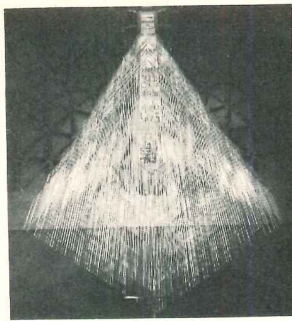
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THE RECORD REPORTS

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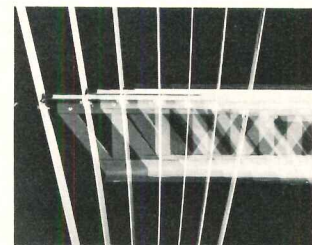


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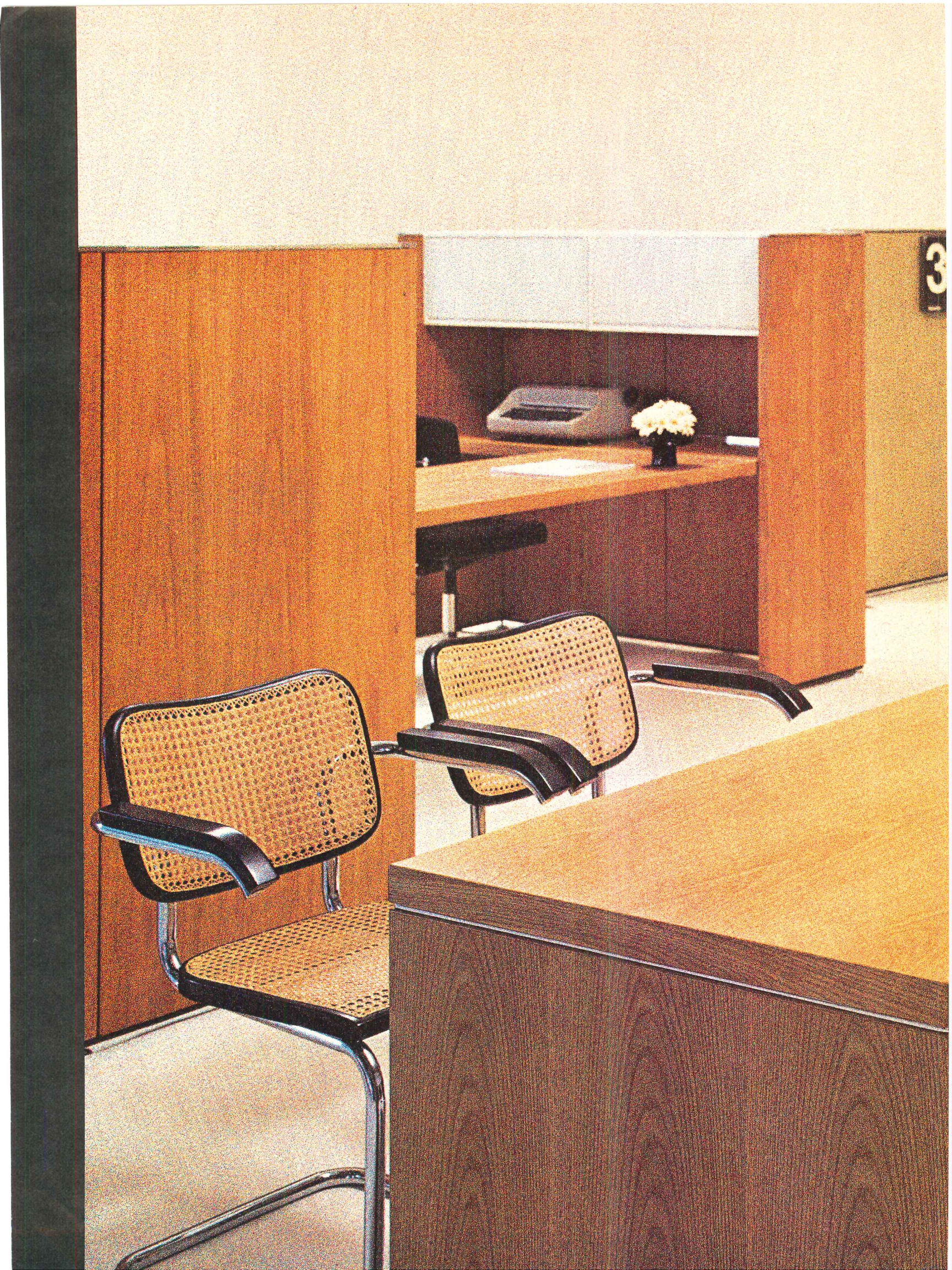
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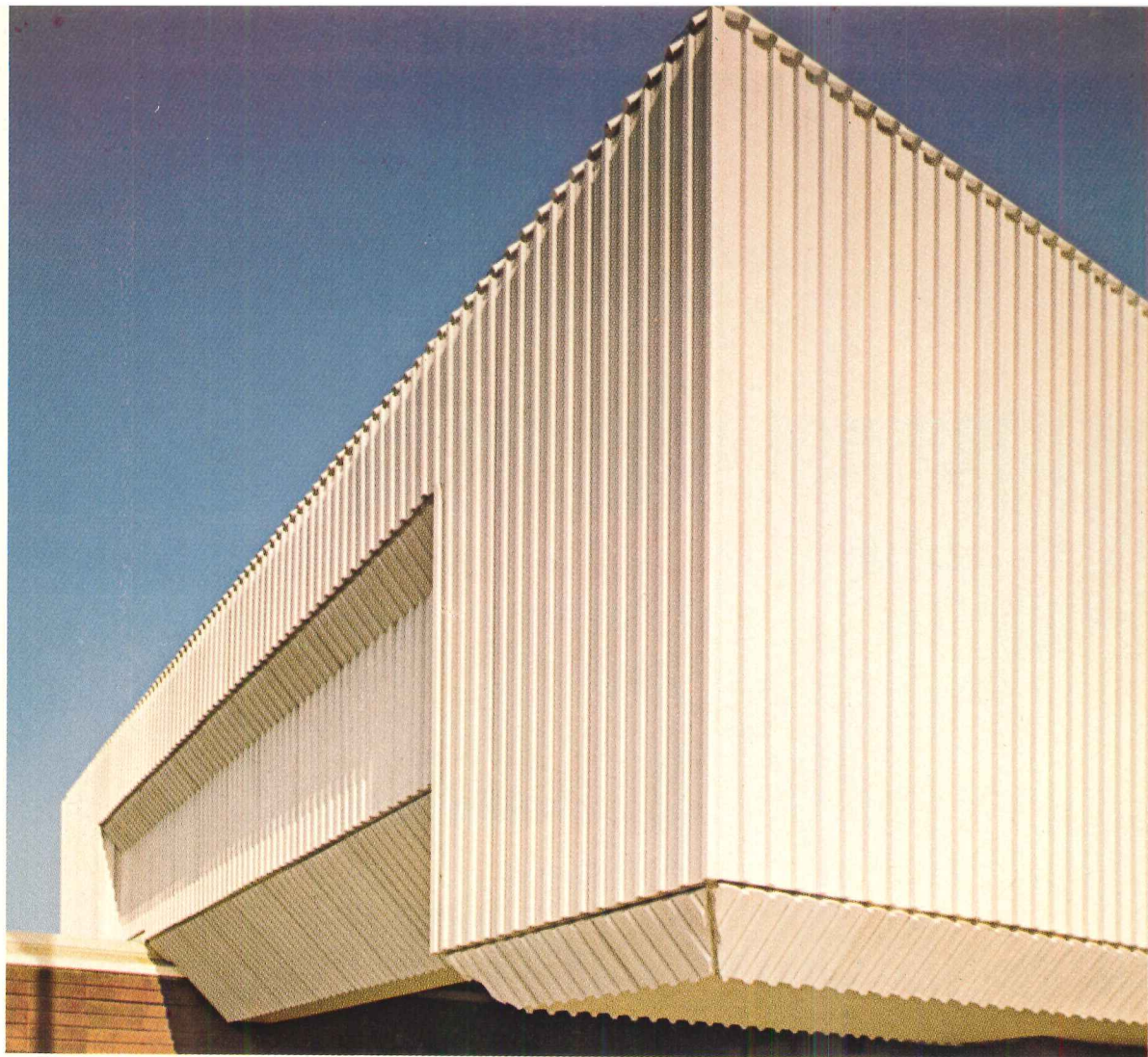
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A new look at registration and licensing

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

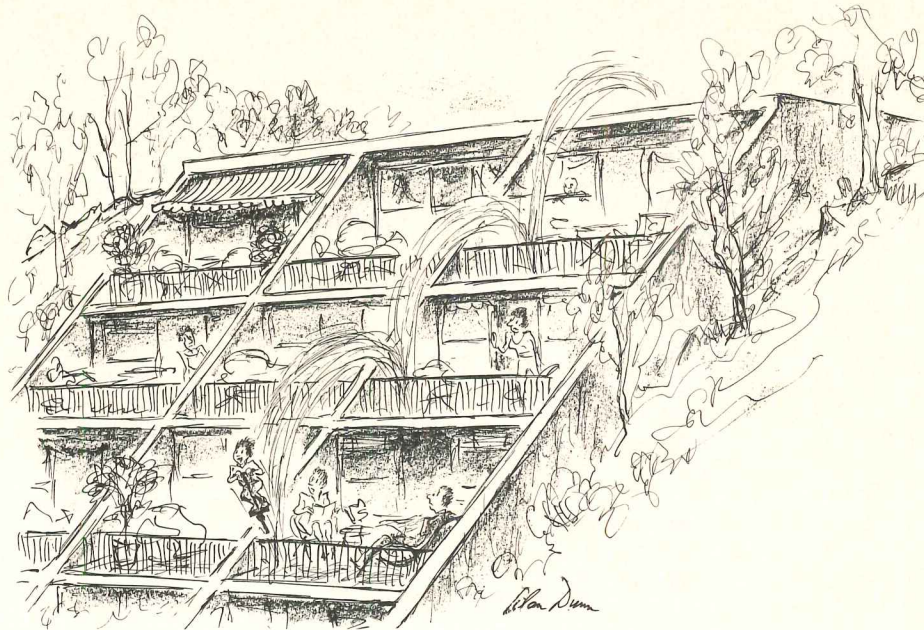
professional exam, on the other hand, is not at all like the existing exam. It eliminates the currently required site and design problems and bases its questions (all of which will be machine-graded and consequently multiple-choice) entirely in the area of architectural judgments related to the environment. 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 proce-

dures. 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



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 ad-

just 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.

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Coming in the Record for October and November

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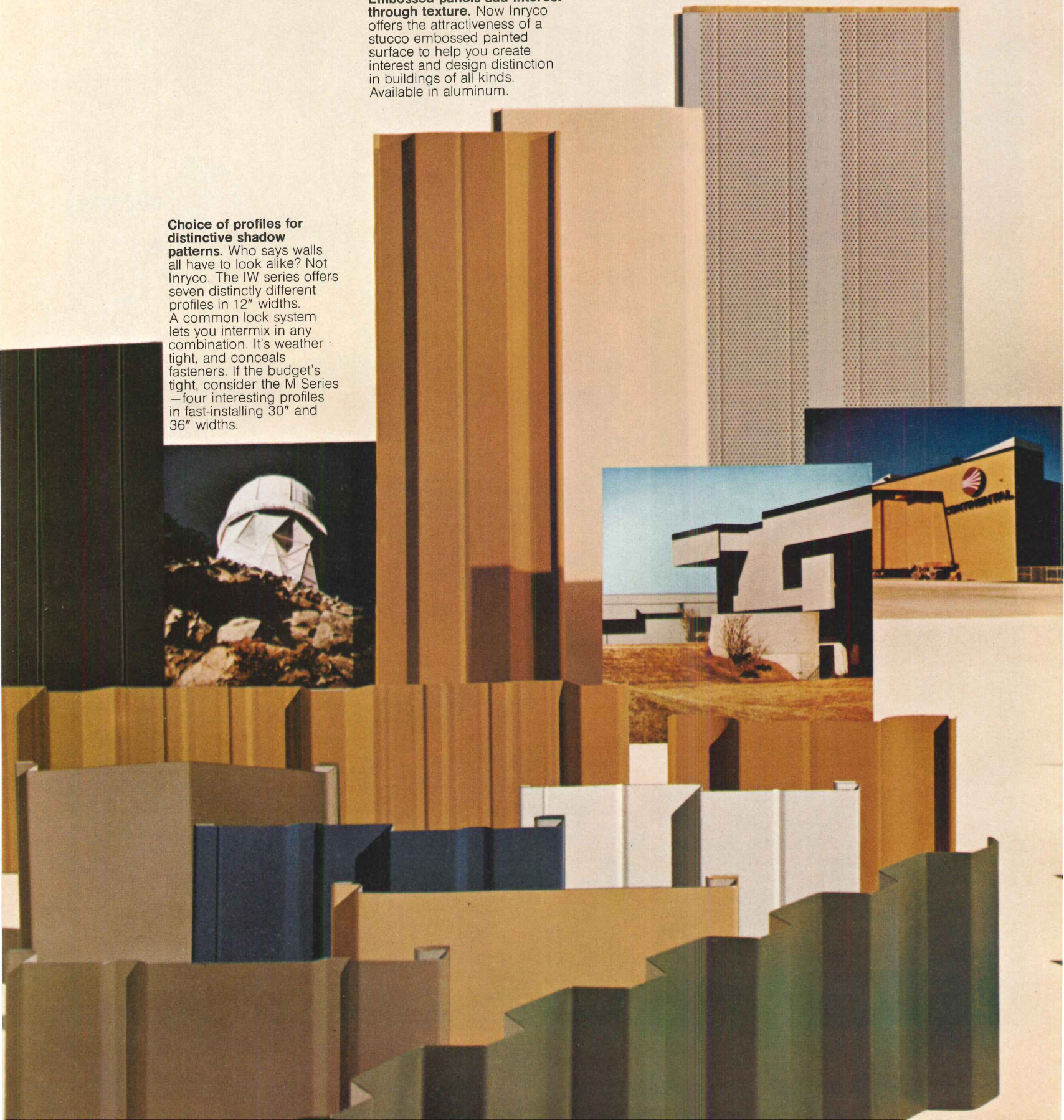
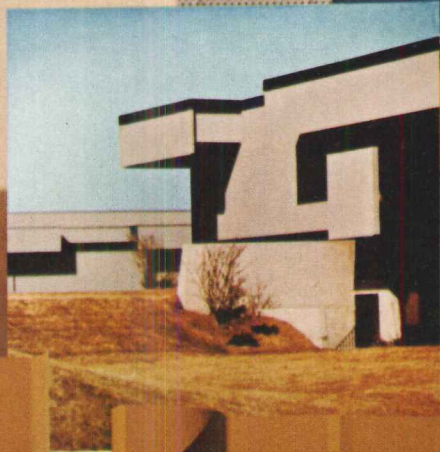
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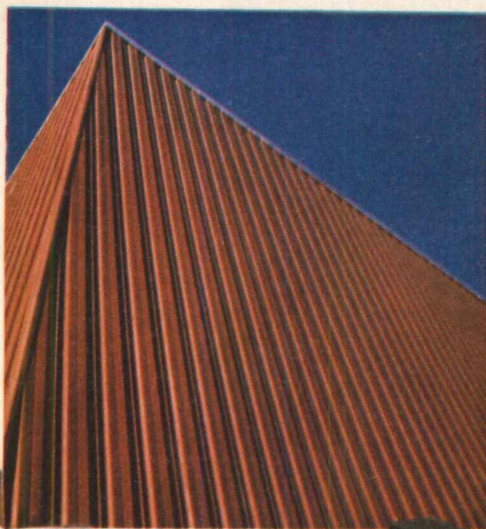
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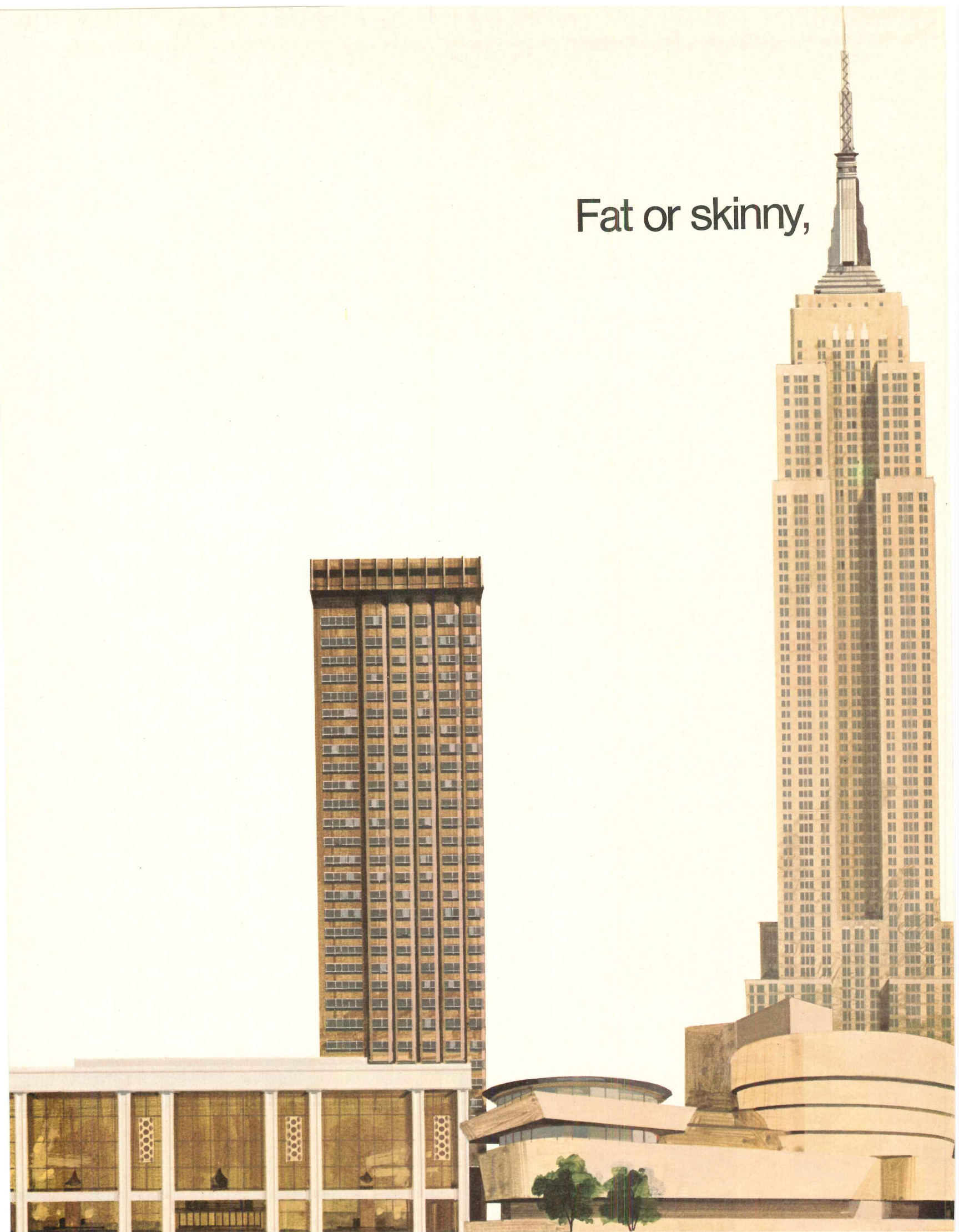
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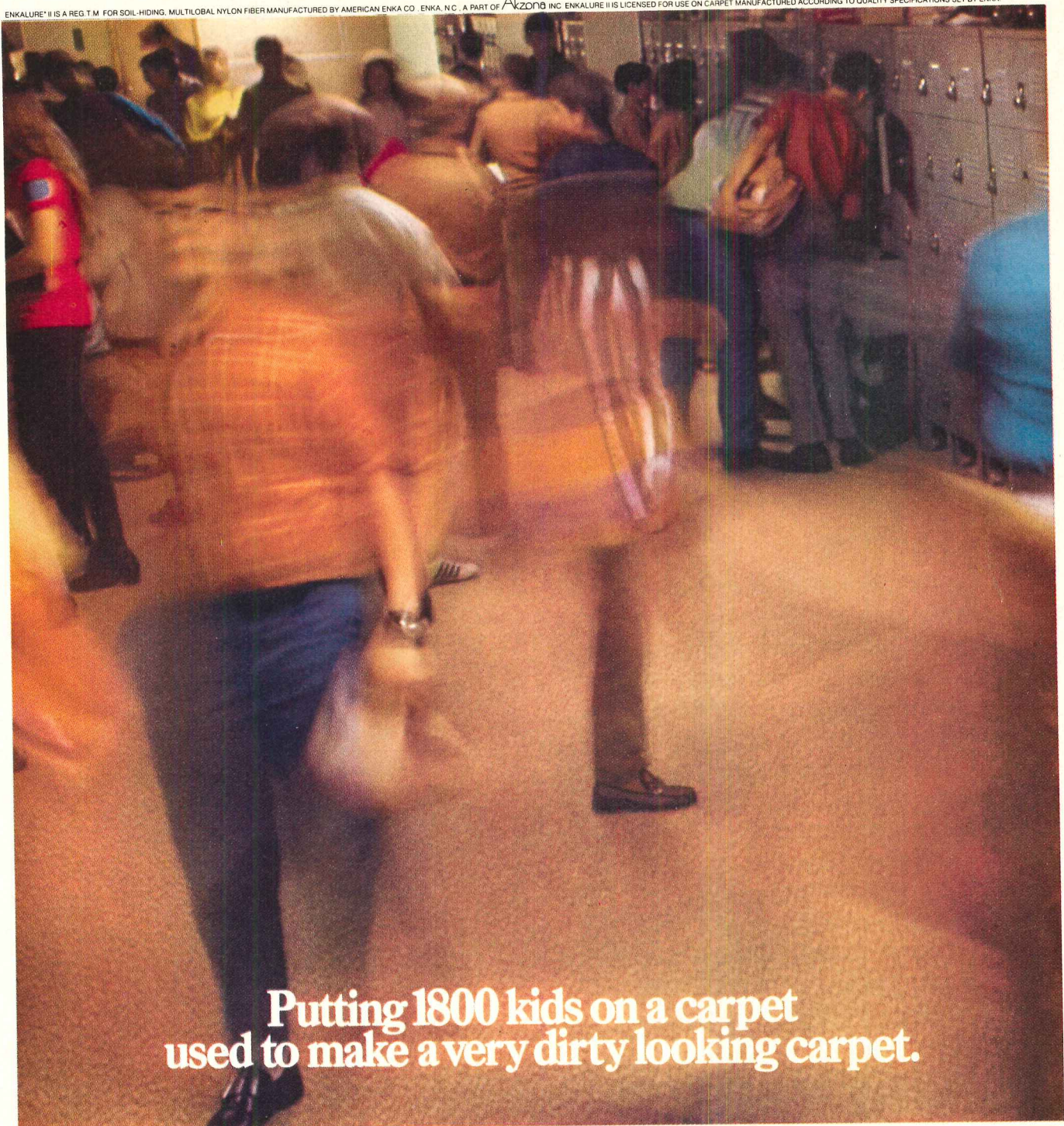
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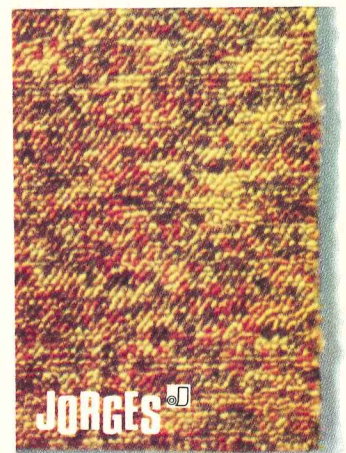
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Instead of being built with deeply grooved surfaces that trap dirt, as is conventional carpet nylon, each fiber of Enkalure® II soil-hiding nylon has smooth, gently curving surfaces. No deep grooves means less fiber surface to collect soil, and no voids or holes that allow dirt to enter and become permanently trapped.

Meanwhile, these specially modified fibers act as reflectors that intensify carpet color and give it the illusion of depth.

This brightness-stamina has been extensively tested in our laboratories, using visual observation and photorefectance methods. We'll gladly send you our complete record of technical reports. Contact Enka's Marketing Technical Department for this information. Data on the excellent wearability of our fiber is also available on request.

All Enkalure II carpet types are tested and certified by Nationwide Consumer Testing Institute and bear

a five-year wear guarantee against a loss of more than an average of 10% pile fiber.

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.

$$\text{Formula: } D = \frac{36W}{T}$$

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.



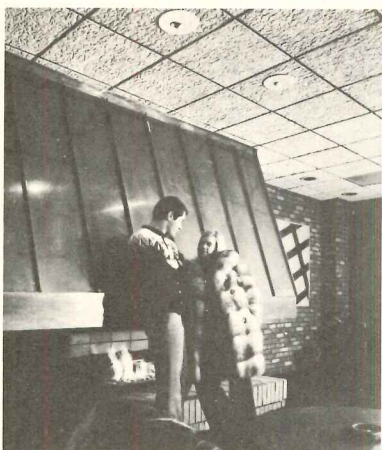
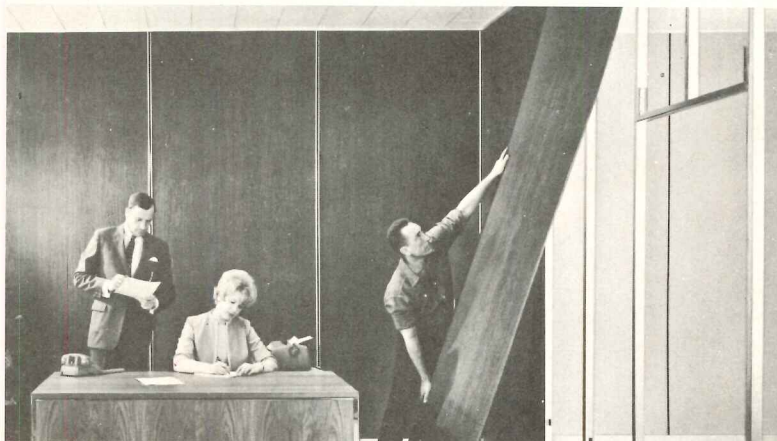
They may give you an honorary degree if you specify Tectum corridor panels.

Tectum® soaks up noise — but things like books bounce off harmlessly. That's Tectum's unique textured surface of resilient 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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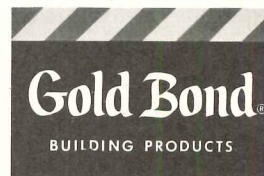
Durasan® Vinyl-Surfaced Gypsum Wallboard Panels are one answer to low-cost maintenance. They're rugged, abrasion resistant and washable. Durasan is available in a wide range of textures, colors and woodgrains.



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.



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.



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



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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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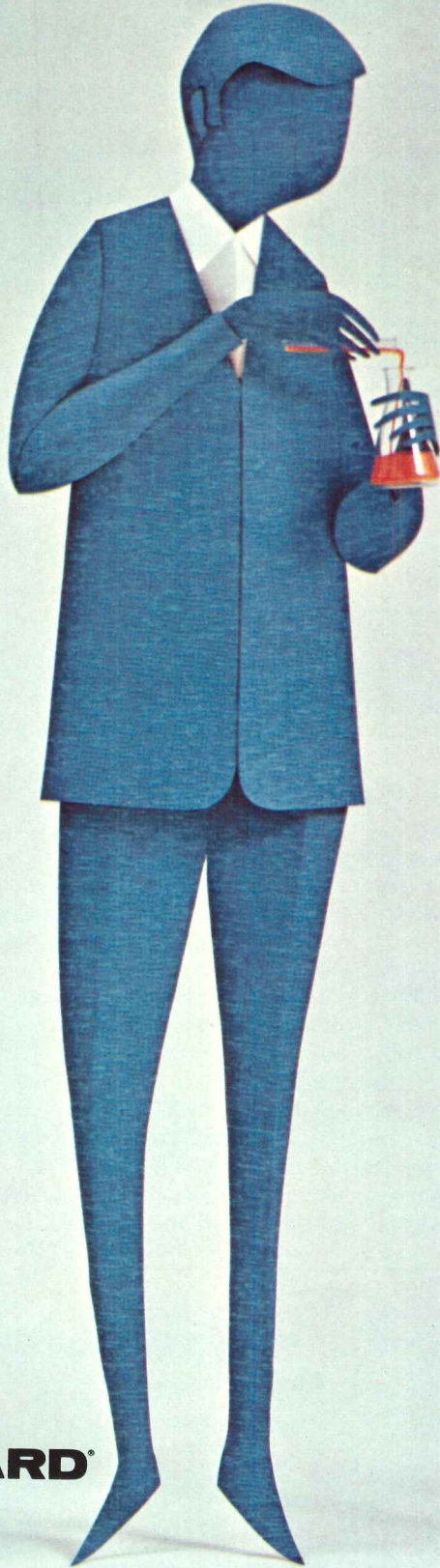
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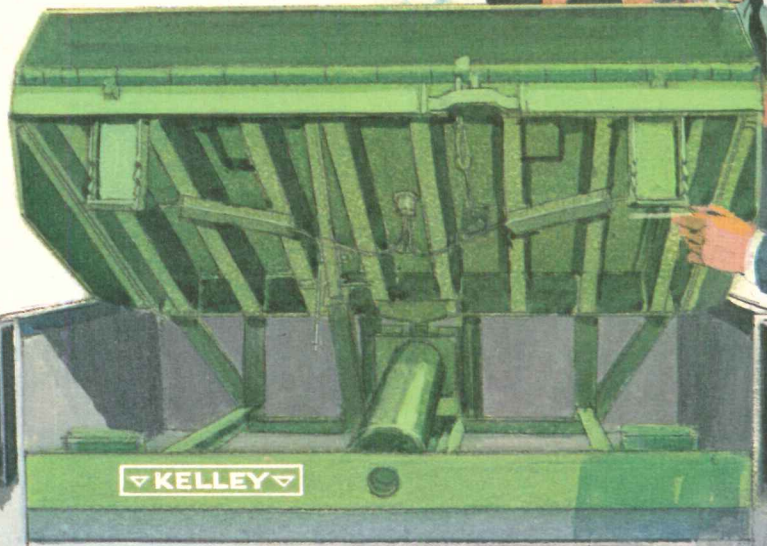
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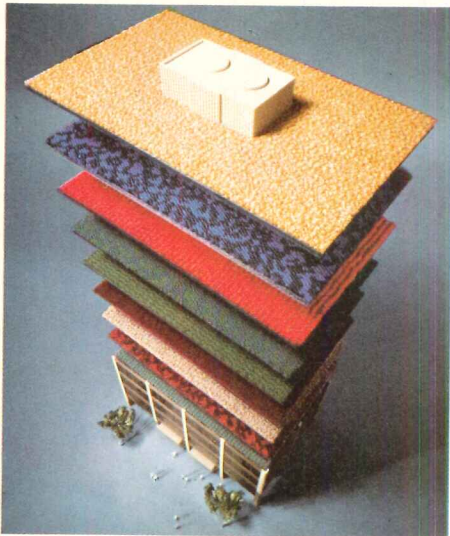


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Beauty meets beauty with a flair for function as Wilson-Art laminated plastics add charm and maintenance freedom to this salon.

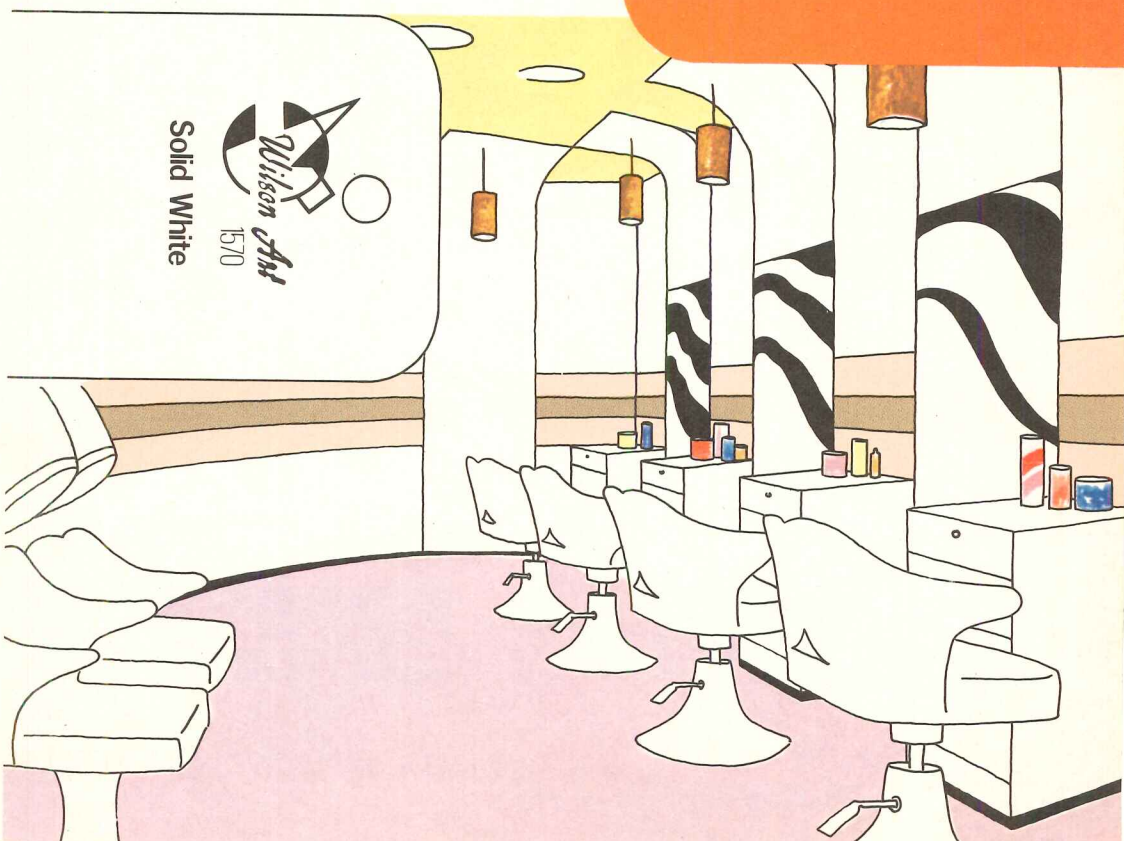
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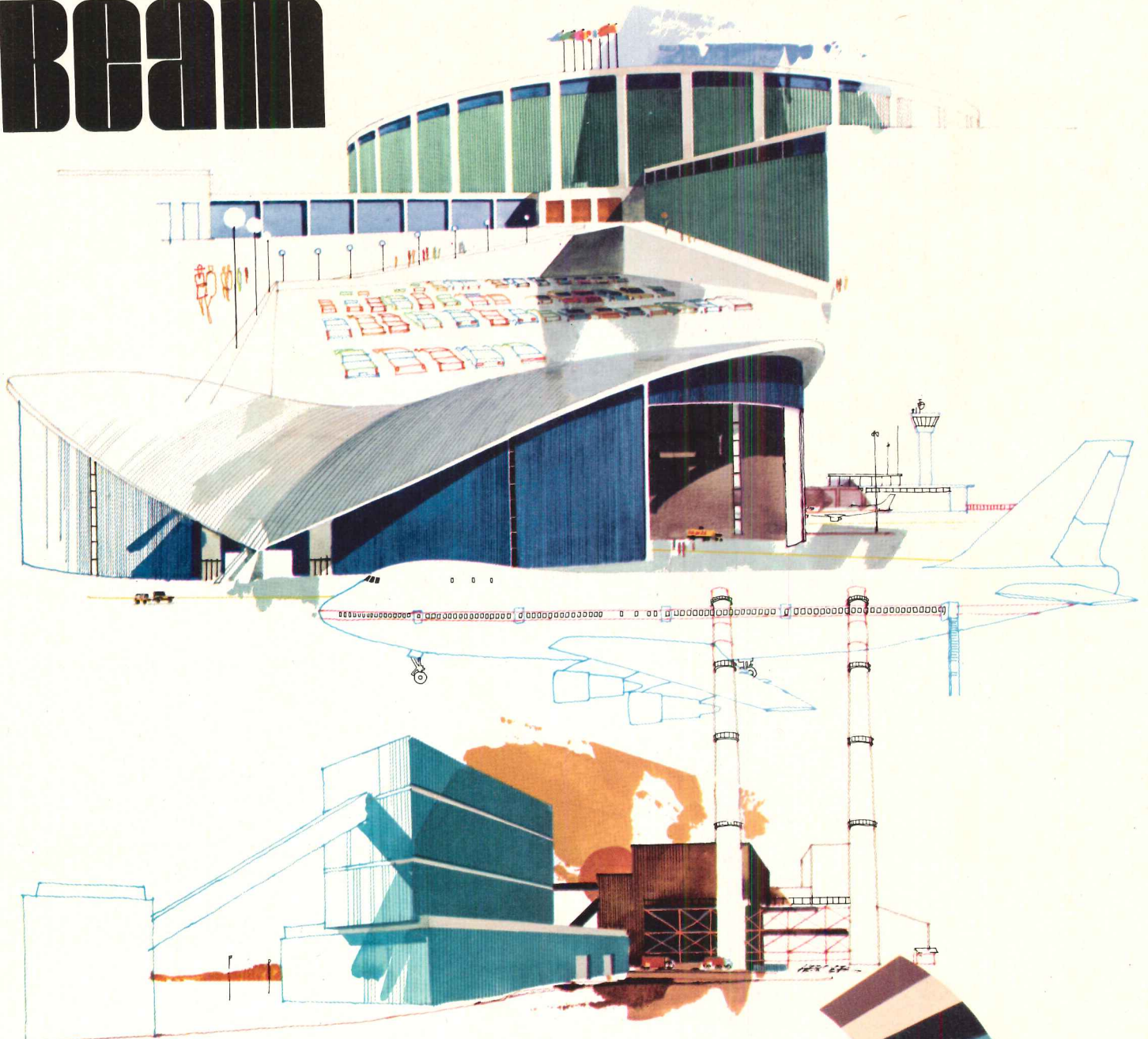
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It takes the instantaneous response of integrated circuit logic—to set a new pace for passenger service. That's the secret of Haughton's new 1092-IC elevator control system.

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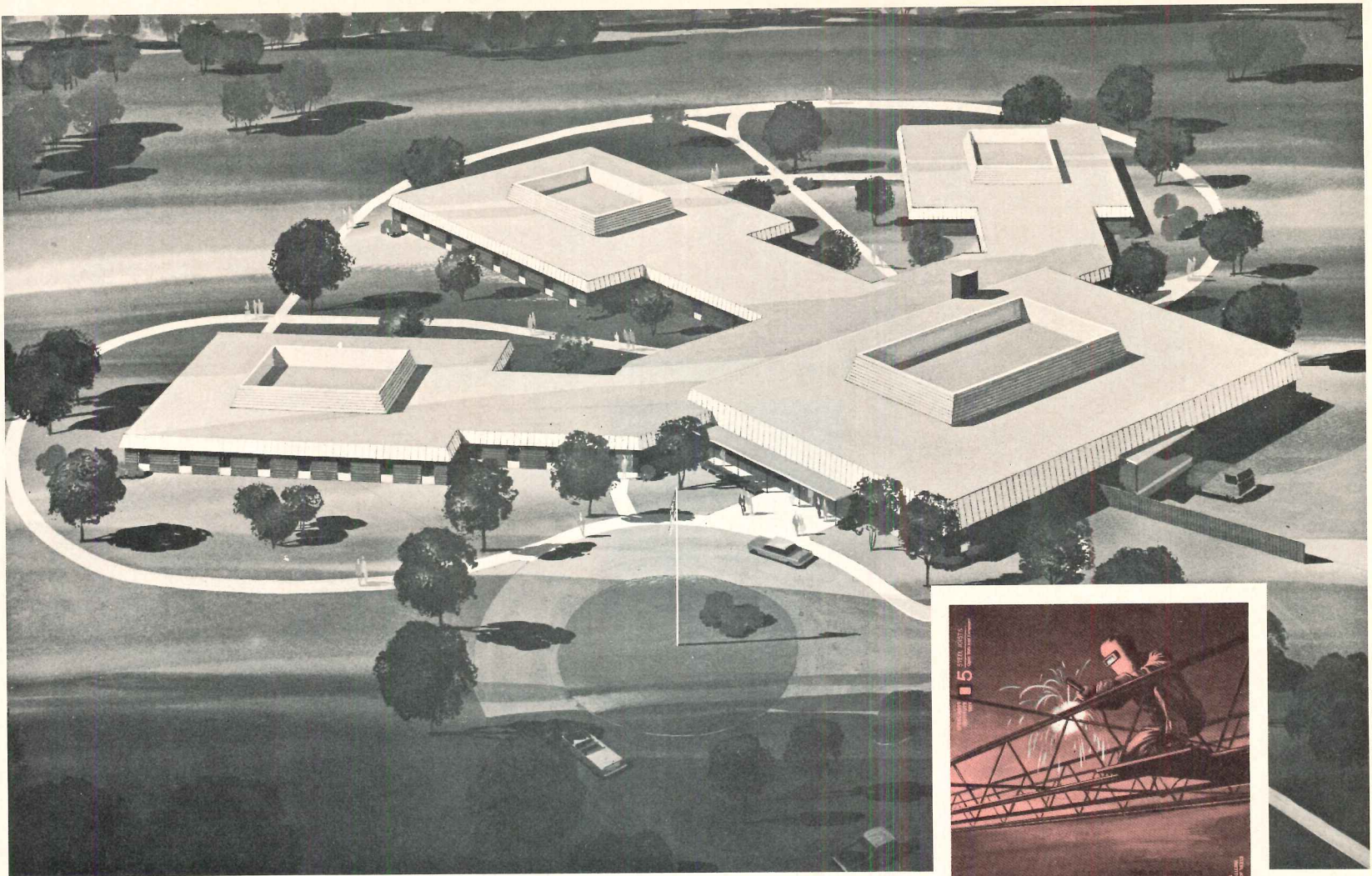
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Why steel joists were the right answer to this building need

MONTGOMERY COUNTY INFIRMARY: A MODERN HEALTH FACILITY AT ECONOMICAL COST

Montgomery County Infirmarium 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 fire-rating requirements by virtue of the suspended ceilings."

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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 Specification 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.

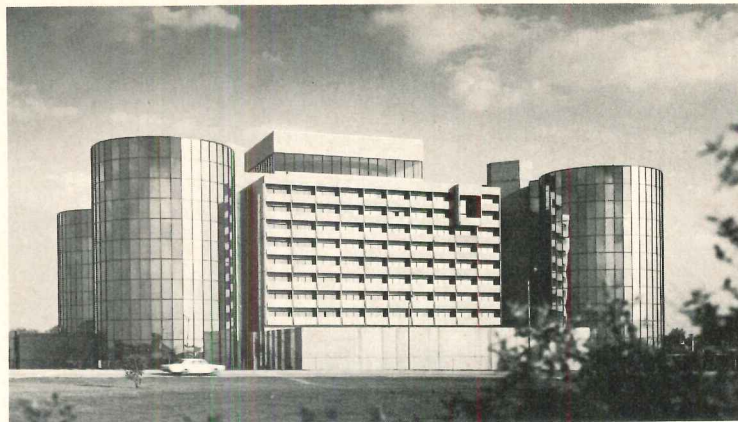
The first effect of the new policy on construction (as for all sectors of the economy) is an instant, if temporary, halt to rising costs. The wage freeze over-rides the Construction Industry Stabilization Committee actions. But chances are this body, given the 90- (or perhaps 120-) day breathing spell, 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.

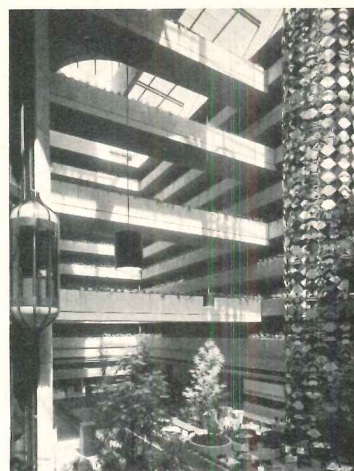
Interest rates? Mortgage money is bound to be tighter as individuals spend more and save less; but diminishing inflation should help halt or at least slow down today's upward drift of interest rates (another possibility: rates may be frozen by fiat.)

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



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.



Hedrich-Blessing photos

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."

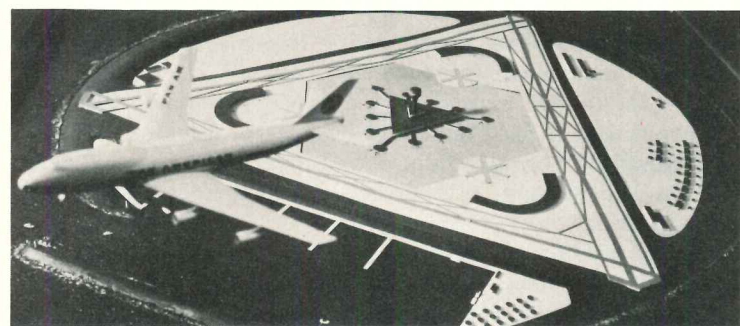
While the architects initiated

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 metrification 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.

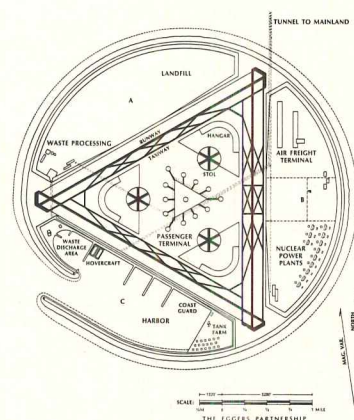
Trade associations and agencies of the Federal, state and local government would be advised by the coordinating group of changes in codes and regulations requiring attention. The report includes this argument regarding the international aspects: ". . . The U.S. has the opportunity to ensure that its 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 & Hennessey, 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



THE EGGERS PARTNERSHIP

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.

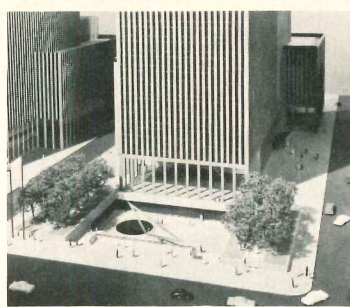
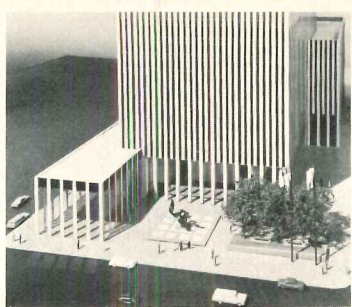
In reporting the second periodic update of the *F. W. Dodge Construction Outlook*, which was originally issued last October, Christie said that construction markets at present are fulfilling earlier expectations. "Housing has already made it in a big way. By spring, the rate of housing starts had already 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 head-quarter 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

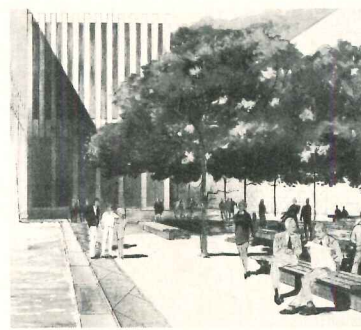
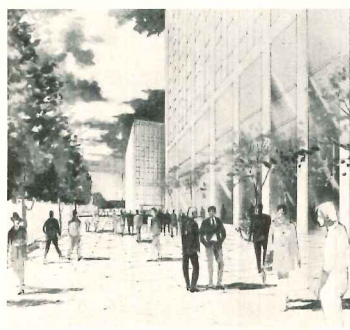
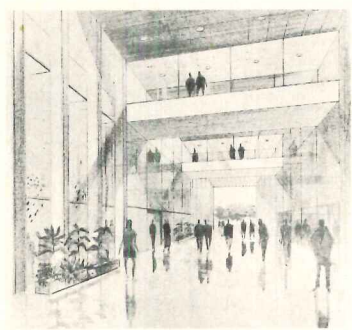
buildings, which devote 40 per cent of the land area to open space, are now under construction and bring the total number of buildings in the complex to 21, on 25 acres of land, with 15 million square feet of space.

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 ap-

plause 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.

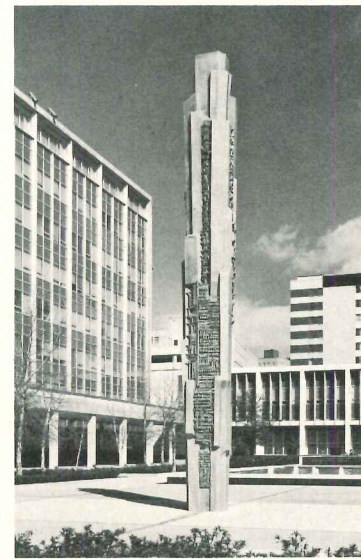
The work of designer-sculptor Lin Emery, and dedicated to the late deLesseps S. Morrison (long time city mayor and former U.S.

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

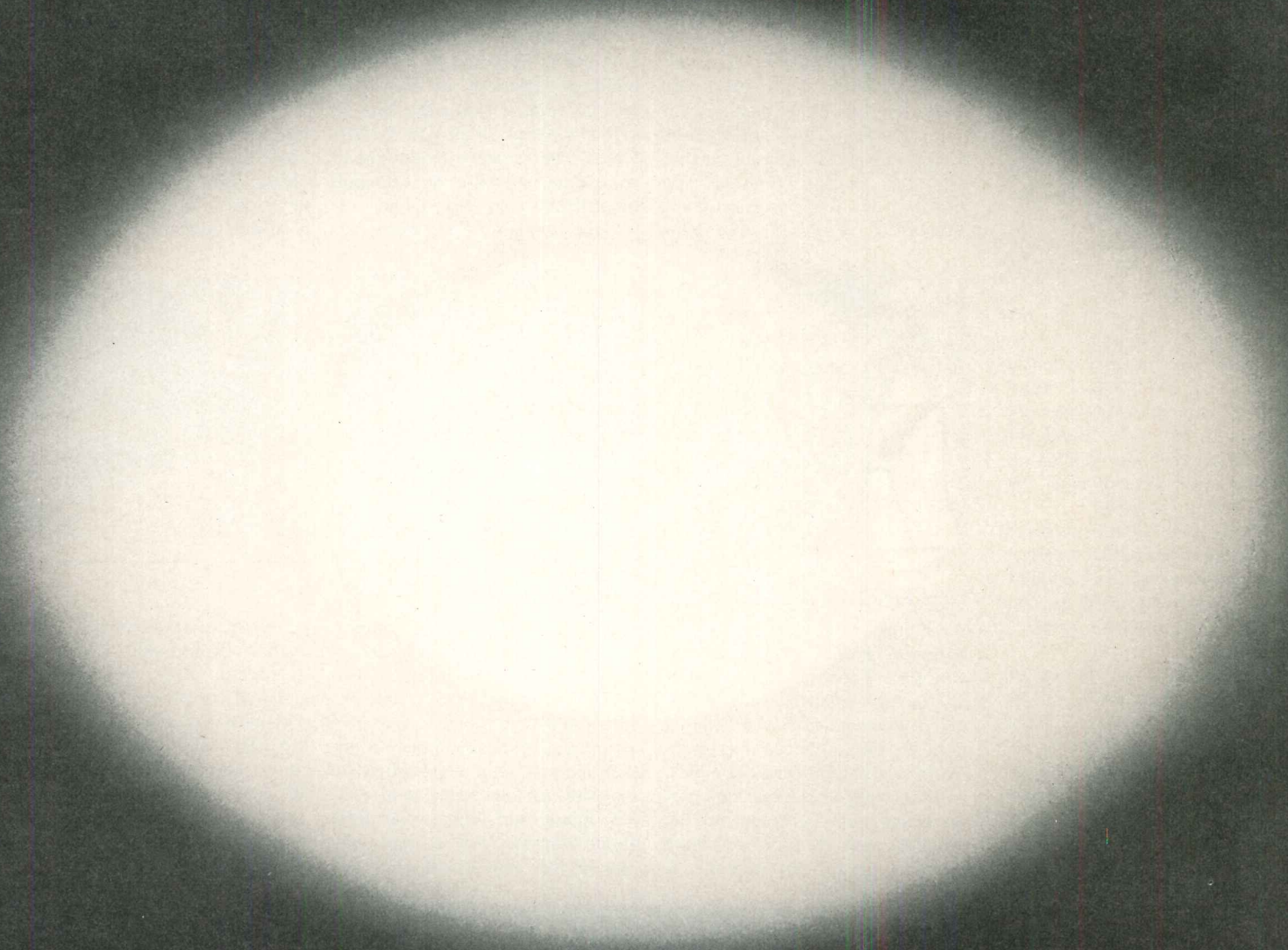
Clarion Herald

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.

Stuart Lynn



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way they're supposed to look.

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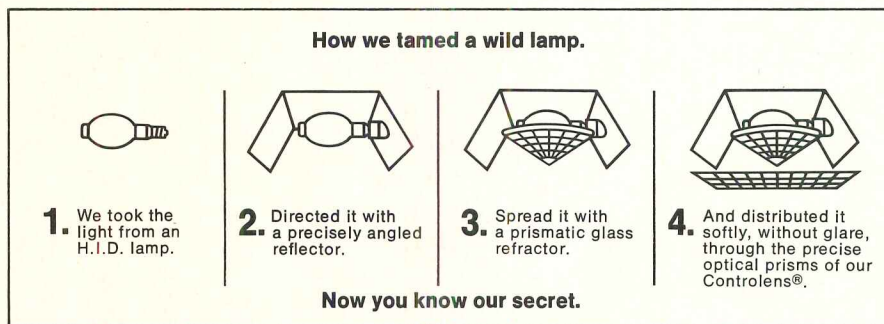
And because of the high output, you'll need fewer luminaires. One 2' x 2' Merculume unit replaces 20 square feet of fluorescent fixtures.

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Contractor: Blackhawk Heating & Plumbing Co., Inc. and Donovan Construction Company, A Joint Venture

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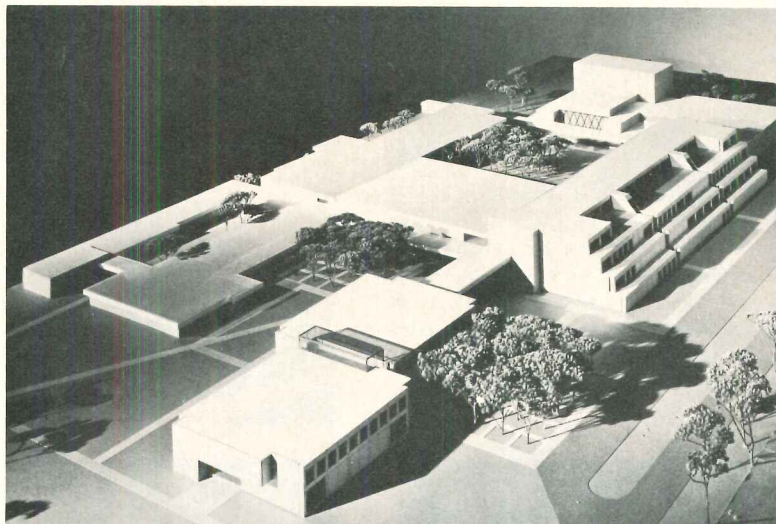
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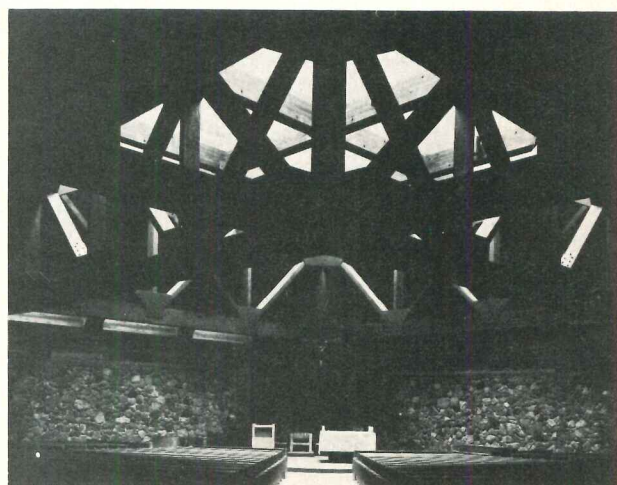
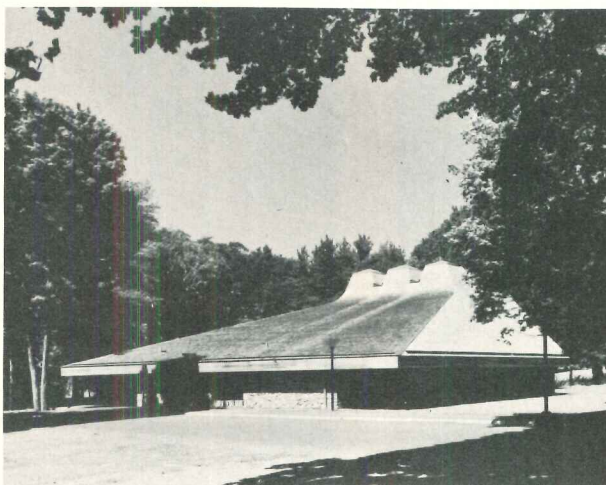
Montgomery Elevators in this building are protected by Montgomery Preventive Maintenance.

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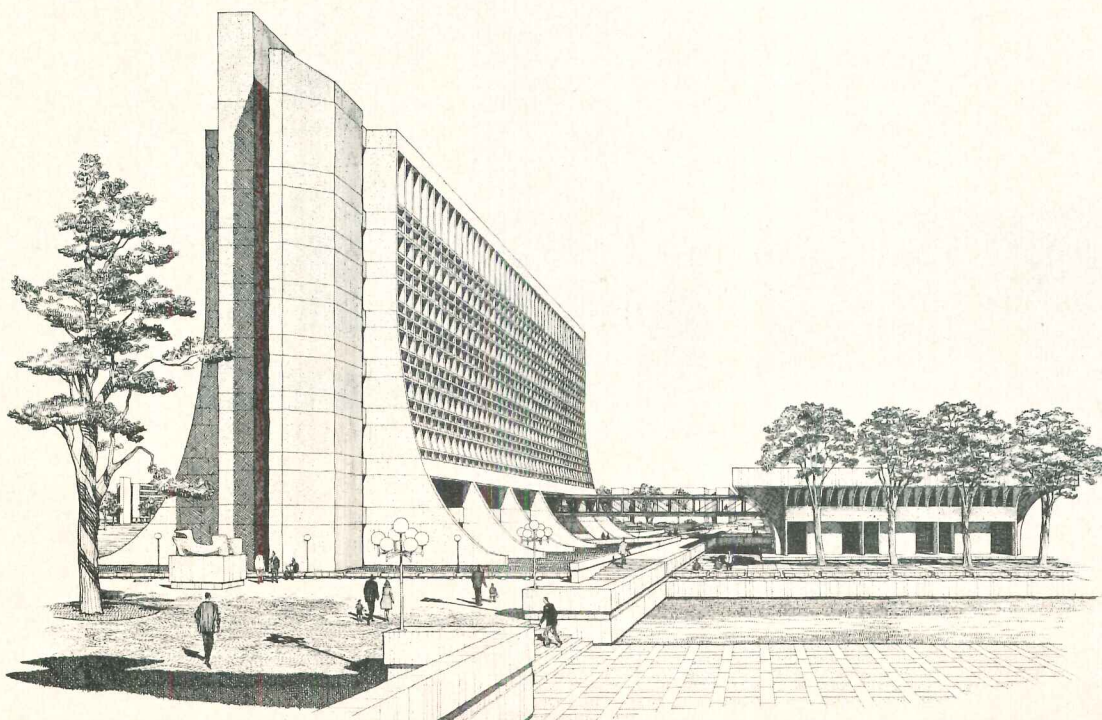
Tarapata-MacMahon-Paulsen Associates, Inc. were awarded a Special Jury Citation for Outstanding Architectural Excellence by The College and University Conference and Exposition for the two-story Fine Arts and Classroom Building (foreground) on the campus of Delta College in University Center, Michigan. 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.



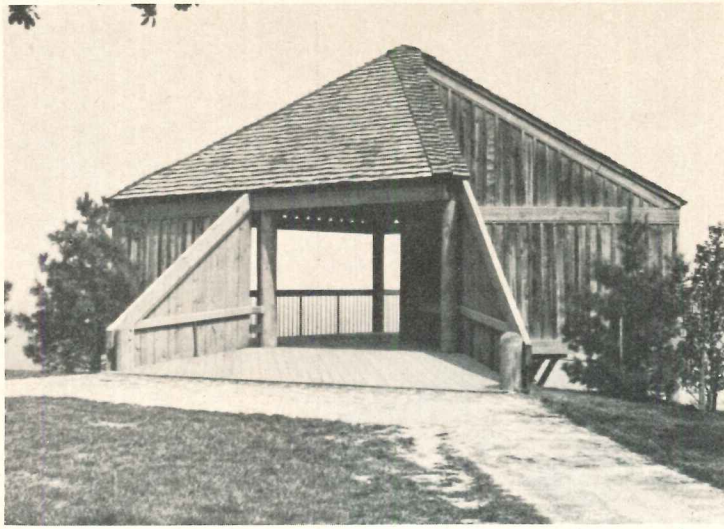
Russell Gibson von Dohlen, architect, received a citation for The Church of St. Peter Claver's "contribution to environmental quality" from the Connecticut Building Congress. Rough textured fieldstone walls and cedar planking on a laminated timber structure are in tune with the natural site and residential 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.



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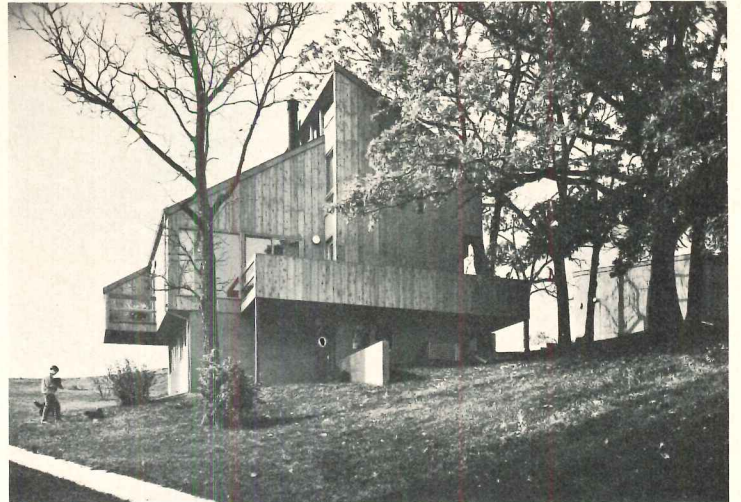


Pancoast/Ferendino/Grafton/Architects in joint venture with **Watson, Deutschman & Kruse, Architects** were honored with the Outstanding Concrete Structure Award by the American Concrete Institute, for the Mailman Center for Child Development at the University of Miami School of Medicine. A tower of 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

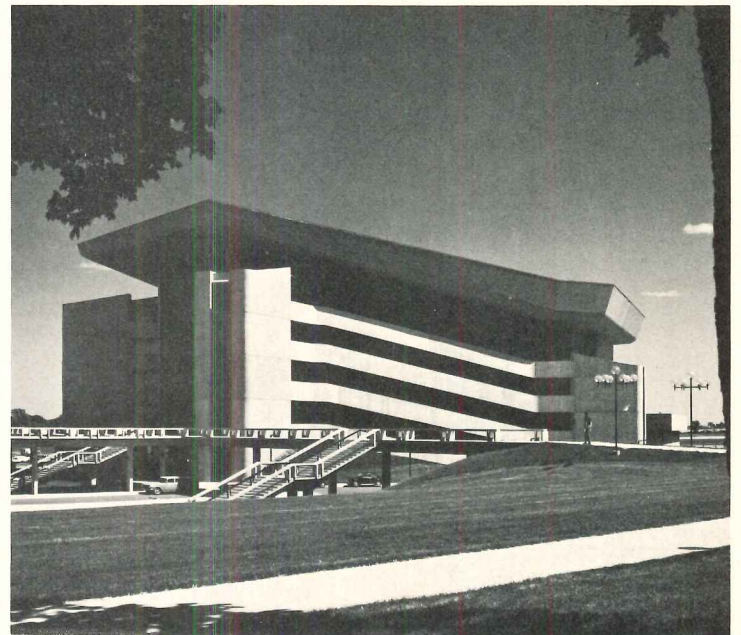
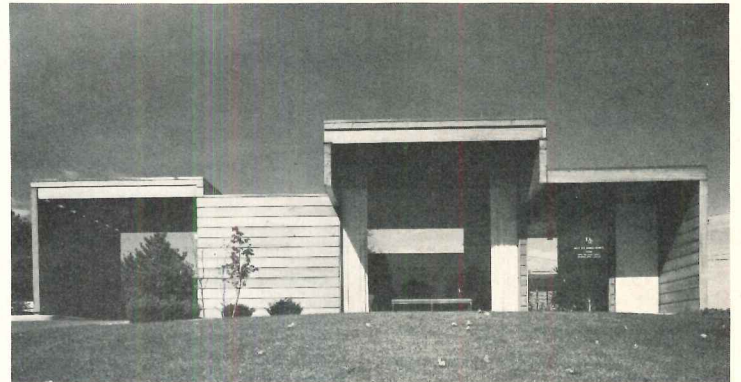


Joel Strasser



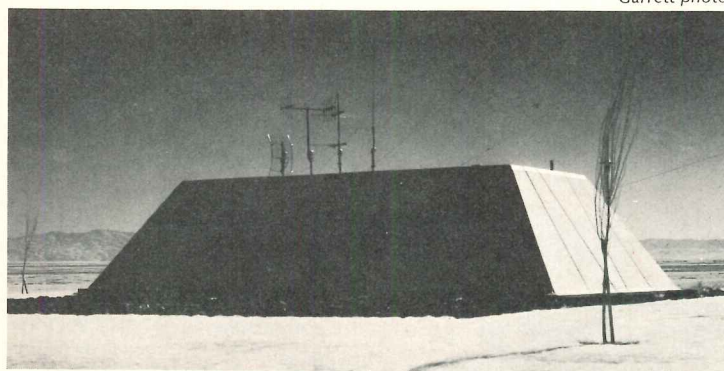
The 101 Southfield building in Birmingham by O'Dell, Hewlett & Luckenbach, Inc. received an award from the Detroit Chapter A.I.A. Other winners were William Kessler & Associates, Inc. for the Bundy Tubing Office Building in Warren; Smith, Hinchman & Grylls, Inc. for the Michigan Electric Power Pool Control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

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.

Garrett photo



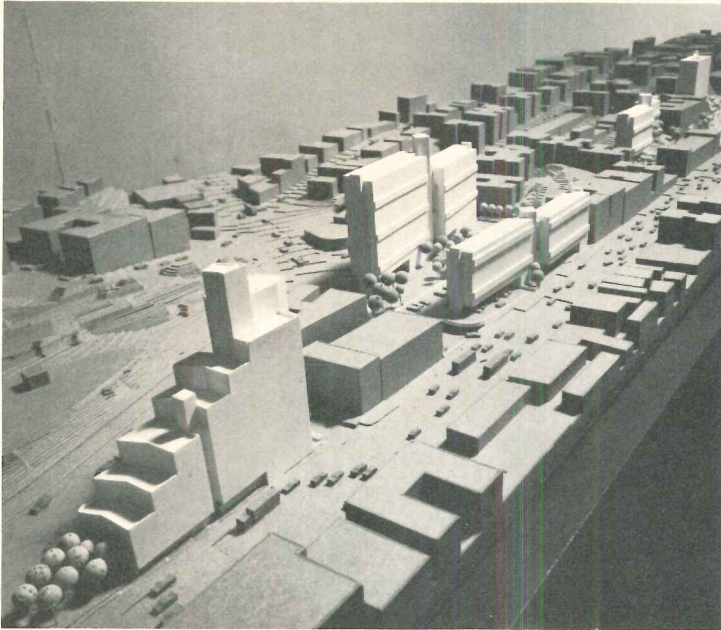
The KBOI Transmitter Building by Cline, Smull, Hamill, Shaw & Associates received a merit award from the Idaho Chapter A.I.A., as did the Root residence by Neil Wright, and the American Reserve Insurance Building by Watson & Leatham. Honor awards went to the Idaho First National Bank by Dropping, Kelley,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

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

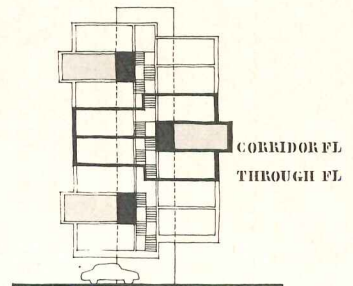
The 1970 jury consisted of Stanley Salzman, architect; Jenepher Walker of House & Home and Burton Eaton of Shelter Realty Corp. In its selections the jury hoped to emphasize the present need for architects to be involved in urban rehabilitation and

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.

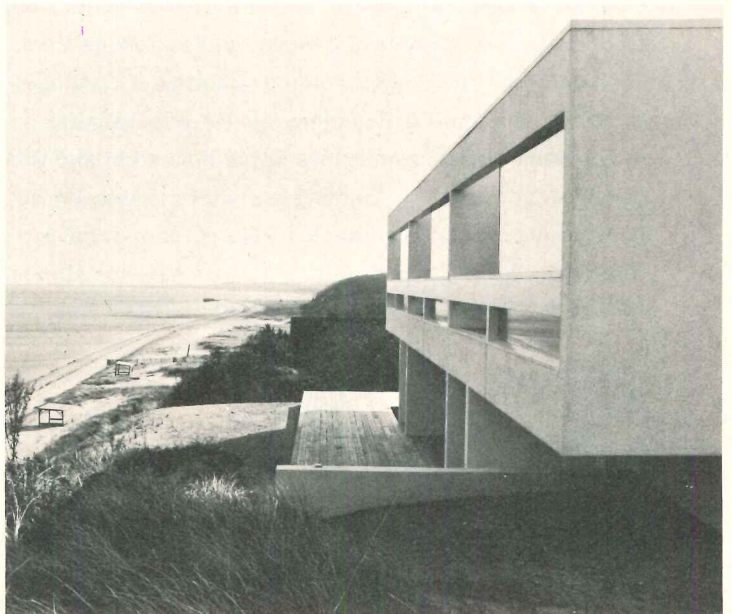


David Hirsch

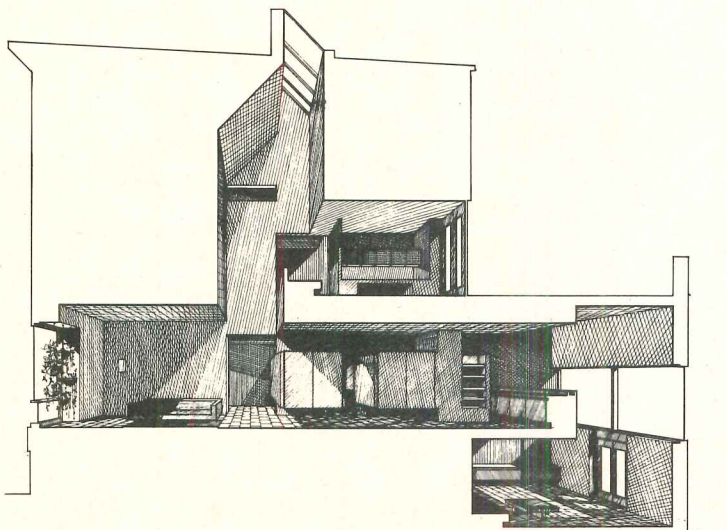


Harbor Village at Paerdegat, a row of 900 middle-income cooperative duplexes. All major living areas face Automobile Workers Local 365, designed by Gruzen & Partners received Special Mention. It will have grass rather than parking. Open spaces will have playlots, seating and swimming.

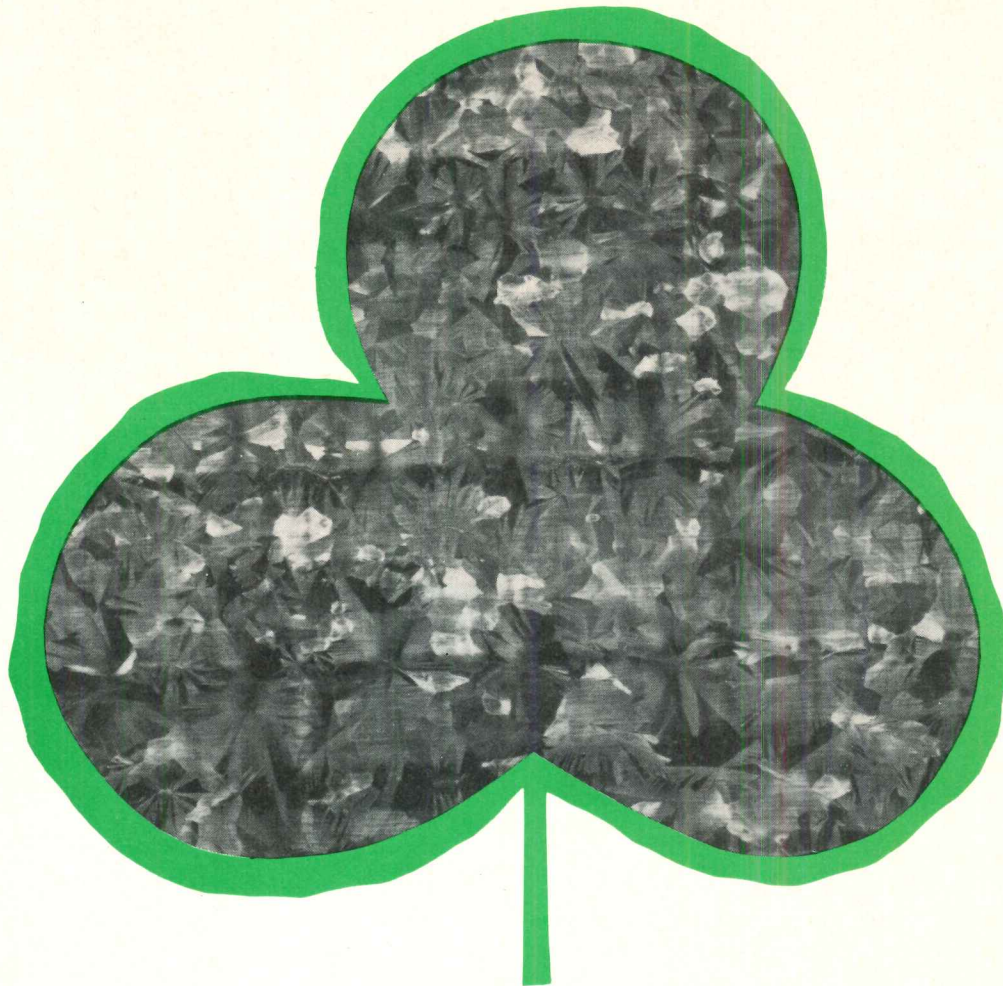
A beach house in Amagansett, New York for Dr. and Mrs. Cates, designed by Julian Neski received a Special Mention. The jury said it's "a direct lift from the Thirties—in Germany—so simplified on the exterior as to be almost stark, the whole second floor rectangle floating above a smaller base." It can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



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.



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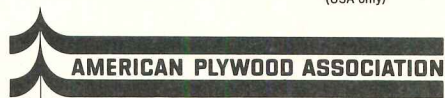
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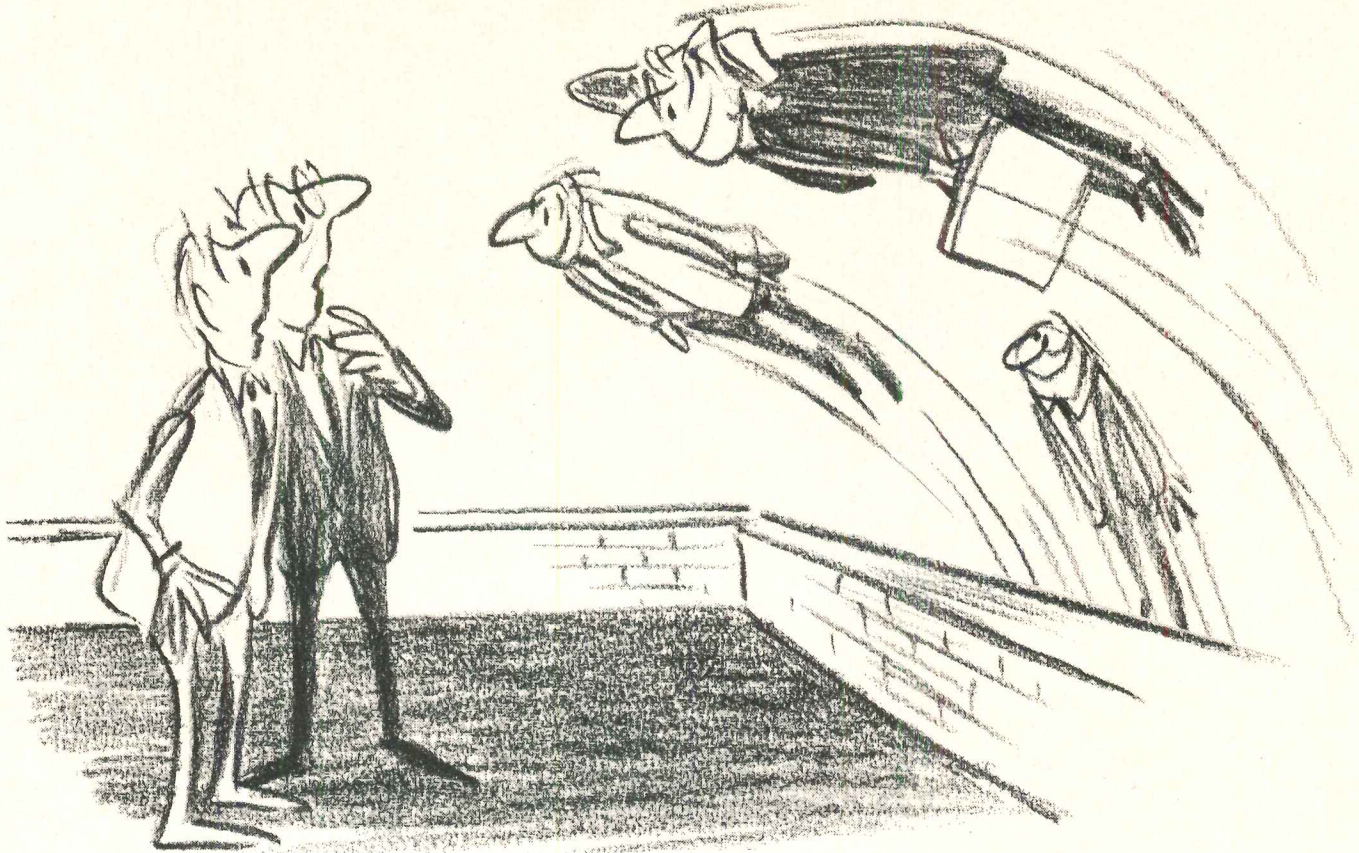
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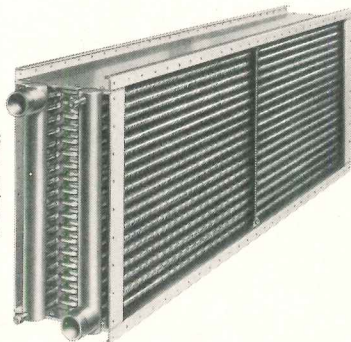
Architects: Thomas E. Batey, Hospital Corporation of America, Director of Architectural Planning and Construction—Gresham & Smith, Nashville

Mechanical Engineers: Smith, Seckman & Reid, Inc., Nashville
Mechanical Contractor—(Macon and Albany, Ga.): Gay Plumbing & Heating—(Chattanooga): Corlew Engineering Company
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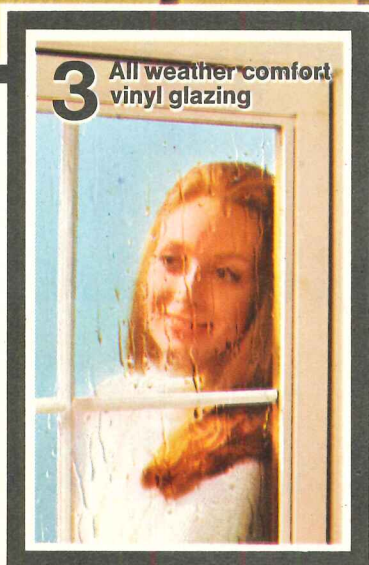
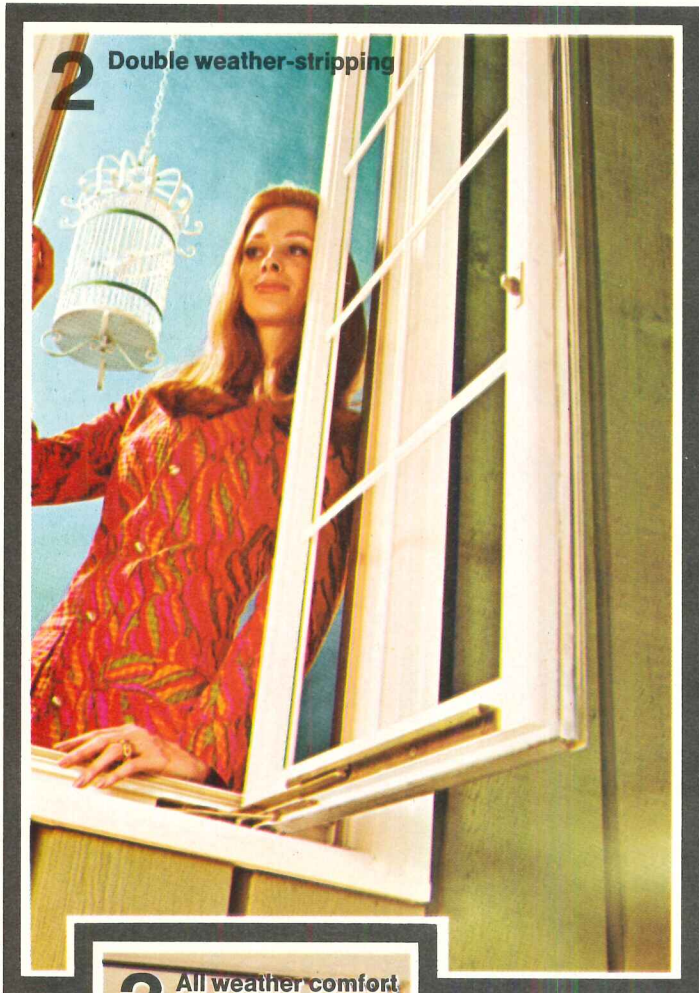
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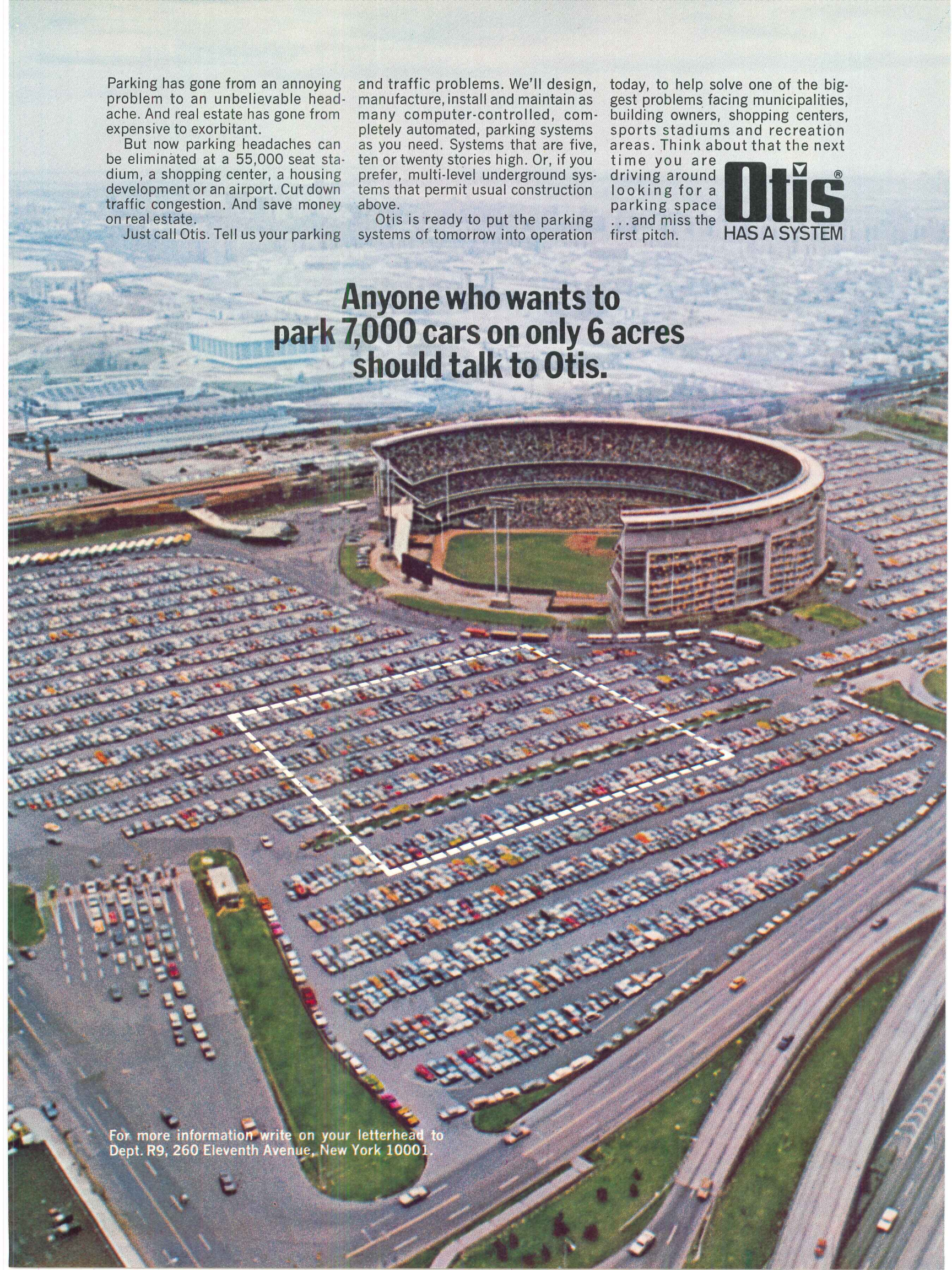
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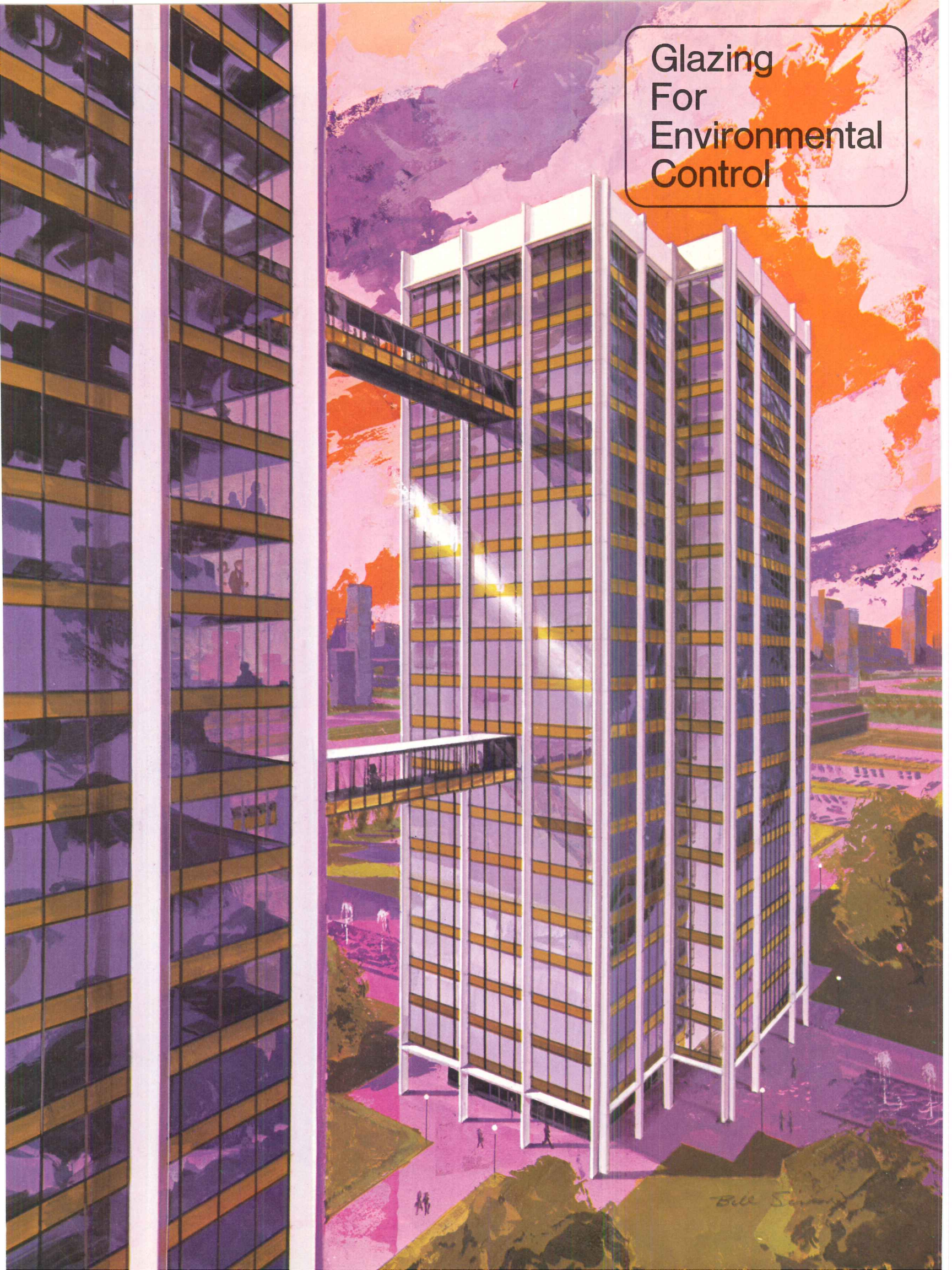
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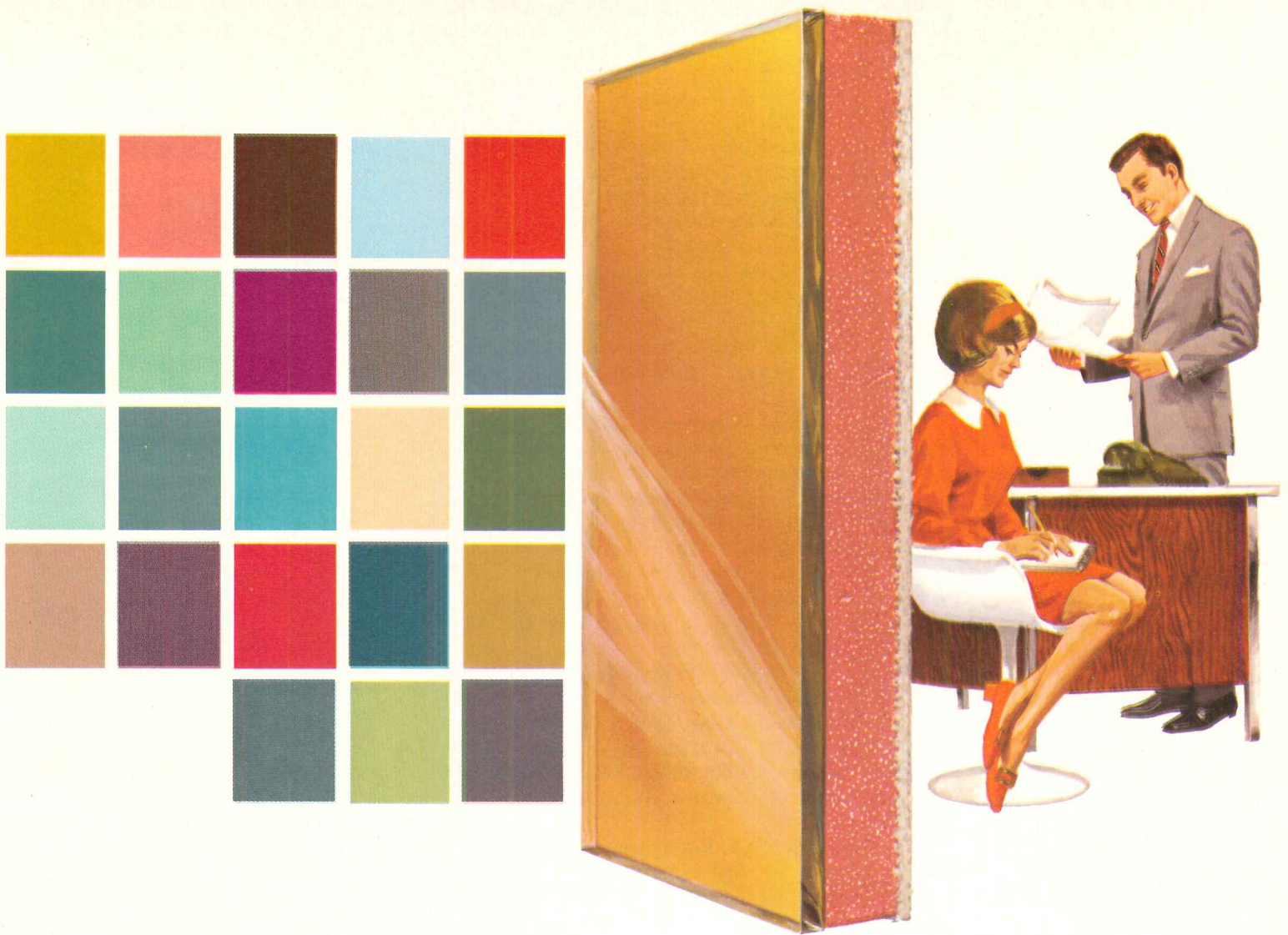
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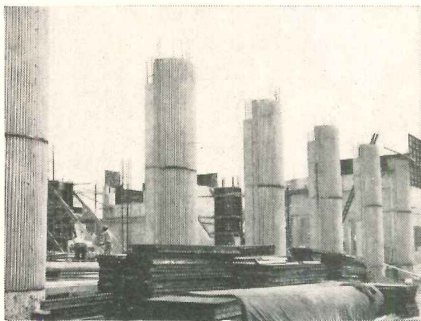
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OFFICE NOTES

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 Saylor**. The change was made to incorporate the name of **Al H. Saylor**, 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.

1971 National Plastics Exposition / Nov. 1-5 / McCormick Place, Chicago

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The National Plastics Conference will offer in-depth seminars on plastics and the environment, plus plastics' role in construction, agriculture, automotive, appliances, packaging, furniture, communications and/or electronics and electrical equipment. **Clip and mail with your letterhead for conference program and advance registration application to The Society of the Plastics Industry, Inc., Department 18A, 250 Park Avenue, New York, New York 10017.**

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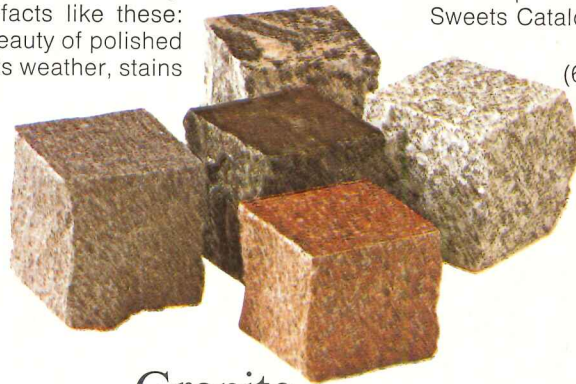
and all types of traffic as no other building material can. It won't fade or deteriorate, and it requires virtually no maintenance. Comes in a wide spectrum of colors, too.

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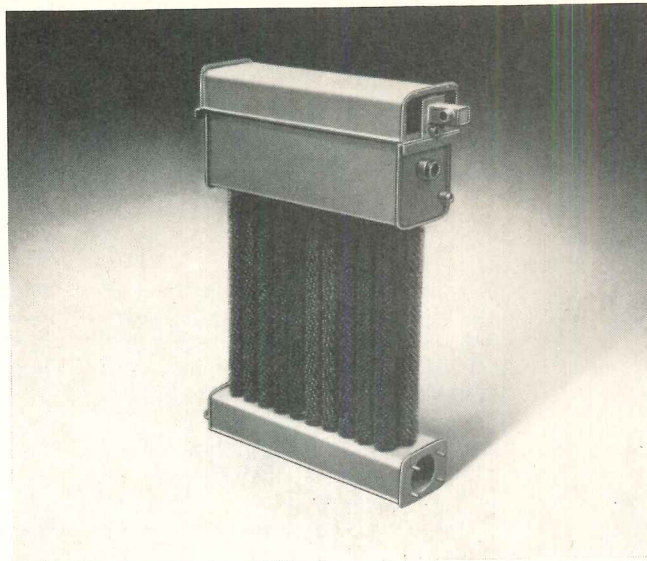
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Look up your GE dealer in the Yellow Pages under "Air Conditioning Equipment and Systems."

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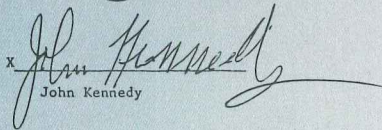


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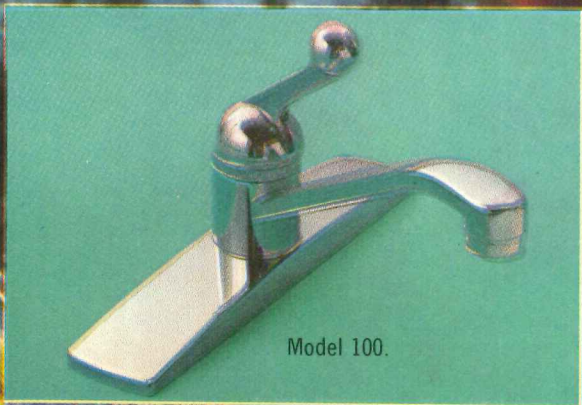
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GSA advocates new financing techniques for public buildings

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 ex-

pendent 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 approxi-

mately 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 lan-

* 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.

guage 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

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 1/4" 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

Coating of Slat	Thru 1/4" Clear Plate		Thru 1/4" HA Plate		Reflect.	Absorpt.
	Open	Closed	Open	Closed		
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.

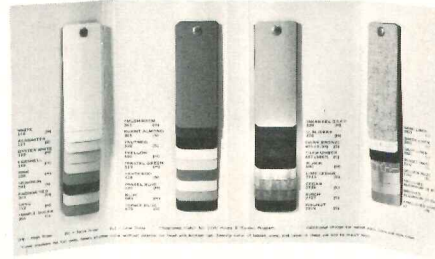
Just as you can cut air-conditioning costs with a reflecting blind, you can cut heating bills with an absorbing blind. And you don't have to pick a dull or uninteresting color, either.

Surfaces that Absorb.

Levolor has come up with a raw-umber colored blind with an absorptance coefficient of .92. Which means that your heating system gets a tremendous boost from the absorbed light and heat during the daytime hours.

Color.

People used to think of blinds as dull, drab, bulky window coverings. But that kind of thinking is outmoded. Levolor Rivieras come in a tremendous variety of colors (50 are in stock), from bright silver



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Gentlemen of Levolor:

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- Architectural Bulletins.
- Window Magic, a booklet about creative window coverings.
- Color chips.

Name _____

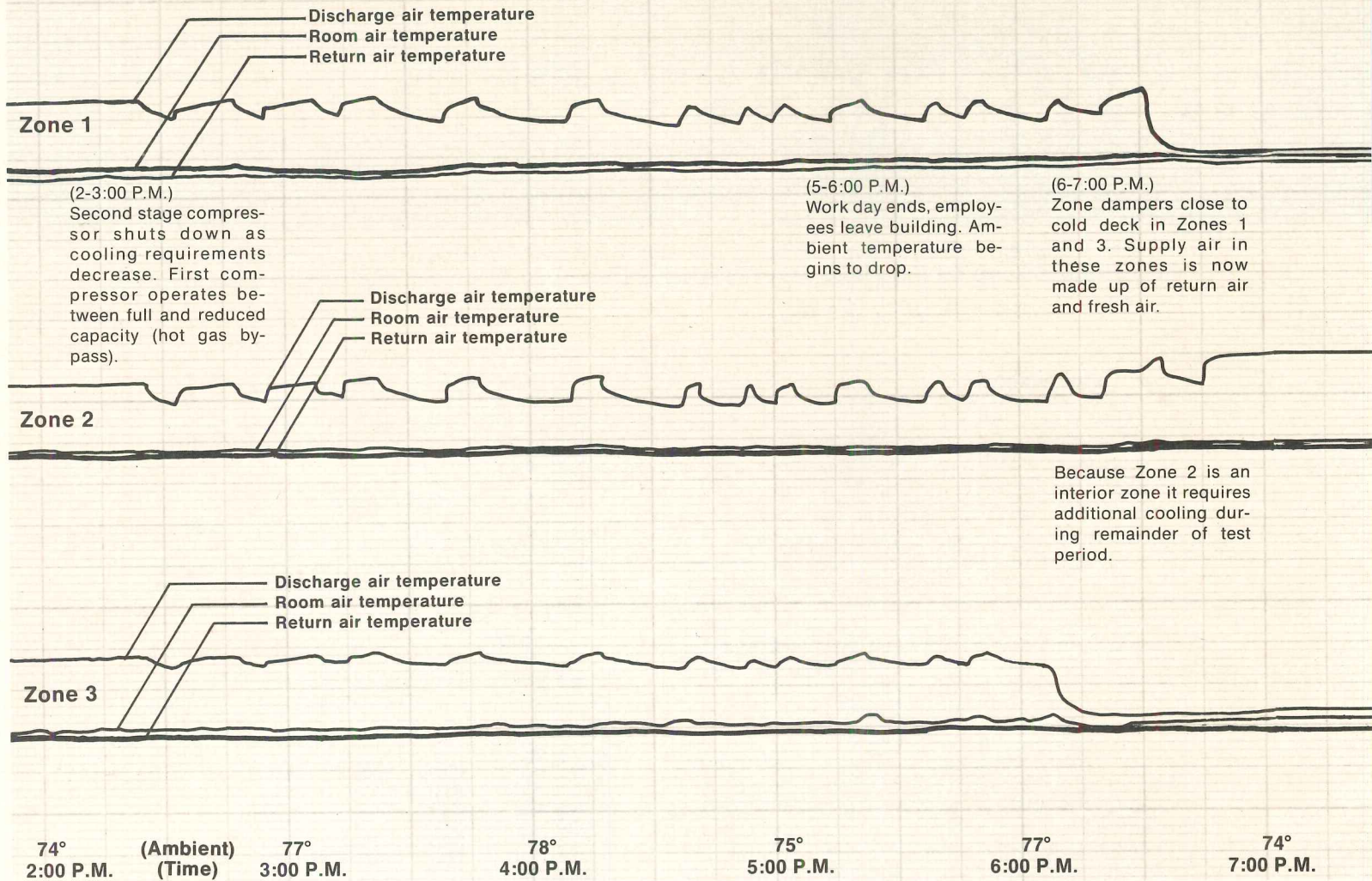
Title _____

Firm _____

Address _____ City _____

State _____ Zip _____

A-9



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!

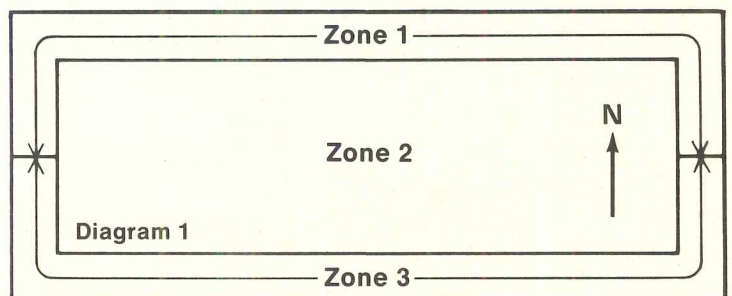
But tests are one thing, field-tested facts another. Enter Belmar Builders, Incorporated.

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.



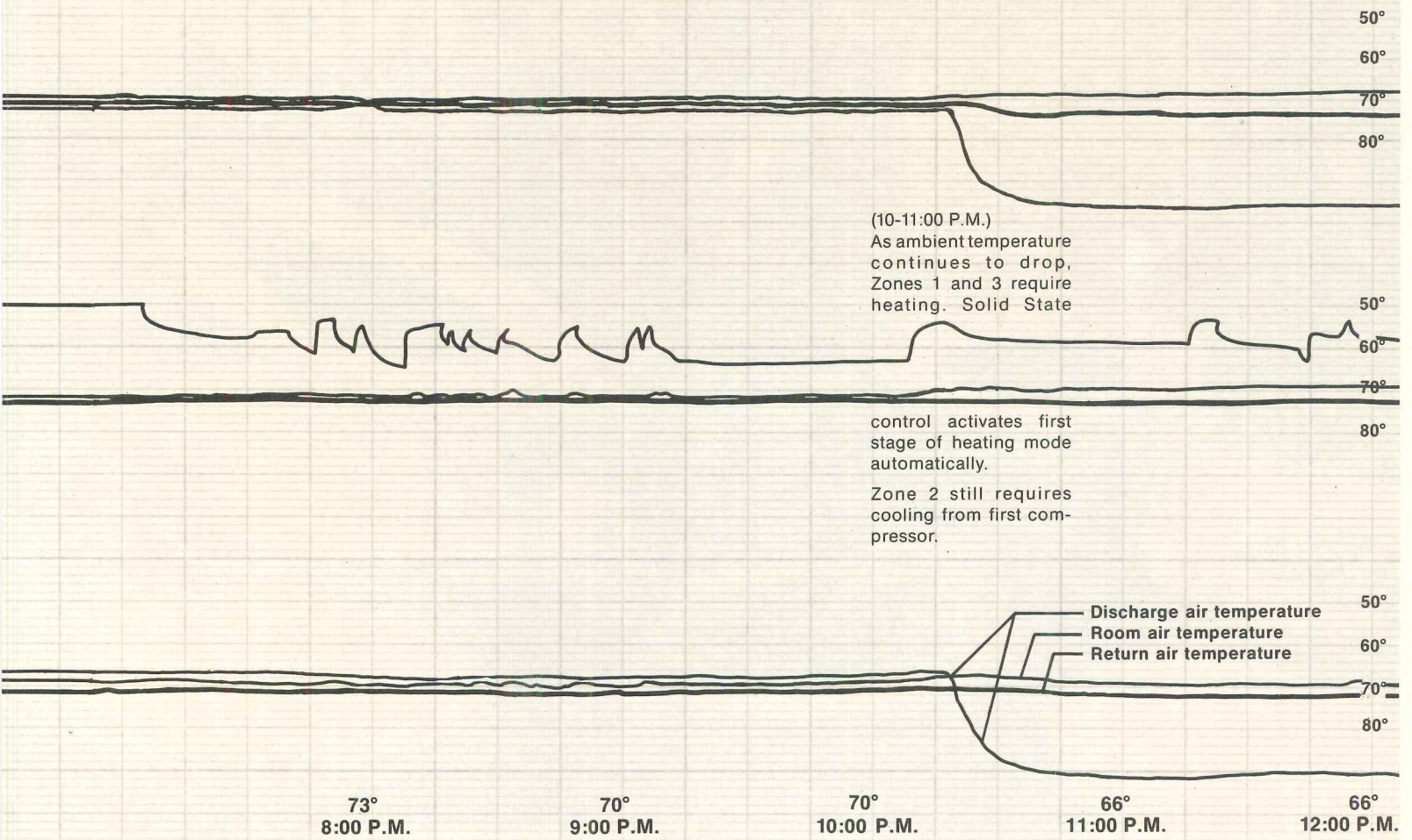
Second story floor plan (approx. 16,000 sq. ft.).

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.



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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! For more data, circle 39 on City Inquiry card

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.

To find out just how much Mammoth can do for you, simply send in the coupon below.

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Lear Siegler, Inc. / Mammoth Division
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Minneapolis, Minn. 55441

Gentlemen, you've done it again. Please:

- Send me more information on Mammoth's FM/Solid State Temperature control system.
- Have a Mammoth field representative contact me.

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Firm _____ Position _____

Street _____

City _____ State _____

Zip _____ Telephone _____

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NEW HI-RISE® SEAT DESIGN

When it's water closet seats, no other source offers more than Beneke in modern concept, comfort, durability and wide selection. Some 75 years of specialized experience is your assurance of complete service and client satisfaction. Beneke produces seats for every conceivable type of installation.

There are quality and cost levels to meet every requirement. There are seats of high impact, solid plastic that are virtually indestructible plus a complete molded composition model selection.

In colors, you name it.

If Beneke doesn't already have the design you need, our engineers will work with you.

Yes, Beneke offers more.

We can prove it.



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

The new Beneke HI-RISE features smooth surfaces and an exclusive hinge raises the seat away from the bowl by a full 1½"! Seat and bowl can be cleaned easier, faster and thoroughly. High impact solid plastic seat is virtually indestructible. It's good looking. Comfortable. 6 marbled colors, solid colors to match all fixtures, plus black and white. Open and closed front models for regular or elongated bowls. Send for HI-RISE details.

BENEKE

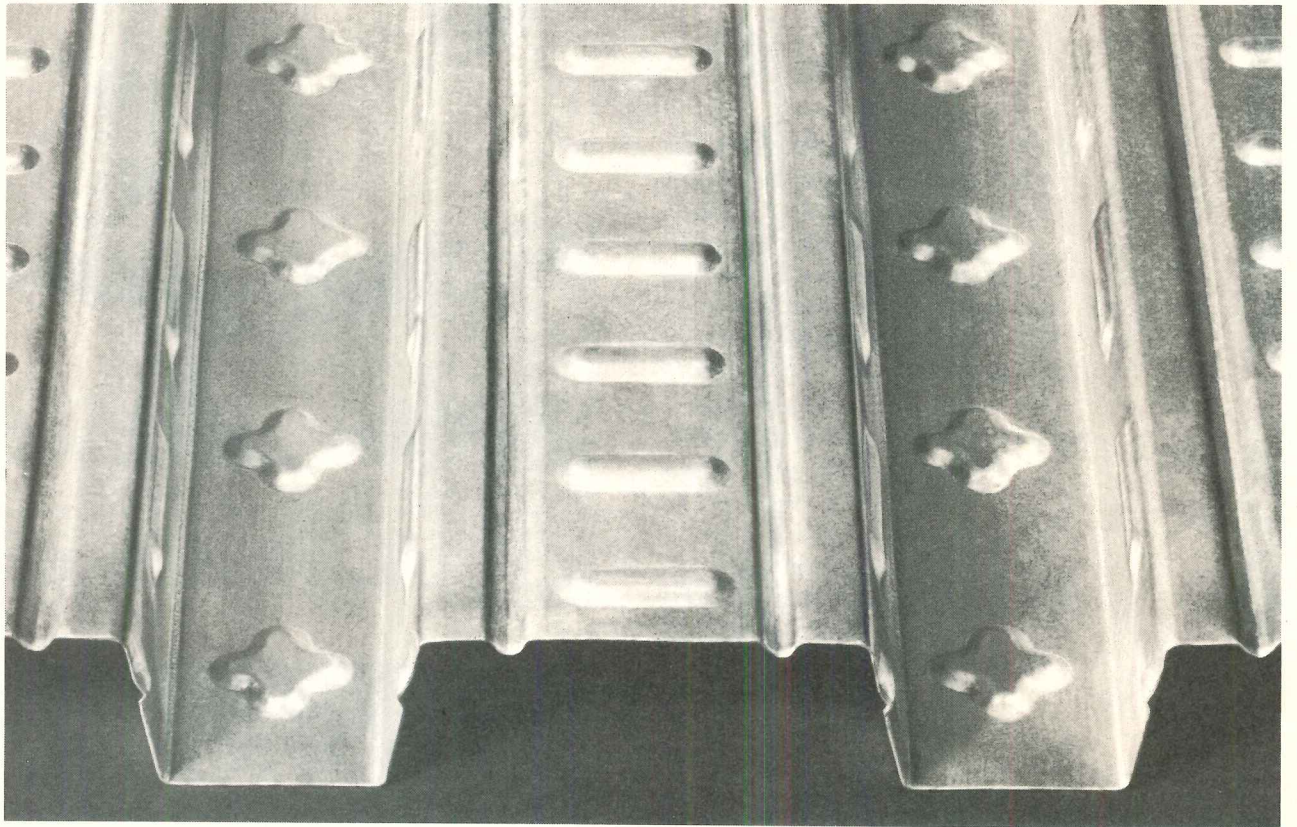
CORPORATION

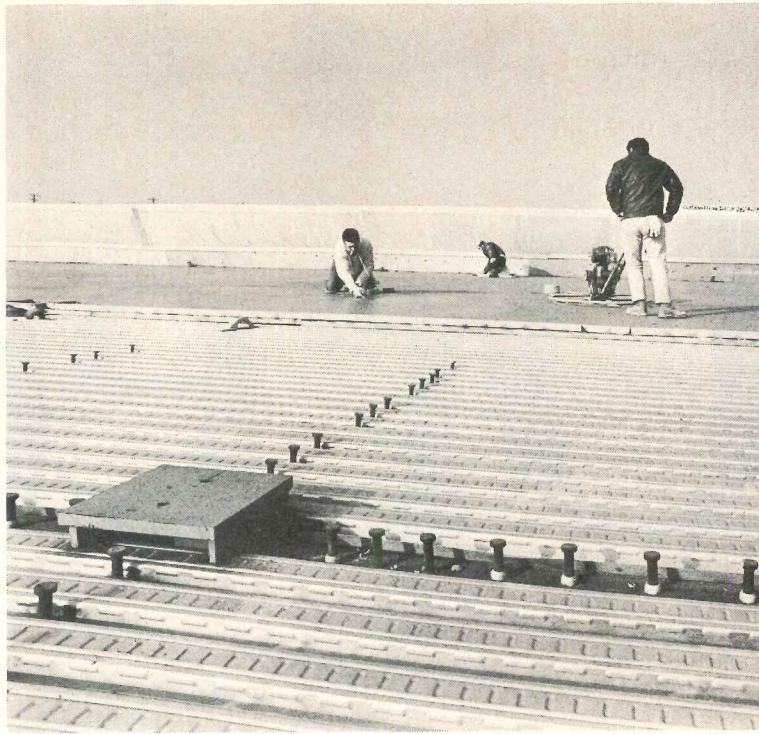
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Washington, D. C.
San Francisco
Toronto / Paris

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Our Versatile Bump...





It can turn a roof into a floor.

It's not magic; it's just an example of the practical versatility of our SUPERBOND BC Deck—the composite deck with more bumps (embossments) than any other.

The Adam, Meldrum & Anderson department store, outside Buffalo, N.Y., was designed and constructed by Brown and Matthews for United National Corporation with a finished concrete floor (shown in photo) under the roofing.

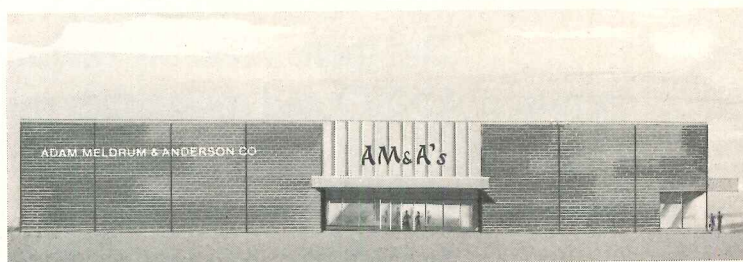
That way, if AM&A wants to add more floors, all they have to do is take off the roofing and extend the steel framework (the square "plate" in the photo is the top of a column which will be covered by the roofing).

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.

In addition, by using our deck in a composite system, B&M was able to use shallower beams. This reduced the over-all height of the building and the cost of exterior walls and all interior materials—and of course, steel costs, too.

SUPERBOND BC Deck comes in wipe-coat and 1¼ oz. galvanized, and prime coat painted. For more information, write for our free brochure WC-380R1.

The versatile bumps. Much too practical to be magic.



Designers, Engineers and Constructors: Brown & Matthews, Inc.

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96% of what we make builds highways, buildings and reputations.

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"Or equal."

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ANSO is opaque to hide dirt.

ANSO has density factor greater than 176,000 for required performance in commercial installations.

ANSO has a Taber Abrasion rating of 4 or better (no sign of pilling or fuzzing).

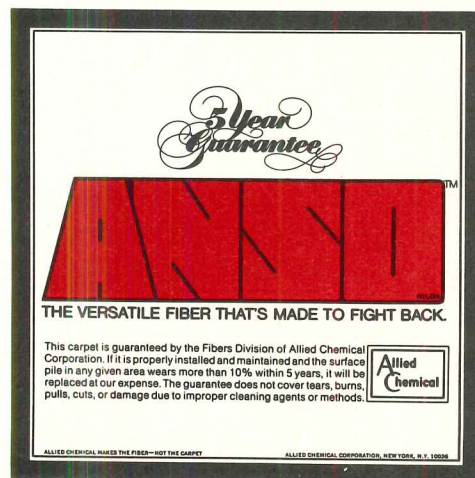
But there's one big difference between ANSO and most other nylon carpet fibers. All carpets made with ANSO nylon are guaranteed* for 5 years.

So when you specify nylon carpet fiber, perhaps you should say, "ANSO or its not-so-equal."

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* Meeting Allied Chemical Corporation Specifications.



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CURRENT TRENDS IN CONSTRUCTION

James E. Carlson

Manager of Economic Research

McGraw-Hill Information Systems Company

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.

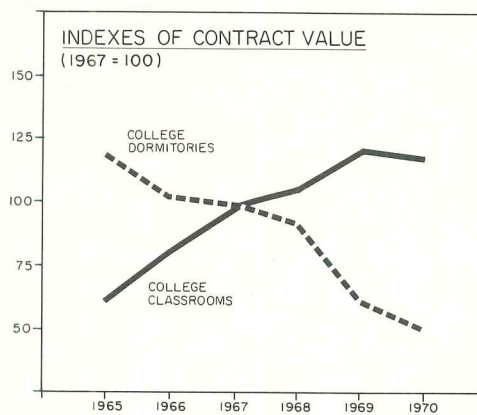
College enrollment growth rates have a significant impact on all college-related construction types, but it is in the area of dormitory building that the impact is most direct. Increased enrollment has been almost immediately reflected in new dormitory construction, because, for many schools, it is the 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 show 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

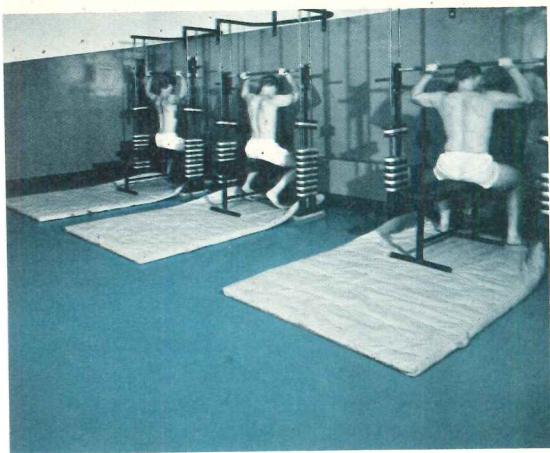
enough to return it to the peak rates of the mid-sixties. In addition to the lower enrollment growth rates, dormitory construction is faced with two other obstacles: Junior colleges (two year institutions) have been accounting for a progressively larger share of college enrollments recently. They amounted 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.

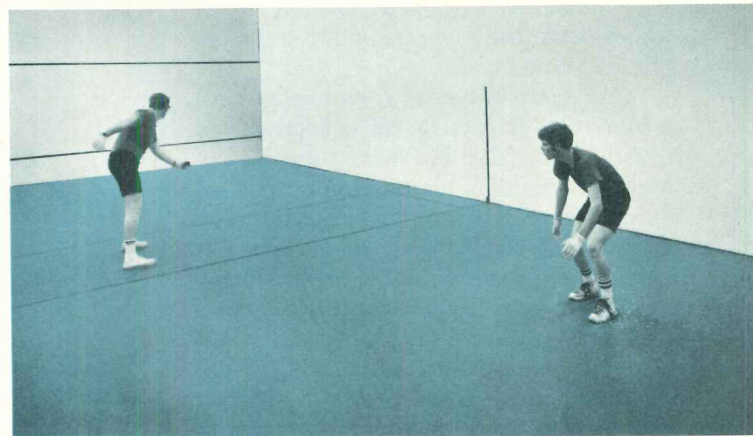
There still exists a significant backlog of demand for college classrooms, however. Despite the impressive growth in the construction of new college classrooms in the last half of the 1960's, construction for the decade as a whole just barely kept pace with the needs generated by new enrollment growth. 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.

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Division of Cook Industries, Inc. **ci** World Leaders in Athletic Floors

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INDEXES AND INDICATORS

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

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.

SEPTEMBER 1971

1941 average for each city = 100.00

Metropolitan area	Cost differential	Current Indexes				% change year ago res. & non-res.
		non-res.	residential	masonry	steel	
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)				1971 (Quarterly)			
									1st	2nd	3rd	4th	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.

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

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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.

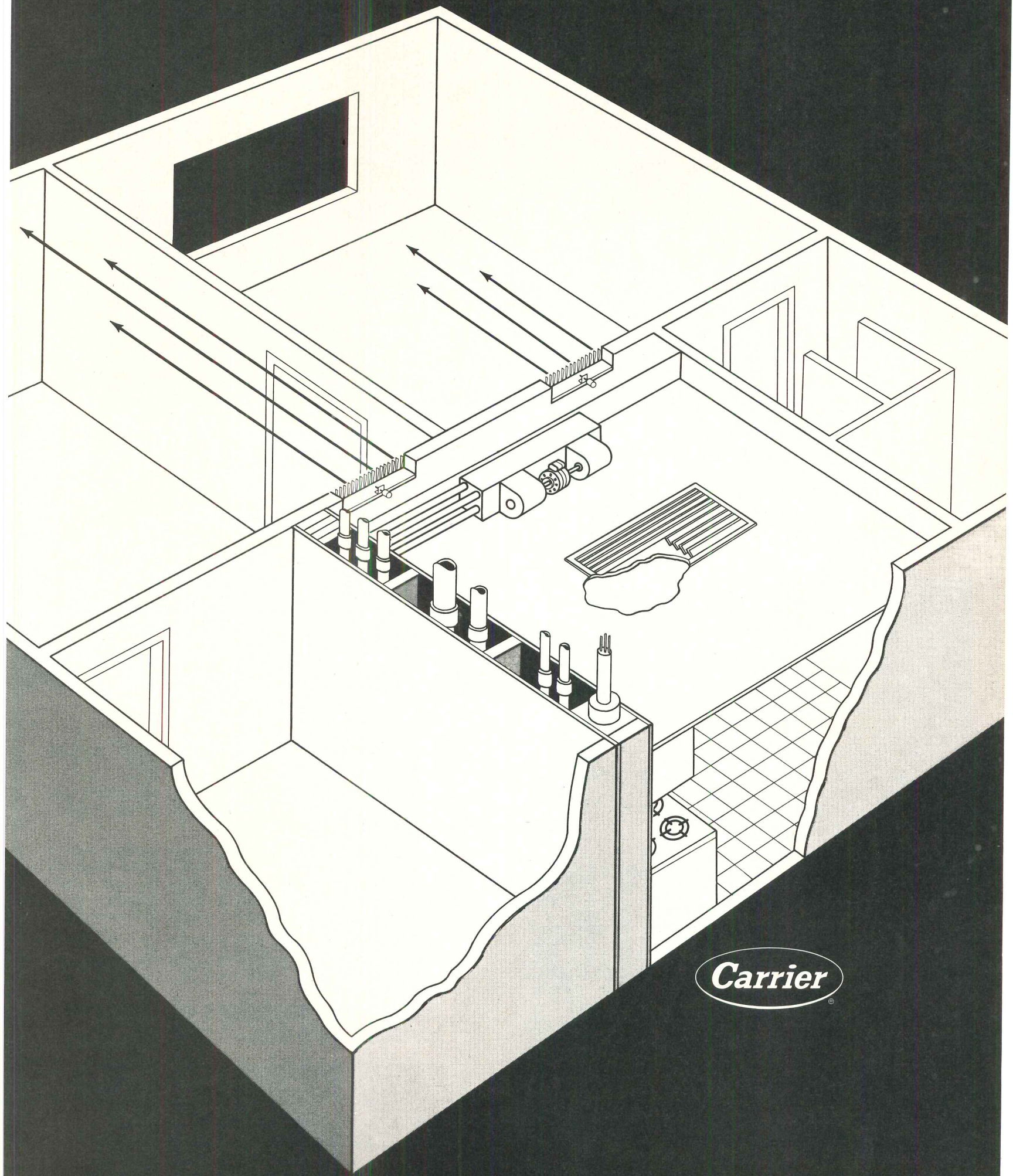
All this gives owners and developers a much higher profit on their investment. And at the same time, it gives tenants the most comfortable, most efficient and quietest air conditioning around.

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Preferred tread for residential and commercial.

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we do our best work in heavy traffic.

When you use Mercer Stair Treads on a job, you can go home and let the treads take the punishment. That's because we build ruggedness into them. All three types are made of solid vinyl for wearability and easy maintenance. Our nosings (square or round) last longer, too — they're not known to crack. And our heavy-gauge treads are easier to install because they're lightweight and pliable. What's more, our treads are available in a wide variety of sizes and colors. On your next job, specify Mercer.

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For more data, circle 46 on inquiry card

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Now you do!

The nation's largest builder of modular concrete and steel garages. Portable Parking Structures International.

Since 1968, PPSI has built more than 20 major garages coast to coast, providing an up-to-the-minute display case of today's solutions to parking problems.

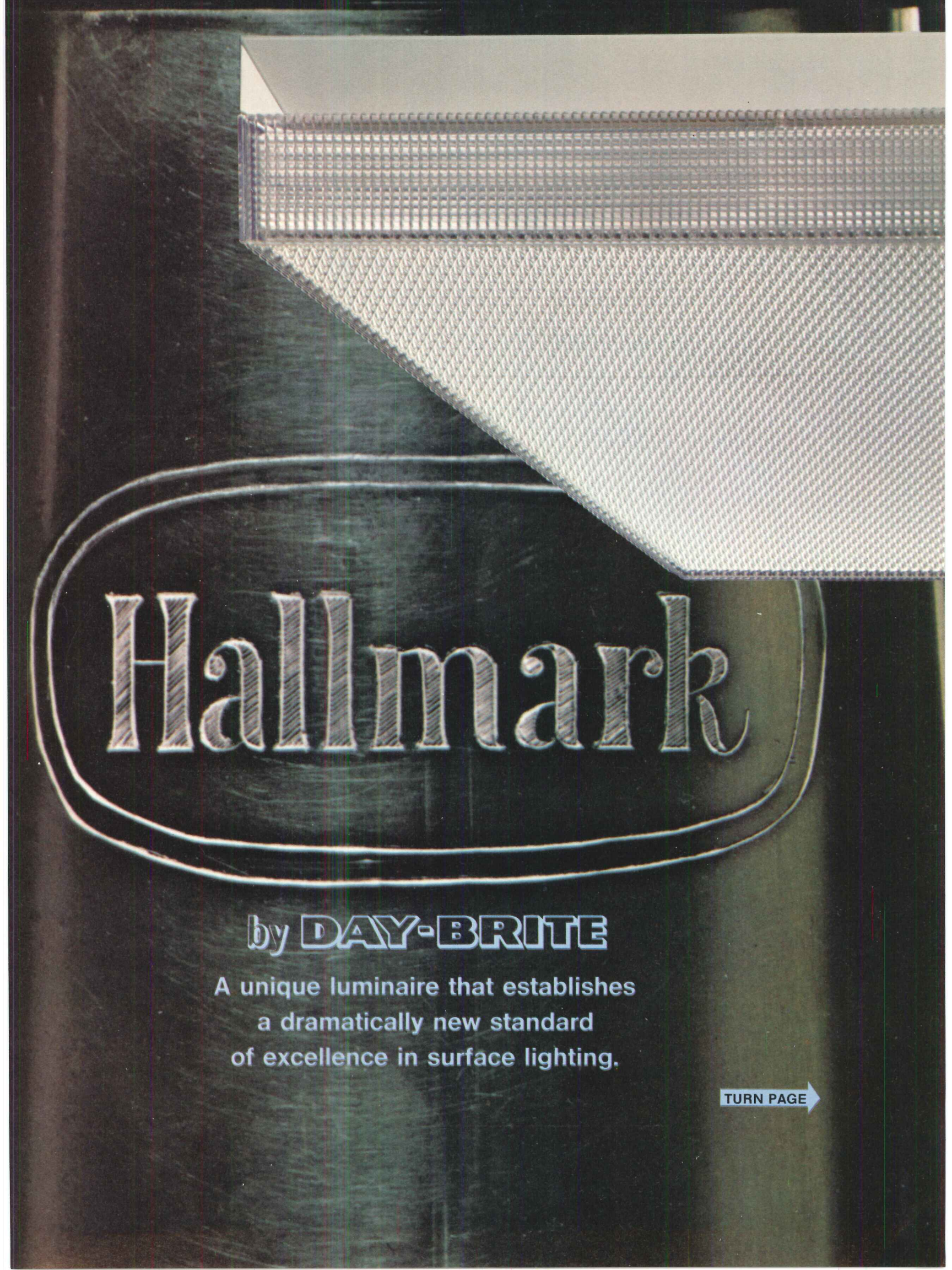
Working with or for architects who are in early project planning phases, PPSI can supply ideas on a wide variety of approaches to site utilization, interim land use, floor plans, ramp systems and facade treatments ... and has the staff capabilities to consult on site analysis, feasibility studies, estimating and scheduling.

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Hallmark

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.

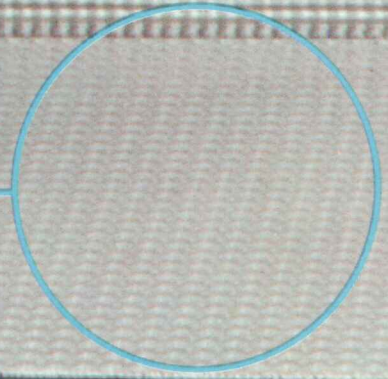
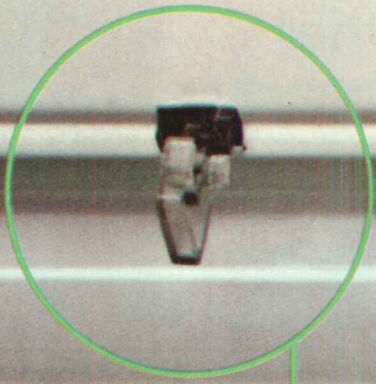
HALLMARK... architecturally correct, highly efficient... with as many applications as your mind can conjure. See it. Then draw your conclusions.



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

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.

For more data, circle 48 on inquiry card



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.

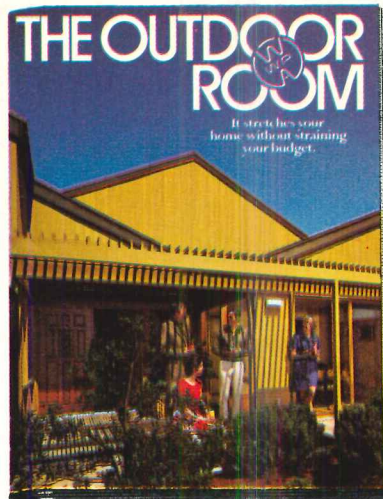
Find out how one architect stretches residential living space without straining the budget.

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.

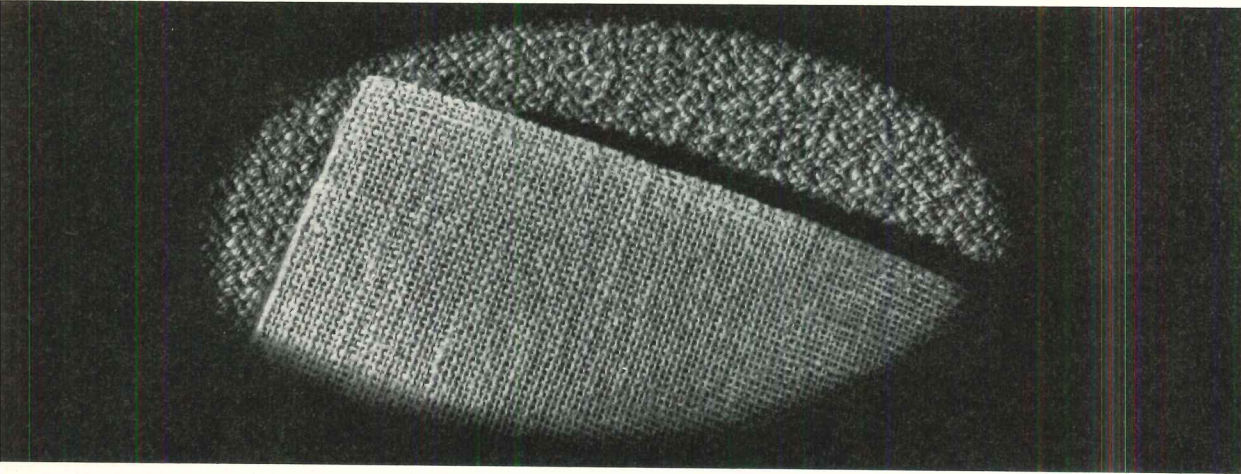




Key to successful glue-down carpet installations...

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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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 sys-

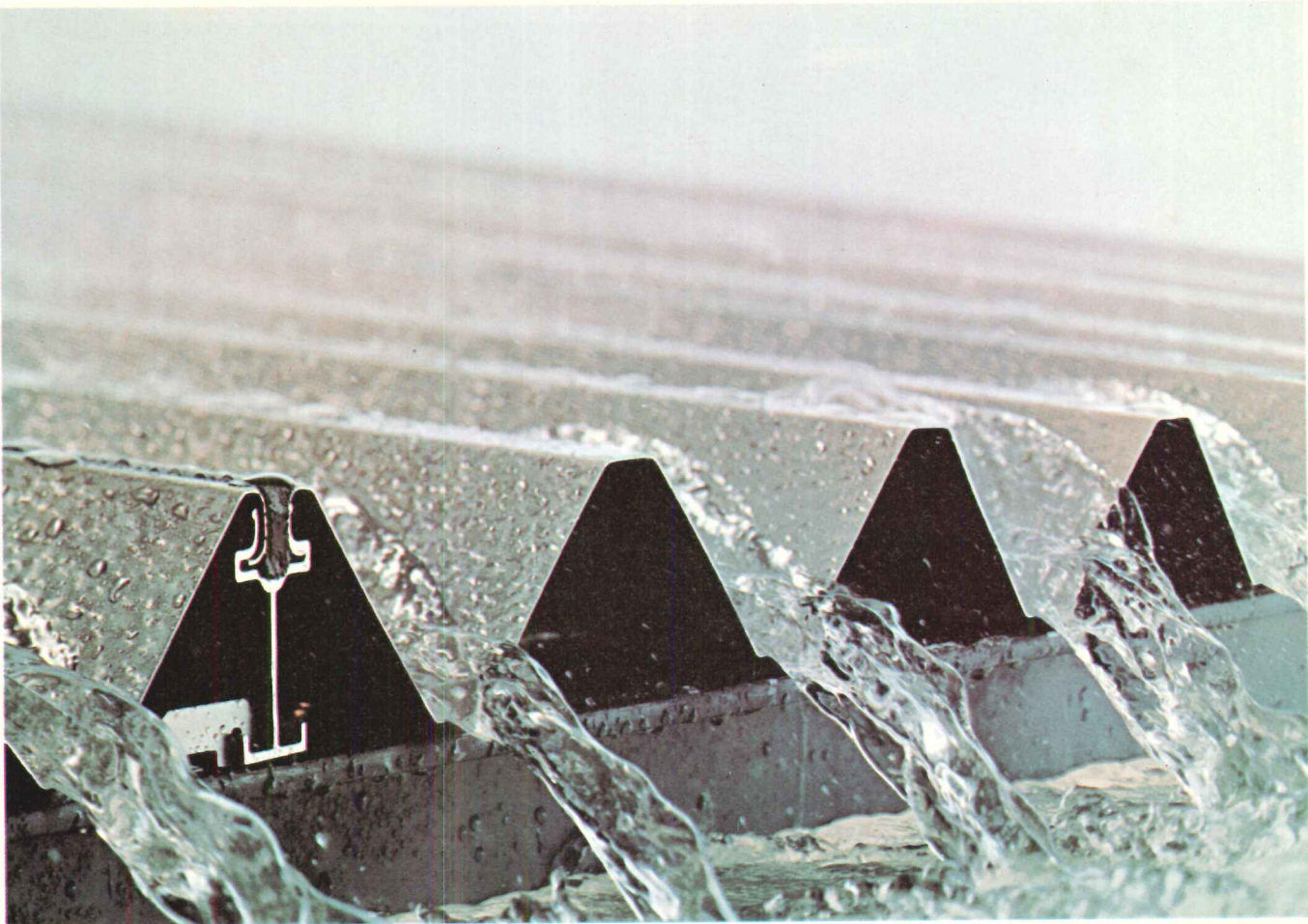
tem offers all the important benefits of low-slope roofing: a higher proportion of functional to dead space, longer spans, fewer purlins, less superstructure and metal surface area, with consequent savings in building costs and less dead space to heat.

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.

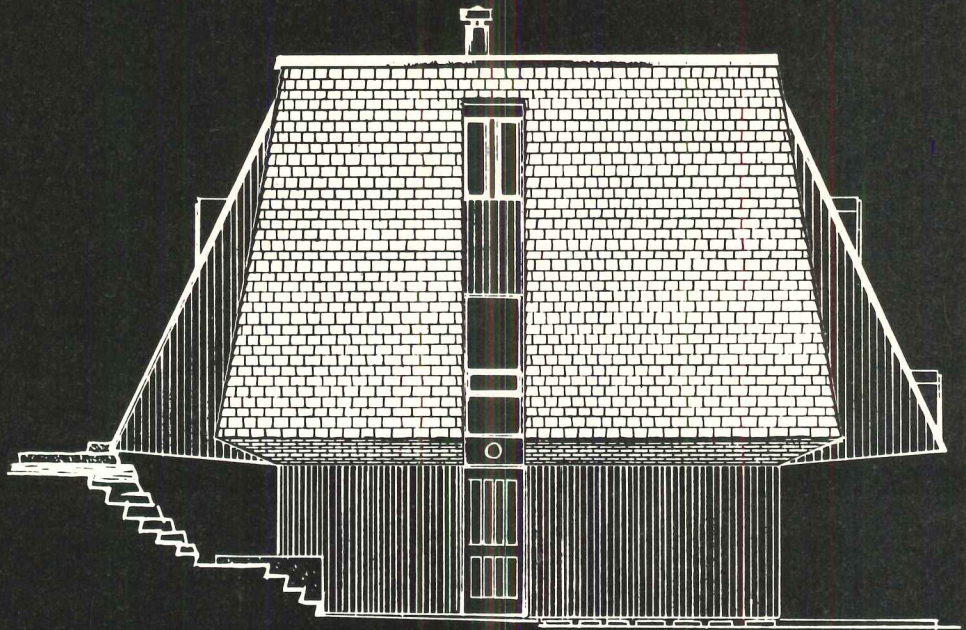
*Trademarks of Aluminum Company of America.



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.)

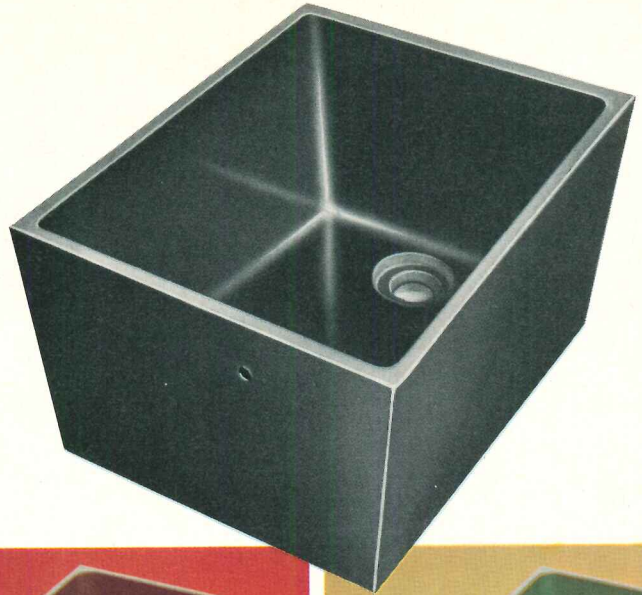


Red Cedar Shingle & Handsplit Shake Bureau

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

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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 alkalis, 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.

LABORATORY SINKS



BEIGE



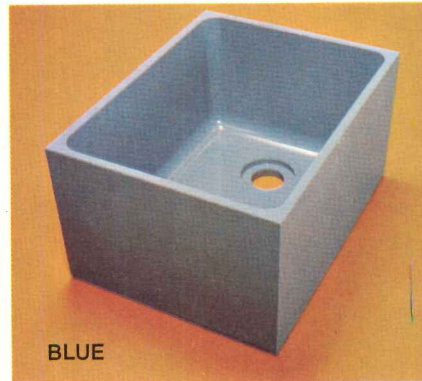
GREEN



OLIVE



GRAY



BLUE



BROWN

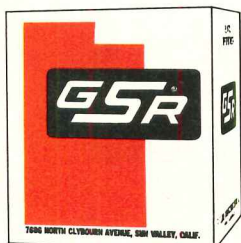
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The GSR FUSEAL bonding process is covered by U.S. Patents No. 3,094,452 and 3,506,519 and Canadian Patents No. 668,419 and 837,562; Fuseal Power Unit, U.S. Patent No. 3,465,126 and Canadian Patent No. 846,954; Fuseal Coil, U.S. Patent No. 3,378,672 and Canadian Patent No. 811,837.

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BOOM TOWN

If you're planning an office building, restaurant, hotel or motel near an airport, you're in the heart of boom town.

Sound pollution is not something you have to live with. You can turn it down. With Amerada Acousta-Pane®.

Acousta-Pane® laminated safety glass can reduce noise levels by almost 50%. And also protect against heat, glare and jet blasts without restricting light or visibility. Acousta-Pane®. It lowers the boom.

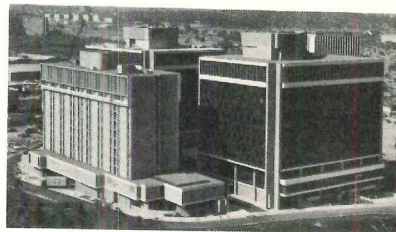


Architect: Everett I. Brown Co., Weir-Cook Airport, Indianapolis Ind.

For more information about Amerada airport noise control, write to:

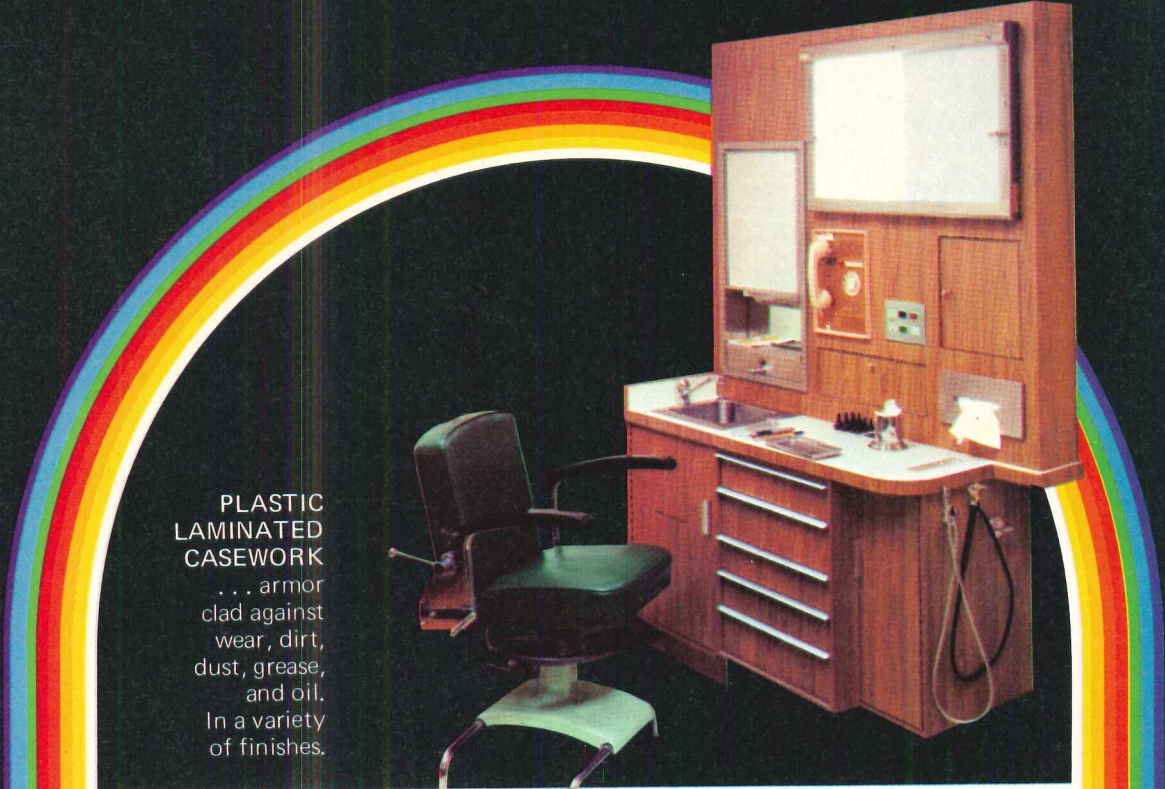
amerada glass company

A Division of Globe Glass Manufacturing Company
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Architect: Holle & Graff, Assoc.,
Washington National Airport,
Jefferson Plaza Complex
Arlington, Virginia

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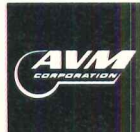


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If it is superb quality casework you want, that is the only kind we make. If it is stainless, enameled, or high pressure plastic laminated casework you want, we make all three. If you require custom work, we are specialists. One source. Reliable. Experienced.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



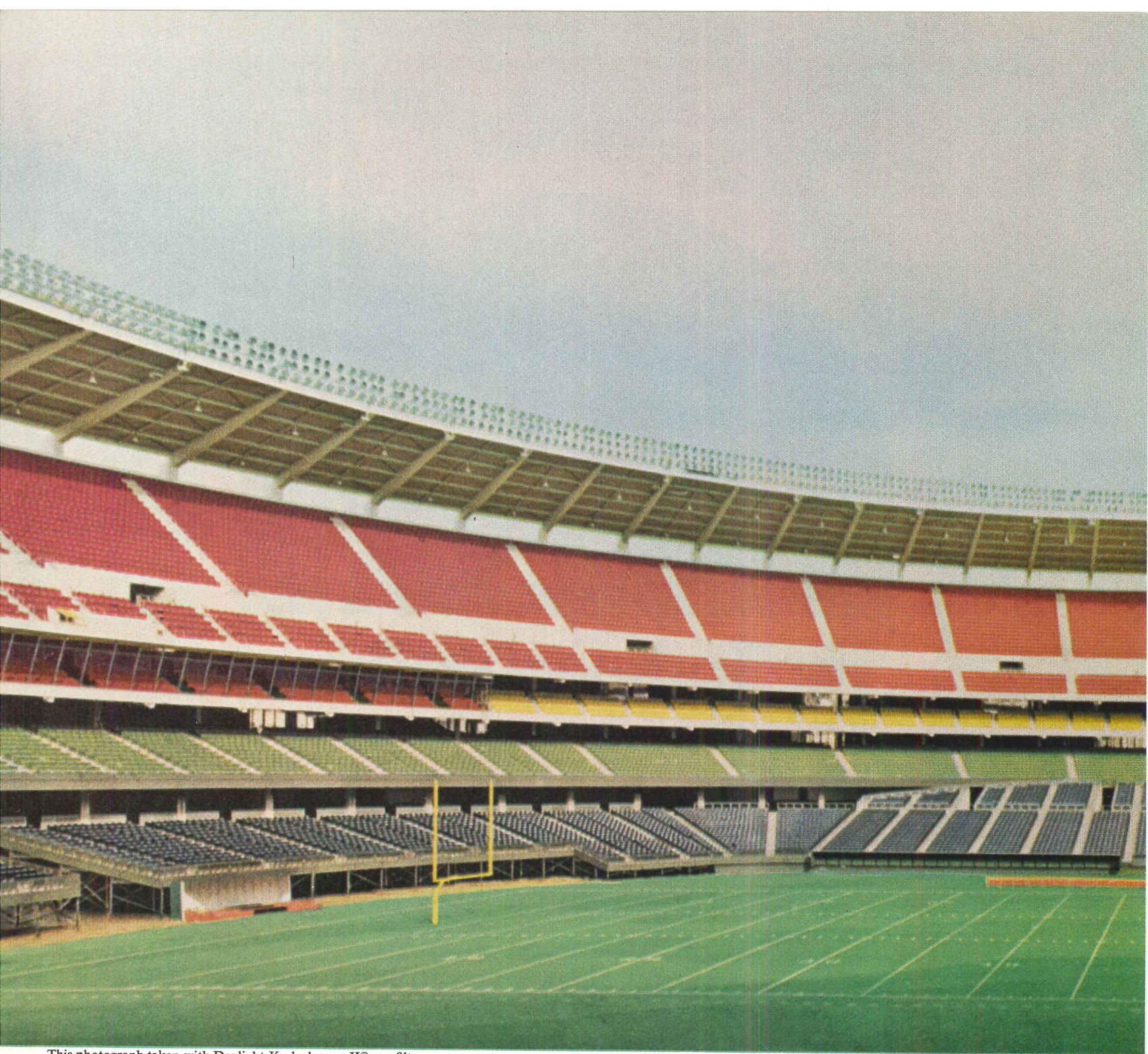
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STEEL AND
STAINLESS
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traditional, in
a range of
pleasant colors,
precision
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ultimate
in service.



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-

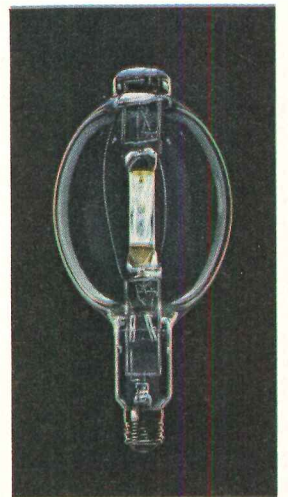
watt incandescent lamps. When it's not showing the score, it can run cartoons, messages and news.

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.

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

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

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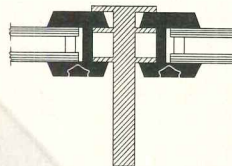
And, Neoprene won't propagate fire.

Du Pont makes Neoprene, not gaskets.

For more information on the architectural
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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 . . . com-

pletely 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.



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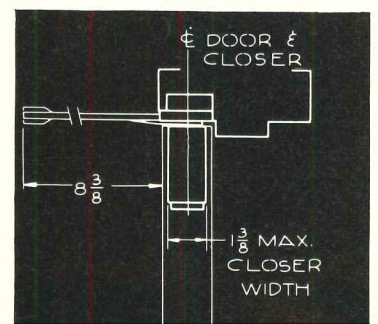
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LCN

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.



City-escape: Glaverbel Bronze

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

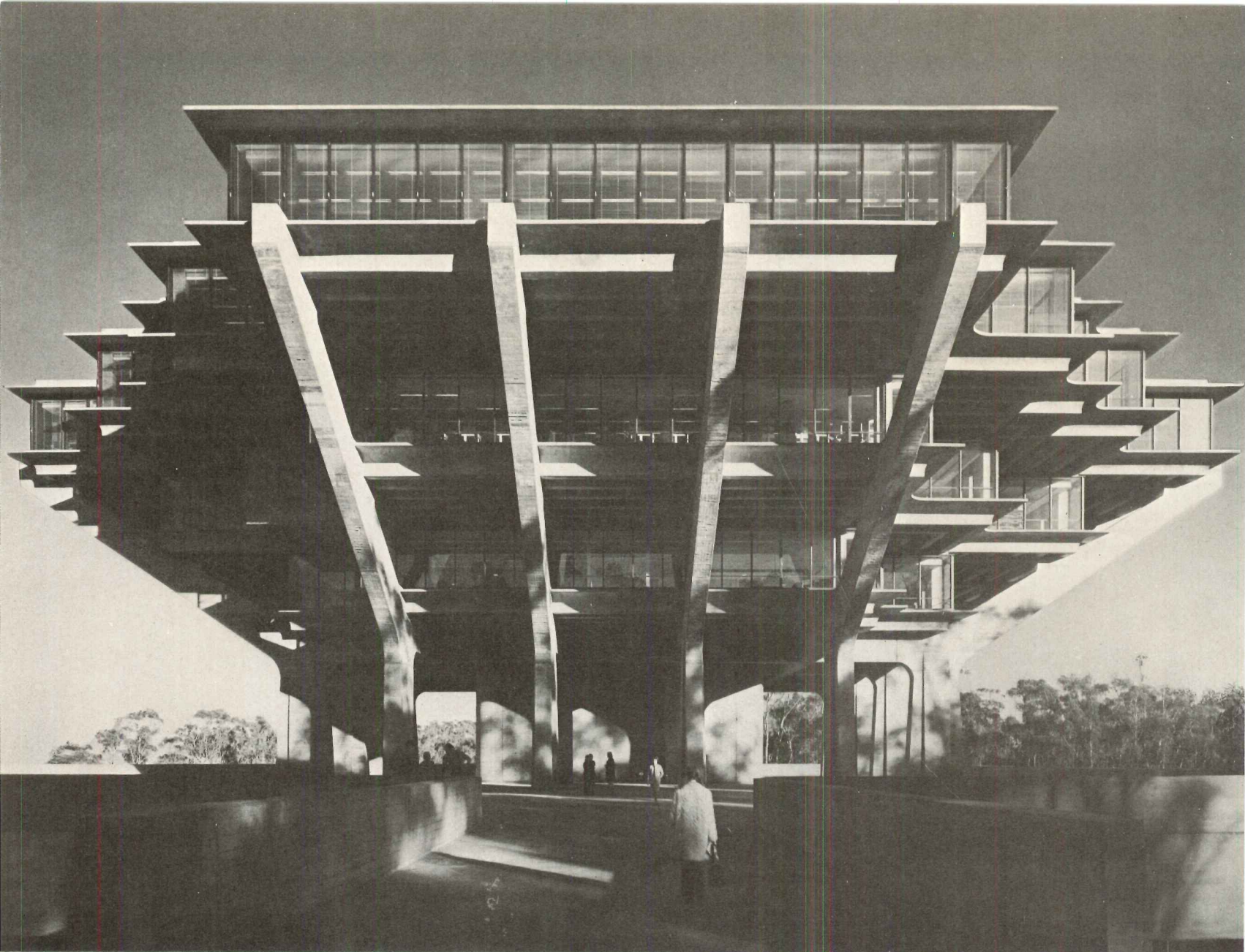
The difference in glass is Glaverbel —
whether you look through it, or at it!

Glaverbel



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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



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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.

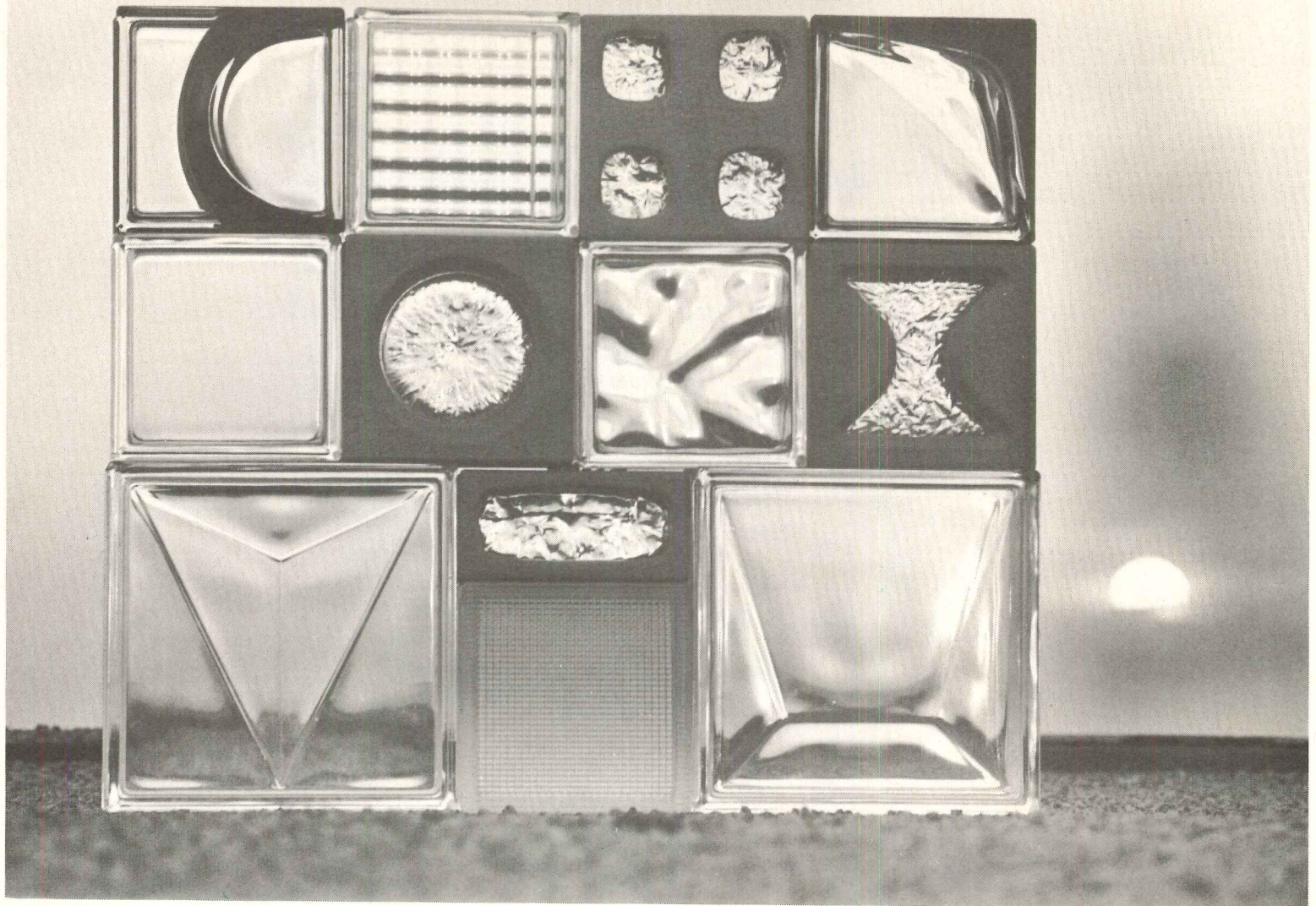


With all its subtleties. With all its explosiveness. It is the only medium that encourages the total exploration of color. Paint is freedom. Let paint be part of your creative decision. And when it is, let it be the finest. Pratt and Lambert. The paint.

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

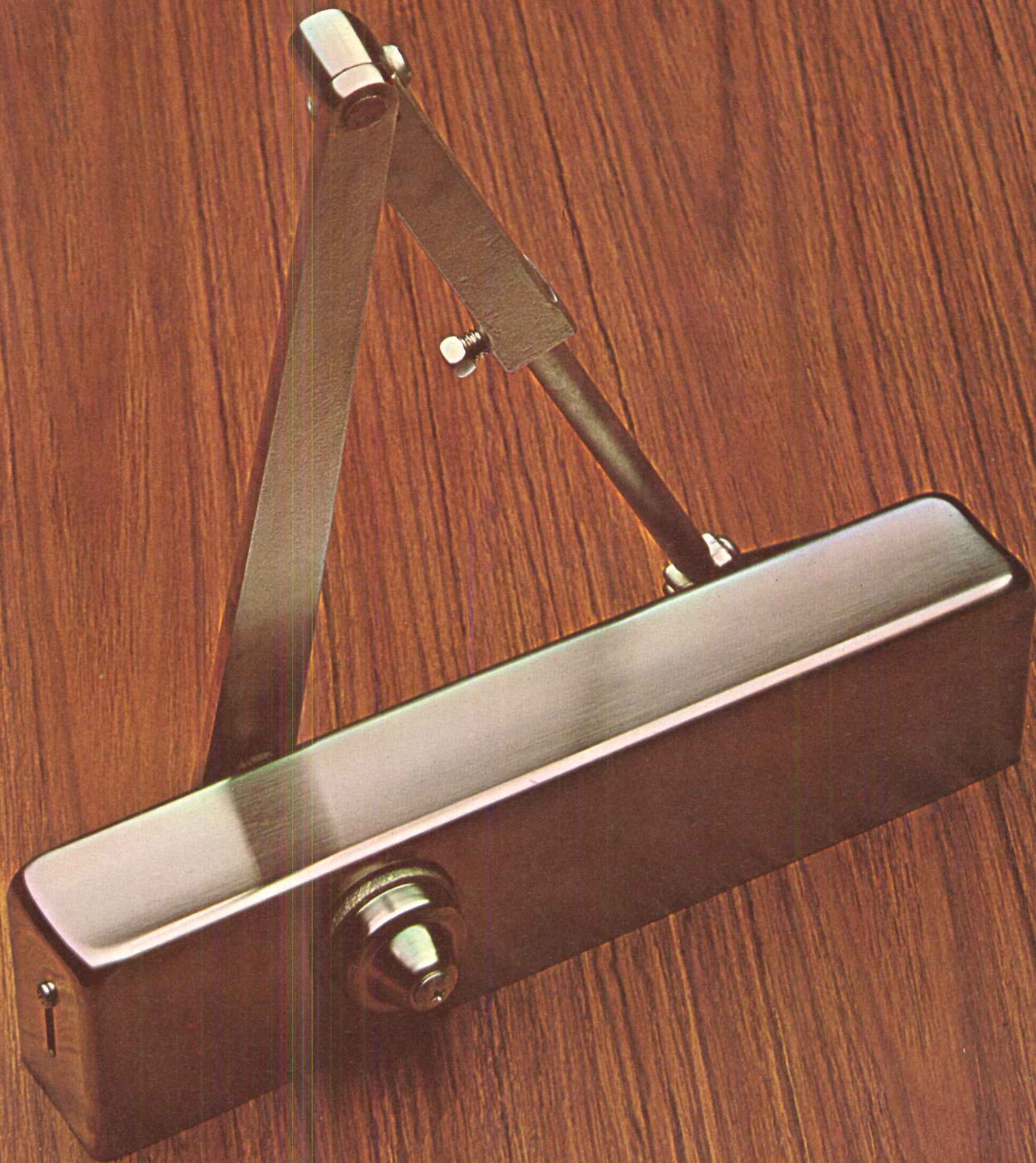


It's the new look of glass blocks. Patterns, textures and sculptured effects with the emphasis on accent. Skyscraping designs with long, narrow lines of light and texture. Low, solid designs with patterns and relief. Light, shape, harmony or contrast. It's the new look of glass blocks to spark your imagination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

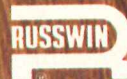
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The close

Surprisingly sleek, startlingly smooth, truly universal . . . #2800 Series door closer gives sustained high performance in any traffic. Unmistakably Ruswin.
Ruswin, Division of Emhart Corporation, Berlin, Connecticut 06037.
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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, Krockner and Dockery,
San Antonio, Texas*

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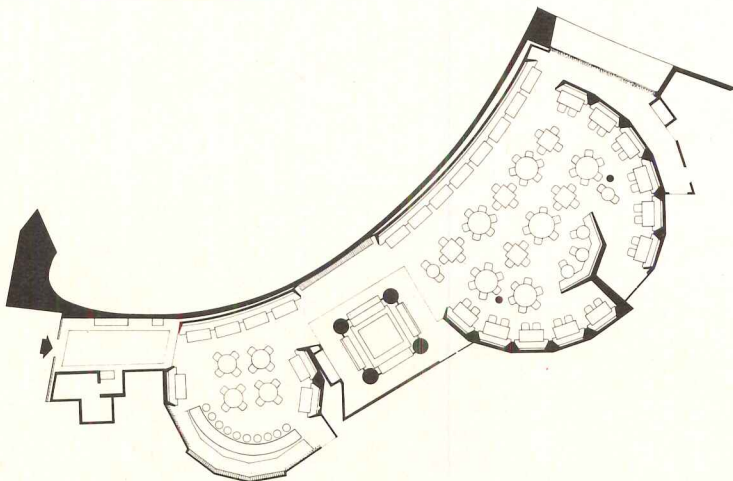
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(Top left) Apartment of Richard Banks, New York, N.Y. Architect and Photographer: Richard Banks. (Top right) Dental Office, Brooklyn, N.Y. Architects: Smith & Munter. Photographer: James Brett. (Bottom) Office of N.Y. State Urban Development Corp.,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

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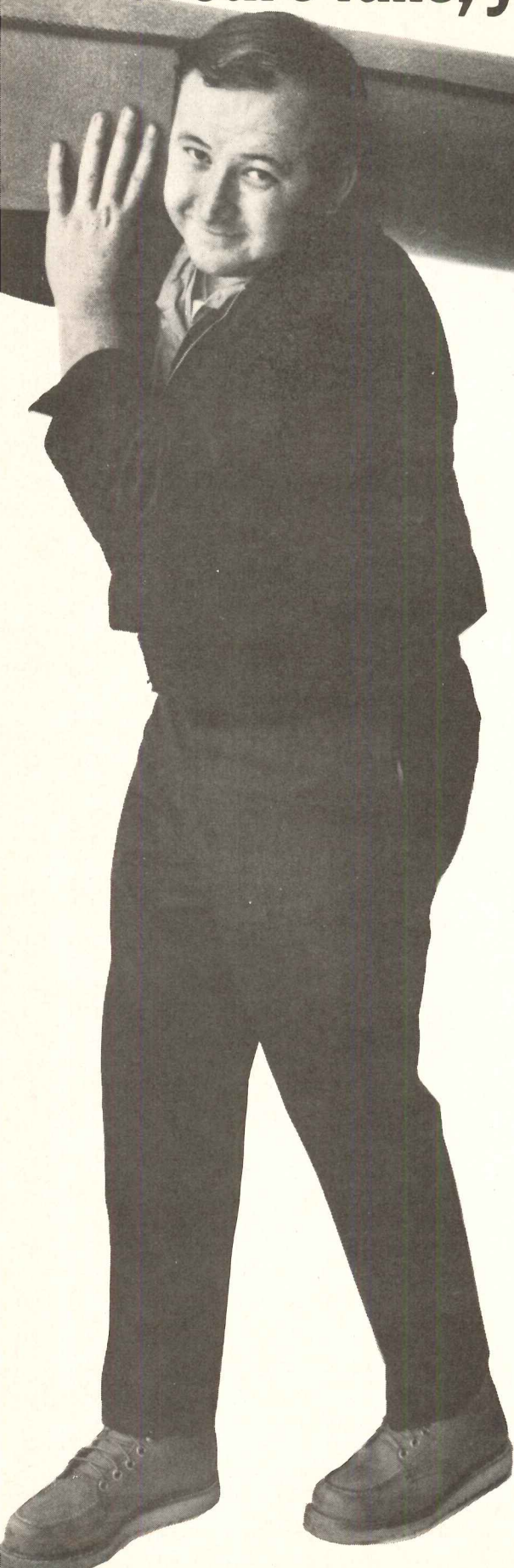
RECORD INTERIORS of 1972 will be published in the January 1972 issue of Architectural Record.

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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.

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How Vari-Tran reduced air conditioning equipment.

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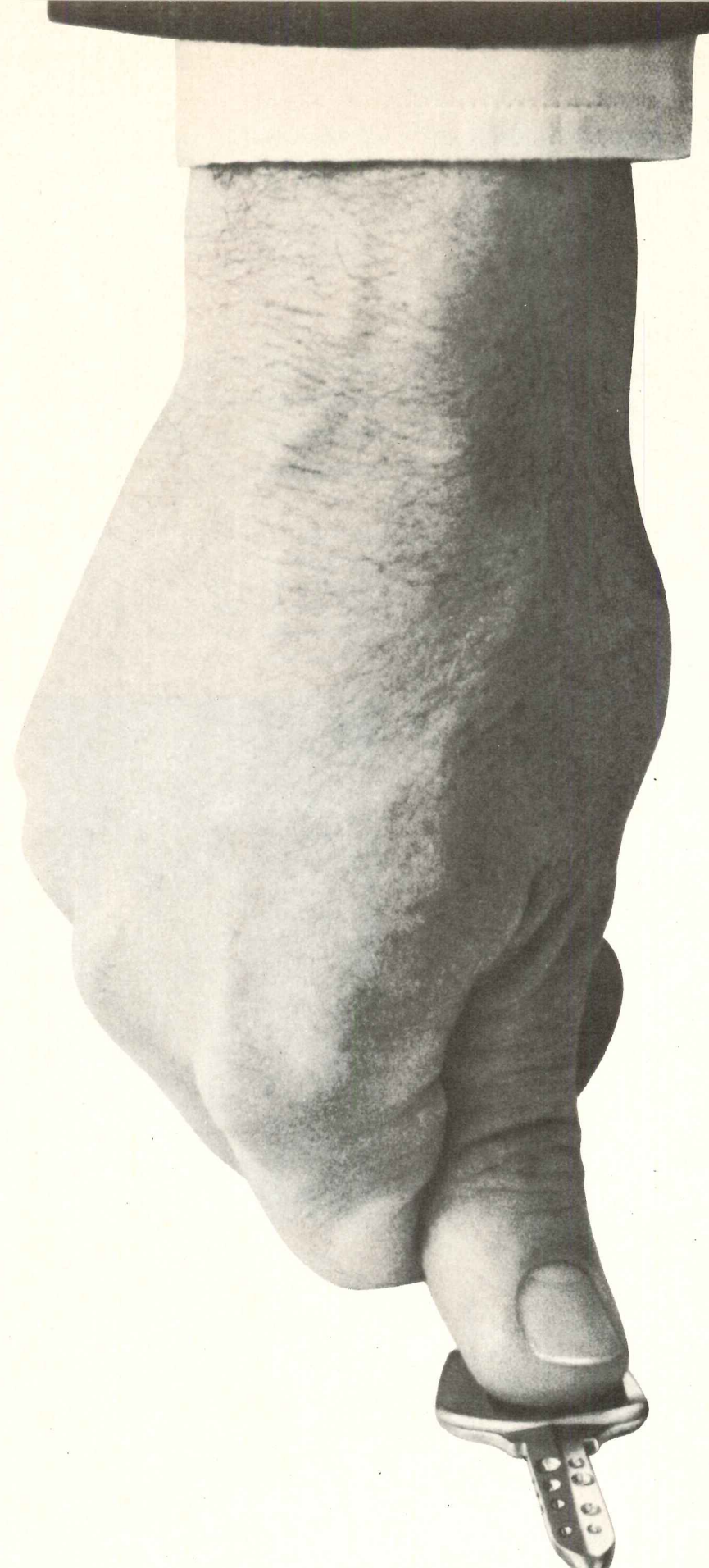
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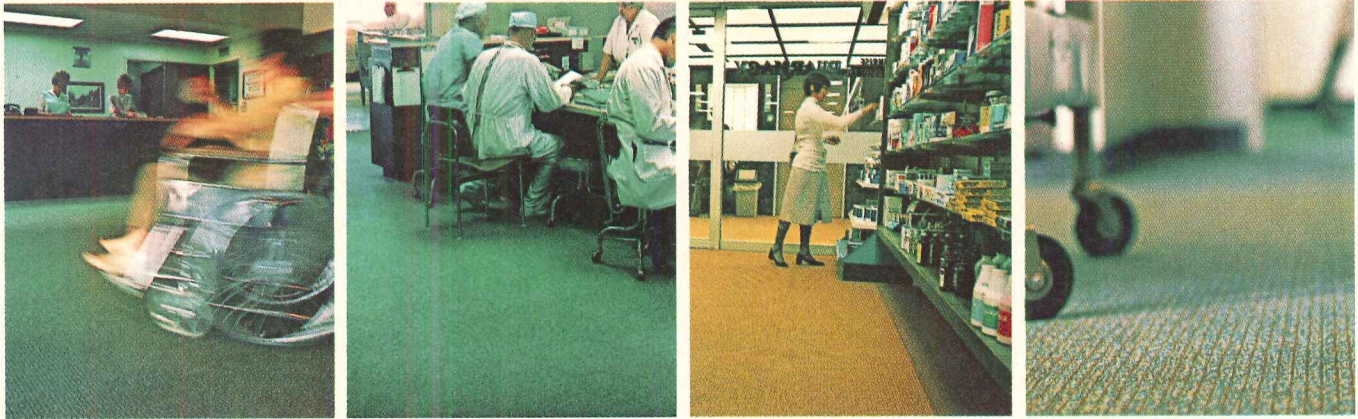
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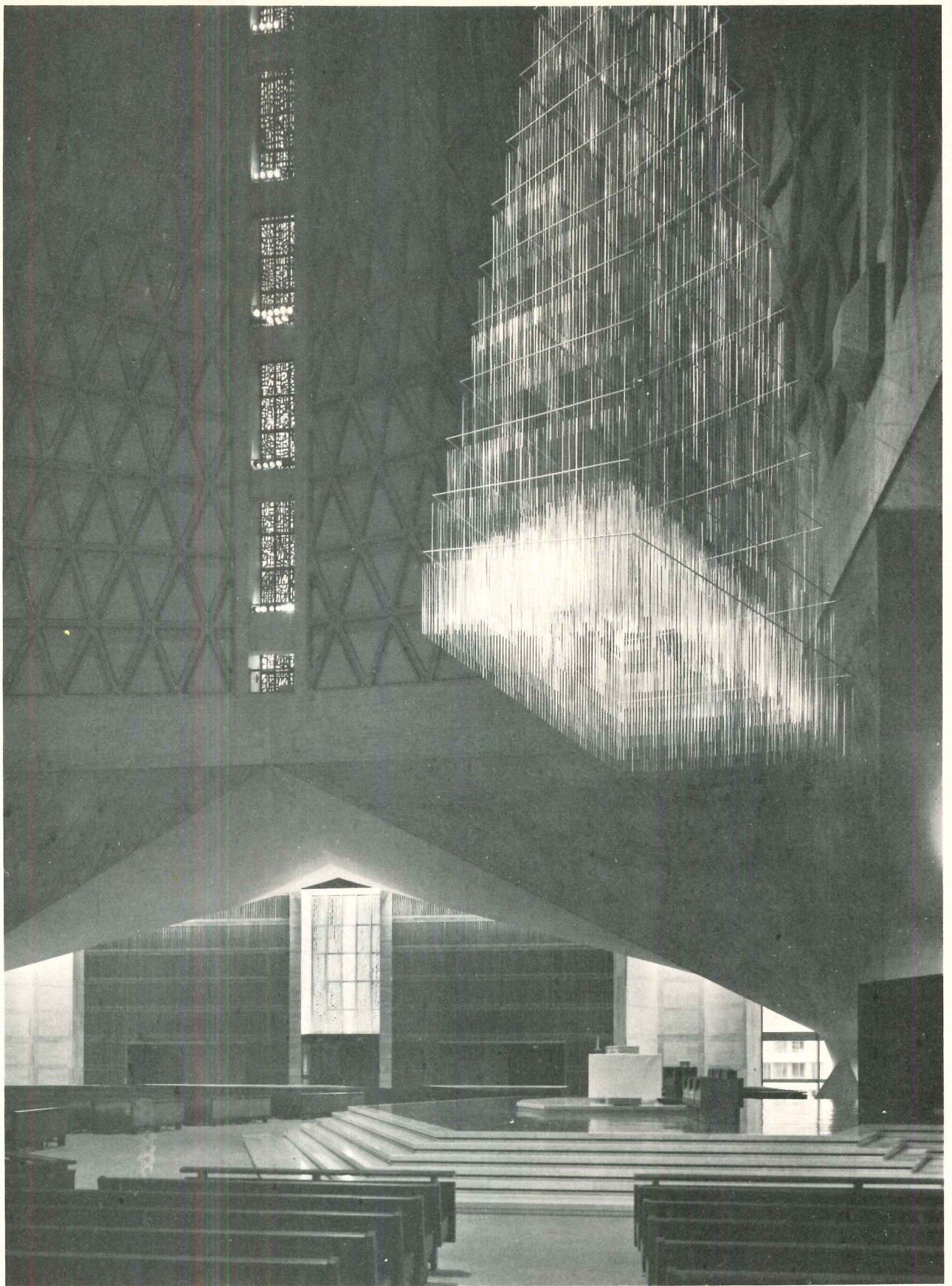
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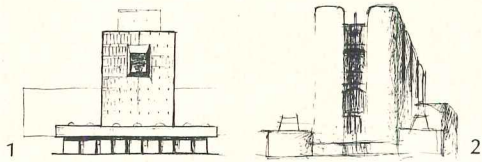




Saint Mary's Cathedral, San Francisco

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

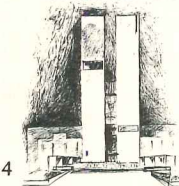


Francisco. Announcement made in the following April that the little-known firms of Angus McSweeney and Ryan and Lee had been appointed, caught the whole community unawares. There was first amazement, then consternation, then strong—and vocal—pressure (especially from wealthy and influential donors) for 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.

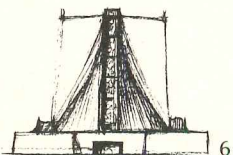
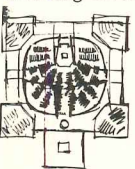
The man on whom all agreed was Pietro Belluschi of Boston, Italian by birth, engineer by training, architect by choice and long experience, Catholic by upbringing, and the designer of some of this country's most distinguished churches. At first Belluschi did not want the job; he knew what agony of spirit 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."



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



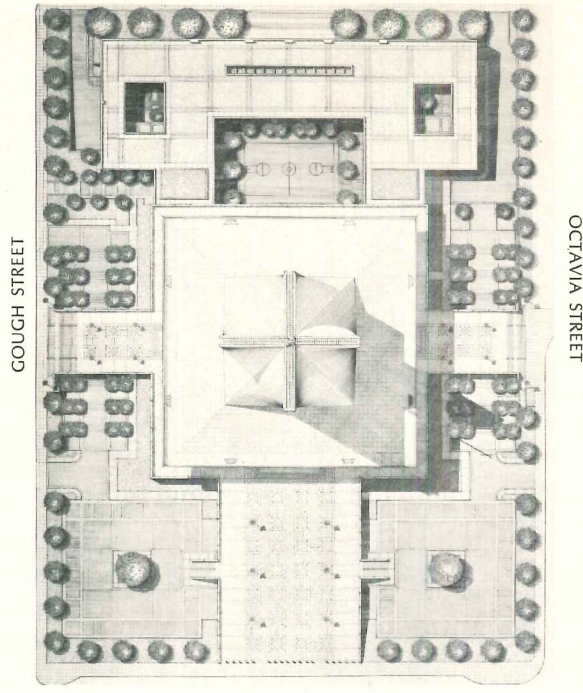
local architects and he had already formed the concept which later became the design of the new cathedral. Because of the engineering inherent in the concept, he had asked that Pier Luigi Nervi be retained as consultant



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ELLIS STREET

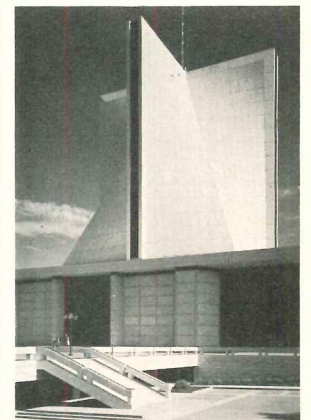
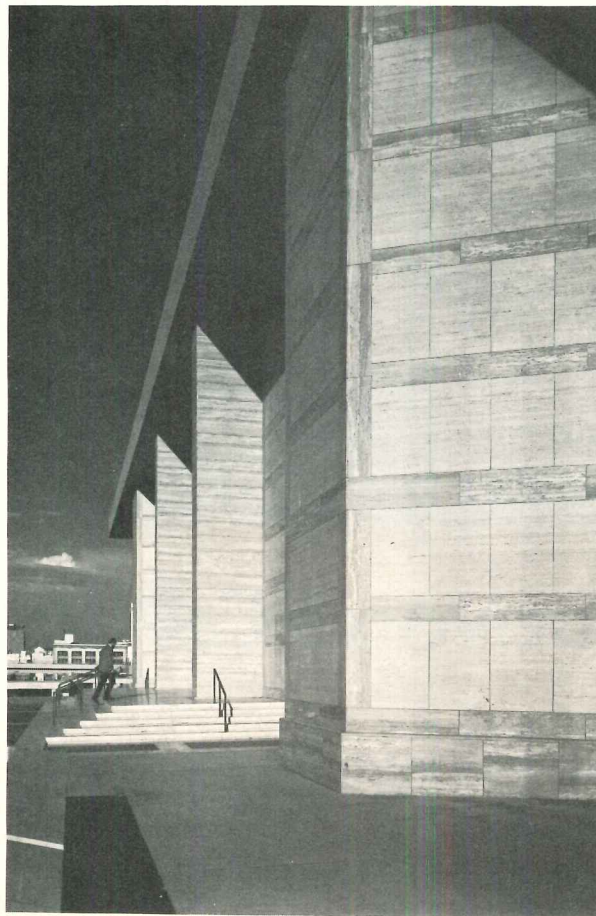


GOUGH STREET

OCTAVIA STREET

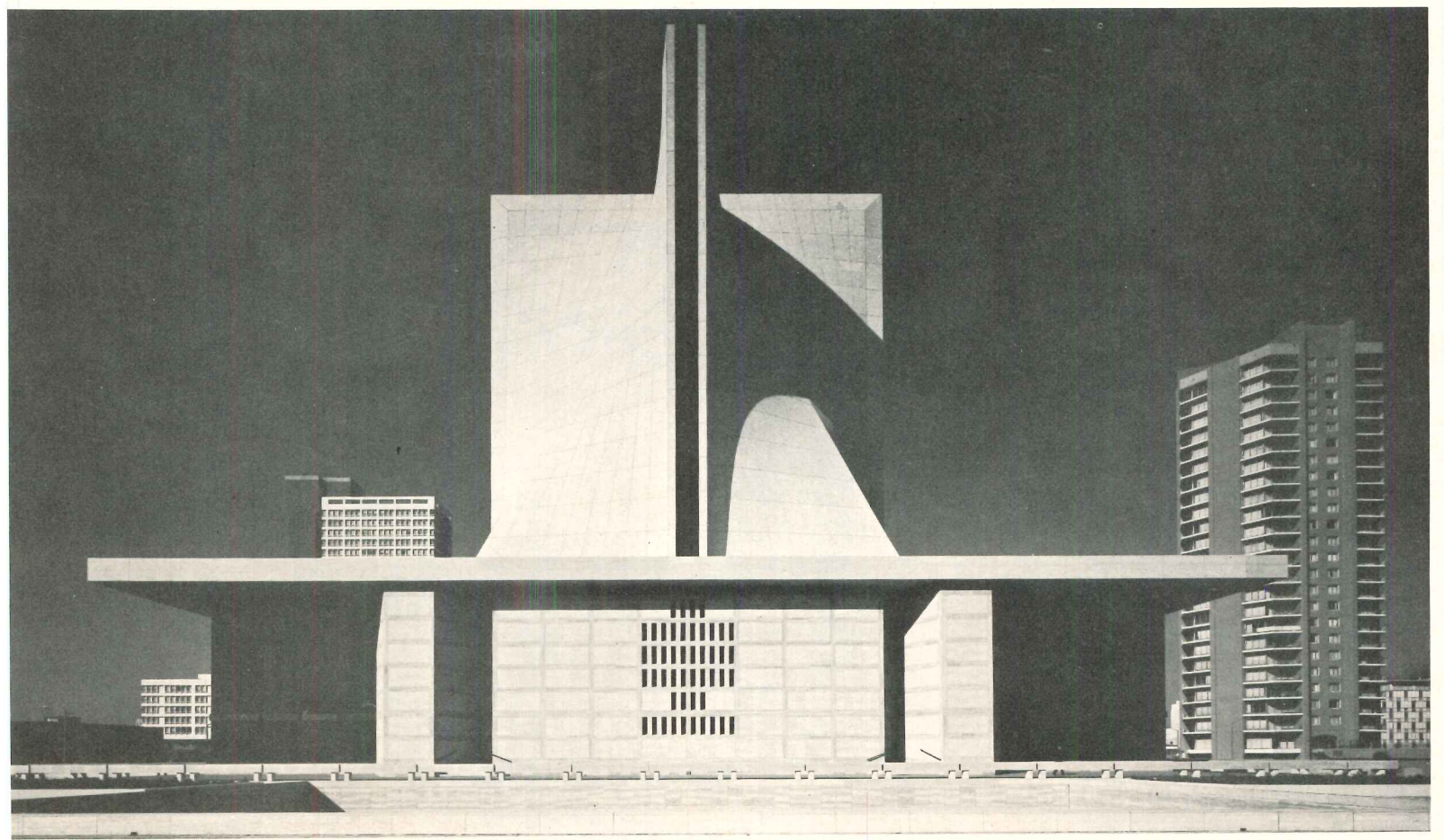
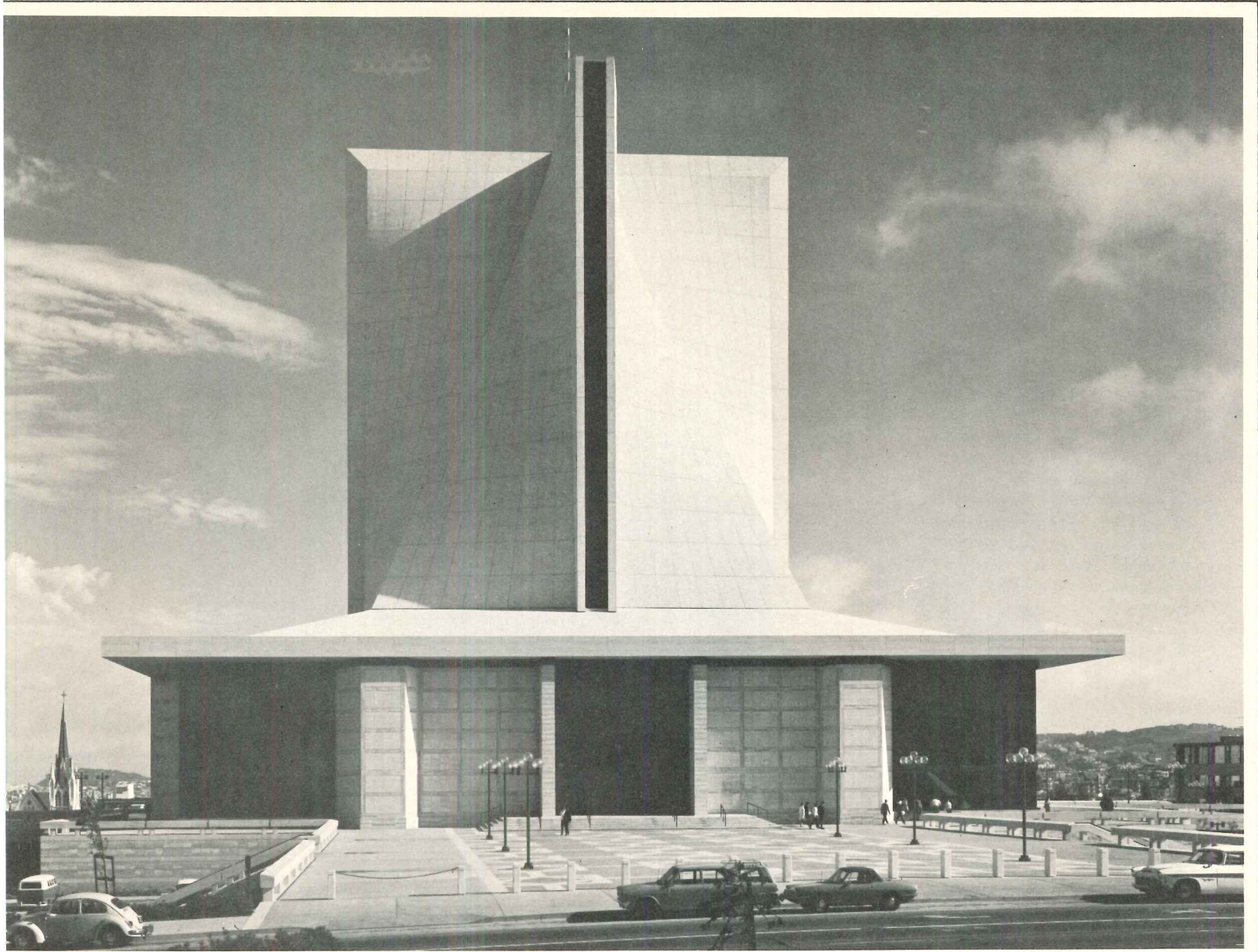
GEARY STREET

"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 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



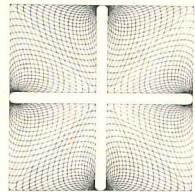
from the plaza lead to the parking area and to the entrance to the 1,200-seat cathedral hall and other meeting rooms, sacristy and kitchen. The rectory, a convent and a high school are on the south side of the site.

"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."

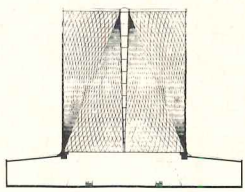


on engineering design, and Nervi's appointment was announced simultaneously with Belluschi's.

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



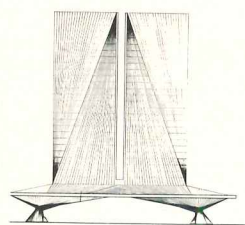
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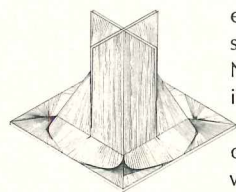
the program and the wishes of Archbishop Joseph T. McGucken and Monsignor Thomas J. Bowe, pastor of St. Mary's, whose first inclination had been toward a design developed from the historic Mission Dolores in San Francisco. But Belluschi's search for form did not stop with the conventional even though 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.



9

"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

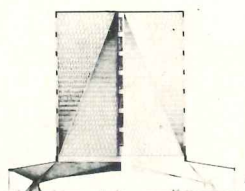


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all aspects of the design, but these have the essence of the idea."



11



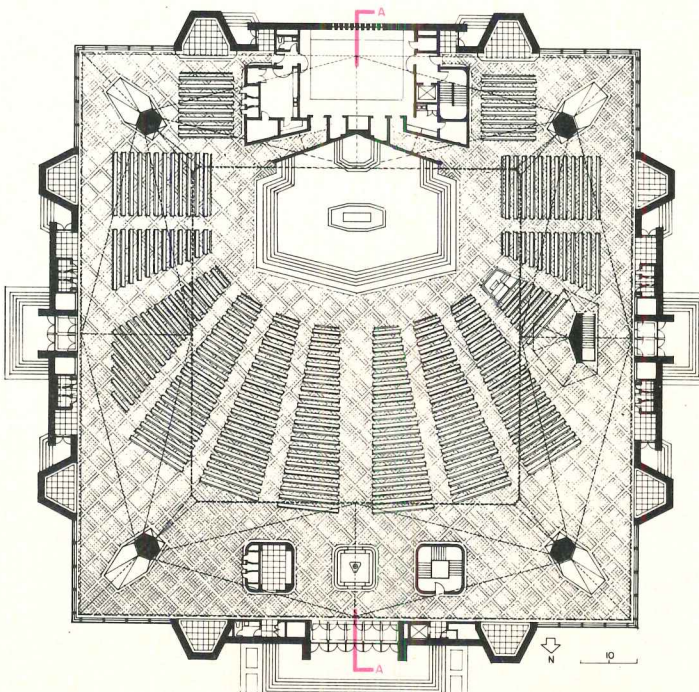
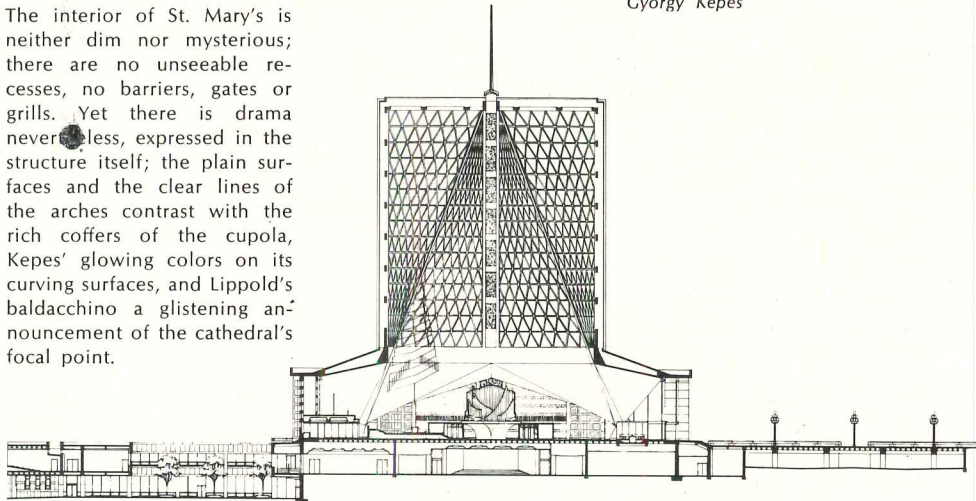
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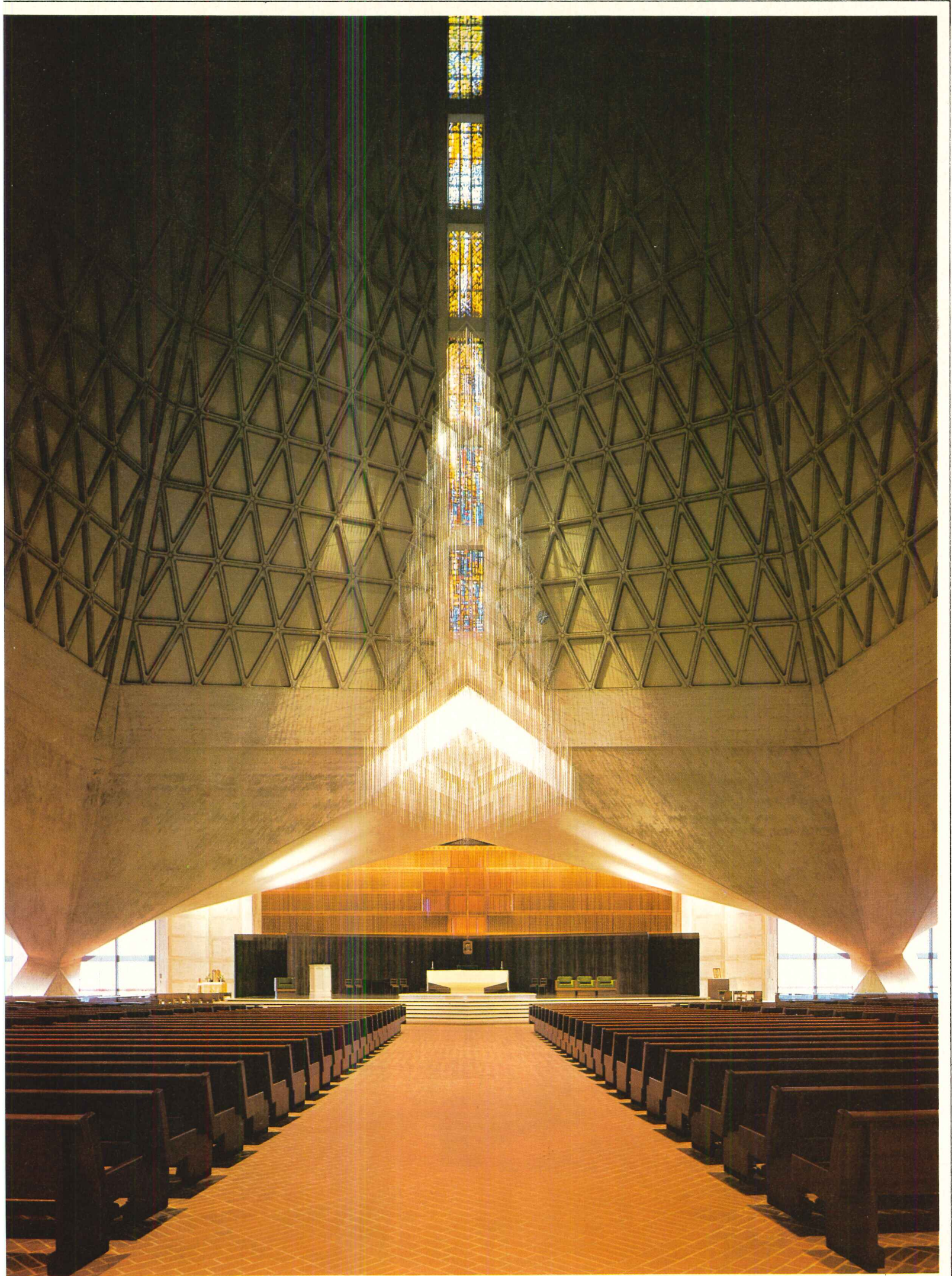
Coincident with this breakthrough in design was the announcement by the Second Vatican Council of a new constitution of sacred liturgy. The new design concept had, fortuitously, pre-



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.



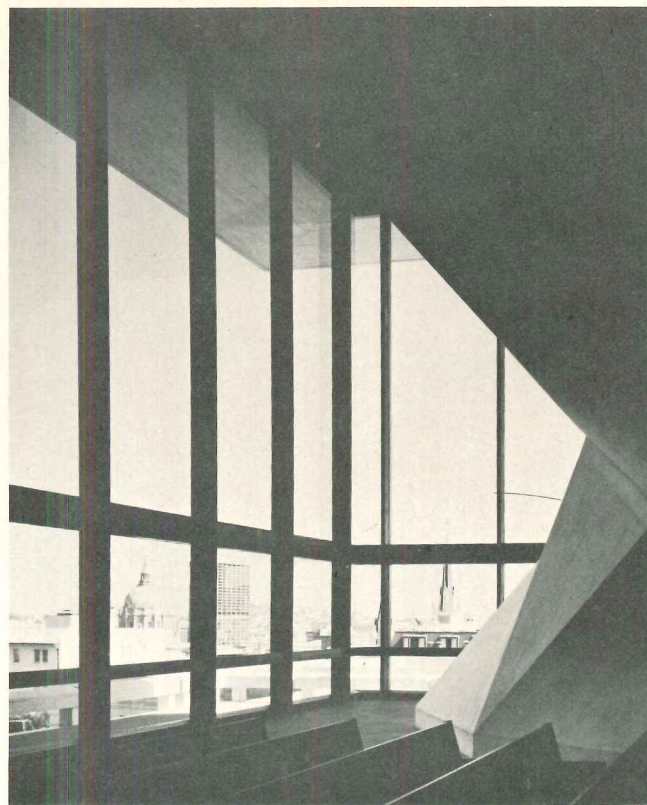
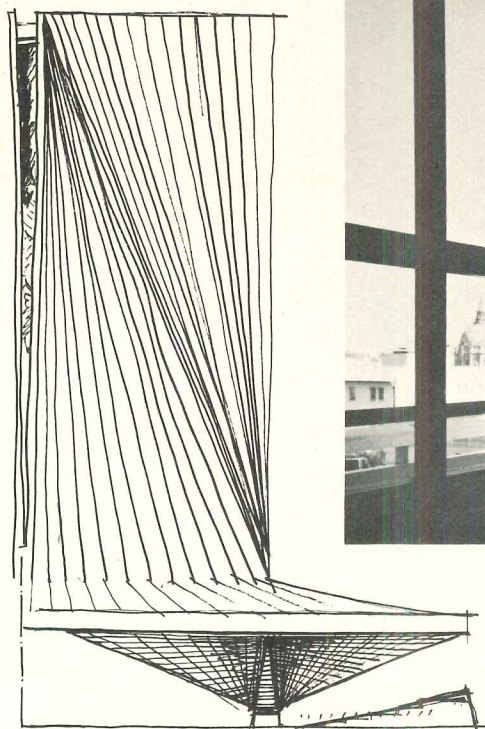


figured the architectural implications of the Council's directive that priest and people should be united with the altar as their focus. Under the great cupola of Belluschi's scheme, in a single unobstructed space, were sanctuary, nave, baptistery and narthex.

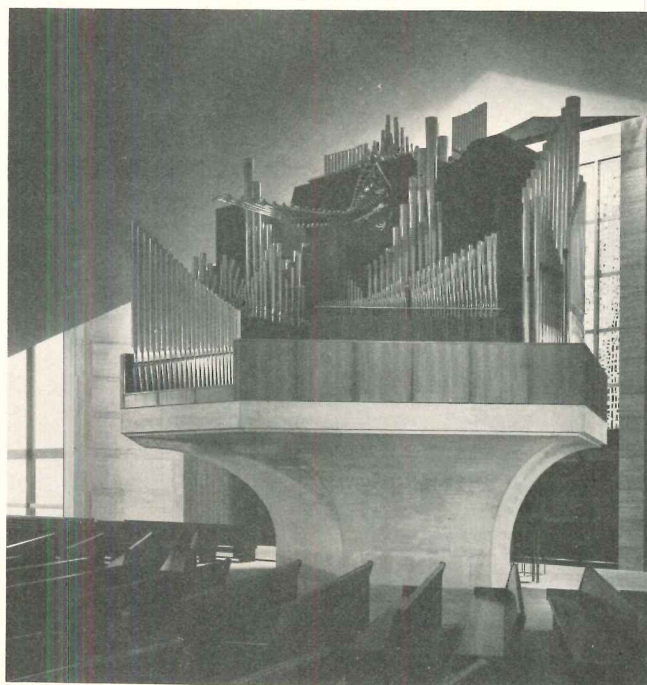
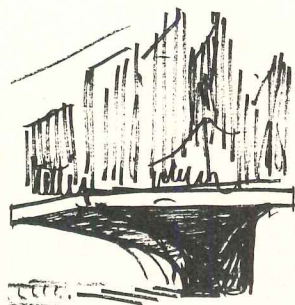
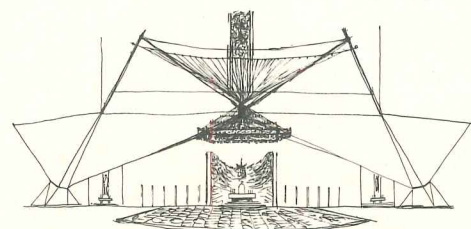
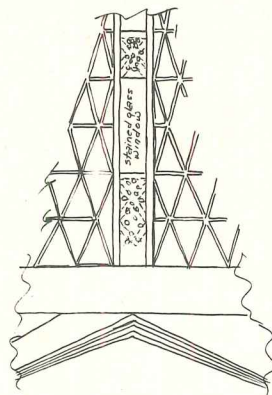
Although Nervi had had no previous direct experience with hyperbolic paraboloids, he set to work immediately and enthusiastically to find the structural solution (7, 8, preliminary; 11, 12 final) for the concept. In his usual way, he had models made and tested at the Istituto Sperimentale Modelli Structure 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.)

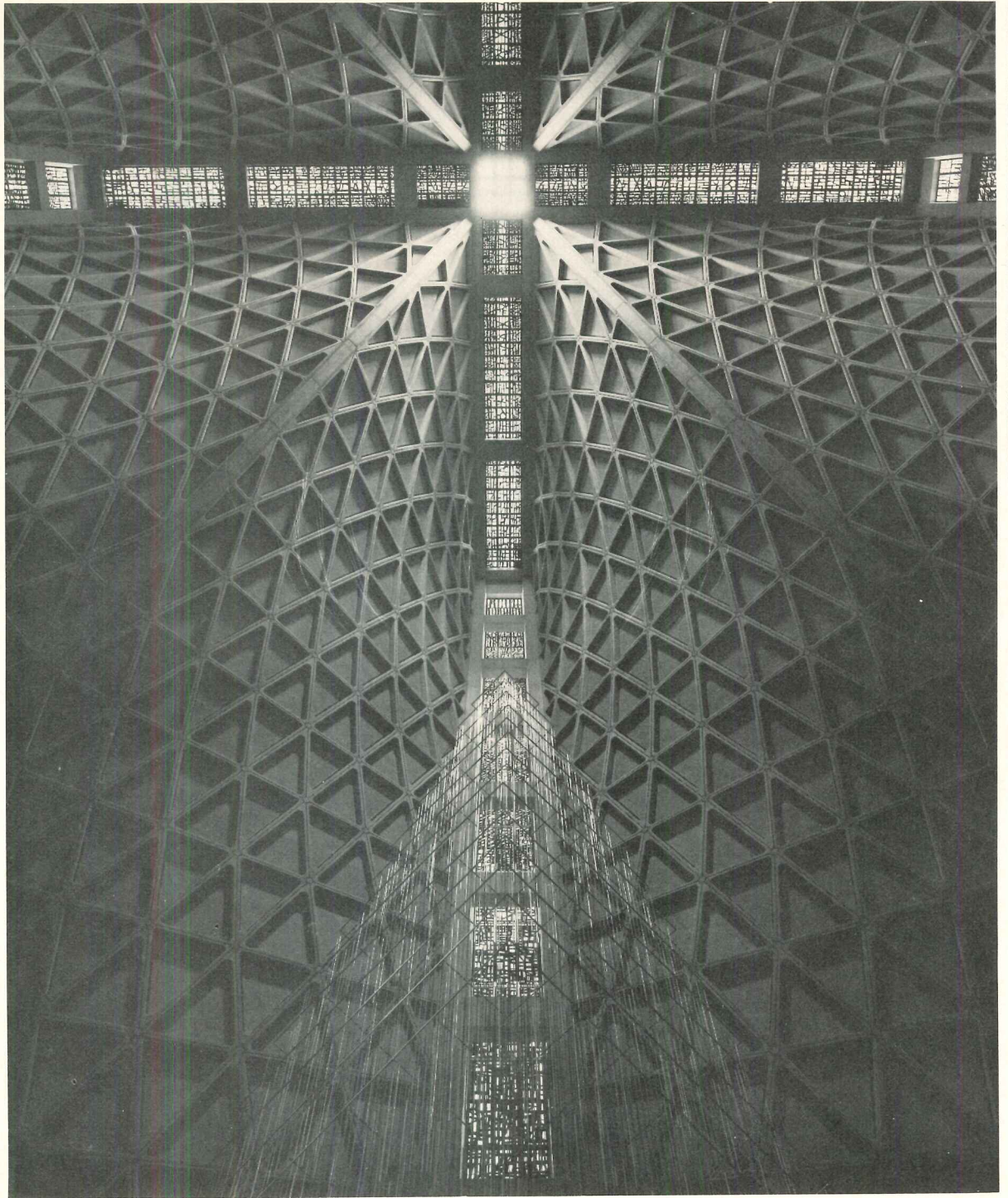
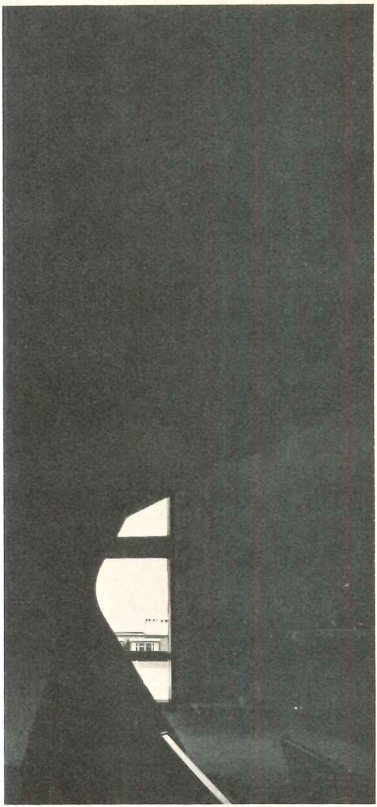
The final design—St. Mary's today—is both dramatic and serene. It is "no mere neutral design," nor does it depend on "engineering tricks" or on "archaic architectural terminology," all of which the Archbishop proscribed. The shells of the cupola, unique on the skyline, announce a building whose purpose 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.



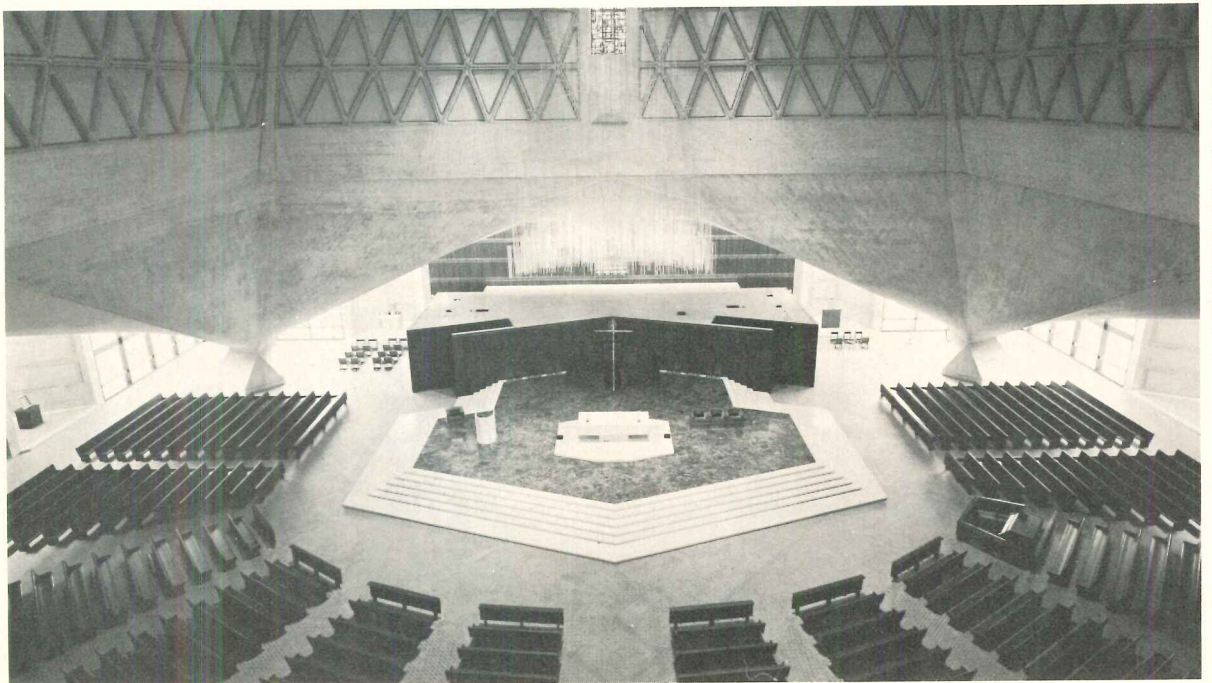
Cost brought the final design of the cupola to one-third less height than in the original design (above left and Figure 9). But the concept remained intact: the interior surface of the cupola enriched by the triangular panels so familiar in Nervi's work, and the means here to feasibility of construction; 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.

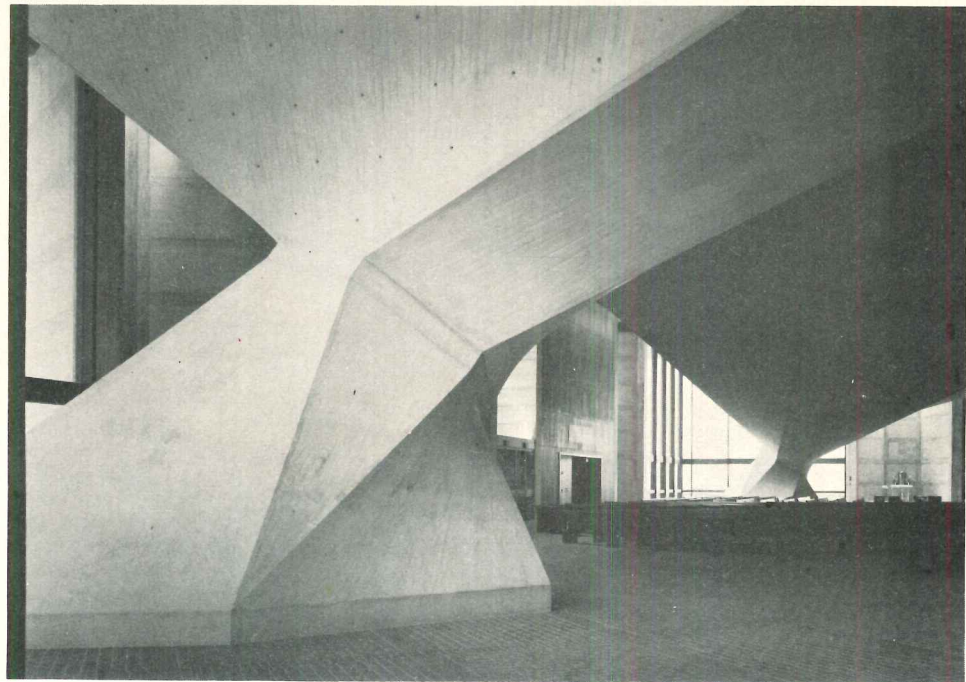
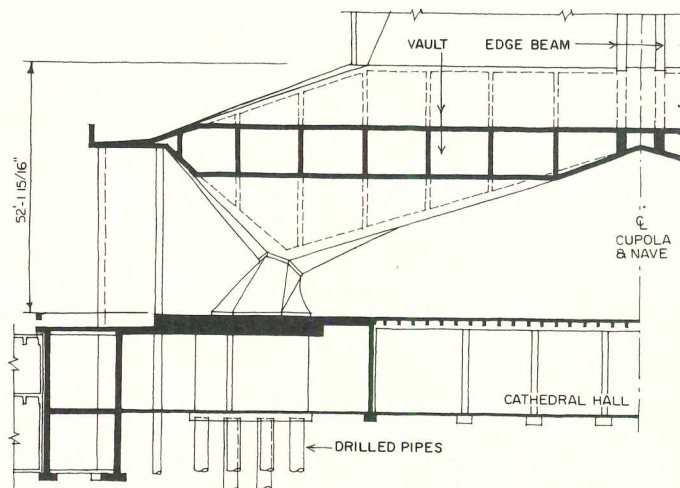
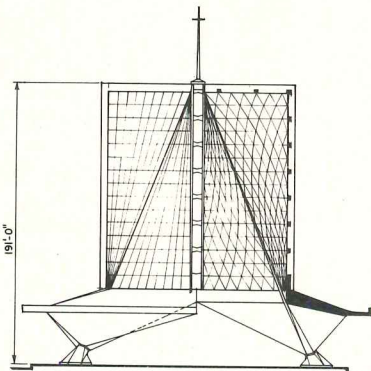
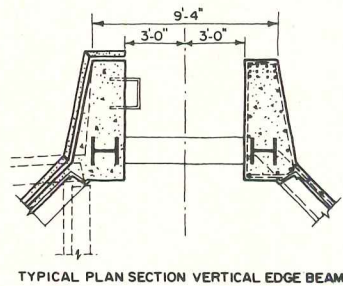
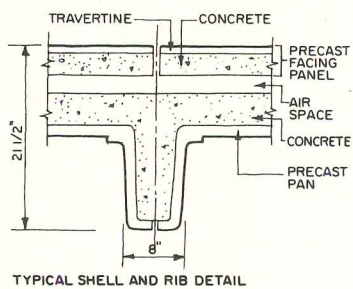
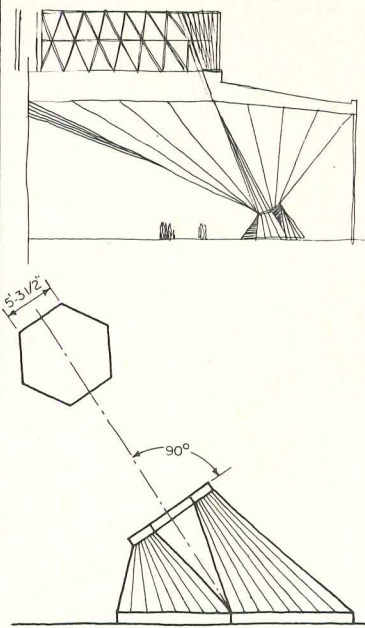




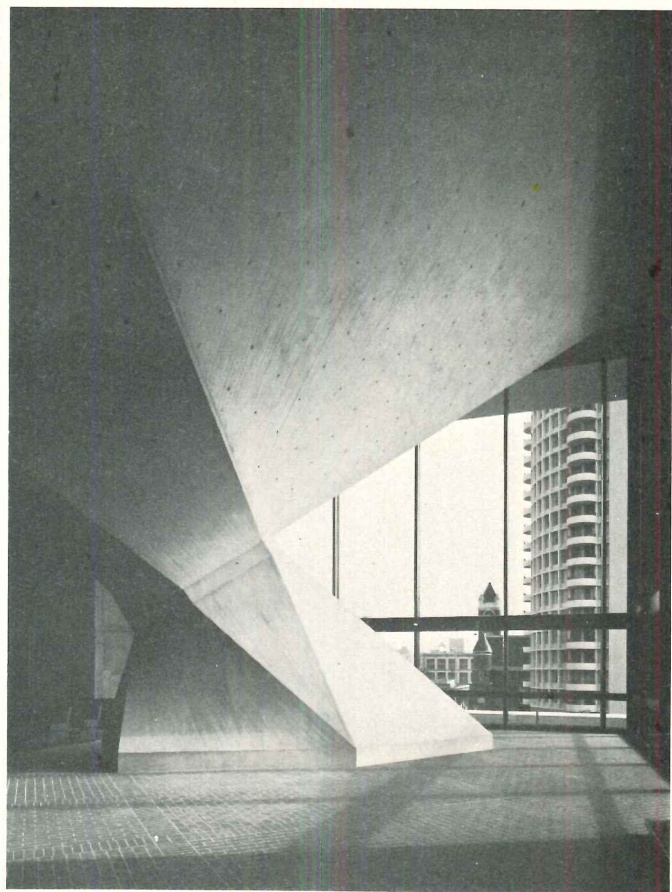
Predella, altar and pulpit, with the simple rosewood reredos, are surrounded on three sides by seats, none of which is farther than 100 feet away.

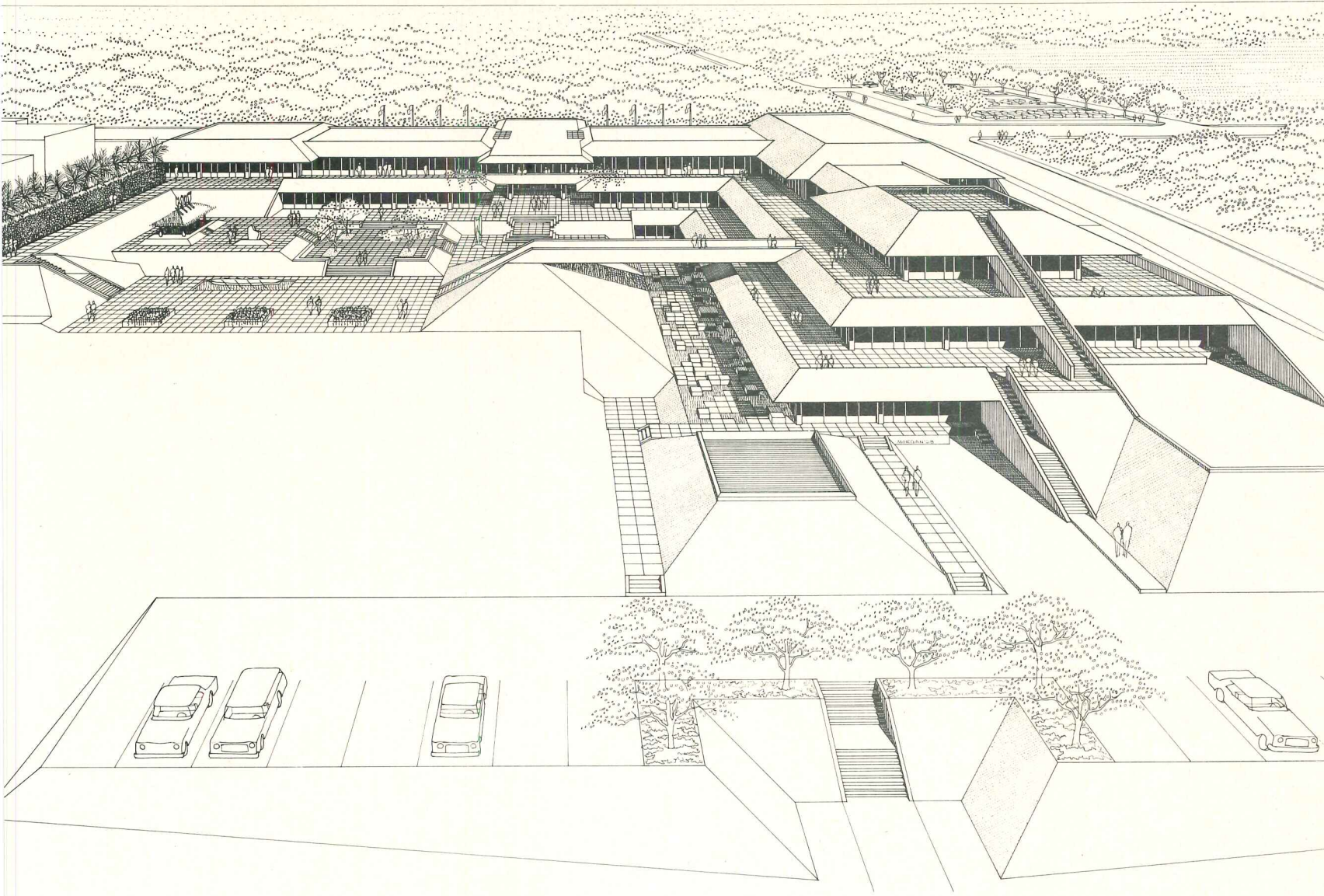
SAINT MARY'S CATHEDRAL, San Francisco, California. Architects: McSweeney, Ryan & Lee—William Schuppel, project architect; Michael Kelly, project coordinator. Pietro Belluschi, consulting architect, design. Engineers: Leonard F. Robinson & Associates, structural; Woodward-Clyde-Sherard, soils; Keller & 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.



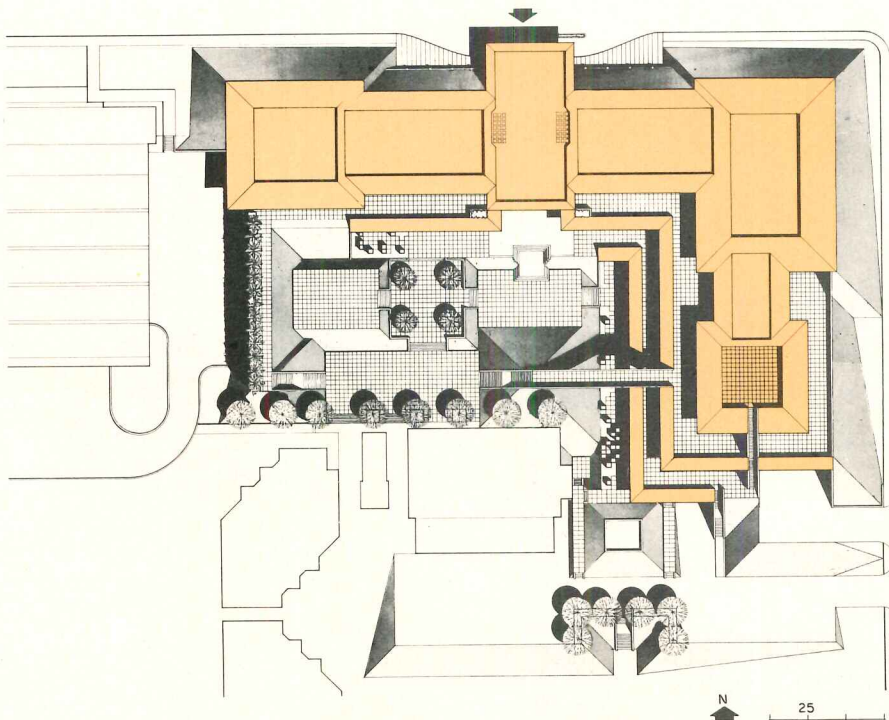


The unique structure required a variance from the city's 160-foot height limit for concrete structures, and was put through a number of conservative reviews for its engineering design. The Nervi panels, precast with the stiffening ribs (half a rib for each panel; see detail at left, center) for the shells, 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 corner 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.



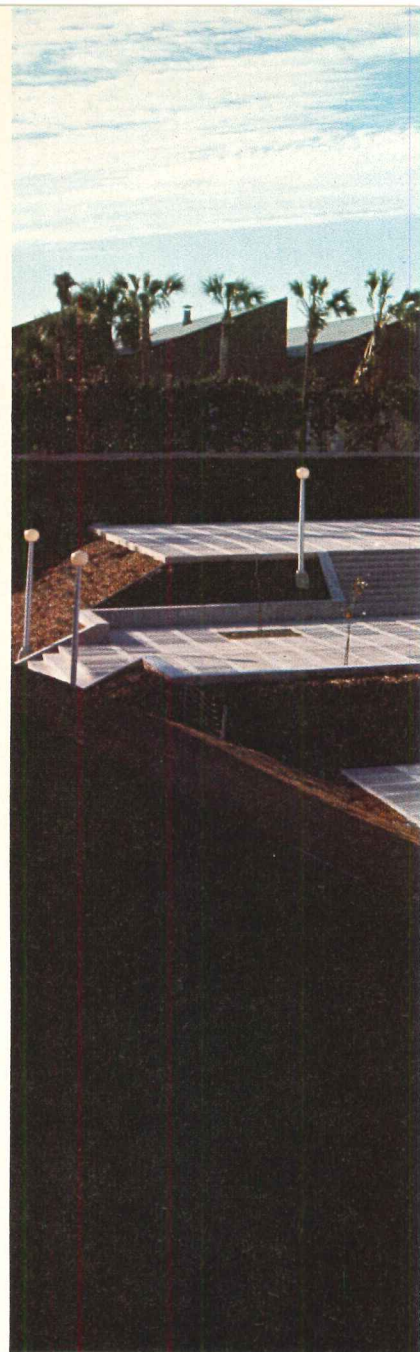


FLORIDA MUSEUM USES EARTH FORMS BOLDLY



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

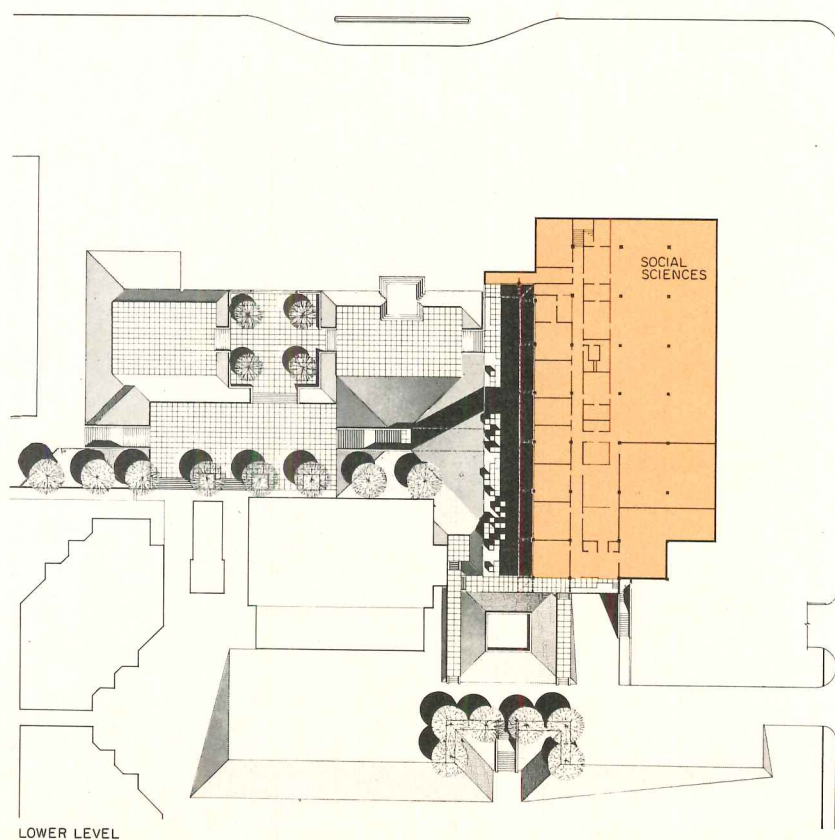


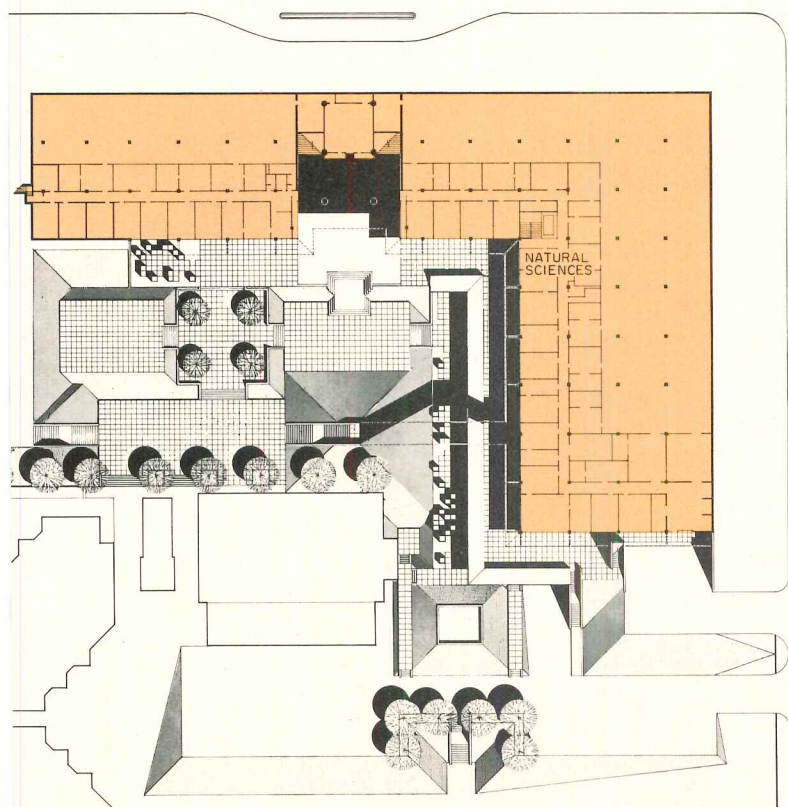
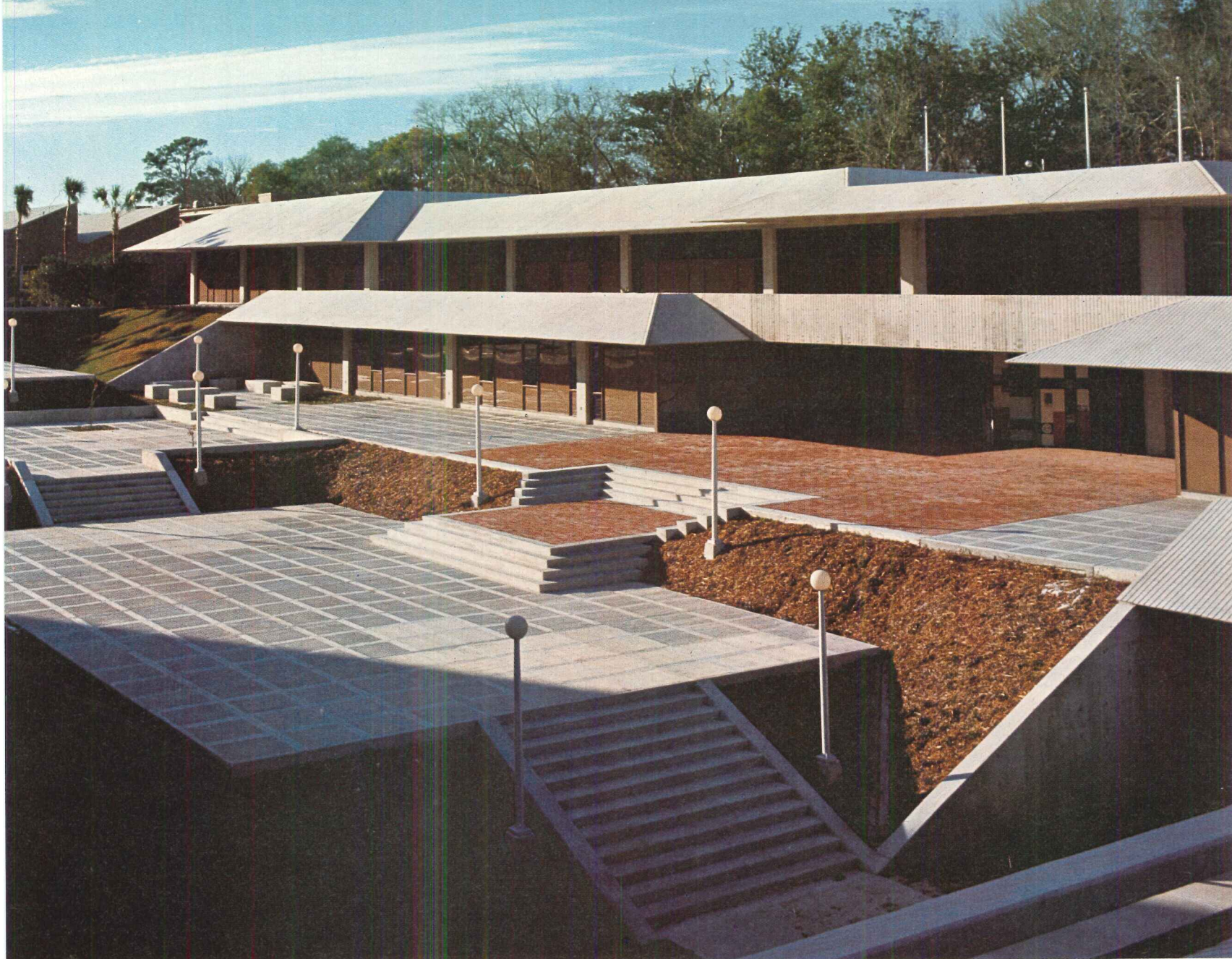
Alexandre Georges photos

FLORIDA STATE MUSEUM

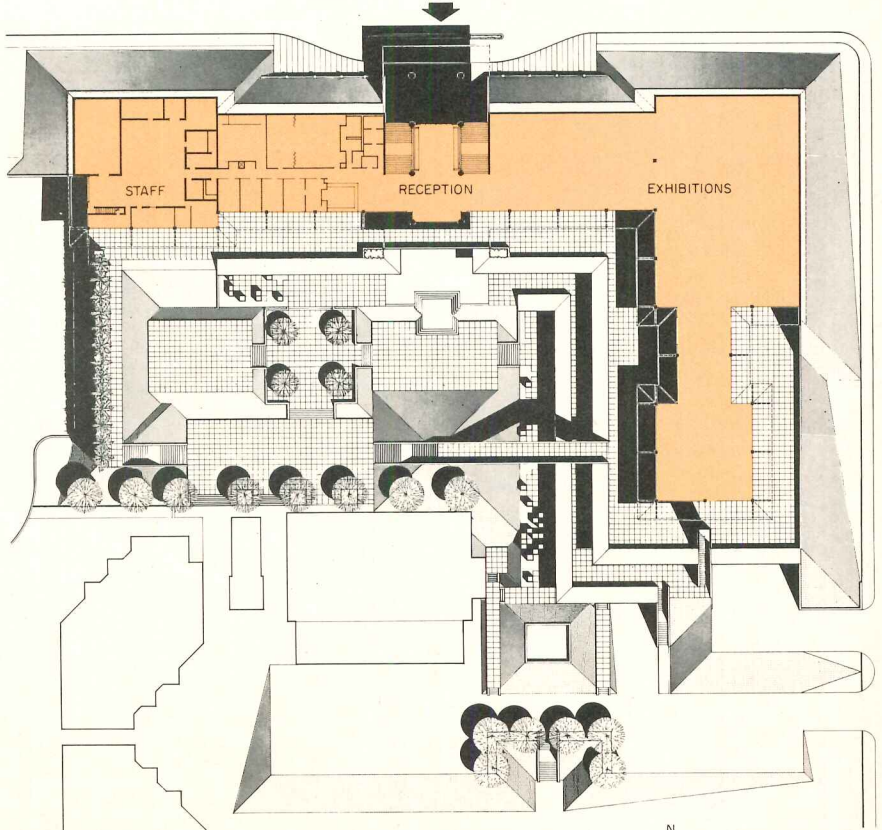
natural and social sciences. Offices line the wall facing the sculpture courts and generous precast overhangs protect the view windows. Small labs link the offices with storage ranges which are buried in the berm. By these simple juxtapositions, the three kinds of staff spaces can be concentrated for 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 multimedia 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.

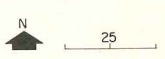


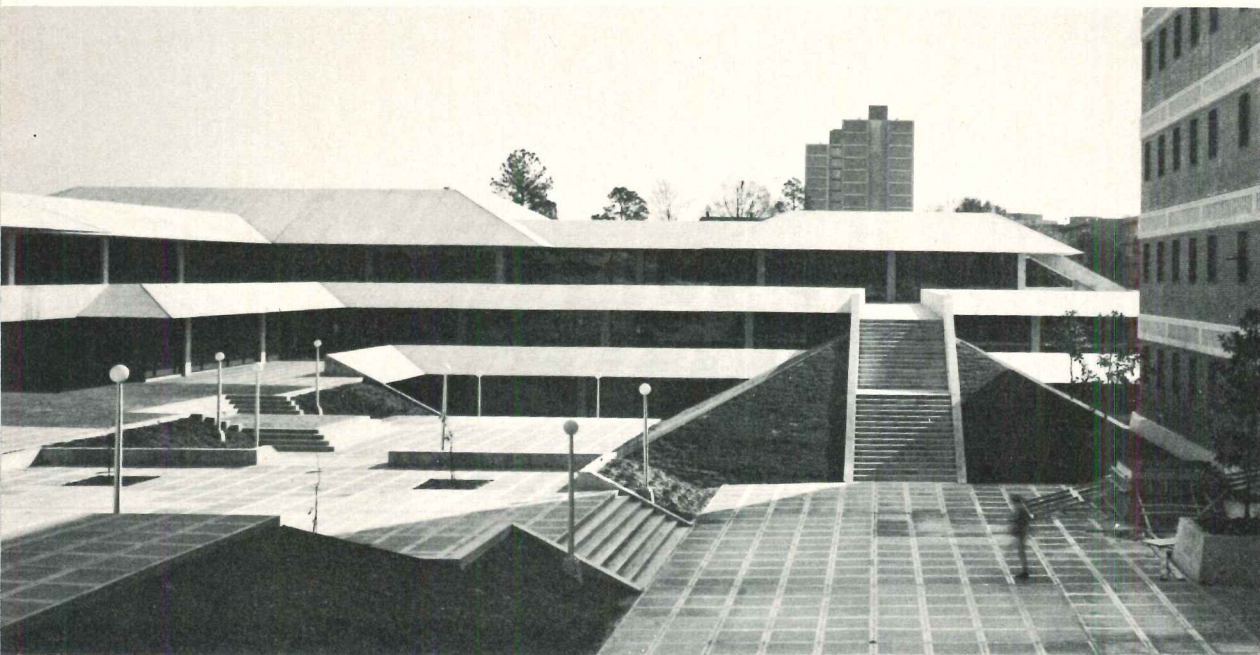
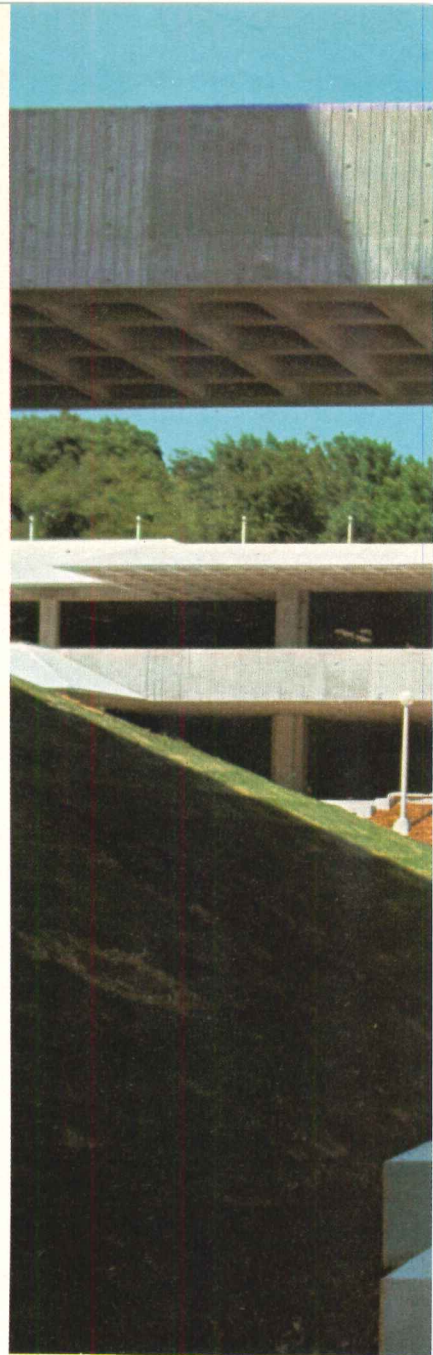
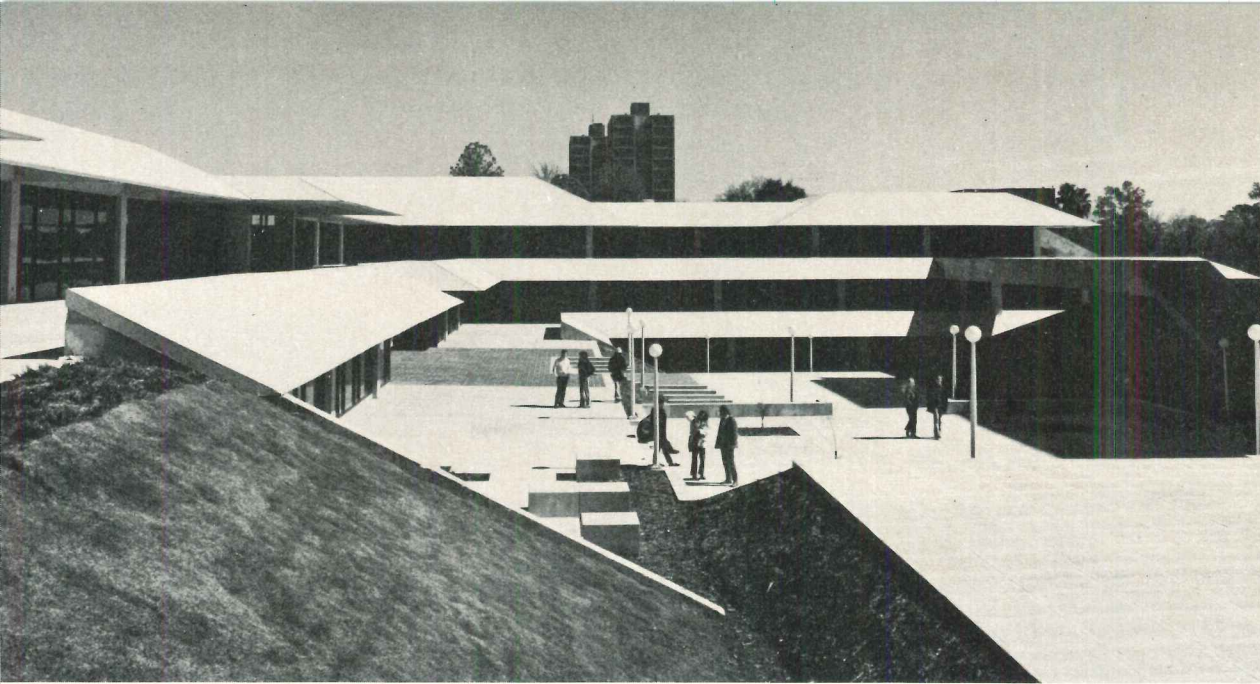


MIDDLE LEVEL



UPPER LEVEL





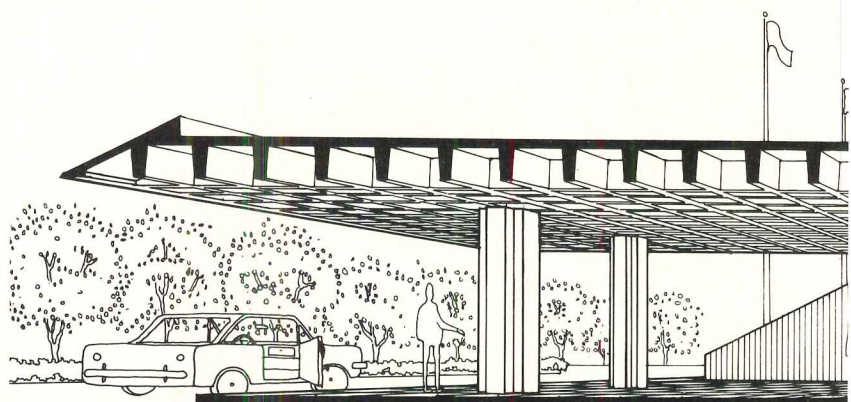
J. W. Hobbs

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.

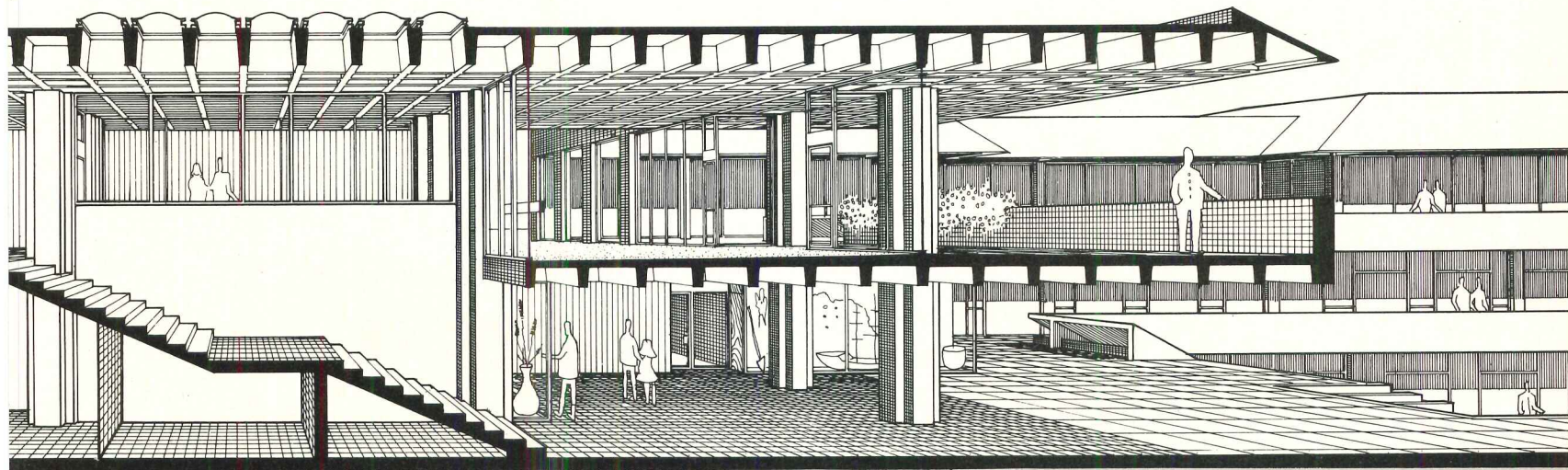
Morgan has long been interested in earth-form architecture, and feels that contemporary architects have too long ignored its design potential. This exceptionally handsome museum, funded jointly by the Florida Board of Regents, private donors and the National Science Foundation, pleads the case for earth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

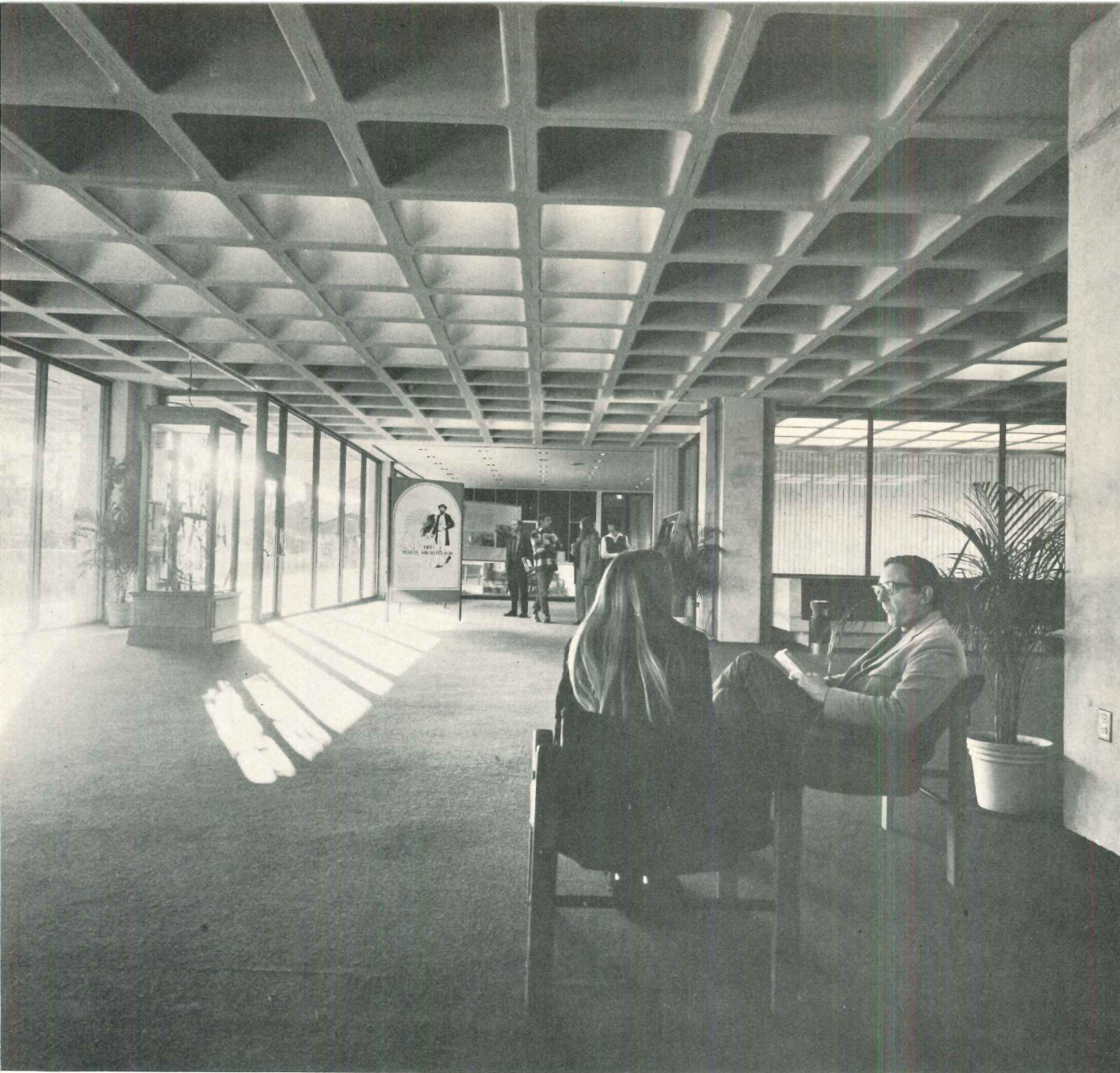
FLORIDA STATE MUSEUM, University of Florida, Gainesville, Florida. *Joshua C. Dickinson, Jr.*, Director. Architect: *William Morgan*; structural engineer: *Haley Keister*; mechanical and electrical engineers: *Evans & Hammond, Inc.*; general contractor: *The Auchter Company*.





William Morgan

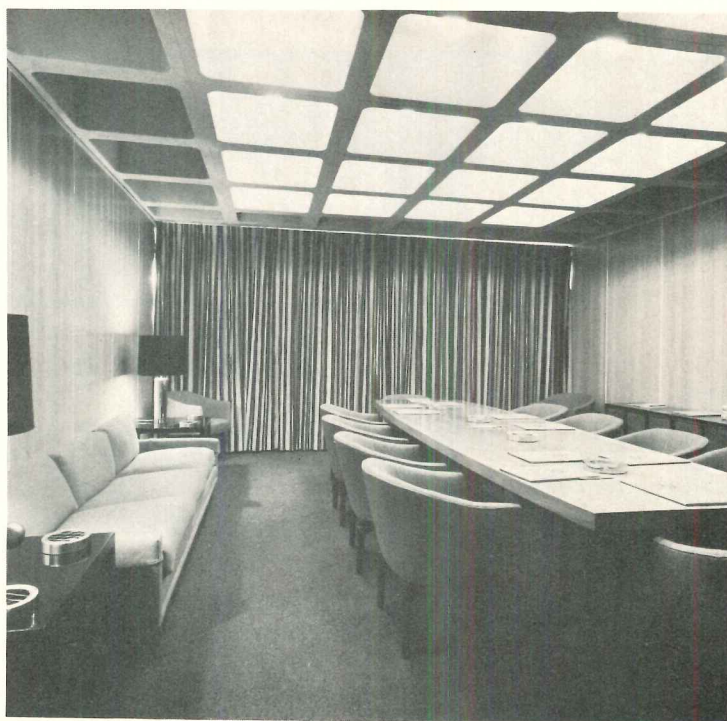




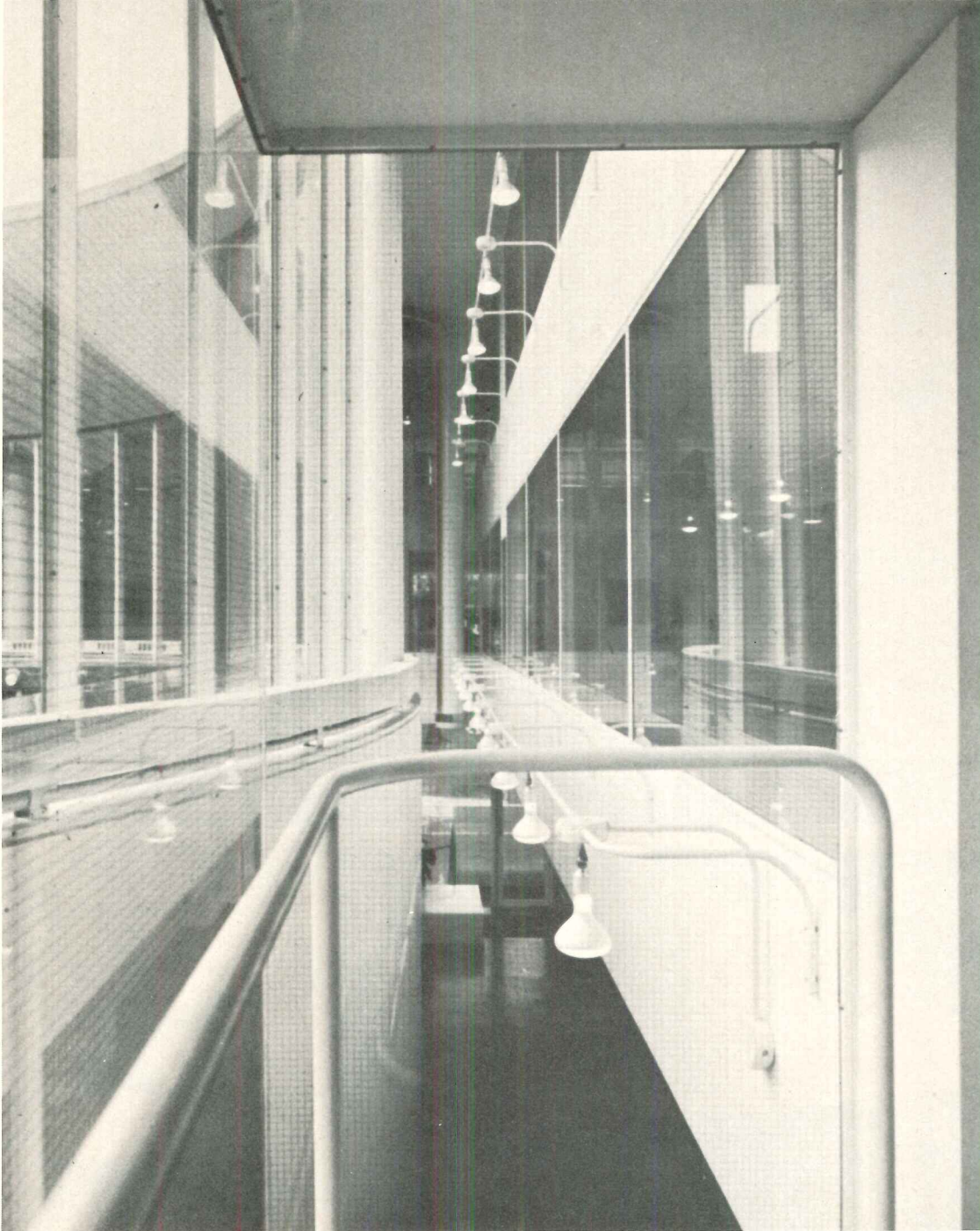
FLORIDA STATE MUSEUM

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.



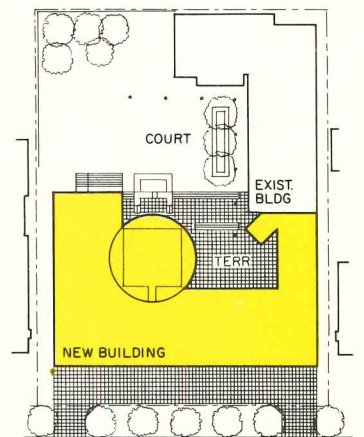
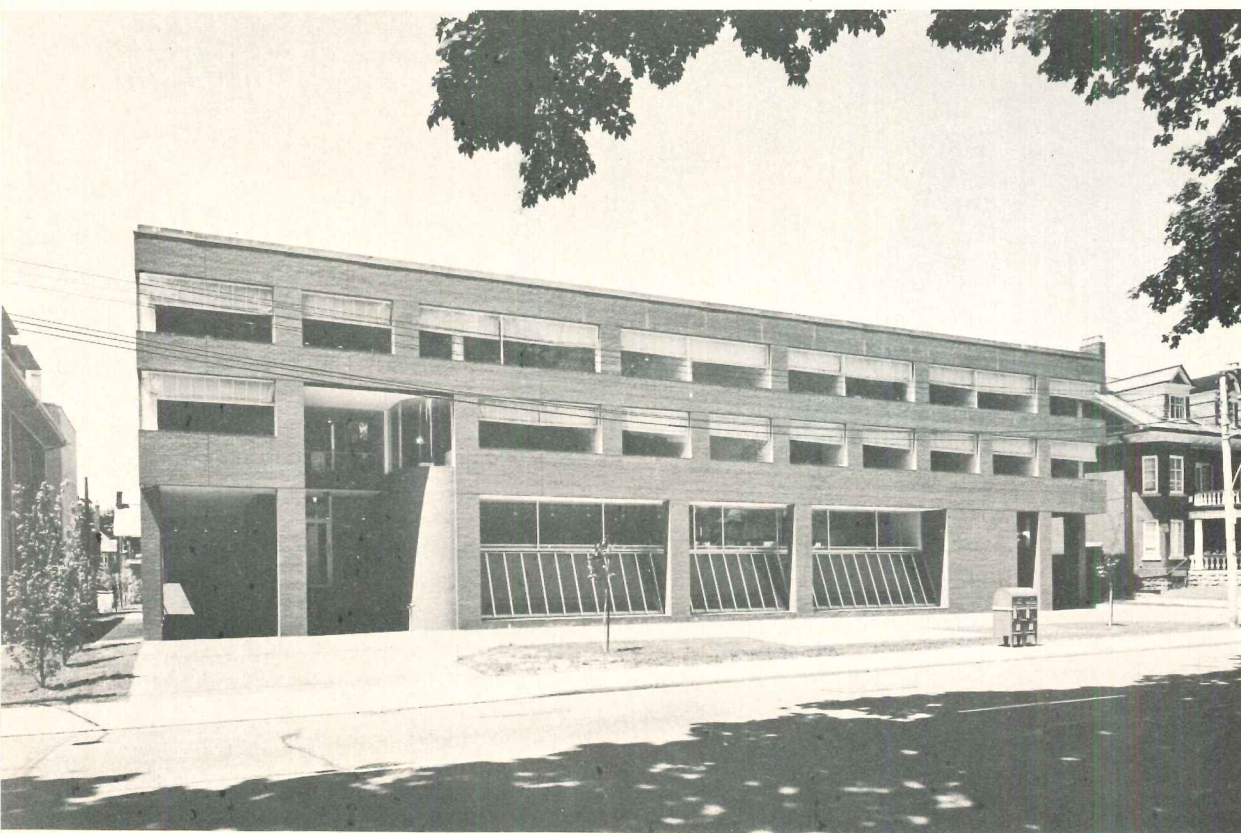
COMMON PARTS AND LEGIBLE SPACES IN TORONTO'S O.M.A. BUILDING



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

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'être* 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 rectilinear, 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.

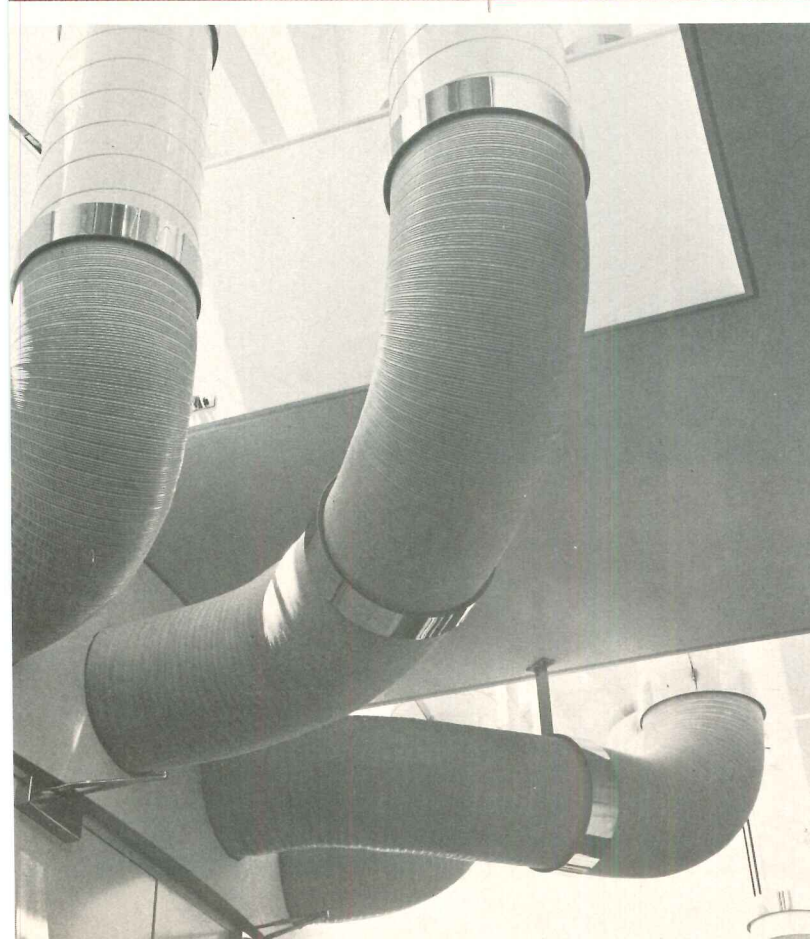
The architects of this small office building have succeeded in expressing the human values and institutional organizational patterns which sponsored the building in the first place, as they intended to do. It is a successful building on that level, and at the same time it manages to impart new meaning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

—Robert Jensen

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.

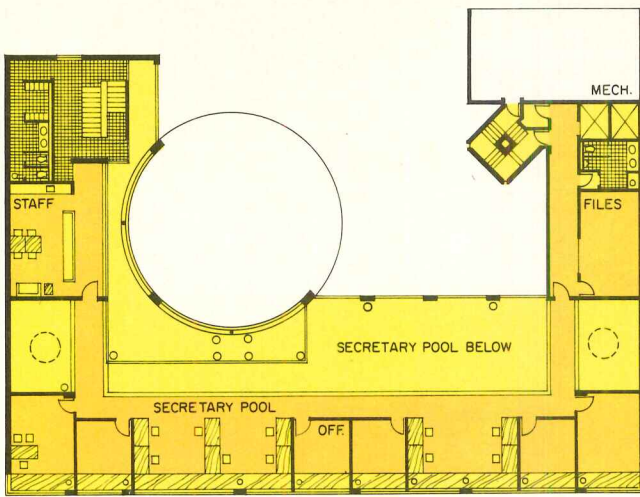


Karl Silva

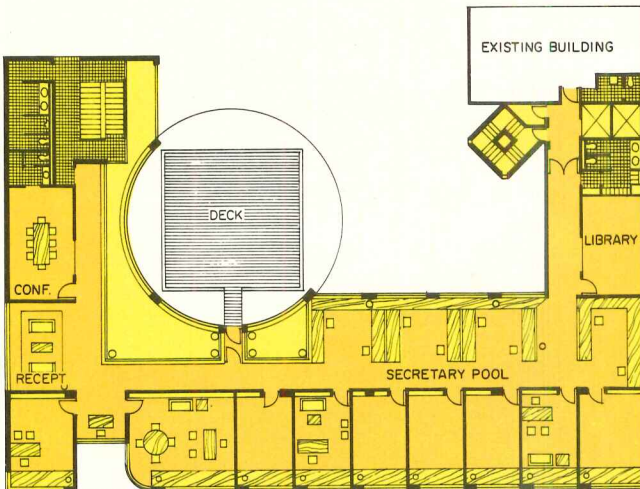




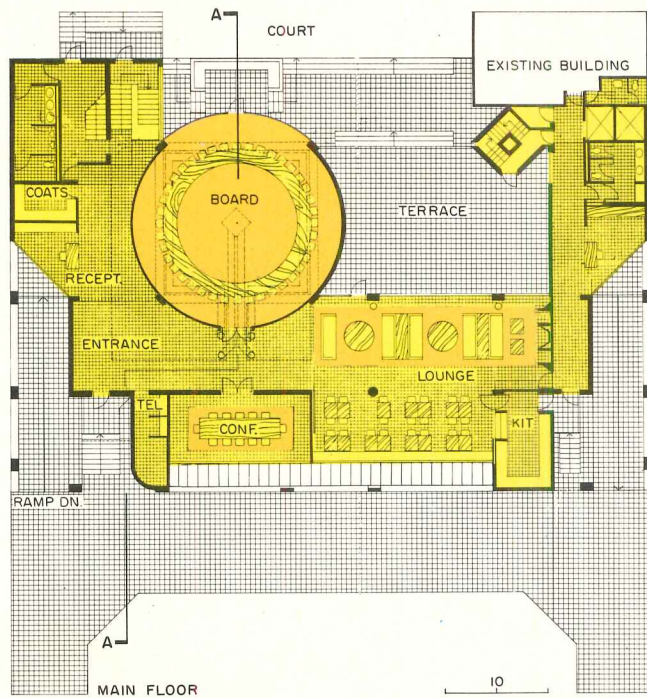
Ian Samson photos



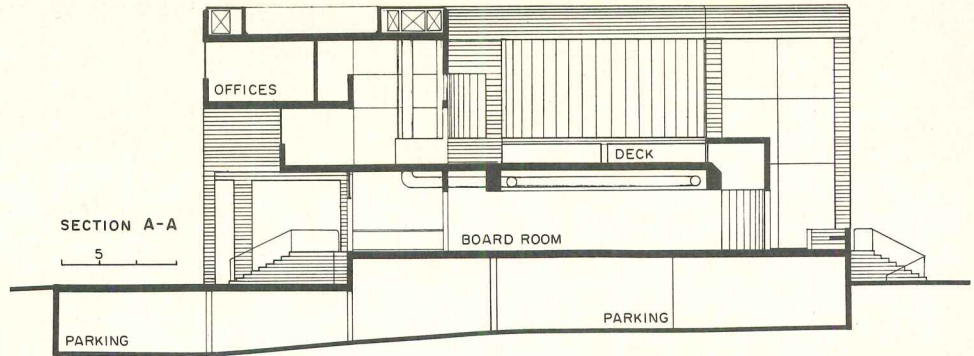
MEZZANINE



SECOND FLOOR



MAIN 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

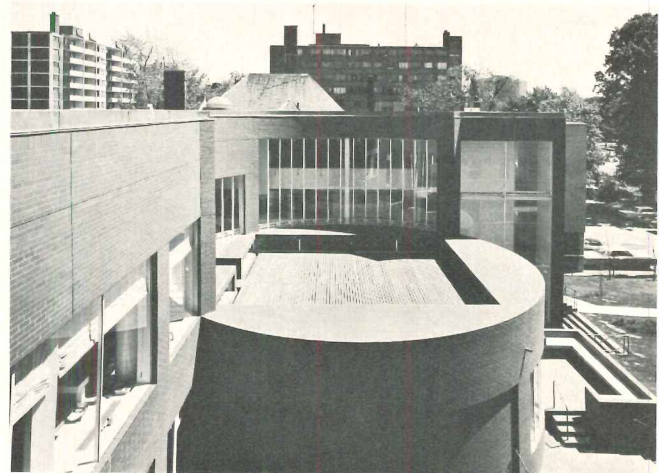
focus toward the back of the building in the expansion plans and in the present bricked terrace, plus the existence of the large underground parking facilities (see section, above) keep the O.M.A. headquarters from encroaching into the street and neighborhood with its present and planned activities.

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.

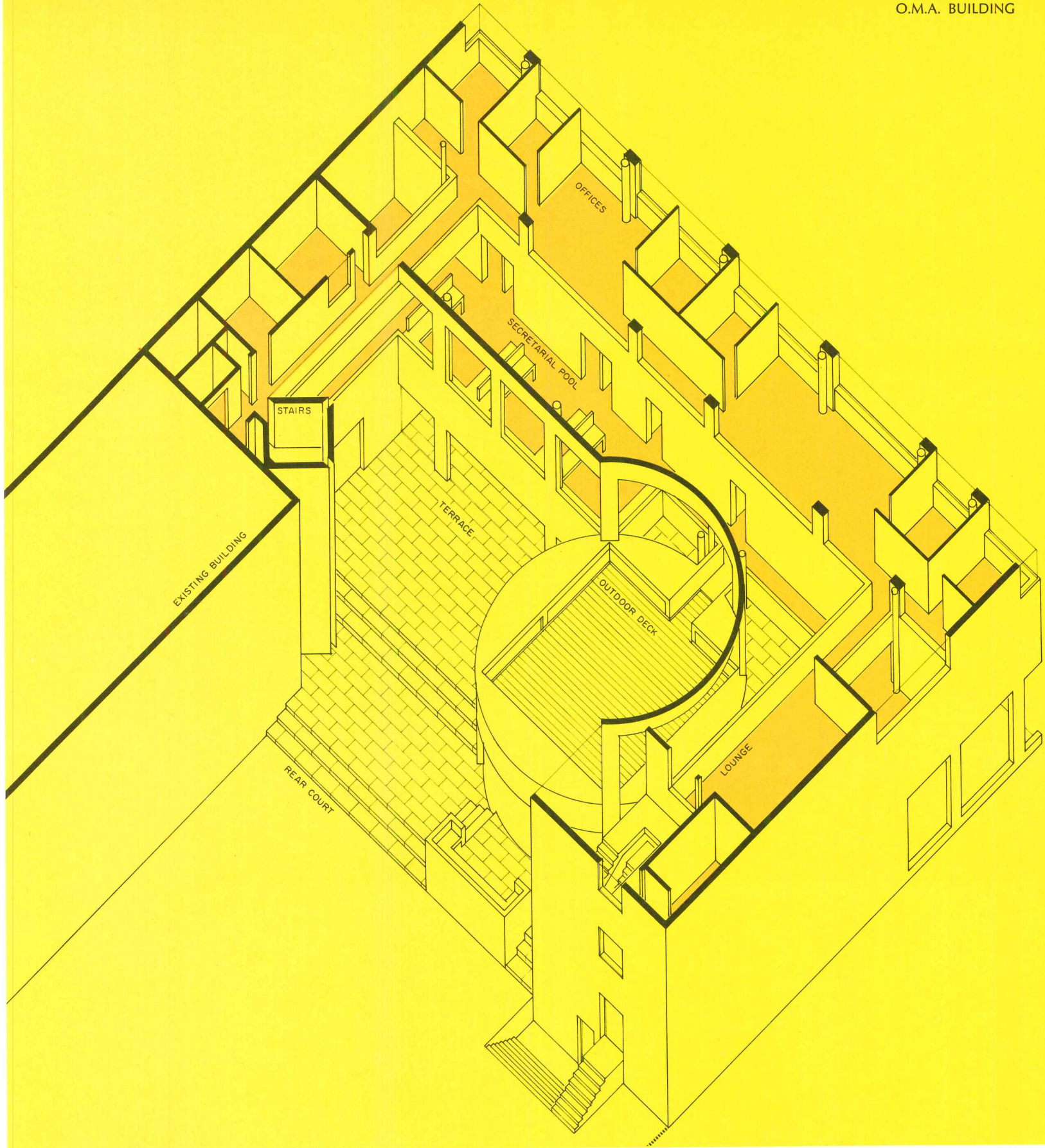




The board room of the O.M.A. Building (photo, above) is prominent from any point of view around the building and its roof has been employed as a deck for lounging; placing a square within a circle allows seating on the parapet, because any seat is usually a safe distance from the edge.

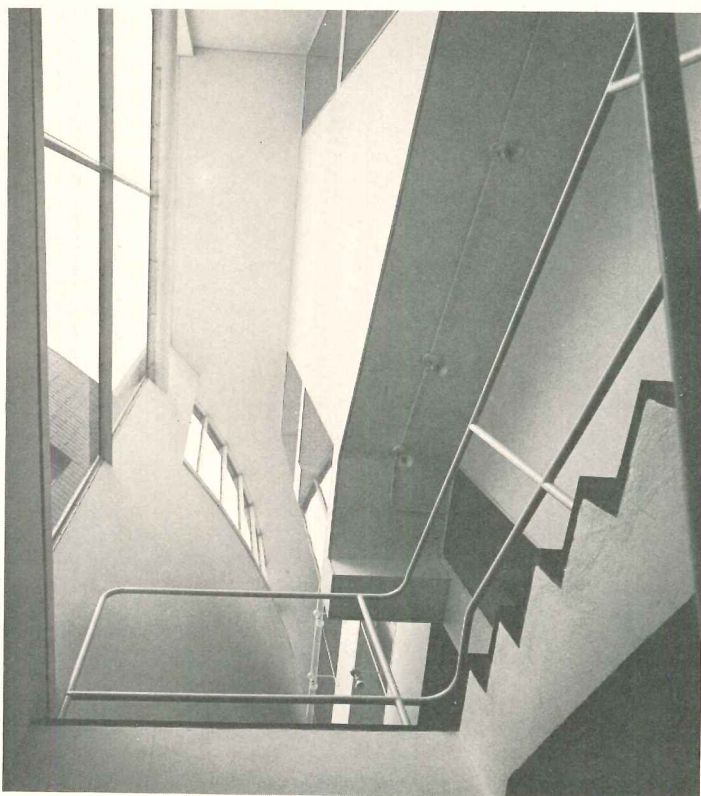


The standard spiral metal ducts in the building, like those in the photo at left, were cut to fit from shop drawings in a factory, rather than formed at the site. Each section of duct received an inexpensive white baked enamel finish which could not have been applied using site fabrication. The isometric 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.

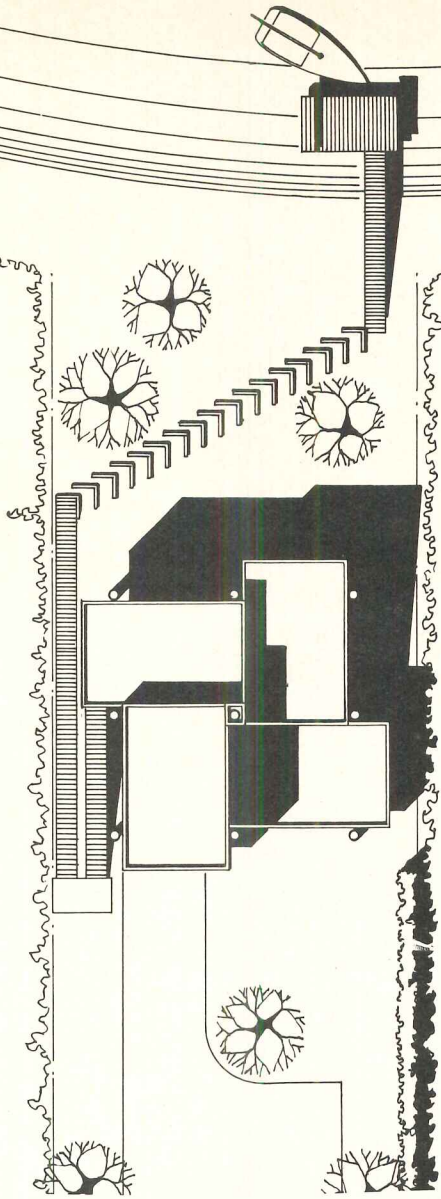




Ian Samson photos



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.

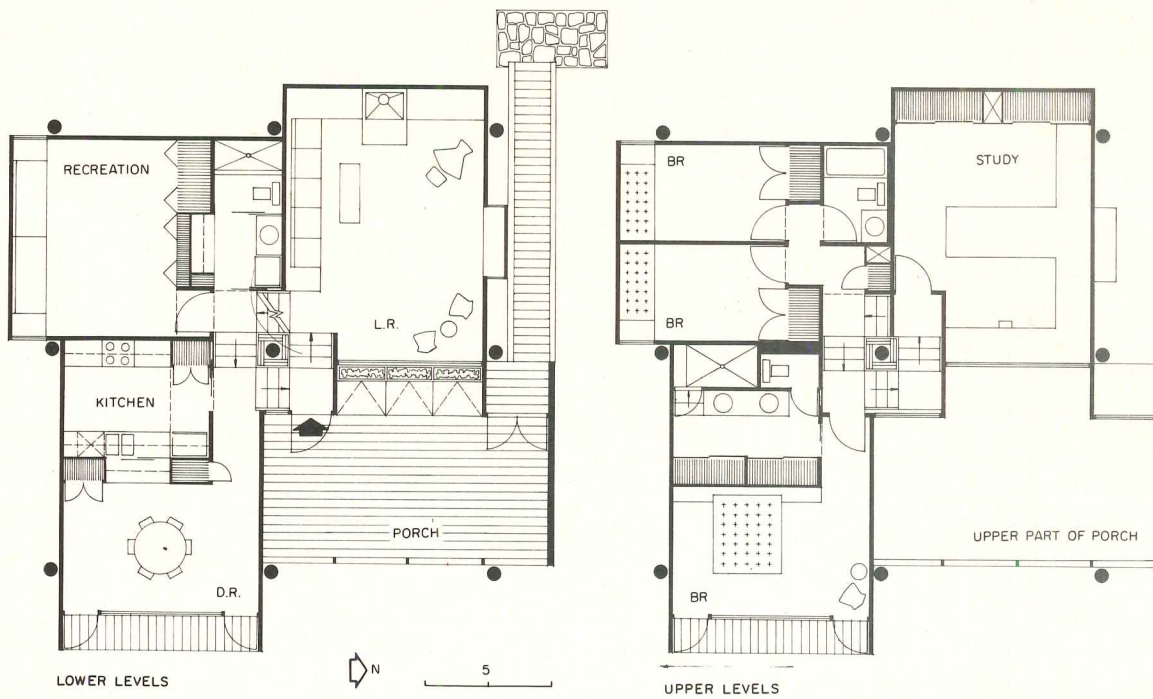
Like a pier over low water the house extends between pilings out over a lakeside slope. It is raised off the ground as part of "a preservationist approach" says architect William Morgan. This minimized

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-



C. 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.

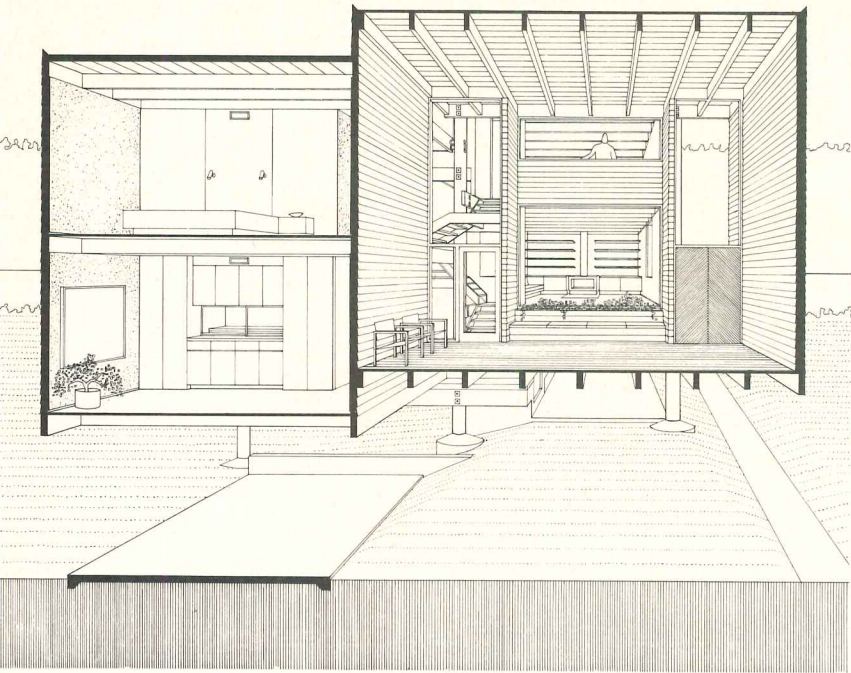
Entry is from the carport at the base of the stair or by ramp up to the two-story porch. From the porch one may go up to the living room, children's rooms, master bedroom and studio; or down to kitchen and dining room and guest-recreation room.

The plan is very compact and neatly accommodates all program requirements including "separate dining room; screened porch over-

looking 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





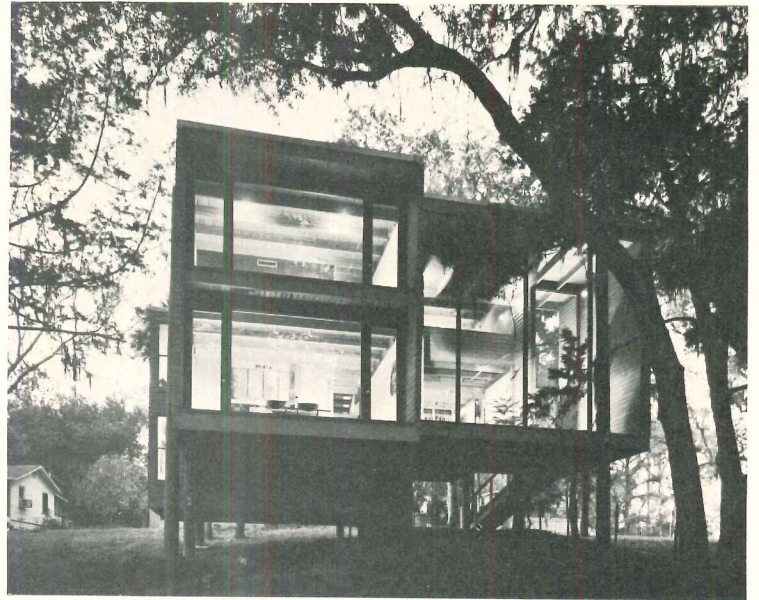


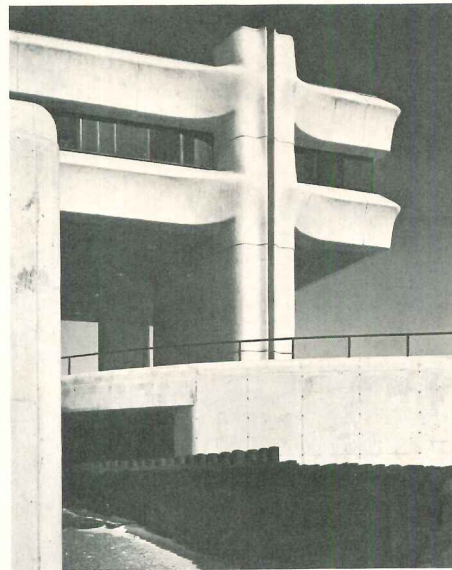
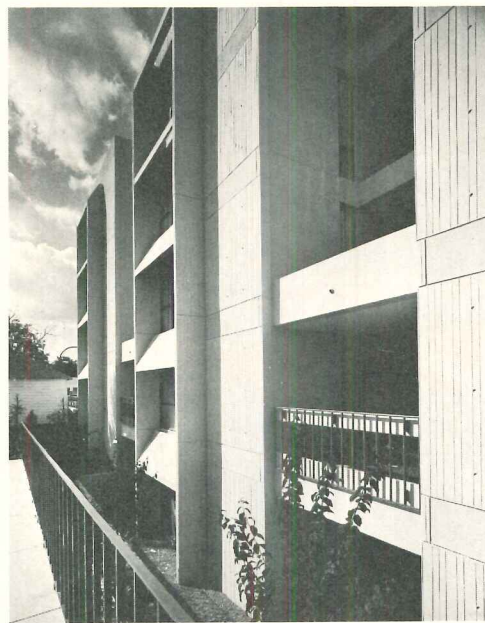
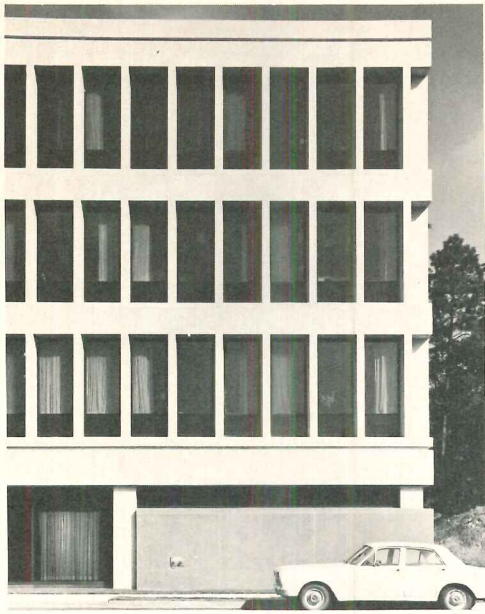
the stairwell. Every major space has a view of the lake.

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.

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





HOSPITALS

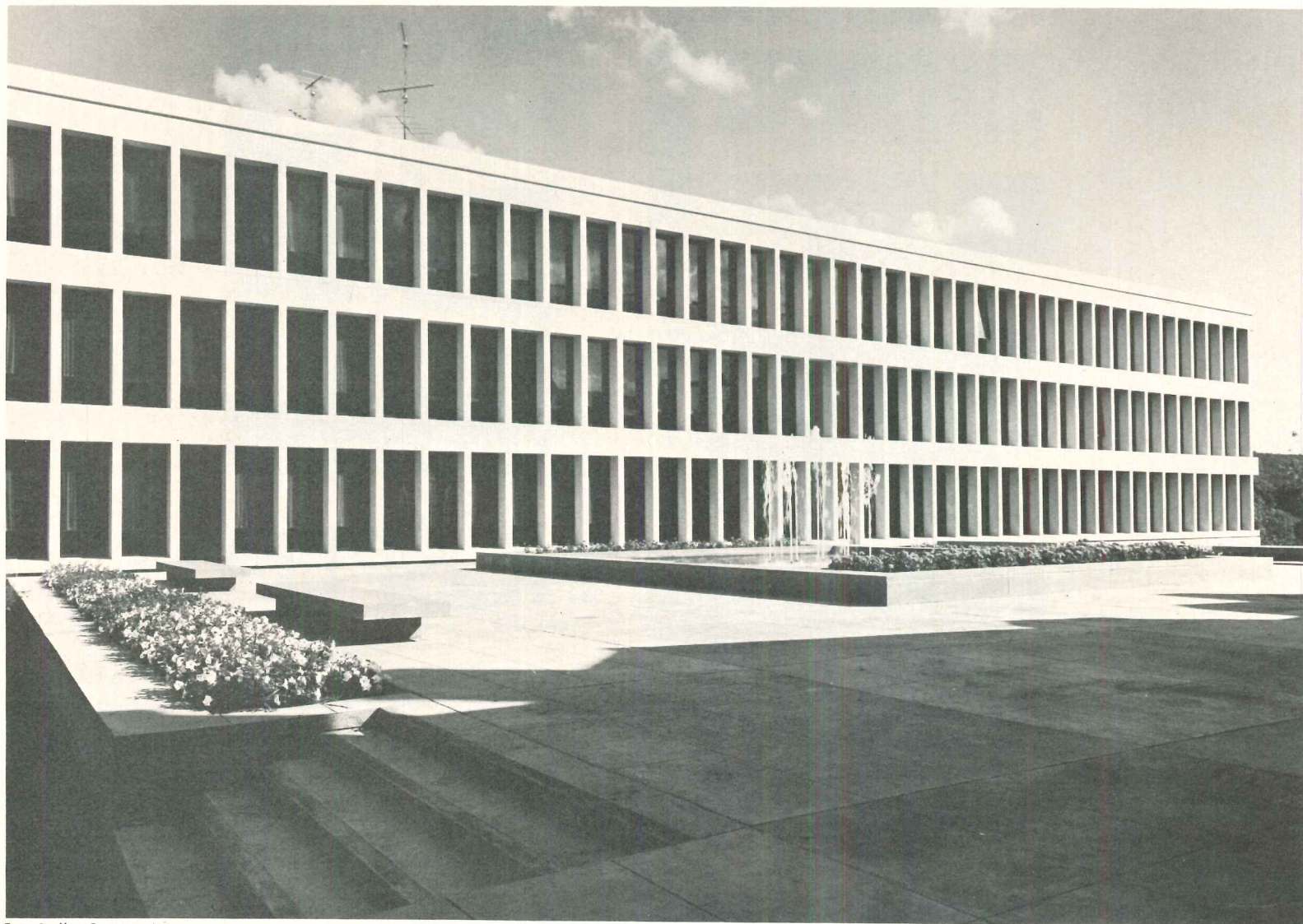
Three trends emerge in the current stream of hospital events. First—as the four, moderate-size hospitals shown here and on following pages demonstrate—the quality of architectural massing and detail is substantially better than has been common in the past. Second, interior designs for hospitals have 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.

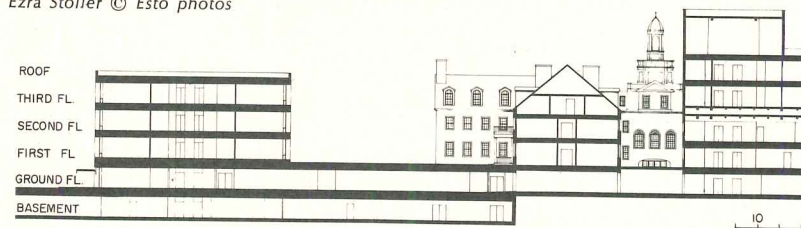
A study of the evolution of nursing care spaces by Michael L. Bobrow, architect and planning associate of Medical Planning Associates, reviews efficiency studies of the past and introduces a simplified, practical method of evaluation developed at MPA. (See page 151.)

—William B. Foxhall

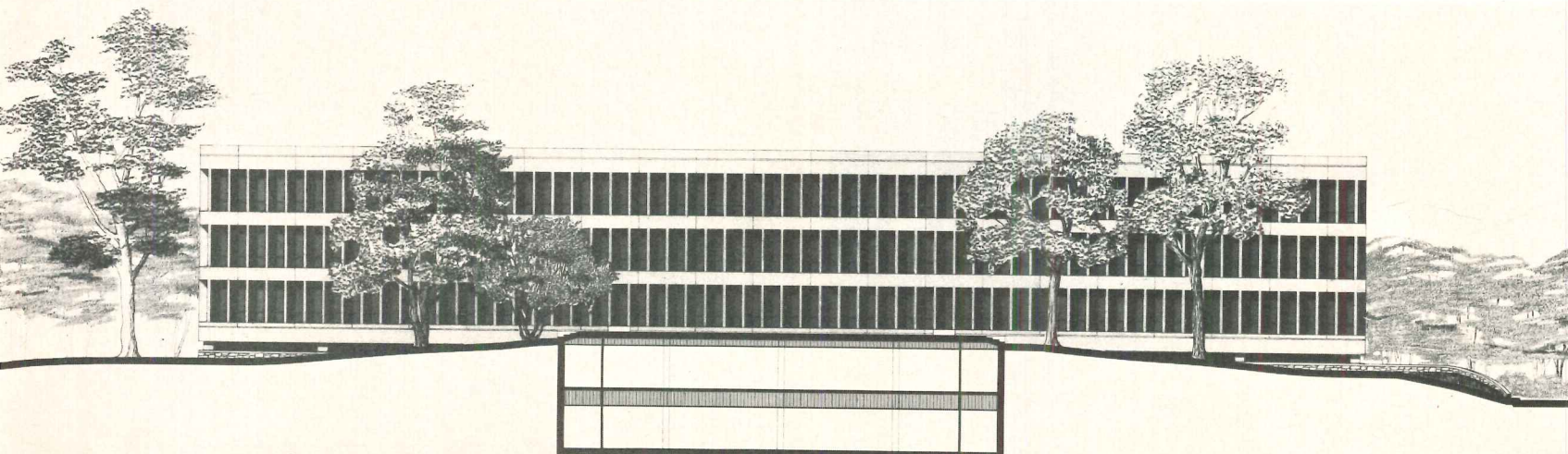
**The Mary Imogene Bassett Hospital
is a mini-medical center for
Cooperstown, New York, designed
by Skidmore, Owings & Merrill**



Ezra Stoller © Esto photos



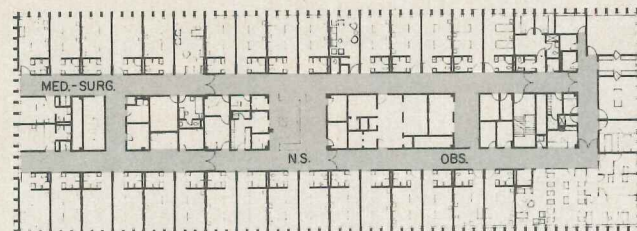
Precast, double-stem tee structure is cleanly expressed in a three-level facade overlooking a plaza atop the ground-floor connection between Bassett Hospital's new wing and the original complex (See section). Radiology and pharmacy are relocated under the plaza, with passages connecting the new main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



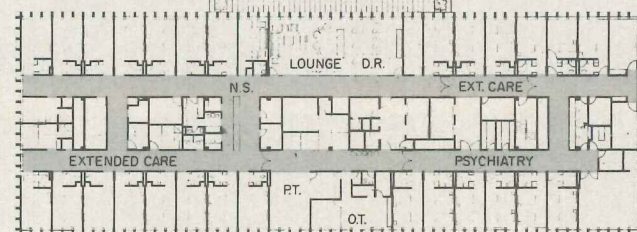
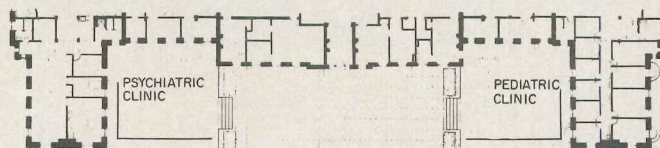
This four-level addition to a 40-year old general acute hospital in Cooperstown, New York, provides 175 beds for a rural community medical center that is unusual in the scope of its service and the organization by which it operates. Community hospitals in rural areas (Cooperstown is a dairy and poultry 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.

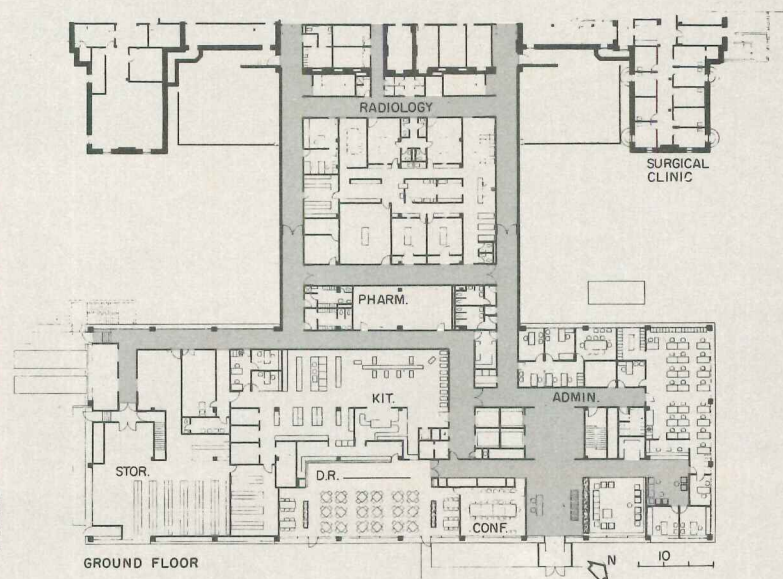
The new addition, completed in the summer of 1970, was constructed with three floor levels facing a plaza connecting the new wing with the existing complex. The connecting structure at ground level under the plaza houses radiology and pharmacy between passages leading from the new main entrance, administration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



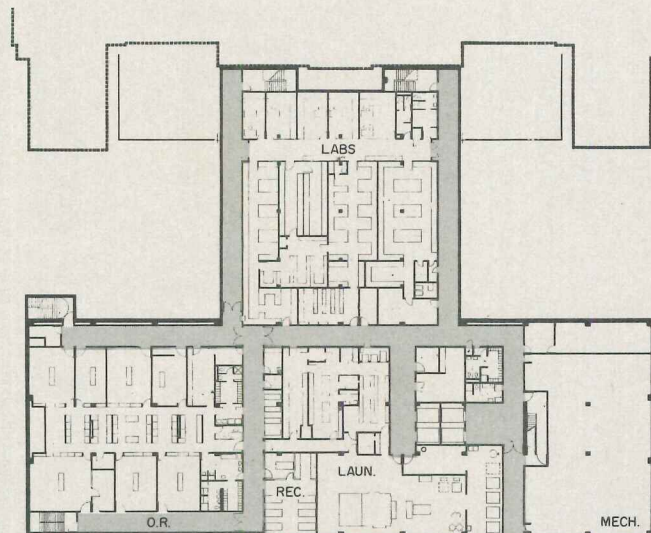
SECOND FLOOR



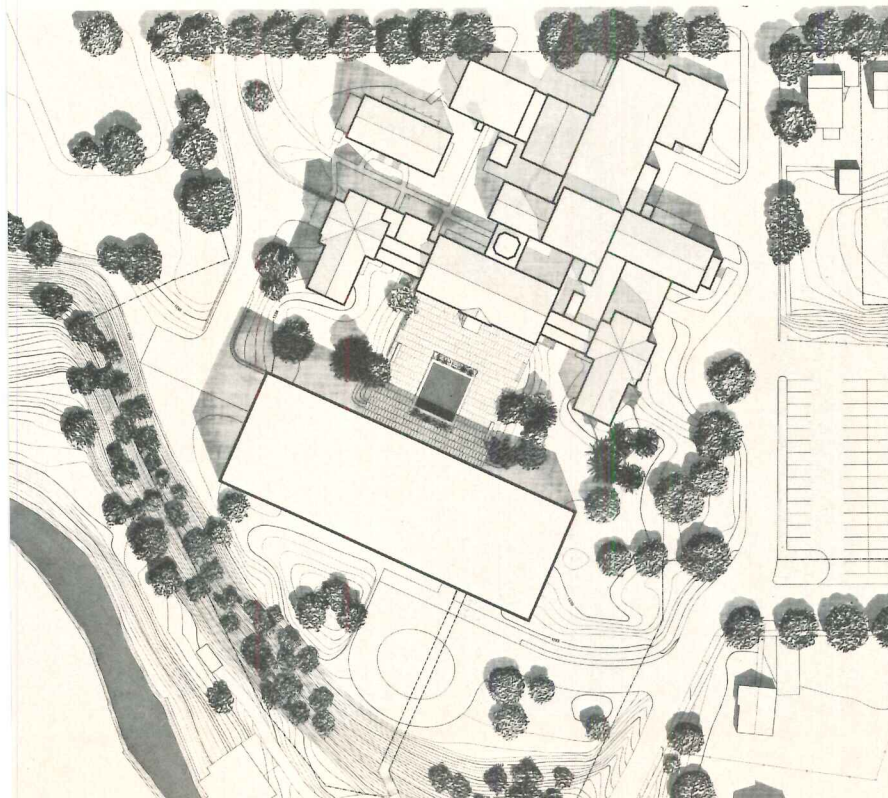
FIRST FLOOR

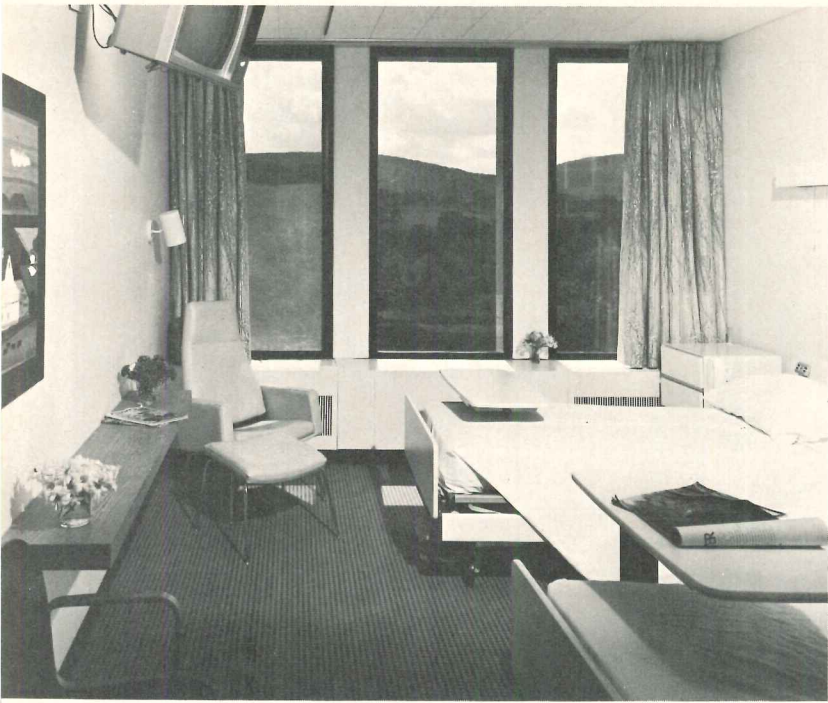


GROUND FLOOR



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 serigraph 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.

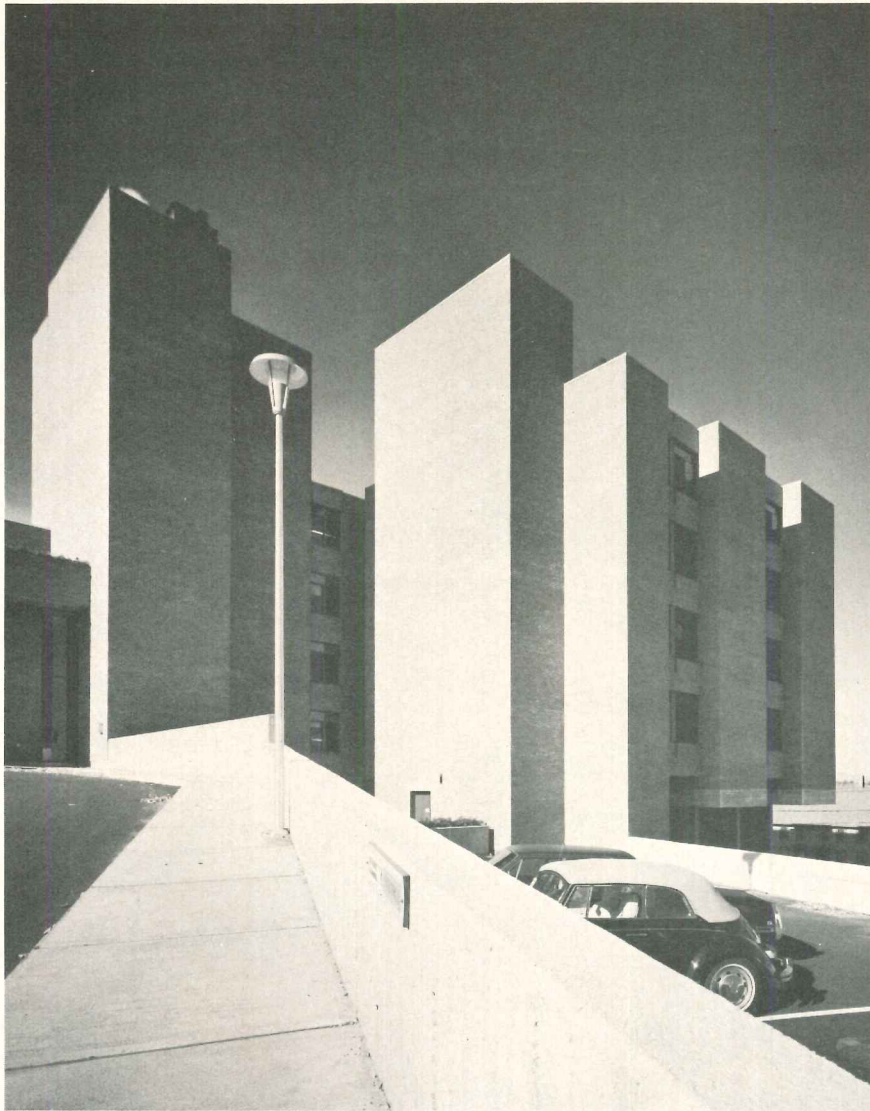
The 137,000 gross sq ft of the wing cost about \$7 million, and the cost index of \$53 per sq ft includes Group I equipment. Patients' rooms are 12.5- by 16-ft with a mix of single and double bedrooms that averages out to about 790 sq ft per bed.

MARY IMOGENE BASSETT HOSPITAL, Coopers-town, 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*.

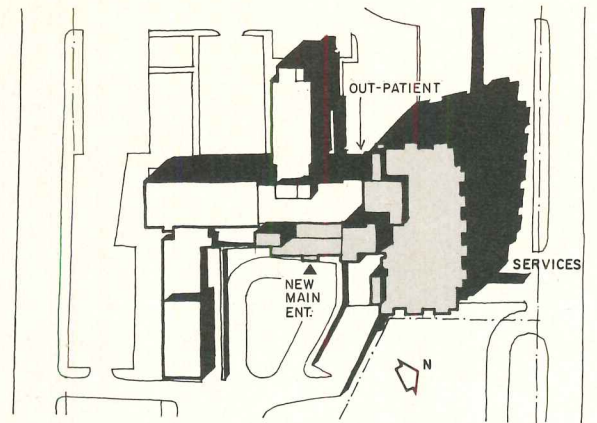
Rather formal waiting and reception areas reflect the group-practice mode of Bassett Hospital's operation. In addition to main cafeteria at ground level, below, there are separate dining and social areas in the open-floor psychiatric section, bottom left, opposite, and in the second-level extended care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



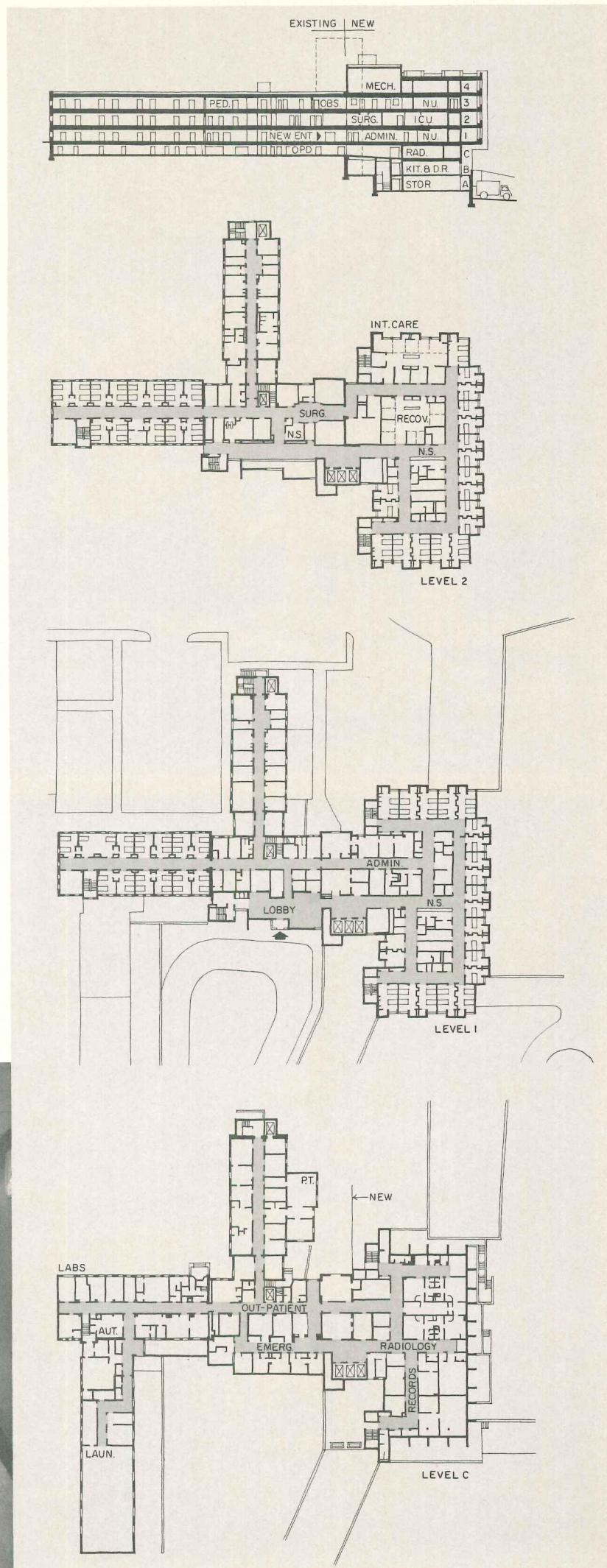
The renovations and additions to the Lakes Region General Hospital presented architects with a double problem. First, the rather undistinguished vocabulary of the existing hospital was nonetheless rigorously New England in its tone and rugged in character. Second, the hilltop site imposed constraints 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.

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.*



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



Gerald Ratto photos

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.

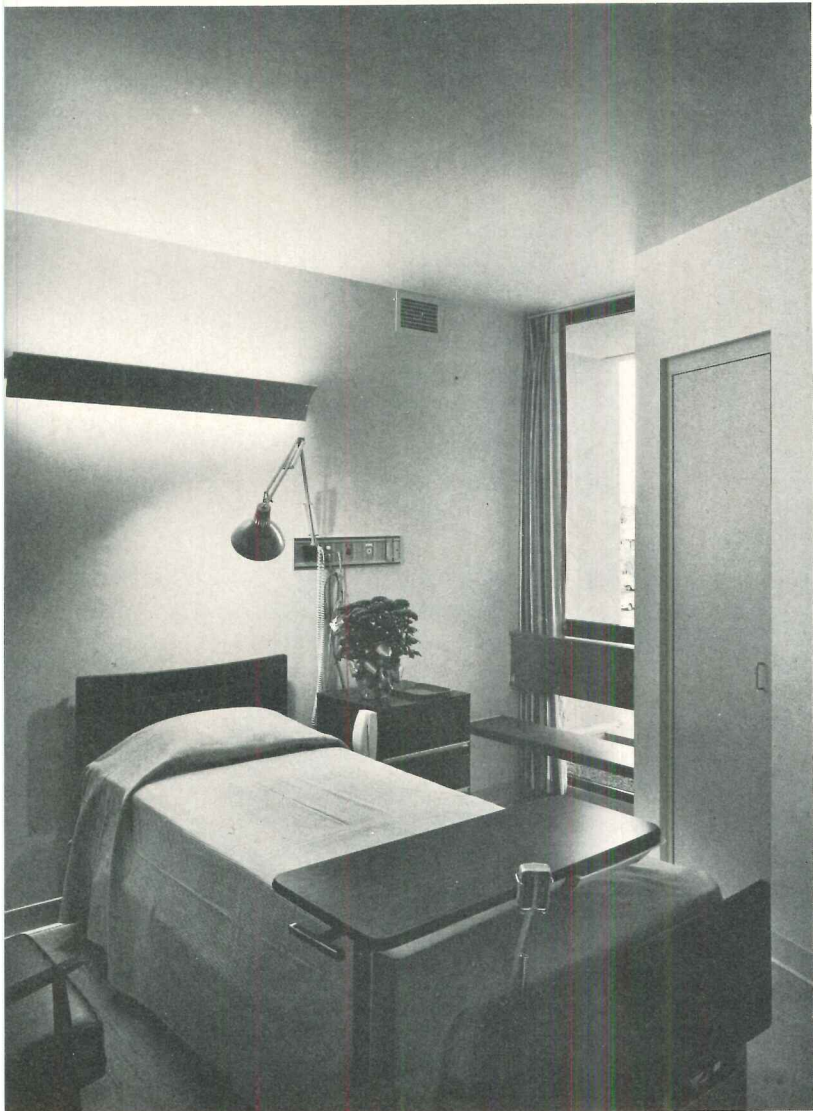
Cost of the new addition was \$2.3 million for 55,825 sq ft.

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.

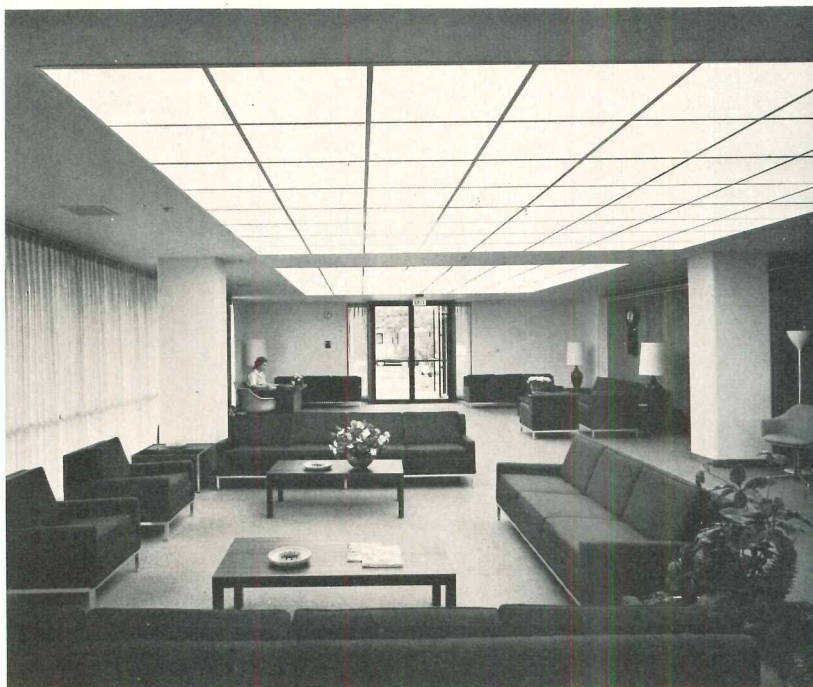
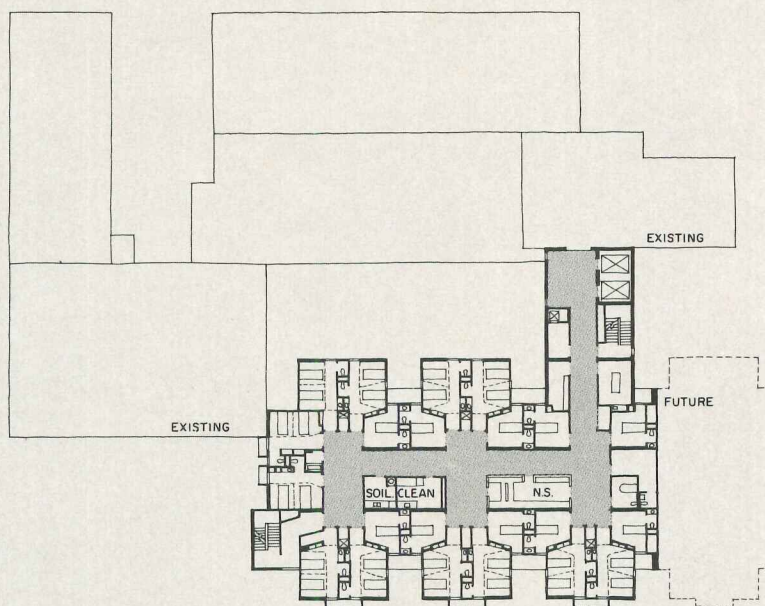
Sunken courts at the south and east provide light and access to below grade areas and to possible future outdoor dining facilities. Future expansion will extend the new wing to the east. No additional floors will be built atop this new wing.

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.

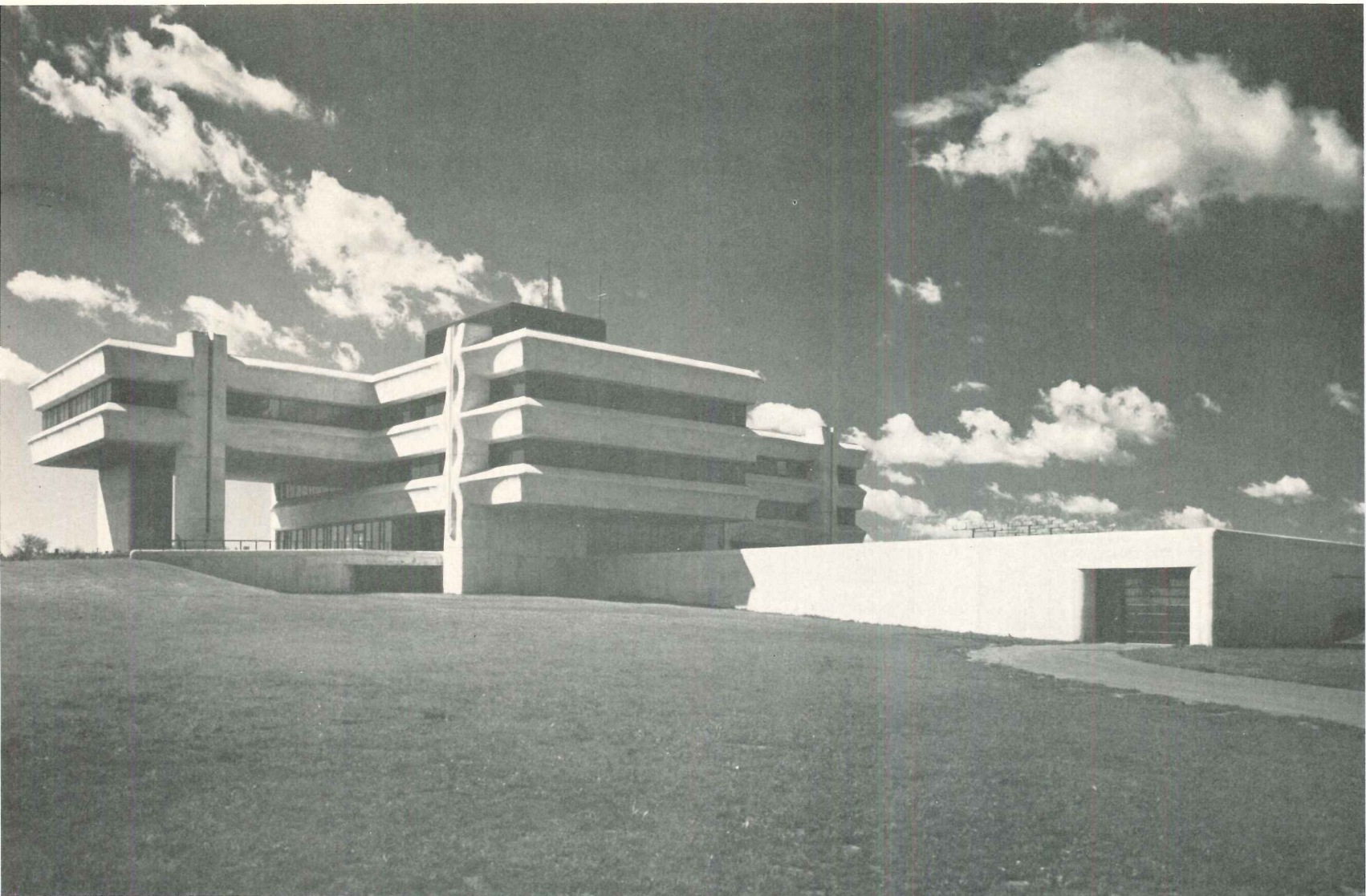




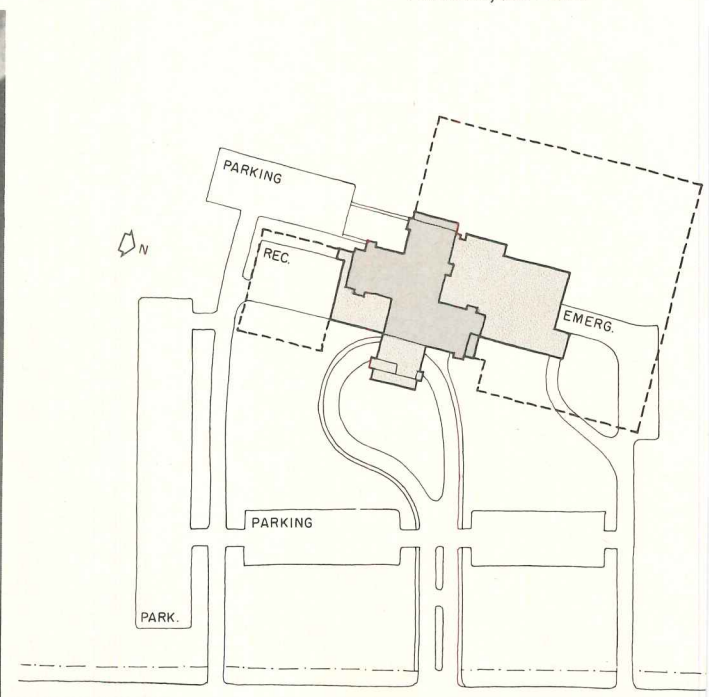
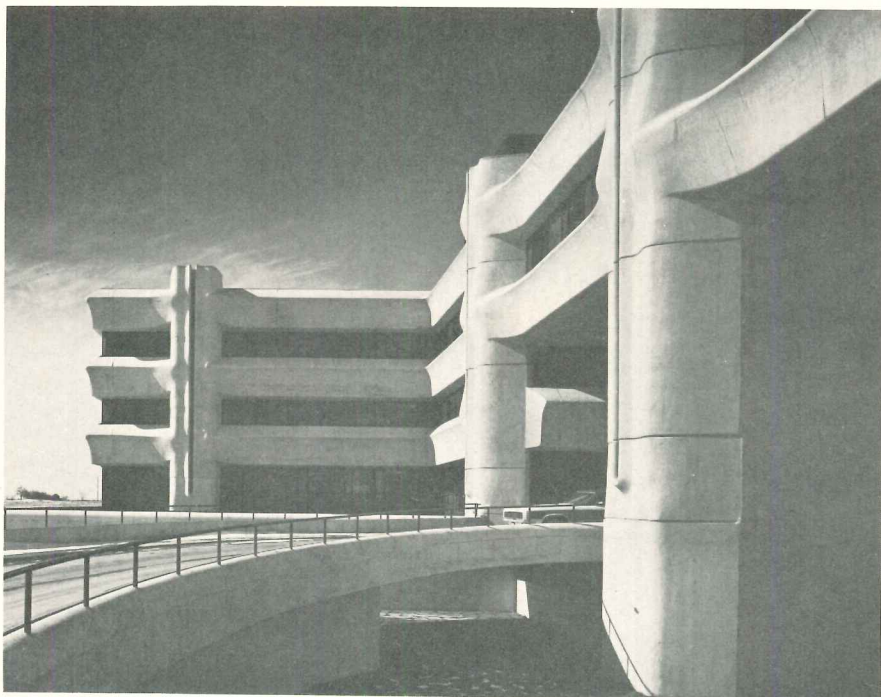
Tied in to remodeled working areas of existing buildings, this compact interlocking arrangement of bedrooms foreshortens corridors and provides operational vestibules with good visibility and convenience of service to each cluster. Space per bed (547 sq ft) is not generous, but layout and furnishings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

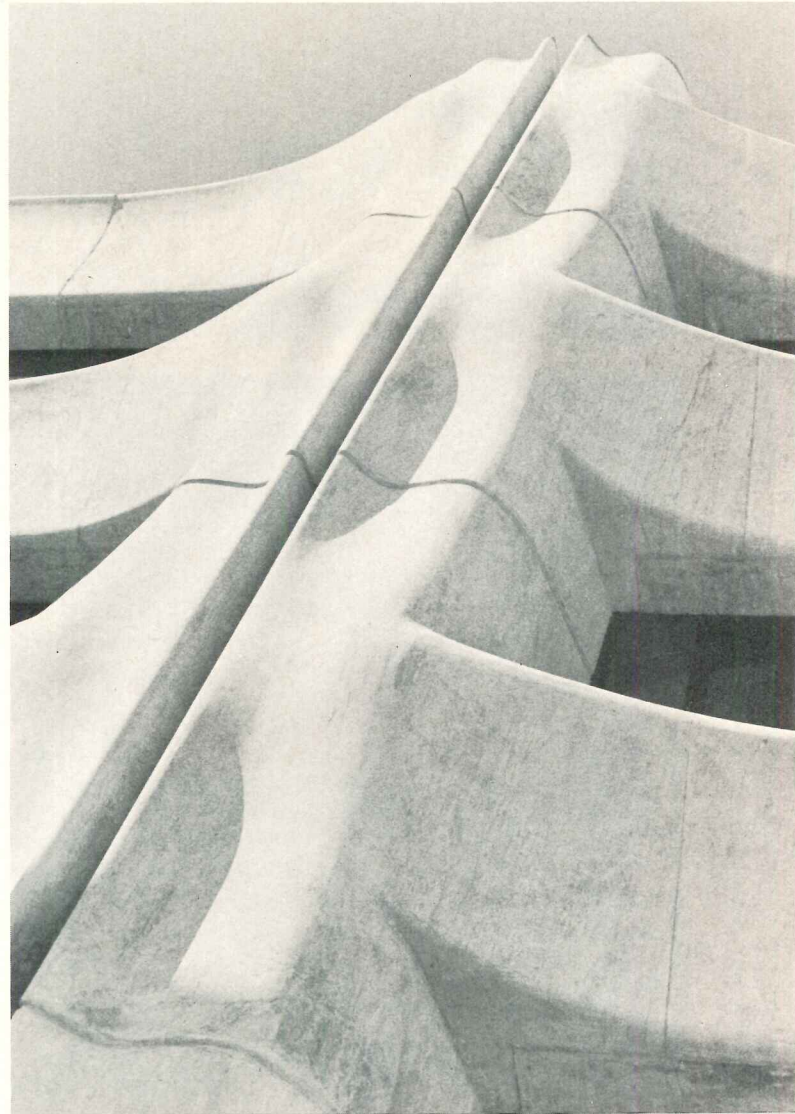
The hospital's lowest floor level, partially below grade, contains all service functions, including emergency, radiology and laboratory, outpatient, surgical suite, physiotherapy, pharmacy, central processing and supply. Any one of these areas can expand independently of other areas on the same floor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

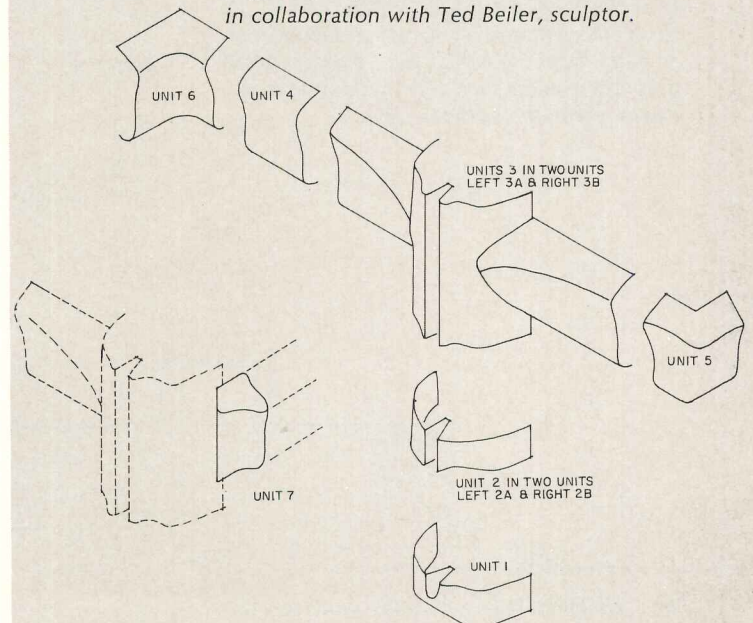
The roof of the ground floor extends beyond the main building core, and its surface holds a 6-in. deep reflecting pond with a fountain, both essential components of the air conditioning system. It is estimated that the pond reduces the roof's temperature in summer by 50 degrees.

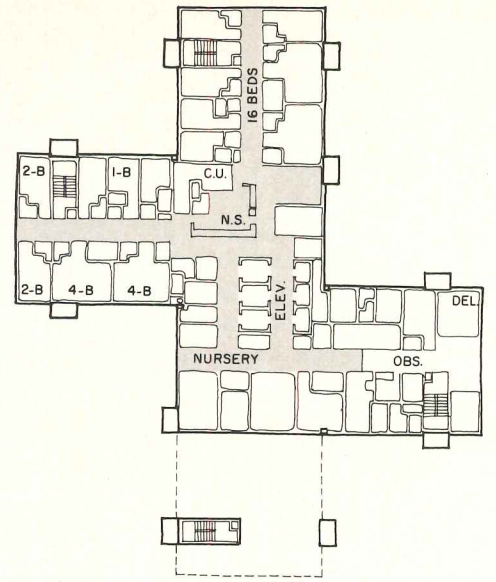
THE DOCTOR JOSEPH O. RUDDY GENERAL HOSPITAL, Whitby, Ontario. Architects: *Craig, Zeidler and Strong*—partner-in-charge: *James S. Craig*; structural engineers: *Gordon Dowdell & Associates*; mechanical and electrical engineers: *W. Hardy Craig & Associates Ltd.*; hospital consultants: *Agnew Peckham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

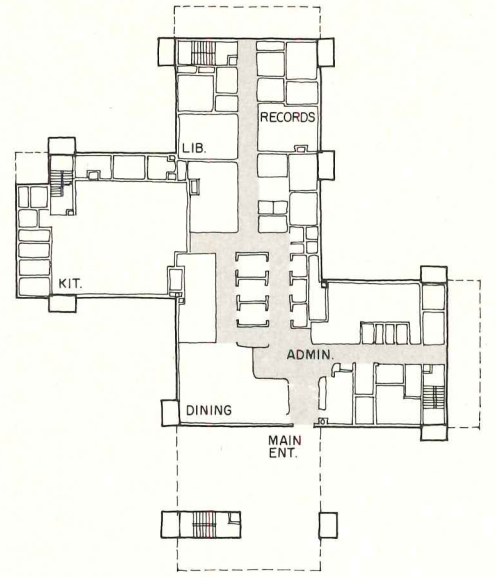


The sketches below show approximate shapes and articulation of formed units. The curved surfaces of the fiberglass forms were manufactured by George Krier, Jr., Inc., from models prepared by the architects in collaboration with Ted Bieler, sculptor.



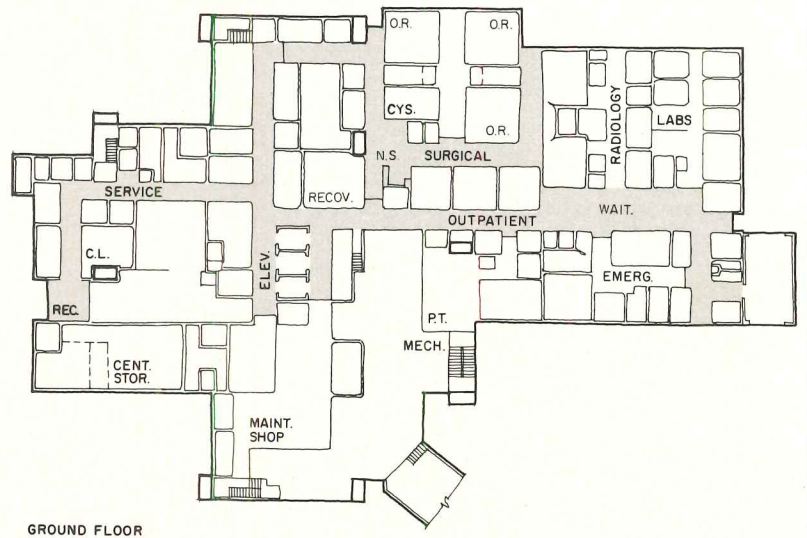


SECOND FLOOR

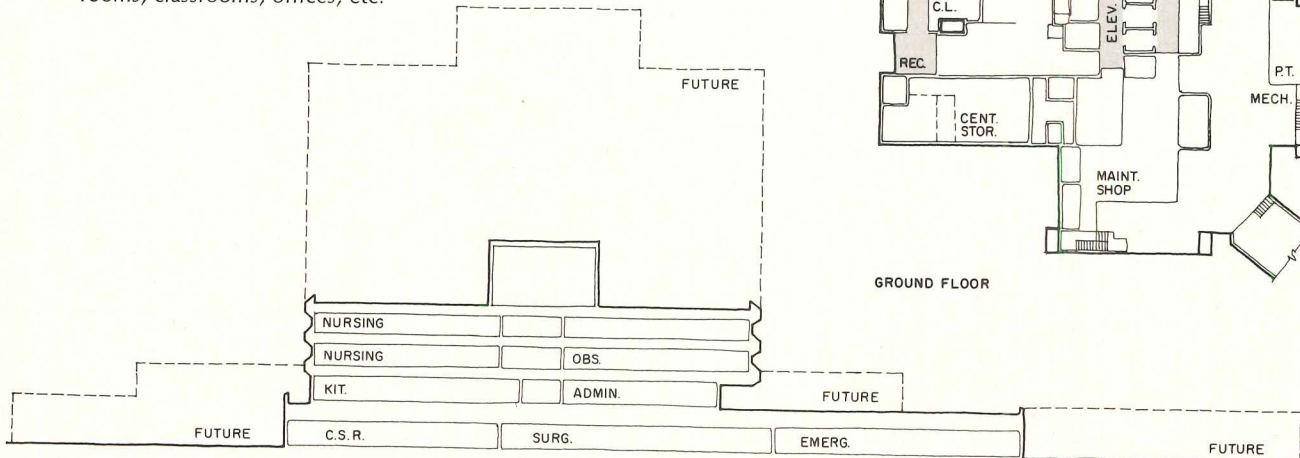


FIRST FLOOR

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.

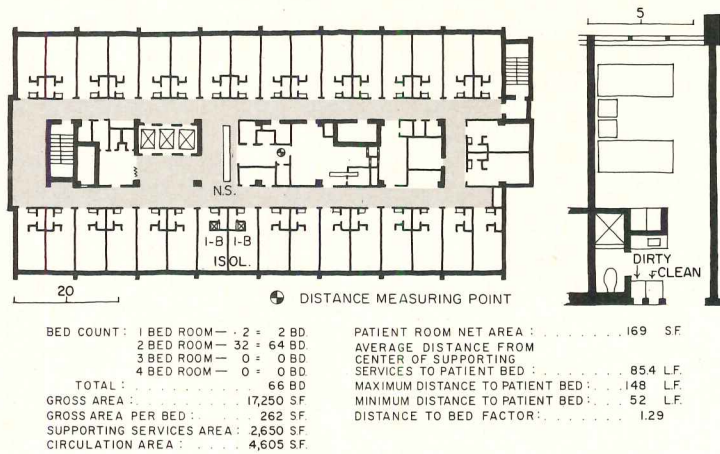
Obviously a clear recognition of each unit's organizational pattern is necessary before the evaluation can be accomplished. One of the most critical aspects is the variation in size, location, and make-up of the staff during *all* shifts. A plan with support space fully dispersed with a close patient-nurse 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.

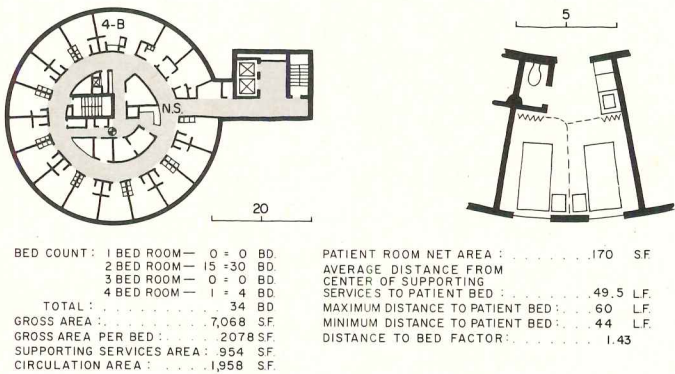
Although each of the cited unit analyses related originally to different hospitals with varying parameters, the rankings of general plan types are surprisingly consistent. The compact plan is recognized as generally superior, with one qualification: the exterior shape is far less an indicator than the 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.



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



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

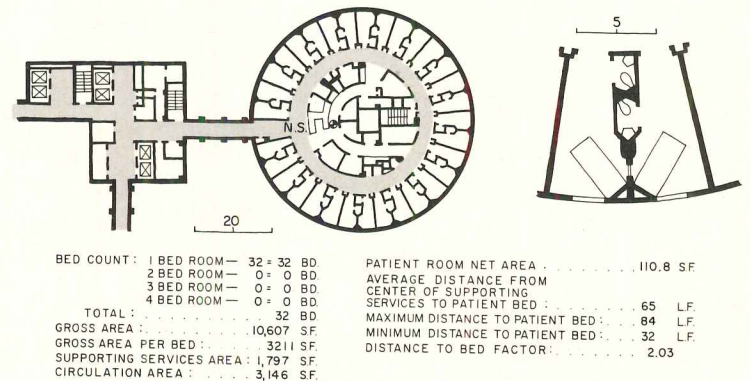
a strong plea for the private room—both from the standpoint of the patient's privacy and comfort, and the hospital's objective of maximum occupancy. The serious problem of contagion, he noted, is greatly simplified, and the physician or nurse can give better examinations and take more complete histories 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.

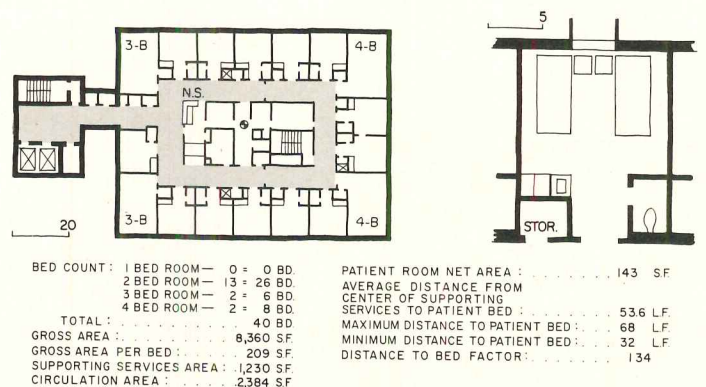
In addition to the advantages posited by Bacon, there are other advantages. Patients can become ambulatory earlier when toilet and shower are near at hand in the room. Any room can be used for isolation. Medication errors are reduced. Finally, the hospital realizes some very considerable economies as 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.



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



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

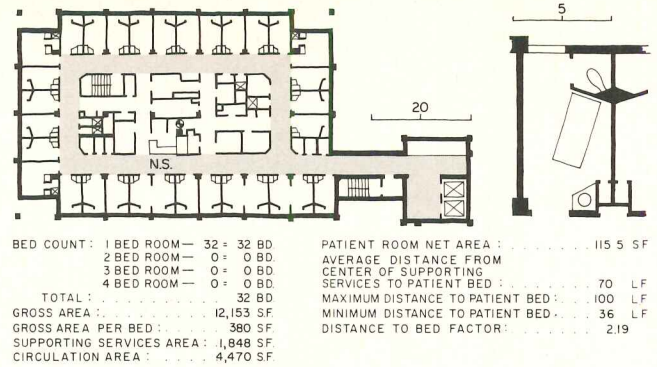
Originally some hospital people, as well as architects, felt unsure whether the public (and the insurance companies) would accept these rooms. A compromise solution, two-bed rooms divided by a movable partition, was tried at a number of hospitals, including *Paradise Valley Hospital* in National City, 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.

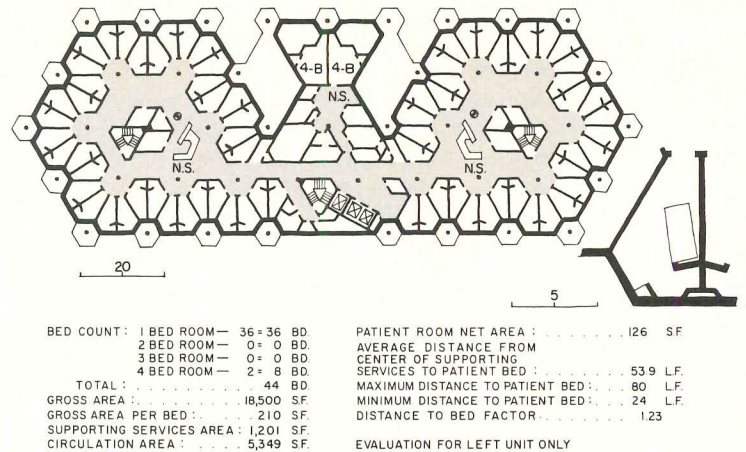
Hospitals can realize cost benefits from single rooms, and, in several, single-bed room rates are identical to two-bed room rates. A 1968 study by architect Herbert McLaughlin compared hospitals with single and two-bed rooms on the basis of the following costs: construction, furniture, maintenance, house-keeping, 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 *Centinel 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.

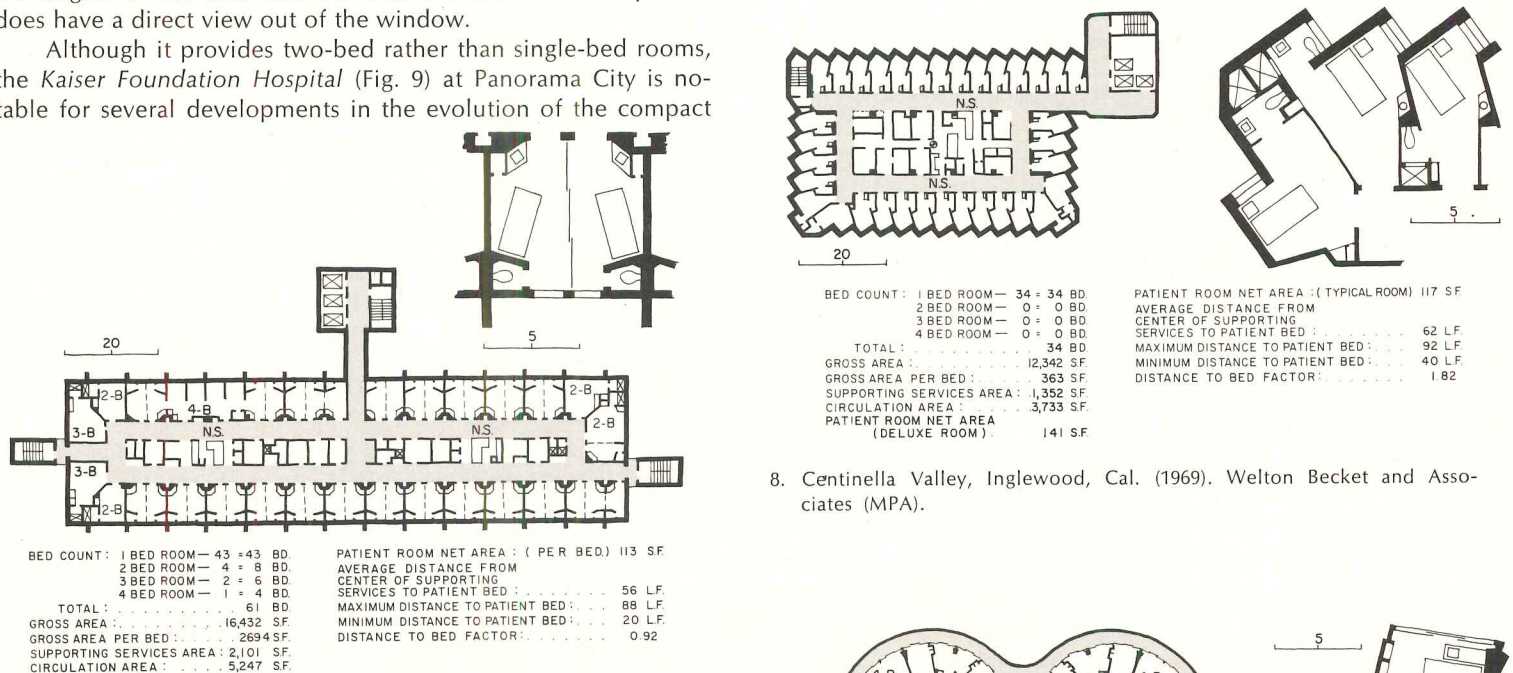
Although it provides two-bed rather than single-bed rooms, the *Kaiser Foundation Hospital* (Fig. 9) at Panorama City is notable for several developments in the evolution of the compact



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



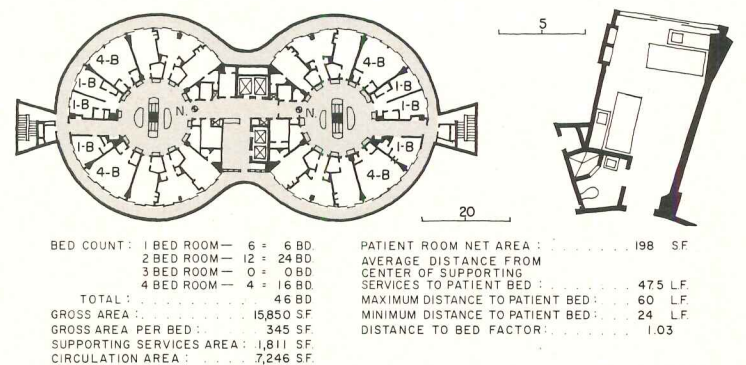
7. Kaweah Delta, Visalia, Cal. (1969). James P. Lockett (MPA).



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

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

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.



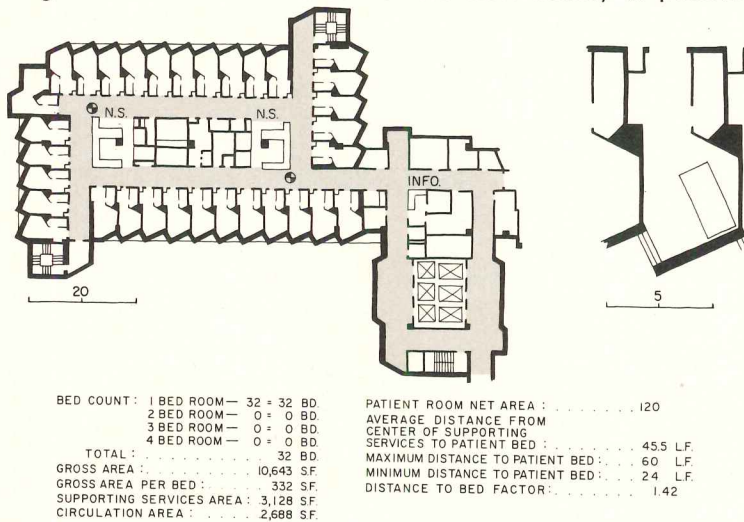
9. Kaiser Foundation, Panorama City, Cal. (1962). Clarence W. Mayhew.

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.

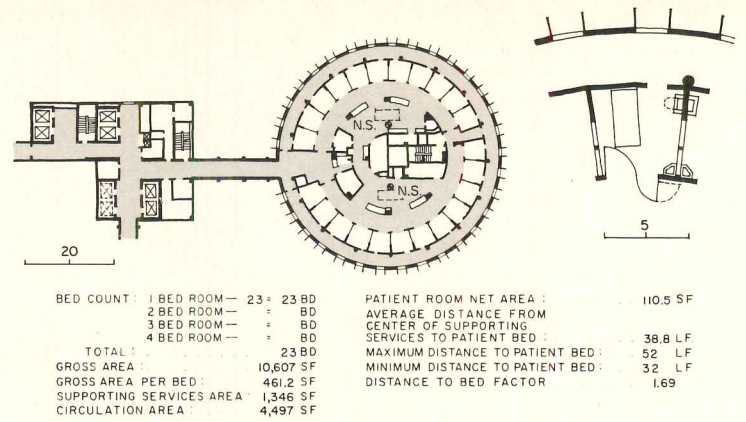
Thus we are able to improve the patient-nurse link, as was done at *St. Vincent's Hospital* in Los Angeles (Fig. 10) by placing at the center of the unit only those items which are essential to direct patient care. For a module of 16 beds—the number which *St. Vincent's* has established as the number 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.



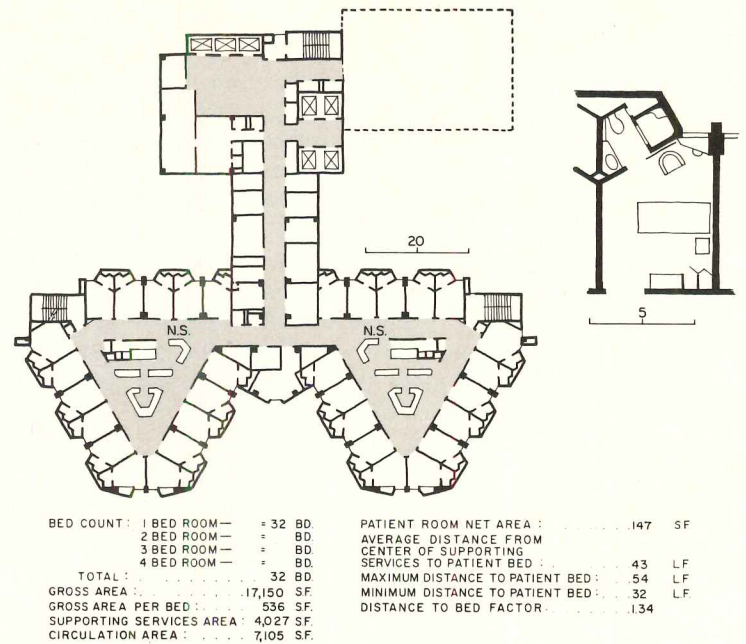
10. *St. Vincent's*, Los Angeles (1970). Daniel, Mann, Johnson & Mendenhall (MPA).

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.



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



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.

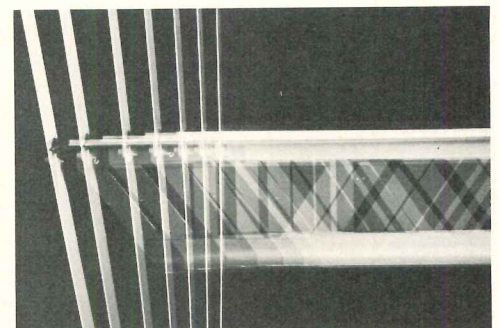
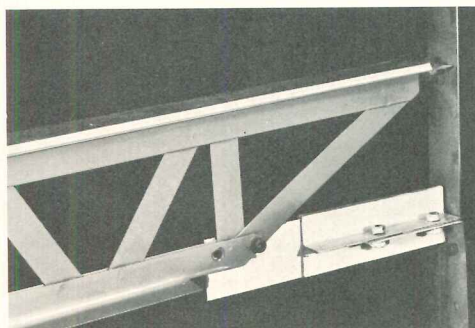
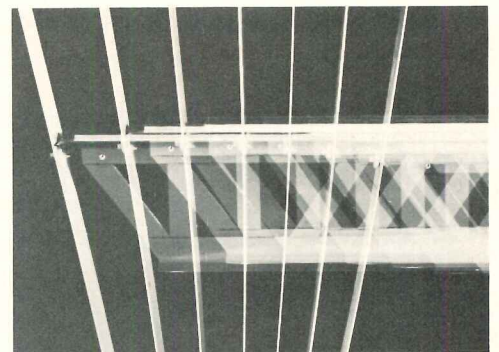
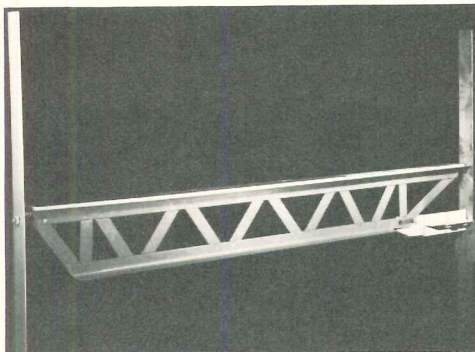
Approximately 10,000 dampers are being installed in each 110-story tower. About

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.

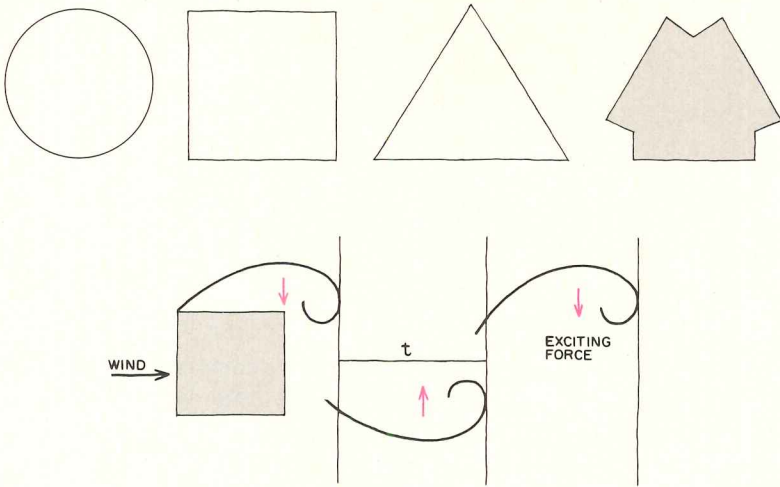
The structural engineers chose the bottom chord location for the dampers because it offered a "large" (relatively speaking) available displacement. Further, it caused no physical interference with any of the other building components. The dampers could not be too stiff, or the wind forces would have 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.

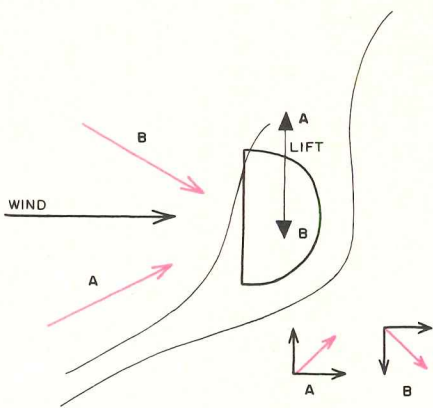
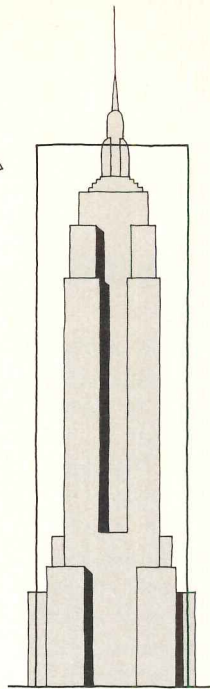
When the frame is undamped (top), the energy is only slowly dissipated, so the frame swings farther to the right than when it is damped (bottom).

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.

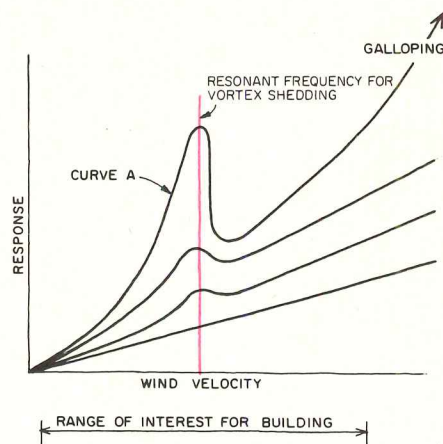
This tendency is minimized by making the building irregular in shape or by giving it a highly textured facade (of some scale).



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 re-

sponse 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.

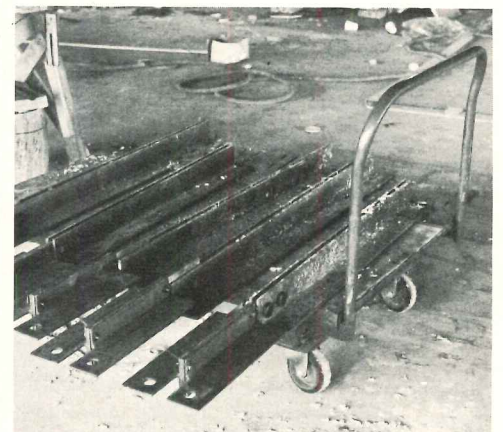


The elastic restoring force of a strained viscoelastic material results from the distortion of chemical bonds and the decrease in the number of possible conformations due to uncoiling of polymer chains. The viscous resistance to deformation is due to the liquid-like drag which the chain segments encounter 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 enclosures.

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.

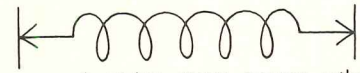
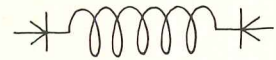
High buildings need damping so the wind won't bother structures or people

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.

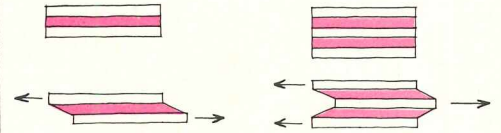
The picture is confused by the fact that over the height of the building, the wind velocity changes. So, the excitation comes at many frequencies, at many levels. And, further, if the building is irregular in shape, you get an additional complication of these exciting frequencies.

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

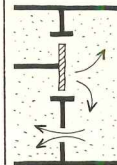
The principles of damping devices



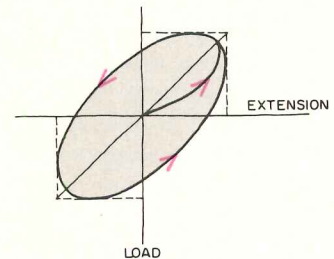
A spring stores energy rather than dissipating it; thus, a spring cannot act as a damper. Once a restraining force is removed, the spring pushes out with the same force.



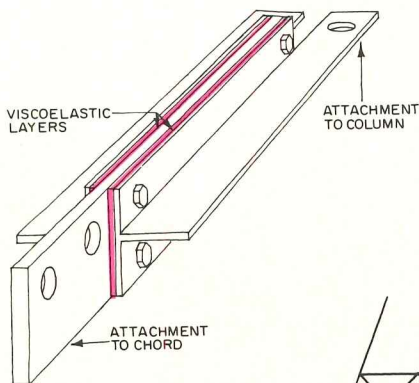
Viscoelastic materials work well as damping media because energy is dissipated as the materials are strained in shear. Because of their elastic nature, they will return to their original shape in time.



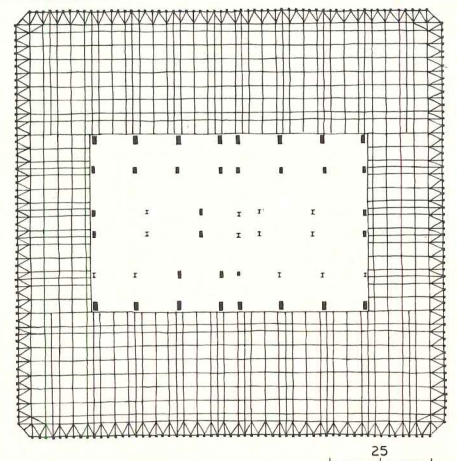
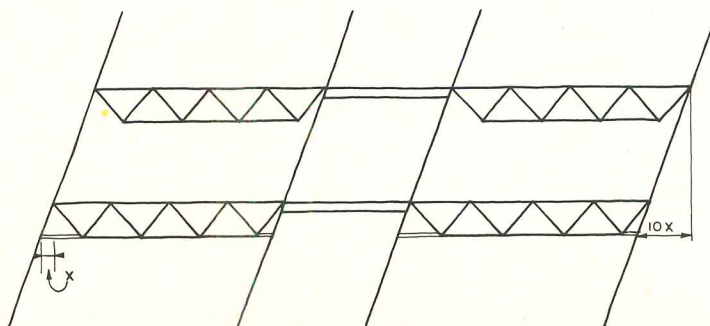
A dashpot often is used as a damping device, but the liquid obviously has to be confined by a container. Further, it is less efficient for its size than a viscoelastic damper.



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

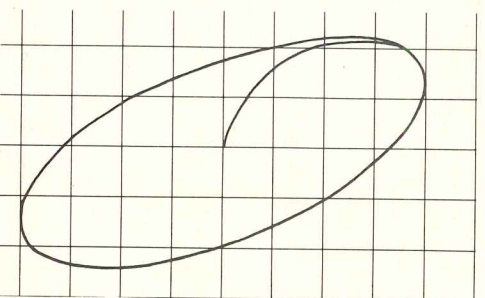
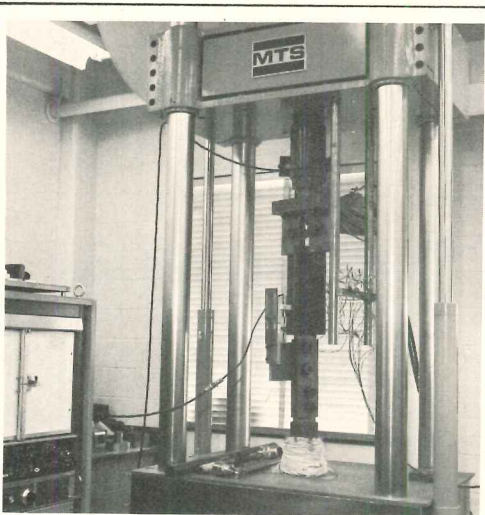
just keeps pumping into a building like soldiers walking across a bridge—they just keep pumping energy into it. But if the wind keeps putting energy into a building with insufficient damping, eventually the point is reached where it is oscillating too much.

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.

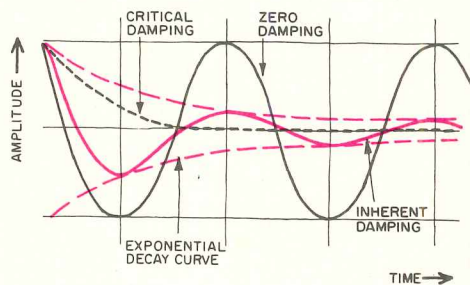
Floor vibration can be damped using engineered materials

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.

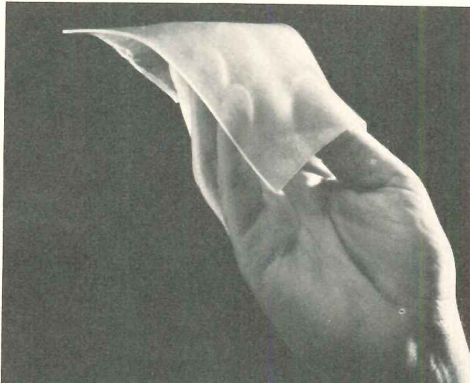
If the designer is dealing with, say, a mezzanine in a store, the addition of depth could be very very costly because it would influence the whole building, not just the mezzanine. So the designer might very well find it economical to put damping into the floor. Damping doesn't prevent vibration. But,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



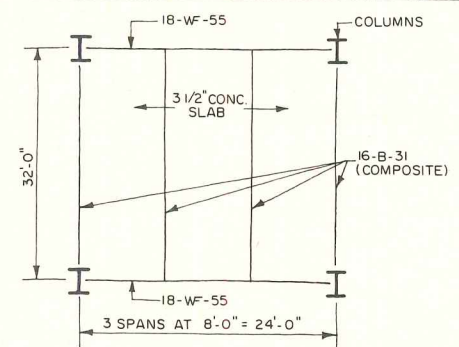
A trace of an actual “hysteresis-loop” plot made by the graphical plotter connected electrically to the testing machine shown at top.



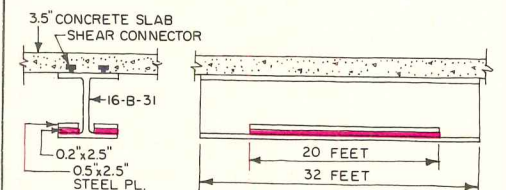
FREE OSCILLATION WITH VARIOUS DAMPING RATIOS
With no damping a body will continue to oscillate at the same amplitude. Increased damping decreases the amplitude. With critical damping, the structure stops before one cycle.



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.

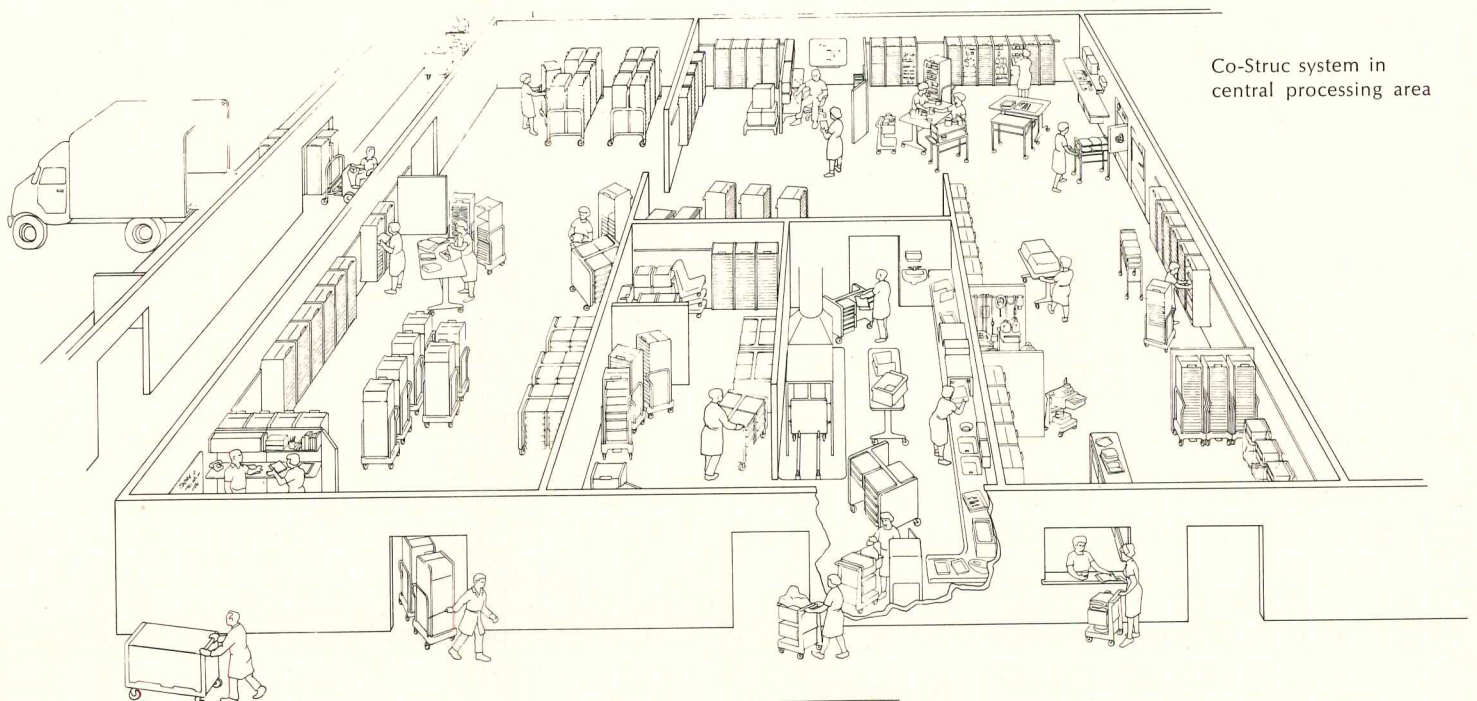


A system of coordinated containers, frames and carts for hospitals

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

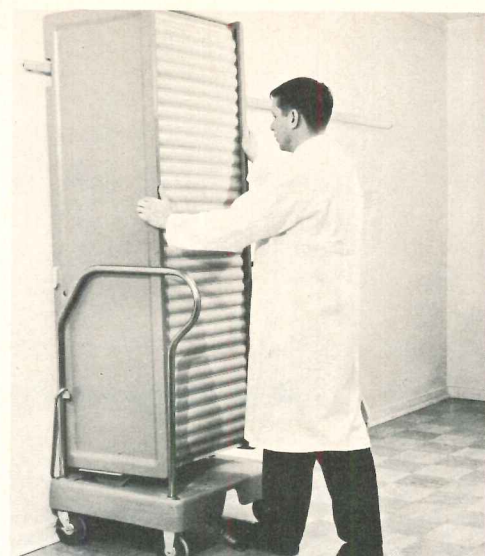
grounds of scope and utility that could be translated into a system of sterilizable and durable components. Such a system would also need acceptable esthetic qualities of color and finish. The result of this research, having been tested in the field, is now ready for introduction to the national market.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

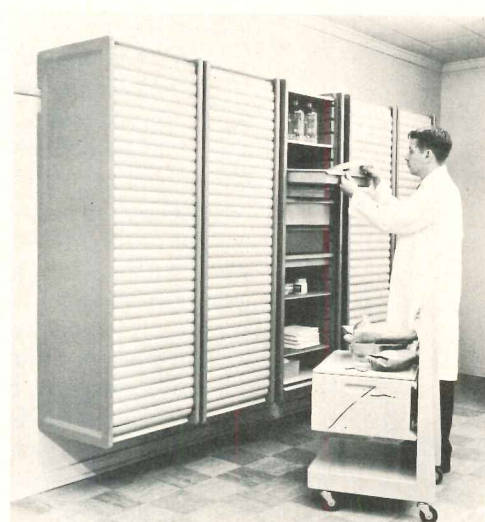
Adaptability to the individual needs of patients and hospital procedures is also part of the objective of the interchangeability of components of various sizes and depths. Rails mounted at various heights allow cabinets to be placed for a variety of services.

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.



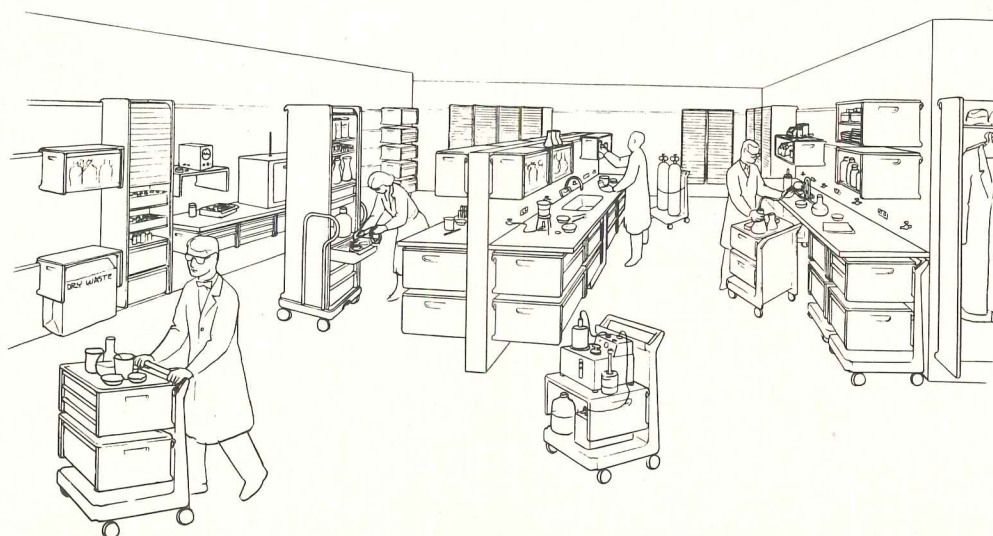
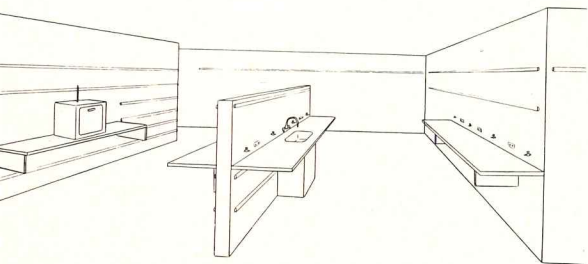
Special carts to transport the system components can also be used as a means of transporting medical supplies and meals, or as portable room service units that can be moved out while the room is being cleaned.

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.

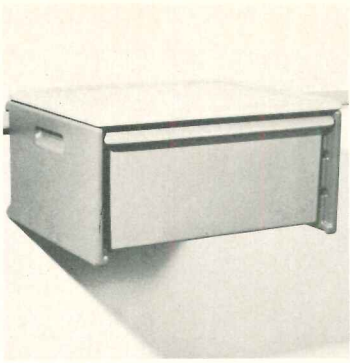


Waste and soiled linen handling is accomplished by the system through a special series of components that allow collection in disposable bags attached to special frames. (See at left of laboratory sketch below and

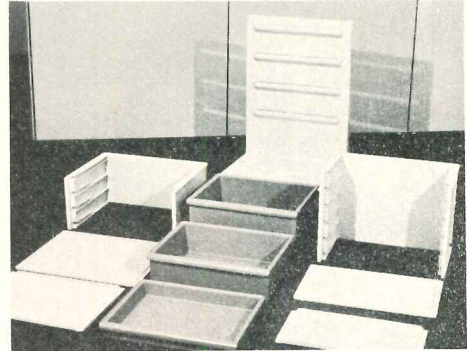
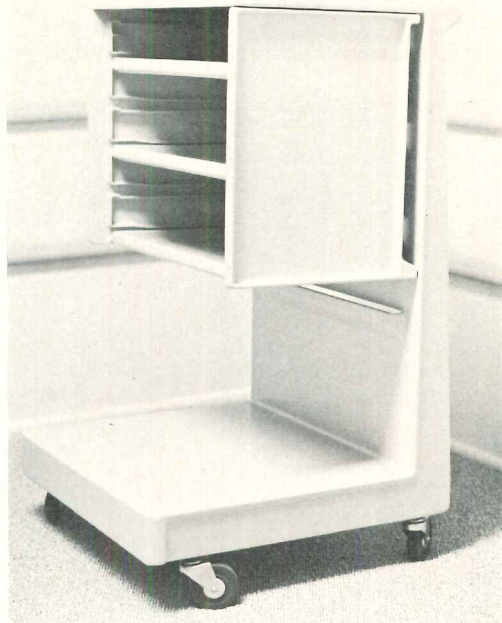
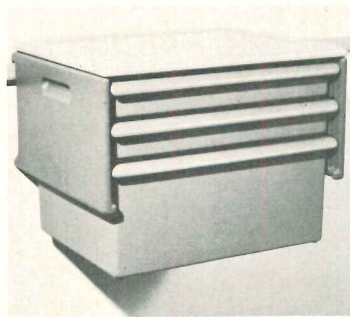
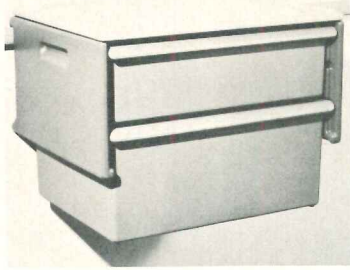
at bedside, page 163). For large capacity waste collection and handling, special carts with pivot bosses permit manual dumping of containers. Bottom-opening bag liners are available for waste handling.



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

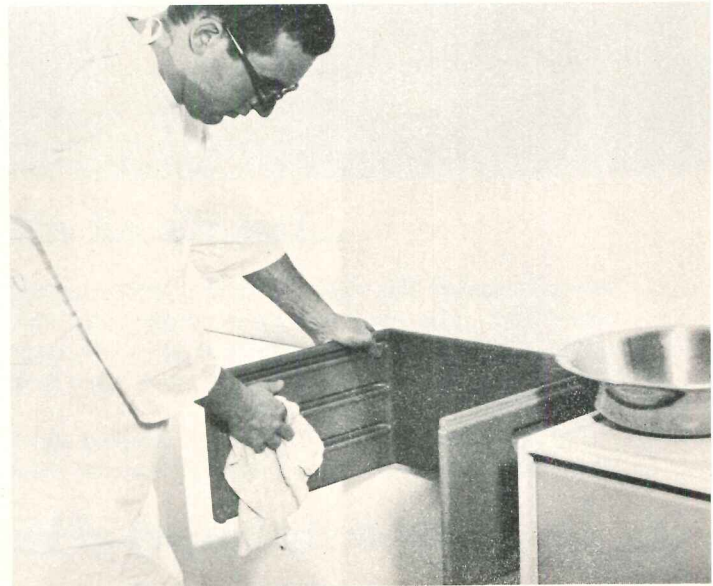


All components of the system are seamless plastic without sharp corners and with completely drainable surfaces accessible to dishwashing jets. All disassembled parts will tolerate commercial dishwashing temperatures and chemical cleaning. Components are either hung from wall hangers or from hangers on 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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any commercial installation. Mrs. Butterworth's couldn't stay sweet on Monarch's carpet of HERCULON fiber. But your clients will.

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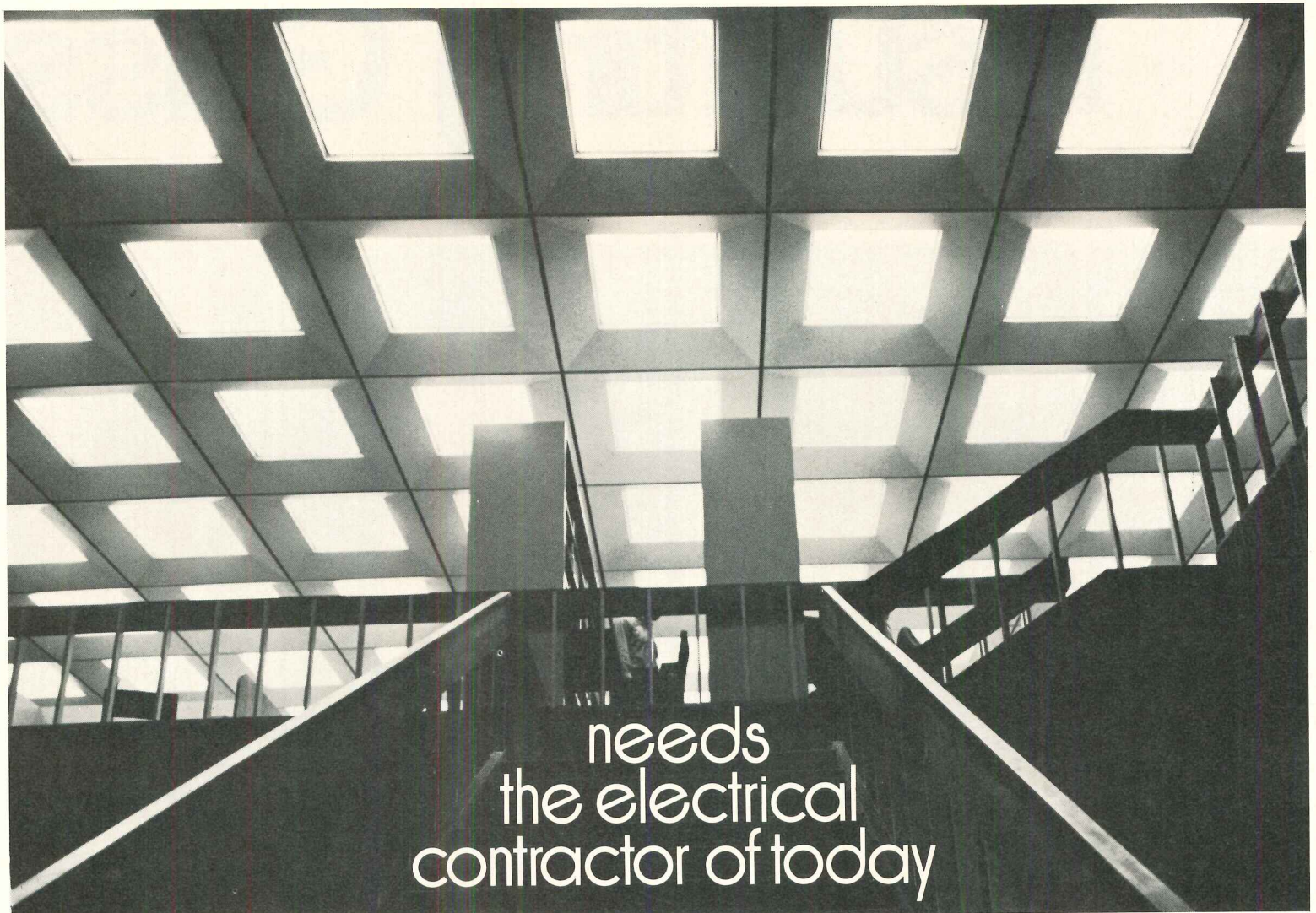
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The integrated electrical ceiling. Offering great design flexibility, it promises comfort and efficiency for years to come. It heats, cools, lights, and carries communications . . . thanks to electricity.

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He, and he alone, possesses the theoretical and technical skills to translate new designs and concepts of electrical technology into working, functioning realities. Trust the qualified electrical contractor to wire your building safely. To anticipate future as well as initial power needs. To coordinate the work of other specialists — carpenters, sheet metal men, heating and refrigeration experts — while he himself handles everything electrical in such installations as integrated ceilings.

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PPG Solarban[®] 575 Twindow[®] Insulating Glass.



How a PPG Environmental Glass gave The Regency Hyatt House—O'Hare, a highly visible and exciting design.

The architect for The Regency Hyatt House near Chicago's O'Hare Field wanted to give guests a comfortable, but exciting and "open" environment. He began working on his design concept by experimenting with circular tower shapes. Modern environmental glass, it proved out, was the most practical, exciting material for his circular design.

Working with PPG, the architect

investigated several of our Environmental Glass products. He chose *Solarban 575 Twindow* insulating glass because it answered his many design objectives. Its high reflectivity offered high visibility and visual excitement for the building. Its double-glazed construction offered insulation against the demanding Chicago climate. It also acted as an acoustic barrier against aircraft noise.

Just as important, the performance characteristics of the glass would enable the owner to reduce his investment in heating and cooling equipment, as well as cut annual heating and cooling bills.

See PPG about *Solarban 575 Twindow* insulating glass—or the others in our family of Environmental Glasses for your next building. Early

in the design stages. There's a PPG Environmental Glass that you can use as an active design medium to meet any esthetic consideration, increase occupant comfort, and contribute to a return on investment.

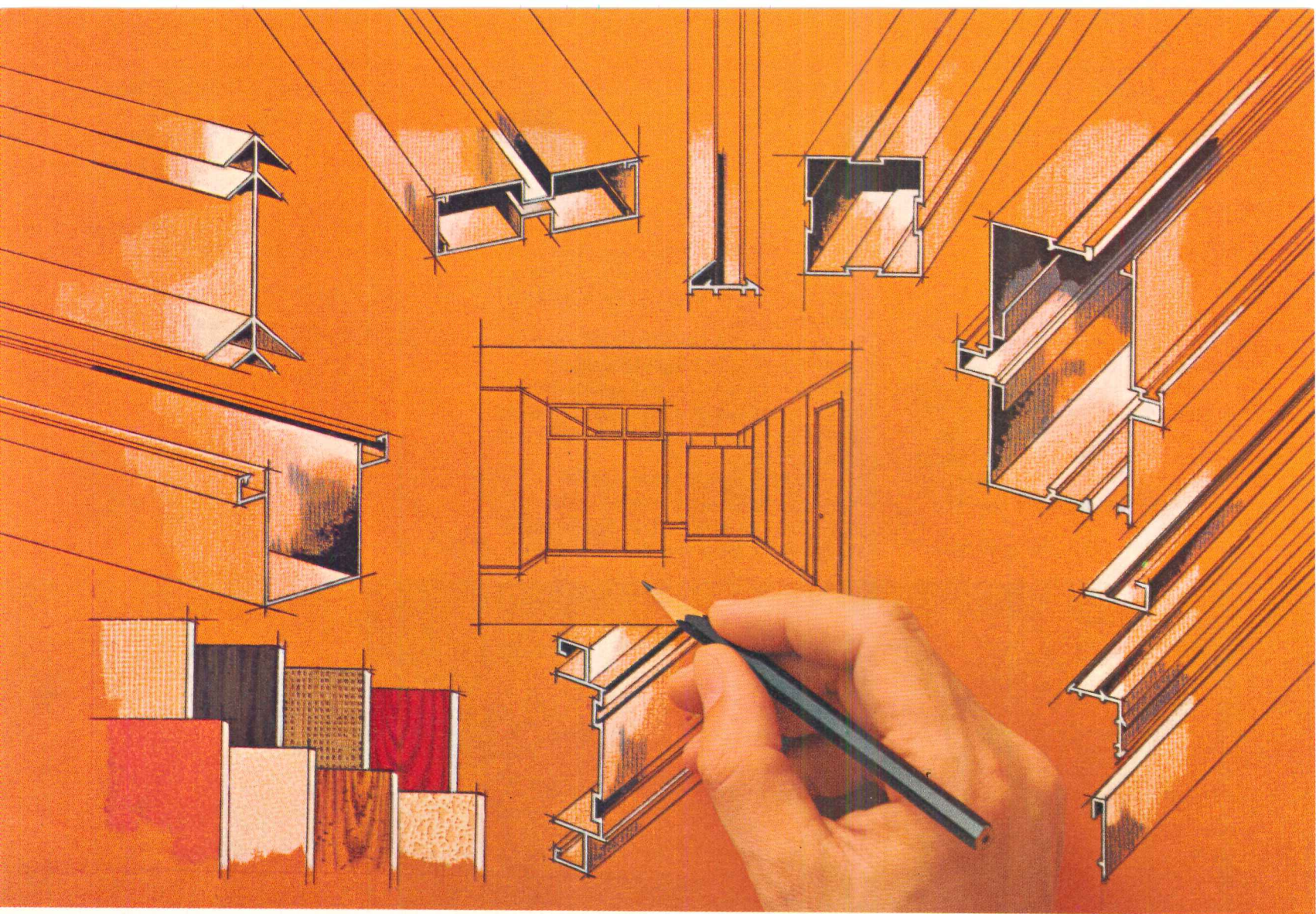
Write PPG Industries, Inc., One Gateway Center, Pittsburgh, Pa. 15222.

PPG: a Concern for the Future

Owner: Hyatt Corporation, Burlingame, Calif.
Architect: John Portman & Associates, Atlanta, Ga.

For more data, circle 73 on inquiry card

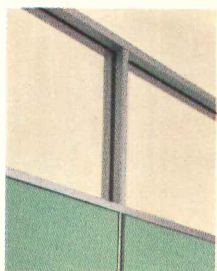




USG[®] Demountable Partitions give you much more to create with in space design.

USG Demountable Partitions combine the esthetic appeal you need to let your imagination work freely. And they offer all the practical reasons you need for ready client acceptance. Handsome reasons such as facings in predecorated TEXTONE[®] Vinyl-Faced Gypsum Panels. Solid reasons such as a one-hour fire rating and sound ratings up to 49 STC. And such complete finishing components as: color-coordinated vinyl-insert battens or low profile designs, recessed anodized aluminum base and floor runners with matching ceiling runners, anodized aluminum door frames with vinyl inserts, concealed hinges and screws.

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UNITED STATES GYPSUM 
BUILDING AMERICA

For more data, circle 74 on inquiry card

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.

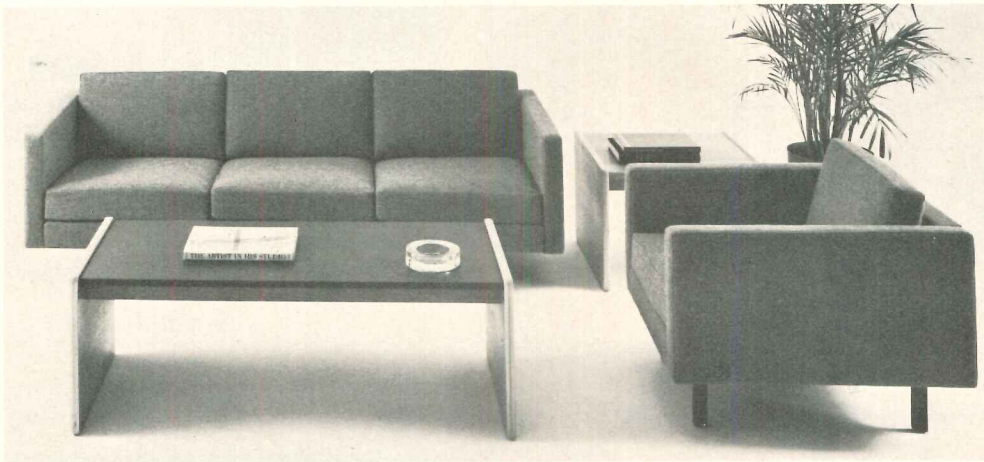
This year, because of the great number of designers expected to attend, Designer's Saturday is extended to a two-day event—Friday, October 15 and Saturday, October 16—with 20 present members participating in the open house. In addition, each firm

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.

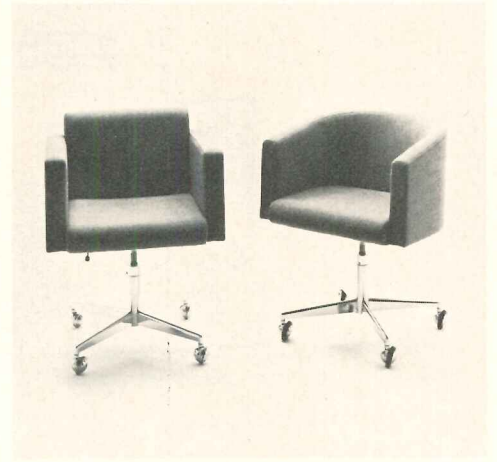
For additional information on Designer's Saturday, contact Judson H. Spencer, Designer's Saturday, 825 Third Avenue, New York City, 10022.

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 Propper Inc., Jens Risom Design Inc., Edward Axel Roffman Associates Inc., Janet Rosenblum Inc., Stendig Inc., and John Stuart Inc.



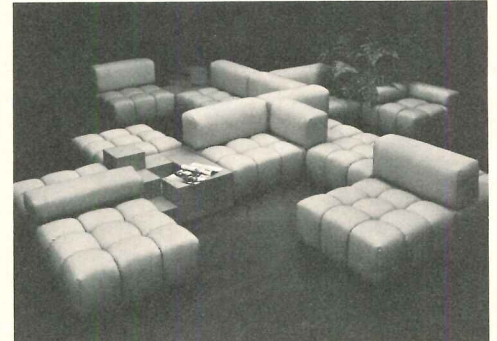
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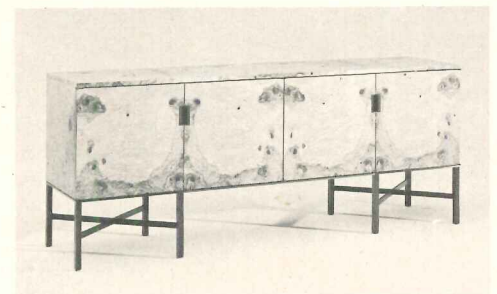
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302



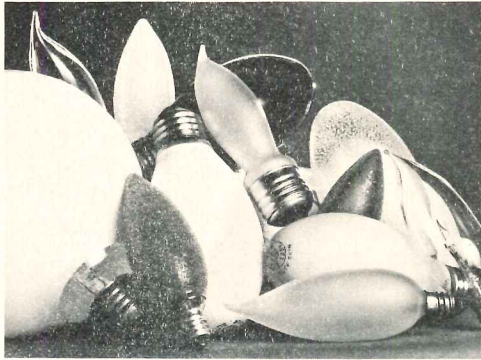
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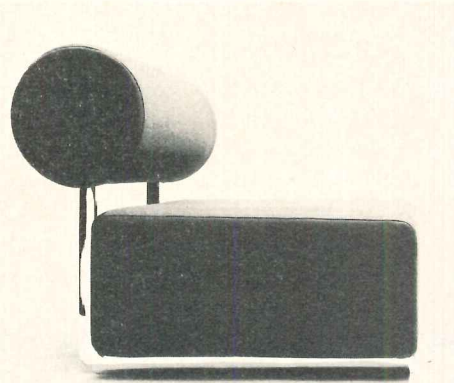
Circle bracketed numbers on inquiry card. Sofa and chair with low tables, Jens Risom Design Inc. (300). Upholstered, swivel-tilt armchairs, Stendig Inc. (301). Chair, two-position and three-position sofa, Atelier International. (302). Modular component system producing a variety of lounge seating configurations, Atelier International. (303). Olive burl, four-door cabinet, Dunbar Furniture Co. (304). More products on page 168.

continued from page 167



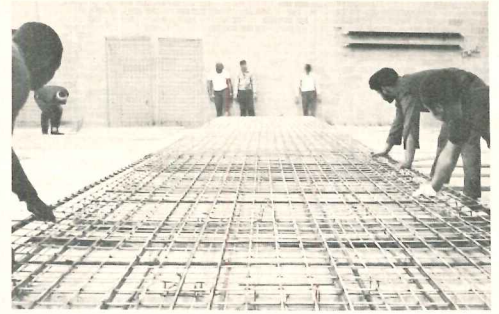
DECORATIVE BULBS / Twenty-three new sizes, shapes and finishes are available in exposed-bulb fixtures for both indoor and outdoor use. ■ General Electric Co., Cleveland.

Circle 305 on inquiry card



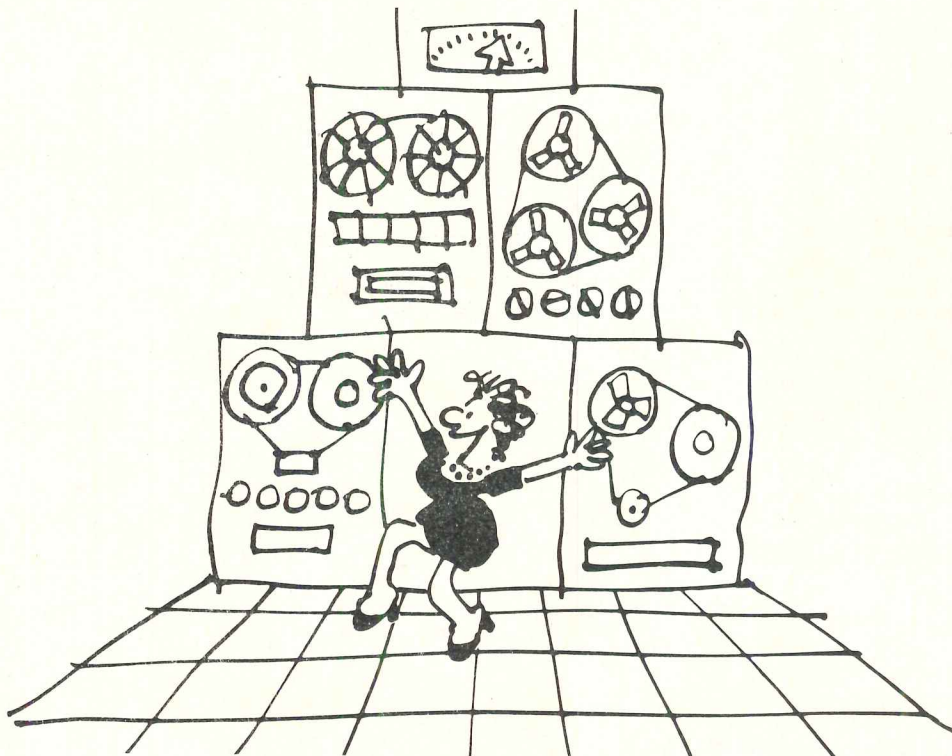
CHAIR / Chrome steel supports the cylindrical backrest and rectangular seat. This unit can be assembled on site. ■ The Slater Co., Chicago.

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



IBM, Honeywell, RCA, Control Data, NCR, Burroughs and Olga haven't been able to put a dent in us yet.

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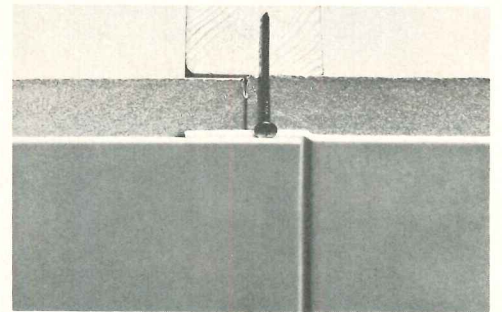
Name _____
 Firm _____
 Address _____
 City _____
 State _____ Zip _____
 Position _____

Perma-Kleen
 Laminated Plastic Floor Tile
GENERAL ELECTRIC



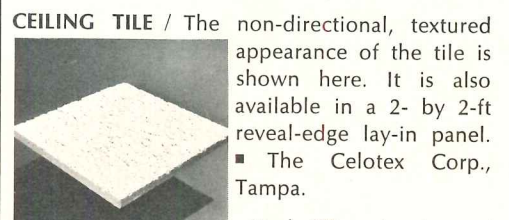
MANSARD ROOFING MATERIALS / Mineral-fiber clapboard, panels and shingles available in a wide range of sizes and colors to accommodate mansard roofing designs are offered by the manufacturer. Lightweight panels with plastic finish reportedly provide a high degree of weather resistance. ■ National Gypsum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

Circle 308 on inquiry card



PANEL SYSTEM / Laminated sandwich construction consists of a fibreglass 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.

For more data, circle 75 on inquiry card

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

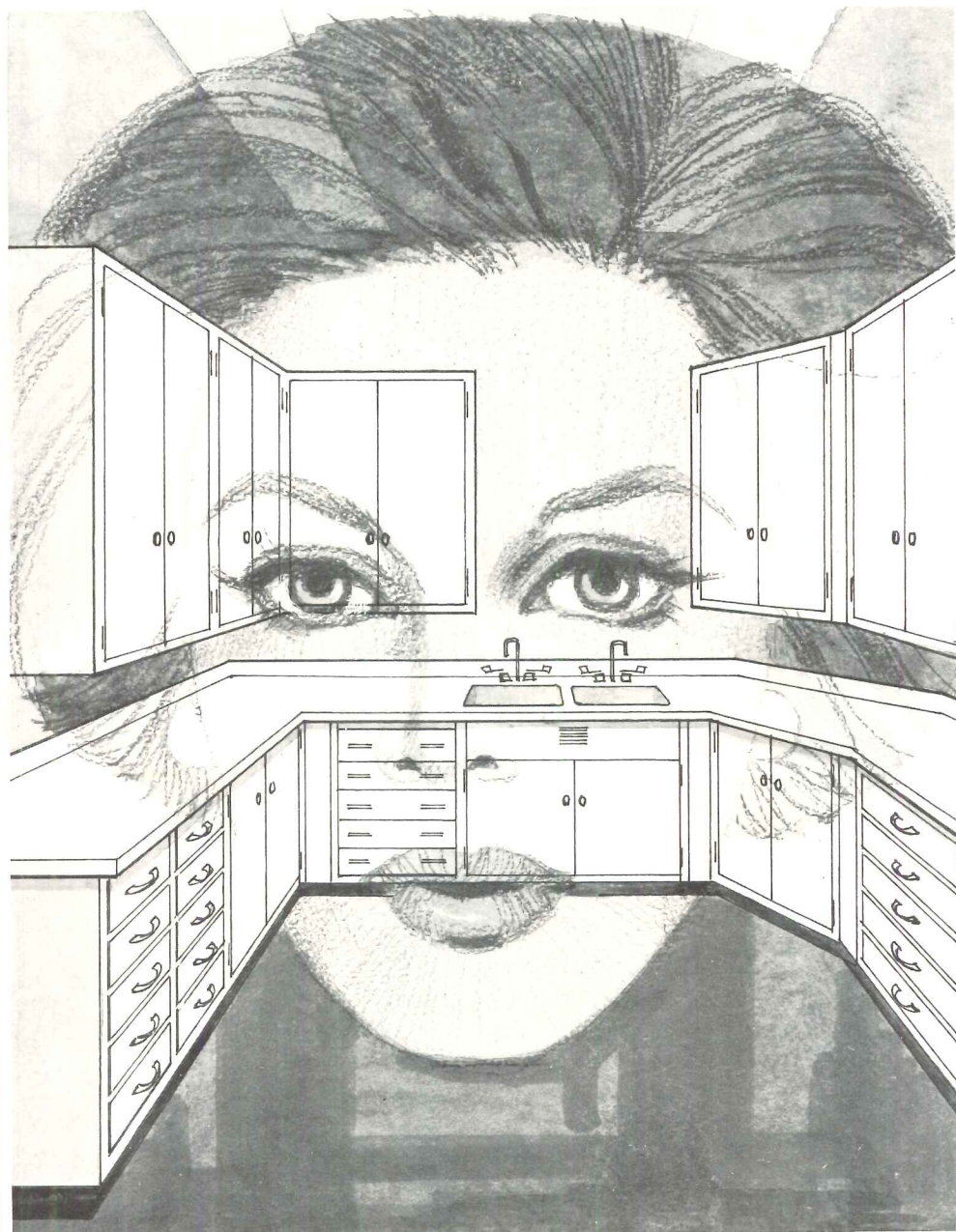
OUTDOOR LIGHTING EQUIPMENT / Product descriptions, retail prices and photometric information for key specification items are included in a 96-page catalog illustrating 1500 items. ■ Stonco Lighting Div., Keene Corp., Kenilworth, N.J.*

Circle 407 on inquiry card

*Additional product information in Sweet's Architectural File

more literature on page 238

◆ For more data, circle 76 on inquiry card



JUST ANOTHER PRETTY FACE?

Several companies produce hospital casework with good looks. But it's what's behind that pretty face that counts most. That's where we have the edge. Our efficiently designed casework is carefully crafted, using high quality materials and construction techniques to insure the highest standards in maintenance and sanitation.

Watson's beauty is more than skin deep. It's quality that goes all the way through.

Our best advertisement is the work we do. Any completed job can be used for customer reference. We are confident it will reflect the functional design, durability, and beauty inherent in all our products.

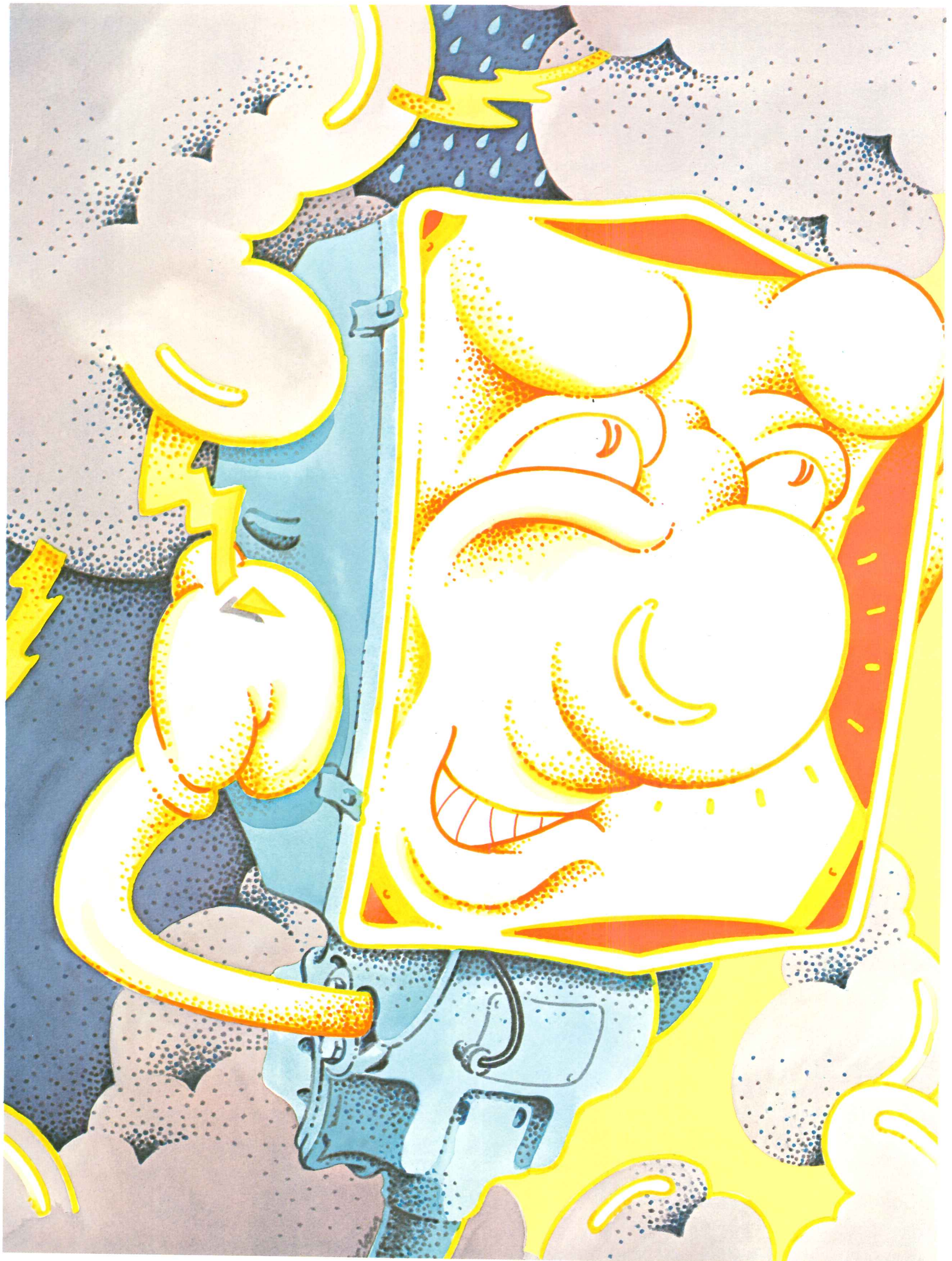
Today's hospitals demand the best. They expect Watson.



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For more data, circle 78 on inquiry card ◆



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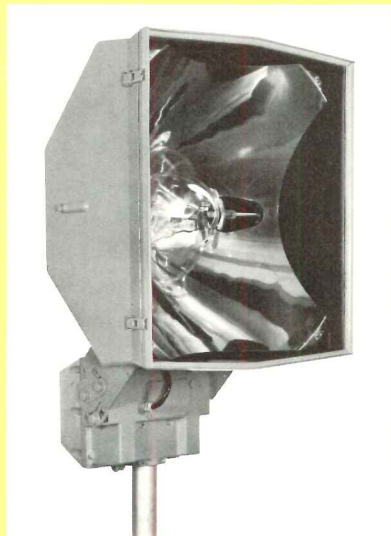
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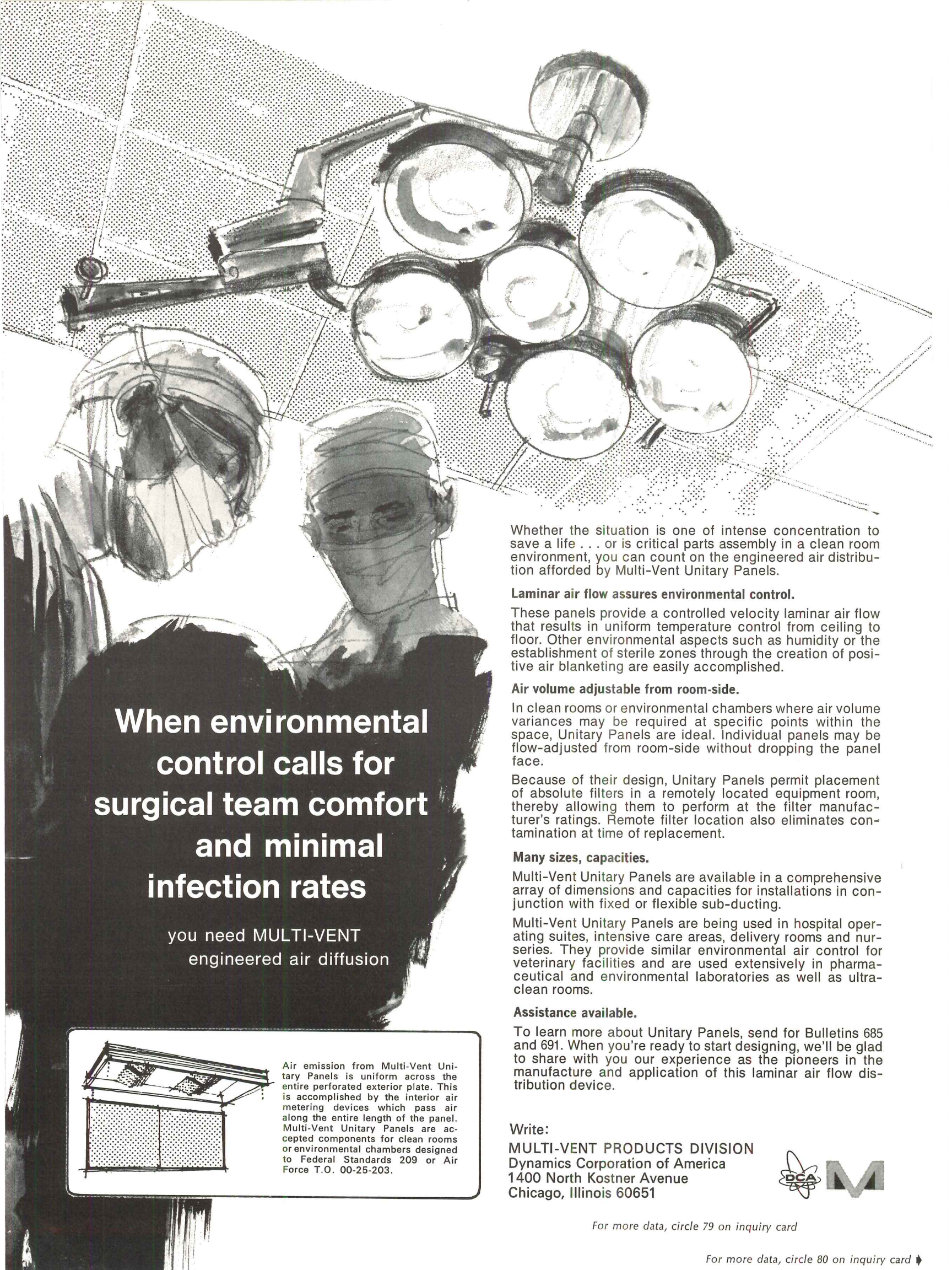
Then, too, with Tite-Lite you get lower maintenance; longer lamp life; and greater efficiency with the larger lamps (including the 1000-watt high pressure sodium, 1500-watt metal halide and 2000-watt European lamps). These Tite-Lite features add dramatically to your savings.

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.

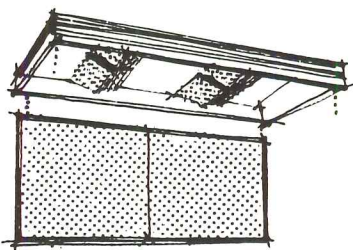
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Multi-Vent Unitary Panels are available in a comprehensive array of dimensions and capacities for installations in conjunction with fixed or flexible sub-ducting.

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.

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1400 North Kostner Avenue
Chicago, Illinois 60651



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 wallcov-

erings 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.

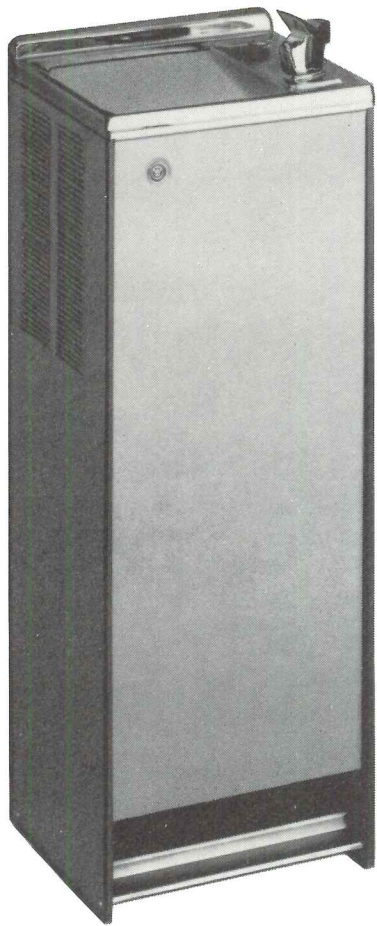
A note on your letterhead will bring samples. Write: Mr. H. J. Smith, Devoe Paint, 224 East Broadway, Louisville, Kentucky 40202.

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

The Water Works.

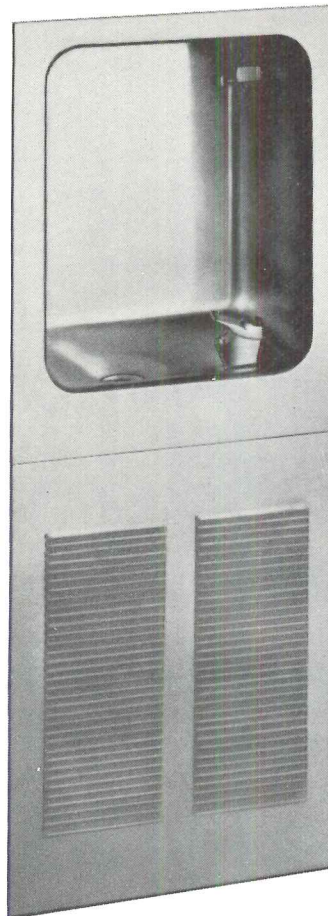
Heavy-duty floor model coolers

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



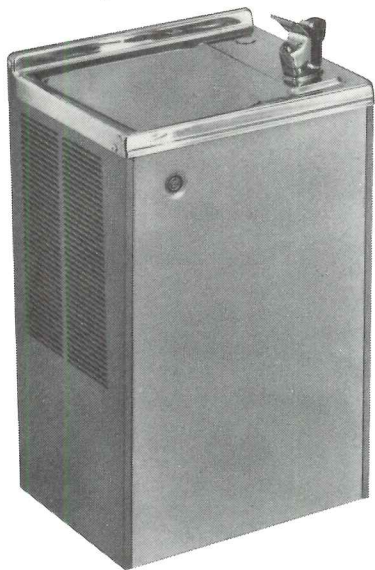
Totally recessed Water Cooler

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

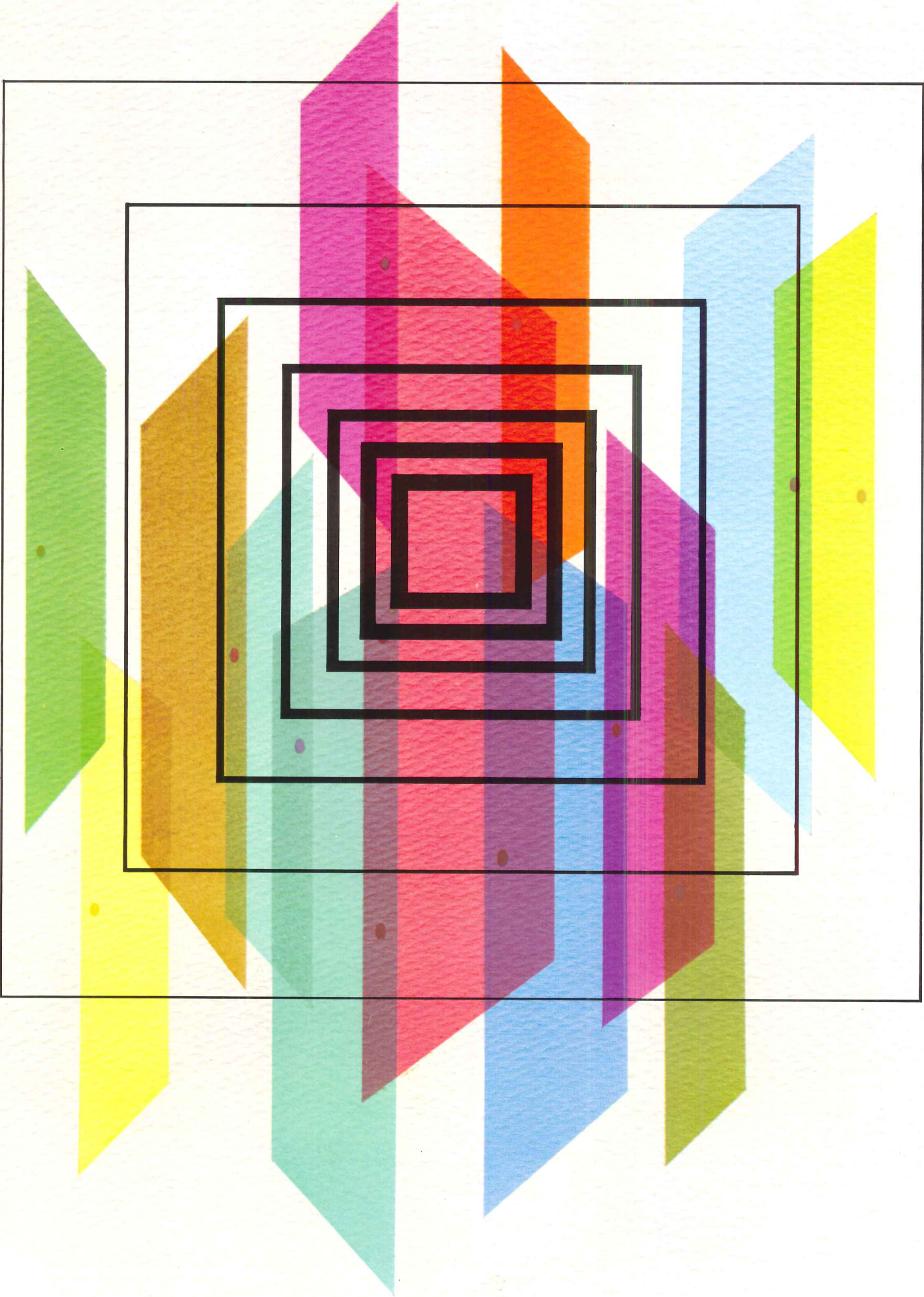


Study hall

Architect: Ronald Vaughn Associates

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

For more data, circle 82 on inquiry card



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 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.

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: Concrete Glass Aluminum	Excellent Excellent Excellent	Questionable Fair Questionable	Questionable Fair 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 ele-



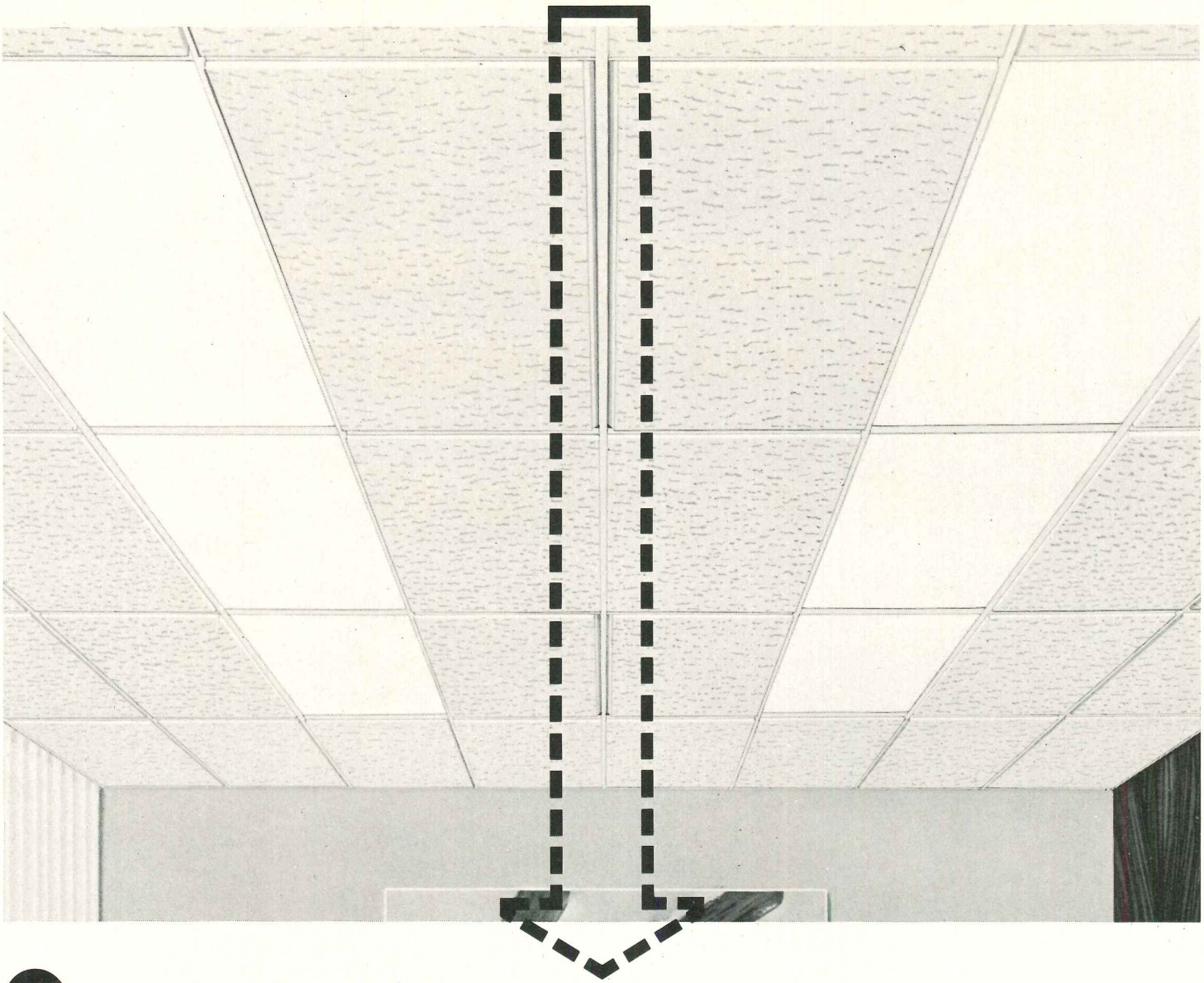
ments dish out over long periods of time.

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



**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.

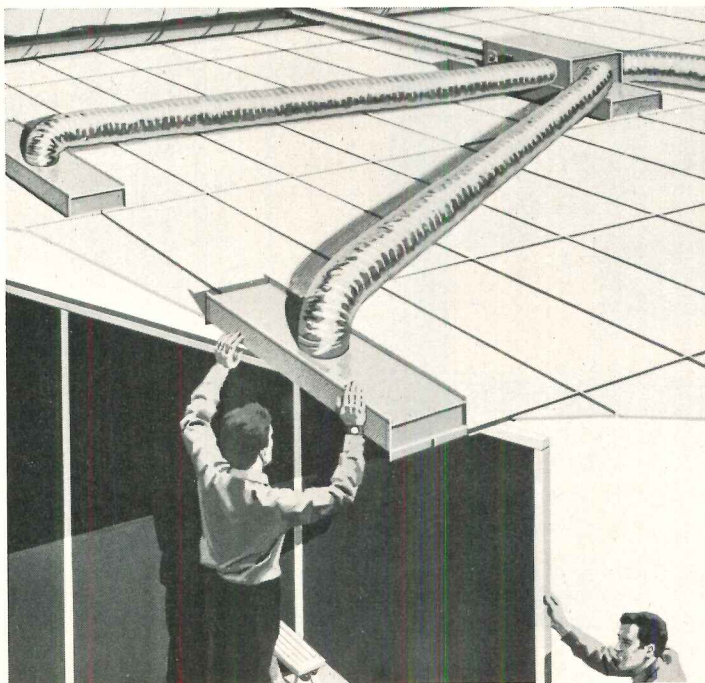
Cuts first cost up to 50 cents/sq. ft. (20%)

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.

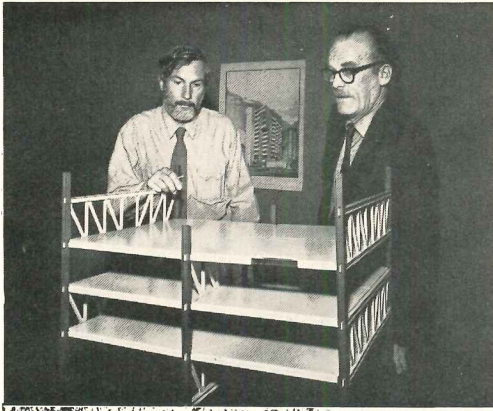
Single-source responsibility

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.



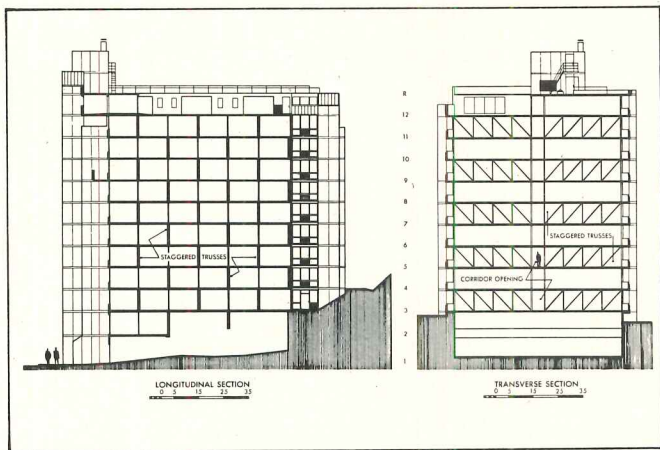
At 7 lbs. psf, staggered truss delivers a 1971 apartment house for 1968 costs.

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:

Floors	40# psf	Wind:	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 3-5/8" precast wall panels.

Interior Walls: At trusses: 7/8" insulating plaster on metal lath and steel channel furring. At stud walls: 1/2" gypsum board on each side and 1 1/2" batt insulation with 2 1/2" and 6" steel studs.

Ceiling: 1/2" gypsum board on 3/4" steel furring channels. 1/2" 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: 8'6-3/4"

Floor-to-ceiling height: 8'





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.

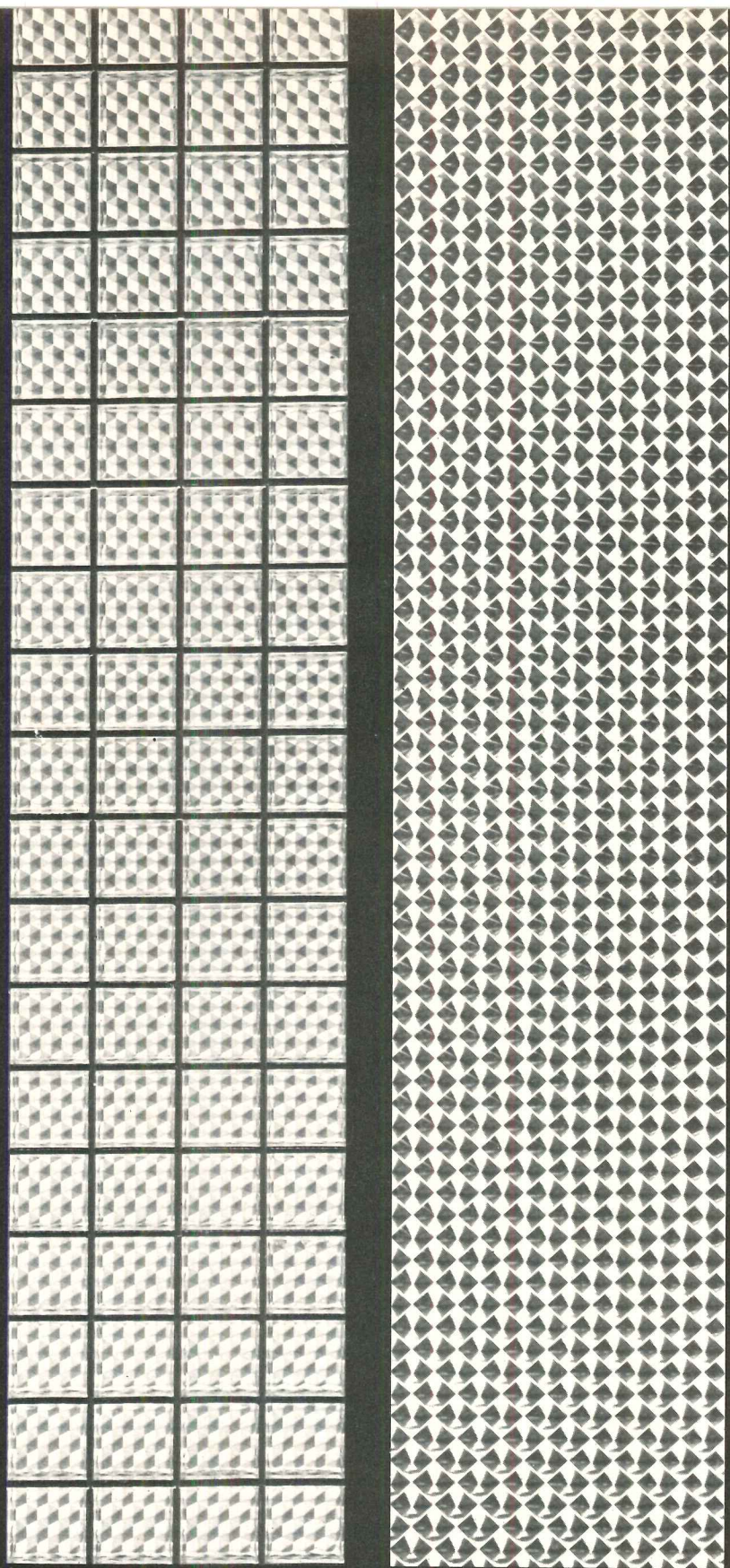
To get the real thing . . . SPECIFY "THE PROFESSIONALS" BY THE NUMBERS.

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



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.

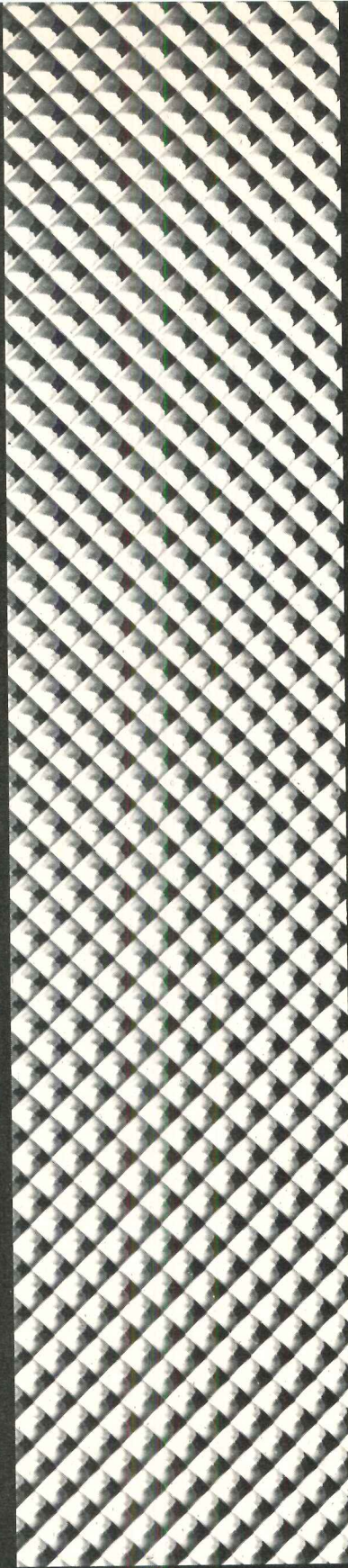
KSH-12

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.



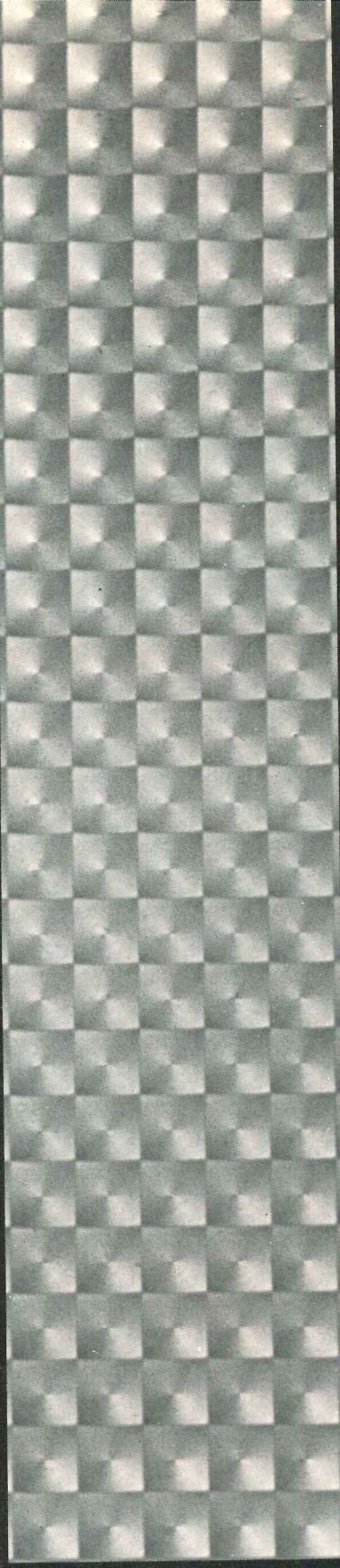
KSH-15

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.



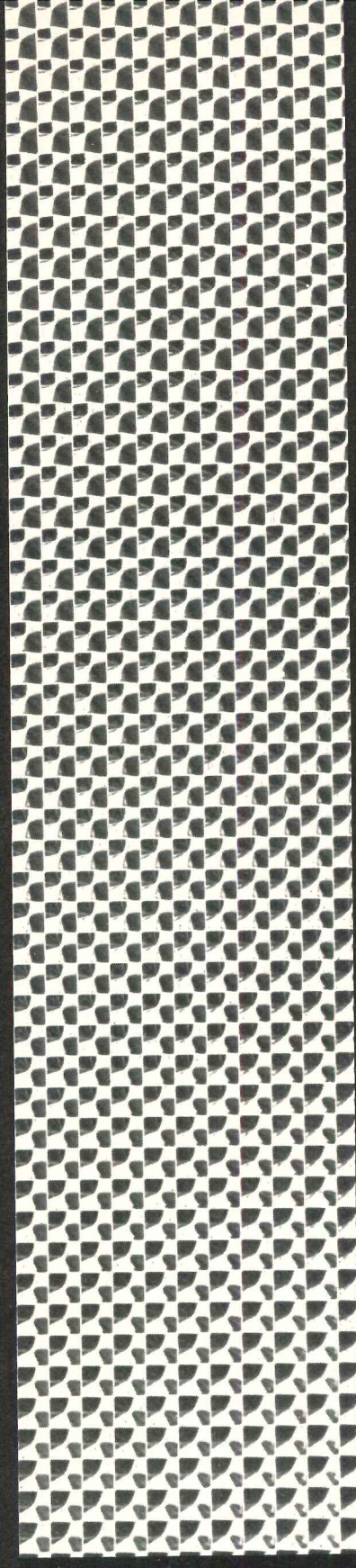
KSH-16

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

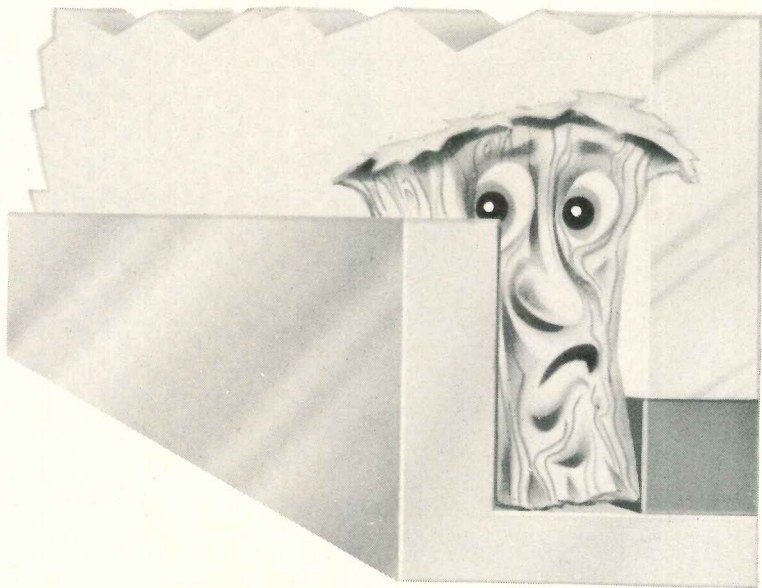
The panel that has everything. A bold modern pattern with thin sheet of acrylic on top. Direct and reflected glare control. High VCP ratings. Clear and silvertints. Sizes up to 4 x 4 in .240.



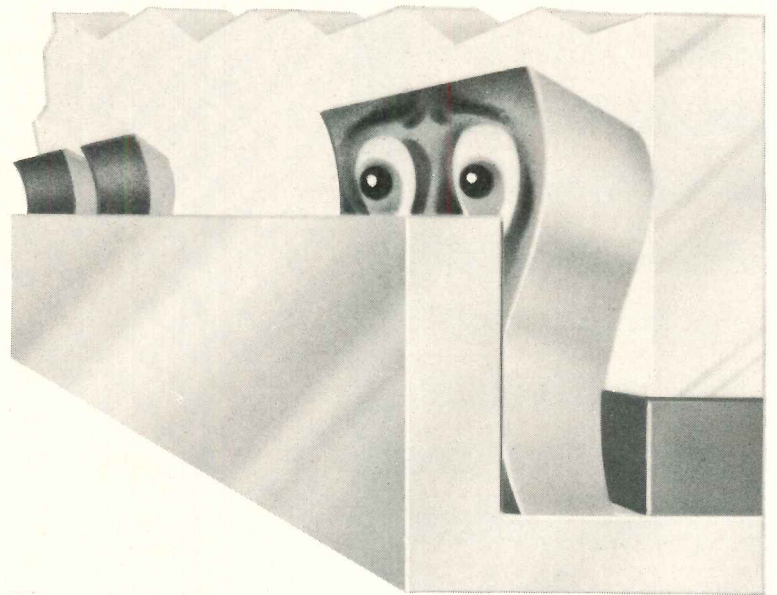
KSH-19

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.

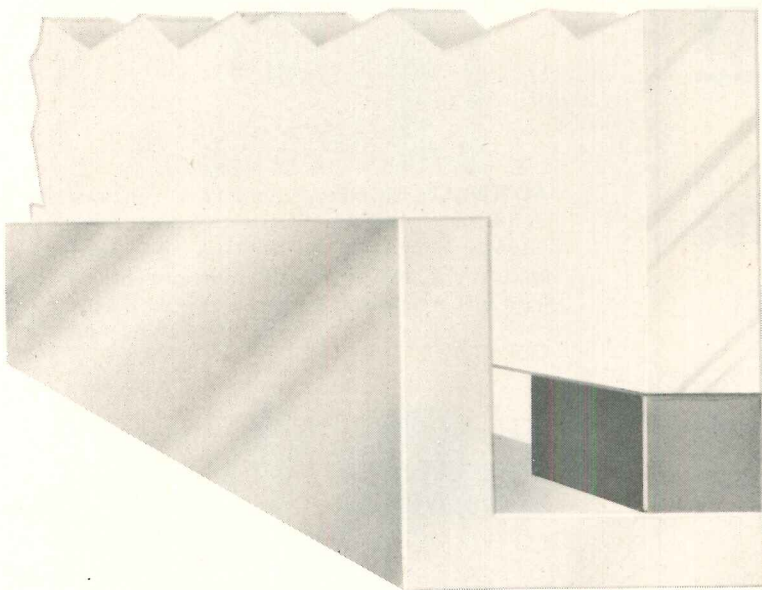
If a shim is unevenly spaced it creates pressure points which could cause glass breakage. A makeshift shim, like a splinter of wood or piece of floor tile, could cause sealant adhesive failure resulting from improper wind load transfer from glass to seal. And if there is no shim at all, the pumping action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

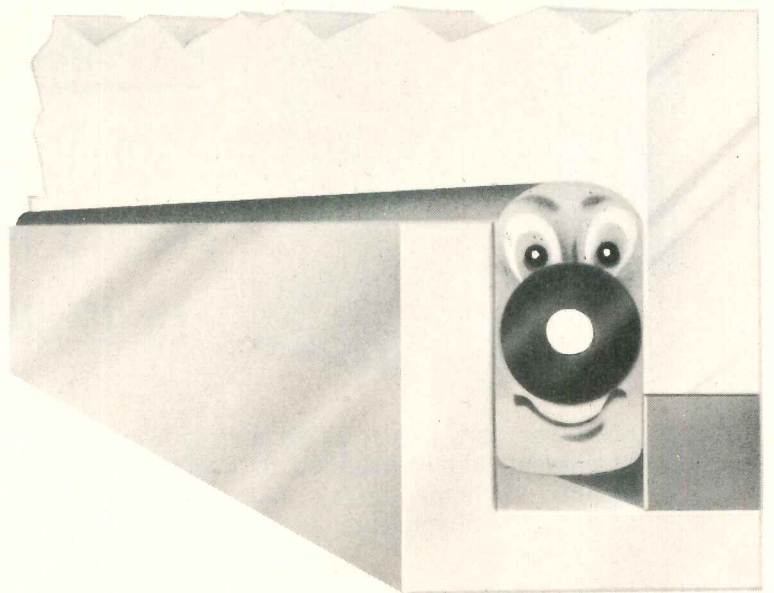
This shim — a continuous elastomeric rod reinforced by a fiberglass core — distributes loading stress uniformly around the perimeter of the frame.

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

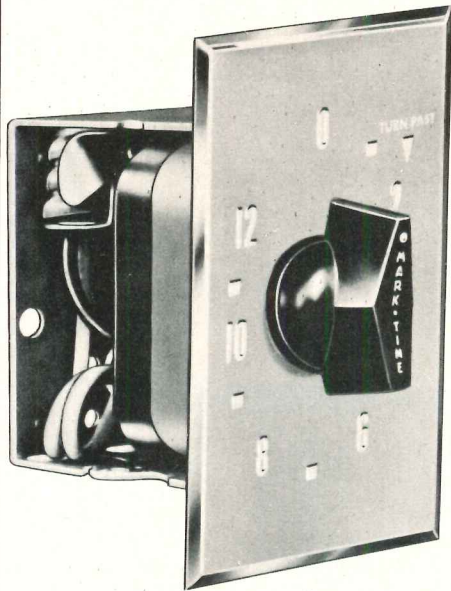
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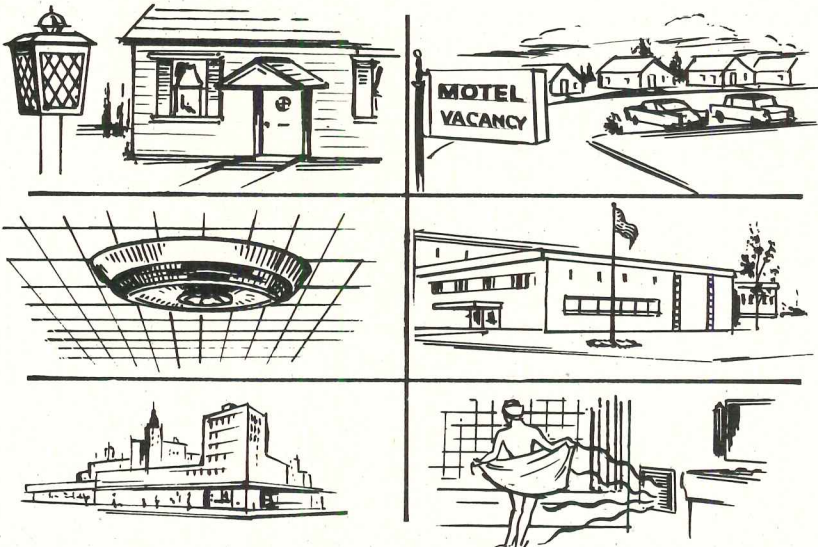
Wall Box Time Switch

**THE ONLY TIMER WITH DIAL FACE PLATE
THAT MOUNTS FLUSH TO THE WALL!**



**Turns Off Lights,
Fans, Heaters
AUTOMATICALLY
In Timings
From 3 Minutes
to 12 HOURS!**

Save electricity, add comfort and convenience, extend life of equipment. Easily installed in standard wall boxes. Recommended for hotels, motels, homes, apartment houses, public buildings. Available through wholesalers everywhere. Send for literature.



M. H. RHODES, Inc.

Hartford, Conn. 06101

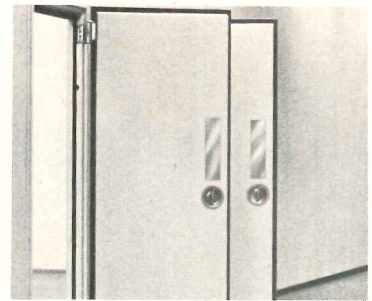
In Canada—M. H. Rhodes (Canada) Ltd., Ottawa 5, Ontario

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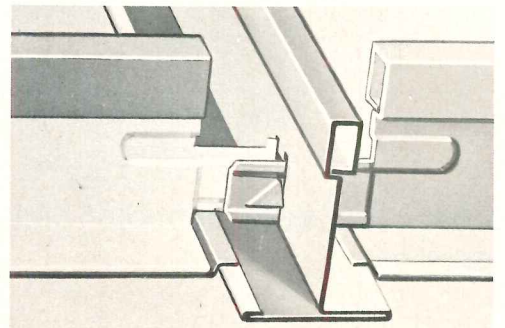
PANELING / Designed for commercial interiors, this plastic-finished hardboard resists heat, moisture and stains. A damp wiping is the only maintenance required. The panels can be coordinated with a wide range of accessories. ■ Marlite Paneling, Dover, Ohio.

Circle 311 on inquiry card



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.

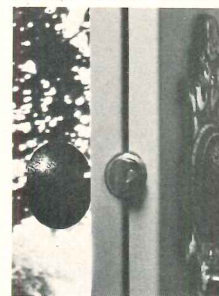
Circle 312 on inquiry card



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" bond-



erized 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.

Circle 314 on inquiry card

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 Panacorn Corporation, Cincinnati, Ohio 45215.

For more data, circle 92 on inquiry card

- Please send me your Waterproofing/Dampproofing catalog.
- Have an Architectural Relations Manager contact me.

Name _____

Company _____

Address _____

City _____

State _____ Zip _____



Dept. AR-971
Philip Carey Company
A Division of Panacorn
Corporation
Cincinnati, Ohio 45215

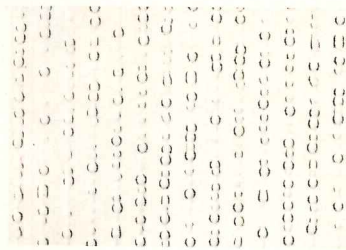


It takes all kinds.

and all kinds of patterned and wired glass are made by ASG
over 40 varieties, all from a single source.



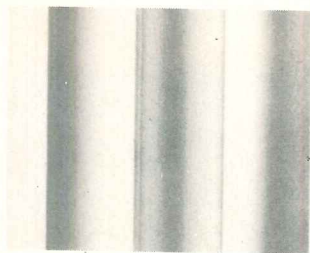
For businessmen: Here's a place to swing free with elegant walls of shimmering Beadex® and its raindrop surface, or Randex® with its random linear pattern. Both obviously creative material.



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.



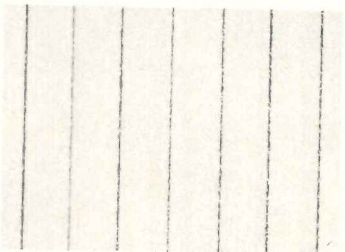
For homes: Bring new light and freedom to any architectural style, and do it safely. Use tempered Flutex® as entrance side lights. Or select finely textured Muralex® to provide both light and privacy. ASG patterned glasses are ideal for privacy panels, room dividers, or clerestories.



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

For more data, circle 93 on inquiry card



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.

For more data, circle 94 on inquiry card

All-Steel[®]



Happy marriage.

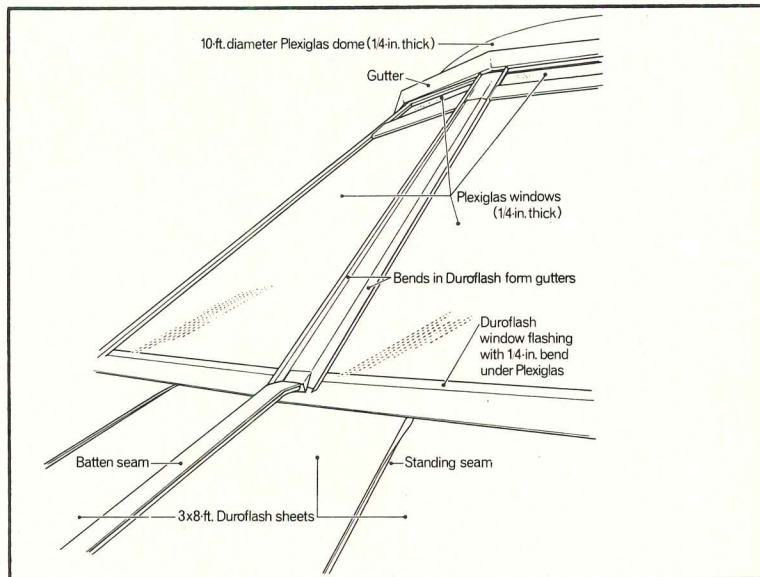
Republic stainless steel and Plexiglas joined in construction of space-age ski lodge.

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.

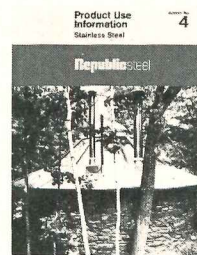
Though DUROFLASH is stronger and tougher than copper and aluminum, it can easily be joined by soldering or welding. Rated as "dead soft," DUROFLASH shows little or no springback when bent for forming. It offers important advantages, too, in stability — both in appearance and price. DUROFLASH will not 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

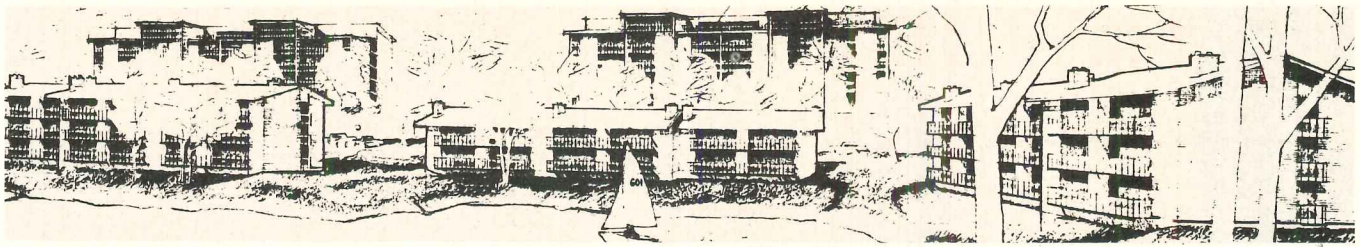


useful reference literature describing this application and perhaps suggesting some for you. Write Republic Steel Corporation, Cleveland OH 44101.

*Plexiglas is a trademark of Rohm and Haas Company.

Republicsteel

For more data, circle 95 on inquiry card



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

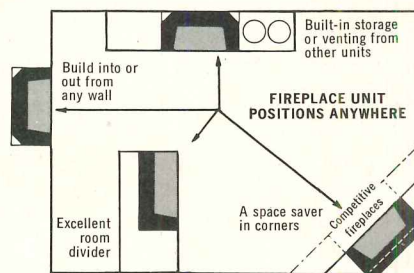


For so many volume developers this Heatilator fireplace is it!

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.

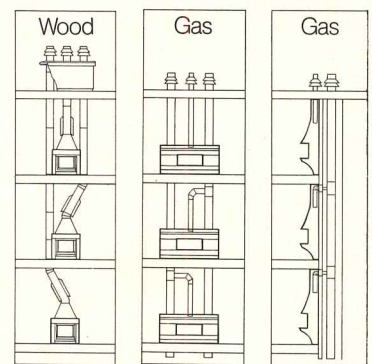
Forget any set ideas about fireplaces. The representative diagrams shown detail the versatility, adaptability and stacking features. Support and surround the Mark 123 with combustible materials. Heatilator Mark 123 systems (fireplace, flue and roof termination) arrive jobsite for under \$300. Twist-lock 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



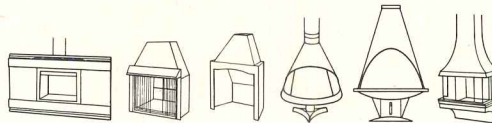
more cash flow, rental profit, loan and sales value for builders and investors.

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

For more data, circle 96 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:

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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 inter-designed and installed under the supervision of the Keene Interior Systems Division.

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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:

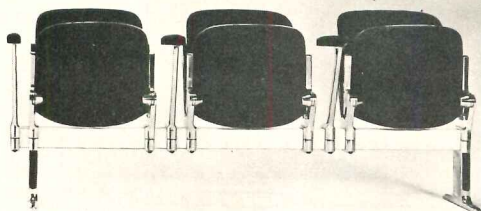
Keene Corporation
Interior Systems Division
Route 206 Center
Princeton, New Jersey 08540

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

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continued from page 194



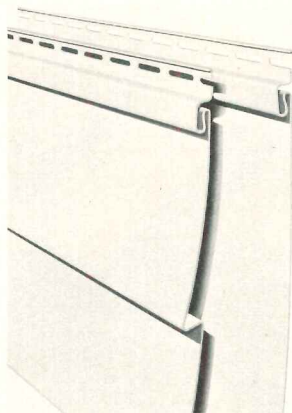
SEATING UNITS / Base sections are made of cast aluminum. As many as six seats and/or plastic-surfaced tables can be used per horizontal beam. ■ Krueger Metal Products Co., Green Bay, Wis.

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.

Circle 316 on inquiry card



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.

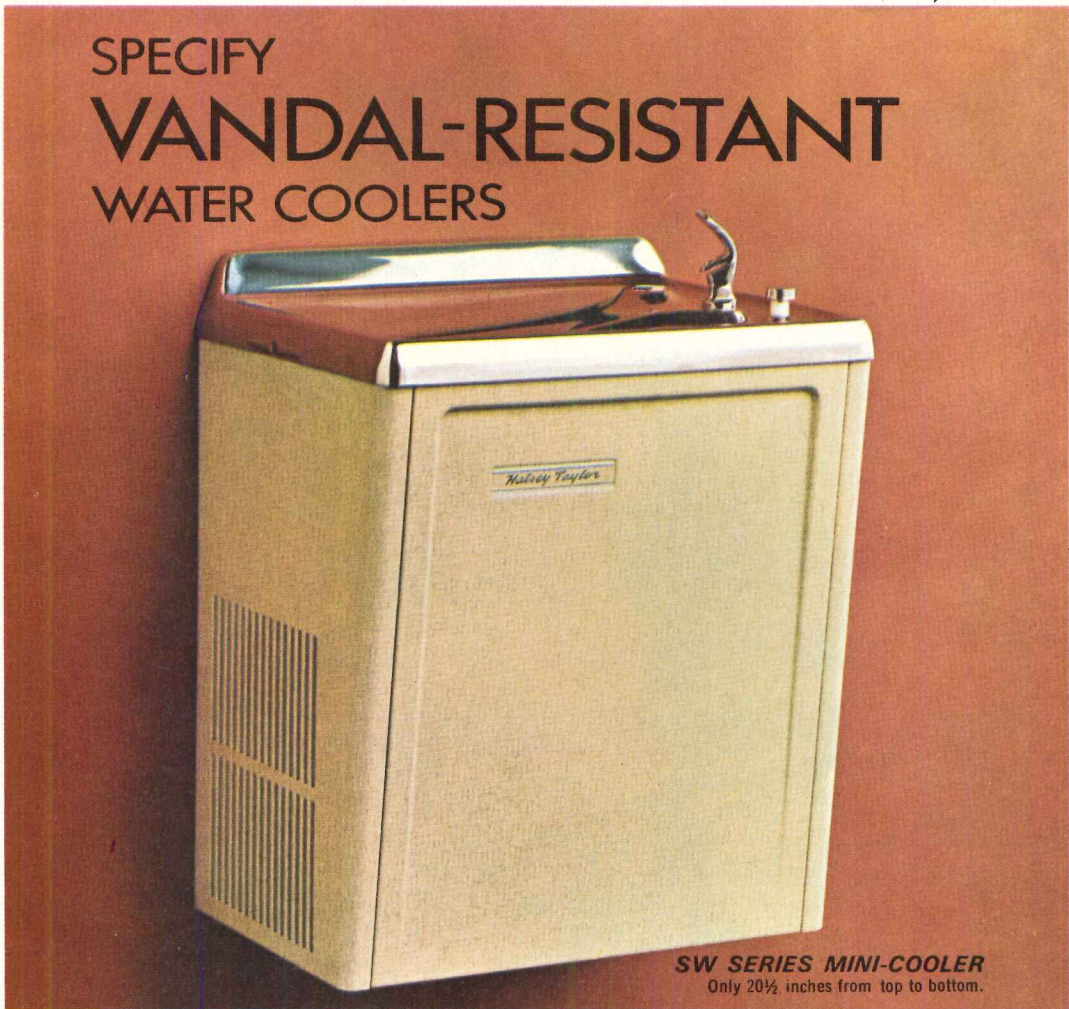
Circle 318 on inquiry card

more products on page 216

WHAT SHOULD YOU DO ABOUT MALICIOUS MISCHIEF?



SPECIFY VANDAL-RESISTANT WATER COOLERS



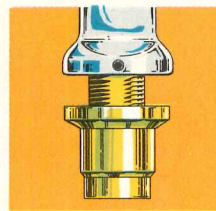
SW SERIES MINI-COOLER
Only 20½ inches from top to bottom.



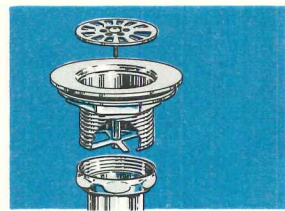
SQUIRT-PROOF
Exclusive 2-stream projector thwarts pranksters. Placing finger over outlets diverts water through slotted openings without squirting.



ALLEN-HEAD SET SCREW
Screw in base of projector locks square nipple in place to prevent turning and unauthorized removal of projector.



SQUARE OPENING
Squared nipple fits into square hole in fountain top to prevent twisting and possible internal damage to cooler.



SECURED DRAIN
Strainer is secured with a special vandal-resistant Allen-head screw, which can be removed by authorized personnel if necessary.

In addition to the features shown above, Halsey Taylor vandal-resistant design includes sturdy, steel cabinets, and all-welded construction that stoutly resists careless use or deliberate abuse. Heavy gauge stainless steel receptor tops will not chip or stain. Removable front panels are available with concealed vandal-resistant fasteners. Automatic stream height regulator and valve is located *inside* the cabinet to prevent possible tampering.

Write for complete information about Halsey Taylor vandal-resistant water coolers, drinking fountains, and classroom sinks.

THE HALSEY W. TAYLOR COMPANY • 1560 Thomas Rd., Warren, Ohio 44481

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For more data, circle 98 on inquiry card

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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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Texas Industries, Inc.
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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:

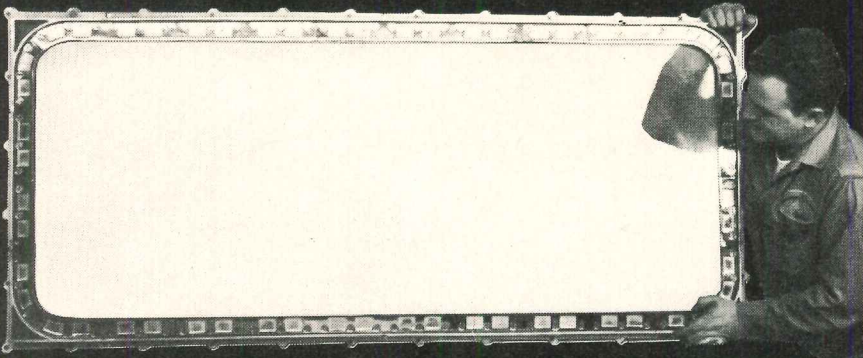
Chemically Prestressed Concrete Corp.,
14656 Oxnard Street, Van Nuys, California 91401
or the sales office nearest you



■ 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 synchronized 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 $\frac{3}{4}$ " tempered polished plate glass or $1\frac{1}{8}$ " 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.

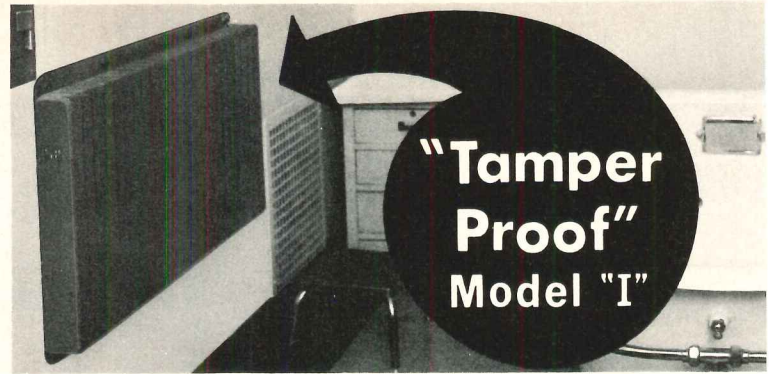
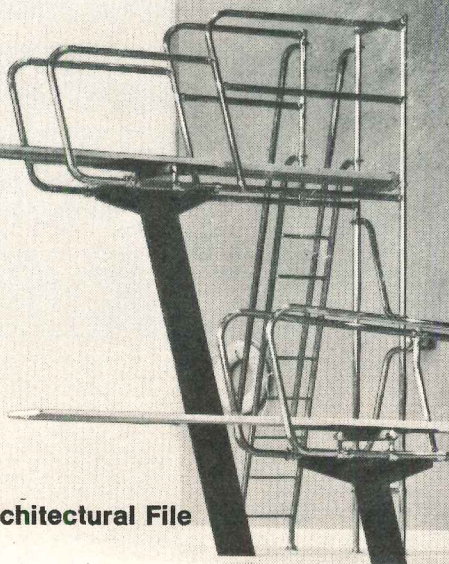
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KDI Paragon Inc.
Mfrs. of Quality Deck &
Underwater Equipment
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Pleasantville, N.Y. 10570
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See Our Catalog in Sweets Architectural File

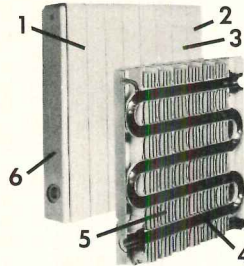
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Where safety comes first, Shaw is the only specification that meets all requirements. Mechanically and psychologically. Perforated cover panels prohibit insertion of foreign objects. Low surface temperature safe enough to touch. Flush mounting and bolting to walls make radiator immovable. End panels make controls inaccessible. Moisture does no harm. Nothing overlooked to make Shaw radiators the safest specification. Only 3" deep. Full range of sizes. Easy installation, no maintenance problems, low original cost and years of safe, comfortable heating. Write for FREE literature on the complete line of PanelVectors or AI Radiators today.



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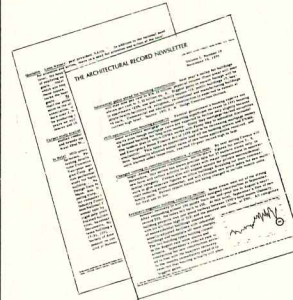
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Make a grand entrance with G-P Curtis® doors



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

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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.

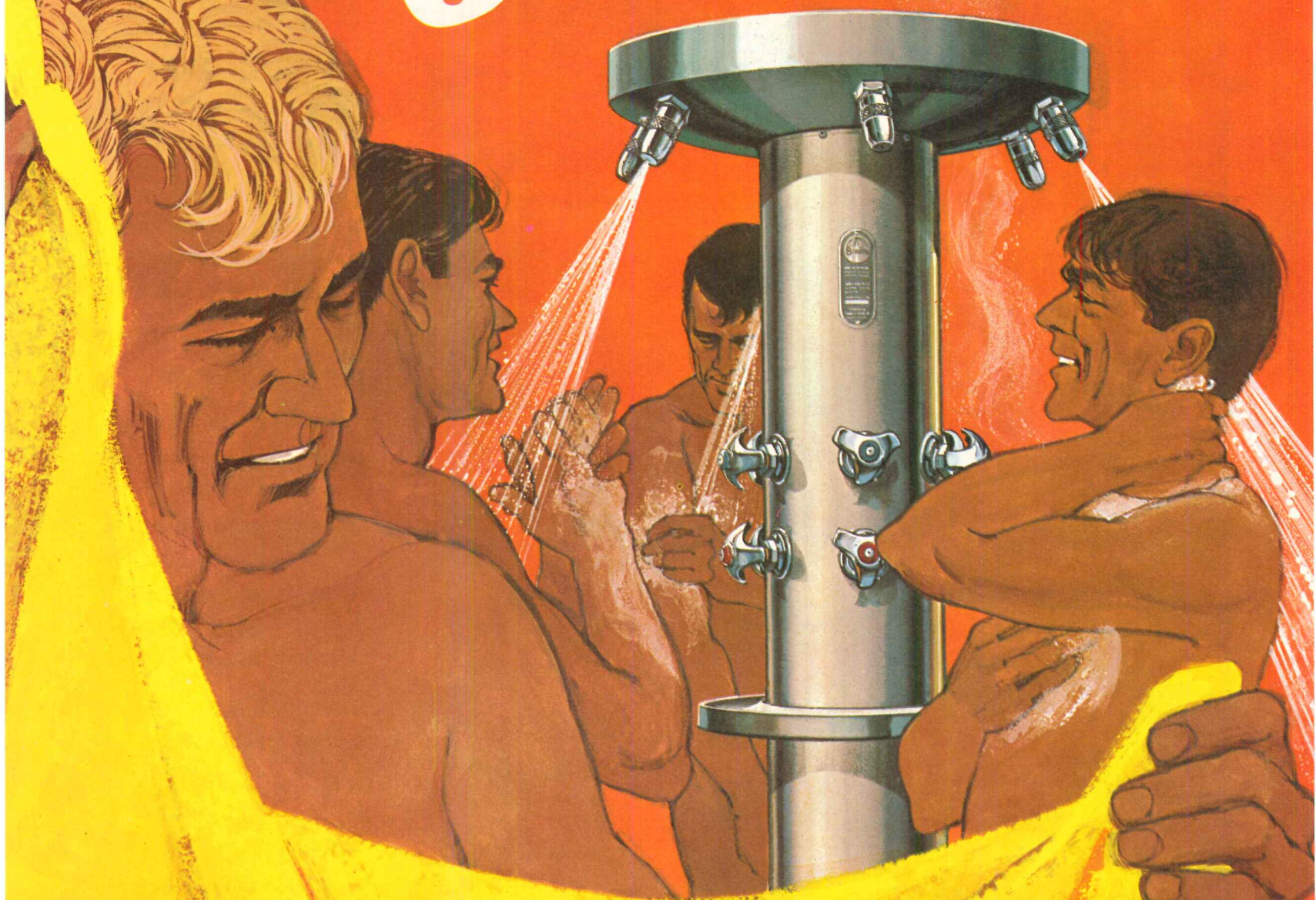
And that'll be a long life, because NOMEX is nylon-tough and long-wearing. It's highly resistant to stains and soiling — yet easy to clean. For more information, write: Du Pont Company, Room CRB 3156, Wilmington, Delaware 19898.

*Du Pont registered trademark.



For more data, circle 104 on inquiry card

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.

For more data, circle 105 on inquiry card

from Bradley!



continued from page 209

show 'em a better way: Ra-matic thru-the-wall Heating & Air Conditioning

A better way to cool, dehumidify, heat, ventilate, and filter and circulate air in industrial, commercial and residential buildings—the Ra-matic is quiet, economical, and easily installed in new or existing structures.

This forced air unit features a convenient push-button selection system, adjustable air flow, 208/230 volt rating, and AHAM certification.

The Ra-matic heating elements are low density totally enclosed sheath type and are equipped with thermal cutout if normal temperatures are exceeded.

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Convenient installation is achieved with sleeve, louver, chassis, enclosure and extender for flush mounting to any wall thickness.

Quality, convenience, and style make the Ra-matic thru-the-wall unit a better way for many applications.



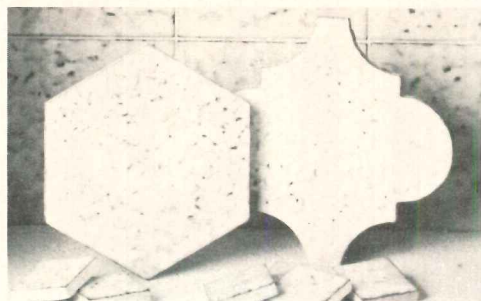
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CERAMIC TILE / Three new shapes—a 5-in. hexagon, 5-in. curved tile reminiscent of Spanish tile, and 1 3/8-in. by 1 3/8-in. square—are offered in the manufacturer's line for wall surfaces and floors. ■ American Olean Tile Co., Lansdale, Pa.

Circle 319 on inquiry card



CEILING SYSTEM / Lighting, acoustical and air conditioning control are provided. Acoustical control on coffer sides is provided by the manufacturer's ceiling panels. ■ The Celotex Corp., Tampa, Fla.

Circle 320 on inquiry card



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.

Circle 321 on inquiry card

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.

Circle 322 on inquiry card

more products on page 238

For more information, write or call any of the Institute members listed below:

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Information Office
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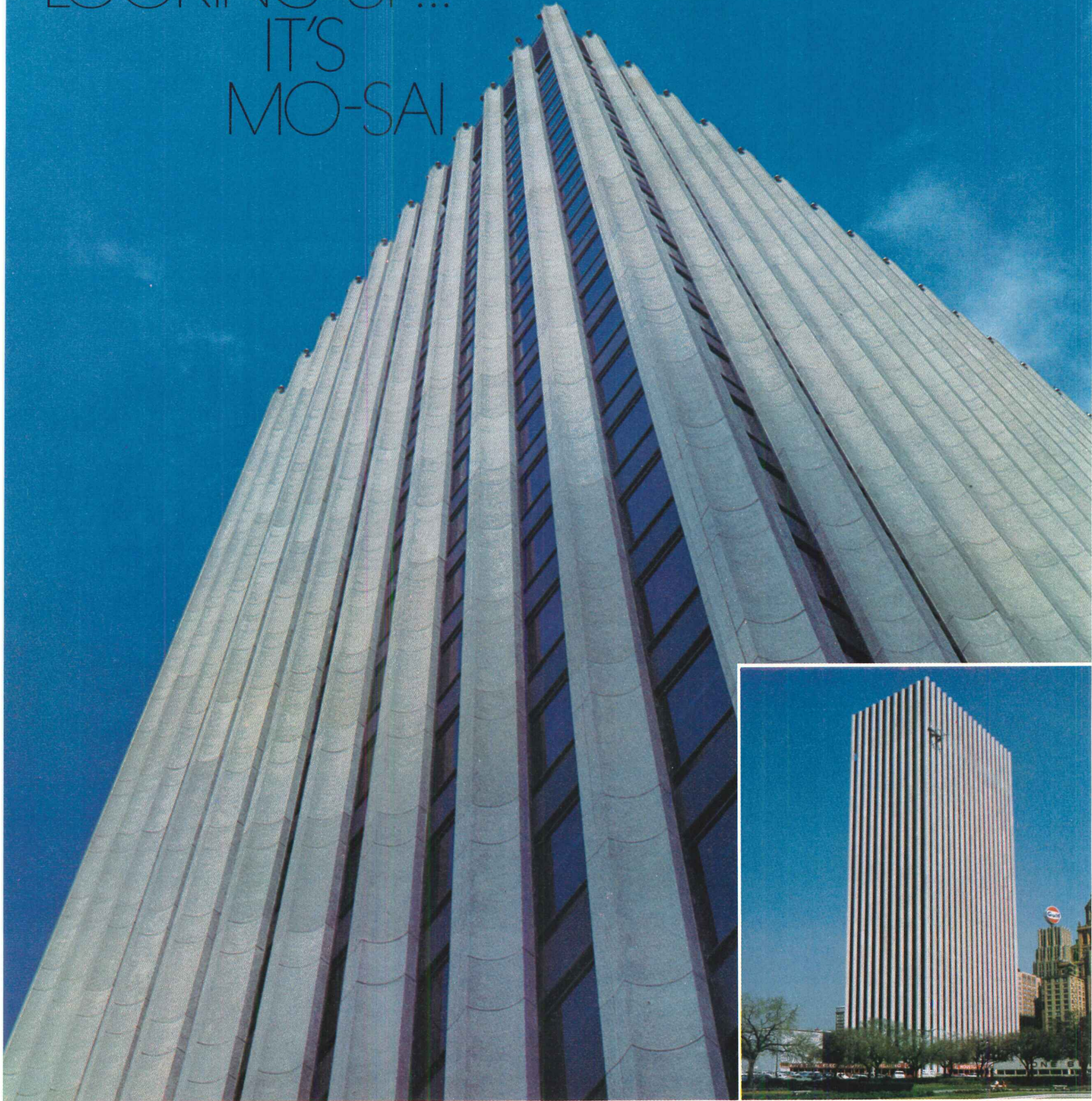
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LOOKING UP... IT'S MO-SAI



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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1818

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.

HOPE'S WINDOWS, *Jamestown, N. Y.*

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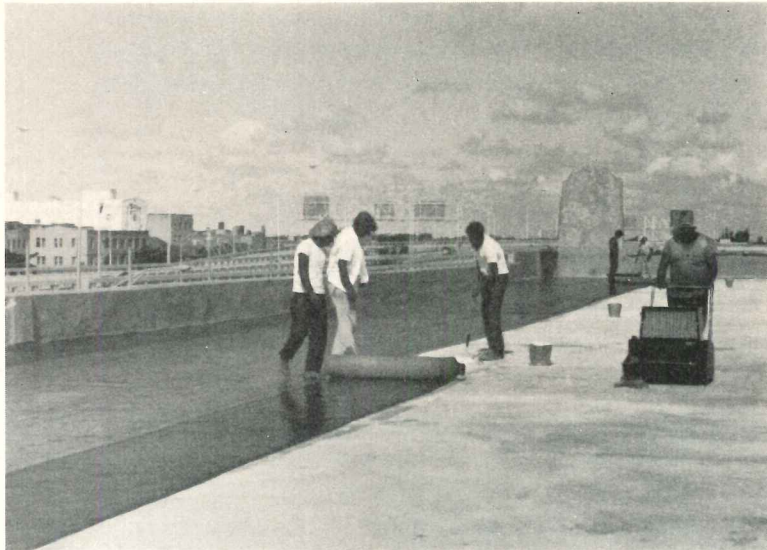


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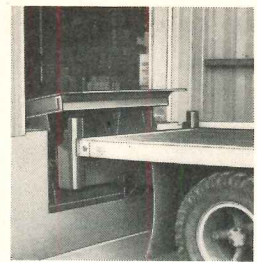
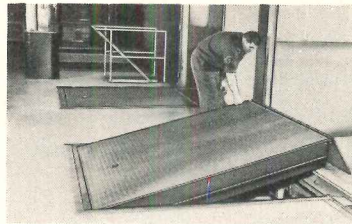
Royalty Building & Industrial Products

A Division of Royalty Industries, Inc.
(Formerly Royalty Designs of Florida, Inc.)

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For more data, circle 109 on inquiry card

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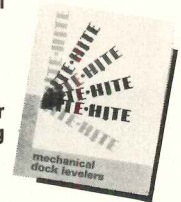
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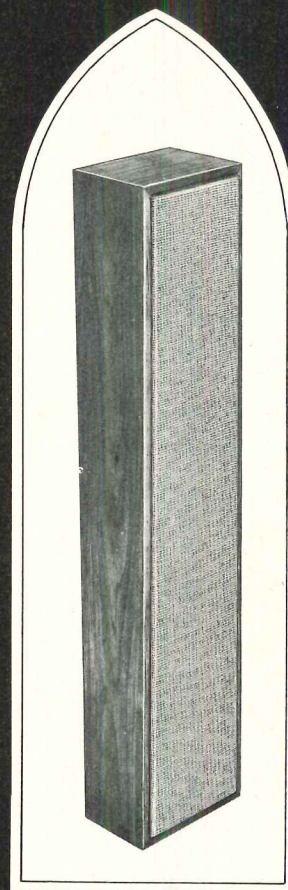


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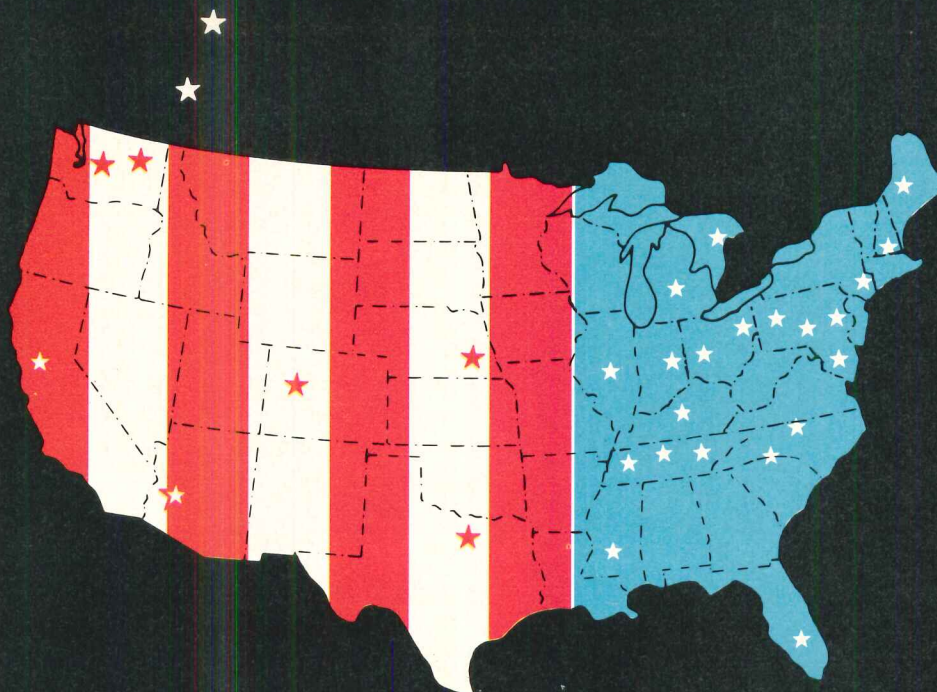
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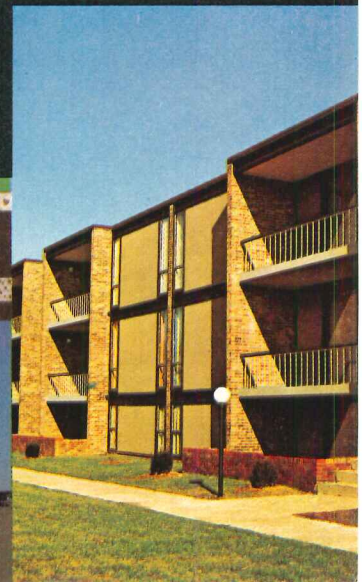
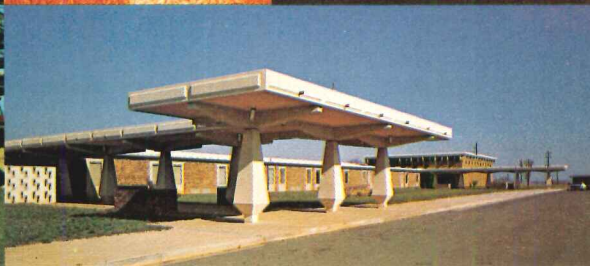
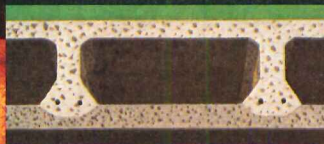
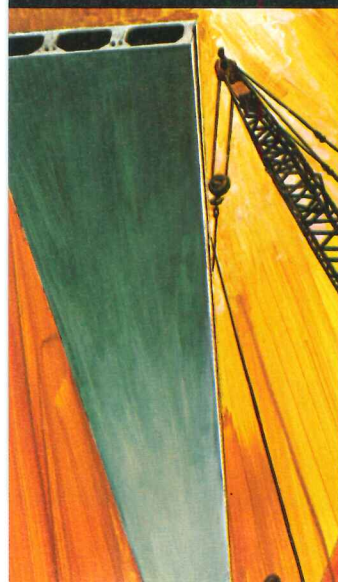
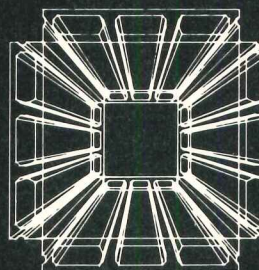
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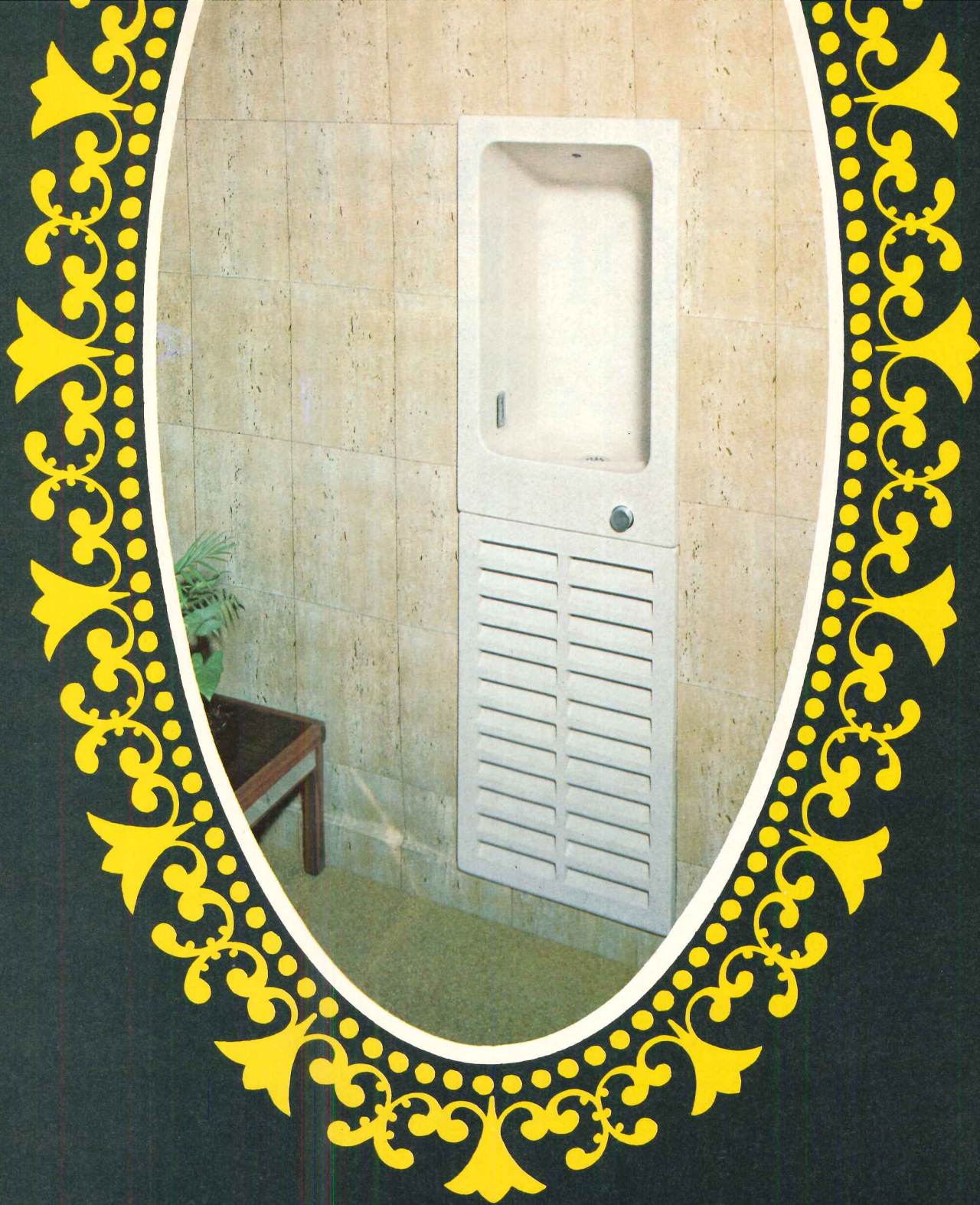
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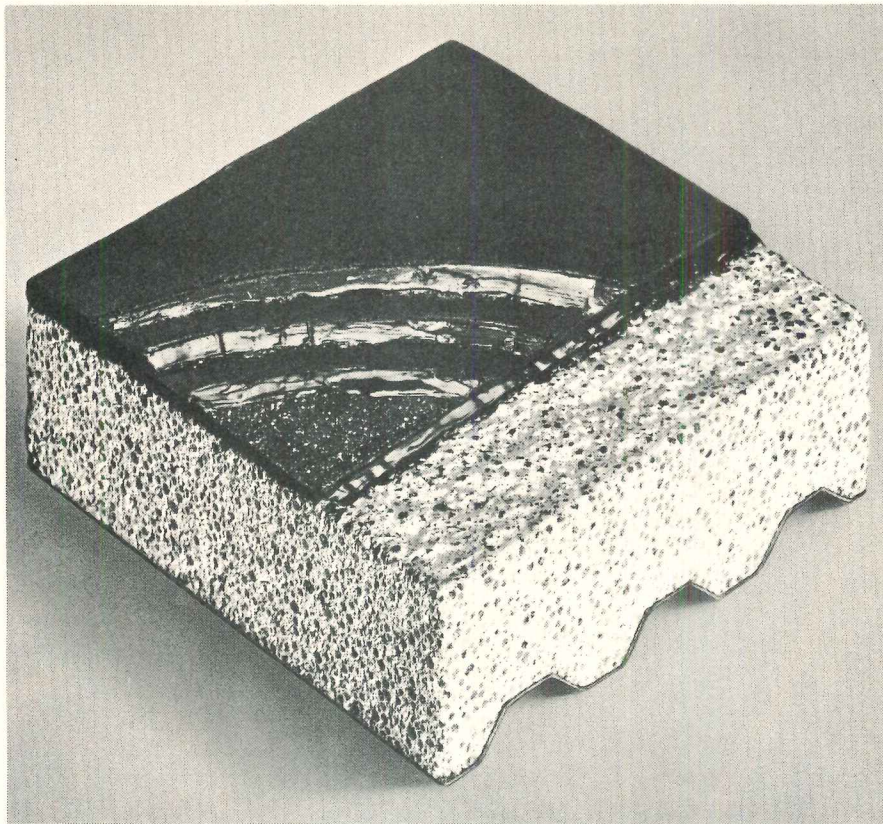
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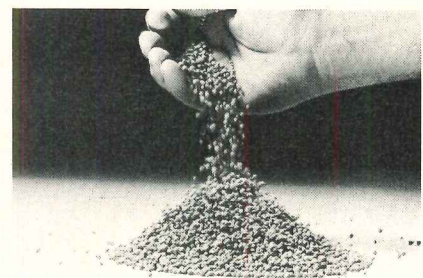
CELRAMIC insulating concrete fill gives a superior base for built-up roofing, by *any* standards. Used with light-gauge steel formwork, it makes a rigid, monolithic concrete roof system.

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But regardless what a businessman is doing today he must be considering pollution control efforts for tomorrow.

One thing he can do is write for a free booklet entitled "71 Things You Can Do To Stop Pollution." It doesn't have all the answers on pollution. But it might give a businessman a few ideas for both today and tomorrow.

People start pollution. People can stop it.



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





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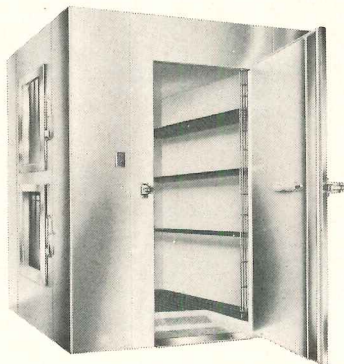
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*Additional product information in Sweet's Architectural File

more literature on page 248

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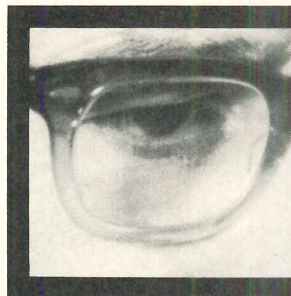
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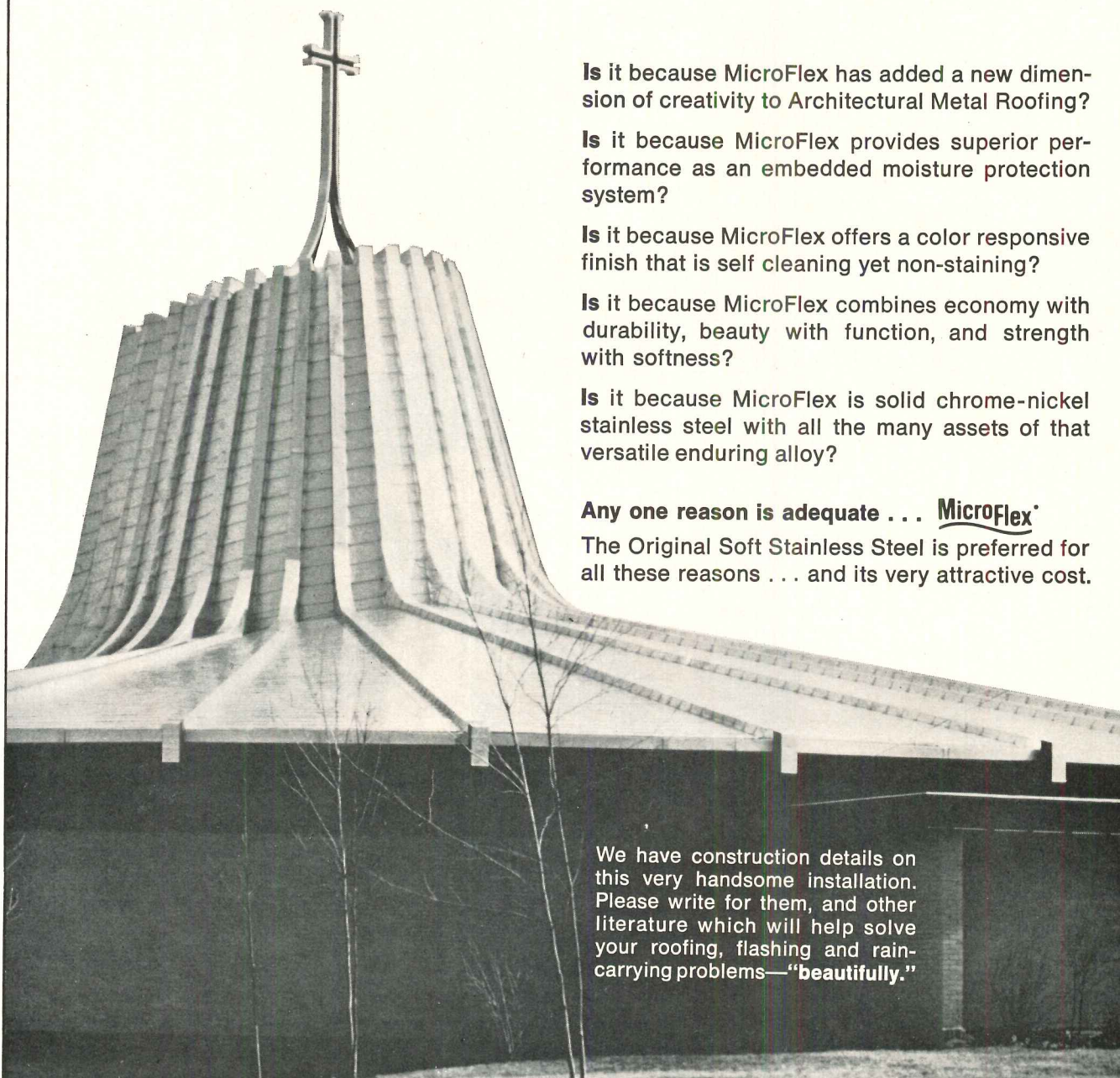
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There's only one fence that gives you quality and features like these.

Only Anchor® Fence gives you Anchor quality—plus all these famous Anchor features.

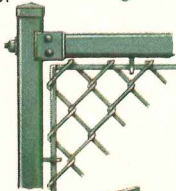
Take Anchor Permafused® vinyl-coated chain link fence, shown above. Many coated chain link fabrics are made with extruded vinyl. It's like slipping wire into a soda straw. Not Anchor. The tough plastic coating on Anchor Permafused is permanently fused to heavy steel wire in a special Anchor process. 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.



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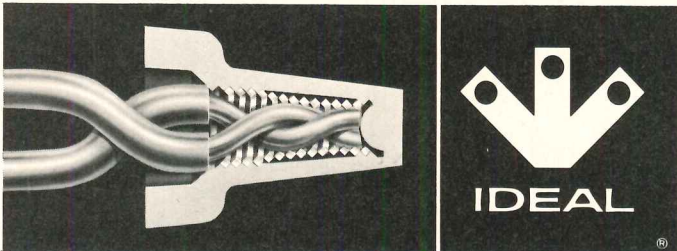
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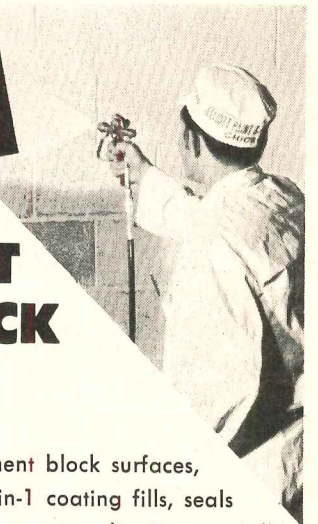
Ideal's new "gray-size" Wing-Nut completes the line. Lets you select the most economical size to fit any branch circuit wiring job. Send for FREE samples and the new Ideal Connector Guide... a complete reference file to the industry's largest line of solderless wire connectors.

IDEAL INDUSTRIES, INC., 1328-1 Becker Place, Sycamore, Ill. 60178. In Canada: IDI ELECTRIC (Canada) LTD., Ontario.



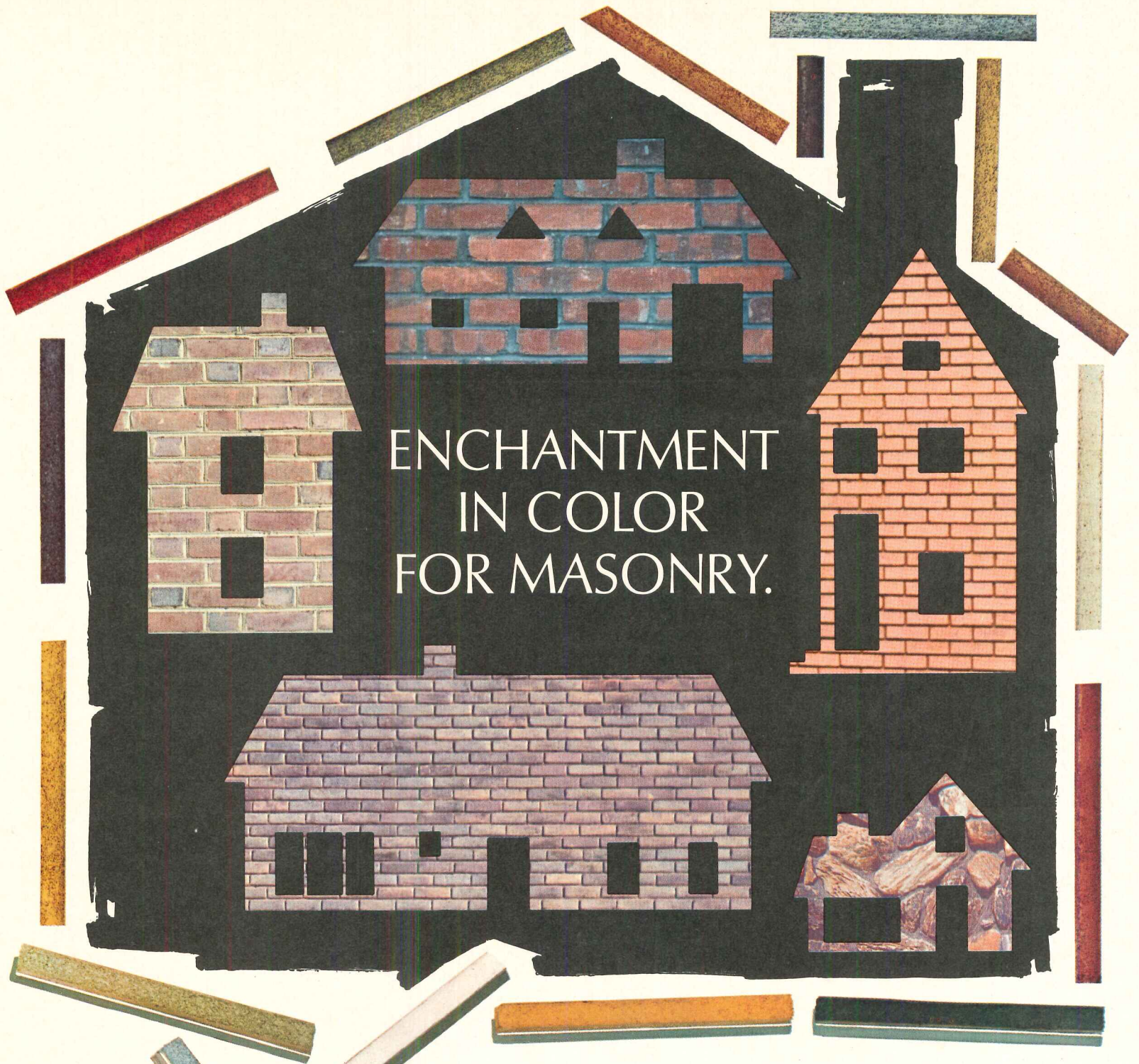
For more data, circle 131 on inquiry card

DID YOU MISS THIS? NEW 1-COAT CEMENT BLOCK COATING



It's amazing SF-50 Sprayfil for exterior cement block surfaces, made by Elliott Paint & Varnish Co. This 3-in-1 coating fills, seals and produces a beautiful semi-gloss finish in one application—actually costs 2/3rds less than multi-coat systems! Non-brittle, Sprayfil withstands severe usage, repels water, resists mildew, mold and chemicals, lasts even longer than three coat systems. The new coating is fortified with white mica to produce excellent filling, sealing and non-conductive properties. Its white, non-yellowing finish (can be tinted), is easy to wash or scrub, is non-toxic for use on interior block walls that must be kept sanitary. Approved by U.S. Dept. of Agriculture for use in Food Processing plants. Approved by Illinois Division of Fire Prevention. Apply with airless spray on interior and exterior walls of schools, hospitals, motels, commercial buildings, shopping centers, factories, warehouses, etc. For paint film sample and details on SF-50 Sprayfil, write: Elliott Paint & Varnish Co., 4525 5th Ave., Chicago 60624.

For more data, circle 132 on inquiry card



ENCHANTMENT
IN COLOR
FOR MASONRY.

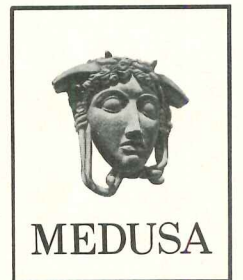
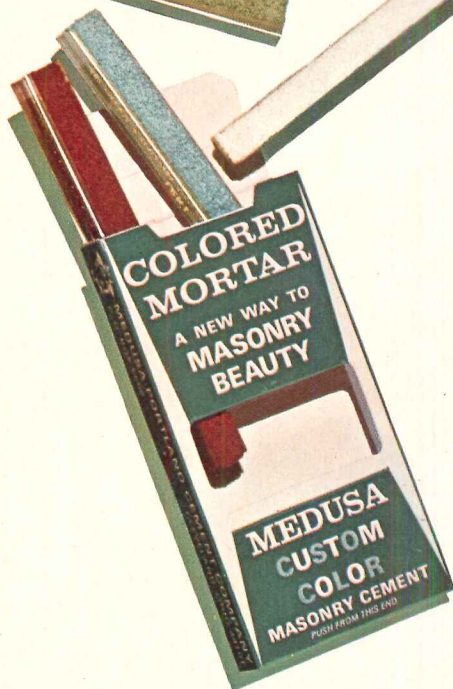
MEDUSA CUSTOM COLOR

Add elegance to new homes with the use of Medusa Custom Colored Masonry Cement for colored mortar.

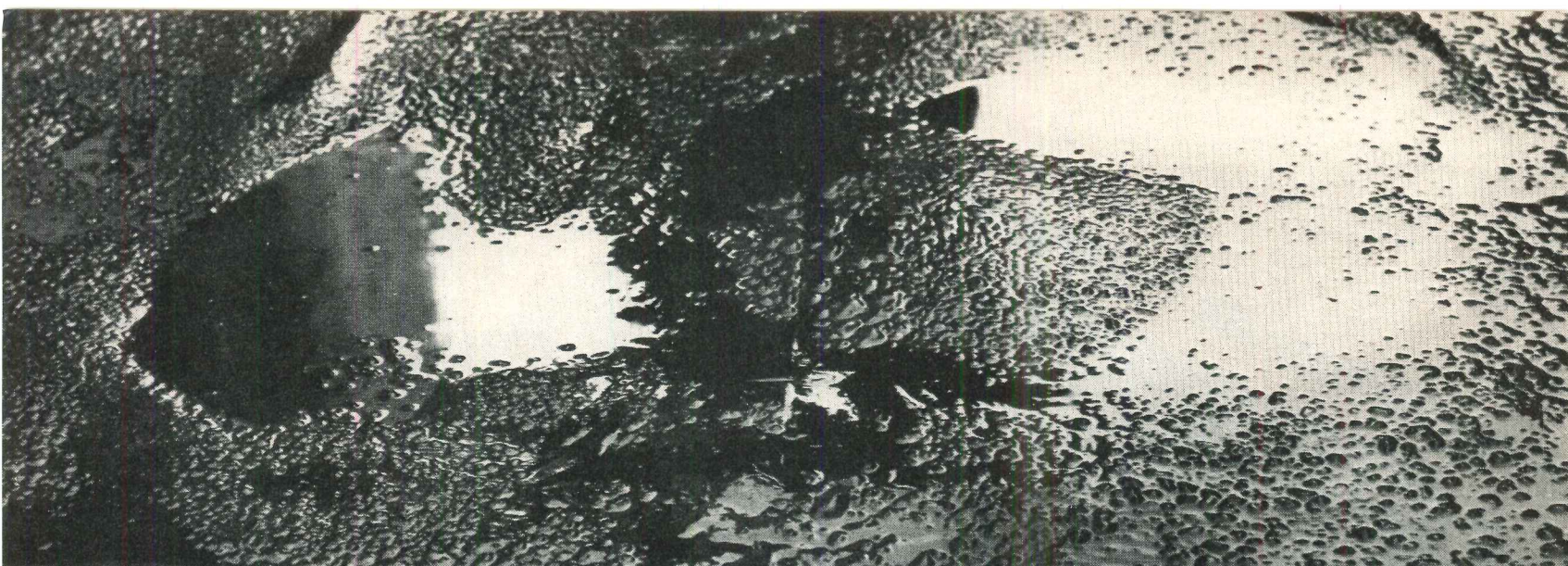
By specifying a colored mortar for your Home, Town House, or Apartment, you customize and personalize its architectural splendor. With little additional cost, you will appreciate your investment to its fullest.

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.



For more data, circle 133 on inquiry card



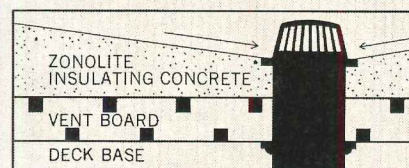
Ponding causes a whole deluge of problems. Zonolite roof deck systems turn them off.

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



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

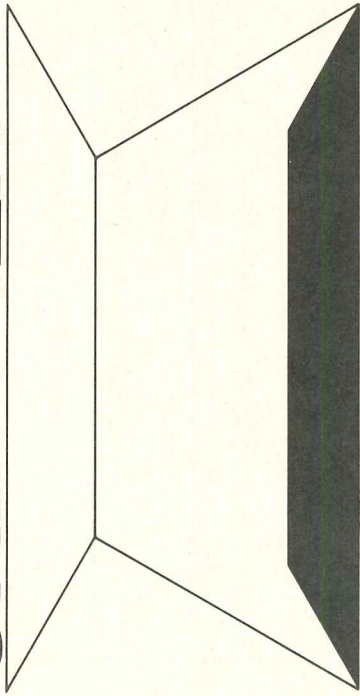


VALLEY TRIMWARE • SPEEDFLEX SUPPLIES • DURO FITTINGS • CONNECTORS
LOOK FOR THESE MARKS FOR SUPERIOR PLUMBING QUALITY

*as detailed in the Valley warranty included with each unit sold.

For more data, circle 135 on inquiry card

CREATIVITY



What's creativity? A word we invented to describe the capabilities of METAL LATH AND PLASTER CONSTRUCTION. Because no one word covered them all.

For instance, in curtain walls. Metal lath systems offer the same strong form as precast concrete, but cost—and weigh—50 percent less.

These modern systems also offer the many advantages of cavity wall construction. Ample chase space for pipes, conduit and other services. Good weather protection. A variety of insulation choices. And the possibility of easy adjustment to unforeseen changes in the structural plan.

For even faster action, components of the metal lath framework can be preassembled into panels at the contractor's shop. Still at lower initial costs and lighter weights.

Finishes? Pick a color—any color. Or a texture. Or a pattern. The facing material used with these systems offers you the widest range of color and texture available today. Finishes that run the gamut from warm and textured to sleek.

Just as with interiors, metal lath exterior wall systems make possible maximum creative expression. They allow for shapes impossible with other materials. Complex curves. Domes. Cones. Free forms. *Almost anything you can draw on paper, we can duplicate in metal lath and plaster.*

Write us for more information on creativity with metal lath. Or ask to see "The Selective 70s," a color sound-slide presentation that tells our story in 16 minutes.

 Metal Lath Association
221 North La Salle Street
Chicago, Illinois 60601

For more data, circle 136 on inquiry card

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 Vertical 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 air-space 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

1
out of
2 who
have it
don't
know
it...

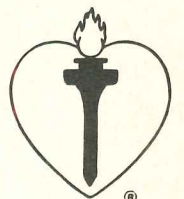
Do you?

21 million Americans have high blood pressure. But 50 percent of those who have it, don't know it.

When blood pressure goes higher than it should, and stays high, it sets the stage for heart attack or stroke.

Most cases of high blood pressure can be controlled with drugs and other advances in treatment. That's why you should see your doctor regularly. Only he can tell if you need help.

A public service
message from your
Heart Association



Contributed by the Publisher

**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.

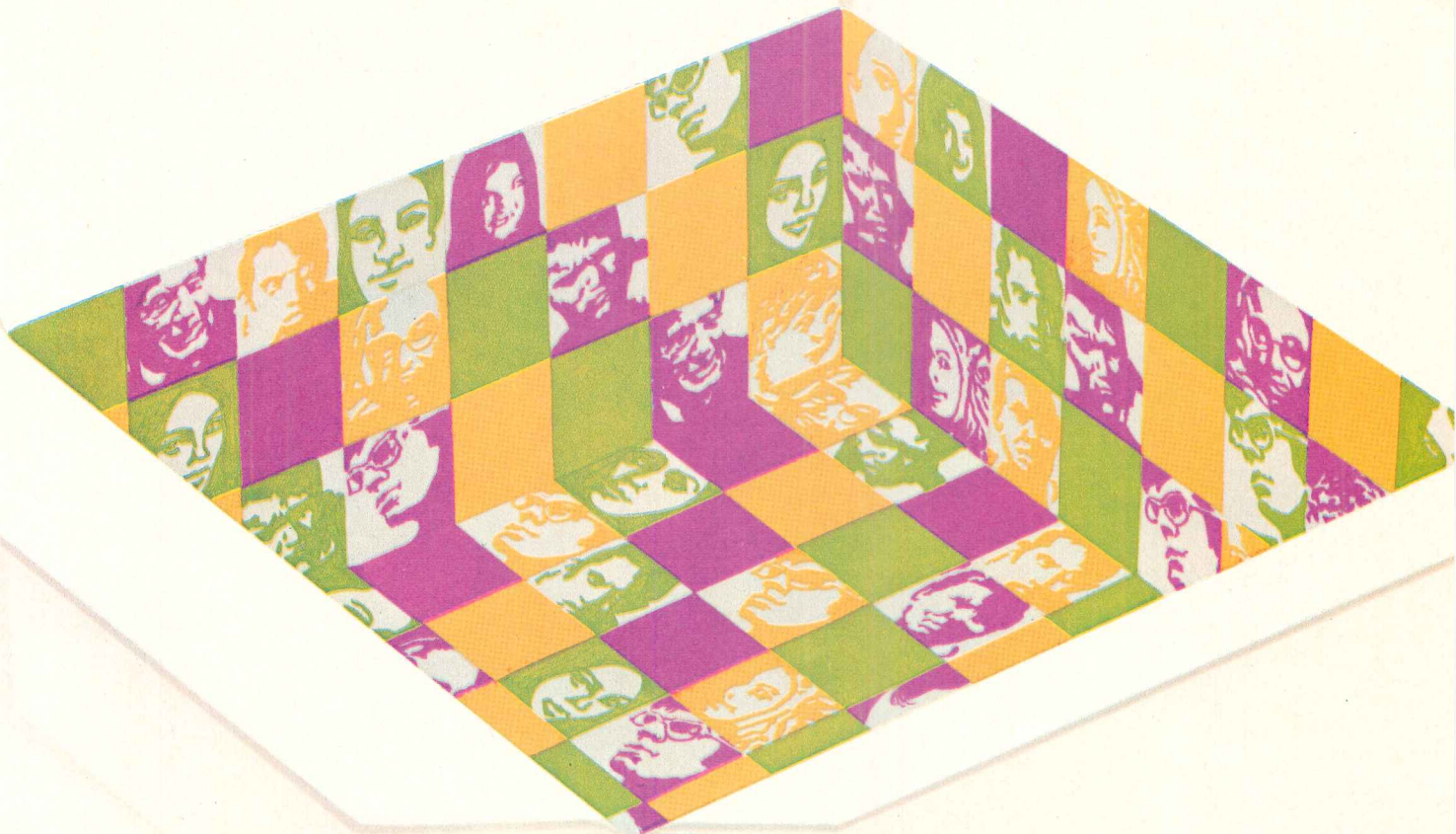
Color Dynamics enables you, the architect, to specify color arrangements that could result in fewer accidents, less absenteeism, greater efficiency, improved production both in quality and quantity, and reduced eye fatigue. It's a valuable aid in servicing your clients.

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

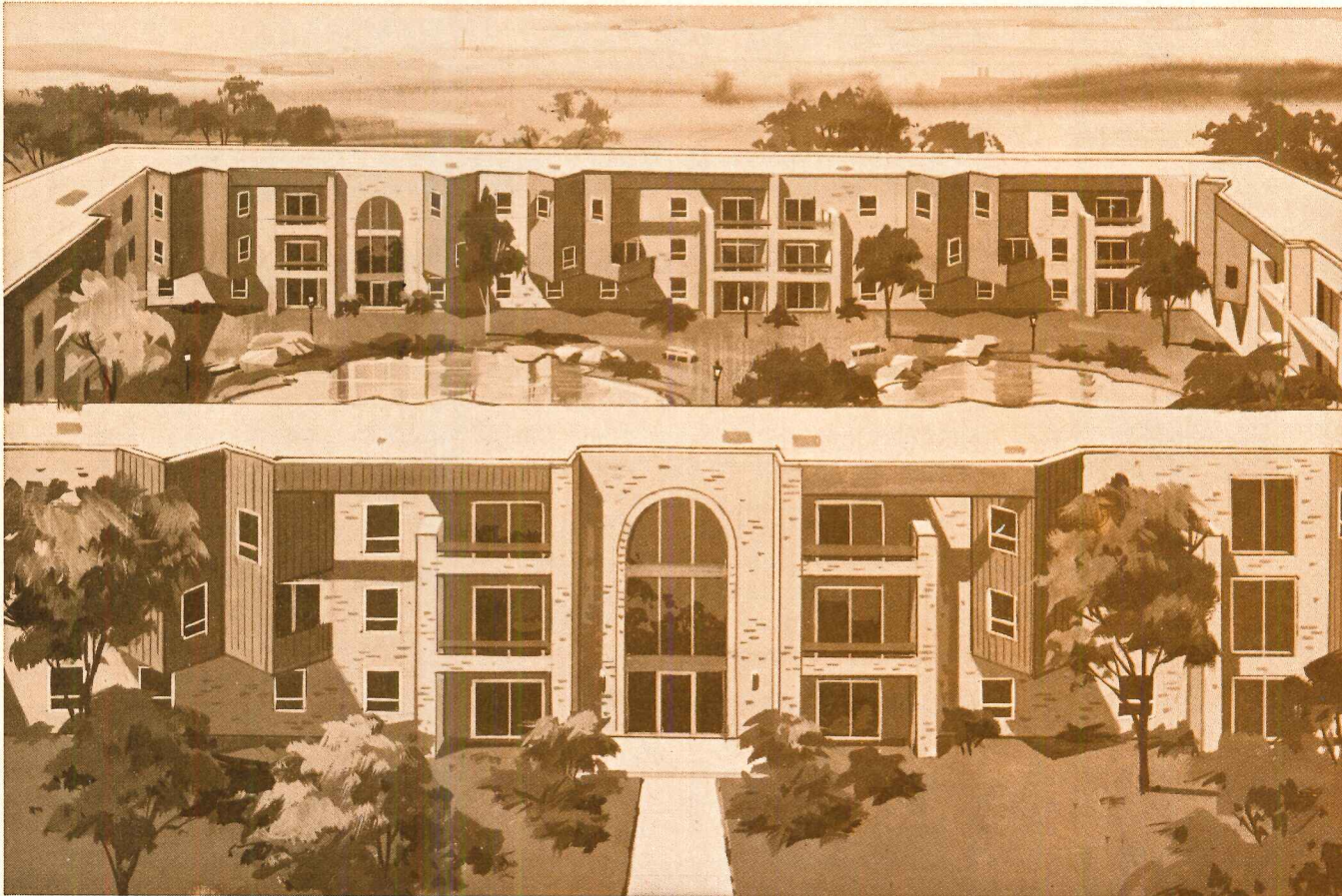


**COLOR
DYNAMICS®**
the
inside
story



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.

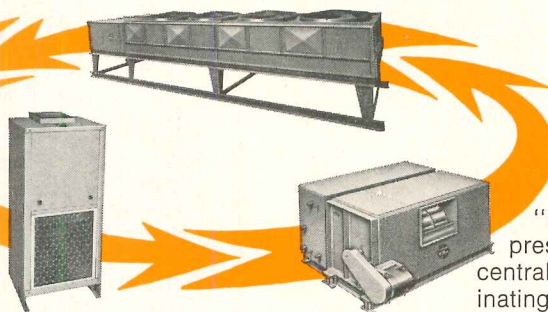


“This McQuay® Environment puts us in a luxury class by ourselves.”

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®**



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.

Compacts and Stores all Waste!

Segregation of material is not necessary. Tin cans, plastic bottles, paper, cardboard boxes, wet garbage

may be hand loaded or chute fed into the PowerMite charging box. The PowerMite hydraulically compacts the waste to a fraction of its former volume and stores it in small mobile containers to be wheeled outside for pick-up.

No Smoke, Soot or Fire Hazards

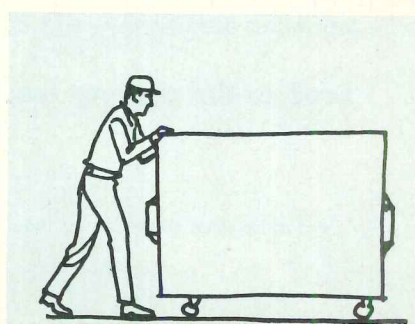
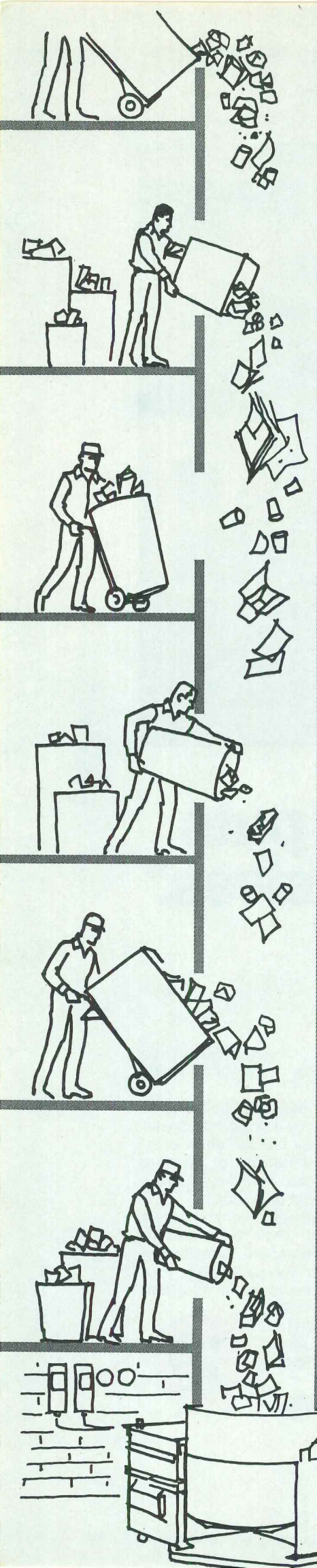
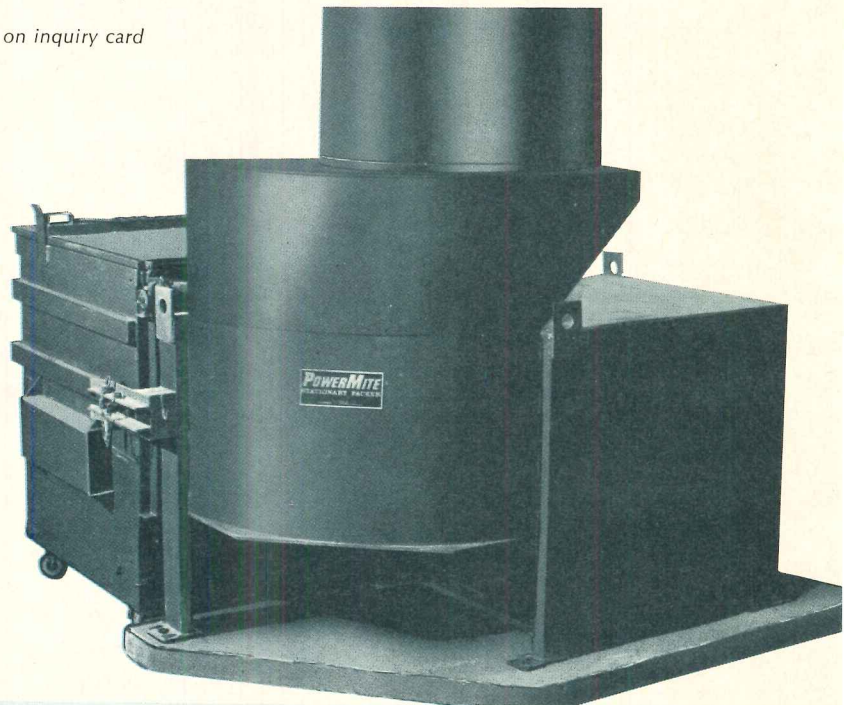
PowerMite's compaction clears the air of smoke, soot, odor, fly ash. It cuts expensive disposal costs by increasing container payloads and eliminates the costly expense of upgrading incinerators to meet strict federal or local burning regulations.

Stop the burning! Write today!

Write today for full details on the PowerMite and for more information on Dempster's full line of stationary packers to:

DEMPSTER BROTHERS, Inc. DEPT. CE-6 / KNOXVILLE, TENNESSEE 37917

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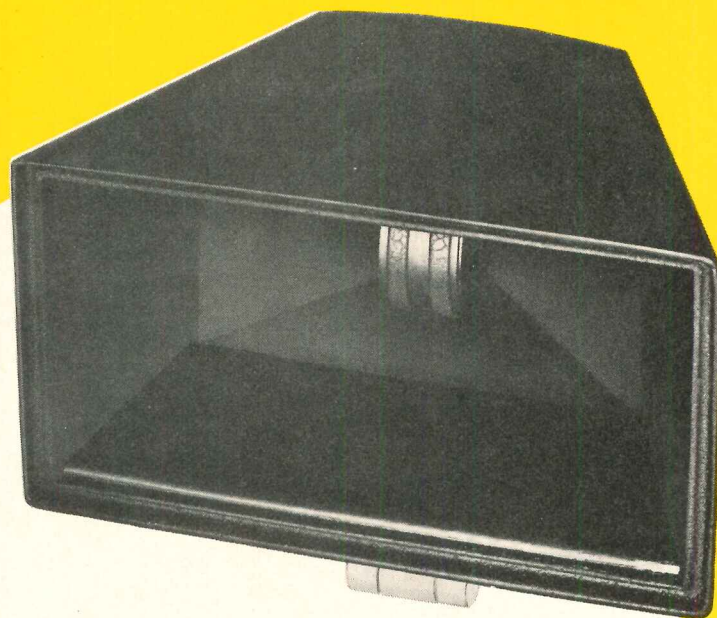


ONE OF THE
DEMPSTER
DUMPSTER®
SYSTEMS

INTRODUCING THE DOR-O-MATIC



PRESENCE
SENSOR
SYSTEM



BREAKTHROUGH IN ELECTRONIC ACTUATION FOR SLIDE-N-SWING® DOORS

The electronic Dor-O-Matic P.S. Presence Detector system invisibly scans the area inside and outside sliding doors for silent, sensitive automatic door operation. Architecturally clean, it requires only two neat scanning heads mounted on ceiling or door header. No grids, mats, or plates in or on floor—no pushplates or pulls—no photocell light beams. Carpeting, concrete, terrazzo and static-free tile can run through the threshold-free entry for decorator beauty. The P.S. Presence Sensor recognizes both objects and people. The signals overlap at the door area, and will not let doors close until entire scanned area is clear. Will not cancel when frames are touched. Unaffected by snow, ice, water or salts in scanned area, and requires no reports to government on energy emission devices. Contact your Dor-O-Matic distributor for details, or write today for "Presence Sensor Bulletin."



BY
DOR-O-MATIC

Division of Republic Industries, Inc.

7360 West Wilson Avenue, Chicago, Illinois 60656 (312) 867-7400

England: Dor-O-Matic G.B. Ltd., Ramsey Rd., Sydenham Industrial Estate, Leamington Spa.

Canada: Dor-O-Matic of Canada, Toronto.

5971

For more data, circle 141 on inquiry card

NFPA No.
204

GUIDE FOR
**SMOKE AND
HEAT VENTING**
1968



Fifty Cents

Copyright © 1968
NATIONAL FIRE PROTECTION ASSOCIATION
International
60 Batterymarch Street, Boston, Mass. 02110

251-A-71-1P(881)
Printed in U.S.A.

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.

For more data, circle 142 on inquiry card

Plasteco Automatic Heat and Smoke Vents



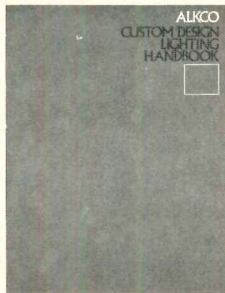
Plasteco Model 420
with fusible link release



Plasteco Model 411
with melt-out PVC top

UPDATE *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.



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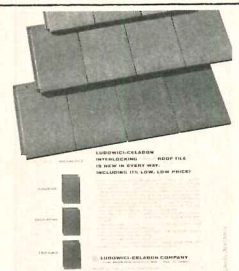
CHROMCRAFT'S CONTRACT FURNITURE DIVISION announces the opening of a permanent show-room at space 1124 in the Chicago Merchandising Mart. A leader in plastic development, Chromcraft will feature many of its newest plastic innovations in the space, including its Rotational and Pacemaker series. In addition, 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.

For more data, circle 144 on inquiry card

REDUCED PRICES ON LUDOWICI ROOFING TILE! Prices reduced as much as 1/3 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.

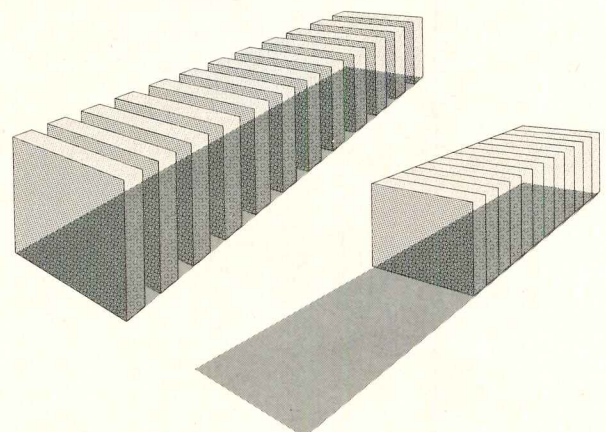


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SAVE MONEY AS WELL AS SPACE.

COMPARE ELECOMPACK TO CONVENTIONAL LIBRARY SHELVING AND SEE FOR YOURSELF.

Conventional		Elecompack
22,500	Volumes	22,500
1,420	Sq. ft.	550
\$42,600	Bldg. space (\$30/sq. ft.)	\$16,500
<u>\$6,000</u>	Equip. cost	<u>\$24,600</u>
\$48,600	Total bldg. & equip. cost	\$41,100
\$2.16	Cost per volume to store	\$1.83
16	Volumes/sq. ft.	41



Elecompack is a moveable, fully automated shelving system that puts all your volumes at your finger tip. It is safe, easy and economical. Before you build or buy, look into Elecompack. And save at least 33¢ per volume.

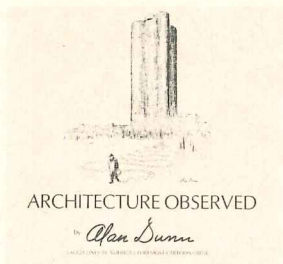


LIBRARY BUREAU
DIVISION OF REMINGTON RAND
801 PARK AVE. HERKIMER, N.Y. 13350

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NEW BOOKS FROM ARCHITECTURAL RECORD

JUST PUBLISHED



ARCHITECTURE OBSERVED

LAUGH LINES BY AMERICA'S FOREMOST CARTOON CRITIC

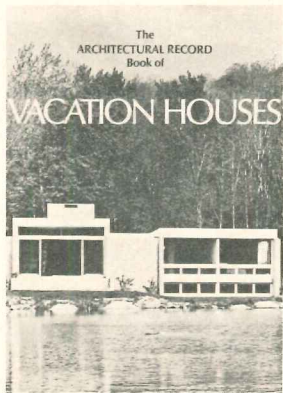
by Alan Dunn

FOREWORD BY LEWIS MUMFORD

A joyous collection of 139 cartoons by a man who is universally recognized as America's funniest, most amiable and most incisive commentator on the foibles of American Architecture and its practitioners. A contributor to Architectural Record for almost 35 years, Alan Dunn knows better than anyone else how to plant the stiletto that tickles!

144 Pages 8½ x 9 \$6.95

EXCITING IDEAS FROM 60 DIFFERENT DREAM HIDEAWAYS



THE ARCHITECTURAL RECORD BOOK OF VACATION HOUSES

by the editors of Architectural Record

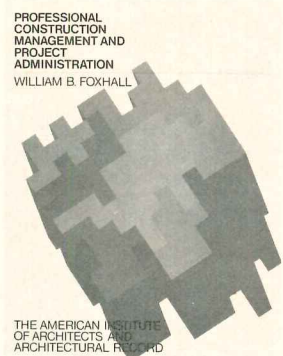
A sparkling collection of architect-designed vacation houses for all climates and terrains—from a mountaintop chalet in British Columbia to a beach house in Florida.

Selected by Architectural Record editors, these architect-designed vacation houses range in price from less than \$5,000 for a very small two-room cottage to more than \$100,000 for large structures. Each house is fully described with floor plans, photographs and construction details.

For easy reference the book is divided into five sections: beach, mountain, lakeside, resort and country, weekend and summer homes.

256 Pages 9 x 12 \$9.95

SPECIAL PRICE...\$12 IF YOU USE COUPON BELOW



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by William B. Foxhall

Senior Editor Architectural Record

This joint publication of Architectural Record and The American Institute of Architects reviews emerging trends in the management of large construction projects and the administration of cost control and management services. Included are outlines of contracting approaches to these new methods.

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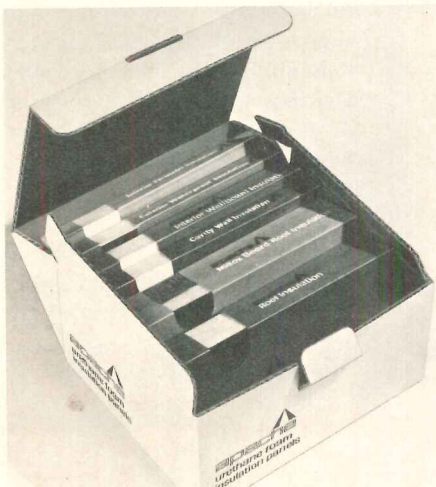
Apache urethane roof panels

THE FAIL-SAFE ROOF INSULATION

Fail-safe in thermal linear expansion. Fail-safe in wind uplift resistance. And fail-safe insulation efficiency. Apache's fail-safe performance record is based on over 50 million sq. ft. already installed. It's a unique insulation. Apache roof panels have a core of urethane foam with asphalt-saturated felt membranes integrally bonded to both sides. They have a .13 "k" factor. And their insulating efficiency lasts the life of the roof because Apache's urethane foam won't wick water, won't absorb moisture.

Thermal linear changes are negligible. And Apache panels stay on the roof. Tests show they won't delaminate even under 145 mph hurricane force winds. See for yourself. Send for the Apache "Sample 6-Pack" of six different urethane foam insulation panels (please send 50¢ for postage and handling). Or look us up in Sweet's 7:15 Ap, 7:14 Ap.

Approved by Factory Mutual for use above non-combustible roof decks.



apache 

Apache Foam Products 2025 East Linden Avenue, Linden, N.J. 07036
A Division of Millmaster Onyx Corporation

For more data, circle 148 on inquiry card

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.

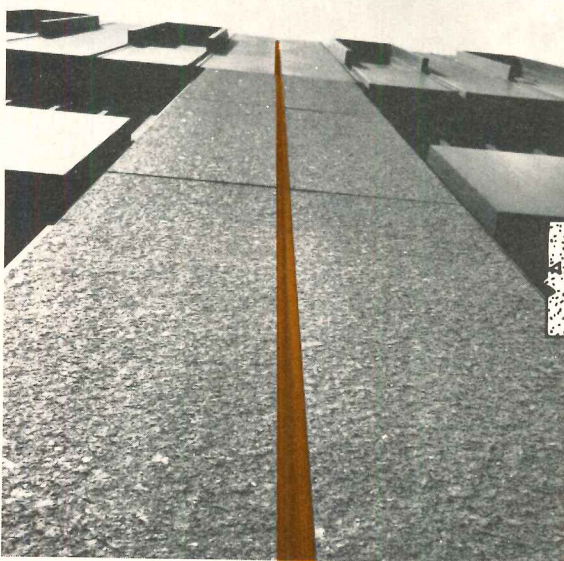
In another recent study of these same problems (1), an attempt is made to relate a generalized programming language to an appropriate building technology. In this work, the hospital organization is described in terms of the way in which its individual parts change over time. Essentially, this work suggests 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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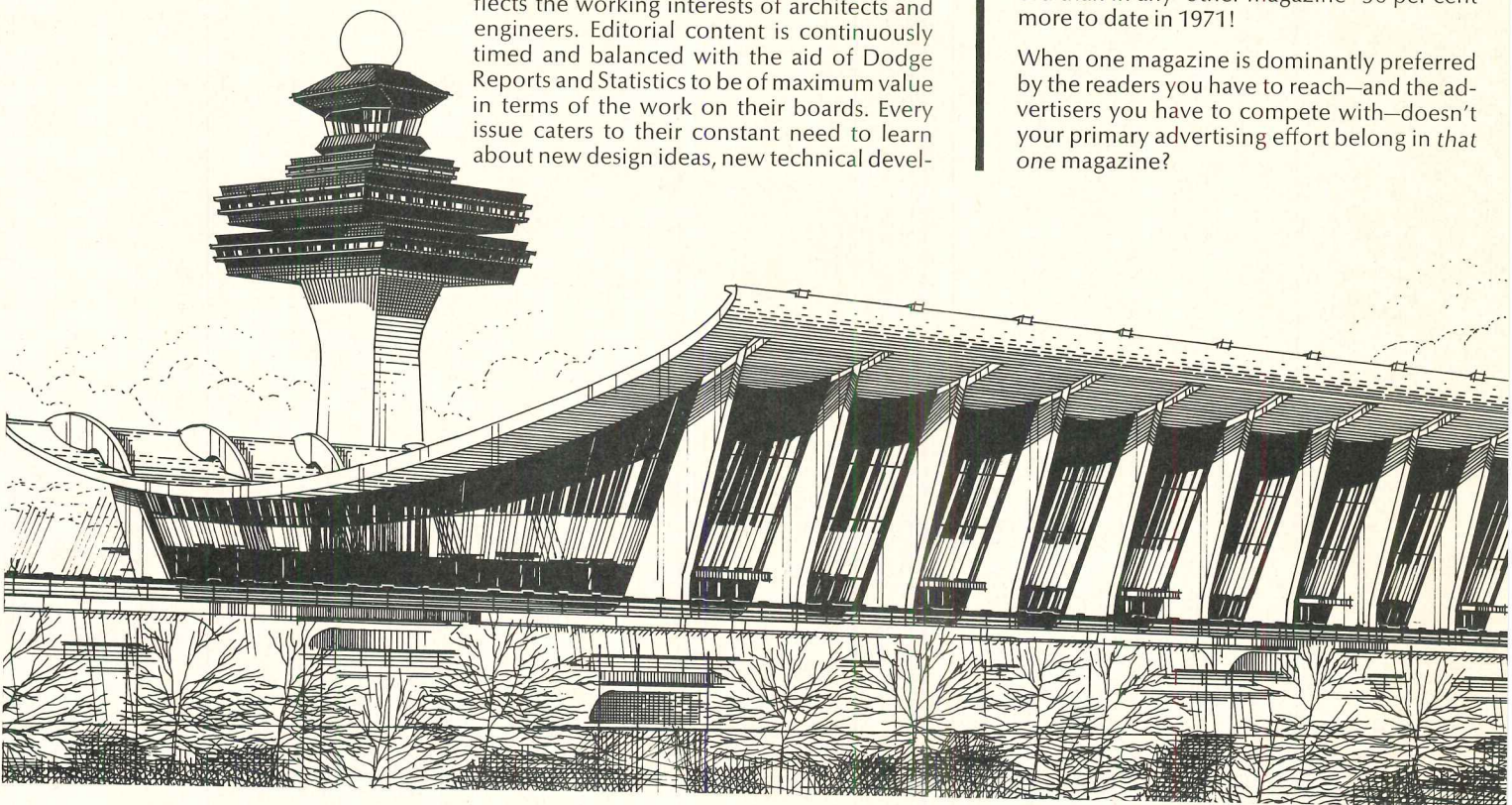
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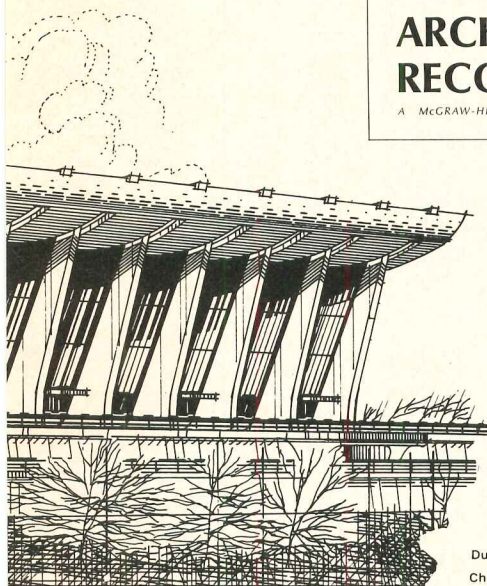
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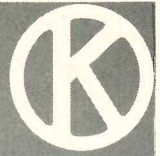
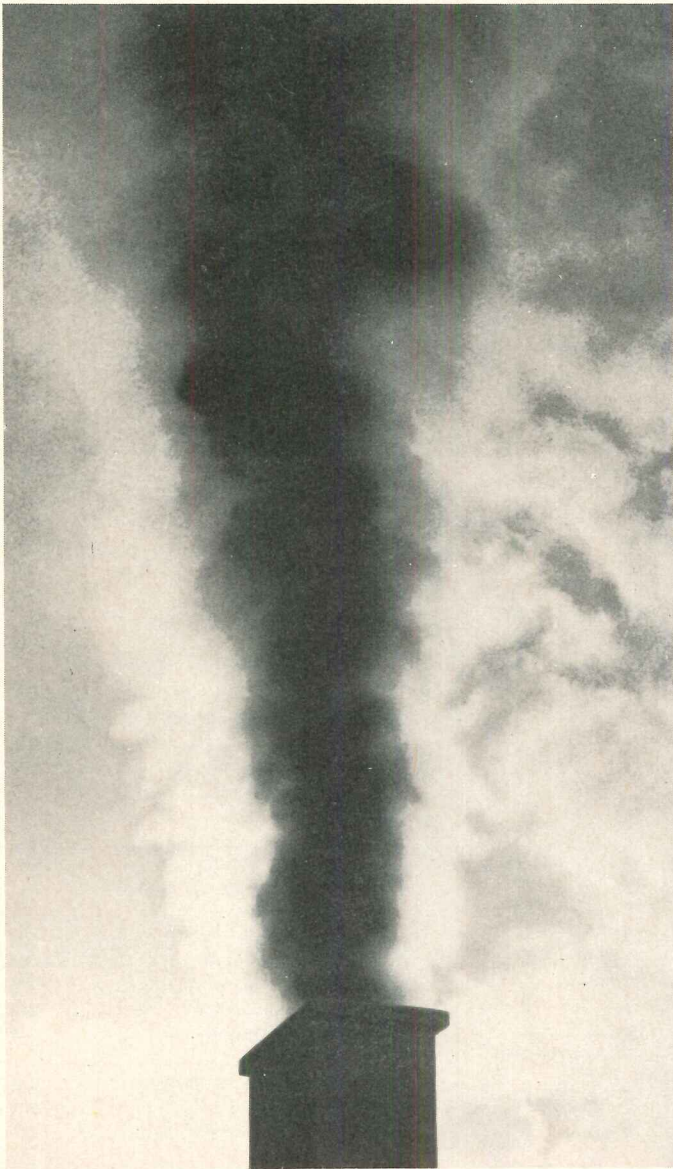
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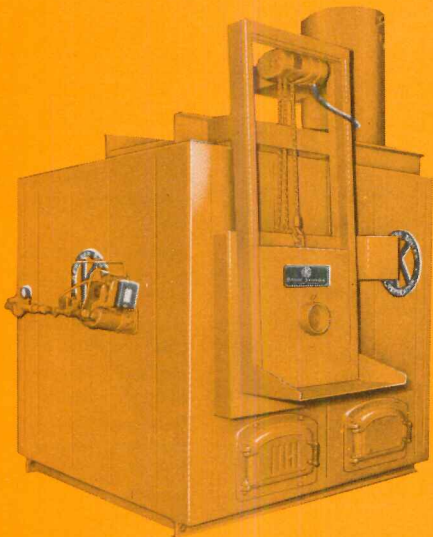


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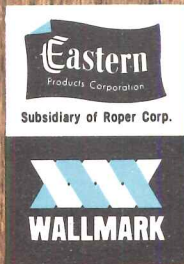
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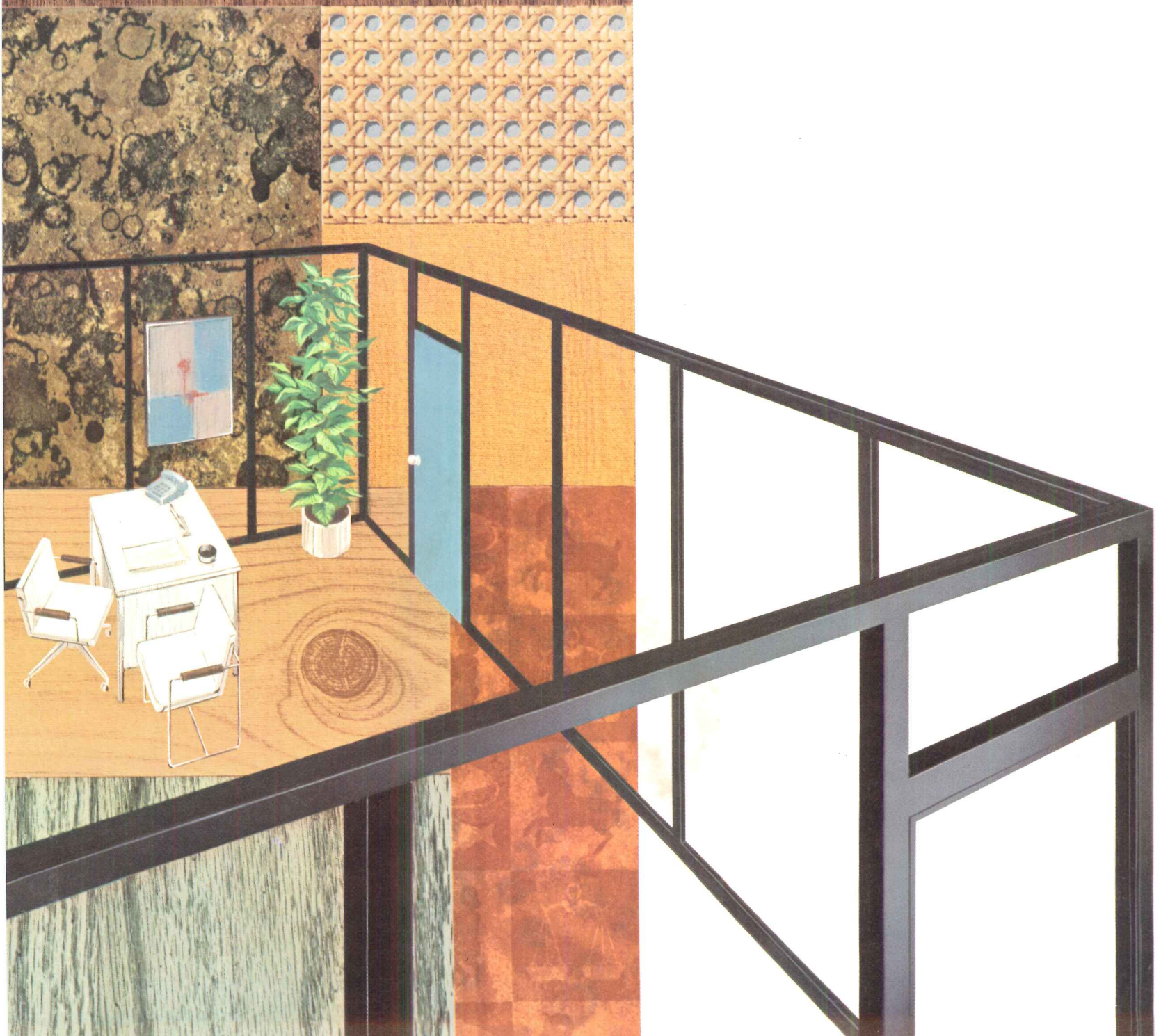


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ARCHITECT & ENGINEER *John Portman & Associates*
PLUMBING WHOLESALER *Mutual Pipe & Supply Company*
PLUMBING CONTRACTOR *Schullo Plumbing, Inc.*
FIXTURE MANUFACTURER *American Standard*



Regency Hyatt House at world's busiest airport is an awe-inspiring sight

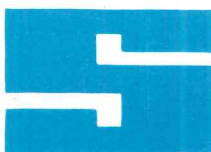
The Regency Hyatt House, a 750 room, 30 million dollar hostelry, is located in Rosemont, Illinois near Chicago's O'Hare International Airport. Architects John Portman & Associates designed this elegant yet functional hotel around the theme of "exploding" interior space, a concept so dramatic as to make the O'Hare Hyatt House a virtual tourist attraction.

Four round towers of gleaming gold glass append each corner of the main building, which in turn is topped by the Polaris, a revolving restaurant with a spectacular view. From the main entrance twin escalators transfer guests to the awe-inspiring sight of the ten story, 160 foot square lobby, resembling a Roman court or atrium.

On each side of the center core in the middle of the lobby, four glass enclosed gondola-like elevators rise to "walkways in the sky" connecting to the balcony-corridors and direct

access to the guest rooms. Thousands of live plants and trees, together with many valued objects of art, adorn these inner balconies and public areas.

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