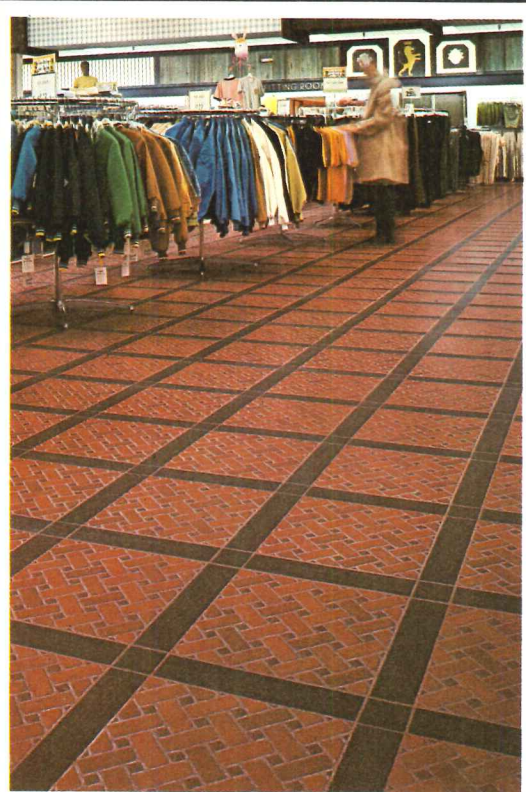




A RESEARCH LIBRARY FOR NORTHWESTERN UNIVERSITY BY NETSCH OF SOM
A SCHOOL FOR SMALL CHILDREN AS BIG AS ALL OUTDOORS
A PARABOLIC-ARCH HOUSE BY BREUER AND BECKHARD
BUILDING TYPES STUDY: OFFICE BUILDINGS
FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

JULY 1970 **7** A MCGRAW-HILL PUBLICATION TWO DOLLARS PER COPY



For the men's shop, floor planners chose the warm look of inlaid brick and wood—the Dungate™ design in Coronelle Vinyl Corlon. A major element in the total decor, Dungate's bold pattern makes the few seams disappear.



This is the Jewel Turn-Style Family Center in Merrillville, Indiana. Under one roof is everything from a supermarket to a gift shop to a haberdashery. Also under one roof is a variety of distinctive Armstrong floors.

ARCHITECT: Teutsch Associates, Inc., 9575 Higgins Road, Rosemont, Ill.
 INTERIOR DESIGNER: Bob Cavanaugh, Jewel Turn-Style, 3030 Cullerton Drive, Franklin Park, Ill.

FLOORING CONTRACTOR: Mammias & Zeheralis, 3746 Arthur Street, Gary, Ind.

In the gift area, Coronelle Vinyl Corlon in the Briarcrest™ design provides the understated elegance of ceramic tile with medallion insets. A special feature is Briarcrest's "2-inch match". While the pattern repeats every 54 inches, it can be matched every 2 inches, to save material. (Floor design copyrighted by Armstrong.)



Complementing the Coronelle Vinyl Corlon at the counters, Montrel Excelon Tile provides an economical, long-wearing flooring for the more heavily trafficked aisle areas. The 1/8" gauge marbled design goes all the way through the thickness of the tile, so the look lasts the life of the floor.



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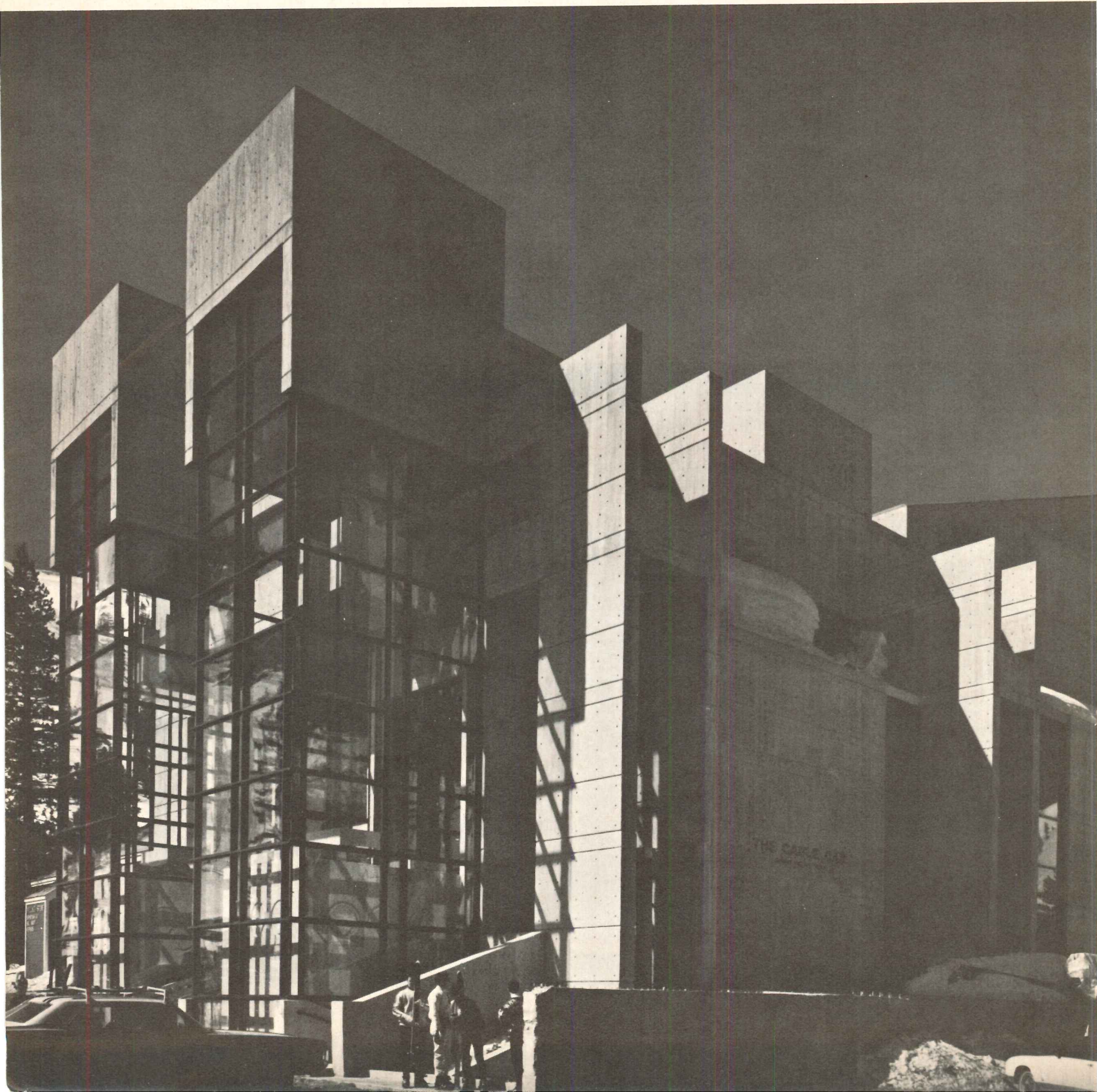
For heavy foot traffic and supermarket carts, the choice was Imperial Modern Excelon—accented with Excelon Feature Tiles. While Imperial Modern is rich in appearance, its cost makes it ideal for a controlled budget.

The next time you're planning a floor, contact your Armstrong Representative. He can show you the largest, most exciting line of resilient flooring available. And he'll make sure that all your flooring requirements are met precisely. Call him. Or write Armstrong, 507 Rooney Street, Lancaster, Pa. 17604.



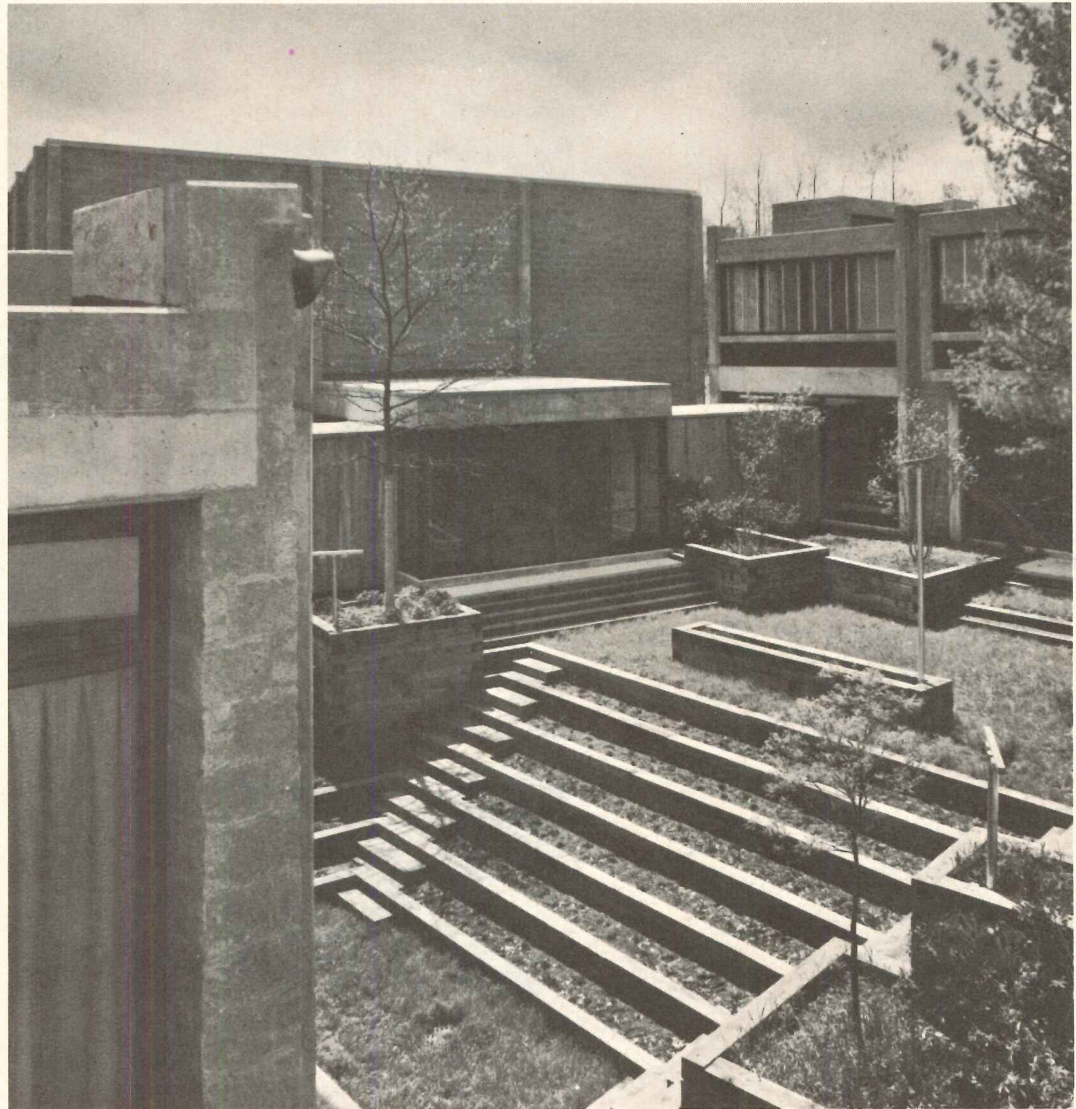
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Dover designed a special Oildraulic® Elevator to meet the unusual requirements of the Squaw Valley Cable Car Terminal at Olympic Valley, California. The car measuring 11' 6" x 28' will take 120 skiers (one cable-car full) from the main entrance level to the cable car level. The car is glass-walled, and moves in a glass-enclosed hoistway with no clutter of overhead cables or machinery. Total lifting capacity of 45,000 lbs. is provided by the powerful Dover Oildraulic cylinder and power unit. ARCHITECTS: Shepley, Bulfinch, Richardson & Abbott, Boston, Massachusetts. GENERAL CONTRACTOR: Campbell Construction Co., Sacramento, California. PHOTOGRAPHER: Julius Shulman, Los Angeles. Dover Oildraulic Elevators installed by Valley Elevator Co., Sacramento, California.



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Dover Delivers Oildraulic elevators for low-rise buildings and electric traction elevators for high-rise buildings. Write for catalogs. Dover Corporation, Elevator Division, Dept. A-7, P. O. Box 2177, Memphis, Tenn. 38102.





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Short items of major national interest, as well as award winners and announcements.



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Includes stories on: City Walls (above), maxi-paintings to enliven the urban landscape; Worcester Center, where first rate design is coming to the aid of a Massachusetts city; ecological news: some architects get into the nitty gritty; and Washington Market Housing, where restoration and high-rise have been planned together.



40 Buildings in the News

Includes: Bard Award Winners (New York City); Portland A.I.A. Chapter awards; also a far-from-institutional state mental hospital administration building (above), and a steel-framed, mirror-walled office structure in North Carolina.

ARCHITECTURAL BUSINESS

59 The F. W. Dodge 1970 construction outlook: a midyear update

Has the business slowdown caught up with the construction industry? Probably—although a special Dodge Index of architect- and engineer-designed construction held at a record 294 for the first quarter of 1970. But Spring brought a gentle decline which may, alas, get steeper during the summer months.

60 Evaluating hidden cost factors

An estimate is only as good as the analysis of the operating background of the project. Contractors' interest, labor supply, training programs and local market conditions can affect accuracy. Here's a check list of things to watch.

63 Labor costs: a recession-proof increase

Construction labor unions are not about to reduce their hard-won rates. Nor is the productivity per worker likely to increase much, despite systems and other approaches to that problem. So, for whatever construction is put in place, the unit costs for labor will continue to rise as union contracts already direct for the next year or so.

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89 A research library for Northwestern University

SOM partner Walter Netsch designed this building in 1964, and it is now just complete. A major work of architecture, it marks a transitional phase in the development of Netsch's current design approach, leading to the crystallization of his well-known 'field theory'.

97 A school for small children as big as all outdoors

Architect Gary Lindstrom has designed a lower school building for the New Canaan Country School campus that is white and bright, as full of light as it is light-hearted.

101 It's Not Just the Cities, fifth in a series by Albert Mayer

Last month, Mayer listed the great issues, limiting the kind of development we are going to maintain. The first of these issues—Land as a Public Resource vs. Speculative Commodity—was discussed in the last article. In this article, Mayer discusses Sloganesque vs. the Real Action Courses.

107 Two industrial buildings

Two buildings—one a technical center for an engine company by architect Harry Weese, the other a garment distribution center by architects Knorr-Elliott—show that handsome results are obtainable by the simplest means, used with sophistication and restraint.

115 A parabolic-arch house by Marcel Breuer and Herbert Beckhard

Seemingly a radical departure from Marcel Breuer and Herbert Beckhard's residential architecture, this house uses a concrete parabolic arch for its structure. But it is, on study, unmistakably the architects'.

BUILDING TYPES STUDY 412

119 Three office buildings

These three buildings are different in size—one is a six-story commercial and architects' office in Cambridge, Massachusetts; one is fifteen stories high on a crowded site in Chicago; and one is a prestigious fifty-two story bank in San Francisco—but they are all very much alike in what they do successfully. These office buildings show a common ability to enhance the city immediately around them; to make that part of the city a better place to be in by providing additional closure for a fragmented street or a new visual strength and assertiveness in the midst of chaotic commercialism, or by providing additional pedestrian open space on an intensely-used downtown block.

119 1033 Massachusetts Avenue Building, Cambridge, Massachusetts. Architects: Hugh Stubbins and Associates, Inc.

122 Blue Cross and Blue Shield Building, Chicago. Architects: C. F. Murphy Associates



126 Bank of America World Headquarters, San Francisco. Architects: A joint venture of Wurster, Bernardi and Emmons, San Francisco, and Skidmore, Owings and Merrill, San Francisco; Pietro Belluschi, Boston, consulting architect.

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133 Equipment that works on the refuse disposal problem

Presently, refuse is either burned or dumped. The problem is that incinerators for apartment buildings, schools and other buildings make smoke, and solid waste has been taking up too much space. Incinerator smoke can be virtually eliminated with a type of collector called a scrubber. Solid waste can be shrunk in volume with a device called a compactor. This article tells how the equipment works, the quality aspects that should be considered, and how much space is required.

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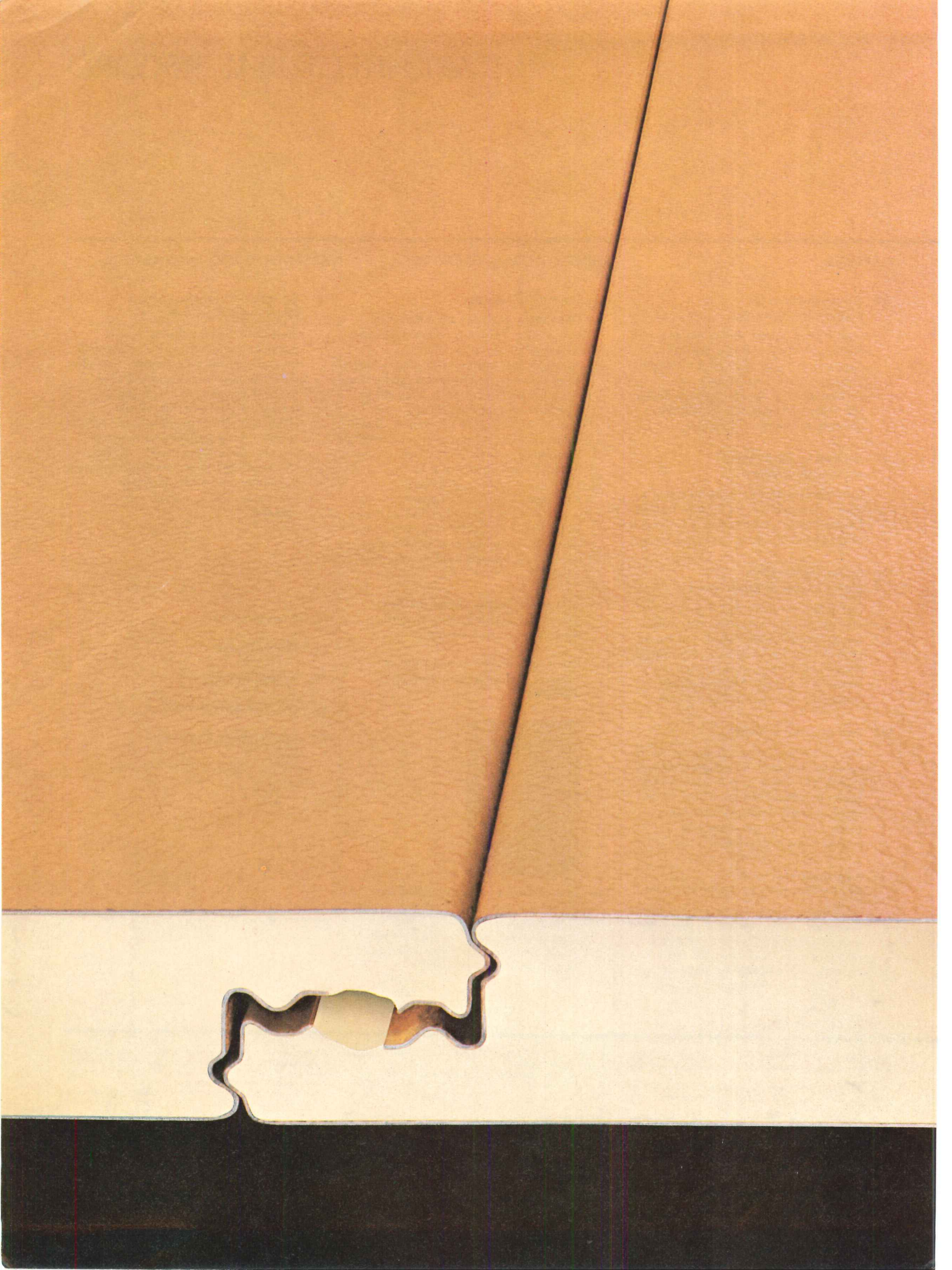
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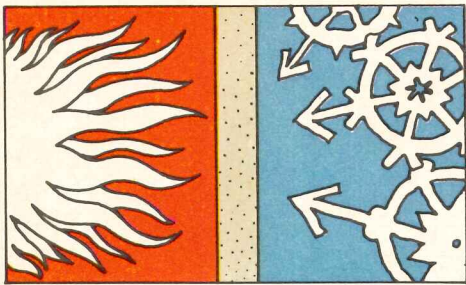




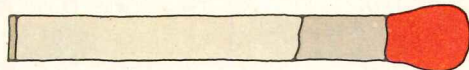
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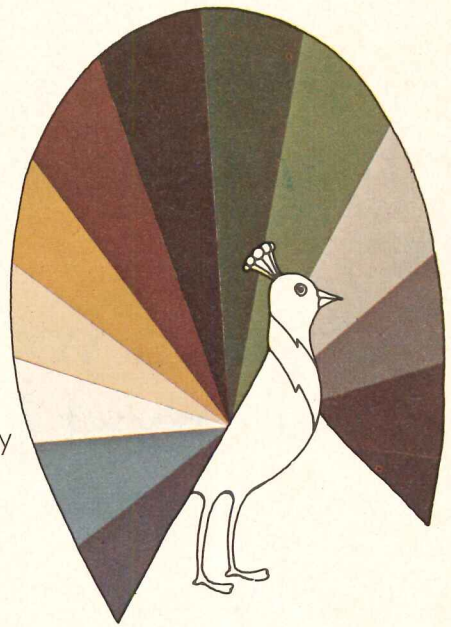


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Wouldn't it be nice if everybody had a trust fund?

In the latest issue of the ARCHITECTURAL RECORD NEWSLETTER, written by our Washington editor, Ernie Mickel, there's an item headed: "A.I.A. supports highway and mass transit trust funding." Mickel reports that "William L. Slayton, executive vice president, American Institute of Architects, urged Congress to legislate a unified trust fund for roads and mass transit. He said architects would like to see highways, subways, bus and rail rapid transit financed from a single transportation trust fund generated from user taxes." But Mickel reports that, somewhat predictably: "Road building interests [and no doubt truck interests, the American Automobile Association, et al, et cetera] oppose the lumping of mass transit with highways; want the present single-purpose trust fund continued."

Well, it's easy enough to see why. For the past 41,000 miles (since the early 1950's) that segment of the building industry concerned with highway construction has been rolling merrily along, come hell or high water or tight money. We are *now*—and have lately been—spending something like \$8 billion a year on highway construction. \$4.5 to \$5 billion of this comes out of the Federal highway trust fund—funds earmarked out of user taxes on trucks, gasoline, tires and the like. This unique Federal disposition of money (I wish more of my taxes went for things I liked and needed) is, as has been pointed out on this page before, many many times more money than goes into, say, Model Cities. And it is enough, unless my long division is off, to pay outright for the construction of at least a quarter million

housing units, complete with wall-to-wall carpeting, per year. All this is not to mention the \$2 billion to \$3 billion that state and local governments add to the kitty so that the Federal money doesn't go to some less deserving (i.e., other) state or locality.

Mind you, I am not now, nor have I ever, advocated the violent overthrow of the Federal Highway Program. I understood back in the 1950's, I still do, that in the interests of The National Defense we had to have some alternate to the railroad system to move troops and materiel from here to there. But I find that I can now also get to Mount Mansfield (Stowe, Vermont, to non-skiers) in three hours instead of the seven hours it took ante-Interstate 84. (Except that now I *have* to drive, which I hate, instead of having the alternate choice of the ski trains that were a lot of fun and that ran until the new highways put them out of business.) So I sometimes wonder, on my way to Vermont, whether we haven't forgotten why the highway trust fund got started and shouldn't start wondering about alternate uses for all that earmarked money.

I also wish to state unequivocally that I have nothing against trust funds. I wish—for instance—that there were trust funds for slum rebuilding, low-income housing, moderate-income housing, parks and recreation land, air-pollution control, water-pollution control, all kinds of physical and mental-health facilities, and schools—from day-care centers to graduate schools for the doctors we need so badly. (I wish I had a trust fund.) There has just been signed in Washington a \$3-billion user-tax-paid trust fund for the

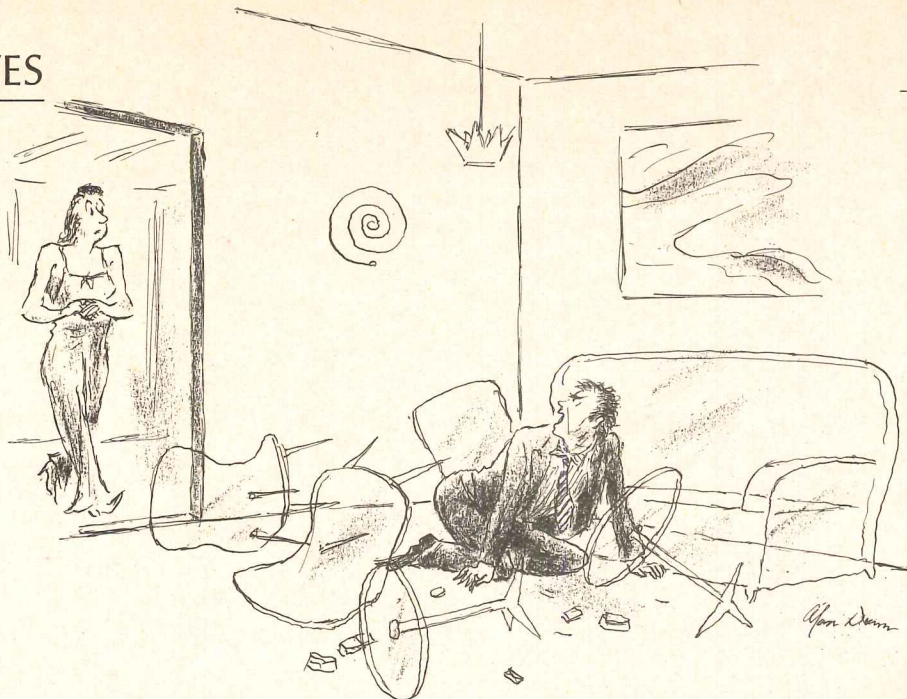
construction of airports over the next five years.

So—while I am against neither the Federal Highway Program, nor trust funds, nor Bill Slayton's proposal for a unified trust fund for roads and mass transit—it does seem that maybe now is the time to reconsider the whole idea of trust funds—and instead collect the tax money and then trust the Congress to listen to all the arguments and put the money where it is *now* most needed.

George Christie, the chief economist of McGraw-Hill Information Systems Company, put it well and strongly to the House Subcommittee on Fiscal Policy, chaired by the Hon. Martha W. Griffiths of Michigan: "Maybe we have reached a point where the trust fund concept itself ought to be looked at. Can we determine 10 or 15 years in advance, as we thought we could back in the early 1950's, that earmarking \$7 or \$8 billion a year would be the best and most efficient and most appropriate allocation for our resources in 1969? I rather think that if we had options on how we wanted to spend this money today we might spend it differently. . . . I point this out," Christie continued, "because there is under consideration [the bill had not yet passed] the notion of doing virtually the same thing in the area of airport construction. We are considering a trust fund approach for airports to be built over the next 10 years. Certainly we need airports. . . . I would not want to see, however, the solution of this problem take the rigid lines it did in the highway trust fund approach of the past decade. I would want to see more flexibility built into the funds provided for airport needs in the future. . . . The question should be asked: Can we really determine priorities that far in advance?"

The answer, of course, is no. And so as long as everybody can't have a trust fund, how about everyone taking their needs and goals to the appropriation committees?

—Walter F. Wagner, Jr.



Powerful postscript to “Why Not a Nationwide Plan for Recreation”

In the May issue (page 131) senior editor Betty Thompson made an impelling argument for a strong national plan for recreation land use. Pointing out that the National Outdoor Recreation Plan, prepared by the Bureau of Outdoor Recreation, has never been published, Mrs. Thompson said: “No one knows whether it is a good plan or a bad one, whether its scope is indeed broad enough to meet the needs of a growing population and an increasingly urban one, whether it is imaginative or innovative, whether it is flexible or inflexible. Yet there was never a time in this country’s development when a plan based, one must hope, on an intelligent study of the needs, means, wants and dreams of the American people was more needed to assure a constructive, beneficial, rewarding use of leisure time—and the best and most far-sighted handling of our natural resources.”

Soon after that story went to press, Secretary of the Interior Hickel similarly stressed the need for planning in his proposal to raise the Land and Water Conservation Fund—made up of revenues from outer shelf mineral leasing, Federal recreation area entrance and user fees, sale of Federal surplus property and motor boat fuel taxes—from the present \$200 million to \$300 million. “It is urgent,” he said, “that we move now to bring recreation opportunities to the people . . . especially in the urban areas where the needs are the most out of balance, suitable open spaces are getting scarce and land costs are spiralling. Three quarters of the population live in and around our major cities. . . . We must bring more parks to the people to relieve the social pressures in these crowded areas. . . . We have got to keep our authorizations and appropriations parallel so that we can pay for our recreation areas at the same time that we select them.”

As Mrs. Thompson points out: “All the

more reason why a comprehensive plan for the recreation needs of this country should be made, published, discussed and, finally, after due consideration, adopted. Without it, it will be impossible to establish the balance mentioned by Secretary Hickel. With it we can not only ‘Bring parks to the people’, but preserve both the quality and variety of outdoor experience.”

Borrowable idea: architectural tours guided by architects

According to W. R. Hasbrouck, executive director of the Chicago Chapter of the A.I.A., the Chicago architects have inaugurated a program of architectural tours. Two are offered to organized groups upon request: the Chicago School of Architecture tour and a Frank Lloyd Wright tour of Oak Park and River Forest. All tours are given on glass-topped sight-seeing buses by trained architectural guides. The tour program was started in 1968 by the firm of Fitch Larocca Carington Jones.

“During the past two years,” reports Robert Carington, “we have exposed thousands of people to the treasures of Chicago architecture. Our tours have been given to groups ranging from grammar school students to alumni associations.”

The chapter charges \$3.50 per person for the Chicago School tour and \$5 for the FLLW tour.

Architects and the single-family house: lots of involvement

Just how involved are architects in the design of single-family houses? The RECORD’s Research Department recently made a survey to update its answer to that question for sales-promotion purposes. The results interested me greatly, and—thus—are reported here:

Last August, a survey was mailed to a national cross section of 1,000 architectural

firms whose names appeared on the 1969 market list for Sweet’s Architectural Catalog File. There were 341 returns (34.1 per cent). The summary of findings:

1. 85 per cent of the architect respondents design houses.
2. In the last year, 70 per cent had designed houses for individual owners—20 per cent had designed houses for builders.
3. In the last year 237 architect respondents had designed for individual owners a total of 886 houses valued at \$48,-214,000.
4. In the last year 68 architect respondents had designed for builders a total of 2,687 houses valued at \$65,070,000.
5. The cost of the average house designed for individual owners was \$54,400. The average house designed for builder clients cost \$24,400.
6. 46 per cent of the architect respondents say they make money designing houses—54 per cent say they don’t.
7. 42 per cent of the architects indicate that they experiment with ideas in houses that they later apply to non-residential work.

Coming in the RECORD next month

The new format of the Table of Contents (see pages 4 and 5) squeezed out the “Coming in the Record” section that we have published for so many years. Henceforth, therefore, it will appear here.

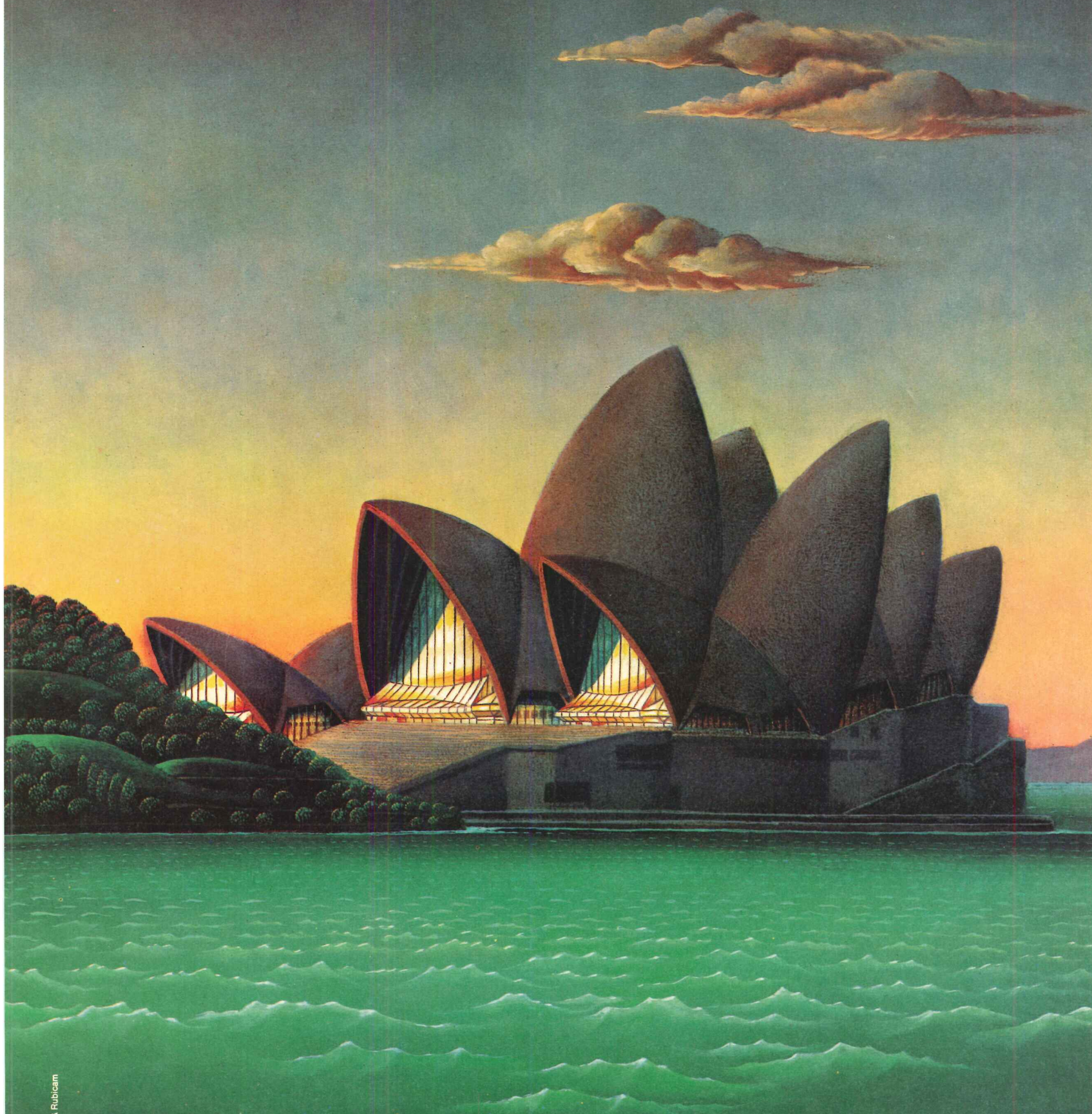
August will include: a 16-page feature on Interiors, including a report on Neocon 2 as well as a portfolio of first-rate architect-designed interiors. Also: a Building Types Study on airports, a kind of design that is being rethought in offices across the country because of the impact on terminal facilities of the 747. There will also be presentations of Kevin Roche’s Knights of Columbus building in New Haven, and Raymond Moriyama’s Ontario Center of Science and Technology.

—W.W.

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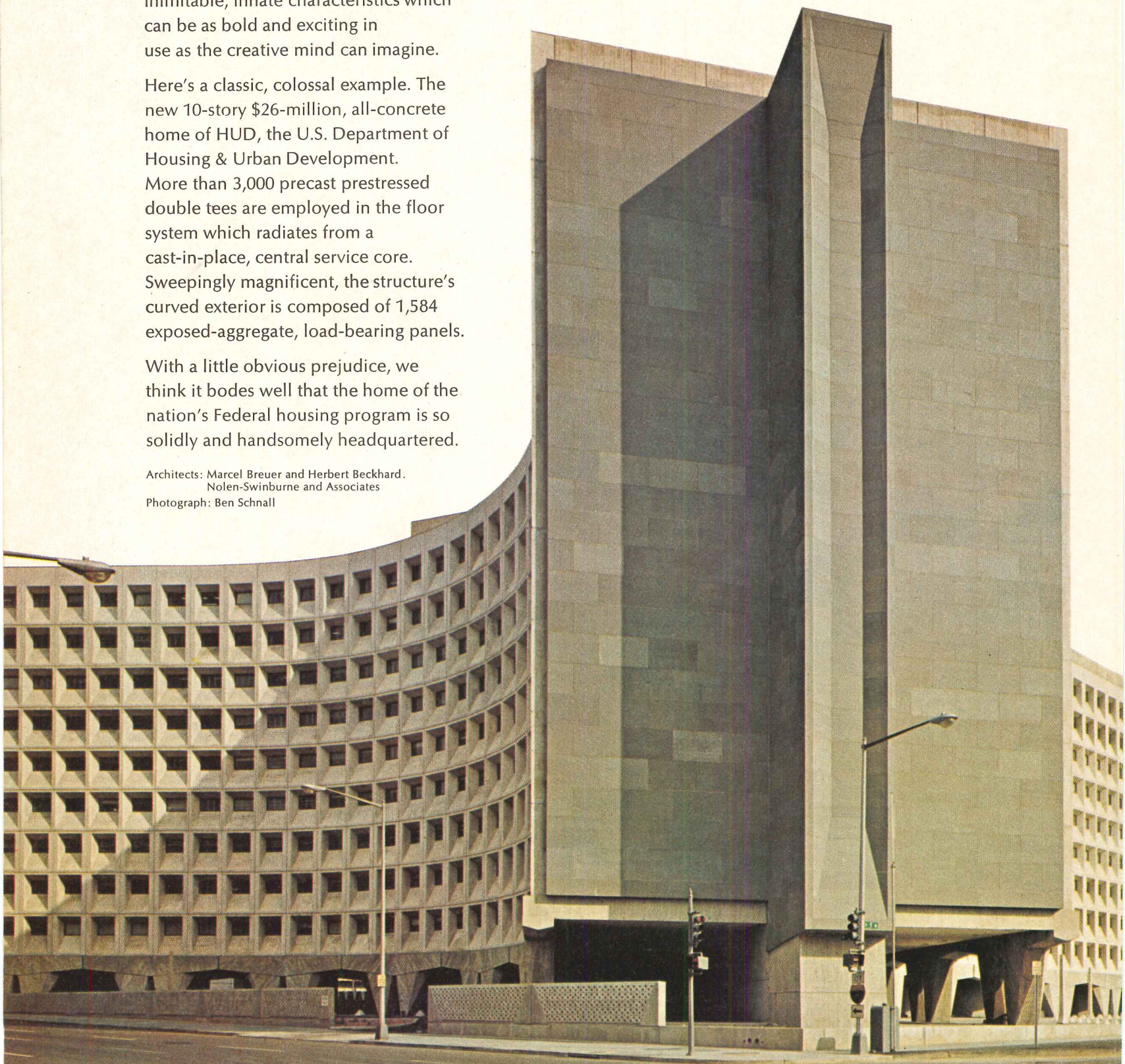
gives you design flexibility
and goes up fast!

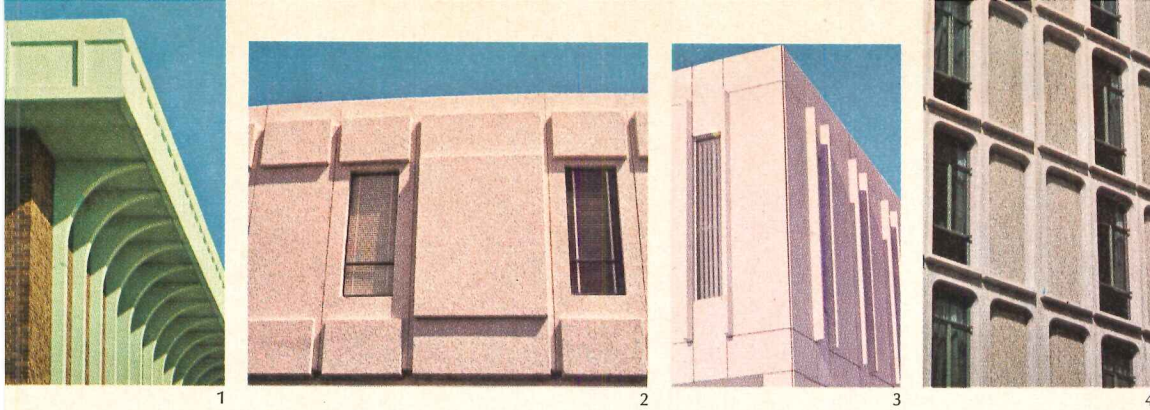
Prestressed concrete is a unique structural and design medium with inimitable, innate characteristics which can be as bold and exciting in use as the creative mind can imagine.

Here's a classic, colossal example. The new 10-story \$26-million, all-concrete home of HUD, the U.S. Department of Housing & Urban Development. More than 3,000 precast prestressed double tees are employed in the floor system which radiates from a cast-in-place, central service core. Sweepingly magnificent, the structure's curved exterior is composed of 1,584 exposed-aggregate, load-bearing panels.

With a little obvious prejudice, we think it bodes well that the home of the nation's Federal housing program is so solidly and handsomely headquartered.

Architects: Marcel Breuer and Herbert Beckhard.
Nolen-Swinburne and Associates
Photograph: Ben Schnall





1. Architect: Smith Voorhees Jensen Associates
2. Architect: Haarstick Lundgren and Associates
3. Architect: Richardson, Seaverns, Scheeler & Associates, Inc.
4. Architect: Charles Herbert & Associates, Inc.
5. Architect: Wescott & Mapes
6. Architect: Stenson and Warm, Inc.
7. Engineer: California Division of Highways

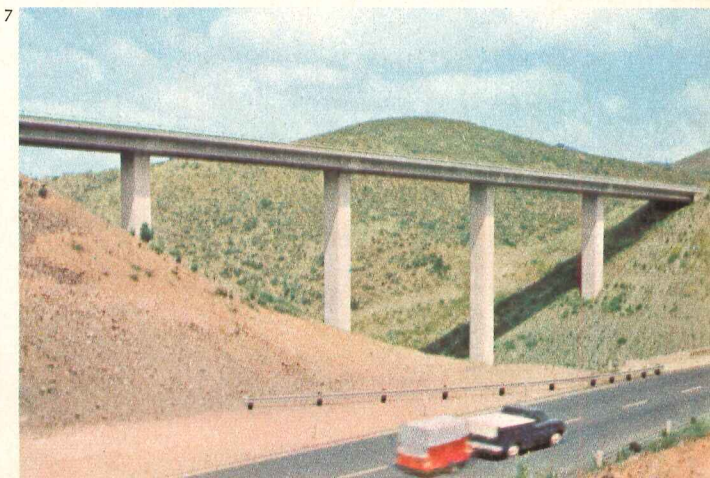
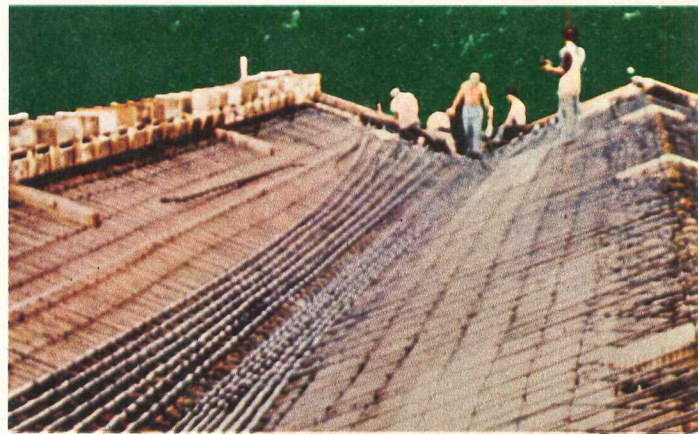
■ Architectural precast concrete knows virtually no restriction in shape, size, color, texture and depth of design. With it, you will know no restraint save architectural and structural integrity. These thoroughly practical panels react to light and shadow to create surfaces of sculptural intensity, brightening the face while adding brawn to modern building design. Perhaps that's why so many of today's most inventive architects, in creative partnership with precasters who transform design into concrete reality, are turning in ever-increasing numbers to this supremely versatile material.

■ The telescoping of construction time is yet another of prestressed concrete's attributes. And who knows better than you do the bite on-site labor costs take from today's building budgets? While site preparation and foundation work proceed, precast prestressed units are mass produced in the plant and move to the site on schedule for placement directly from truck to structure. Prestressed concrete members fit together so quickly and with such nice precision that your most anxious, eye-on-the-calendar client intent on early occupancy will approve.

■ Another structural method employs post-tensioned prestressed concrete. When cast in place, this type of construction takes on any shape you choose. Post-tensioning is often used to tie precast prestressed concrete units together. It is also combined with precast construction when continuous slabs are desired. For example, parking decks are frequently post-tensioned while precast units are used for structural framing. In segmental construction, now in ever-widening use, precast members are post-tensioned together to further extend the already long-span capability of precast prestressed concrete.

■ You will find that the longer spans so patently advantageous with prestressed concrete provide wide bays, increasing usable, column-free floor space. Ceilings are clean and trim when easily accessible mechanical and electrical systems are neatly channeled between stems of well-proportioned structural members. And this long-span strength is by no means limited to the indoors, as its burgeoning application to bridges will attest.

■ Talk with your nearest PCI producer member. He can help you make the most of prestressed concrete—the construction material that gives you design flexibility and goes up fast!

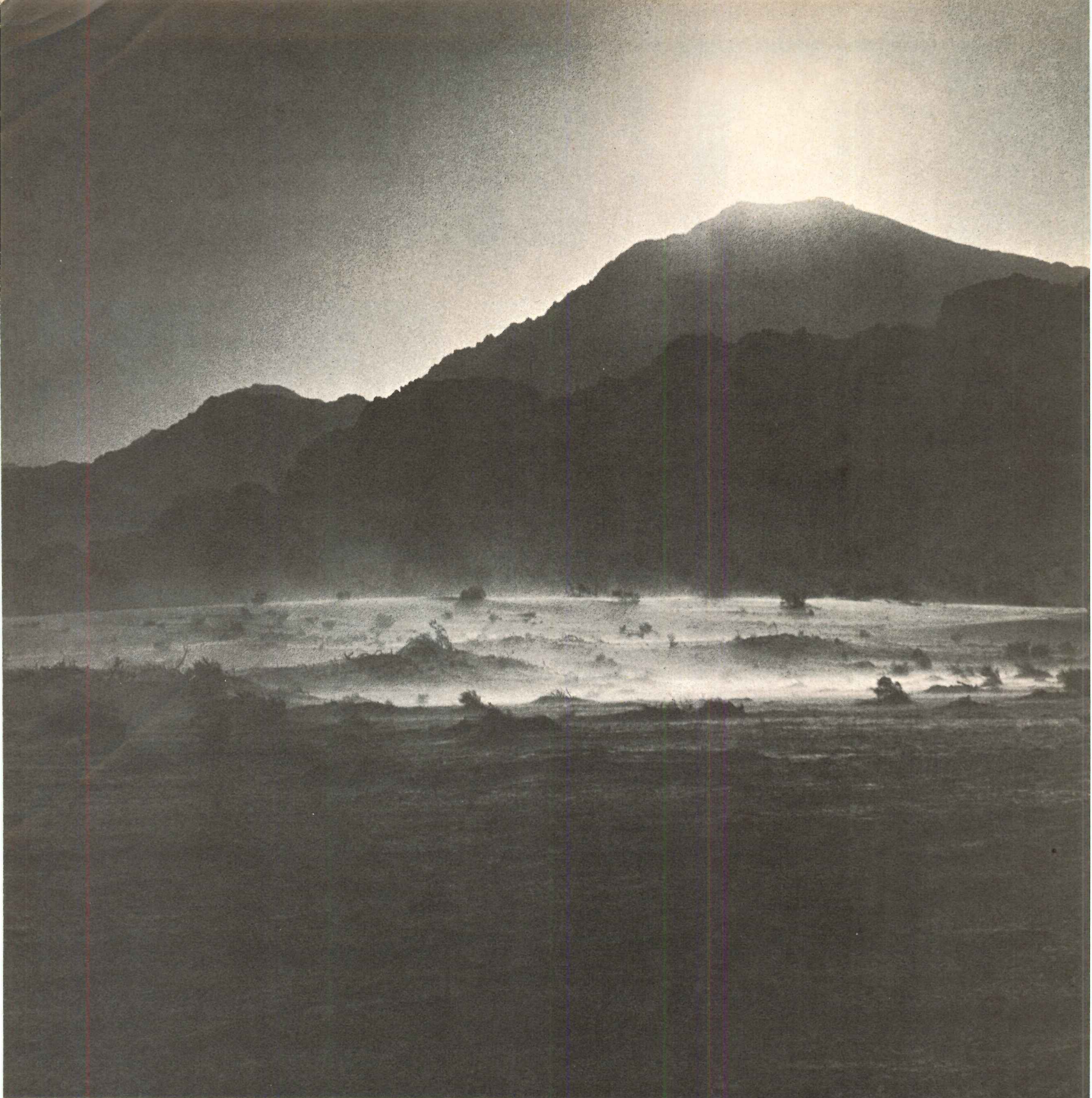


PRESTRESSED CONCRETE INSTITUTE **PCI**

 ARCHITECTURAL STRUCTURAL
 205 West Wacker Drive Chicago, Illinois 60606

For more data, circle 7 on inquiry card





Light and man.

Light, natural or man-made, affects man in his every environment, outside or inside, comforting or hostile. To deal with light, to shape it, direct it and utilize it, to meet the needs of man is what we do. To Sunbeam, our product is the tool which allows the architect and designer to create the proper atmosphere for working and living, whether that tool is a single fixture or an entire system of illumination and air control. As a contribution to the architectural community, Sunbeam Lighting is preparing a series of booklets entitled *Light in the Human Environment*, written by authorities

of various disciplines...art, psychology, anthropology, behavioral science, human engineering and the social sciences. The first in this series, ...*as the artist sees it*, is available free of charge or obligation merely by writing David T. Traitel, President, Sunbeam Lighting, 777 East 14th Place, Los Angeles, California 90021. On your letterhead, please.



For more data, circle 8 on inquiry card

...more
than a
pretty
face

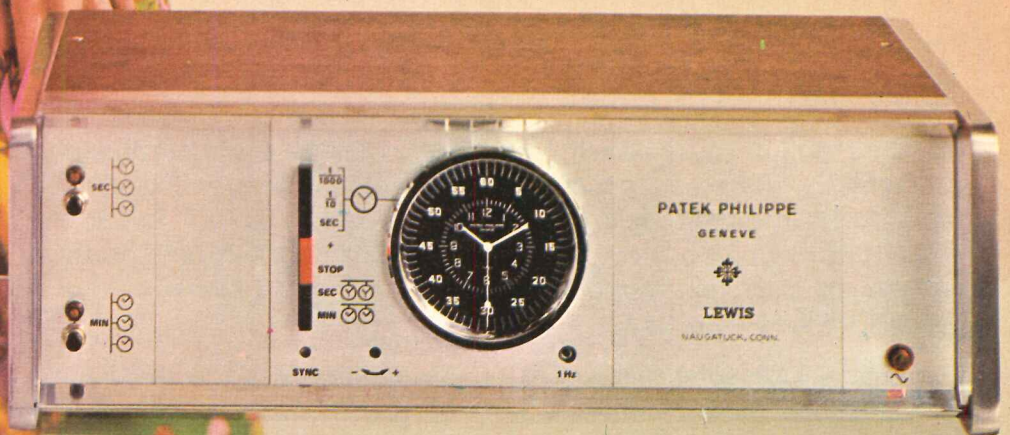
Lewis/Patek Philippe Master Clock systems are endowed with features you wouldn't believe.

- complete modular integration
- no hourly correction needed
- no line interference
- 60 hour reserve — entire system
- completely solid state
- unparalleled accuracy
- virtually maintenance free
- vital statistics $5\frac{1}{4}$ - $16\frac{3}{4}$ - $9\frac{1}{4}$

If you want to install a master time system and forget it, see Lewis for the time of your lifetime.

Horological Division
The Lewis Engineering Company
Naugatuck, Connecticut

For more data, circle 9 on inquiry card



LEWIS



Introducing the gas escalator.

The switch to Gas Total Energy is on.

Jan Johnson just saved herself 24 steps, thanks to the gas company. So did a lot of other bargain hunters in shopping centers and department stores all across the Northern Plains.

Explanation? Gas total energy. The use of natural gas prime movers to produce electric power on-site, right where it's used for lighting,

motors, appliance demonstrations and, you guessed it, escalators. While the engine/generator sets churn out the power, engine heat is recovered to heat or cool all the stores in the "center," as well as provide energy for water heating and other applications.

Why gas total energy? Because the people who design, build and operate sprawling shopping centers know a gas total energy system is one sure way to provide maximum

reliability of energy service with minimum maintenance. And at annual cost savings not possible ten years ago.

Sold? If not, you soon will be. For further information contact your gas company or Bob McChane, Northern Natural Gas Company, 2223 Dodge Street, Omaha, Nebraska 68102.

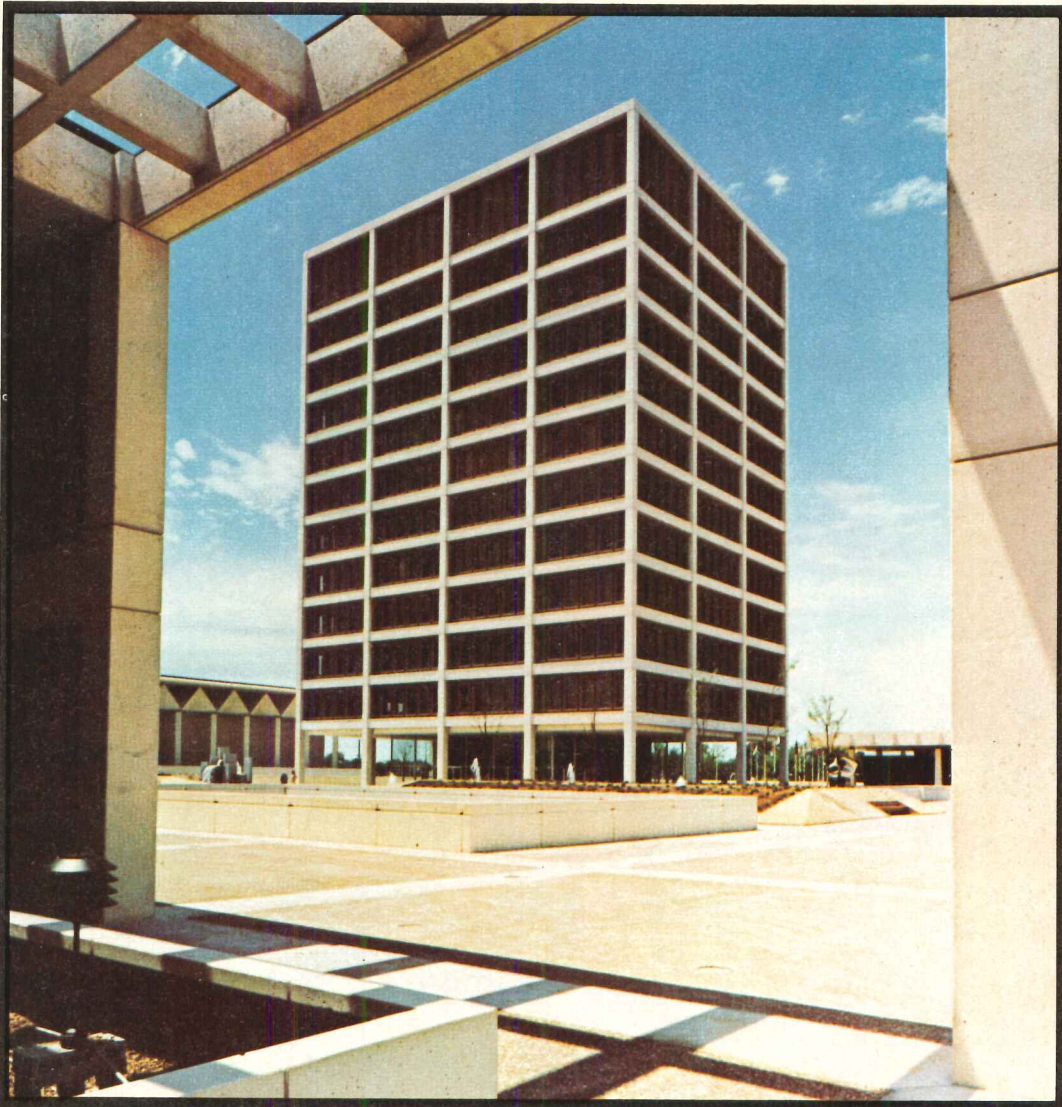


Northern
Natural Gas
Company

Home Office: Omaha, Nebraska

For more data, circle 11 on inquiry card

Cast-in-place white concrete goes tall in Tulsa



Credits: Architects: Murray-Jones-Murray, Coleman-Ervin-Ragsdale & Whimside, Shultz & Chadsey, Tulsa, Oklahoma. Concrete Consultant: Architectural Concrete Consultants, Inc., Houston, Texas. Precast Panels: Harter Concrete Products, Inc., Oklahoma City, Oklahoma. Cast-in-place concrete: Bagby-Harris Concrete Co., Tulsa, Oklahoma. General Contractor: Manhattan Construction Co., Muskogee, Oklahoma.

Tulsa's sparkling new City Hall and Police Court complex represents a unique collaboration between architect, concrete consultant and contractor.

Design specifications called for an eleven story cast-in-place concrete post and lintel exposed construction—of subtle texture and warm white color. Trinity White, with its superior uniformity and whiteness, was combined with aggregates to produce the color tone desired. Specially fabricated fiberglass reinforced plastic forms were used in the casting process. Then, light sand blasting revealed the natural color of the aggregate—the only finishing required. Results: a graceful exterior that will retain its appear-

ance, with little or no maintenance, for decades to come.

The precast panels consisted of 840 window units with glazing reglet cast-in. Erection took place at the rate of 4 floors per week.

The effective use of pre-cast concrete panels coupled with cast-in-place white concrete that is clean and uniform, opens a whole new world of flexible architectural design possibilities. Tulsa's new cast-in-place City Hall is beautiful evidence.

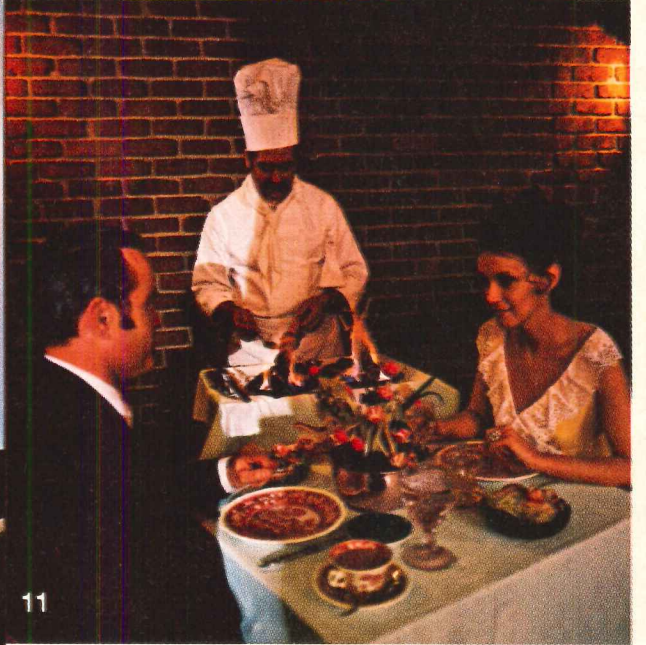
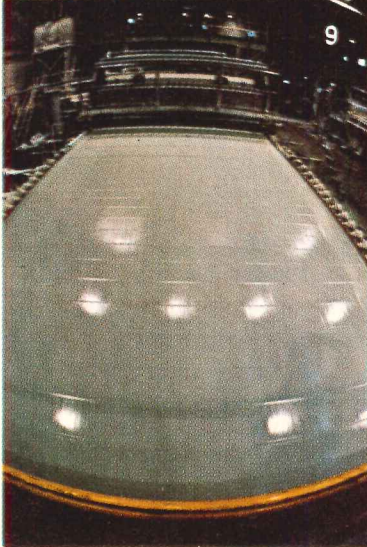
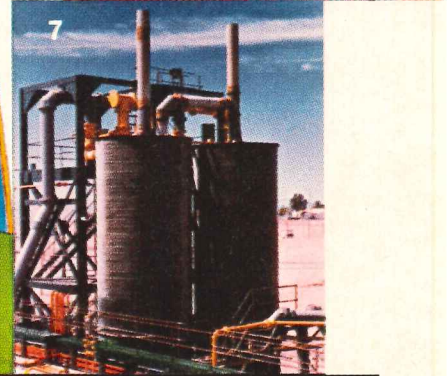
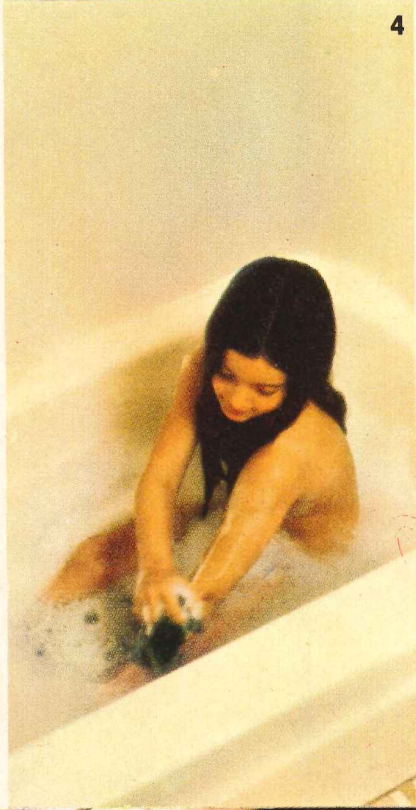
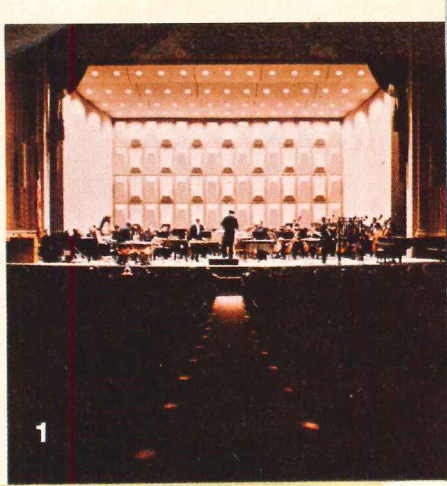
Trinity White Portland Cement



General Portland Cement Company

DALLAS • HOUSTON • MIAMI • TAMPA • CHATTANOOGA • FORT WAYNE • KANSAS CITY, KAN. • LOS ANGELES

For more data, circle 12 on inquiry card



1. The San Francisco Opera House picked Hetron-based acoustical panels to sound off to the best advantage. Structurally safe and flame retardant. Meets fire codes for sell-out crowds.

2. Up in the big birds, it's good to have fire-retardant Hetron along for galley panels, flooring, wing tips and tail fins. Meets the stiffest FAR requirements. Stands the roughest stress. Light enough to pay its own fare.

3. Uniflite puts Hetron safety in the hull of every boat. Slaps out fire. Stands up to salt water and the knocks of floating debris. Makes the long voyage just like home.

4. From bathtub stall to outer wall, Hetron-based sanitary units and plumbing fixtures will douse the welder's spark for sure installation and provides a safer building for the bathing beauty.

5. Hetron-based Sanpan® translucent panels let daylight inside the biggest man-made missile complex. Won't break up when rockets blast off. Holds up in hurricane, sun and salt water.

6. To squeeze 300,000 volts, a lineman needs a mobile aerial bucket made of Hetron. Shock-proof. Meets NEMA standards. UL tested. Tough enough for computers, switchgear and complex electrical systems.

7. Hetron took on the Chile desert for Anglo-Lautaro Nitrate Corporation's iodine-extraction complex. Takes the load stress of 425,000 gallons in tanks and scrubbers. Corrosive problems of iodine, kerosene and brine. Outside temperatures from subfreezing to sizzling hot.

8. Rapid-transit cars put passenger safety on top with Hetron on the ends, front light housings, seats and window trim. Fights fire and corrosive fumes. Holds down repairs and repainting. Keeps everything moving, from motor vehicles to monorails.

9. Tough enough to handle chlorine dioxide bleaching, Hetron FRP laminates are inherently corrosion and fire resistant. Takes chemicals at 250°F operating temperature.

10. To buffer a fast-running, humid air system, Froedtert-Malt Corp. picked Hetron for one of the largest duct systems in the world. Stands tight when fire and corrosive fumes at 200°F try to stop a job.

11. Cavrok® simulated-brick FRP panels with fire-retardant Hetron keeps dinner guests safe. Smart looking inside and out. Flame-spread ratings under 25 comply with building codes wherever people get together.

**You supply
the sparks,
the sizzle,
the rot,
the stress.**

Hetron supplies the durability.

**You've got to take your design
off paper. Put it in the field
and make it work.**

**Get Hetron.®
Works like its own fire engine.
Proven in the
toughest surroundings.
FRP resins with
built-in fire retardance.
Self-extinguishing to nonburning.
Meets the stiffest building codes.**

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For opaque and translucent
building panels and sandwich-wall
applications. Simulated brick
and wood veneers.**

**Plumbing fixtures and
most any architectural shape.
Inside and out.**

**Corrosion resistant. Shock-proof.
Or a combination to fit your specs.**

**Think creative for your
environment. Then let Durez®
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staff now.**

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

versatility

Delivering top sealant performance without imposing limitations on architectural design is a job for DAP Flexiseal®. It's not unreasonable to expect 20 years' service without failure from this outstanding polysulfide polymer system—even in moving joints once considered marginal. Now available in two-part and one-part systems. Both feature *balanced modulus*—adhesion always exceeds cohesion. Both have received the Thiokol* Seal of Security. For catalog on the complete line of DAP architectural sealants, please write: DAP Inc., General Offices: Dayton, Ohio 45401. Subsidiary of *Plough, Inc.*

For more data, circle 14 on inquiry card

DESIGN CONCEPT: The featured apartment tower is the focal point of a high density commercial and residential complex set in a suburban locale. The tower is supported on four massive U-shaped columns housing vertical transportation. Lower area of the structure, less desirable for living space than upper floors, is used as a 5-story atrium garden for year 'round greenery.



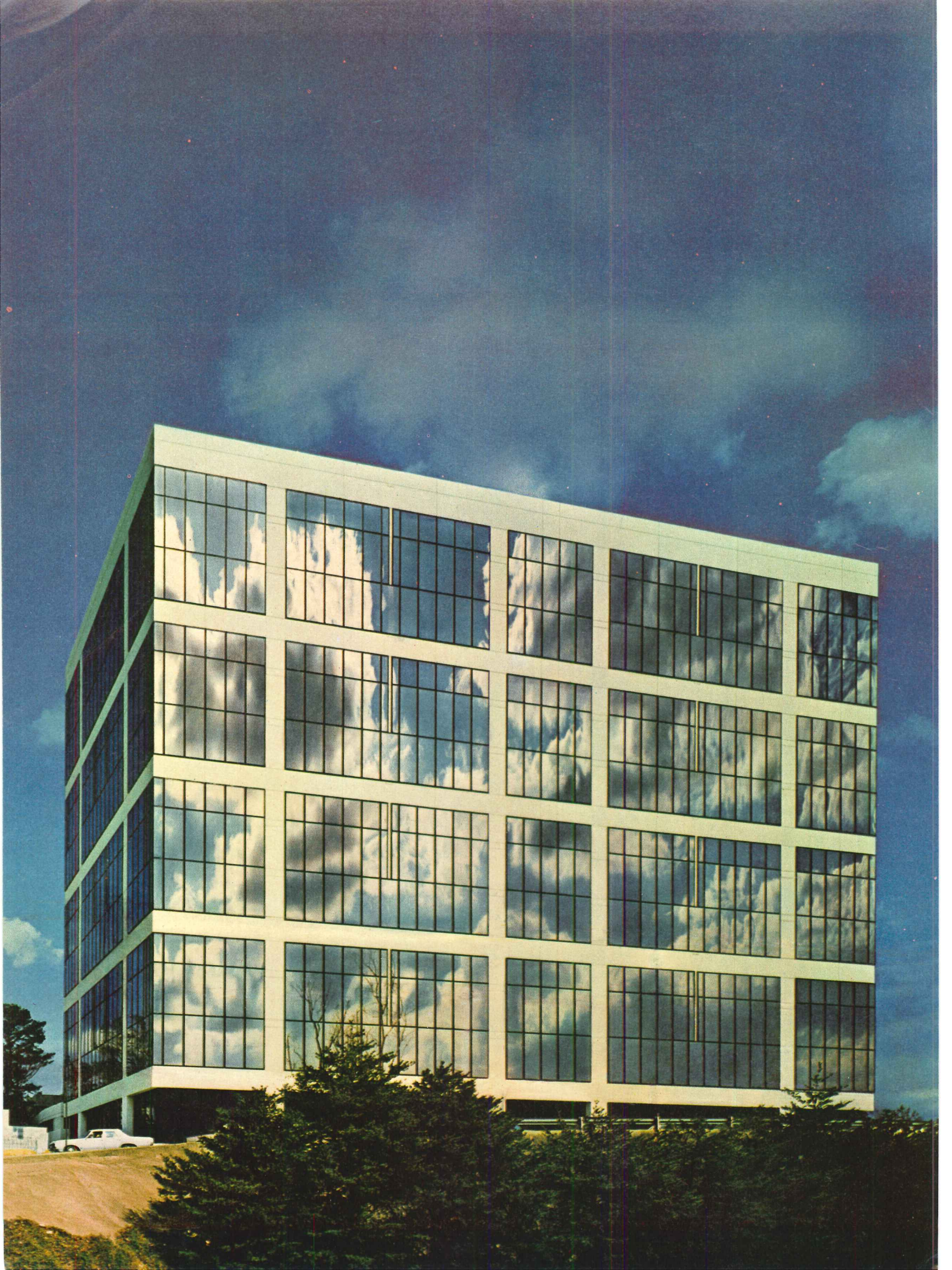
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ARCHITECTURAL
SEALANTS

Also available in Canada



*Trademark of the Thiokol Corporation





If you look *at*
PPG Performance Glass,
you can see its beauty.

Look *into* it, and you'll see
how to get
a better building.

(For the same money you'd spend
on conventional glass.)

PPG Performance Glass enabled the architect for the new Cities Service Building in Atlanta to achieve the exact esthetic effect he desired.

He chose to use the reflectivity of the *Solarban® Twindow®* Unit as an active design medium. The facade is never static . . . its color and tone change as constantly as the cloud patterns and sky tones change.

In choosing *Solarban Twindow* Units, the architect and mechanical engineer also found that the performance characteristics of the glass would offset its higher cost by contributing to savings in HVAC equipment and capacity costs.

The result: "We were able to build a superior building at the same cost as with conventional materials."

Significant mechanical system savings can be realized with *Solarban Twindow* Units because of the

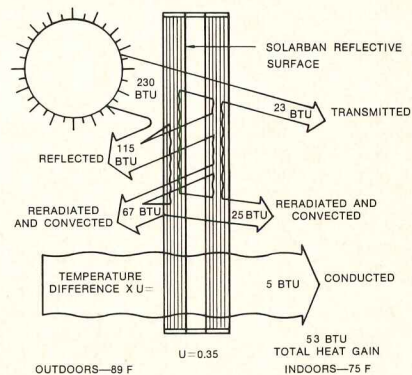
reflective coating which turns back much of the solar radiant energy, rather than permitting it to become a load on the cooling system. This same low-emissivity reflective film on the *Solarban Twindow* Units (normal insulating glass constructions with a 1/2" air space) enables them to perform like triple glazing in reducing conducted heat loss during the winter. In addition, chilly down-drafts and condensation are significantly reduced.

Put PPG Performance Glass to work in your next building. It can help realize significant savings in mechanical systems costs, reduce brightness, aid in temperature control or reflect to enhance the exterior design.

Contact a PPG Architectural Representative for technical data or write: PPG INDUSTRIES, One Gateway Center, Pittsburgh, Pa. 15222.

Architect: Toombs, Amisano & Wells, Atlanta
Developer: Office Planning Associates,
a Division of Cousins Properties Incorporated,
Atlanta
Mechanical Engineer: Lazenby & Borum, Atlanta

**SOLARBAN(2) TWINCOW
INSULATING GLASS**



This diagram is illustrative of relationships for a given specific set of conditions.

PPG is Chemicals, Minerals, Fiber Glass, Paints and Glass. So far.

PPG
INDUSTRIES

For more data, circle 15 on inquiry card

New Denver tower...

Prudential Plaza will have 1200 fpm Montgomery elevators.

Prudential Plaza, joint venture of Del E. Webb Corp., and Prudential Life Insurance Co. of America, is the first major investment in Denver's Skyline Urban Renewal Project.

Montgomery Elevator Company's more than one million dollar installation in the new 27-story office tower will include four high-rise 1200 fpm gearless elevators, five high-rise 700 fpm gearless elevators, and four low-rise 300 fpm geared elevators. All high rise units will be under the command of Montgomery's latest group supervisory control, ESP Measured Demand, with Zones of Service. The result will be Denver's fastest elevators, and the Mile-High City's most efficient elevator system.

Montgomery will also install two 48" escalators in the Mall section of Prudential Plaza.

This combination of People-moving capability is characteristic of Montgomery Elevator Co.: high speed, high-rise elevators; mid-range elevators; low-rise oil hydraulic elevators; escalators with exclusive two-steps-level entry and exit; moving walks and ramps; powerful heavy-duty oil hydraulic freight elevators; and hundreds of special designs to satisfy unusual requirements. In all these ways, Montgomery *moves* people—dependably, quickly, safely.

Architect: Flatlow, Moore, Bryan & Fairburn; Albuquerque
General Contractor and Owner: Del E. Webb Corporation; Phoenix



montgomery
ELEVATORS/ESCALATORS
POWER WALKS & RAMPS

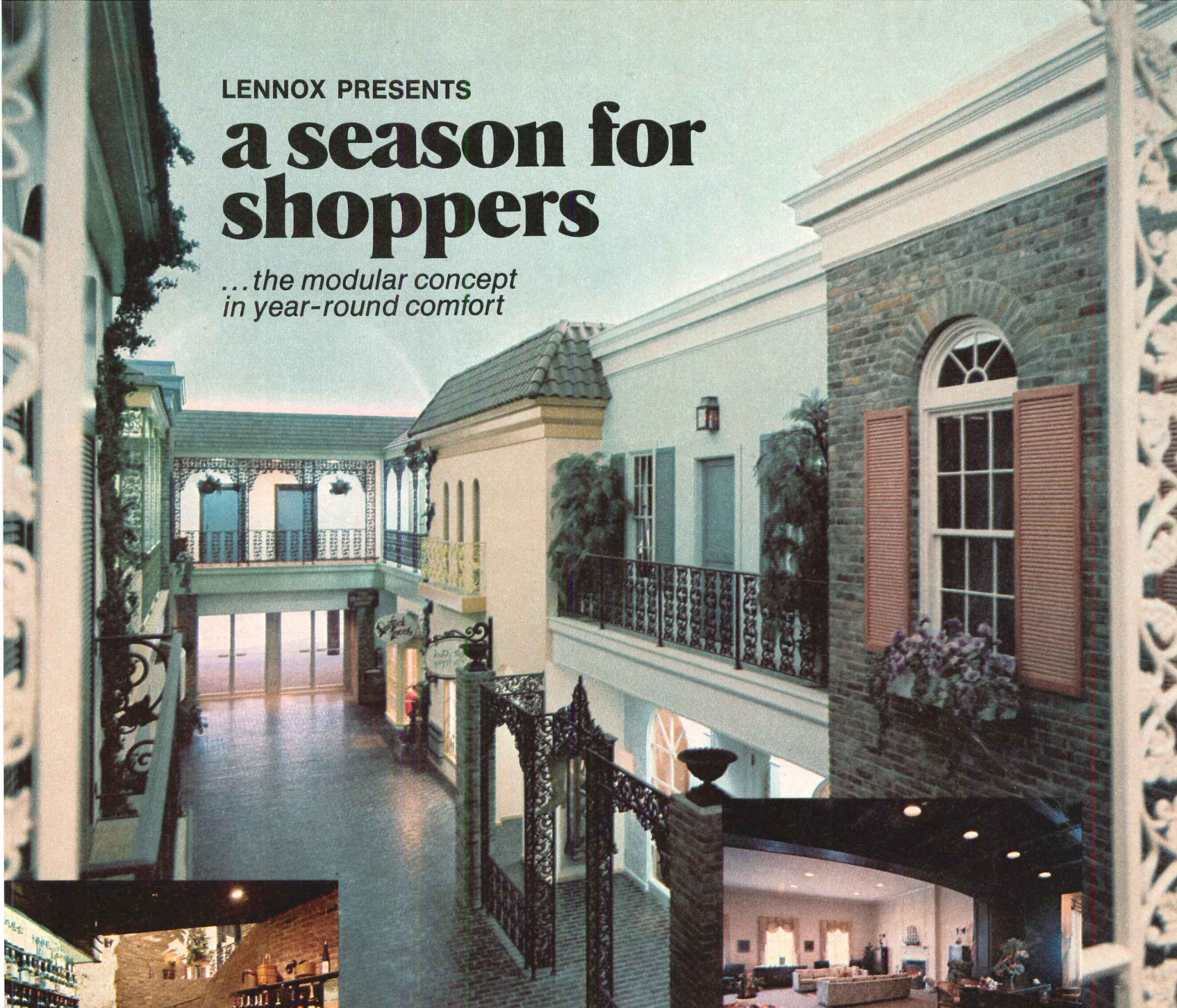
Montgomery Elevator Company, Moline, Illinois 61265
Montgomery Elevator Co. Ltd., Toronto, Canada
Offices in principal cities of North America

For more data, circle 16 on inquiry card

LENNOX PRESENTS

a season for shoppers

*... the modular concept
in year-round comfort*



In Beachwood, Ohio—
a Cleveland suburb—LaPlace
shopping center blends

New Orleans elegance with modern convenience and year-round comfort
in some forty businesses such as (clockwise from lower left): the Inner Circle restaurant,
Le Potpourri gourmet shop's wine cellar, the mall, and Park View Federal
Savings & Loan Association. (See next page for credits.)



The modern merchant recognizes the sales value of shopper comfort. Storewide or through an entire mall, it's good business to keep the temperature even, the air fresh, the comfort continuous. And the economics are especially sound where the comfort comes from Lennox modular heating and air conditioning systems. With comfort designed in from the start.

... continued overleaf



The 83,000-sq. ft. LâPlâce shopping center utilizes the modular comfort concept of heating/cooling/ventilating each shop or office with its own unit or units. Among the 180 tons cooling installed, Lennox equipment serves comfort needs from the rooftop—single-zone, single-package air conditioning with electric heat elements in the cabinets. Architect: Andonian & Ruzsa. Owner: Park View Federal Savings & Loan Association (James W. Male, president). General contractor: The Bolton-Pratt Co. Heating & air conditioning contractor: The Brewer-Garrett Co.

continued...

shoppers' season: a modular comfort concept

In shopping center planning, Lennox modular heating and air conditioning systems offer everything that's needed: comfort, economy, flexibility, design freedom. For initial cost savings, there are Lennox rooftop flash-in-place mounting frames, shortened duct runs. Plus time-and-labor savings from factory assembly, wiring and testing—including electric or pneumatic controls. For predictable long-range savings: quality-built systems with long life, little maintenance. And extended guarantees on critical components.

The modular nature of Lennox equipment prevents a total system breakdown. If failure occurs, only one area is out of service. And, because repairs usually are simpler, recovery is faster. Then, there's Lennox single-source responsibility for equipment and controls; if anything does go wrong, it's on our back.

Compact, low-silhouette Lennox units protect your design freedom. Modular concept simplifies future growth. Scores of systems to choose from. All capacities. Single-zone or multizone. Rooftop or ground level. Compatible combinations. Any fuel. Before planning your next development, consider the esthetics, the comfort, the economics, when the comfort's from Lennox.

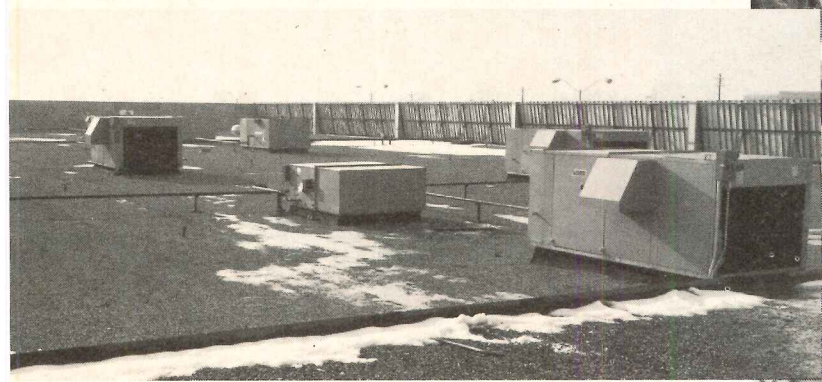
*See Sweet's 29a/Le, or write Lennox Industries Inc., 804 S. 12th Avenue,
Marshalltown, Iowa 50158.*

LENNOX
AIR CONDITIONING • HEATING



Glamorous Centre Laval in Montreal is 400,000 sq. ft. of patron convenience and comfort—in fifty stores, six restaurants and the mall itself. The major portion of its shoppers' season—all-year heating/cooling/ventilating—comes from Lennox single-zone modular equipment: 53 combination rooftop gas/electric units and 17 remote cooling units. Lennox supplied the units for all the allied stores for a total capacity of 433 tons cooling, 15,970,000 Btuh heating. And some 90% are equipped with POWER SAVER™ which cools free when the outside air temperature is below 57°F. Architects: Mayers and Girvan. Mechanical Engineer: Levine & Jonas. Owners: Centre Laval, Inc. Owner/Developer: Frego Construction, Inc.

Phase II of The Mall was a major expansion, almost doubling the original 332,000 sq. ft. of the giant Louisville, Kentucky, shopping center. Shoppers' comfort in eighteen of the twenty stores, plus the mall, is assured by Lennox single-zone combination gas heating/electric cooling units. The twenty rooftop units, rated 3 to 22 tons, provide more than 200 tons cooling capacity. Architects: Katzman & Associates, New York City. Owner/developer: The Rouse Company, Columbia, Md. Heating/air conditioning contractor: Hussung Mechanical Contractor, Inc.



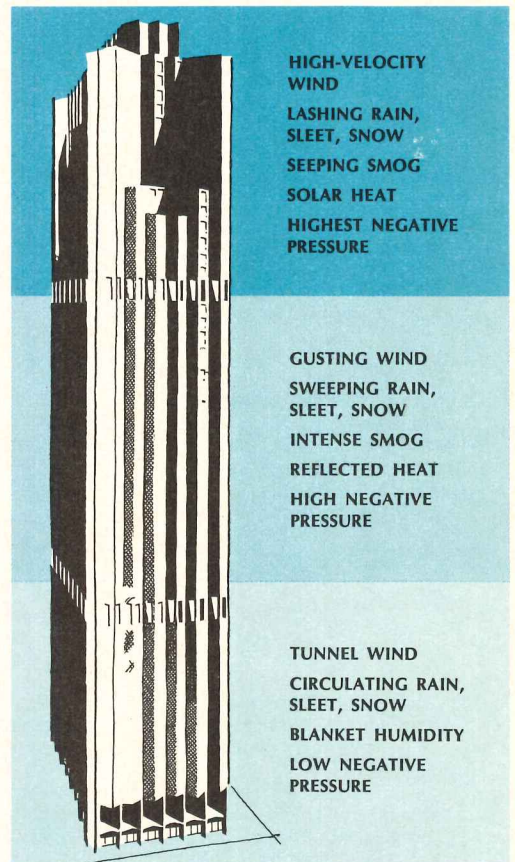
Proven results

Kawneer wall/window capability tames the elements on any size building.

Ground zero to top, the ultra-rise wall/window installation has to stand up to the widest, wildest range of turbulence and temperature of every weather condition.

So—as a result of Kawneer's attention to detail on many of America's most emulated larger buildings—Kawneer wall/window systems handle more modest size installations in stride. The Kawneer-clad building—commercial, educational, institutional, or apartment—keeps the outside out, the desired environment within.

From aluminum billet to installed wall system, Kawneer assures proven results. True today . . . and true tomorrow. For full information write Kawneer Product Information, 1105 N. Front Street, Niles, Michigan 49120.



Bank of America, San Francisco, Calif.

Architects: Wurster, Bernardi and Emmons
Skidmore, Owings and Merrill
San Francisco, Calif.

General Contractor: Dinwiddie, Fuller and Cahill
San Francisco, Calif.

KAWNEER
ARCHITECTURAL PRODUCTS



Kawneer Company, Inc., a Subsidiary of American Metal Climax, Inc. Niles, Michigan • Richmond, California • Atlanta, Georgia • Bloomsburg, Penn. • Kawneer Company Canada, Ltd., Toronto

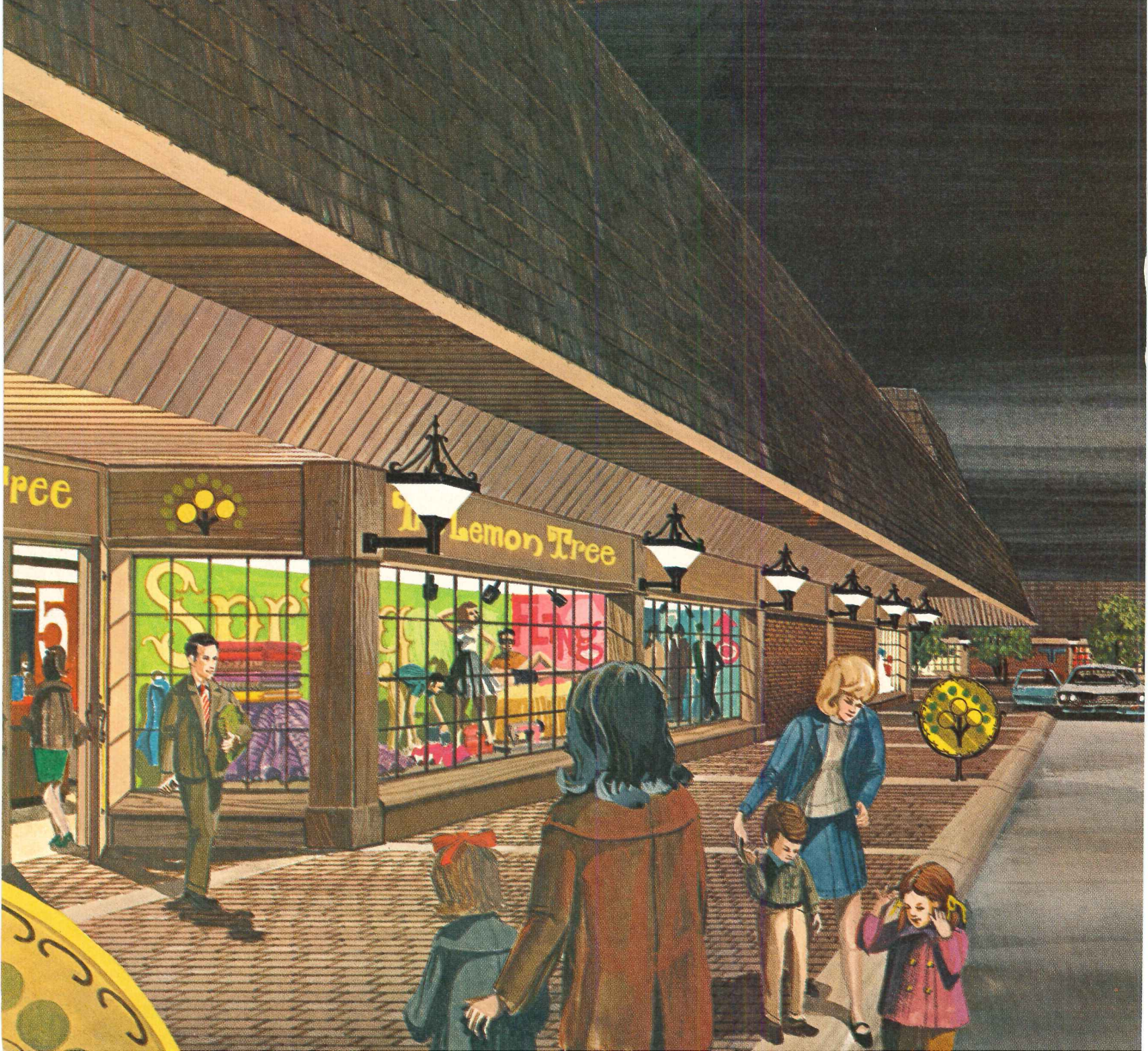
For more data, circle 18 on inquiry card



**THE KAWNEER CONCEPT:
Attention to detail**

H. D. Lee Company, Kansas City, Mo.
Architect: Linscott, Kiene and Haylett
Kansas City, Mo.
General Contractor: Bob Eldridge Construction Co.
Kansas City, Mo.

Light is to look your best by.
And here's new
Ultra-Lite[®] to match your
motif by.



This distinctive luminaire gives you a big, bold say in customizing light to fit your scene.

In fact, you pick the siding. Cedar shakes. Clapboard. Vinyl cladding. Silk-screen signs or designs. Any color paint. Whatever you say to match your style.

Another choice, too, with Ultra-Lite. Straight or canted sides. Again to match your style.

Good light for customers to come into, of course. Four 1000-watt mercury vapor or metal halide lamps see to that. With light on the ground, not in somebody's eyes.

New Ultra-Lites. They're the newcomers among hundreds of light touches we can show you.

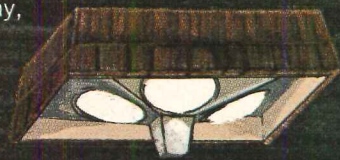
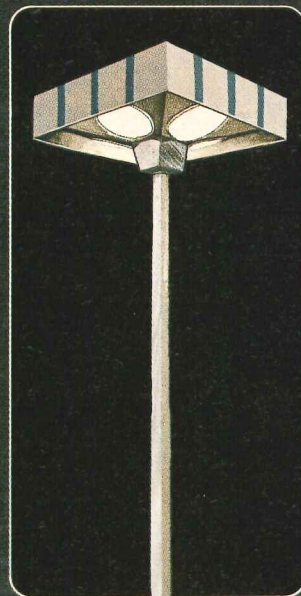
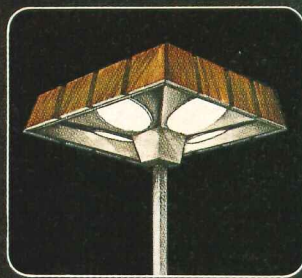
May we?

Just circle the reader service card. Call us.

Or call your nearby Crouse-Hinds lighting sales agent. He's ready to do the analyzing, costing and comparing, with an assist from our home office computer.

Crouse-Hinds Company,
Lighting Products Division,
Syracuse, N. Y. 13201

For more data,
Circle 33 on Inquiry Card



CROUSE-HINDS





In corporate headquarters offices of Heublein, Inc., in Hartford, Conn., tiles fit snugly in the Accesso Concealed Suspension System to form a smooth, almost seamless ceiling.



Every tile is an instant-access panel

with the new Keene Accesso™ Concealed Suspension System for acoustical tiles and pans.

Tilt any tile up and lift it out. With the Keene Accesso system, that's all you do for instant access to overhead systems anywhere in a building. With no need to interrupt office routine. No searching for special access panels. No special tools to strong-arm tiles down.

Accesso is the most convenient ceiling system ever. What's more, Accesso members aren't locked permanently, so you're not locked into the building module. You're free to locate, and relocate, lighting fixtures and air-handling devices wherever you like. And because the Accesso system—exclusively—can also be used to suspend metal-pan ceilings in high-humidity areas, you can specify just one ceiling system for the whole building.

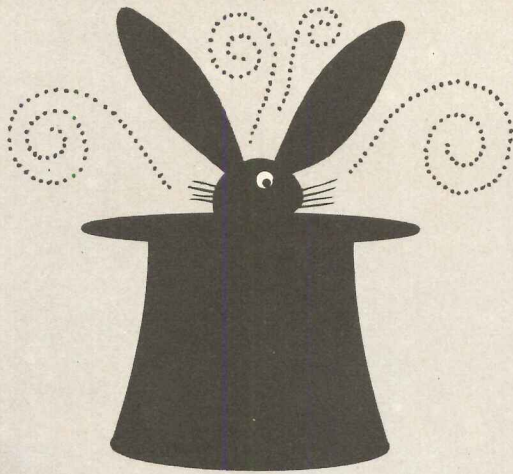
You can use any standard tile in the Accesso system, with no special machining. But for looks to match convenience, specify beautifully fissured Styltone or other acoustical tiles from Keene. For full details, write Keene Corporation, Sound Control Division, Princeton Service Center, U.S. Route 1, Princeton, New Jersey 08540.

KEENE
CORPORATION

SOUND CONTROL DIVISION

We've just begun to grow.

For more data, circle 19 on inquiry card



Seems like magic!

RACONTEUR

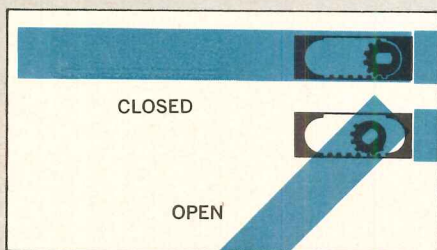
Open the door, and, for a second, you think magic is at work. Raconteur, the 500 rack and pinion pivot hinge*, stages a little side step that's almost dramatic in the double-pivoting maneuver.

The door not only opens in a swinging arc, but also shifts laterally away from the jamb. What a difference this makes for flush-mount precision! Paneled walls can have doors about anywhere you wish without framing, clutter, or gaps.

No other pivot can give this two-way movement.

No other pivot hinge can show off door action to such good advantage.

Let your Hager representative show you the desk-top miniature that reveals all that's hidden.



*Patent No. 3,394,428



HAGER HINGE COMPANY

139 Victor Street • St. Louis, Mo. 63104

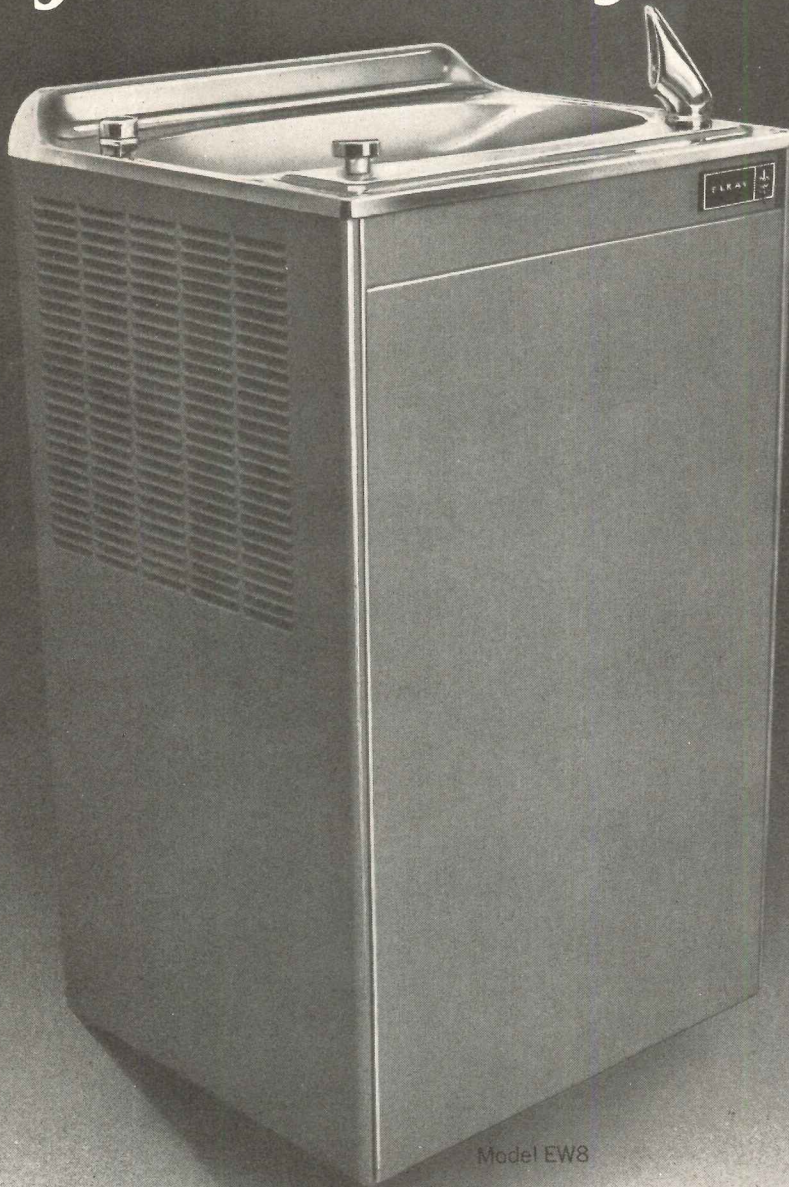
In Canada: HAGER HINGE CANADA, LTD.

"Everything Hinges on Hager"

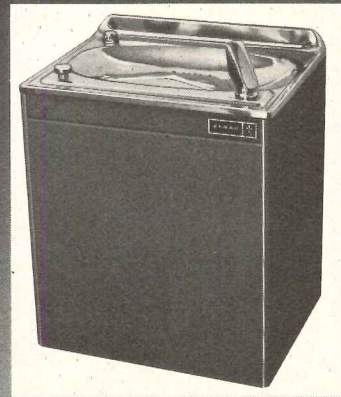
For more data, circle 20 on inquiry card

A totally different design concept makes Elkay wall mounted water coolers easier to install and service and provides flexibility to meet a greater number of user requirements. Regular model, 29½" high, and the popular compact, 22" high, are available. Both feature interchangeable decorative panels—with nine colors in vinyl and two in baked enamel in stock for immediate delivery and at no extra charge. (A slight extra charge for stainless steel panels.) Exclusive cascade design stainless steel anti-splash basin has vandal-proof drain and hooded stream projector with remote control. Hot dispenser and glass fillers are optional. Two level versions for adult and child service are available.

from the ELKAY® family of firsts




Model EW8



Model EWC8



For complete information write for Catalog No. DFC-4 or call Customer Service Dept., Area Code 312-681-1880. ELKAY MANUFACTURING COMPANY, 2700 S. Seventeenth Ave., Broadview, Ill. 60153

see our catalog in Sweet's 

For more data, circle 21 on inquiry card

News in brief

The Dodge Index of architect-engineer planned construction rebounded in April to 277 (1957-59=100). The latest month's seasonally-adjusted advance was due mostly to renewed strength in industrial and commercial building. Institutional construction sagged in April as educational and religious construction had financing problems. Apartment projects gained.

A unified view of the global effect on climate of pollution is the goal of a major M.I.T. conference of authorities on many aspects of the problem. One purpose of the conference, which will run throughout this month, is to do "homework" for the 1972 United Nations Conference on Man and the Environment. The aim will be to ascertain rates, routes, and reservoirs of pollutants, to study their global effects and to determine what options are available to us and what priorities need to be established.

Construction workers' demands could double wage rates in three years, according to a spokesman of the Associated General Contractors of America, who argues that productivity has only increased at the rate of 1 per cent per year during the last five years. According to the AGC, construction strikes are up 100 per cent over the same period a year ago with settlements averaging over 18 per cent a year.

The Labor Department's "Washington Plan" will require contractors on Federally-assisted projects in the Washington, D.C. area to employ increasing percentages of minority workers over the next four years. Directors of Metro, which is building the city's subway, wholeheartedly adopted the plan.

Chrysler Realty Corporation will build the largest planned community in Michigan, working with Levitt and Sons, Inc. Northfield Hills, which will be a suburb of Detroit, will also be the first community to be developed under the state's new zoning concept of Planned Neighborhood Development. Architect Minoru Yamasaki is in charge of over-all architecture and master plan.

A joint venture company to deal with environmental problems has been formed by ten leading engineering firms in the San Francisco Bay area. Engineering Research Associates (acronym ERA) will bring together more than 300 engineers and architects to give pollution control and waste disposal problems a broad-based approach.

A slowing rate of U.S. population growth may reduce the need for new town construction, according to a report done by William Alonso, of the department of City and Regional Planning, University of Calif. at Berkeley. The report says the U.S. population will increase by 75 million by the year 2000 at the present rate of growth, rather than the widely accepted estimate of 100 million. Present metropolitan areas are said to be able to absorb about 80 million more. That moves the saturation point up to the year 2002.

Planned Unit Developments are the housing wave of the future, according to architects and developers who met last month at the Pacific Coast Builders Conference. Architect Charles Delk, A.I.A. told the conference the public must be educated to the virtues of cluster housing. Also at the conference, Oakley Hunter, president of the Federal National Mortgage Association promised "Fannie Mae" would maintain its support of the homebuilding industry despite the stresses of the current money market. Three business leaders told the conference the biggest contributor to the slowdown in the purchase of homes is the feeling of uneasiness regarding the political situation abroad and domestically.

American Institute of Steel Construction Architectural Awards of Excellence entries must be received by September 1. **The \$4,000 Pilkington Travelling Scholarship in Architecture,** the richest prize open to young Canadian architects, went to Ronald W. P. Hoffart, a 23-year-old graduate of the University of Manitoba's School of Architecture, for his "new urban living mode," a plan for restructuring Winnipeg through decentralization and mixture of functions. **The 1970 Eaton Yale and Towne Urban Design Fellowship** of \$5,200, administered by the A.I.A., went to Donald R. Simpson of Philadelphia. **The Grand Award of the New York Association of Consulting Engineers'** Engineering Excellence Awards program went to the Newport Bridge, Newport, R.I., the U.S. Steel Building in Pittsburgh, and the John F. Kennedy Center for the Performing Arts in Washington, D.C. Architect Marcel Breuer received First Prize in the structural category for his New York University Technology II Building.



© Louis Checkman

Worcester, Mass. opts for high-quality renewal

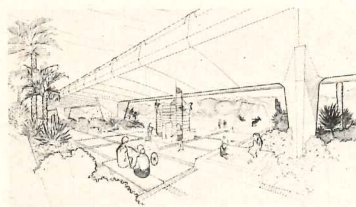
A group of prominent architects and planners are putting their stamp on Worcester, Mass. in a major way. In 1966, the city held a competition for the rebuilding of a large portion of its downtown core, to include local stores, two large department stores, Filene's and Jordan Marsh, neither of which are used to building in inner city areas, two office buildings, a 4,500-car garage, and a 360-room hotel and convention center. Welton Becket and Associates, Architects won with a design that included a 475-foot long by 62-foot high shopping "Galleria" (above). Graphics for the Galleria, as well as the hanging light sculptures shown, were designed by Chermayeff and Geismar. Other art works for the Galleria were chosen by Annie Damaz (see also "City Walls" below). The Becket project will form an "L" around the city's common, which, itself, is being redesigned by landscape architects Sasaki, Dawson, DeMay Associates. The multistory garage will border the outer edge of the project.

Worcester Center Associates, the developer, is a joint venture of the Beacon Construction Company and the Berenson Corporation. The work is under the supervision of the Worcester Redevelopment Authority.

Several other notable buildings are rising in downtown Worcester. Architects Sert, Jackson & Associates, Inc., will do a theater near the hotel. Curtis and Davis will do the nearby library. Benjamin Thompson and Associates, Inc. have designed an apartment tower; and Kevin Roche John Dinkeloo and Associates have designed an office tower (July 1969, page 42).

Architects recommend mini-freeway system for Phoenix area

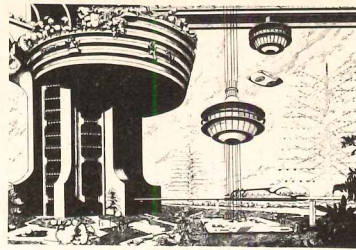
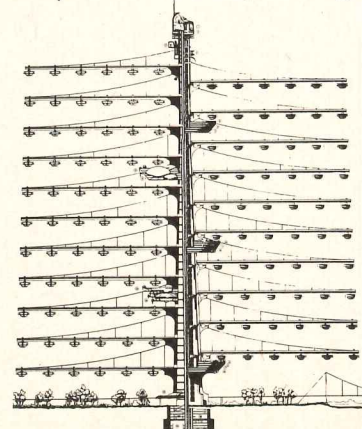
A transportation concept replacing the usual urban freeway with a network of small, narrow, limited access roadways, is being recommended for Scottsdale, Arizona by a team consisting of Taliesin Associated Architects, Earle V. Miller, Engineers, and John D. Herbert and Associates, Economists in a study prepared for the Arizona Highway Department. The roadways would be built for auto traffic alone, deferring construction of truck routes until they were more necessary than they are now. This would result in cheap, light, esthetically appealing (or, at least, less damaging) structures.



Dendratom: structure designed for cities in the sky

"Within ten years . . . There will be no wheels and no roads but only anti-gravitational transport"—Marshall McLuhan, 1968. Anticipating this not-so-far-fetched possibility, two Italians who may or may not have read McLuhan, Massimo Maria Cotti and Tullio Rolandi, have designed a dwelling tree permitting direct access to any level from external space. It is, they say, a tree for the atomic age, a "Dendratom." They have put out a small book with beautiful drawings to illustrate the concept.

The book argues town and housing design would automatically and radically change



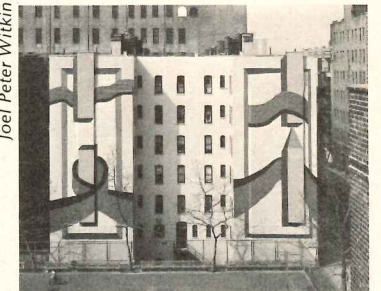
upon the introduction of air cushion vehicles. Dendratom houses would be "nests" in the branches of a tree whose trunk could contain necessary social services such as stores and recreation facilities and whose roots would contain independent heat and power sources. Each branch would have a small garden restricted to the use of the few families whose living cells were attached to it.

NASA plays the World Game

"Ecological Surveys from Space" is the name of a new illustrated book put out by the National Aeronautics and Space Administration. "With cameras and other sensing devices on orbiting satellites, the whole world's surface can be surveyed in a variety of ways, as often as necessary, to help meet increased demands on the Earth's resources," says NASA. The first Earth Resources Technology Satellite will go into orbit in 1972.

has remained nearly as casual as it was at the start: "Just find a good wall and approach the owner," says Mrs. Damaz. Most owners are cooperative, since City Walls will also repoint the bricks and generally improve the wall's structural condition. Money has come from foundations. Sign painters do the painting.

The paintings—15 so far and no end in sight—grace buildings of all types and locations, from a Bronx tenement to an office tower whose wall overlooks Madison Square to a New York University classroom building. A three-tiered City Walls painting recently concealed (temporarily) the front of the Jewish Museum on Fifth Avenue.



City Wall by Allan D'Arcangelo

Environment group brings architects into the act

The Environmental Action Coalition, a New York City organization which, among other achievements, organized an enormously successful Earth Day (May, Page 40) is getting architects involved in a personal and hard-working way. The Coalition's leader, Fred Kent, who is in his mid-twenties, studied urban planning at Columbia University, where he met many of the planners and architects now working with him.

Fred Kent believes it's imperative that architects get involved, not just as architects, but as individuals. This non-architectural, non-professional commitment, he says, is just as important as the ability to design a better environment. Many of the problems are so pressing and immediate, the only solution is to go in and fight, publicity being the ultimate weapon. Architect Lee Harris Pomeroy, for example, helped organize the highly successful rejuvenation of the block on which he lives, but he now finds himself on the garbage commit-



City Wall by Mel Pekarsky

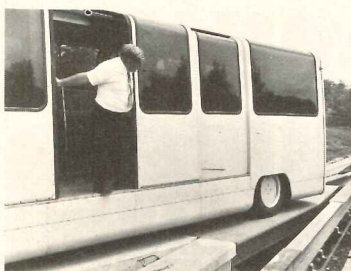
New York artists paint the city's walls

With the blessings of the Mayor, a group of artists is embellishing New York walls on the scale to which the city is accustomed. The idea started three years ago with two artists, Jason Crum and Allan D'Arcangelo, and has since expanded into a non-profit corporation called "City Walls, Inc.," now under the guidance of art authority and architect's wife Annie Damaz. The process

tee because that's where the biggest problem is.

Architects as such can and do make contributions. Architecture students from Pratt, City College, Columbia, and Cooper Union designed and built dozens of Earth Day booths; architect Barry Feiss, of the Pomeroy firm, designed the Earth Day stage, and the local A.I.A. chapter built a booth. Mr. Feiss suggests local neighborhoods might hold their own Earth Days, resulting in permanent, architect-designed improvements. Consolidated Edison, supplier of New York's power, will begin a major plant beautification program and is considering a Pomeroy-designed scheme.

While such successes are real enough, and while such urban anti-pollution victories as London's are there to egg New Yorkers (who have the worst air of any major city in the world) on, Fred Kent thinks there will be tough fighting ahead. "Environment is a very radical movement," he says, "It means changing the kind of life people are living."



A host of innovations mark two new rapid transit systems

Pittsburgh's new Transit Expressway (above) will consist of computer-controlled cars moving on rubber tires. The vehicles were chosen because of their lack of noise, simplicity of operation and non-pollution. They run on their own wide tracks. Speed—sometimes as low as 15 mph at a switch—is the only drawback, but on the 11-mile line now being built it isn't a serious problem.

BART, the San Francisco Bay Area's new rapid transit line, is said to be the fastest in the world—top speeds of 80 mph—and it will be automatically controlled by computers (above right). The console operator can talk directly to train attendants and make announcements to



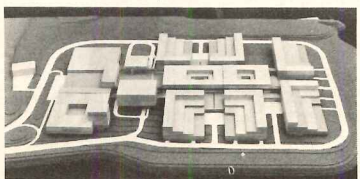
passenger stations. Support facilities, such as ventilation fans and fire alarms will also be under surveillance from the central computer console.

U. Mass./Boston: Immense new campus to rise by the sea

On Columbia Point, a spit of land on Boston's southeast edge, the Boston campus of the University of Massachusetts is to be built. It will be the largest building project ever undertaken by the Commonwealth of Massachusetts and will attempt to make the utmost use of a confined site.

Architects Pietro Belluschi and Sasaki, Dawson, DeMay Associates, Inc. designed the master plan. Fourteen major buildings are to be completed by 1980 for the use of 15,000 students. The first phase will include a science center by Anderson, Beckwith and Haible; the first of six "colleges" by Halde-man and Goransson Associates, Inc.; a second college by Cambridge Seven Associates, Inc., a library, the university's dominant building, by Harry Weese and Associates; an administration building by Marvin E. Goody and John M. Clancy, Inc., and a central service building by Geometrics, Inc. All except Harry Weese (Chicago) are local firms.

The buildings will be closely coordinated with regard to materials, size, shape and circulation patterns, for which criteria appear in the master plan. The six colleges will be academic as well as social units. A one-way road loop will encircle the campus. Pedestrian circulation will include a long seashore promenade. The planners hope the community will make use of this facility, as well as several academic buildings to be open for community use.



Follow-ups

Alcatraz: Fire destroyed three buildings on American Indian-occupied Alcatraz last month, including the Victorian warden's house (May, page 39). The Alcatraz Indians claimed the fires were started by a group of whites. Three days earlier, the Department of the Interior had declared its intention to convert the island into a park, destroying all the prison buildings and even changing its name. The Indians said they wouldn't leave without a fight. Another band of Indians occupied a California campground belonging to the Pacific Gas and Electric Company.

SST: The House has voted by a narrow margin to go ahead with the supersonic transport (February, page 36), but the Senate has yet to decide on the plane.

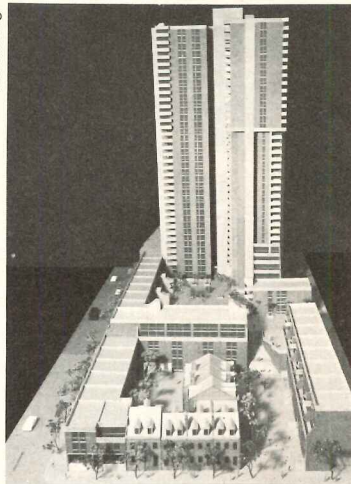
Jonathan Hale



casting its shadow to the north.

The housing is also designed to harmonize with the rest of the redevelopment, which will include commercial buildings and a community college (June, page 148) directly to the west, by architects Caudill Rowlett Scott. Pedestrian walks will continue the city's grid street pattern; stairs and walks will lead to college circulation points.

The most "historic" of the houses were built in 1797 and 1818 by John McComb, said to be the first American born and trained architect. He designed New York's celebrated City Hall. All the houses will require extensive restoration, having been converted for use in the market. HUD will provide the funds.



Gil Amiaga

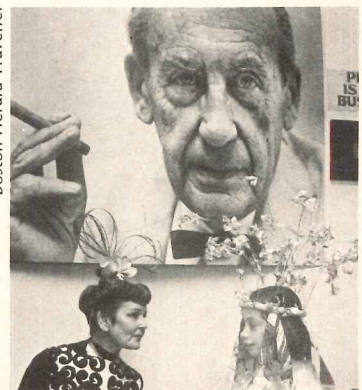
Federal houses restored amidst high-rise housing

Ten early 19th century houses and one dating to the 1700's will be rehabilitated as part of a 1335-unit middle income housing project, within a vast area of renewal and expansion in lower Manhattan. The plan is especially notable because early New York houses have been demolished by the acre in recent years.

The housing, named for Washington Market, which occupied the site for nearly 100 years, is designed by Oppenheimer, Brady & Associates/Architects, Barry Goldsmith project designer, and Pruyne-Bergen and Associates, Architects. The old houses will be surrounded by low buildings: a school, duplexes and townhouses. The only tower adjacent to the houses will be across the street,

"Grope Fest" honors Gropius

Admission was "by metallic decoration only," as friends, admirers and co-workers by the hundred of Walter Gropius gathered at The Architects Collaborative in Cambridge, Mass. last month. It was the "fiesta à la Bauhaus—drinking, laughing, loving" Grope had called for in his 1933 testament in the event of his death.



Mrs. Ise Gropius and her granddaughter, Erika Forberg, at the "Grope Fest"

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Eight Annual Bard Awards Presented by City Club of New York

Bard First Honor Awards for Excellence in Architecture and Urban Design went to the **Concert Halls of the Juilliard School** and the **Muse of the Bedford-Lincoln Community Center**. An Award of Merit went to the **Wagner College Student Union**. Six additional Awards of Merit were given for innovative Manhattan shop designs. Those not shown here were **Creative Playthings**, Walker,

Hodgetts, Mangurian and Godard, architects; **Latinas**, Bill Hock, architect; the **Rive Gauche Boutique**, by Isabel Hebey and Justin Henshel, A.I.A.; and the **Richard Feigen Gallery**, Hans Hollein, architect. Jury members were Giorgio Cavaglieri, F.A.I.A., James Rossant, A.I.A., Dean Bernard P. Spring, A.I.A., and Max O. Urbahn, F.A.I.A.



MUSE, the Bedford-Lincoln Neighborhood Museum, Hardy Holzman Pfeiffer Associates, architects, is part of the Brooklyn Children's Museum. It was converted from an

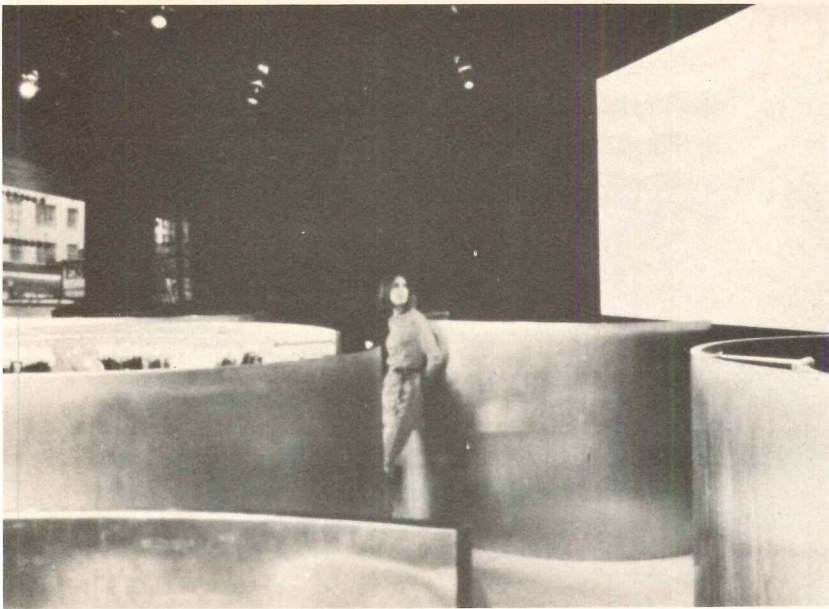
existing automobile showroom and pool hall for \$31,500. The jury said it was "impressed by the fact that so much life could be created with such limited resources."

The Wagner College Student Union (Staten Island), The Perkins and Will Partnership, architects, "solves an architectural problem . . . more characteristic of the suburbs than of high-density areas in our city. . . . But it is a design of great brilliance, wit and skill," the jury said.



The Concert Halls of the Juilliard School (January, page 121), Pietro Belluschi, F.A.I.A., architect, Catalano and Westermann, associate

architects, add "three of the finest halls the jury has seen anywhere" to New York City's short supply of good halls.



Paraphernalia (left), Ulrich Franzen, architect, was among the six shops chosen for Additional Awards of Merit in the Board competition. Dresses are concealed from direct view in large drums; there are also no window exhibits. Instead, attention is focused on slides of the clothing for sale projected continuously on a large screen set about twenty feet back within the store and clearly visible from the street.



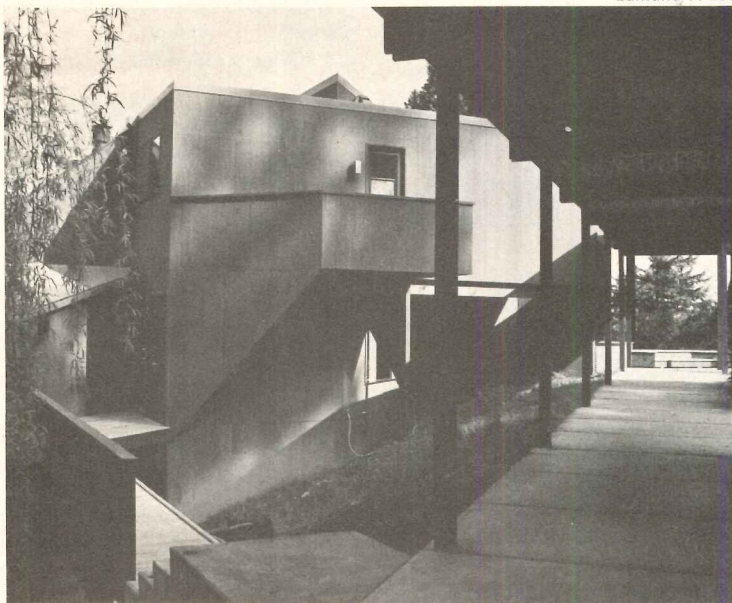
Zum-Zum (right), another of the six shops, is a chain of restaurants whose architects were Paul K. Y. Chen and George Thiel. Interiors are of tile (red floors, white walls) and wood (counters and seats), with brass trim. Acoustical tile ceilings contain exposed globular light bulbs.

Portland, Oregon A.I.A. announces 1970 Annual Design Award winners

The jury, consisting of architects Demetri Vendensky, William Hocking and Eric Vartianinen, "impressed with the general quality of architectural design submitted," gave six awards and put all 45 entries on exhibit at the Portland Art Museum. Winners not shown are: **The Permanente Clinic**, Beaverton, Ore. Wolff/Zim-

mer/Gunsul/Frasca/Ritter, architects (Honor Award); **Cluster Cabins**, Sunriver, Ore., Church and Shiels, architects (Merit Award); and **South Park Hall Addition**, Portland State University, Wolff/Zimmer/Gunsul/Frasca/Ritter, architects, which also received a Merit Award.

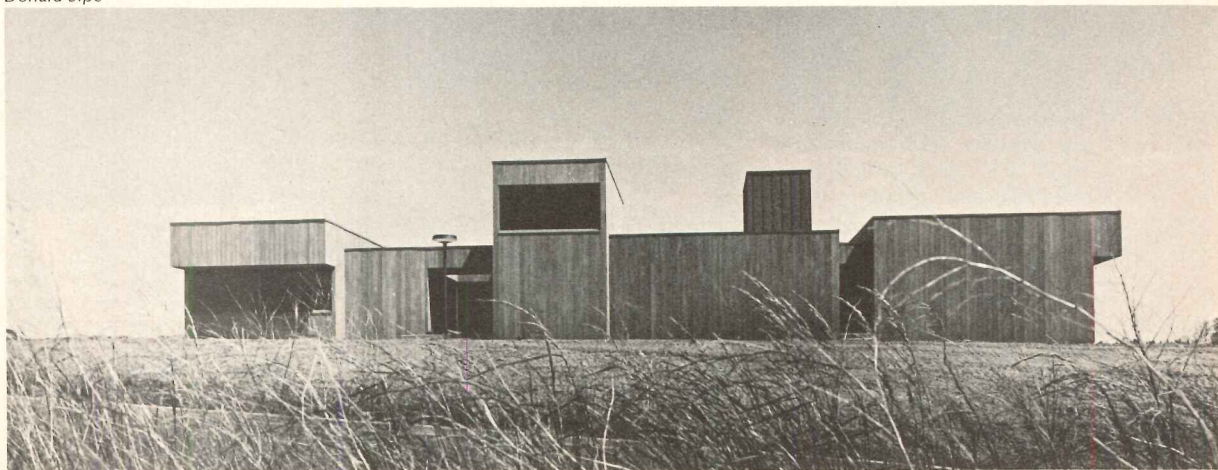
Edmund Y. Lee



James I. Hessler house, Church and Shiels, architects, Bill Bess designer, is "a direct result of both the site and life patterns of the occupants." Construction is 2x4 Western framing with a stained rough-sawn plywood exterior.

Donald Sipe

American International Forest Products, Inc. office building, Fletcher, Finch and Associates, architects, attempts to reflect the different interior areas by scaling volume, size and height in relation to the functions and number of people housed.

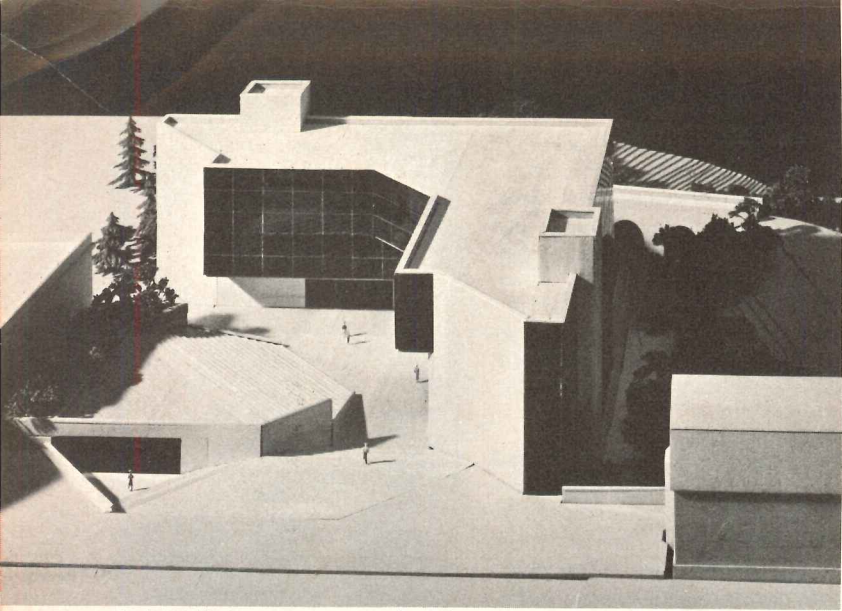


Alan Hicks

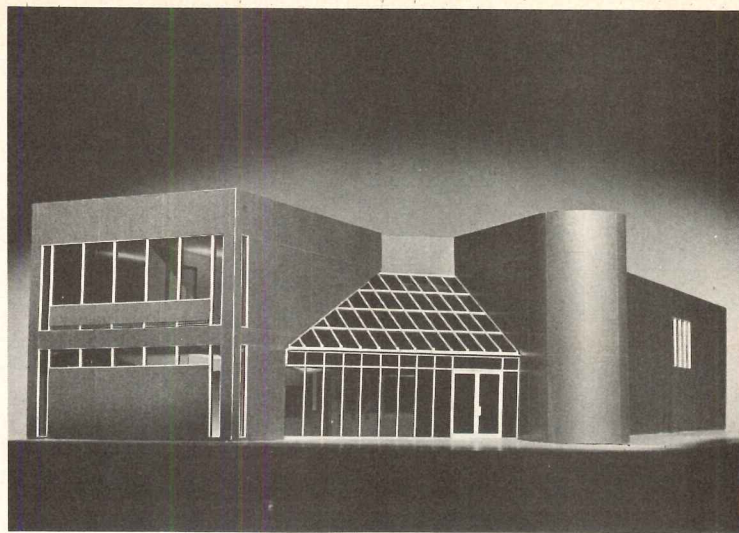


Mountain Park Corp. Office Building, Broome, Selig and Oringdulph, architects, is designed to make use of a rural but conspicuous site with superb views. Sales, engineering

and administrative spaces are linked by a continuous night-lighted display space around the core area. The shingle walls are meant to blend with the surroundings.



Gorchev and Gorchev



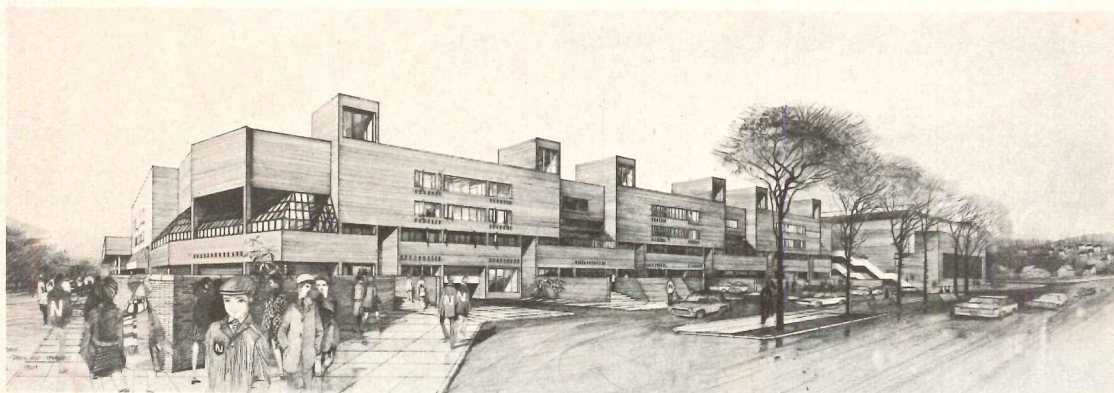
Gil Amiaga

Tuck Mall Center, Dartmouth College, Campbell, Aldrich and Nulty, architects, contains a library above a plaza and three 75-seat lecture classrooms, a 350-seat auditorium,

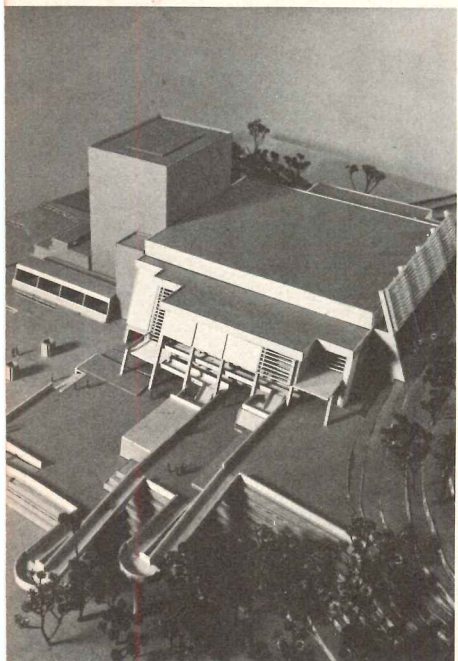
a computer services area, and audio-visual service space. The sloping auditorium roof is paved with brick steps to serve as an amphitheatre and outdoor seating area.

Administration Building, Middletown State Hospital, Middletown, New York, Prentice and Chan, Ohlhausen, architects, will be faced in high-gloss aluminum sandwich pan-

els, zipper-gasketed with neoprene. A windowless service core wall faces a parking lot and coal pile, while other sides are extensively glazed.

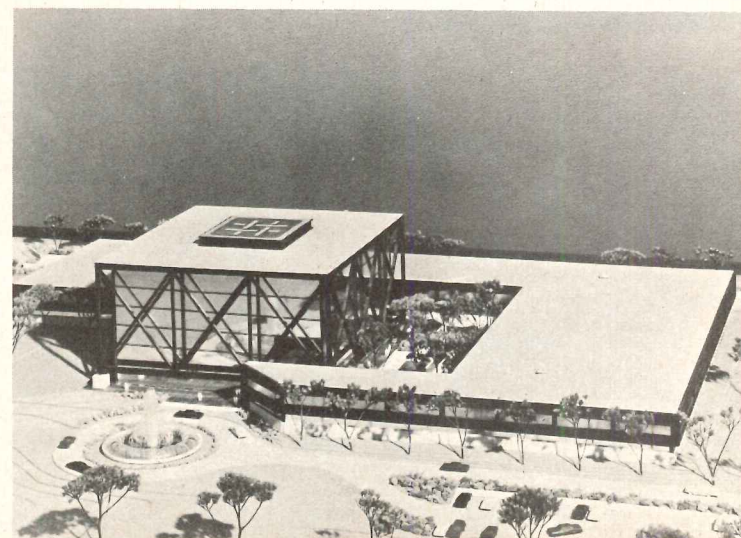


Newton Senior High School, Newtonville, Mass., Perry, Dean and Stewart, architects, groups its 2,750 students into six "houses" in three four-story nodes. Room sizes vary greatly according to use. All spaces are oriented towards a central circulation spine. The building is also planned for extensive community use and easy public access.



Niagara Frontier Performing Arts Center in Lewiston State Park near Niagara Falls, N.Y., Vollmer Associates, architects, is conceived as a summer pavilion with 3,000 lawn places complementing the 2,500 interior seats. Air-flow louvers will allow the sides and rear of the auditorium to be closed for daytime performances.

Pedestrian mall at the City University of New York Graduate Center is part of the remodelling of an old office building for school use by architect Carl J. Petrilli, Samuel J. DeSanto, project architect. The mall spans a block in mid-Manhattan, providing a "vest-pocket campus."



Burlington Industries executive office building in Greensboro, N.C., A. G. Odell, Jr., and Associates, architects, suspends four office floors from a steel roof frame supported by diagonally-braced exposed steel trusses. Walls are topaz-tinted mirrored glass. The steel is painted brown. Roof frame engineering required extensive use of computers.

Bally urethane foam insulation first in nation to pass UL Fire Test for walk-in refrigerator panels

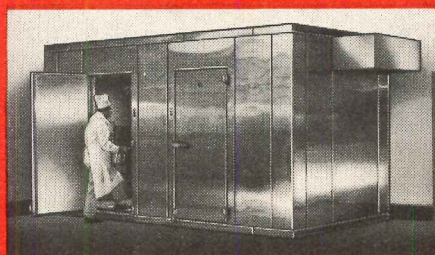
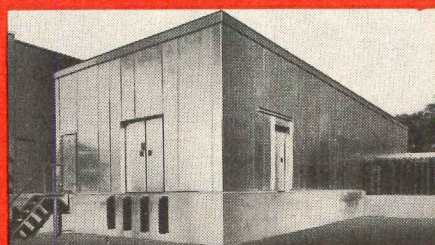
For the first time ever, Underwriters' Laboratories (UL) has granted a 25 low flame spread rating to a urethane foamed-in-place Walk-In refrigerator panel. It was awarded to Bally and now in most states qualifies their panels to receive the same low rate which insurance authorities apply to masonry refrigerated structures.

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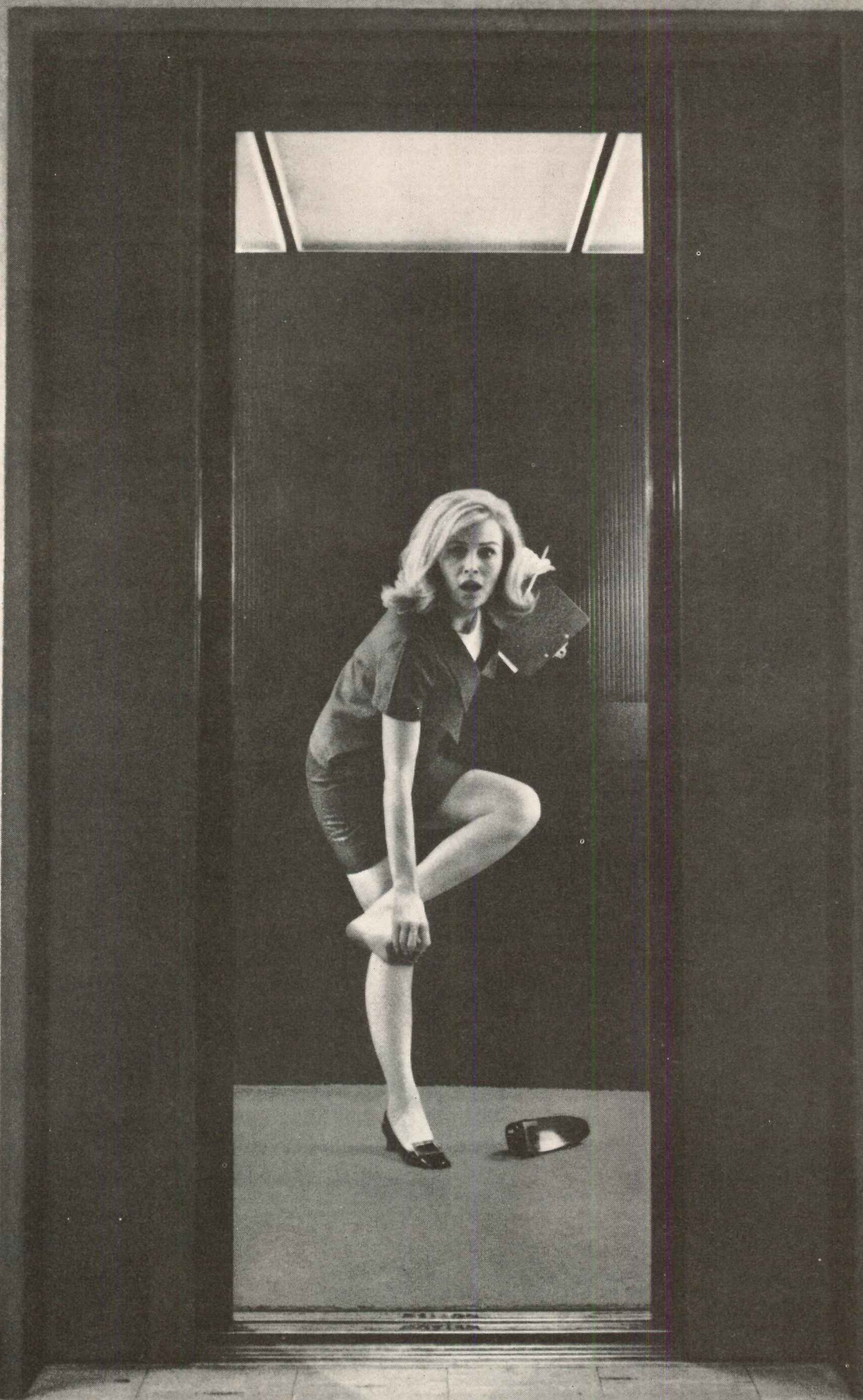


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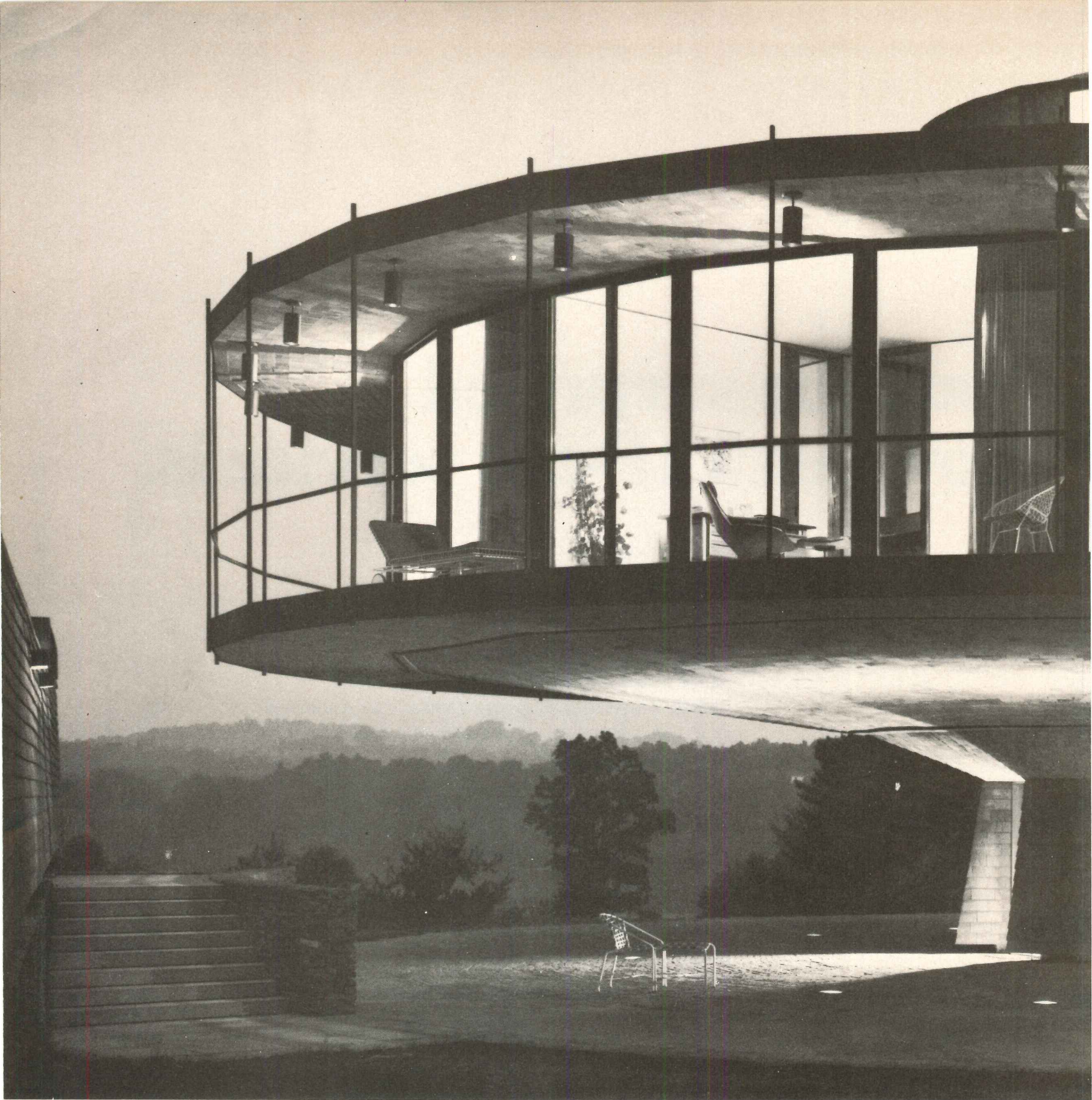
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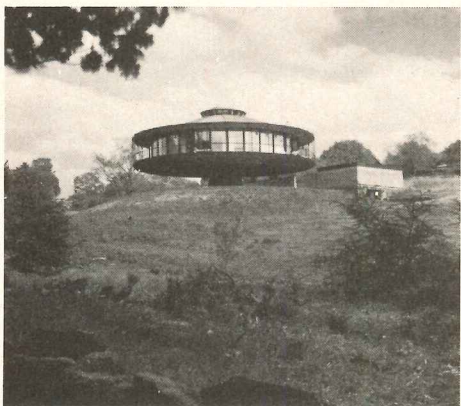
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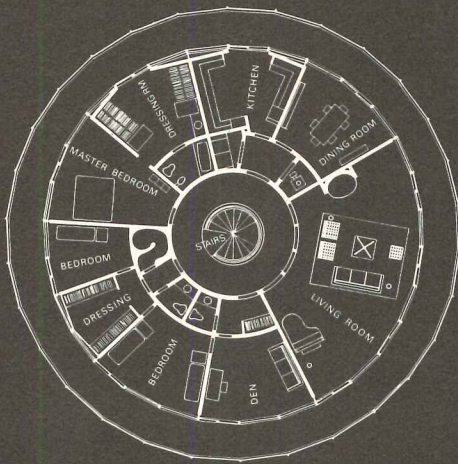
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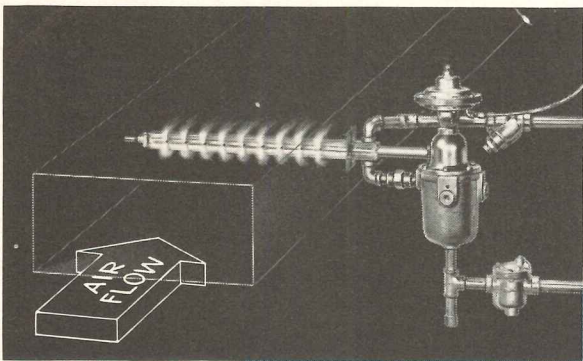
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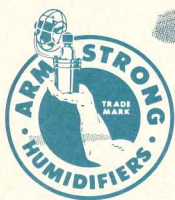
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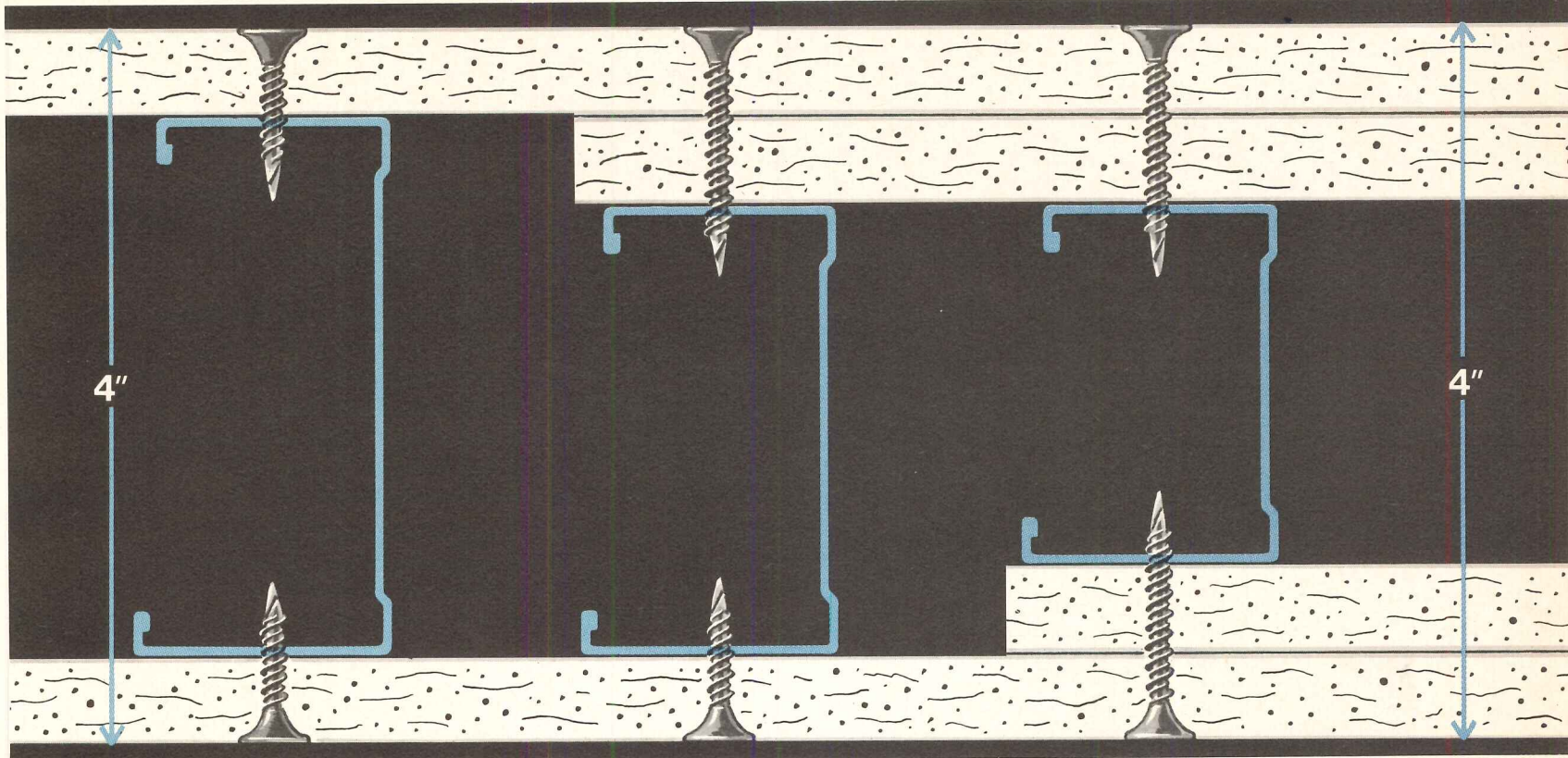
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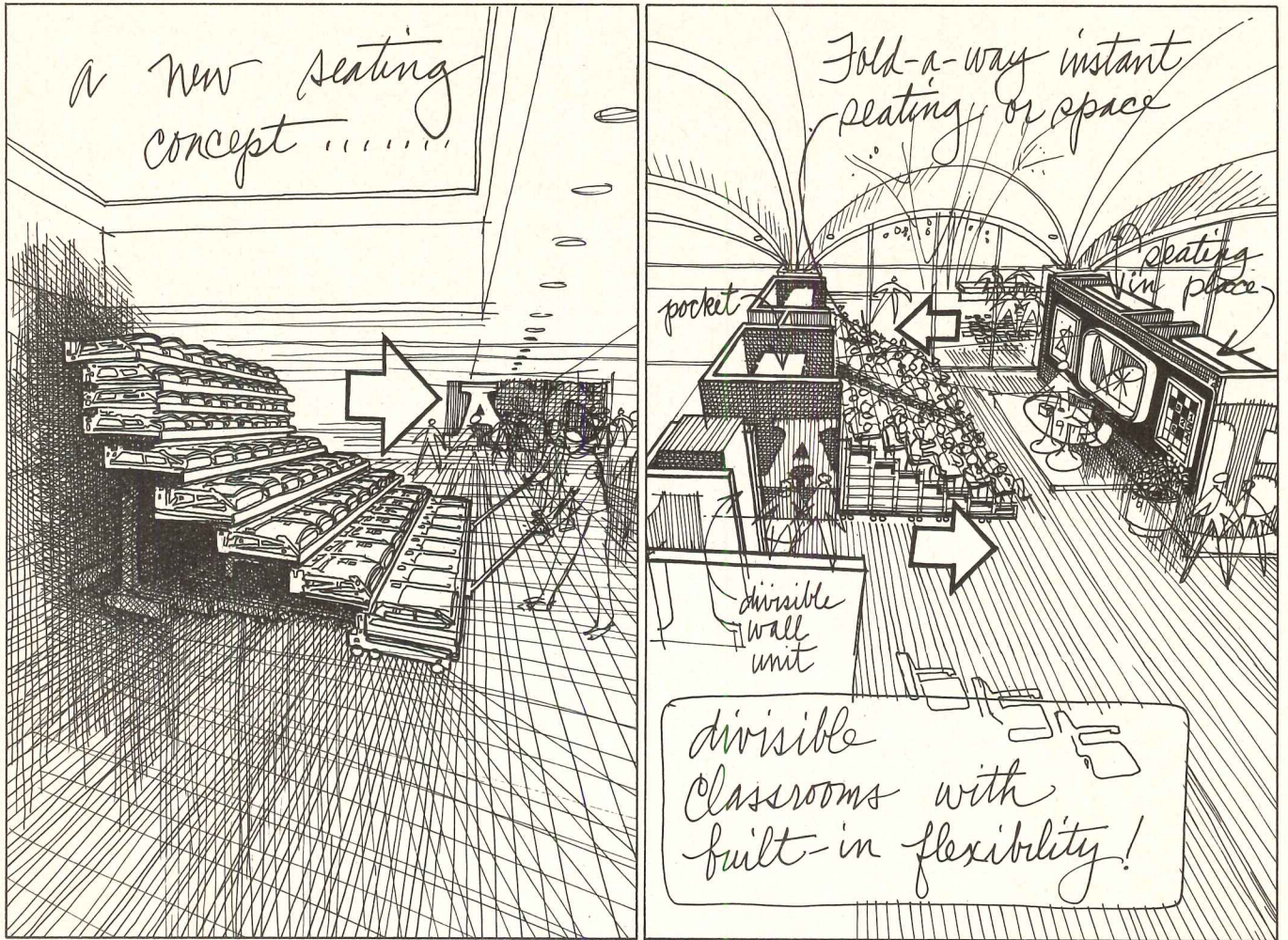
PARTITION THICKNESS	STUD SIZE	½" WALLBOARD LAYERS	1½" SOUND BLANKET	FIRE RATING**	SOUND RATING STC	COST INDEX
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4"	3"	2	Yes	1 hr.	43	65
4"	2½"	3	—	—	41	68
4"	2½"	3	Yes	1 hr.	49	82
4"	2"	4	—	2 hr.	45	86
4"	2"	4	Yes	2 hr.	52	100

**Estimate based on engineering analysis of tested assemblies with similar construction.

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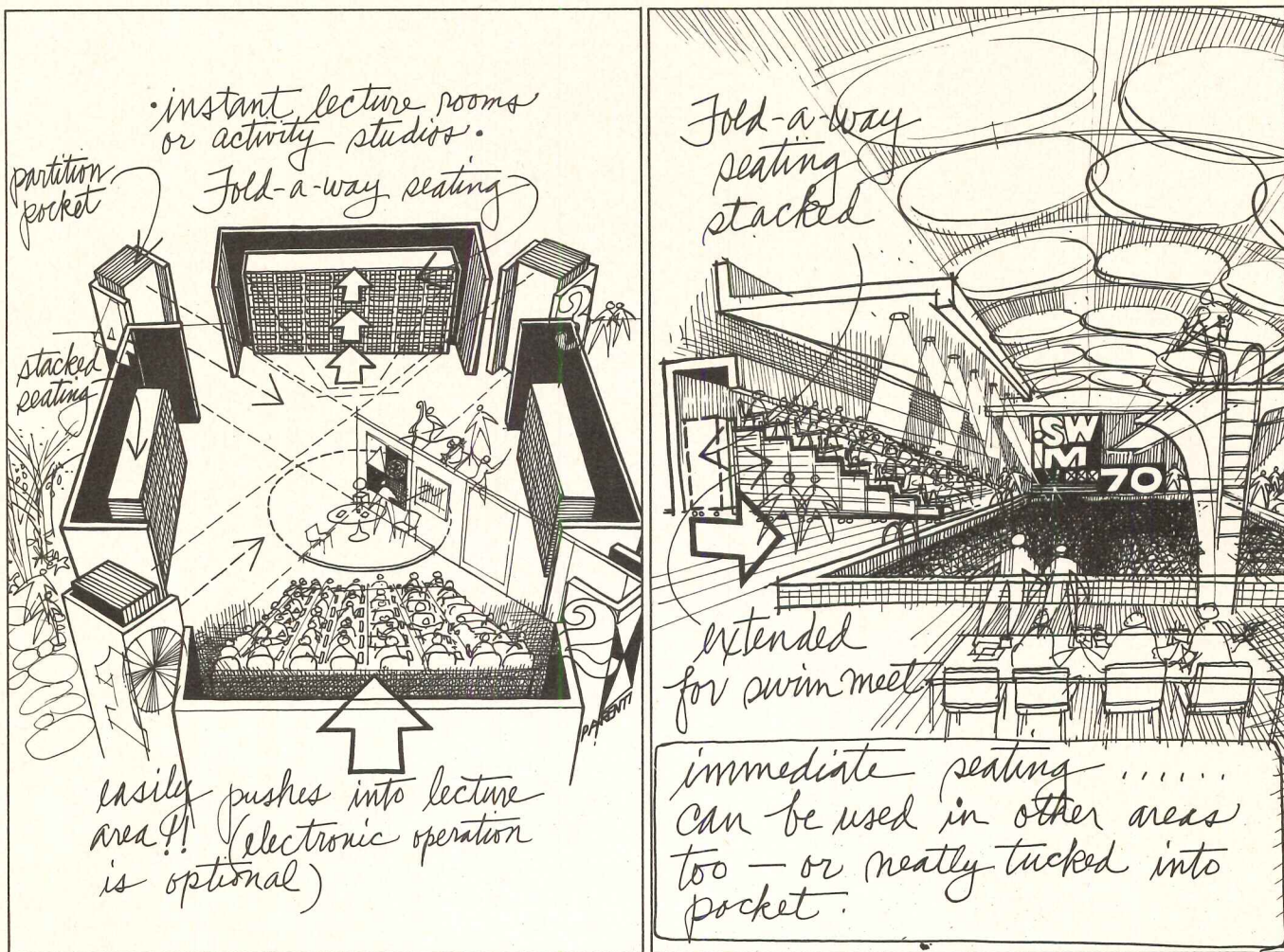
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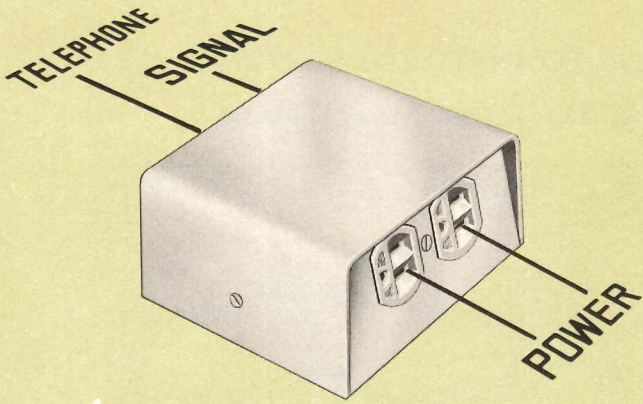
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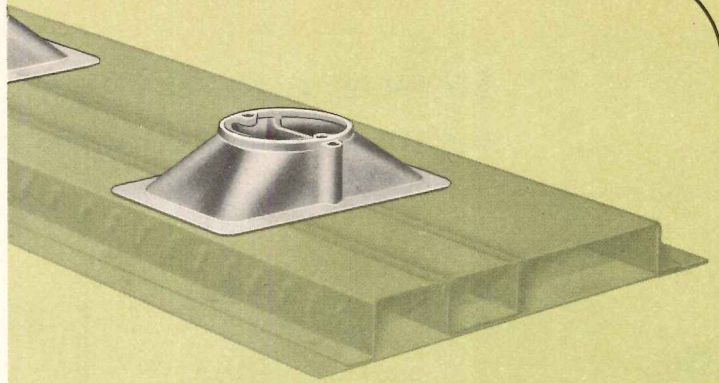


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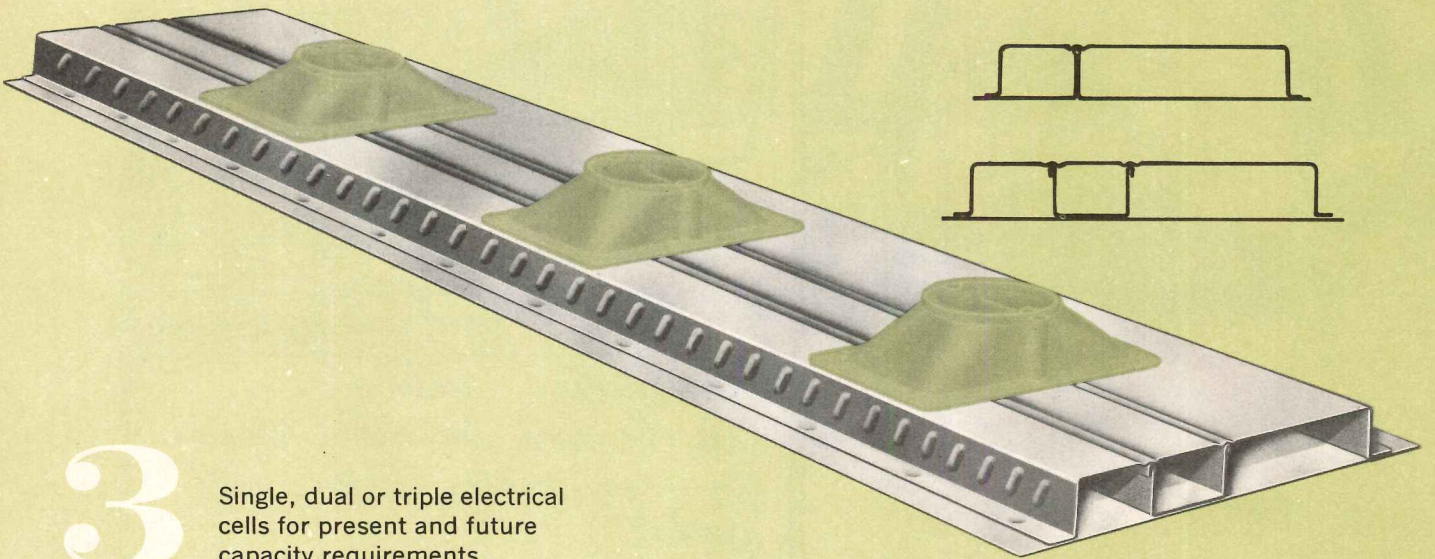
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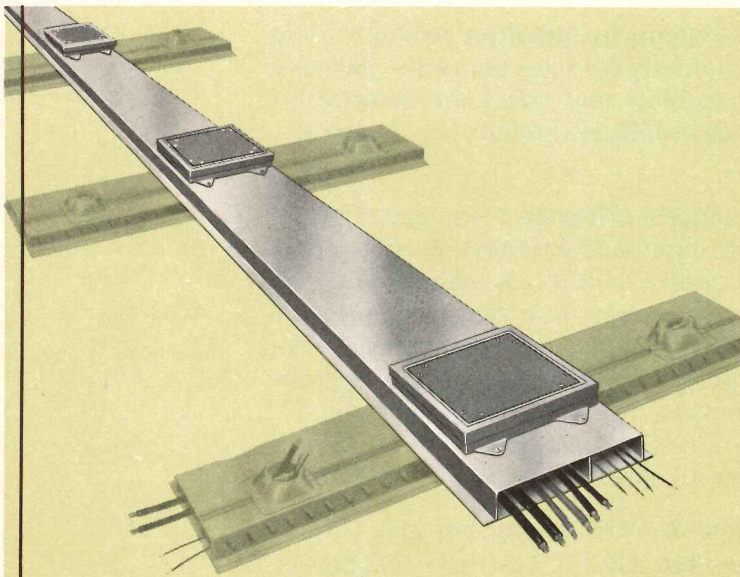
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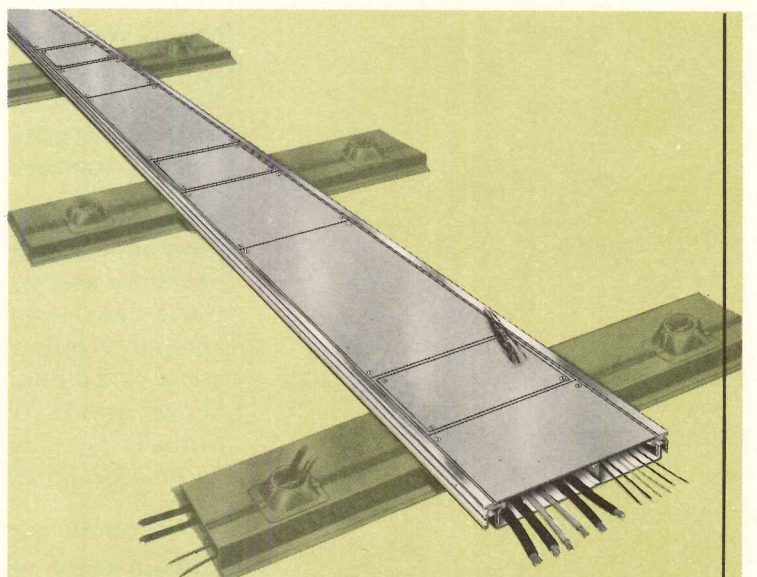
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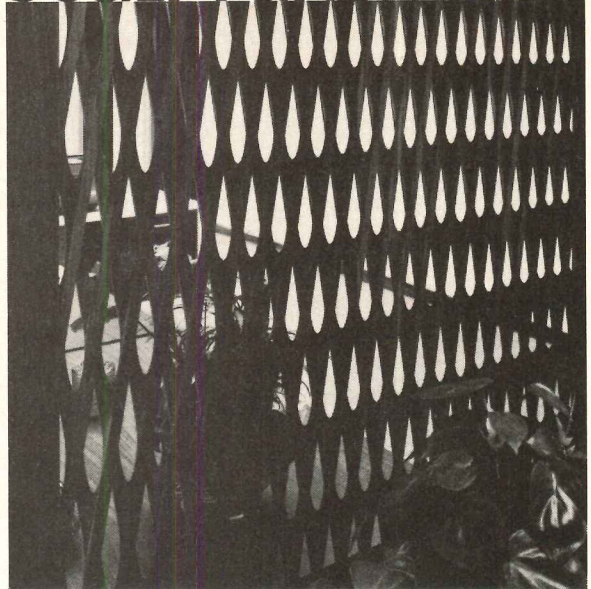


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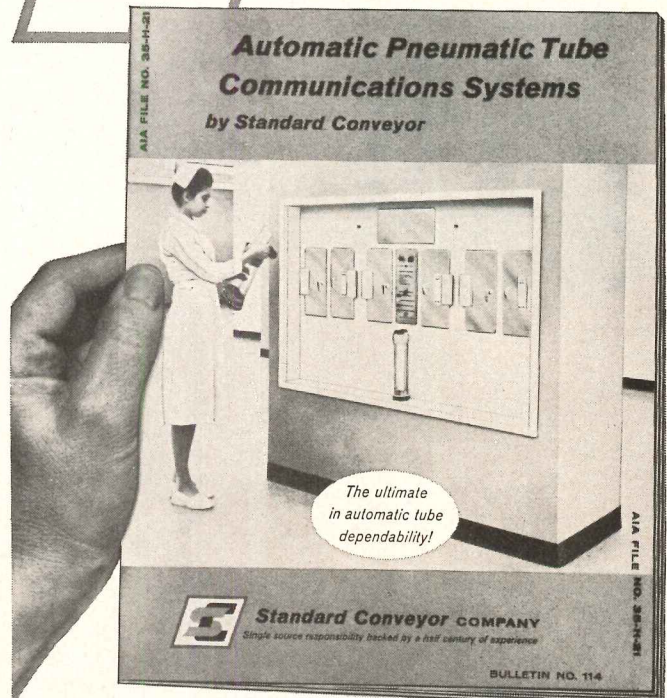
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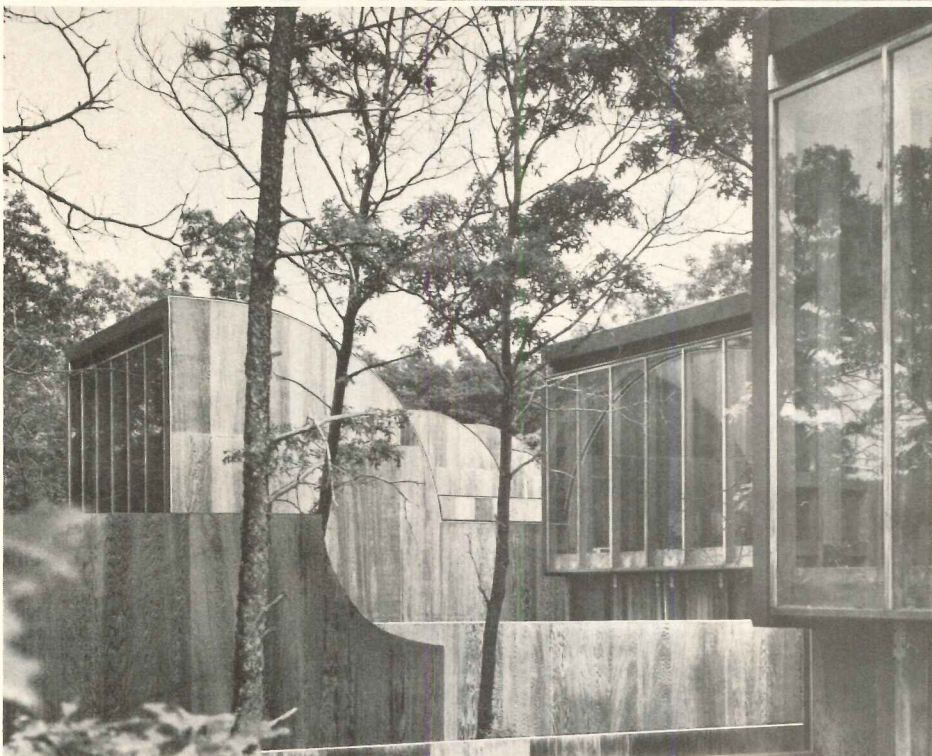
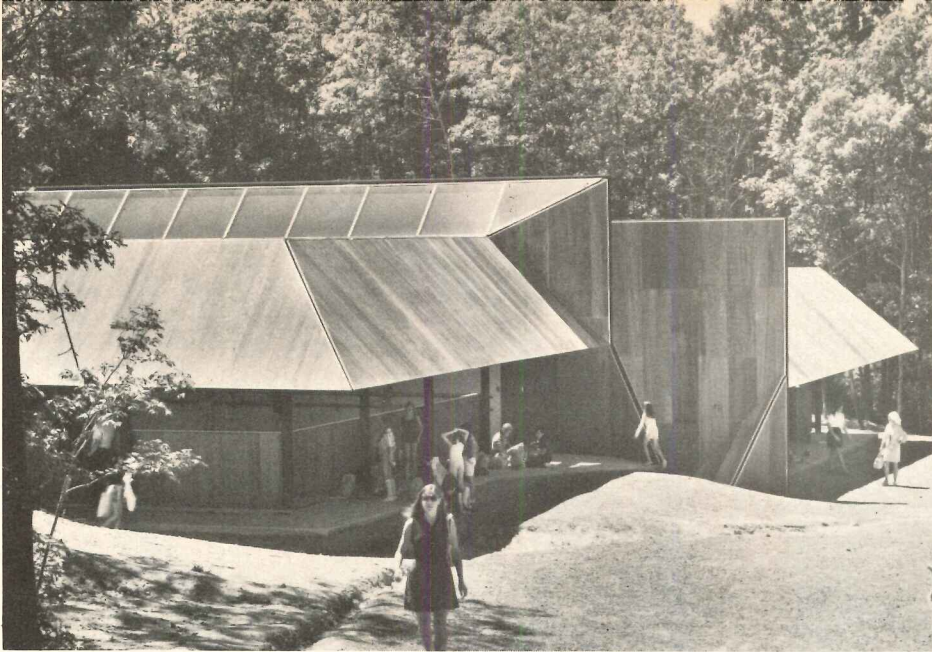
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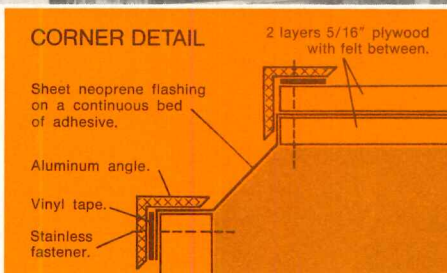


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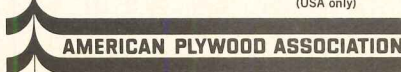
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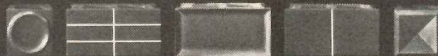
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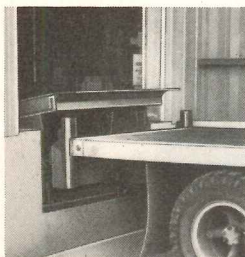
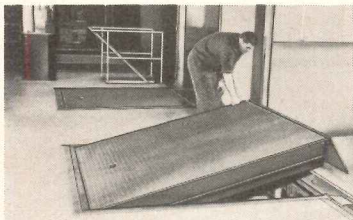
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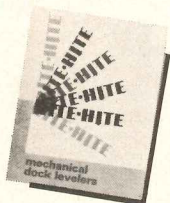
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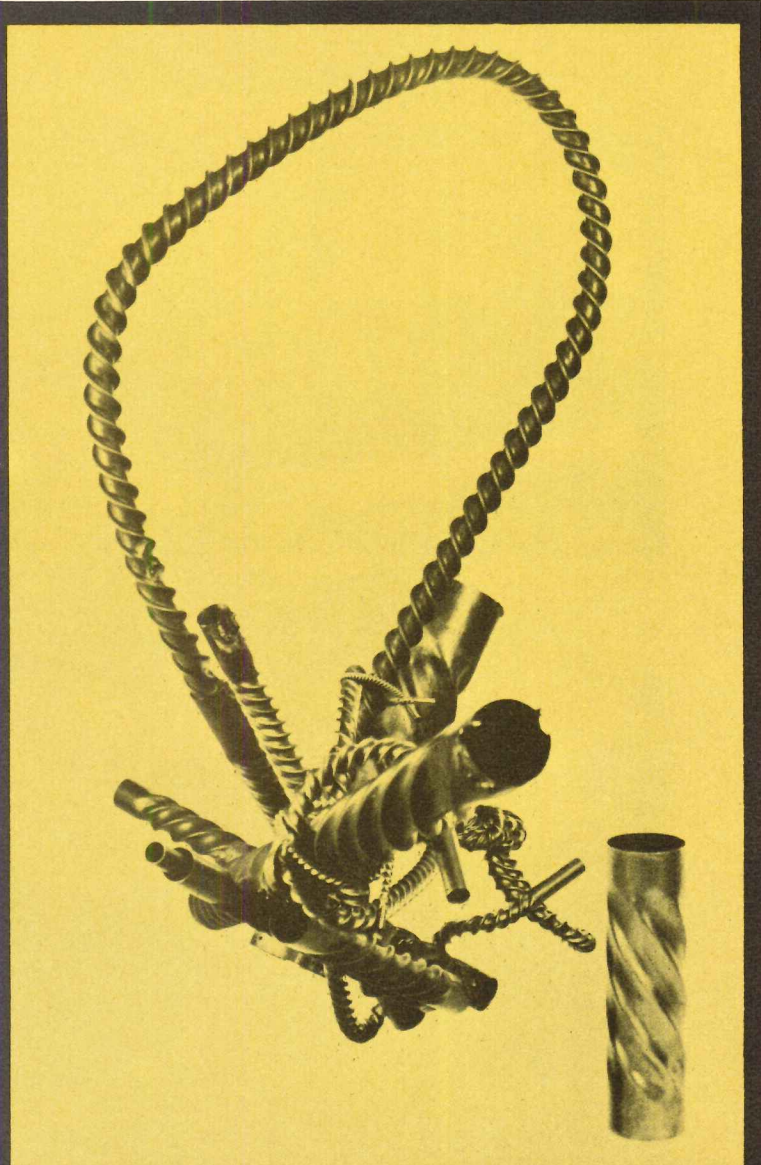


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The F. W. Dodge 1970 construction outlook: midyear update

By George A. Christie, Vice President and Chief Economist, McGraw-Hill Information Systems Company

Has the business slowdown which has been so evident in most other parts of the economy finally caught up with the construction industry, too? Probably, though the way 1970 started off it was beginning to look as if the demand for nonresidential buildings and other facilities (as well as the ability to finance them) was limitless. The Dodge Index of total construction contract value averaged 209 during the first three months of 1970, setting a new quarterly record. Our specially-constructed index of architect/engineer designed construction soared even higher—to a peak of 294!

But along with spring came signs that the best part of the year was already history. A gentle but noticeable decline had begun to set in, one which could be expected to gather momentum in the months ahead. This development, if it continues, fits the general outline of the original 1970 Dodge Construction Outlook issued last October. Things are a bit behind schedule, though. We expected that anti-inflationary restraint of the economy would begin to cool the boom in industrial and commercial building by the start of this year. The next step—contingent on an easing of credit—was to be a mild recovery of the depressed housing market. With these two trends more or less canceling each other, we've been looking for 1970's most important change to be in the *mix* rather than in the total amount of construction contracted.

This pattern, still the most likely course of events, has been reluctant to develop until now. In the opening months of 1970, nonresidential building soared to a new peak and then dropped off as the spring quarter began. Housing's year-long decline bottomed out in the early months of the year and the relaxation of credit restraint offered the hope that recovery was near at hand. The next few months' results will tell how well these changes are taking hold.

A couple of inconsistent developments in the early months of 1970 obscured the picture a bit. One was the extraordinary total of utility construction: over \$2 billion of work started through April. That's more than in any *entire* year prior to 1968. Another was the amount of highway work contracted. The President ordered highways

and certain other Federally financed projects cut back so that construction resources could be shifted to housing. Apparently no one took this edict seriously, since highway contracts increased in the first quarter while housing declined.

One unfortunately reliable force in the construction market has been cost. Fully three-quarters of 1970's early lead over 1969 contracts has been due to nothing more than the inflation of values over the year. And with the inflation-recession issue more critical than ever at mid-1970, a new look at the economic environment is appropriate.

Economic environment/mid-1970

At this point in 1970, the Administration's highly publicized "economic game plan" for bringing inflation under control is in need of some half-time modification. To no one's great surprise, the *intermediate* goal of slowing economic activity (to squeeze out excess demand and create a climate for price stability) was finally accomplished. In fact, the first quarter's \$5 billion decline in GNP (measured in constant prices) was even a bit more than policymakers had bargained for. So, too, were the sharp drop in corporate profits and the quick rise in unemployment from a safe 3.9 per cent in January to a dangerous 5 per cent in May. Yet it all seemed in vain as prices kept rising as fast as before. For the time being it was the worst of both worlds: recession with inflation.

Responding to these circumstances, the Federal Reserve made its long-awaited move to monetary ease late in March. This step removed one critical element of uncertainty from the original 1970 Dodge Construction Outlook.

The question now changes from *when* to *how much* credit expansion can we anticipate.

The Reserve Board's chairman recently assured the business community that he intends to supply enough money to keep the economy expanding without adding to inflationary pressures. Now that the Federal budget has shifted into deficit, however, he doesn't have a great deal of room in which to maneuver. A budget deficit, like credit

ease, is useful for heading off a recession, but it, too, aggravates inflation. This year's shift from surplus to deficit, which will worsen when the surtax expires on June 30th, takes away some of the opportunity to ease credit during 1970's second half,

NATIONAL ESTIMATES

construction contract value (millions of dollars)	1969	1970	per cent actual forecast change
--	------	------	---------------------------------------

nonresidential buildings

commercial	\$ 9,724	\$ 9,250	- 5%
manufacturing	3,887	4,100	+ 5
educational	5,480	5,700	+ 4
hospital/health	2,780	3,200	+15
public	1,141	950	-17
religious	669	600	-10
recreational	1,100	1,150	+ 5
miscellaneous	886	900	+ 2
TOTAL	\$25,667	\$25,850	+ 1%

residential buildings

one- and two-family homes	\$16,067	\$15,500	- 4%
apartments	7,627	8,100	+ 6
nonhousekeeping	1,525	1,550	+ 2
TOTAL	\$25,219	\$25,150	-
TOTAL BUILDINGS	\$50,886	\$51,000	-

nonbuilding construction

streets, highways and bridges	\$ 7,560	\$ 7,350	- 3%
utilities	3,604	4,300	+19
sewer/water supply	2,429	2,600	+ 7
other nonbuilding construction	2,946	3,250	+10
TOTAL	\$16,539	\$17,500	+ 6%
TOTAL CONSTRUCTION	\$67,425	\$68,500	+ 2%
DODGE INDEX (1957-59=100)	189	192	

physical volume of floor area (millions of square feet)

nonresidential buildings

commercial	567	540	- 5%
manufacturing	316	260	-18
educational	219	215	- 2
hospital/health	86	90	+ 5
public	36	29	-19
religious	33	28	-15
recreational	53	51	- 4
miscellaneous	44	45	+ 2
TOTAL	1,354	1,258	- 7%

residential buildings

one- and two-family homes	1,202	1,090	- 9%
apartments	577	570	- 1
nonhousekeeping	73	74	+ 1
TOTAL	1,852	1,734	- 6%
TOTAL BUILDINGS	3,206	2,992	- 7%

except at the cost of more inflation. (Retention of the surtax, on the other hand, would give some much-needed flexibility to the management of the money supply. It would seem a more appropriate, though less popular, blend of economic policy for this year's problems.)

The private sector has been counted on this year to deliver a major thrust to the economy through continued high business capital spending and rising consumer investment in housing. If business sticks by its current plans to raise capital spending eight per cent in 1970, those outlays (along with some inventory rebuilding) would be an important prop to the sagging economy. But having seriously overestimated this year's profits, businessmen are now reevaluating 1970's investment goals to see how much of this year's planned new capacity can be postponed until 1971. Housing is ready to move ahead in this year's second half but its potential for growth is limited by the rate of credit expansion and by Federal appropriations for housing programs. Neither prospect is very exciting.

Even if these several stimuli—easier money, a budget deficit, high capital spending, improved homebuilding—don't all

quite live up to earlier expectations, their combined thrust should be enough to get the economy moving ahead again in the second half. *But compared with the outlook at the start of 1970, the enforced "slowdown" has turned out to be a bit more severe than its name implies, and the expected recovery a bit more tenuous.* Our updated 1970 Dodge Construction Outlook, modified by these and other events, follows.

Construction/1970

The estimates shown in the table are a blend of 1970's initial very high rate of construction contracting with the moderately lower rate expected in the months ahead.

The over-all result: a present estimate of \$68.5 billion in total construction contract value for the year, a bit higher than indicated by our previous forecast. A small (two per cent) increase over 1969's value is now expected, though physical volume will be less.

Much of the change from our earlier analysis is concentrated in the nonresidential categories, especially electric utilities, and in construction costs higher than previously expected. Another change is in the

"contour" of 1970's construction market. This *Update* anticipates that the year's lowest rate of contracting will be reached in the third quarter; at that time nonresidential building will have slipped, but housing will only be in the early stages of recovery. There will be a mild improvement in the fourth quarter, as housing picks up.

The housing outlook still depends almost entirely on the availability of mortgage money. Because both government and business are expected to be heavy long-term borrowers in the capital markets later this year (with government financing its deficit and business lengthening last year's excessive short-term borrowing), it's not likely that very much of the year's expansion of the money supply will be of great benefit to potential homeowners seeking mortgages. Rates will come down only slightly, money will remain scarce, and the pressure of demand for housing will go largely unrelieved in 1970.

Expected developments over the balance of the year are likely to inhibit contracting in the Northeast and Midwest, where commercial and industrial building are especially important. All regions should gain from any improvement in housing.

Evaluating hidden cost factors

By Bradford Perkins, McKee-Berger-Mansueto Inc., Construction Consultants

Exact quantity take-offs and careful unit pricing do not always insure an accurate construction cost estimate. Care in both areas is essential, but there are many other factors which have significant effects on the final cost of a construction contract.

Some of these factors—for example, the accuracy of the contractors' own estimators—defy prediction. Others, however, can be analyzed and, to some extent, quantified. Therefore, qualitative and quantitative analyses of local construction markets are becoming increasingly important elements of cost management programs.

These analyses do not have a standard format because each project differs from all others, but some general areas covered are: 1) local geographical, sociological and economic factors; 2) contractors' interest in and capabilities for the job; 3) labor availability and cost; 4) availability of materials; 5) owner and designer factors.

The first set of factors, including data on population density, proximity to urban centers and accessibility via major traffic routes, can readily indicate potential problems. The construction industry's capabilities in smaller towns can be strained by the requirements of a large project, so the estimator should take note of the work experience and size of local contractors' firms and labor pools.

The character of a town can also have other potential effects on costs. In one town outside New York, for example, the construction industry depends heavily on one owner for work. Therefore, local work has to be suited to this employer's construction program. In another area, organized crime often determines the number and interest of bidders.

General market information such as that described rarely provides the detail necessary for either design decisions or final cost estimates, but it does indicate where further research is necessary. It is the research on local contractors, labor, material and owner-architect factors which can and should help shape the final plans.

Lack of interest raises costs

Contractor interest and capabilities are often the major additional cost considerations. A New York community college was bid at over \$100 per square foot last year. In retrospect, this well-known disaster resulted, at least in part, from a shortage of contractors with both adequate bonding capacity and interest in the project. Only two firms were willing to bid on a city project that would last four years, and neither was willing to take it without premiums which approached 100 per cent.

Shortages of large, interested contrac-

tors have been common for several years in the major cities. However, similar situations appear on small projects in other areas.

A recent development of the reverse type is the "negative escalation" now experienced on small projects in many regions. Smaller projects tend to dry up sooner because their owners are more sensitive to national economic slowdowns, inflation and financing problems. In Boston and many smaller cities, for example, owners are reporting as many as eight bidders on projects under \$5 million. As a result, some over-all project costs have temporarily leveled off or declined in spite of the continuing increases in labor and material prices.

Multiple contracts help on large jobs

Interest is only one of the two important contractor considerations; the other is capability. In small cities and rural areas, local contractors may not be able to build a complex project efficiently. An inexperienced contractor facing a complex project usually adds a significant premium to his bid—if he bids at all. What usually happens is that large outside contractors have to be encouraged to bid since they have to expect problems working in a new area with a limited pool of skilled labor—large outside

contractors add premiums also. It was in part this experience which recently prompted Cornell University in upstate New York to let a large project in several small packages so that it could be handled by local contractors.

On a smaller scale, many contractors will add a premium for handling new materials. Fiberglass duct, for example, should be cheaper than metal in many cases, but the premiums being added by inexperienced contractors have made it more expensive than sheet metal on recent projects.

Check list of key questions

Unfortunately, there is no central source for this information. However, by calling A.G.C. chapters, local contractors, and other industry sources, it is usually possible to obtain partial answers to the following key questions on this subject of contractor interest and capability:

How many contractors in one area work in a given category of construction?

How many bids does a project of a given size normally receive?

Is there so much directly competing work in the area that there is a reduction in the number of potential bidders?

Is the seasonal factor any more pronounced than is normal for the construction industry?

Are there ways of stimulating increased contractor interest?

What is the prevailing contractor attitude toward unusual design or site location?

Are local contractors familiar with unusual materials which might be employed on the project?

Is there likely to be any reduction in the number of bids or bid premiums resulting from minority hiring or training requirements?

Are local contractors finding construction loans unusually difficult to obtain?

Labor shortage may restrict design options

A major factor in contractor interest and capability is, of course, the local labor force. A cost estimator must know the local wage rates, be aware of shortages in critical trades, prevailing premiums necessary to obtain local labor or induce migration, trade jurisdictions, and any other factors which can have cost ramifications.

Shortages can be an important factor. An architect recently designing a project in upstate New York was informed of a shortage of carpenters. This helped him during schematic design as he realized that several design options, such as a poured-in-place concrete structure, were closed. All estimates and designs in the Lordstown, Ohio, region have taken account of a shortage in most trades due to the heavy demands of the new General Motors plant being built there.

Local work practices are also important. In many areas prefabricated components such as pre-hung doors are disassembled and then reassembled on site because

of local union rules. In other areas, belligerent locals prevent use of any new labor-saving materials or techniques.

Training programs can add premiums

Currently, the most controversial labor factor is minority employment. Few building-trade locals, other than laborers, have significant minority membership. This has made it an explosive issue. In response to community pressure, an increasing number of public and private owners are inserting minority training and hiring clauses into their construction contracts.

Not only have the unions resisted, but the contractors have regarded such programs as an additional risk and an unknown cost. As a result, some contractors avoid projects covered by such clauses and others add premiums. Despite contractors' denials that they add premiums, detailed bid analyses indicate that most add as much as 10 to 20 per cent to their bids for large minority hiring and training programs.

Strikes are a similar risk and another unknown cost for the contractor to estimate. Therefore, it is important to check on the expiration date of existing contracts, the likelihood of strikes, the size of the increases likely to be negotiated in the next contract and related factors. The high bids on the community college mentioned earlier resulted in large part from the contractors' uncertainty about future labor settlements. In such extreme situations it has become necessary to split the project into smaller contracts to fit the schedule of major contract negotiations.

What to ask about labor

Information on these and other labor-related cost factors can be supplied by the local contractors and construction trade associations, minority group representatives and other related sources. These are important questions to ask:

Are the jurisdictions of unusual size?

Are there any jurisdictional disputes which might affect the project?

Are there significant variations in the labor supply due to seasonal factors?

Are there extreme shortages in any trades, and if so, will they cause premiums and/or delays in construction schedules?

What inducements are required to encourage migration to the area?

What is the impact of training programs; and what is the availability of minority workers?

What are the basic and fringe rates for each trade?

When do local contracts expire, what increases are scheduled in existing contracts, and what percentages are predicted for the next contract?

Is local labor cooperative or belligerent, and what is its level of interest in the project?

What to ask about materials

Materials are usually less of a problem than either contractors or labor, but on some

projects material supply considerations are critical. Too often designs include materials that are either unavailable locally or unfamiliar to local contractors. In other cases too many projects are competing for the same material. Where any of these situations occur, it is worth devoting part of the market study effort to this subject. Some of the basic questions are the following:

Are any of the critical materials unusual or difficult to obtain?

How near—or how far—is the project site to the nearest major source of materials?

Are there other projects in the area which may compete directly for the same materials?

Are there complications—shipping limitations, delays, etc.—in supply due to unusual materials?

Which materials are on national rather than local price scales, and are any local materials unusually expensive or inexpensive?

What about job conditions

The last area, and most difficult to research for a full market study, is the owner-designer factor. There are a few good clients who actually attract additional bidders or an unusually large number of bidders for their projects.

Most owner-architect cost factors are negative, however. Recently, New York's subcontractor association told the city that its members have added up to 20 per cent to their bids on city projects to account for slow payments.

Some architects are known to cause bid premiums too. Consistently incomplete construction documents, disruptive actions during the construction phase and unnecessarily complex designs are some of the most common reasons.

Therefore, more market studies are including such questions as the following:

Do the owner's administrative or inspection procedures cause significant problems for the contractor?

Does the architect have a reputation for causing problems or providing inadequate construction documents?

Are there problems which the owner or architect can help mitigate?

If the market study reveals serious problems in any of the above areas, it is possible to save more money concentrating on overcoming adverse market conditions than by refining costly segments of the design. The difference between an efficient and inefficient design is often less than 15 per cent, while market conditions can add up to 100 per cent in premiums.

Adverse market conditions can usually be overcome. Split contracts, expedited payment procedures, careful selection of local materials, contractor orientation meetings, and careful timing of bids and other techniques are being used with increasing frequency to solve market problems. The first step, however, is to identify the problems.

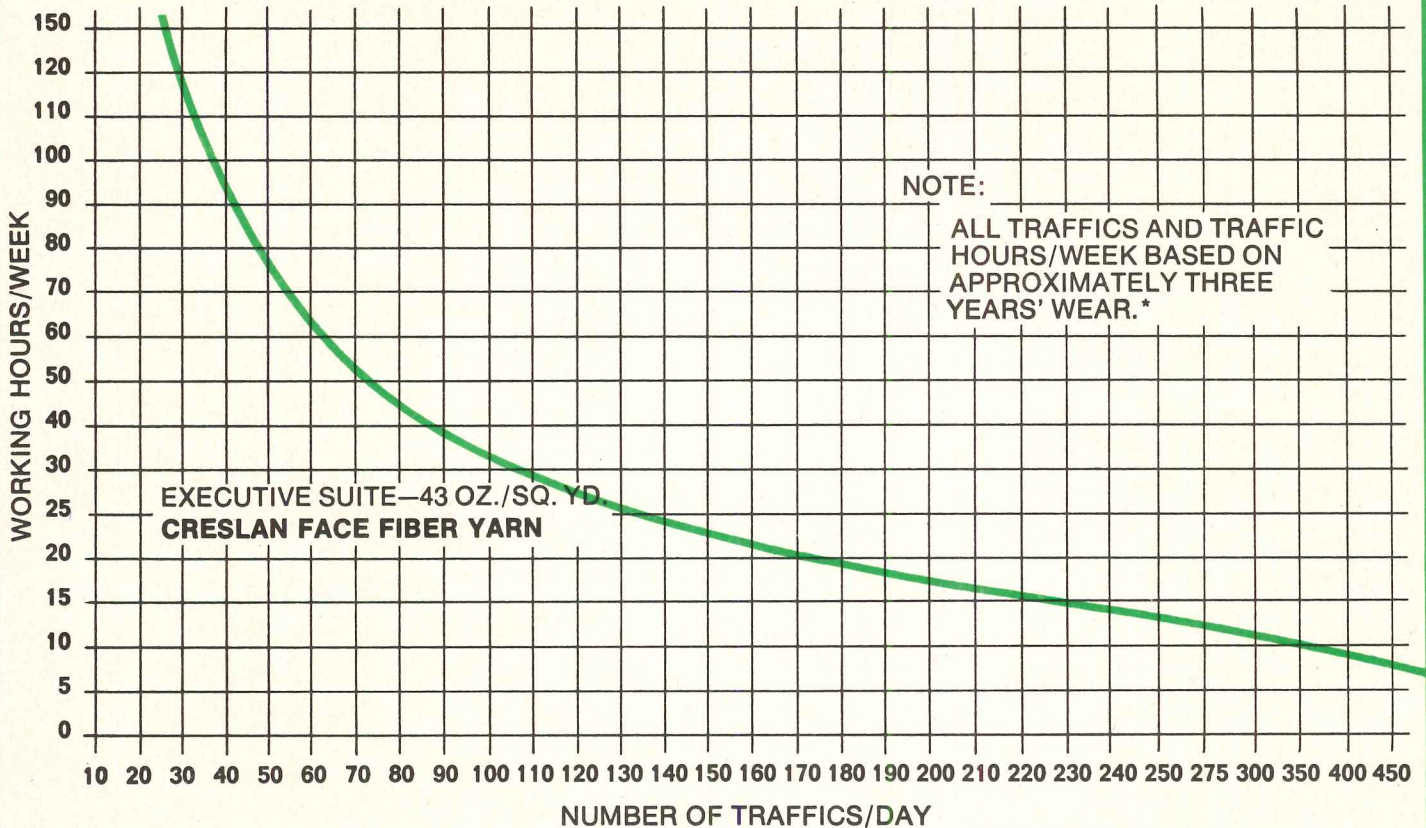
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INDEXES AND INDICATORS

William H. Edgerton
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LABOR COSTS: A RECESSION-PROOF INCREASE

During the past twelve months, average annual wage increases in the construction industry were at the 15 per cent level, and no end to this spiral is in sight—most construction wage contracts cover several years, insuring substantial increases each year. Many contracts are keyed to a July date, thus the labor component of the cost to build will be pushed up significantly in many cities this month. Since labor contracts stretch out over a period of two or three years and increases are built into the contract, the current high level of construction labor costs is recession resistant. Materials prices are also increasing but at a much slower rate than wage rates. The net effect is a squeeze on the contractor's percentage of profit and overhead leading inexorably to increasing numbers of contractor failures and bankruptcies.

Unbalanced pressures on building costs will continue well into 1970, and the client who did not accept the 3 to 4 per cent annual increase in building costs in the mid-sixties may do himself even more harm by postponing construction. The old maxim about hindsight has proven to be true once again.

Building cost indexes

The information presented in the tables indicates trends of building construction costs in 35 leading cities and their suburban areas (within a 25-mile radius). Information is included on past and present costs, and future costs can be projected by analysis of cost trends.

The indexes are computed on a basis of 40 per cent labor rate and 60 per cent materials price. Wage rates for nine skilled trades, together with common labor, and prices of four basic building materials are included in the index for each listed city.

Differences in costs between two cities can be compared by dividing the cost differential figure of one city by that of a second.

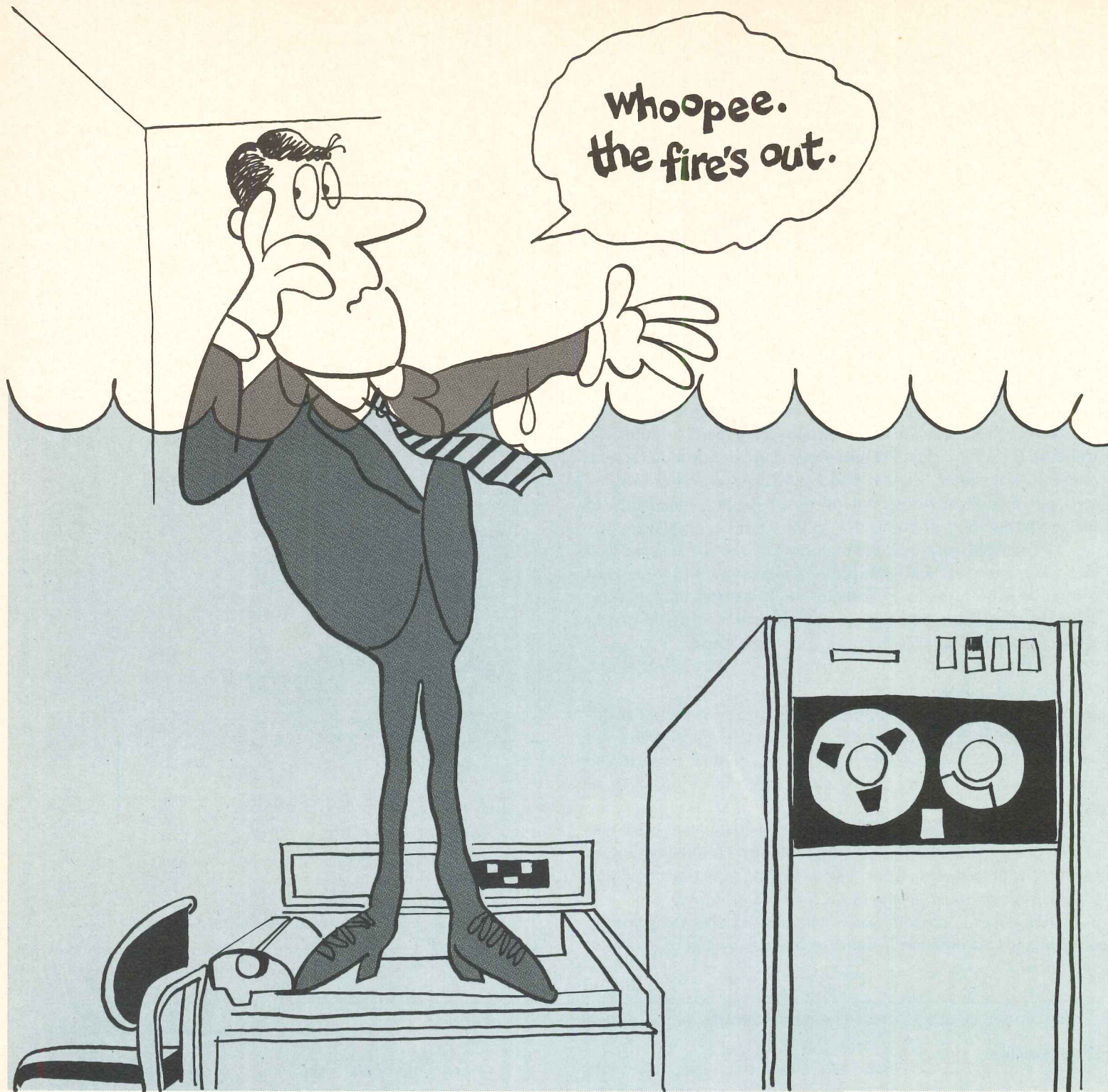
Metropolitan area	Cost differential	Current Index		% change year ago res. & non-res.
		residential	non-res.	
U.S. Average	8.5	303.6	323.5	+ 7.81
Atlanta	7.5	383.4	406.7	+ 9.73
Baltimore	7.6	310.9	330.7	+ 3.80
Birmingham	7.2	287.3	309.0	+ 5.10
Boston	8.4	289.1	306.0	+ 7.94
Buffalo	9.2	335.7	357.6	+ 9.07
Chicago	8.8	351.0	369.1	+ 6.31
Cincinnati	9.0	318.7	338.8	+ 7.25
Cleveland	9.8	344.9	366.6	+ 7.28
Columbus, Ohio	9.0	324.6	345.7	+ 7.31
Dallas	7.7	304.8	314.8	+ 7.97
Denver	8.3	328.2	348.9	+ 8.26
Detroit	9.5	343.9	361.1	+ 8.61
Houston	8.1	297.0	316.4	+11.24
Indianapolis	8.8	288.5	307.2	+ 6.47
Kansas City, Mo.	8.3	290.3	307.2	+ 7.33
Los Angeles	8.3	325.2	355.8	+ 6.88
Louisville, Ky.	8.1	300.0	319.5	+ 8.59
Memphis	7.6	290.5	309.4	+ 5.58
Miami	8.6	327.8	344.1	+ 9.16
Milwaukee	9.2	358.5	381.8	+ 8.32
Minneapolis	8.9	326.5	347.1	+ 9.86
Newark	8.9	299.0	318.5	+ 7.80
New Orleans	7.9	293.5	311.0	+ 6.83
New York	10.0	335.8	361.2	+ 7.99
Philadelphia	8.6	318.5	334.4	+ 7.90
Phoenix	8.2	169.1	180.1	+ 6.67
Pittsburgh	9.1	302.9	322.0	+ 6.56
St. Louis	9.2	322.1	341.3	+ 9.18
San Antonio	8.1	123.1	131.1	+ 7.67
San Diego	8.2	123.5	131.5	+ 7.73
San Francisco	8.9	427.2	467.4	+ 9.44
Seattle	8.6	300.2	335.5	+ 9.81
Washington, D.C.	7.9	278.9	297.1	+ 8.25

Cost differentials compare current local costs, not indexes.

Metropolitan area	1962-1968								1969 (Quarterly)				1970 (Quarterly)			
	1962	1963	1964	1965	1966	1967	1968	1st	2nd	3rd	4th	1st	2nd	3rd	4th	
	Atlanta	298.2	305.7	313.7	321.5	329.8	335.7	353.1	364.2	365.9	382.8	384.0	399.9	406.2		
Baltimore	271.8	275.5	280.6	285.7	290.9	295.8	308.7	311.4	313.0	321.8	322.8	323.7	330.3			
Birmingham	250.0	256.3	260.9	265.6	270.7	274.7	284.3	288.4	289.9	302.4	303.4	303.5	308.6			
Boston	239.8	244.1	252.1	257.8	262.0	265.7	277.1	278.2	279.6	294.0	295.0	300.5	305.6			
Chicago	292.0	301.0	306.6	311.7	320.4	328.4	339.5	340.4	342.1	354.9	356.1	362.2	368.6			
Cincinnati	258.8	263.9	269.5	274.0	278.3	288.2	302.6	309.8	311.5	324.8	325.8	332.8	338.4			
Cleveland	268.5	275.8	283.0	292.3	300.7	303.7	331.5	334.9	336.7	357.1	358.3	359.7	366.1			
Dallas	246.9	253.0	256.4	260.8	266.9	270.4	281.7	287.2	288.7	307.6	308.6	310.4	314.4			
Denver	274.9	282.5	287.3	294.0	297.5	305.1	312.5	317.9	318.5	337.9	339.0	343.4	348.4			
Detroit	265.9	272.2	277.7	284.7	296.9	301.2	316.4	326.8	328.5	351.8	352.9	355.2	360.5			
Kansas City	240.1	247.8	250.5	256.4	261.0	264.3	278.0	281.0	282.3	294.5	295.5	301.8	306.8			
Los Angeles	276.3	282.5	288.2	297.1	302.7	310.1	320.1	323.7	325.4	343.0	344.1	346.4	355.3			
Miami	260.3	269.3	274.4	277.5	284.0	286.1	305.3	309.6	311.2	328.3	329.3	338.2	343.5			
Minneapolis	269.0	275.3	282.4	285.0	289.4	300.2	309.4	310.6	312.2	330.1	331.2	341.6	346.6			
New Orleans	245.1	248.3	249.9	256.3	259.8	267.6	274.2	285.5	287.1	296.6	297.5	305.4	310.6			
New York	276.0	282.3	289.4	297.1	304.0	313.6	321.4	324.9	326.6	343.4	344.5	351.1	360.5			
Philadelphia	265.2	271.2	275.2	280.8	286.6	293.7	301.7	304.6	306.2	320.0	321.0	328.9	337.7			
Pittsburgh	251.8	258.2	263.8	267.0	271.7	275.0	293.8	297.0	298.6	310.0	311.0	316.9	321.6			
St. Louis	255.4	263.4	272.1	280.9	288.3	293.2	304.4	306.8	308.3	323.7	324.7	335.2	340.8			
San Francisco	343.3	352.4	365.4	368.6	386.0	390.8	402.9	415.6	417.5	439.9	441.1	455.4	466.9			
Seattle	252.5	260.6	266.6	268.9	275.0	283.5	292.2	296.1	297.5	316.8	317.8	325.4	335.1			

Costs in a given city for a certain period may be compared with costs in another period by dividing one index into the other; if the index for a city for one period (200.0) divided by the index for a second period (150.0) equals 133%, the costs in

the one period are 33% higher than the costs in the other. Also, second period costs are 75% of those in the first period (150.0 ÷ 200.0 = 75%) or they are 25% lower in the second period.



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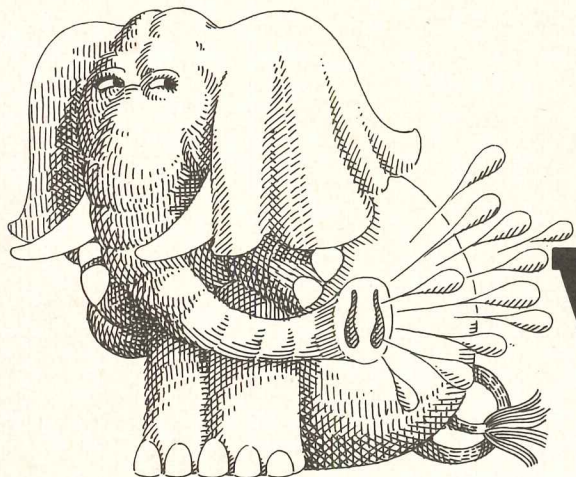
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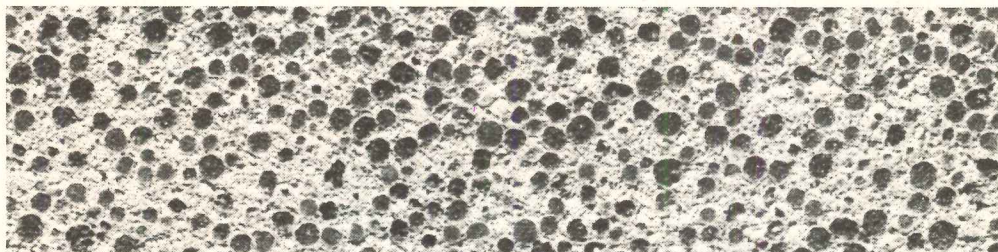
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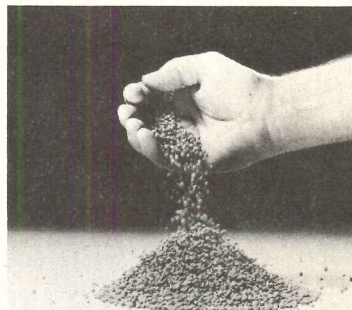
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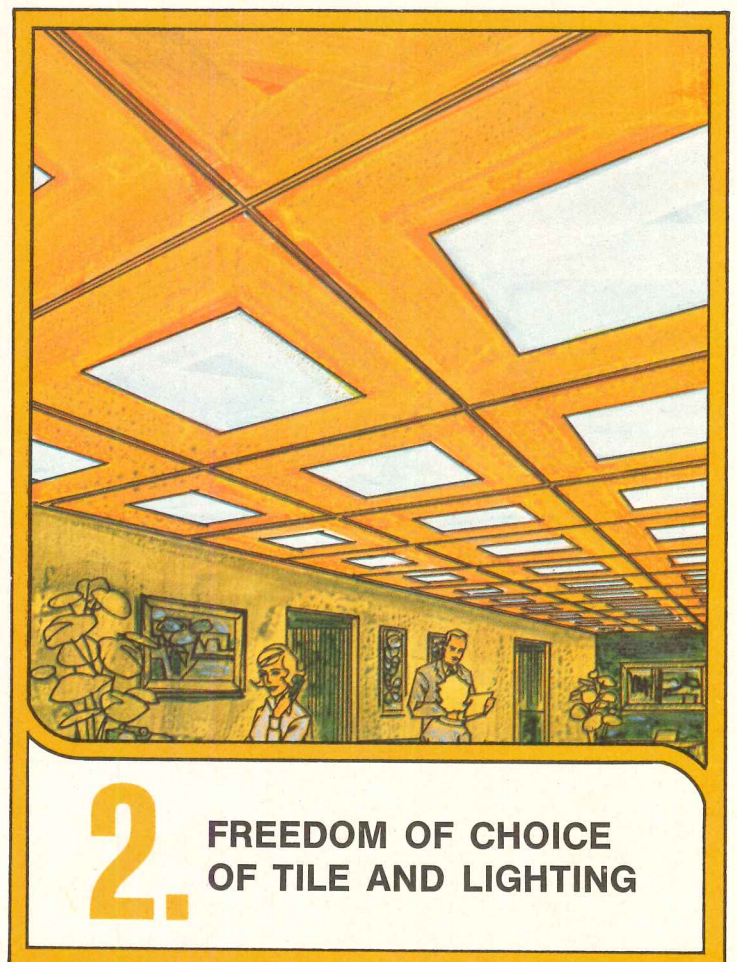
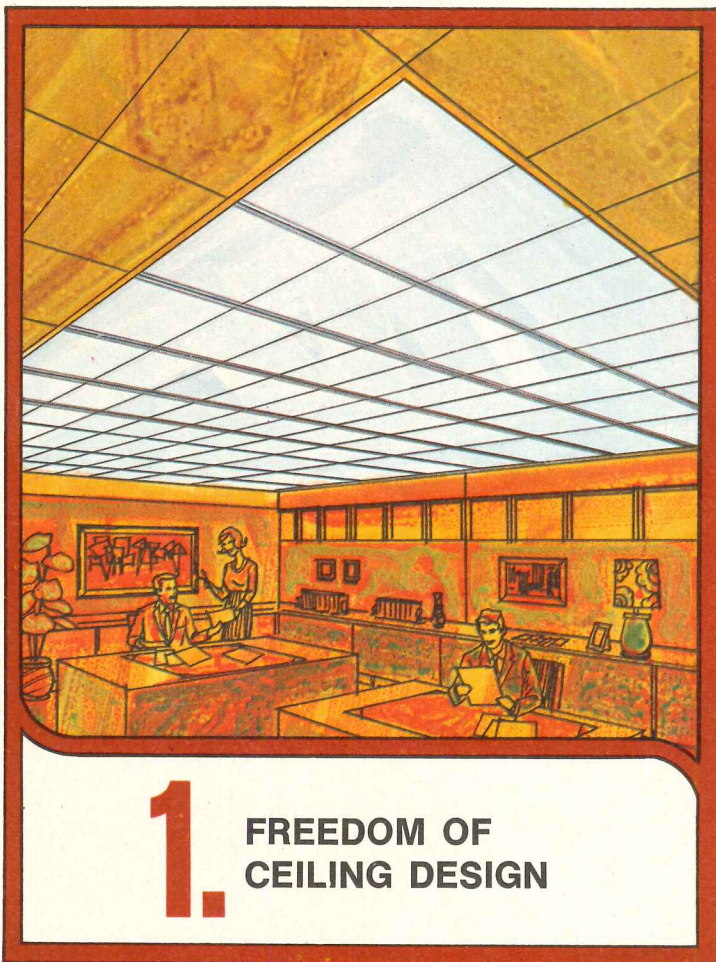
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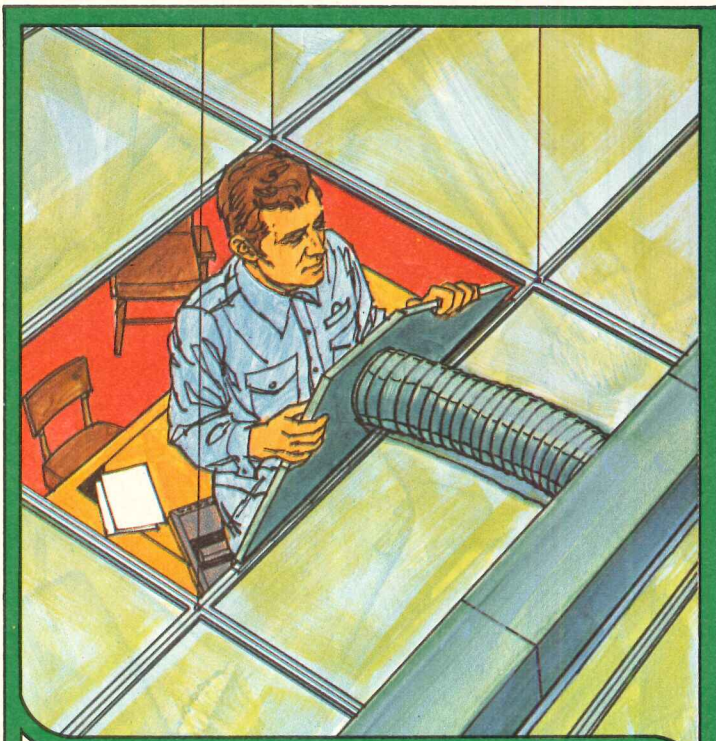
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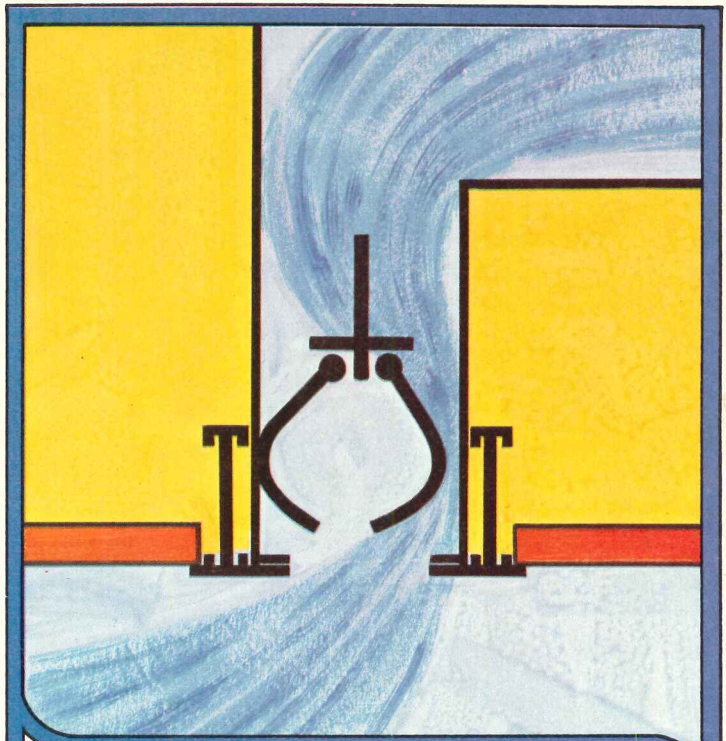
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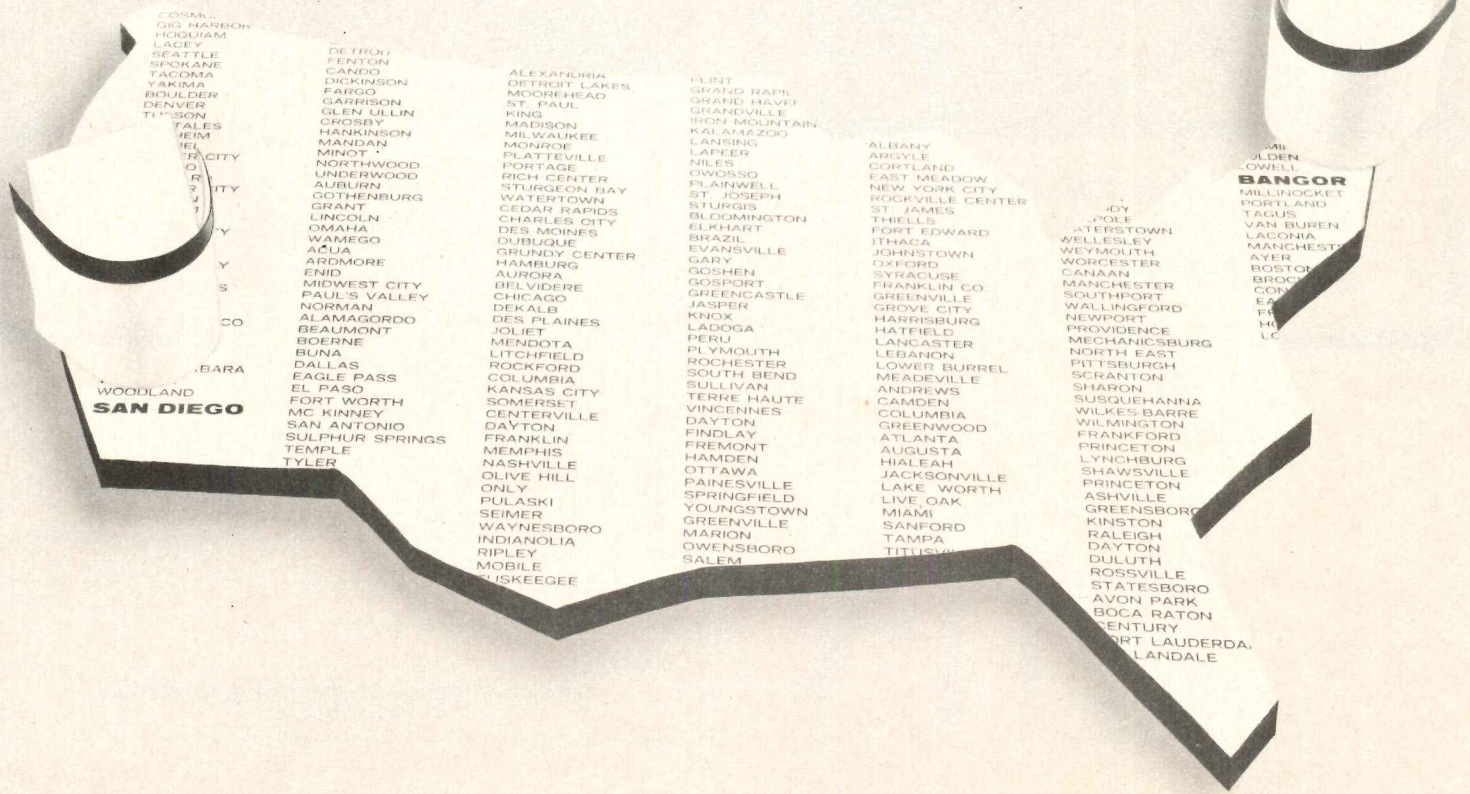
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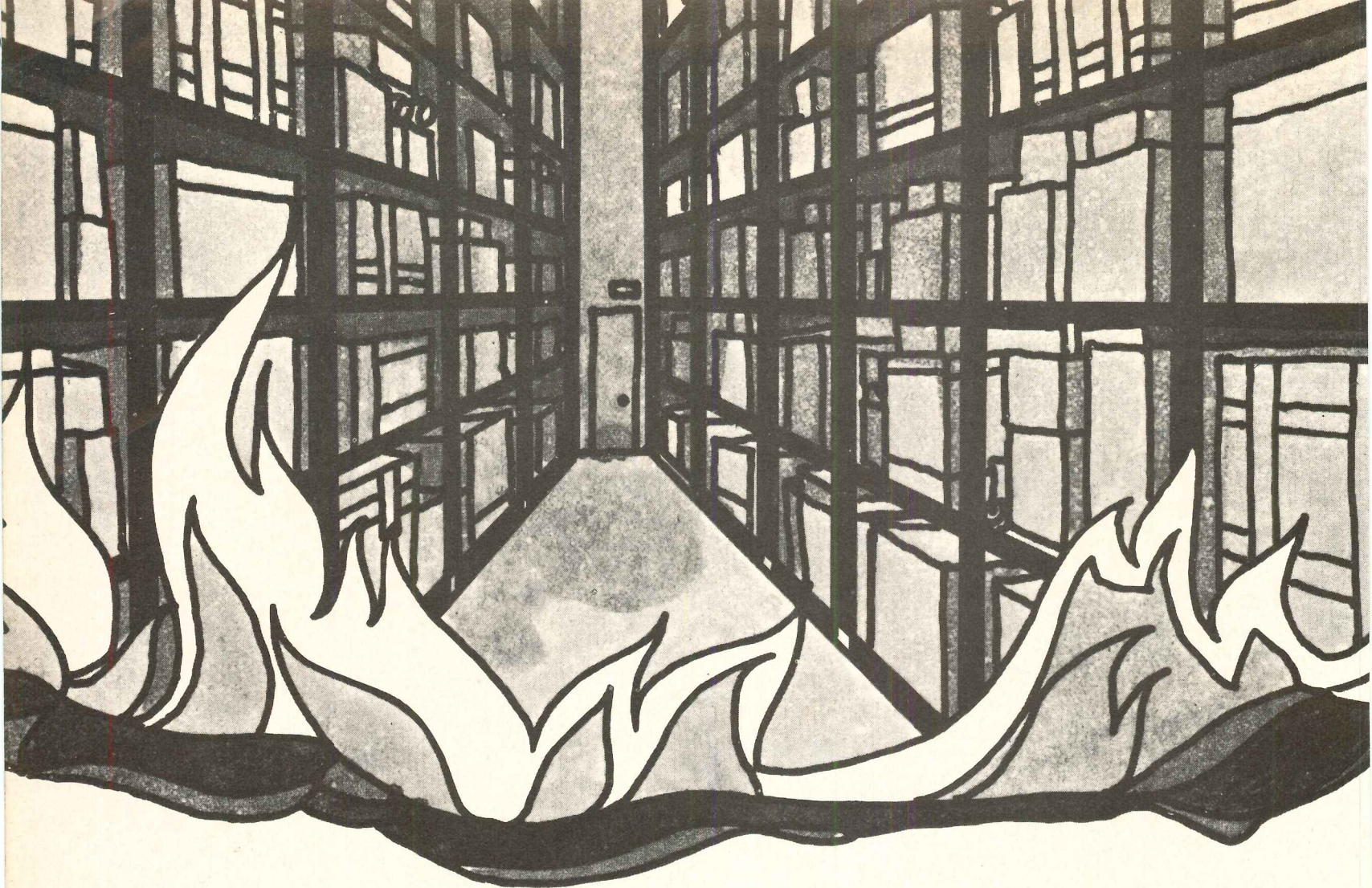
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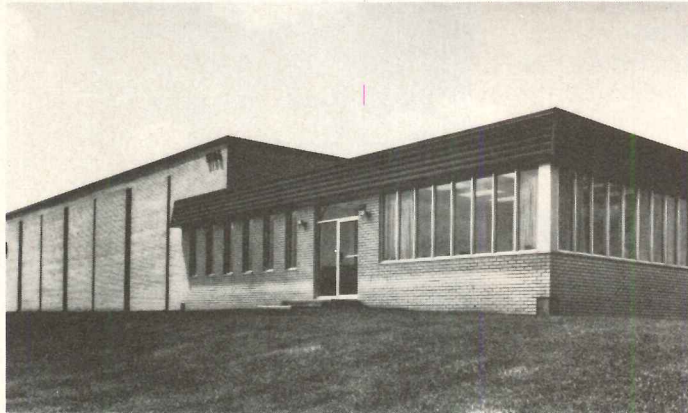
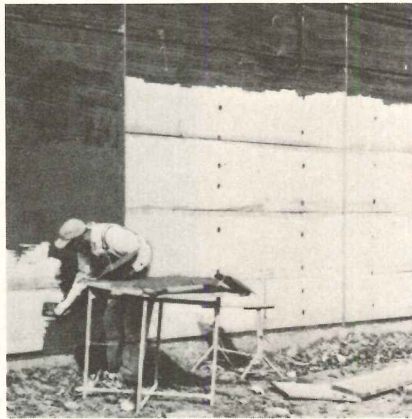
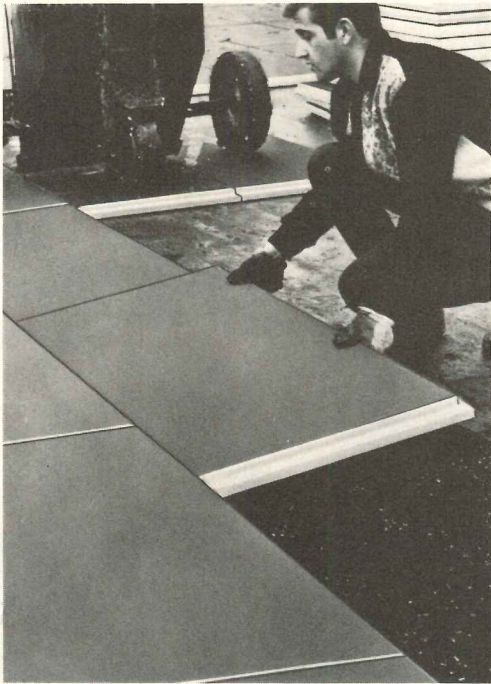
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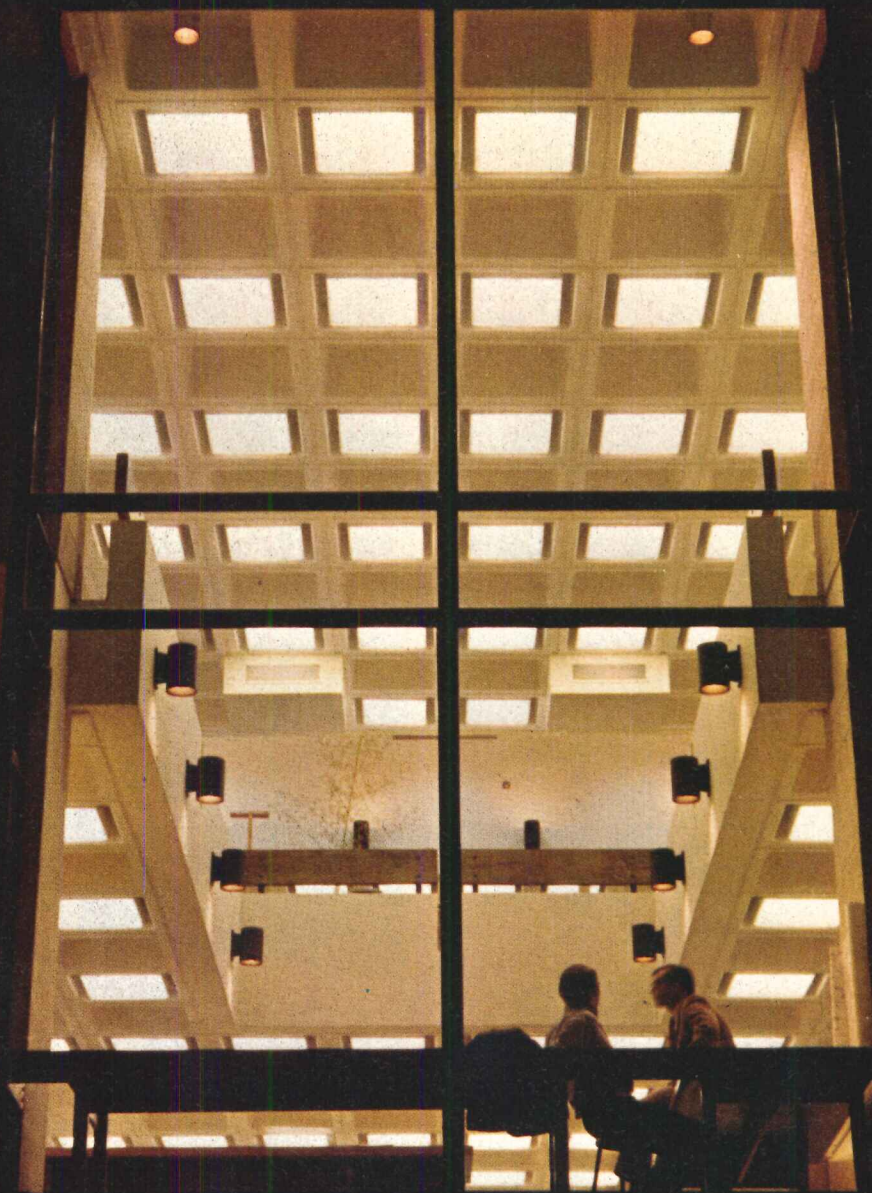
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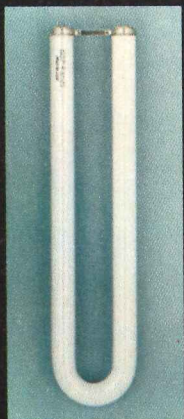
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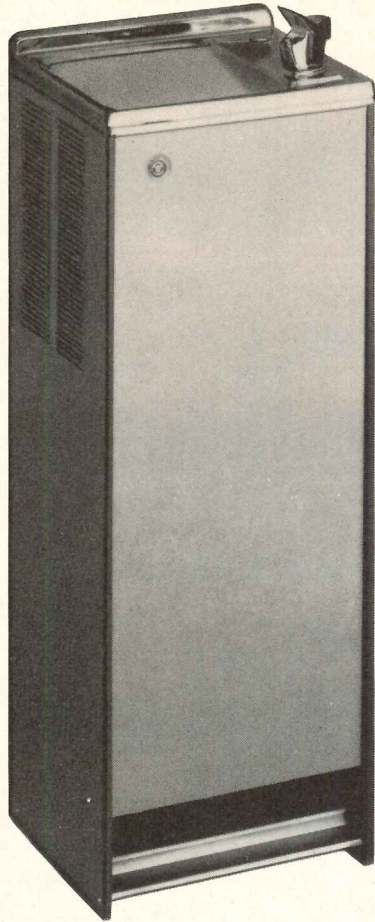
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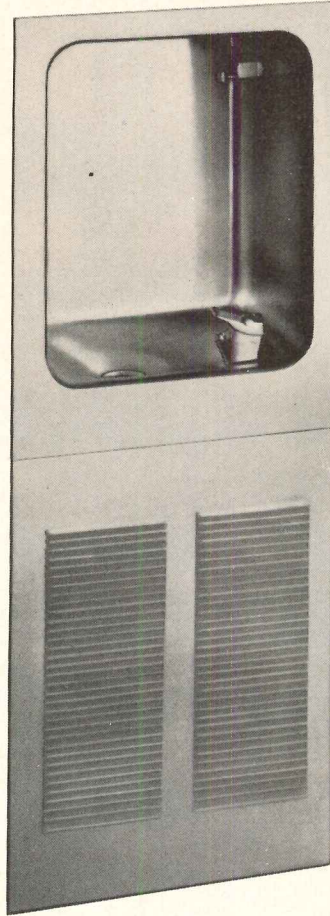
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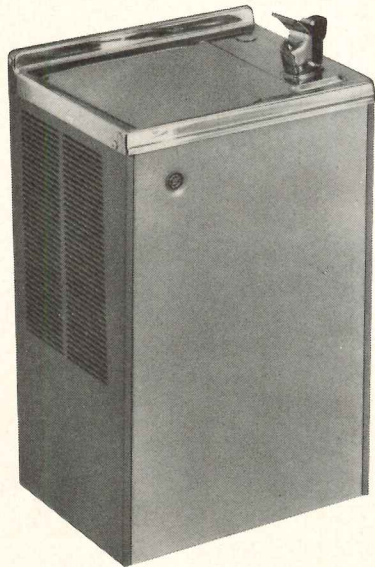
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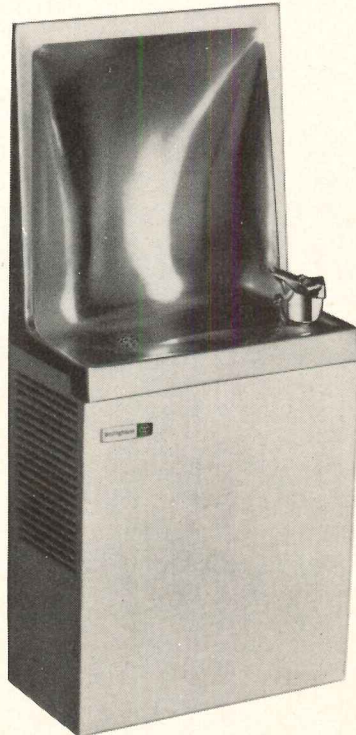
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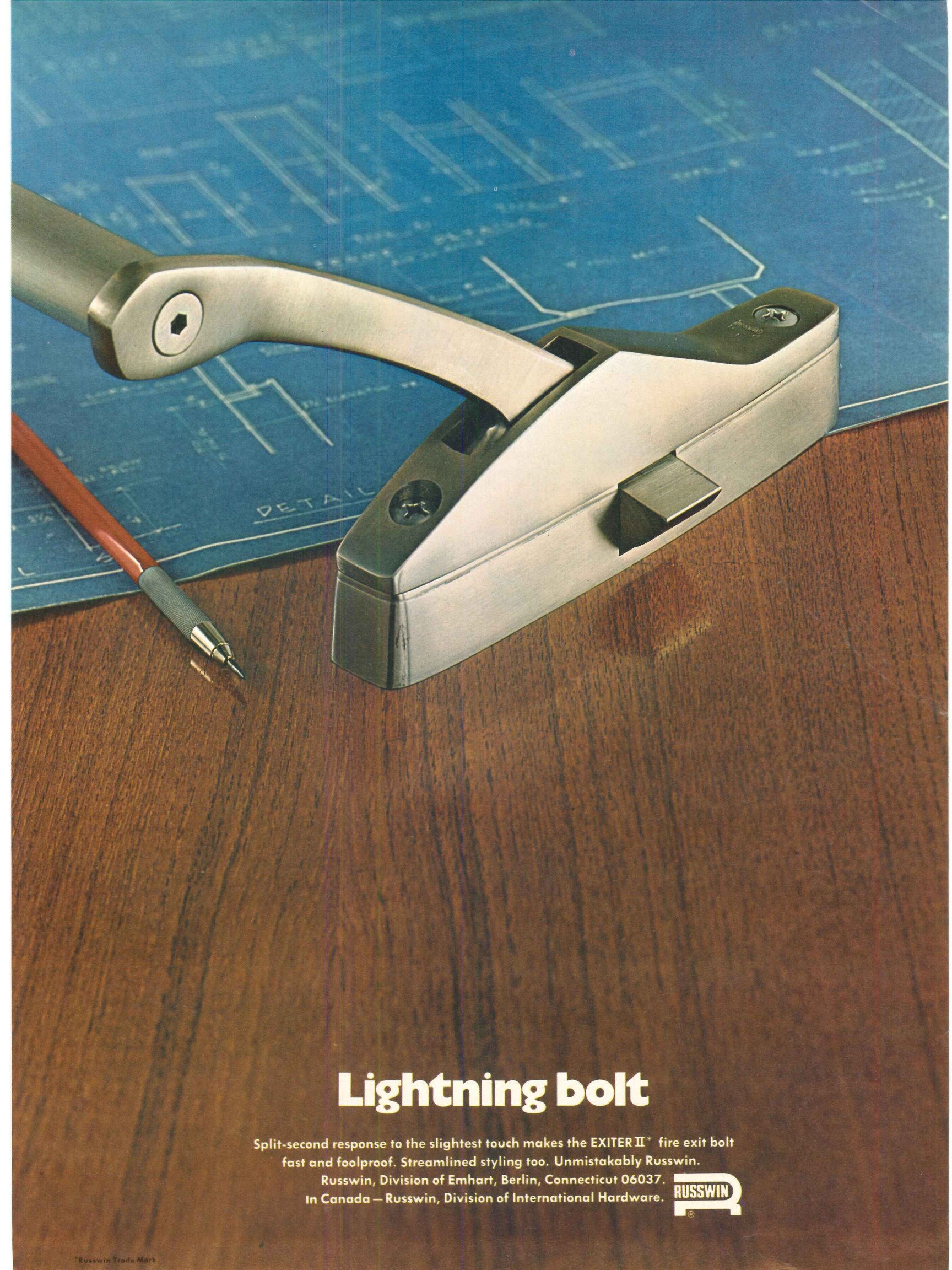


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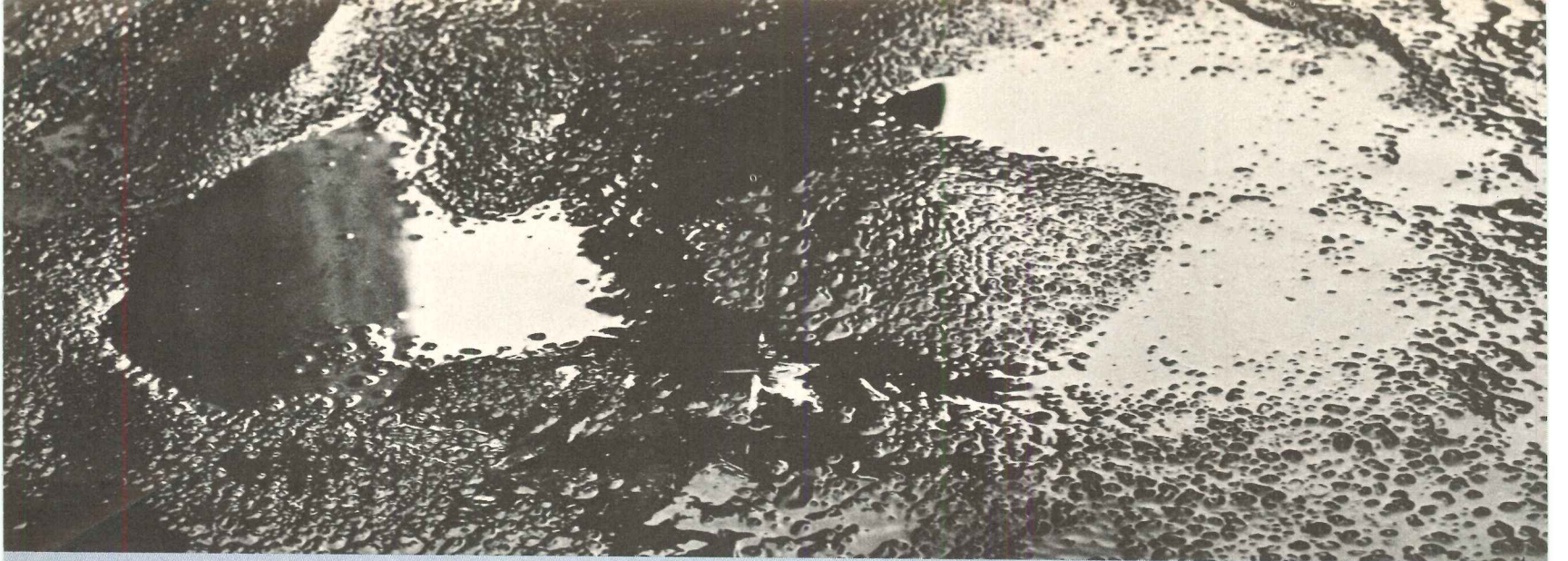


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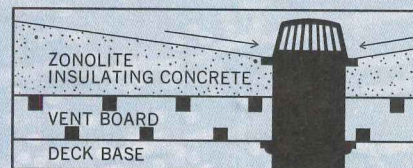
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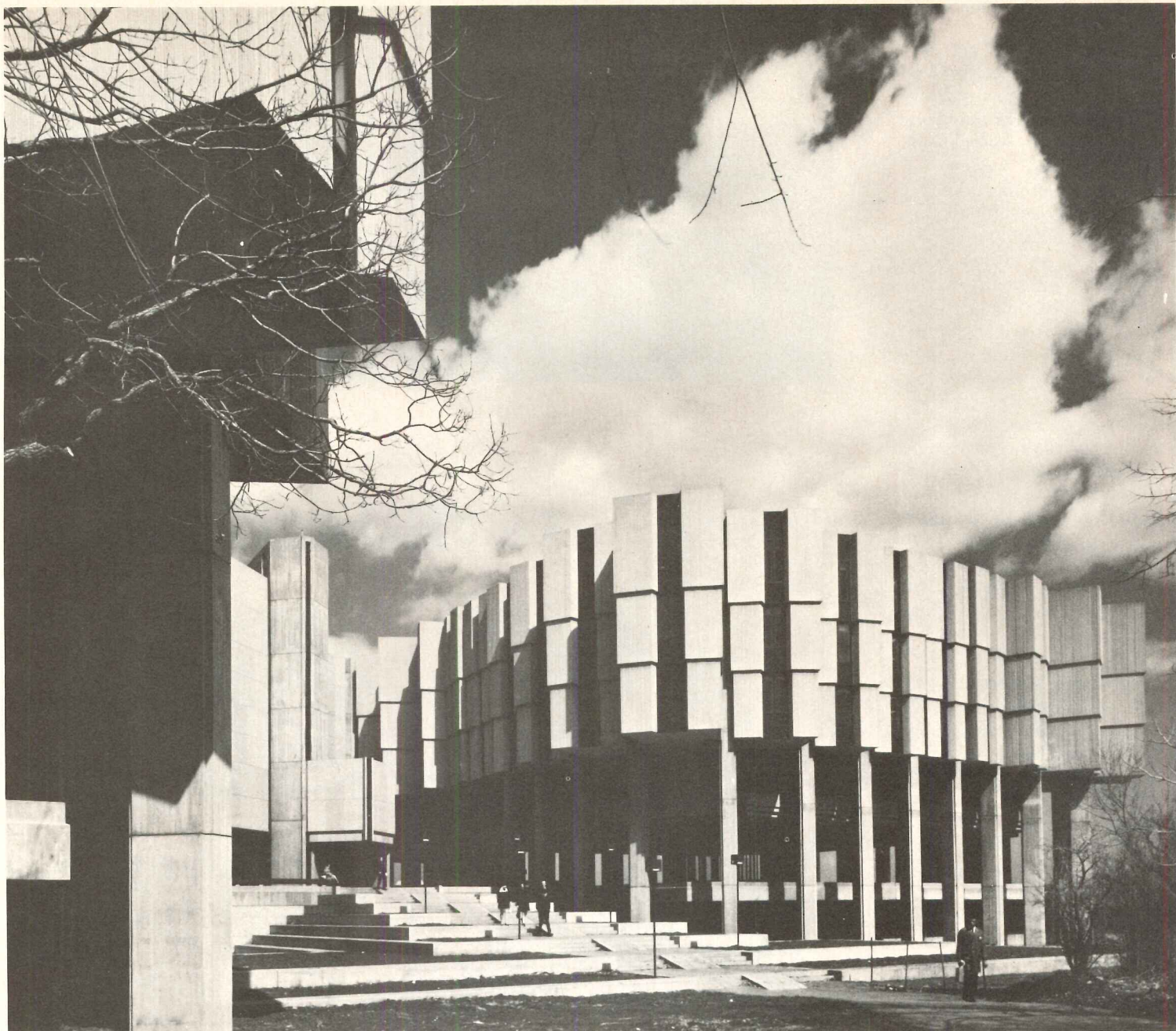
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Just say Grace.



The Northwestern University Library by Walter Netsch of SOM

is a complete break with the tower and podium designs which, in recent years, have been so widely accepted as good solutions for major campus libraries. This break with current tradition is partly the result of considerations of the physical environment and scale of the campus, but even more importantly it grew from a total reassessment of the functions of a university library as a user-directed structure, in which all members of the campus community enjoy the same freedom of access to the collections and where access to and communication with one another became principal design goals. Netsch's solution to this freshly conceived program has generated a building of crystalline beauty—certainly a major work of twentieth century architecture.

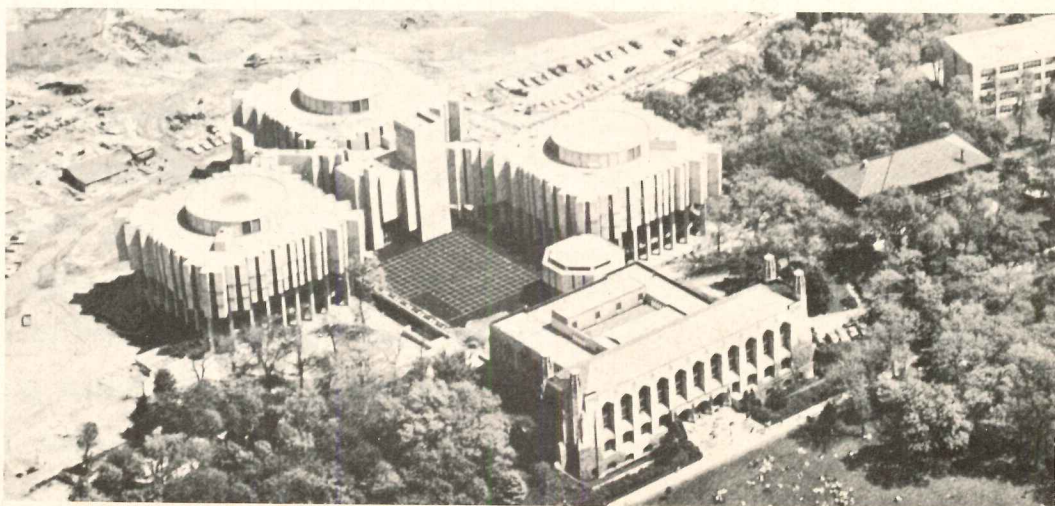
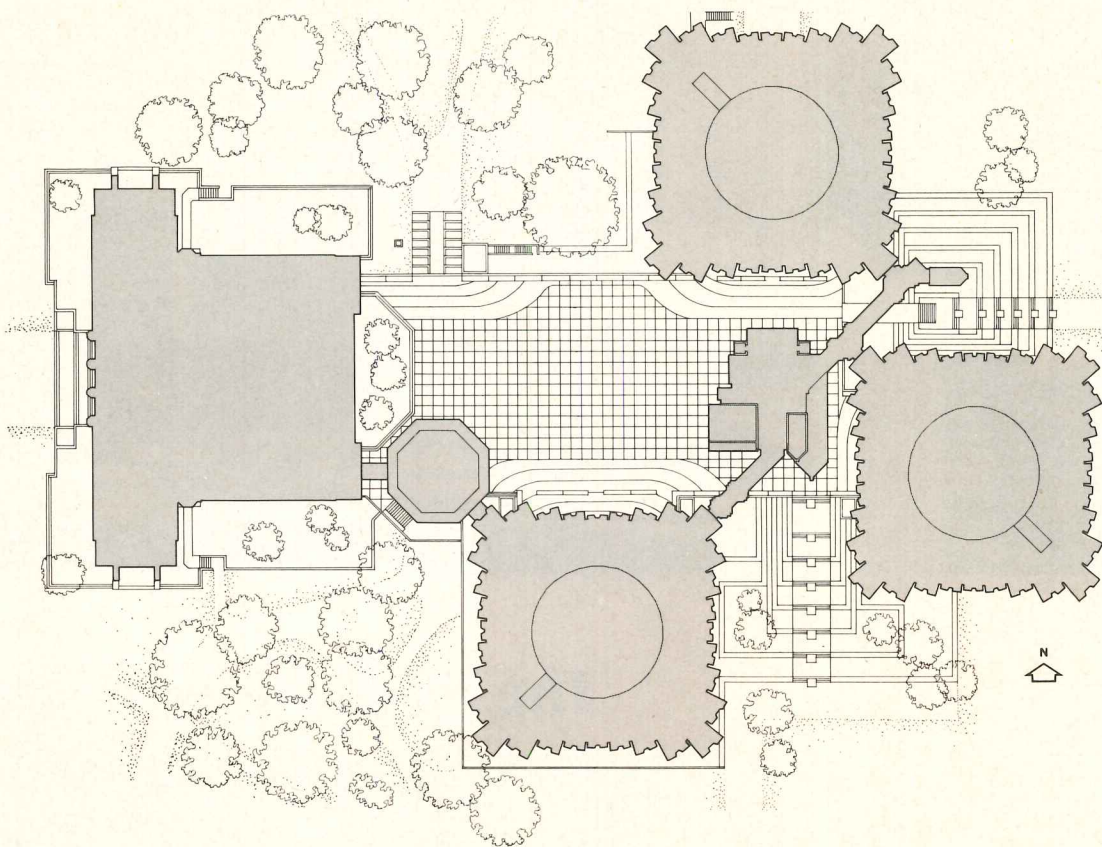
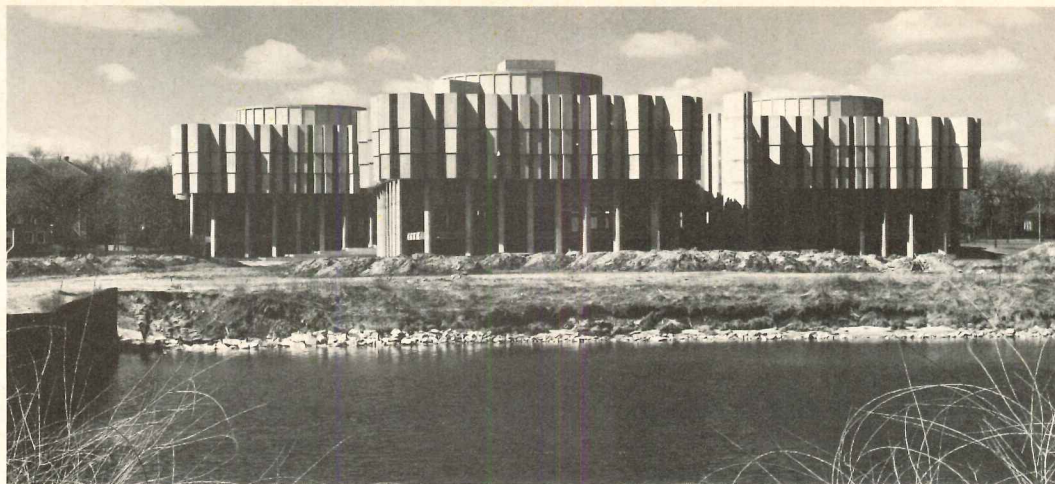
Reconciling program and site —a problem of scale

The site of the Core and Research Laboratory Library on the Evanston campus of Northwestern University is near the shore of Lake Michigan overlooking a large man-made lagoon, as shown in the photographs this page. Programmed to accommodate a so-called core-library (a collection of 50,000 basic books which are indispensable to each of the disciplines taught at the University) and a research collection of 1.2 million volumes, the new structure has a total interior net space of 329,941 square feet. Walter A. Netsch, SOM partner in charge of the library, sought a design solution which would minimize the apparent bulk of this huge structure to bring it into scale with the older Deering Library to which it is attached, and other adjacent campus buildings.

Organization of elements

Netsch has described his basic solution as follows: "Sheltering and enclosing a broad plaza are three levels of three research towers (photos, plot plan and elevation this page), the octagonal entrance 'lantern' and Deering Library (photo opposite page). Beneath the plaza a single area exceeding 90,000 square feet has been devoted to cataloguing, reference, bibliography, periodicals, technical services, data processing, receiving new materials and administration. This space forms the main level and acts as a transitional base—physically as it connects to the Deering Library, and esthetically as a nodal interchange on the main north-south campus walk. This level functions as a walk interchange to the passive meadows of the lagoon and lakefront campus, and will eventually connect to a new complex which will include student services, art and music and the performing arts.

"The first level above the plaza contains those special group reader environments that logically participate on the plaza—the core library, the reserve collection, an assembly room, the poetry and audio-visual spaces and the student and coffee lounges. Reached by a separate stair from the entry lantern, each of these spaces can function independently of other library activities."





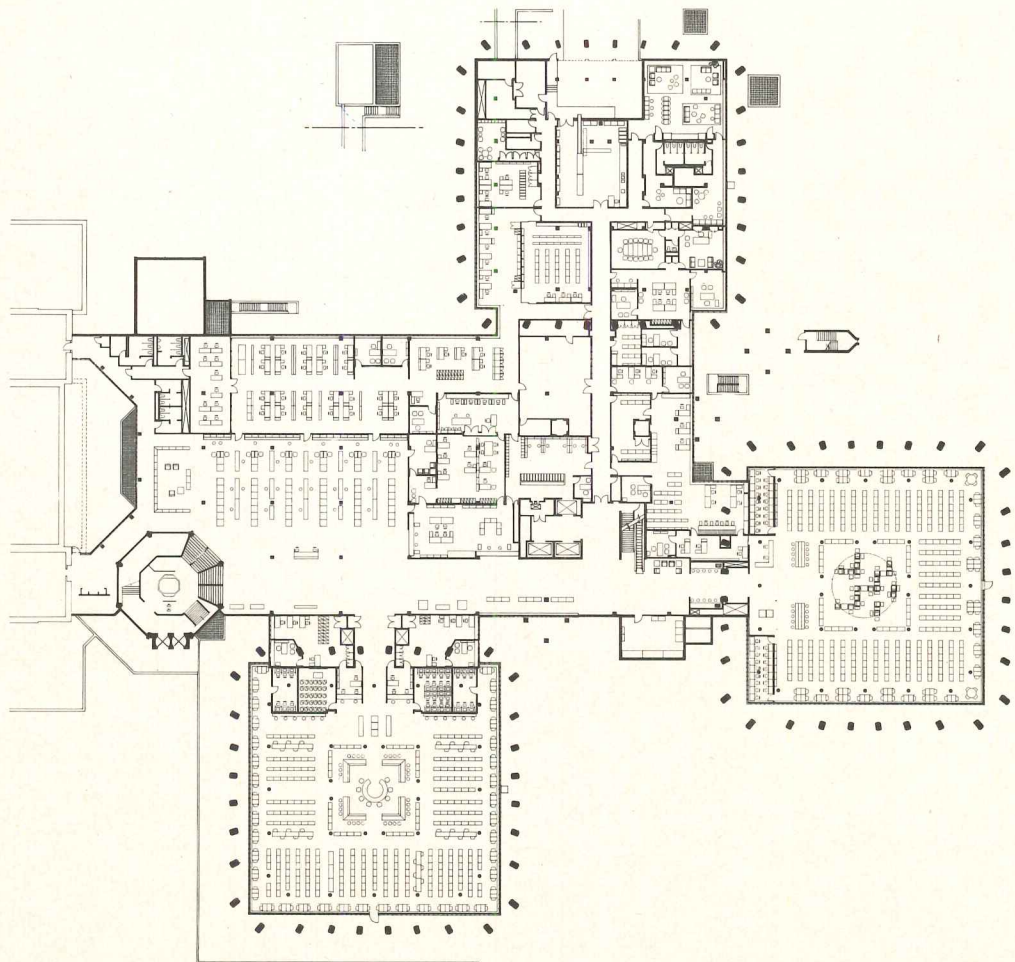
Exterior and interior expression

According to Netsch: "The programmatic forms (the seminar, study and carrel alcoves in the research collection); the combined orthogonal-radial column spacing; the relatedness of textured concrete and limestone to the older Deering Library all contribute discrete design elements to the exterior structure. The primary contribution, however, came from the combined common purpose of maximizing edge to give light to as many individual readers as possible and to give this immense library an over-all reader scale as a collection and as an object in the environment." The geometric variety and size of the columns and overhangs provide a sheltered foreground which emphasizes the lake and campus vistas. Netsch has designed the building, both inside and out, "to become at times an object, at other times a place, and at other times a continuous event. For all of this to happen, a building must be both used and perceived—fortunately a common set of goals for a library."

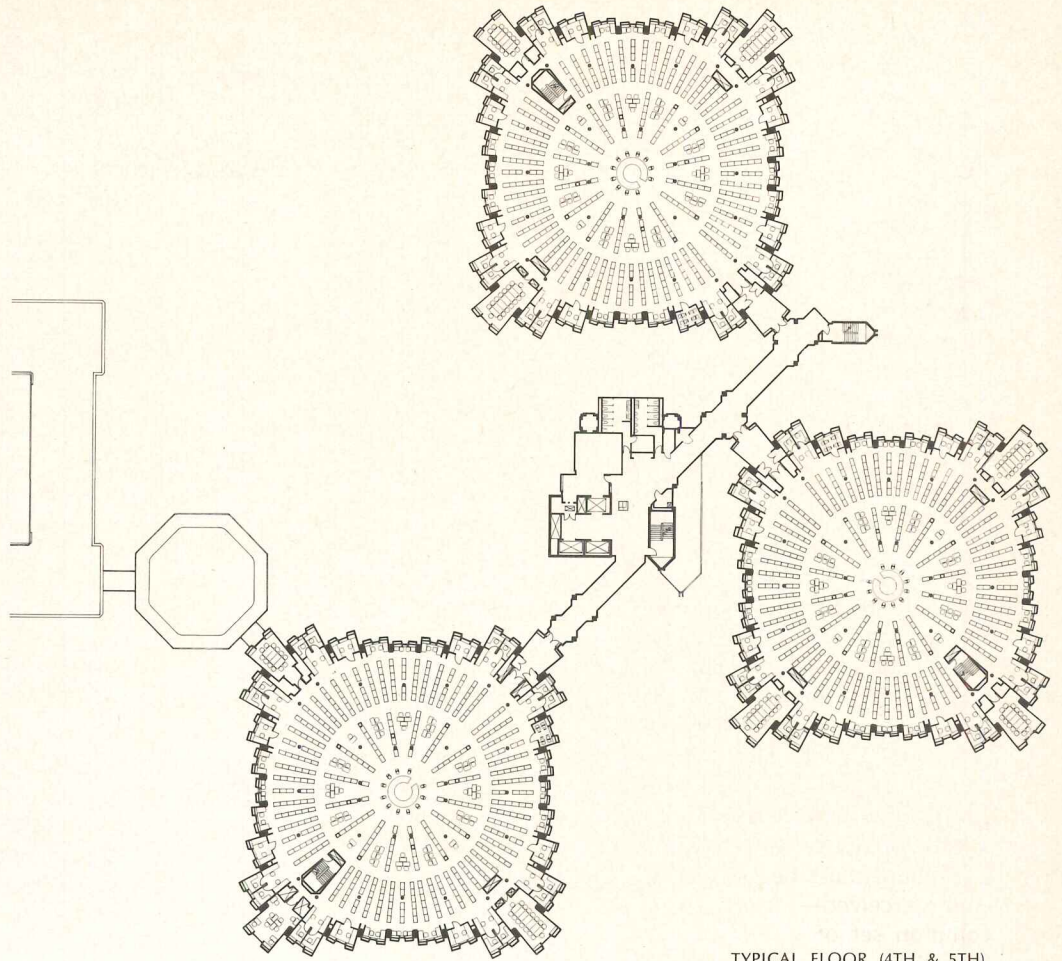
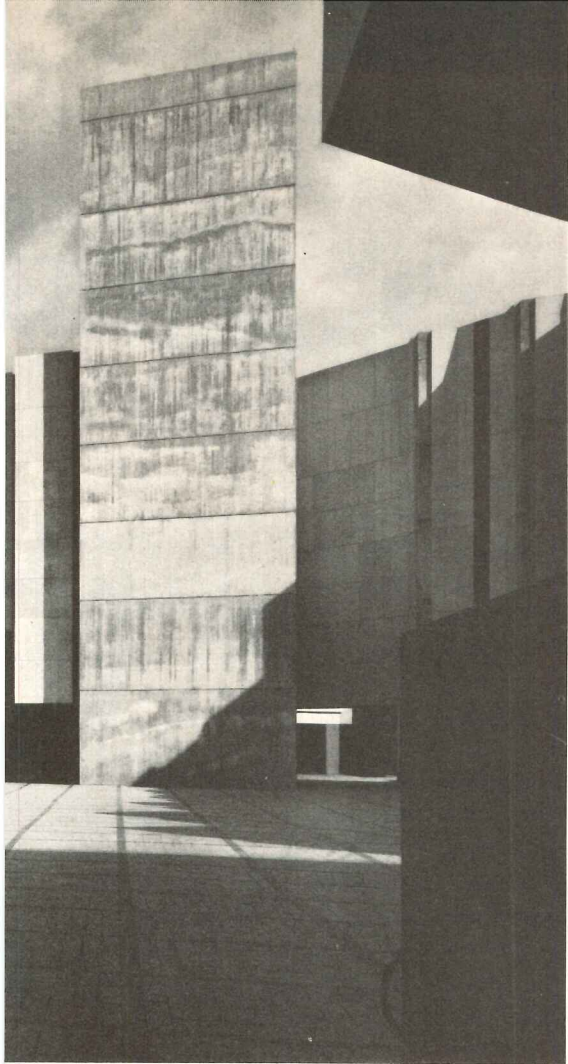
How the library functions

Netsch's plans for this building have a crystalline geometric beauty rarely found in the work of his contemporaries. Since the library was designed before Netsch had fully developed his now famous Field Theory, it is not a two- and three-dimensional lattice of interlocked rotated squares as his subsequent designs have been. The strong radial patterns formed by stack and study areas converging toward informal reading centers do prefigure the Field Theory, however, and represent an important step in its development. As in the Field Theory the geometries of this structure disallow the arbitrary and capricious. They appear to function superbly, as careful study of these plans will prove.

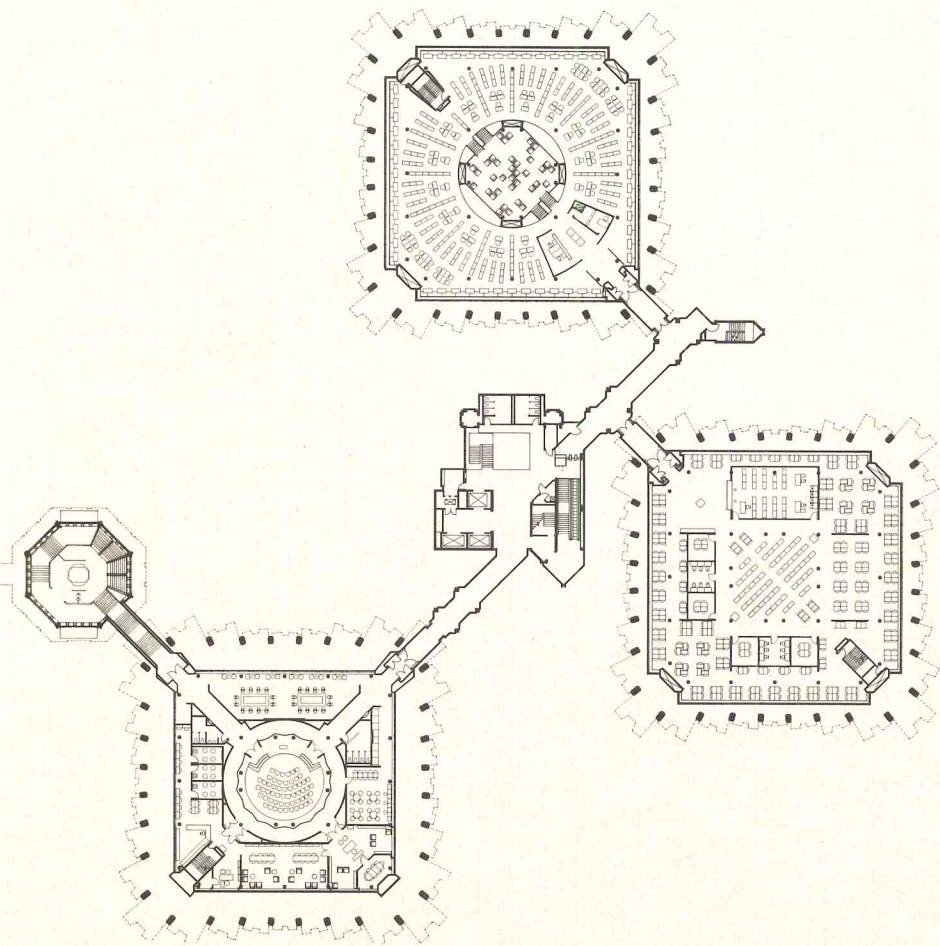
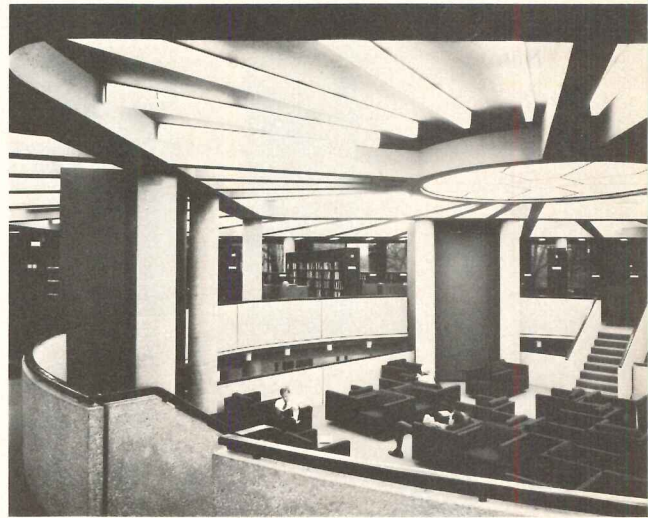
In each of the research towers the major collection is shelved in an environment of radial book stacks, which make search easier, and enclose readers in small private libraries, leaving the periphery of each collection to windowed carrels, conference seminars, faculty studies and future electronic recess centers. In the center of each floor is an informal seating area related to the search cycle.



FIRST FLOOR PLAN



TYPICAL FLOOR (4TH & 5TH)



SECOND FLOOR PLAN



Clarence L. Ver Steeg, chairman of the faculty planning and building committee, points out that the library is strongly user directed. Entering freshmen and distinguished scholars alike enjoy the same freedom of access to the collections and all library services and facilities in a setting conducive to the maximum integration of people and books. Private study and research space for undergraduate as well as graduate students is made possible by the individual seating at any given moment of 40 per cent of the undergraduates, 80 per cent of the graduate students in the sciences and the humanities, and more than 30 per cent of the social science and humanities faculty—an achievement unequaled in any other university library.

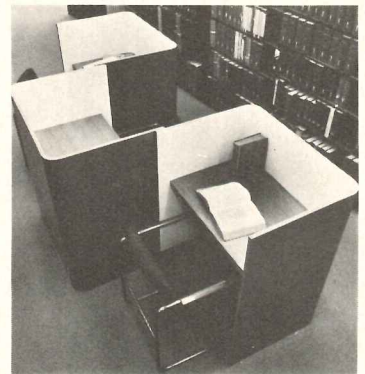
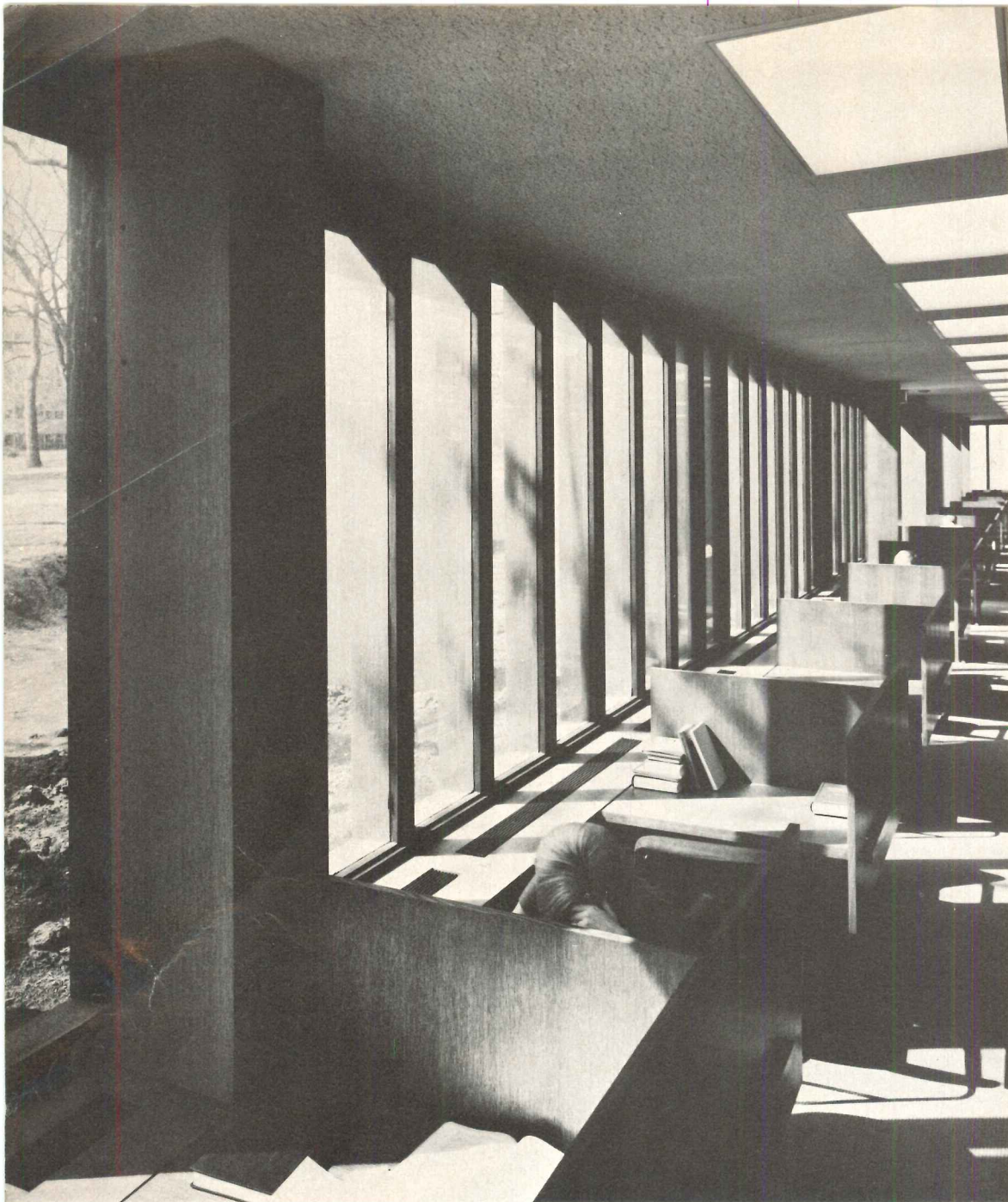
Because of the internal arrangement of carrels, group study rooms, faculty studies and typing and seminar rooms, each person can find the particular study environment he wishes.

Library plan facilitates academic goals

Each level of each tower not only provides for a close relationship between the user and his resources, but between different types of users—the undergraduate, graduate and faculty—thus fulfilling one of the principal academic goals of the library and university, the preservation of the sense of human scale in an intellectual environment which makes a community of scholars possible. The radial pattern of book stacks integrates the three types of users at the perimeter of each level of each tower by a planned sequence of seminar rooms, faculty studies and graduate and undergraduate carrels. This pattern is repeated 12 times in each research tower. Each level of each tower contains 120,000 volumes, and the three towers combined have more than 1,600 carrels. The three research towers include a total of 18 seminar rooms, 136 faculty studies, 50 faculty carrels and 18 typing rooms.

Corridors (right top) link the three towers. Here the inevitable change in noise level provides an aural break. Located in the corridors are exhibit spaces, book charge-out stations, elevators, internal telephones and toilets. Staff work centers border the corridors.

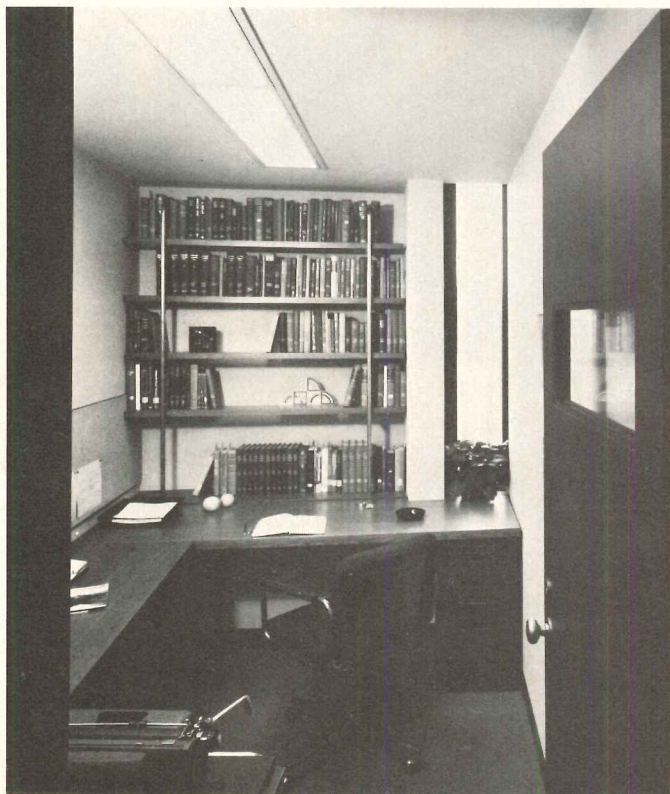


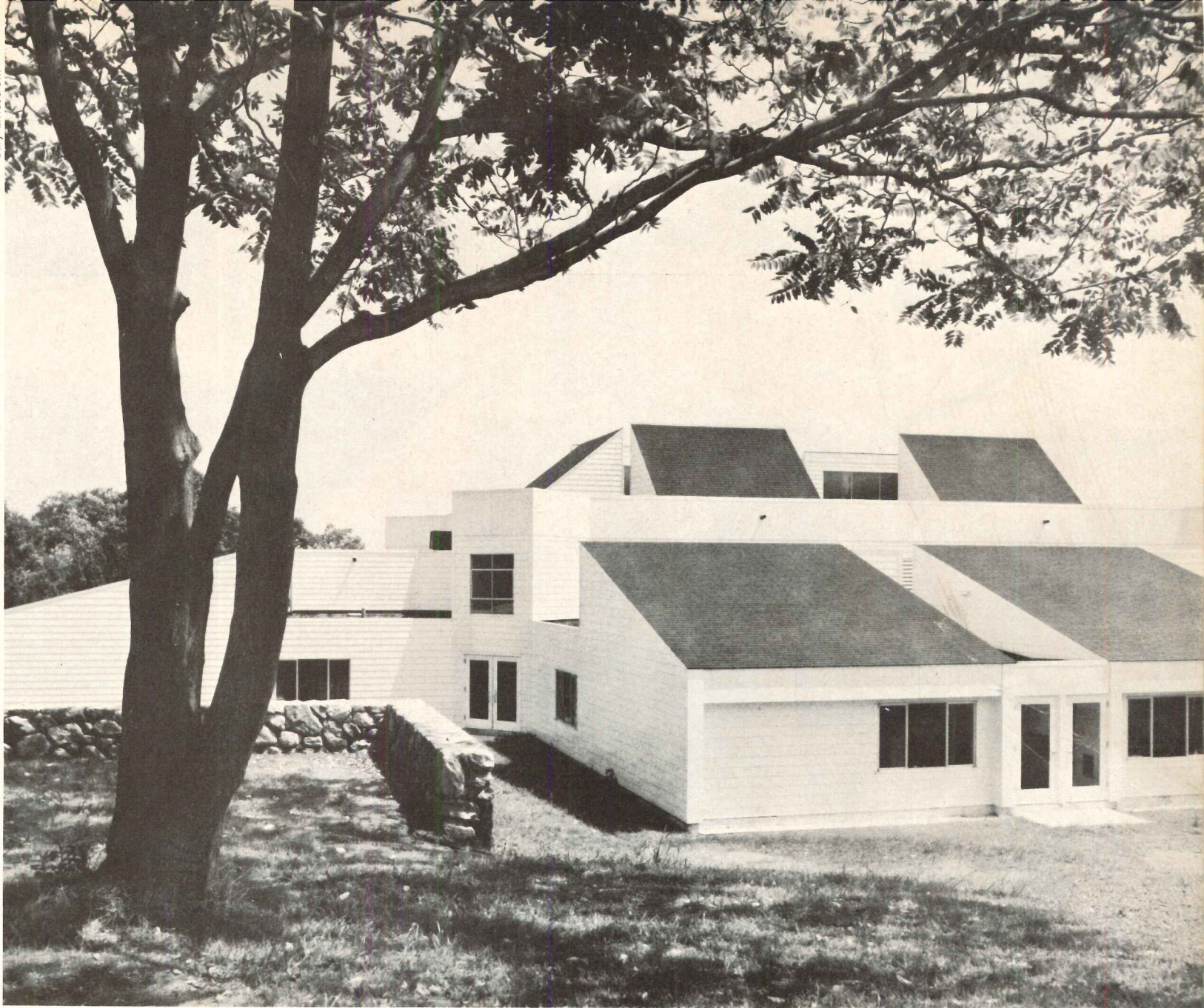


Interior design

Netsch's design team, including Robert D. Kleinschmidt, project designer for the interiors, developed a new type of library seating which consists of a complete line of chairs and stools of bronzed steel tubing enclosing a structural plastic seat shell supporting the special upholstery module. Two of these seating types appear in the photos (right and above right). Special carpets, tables and bentwood study carrels (above right) were also designed by SOM.

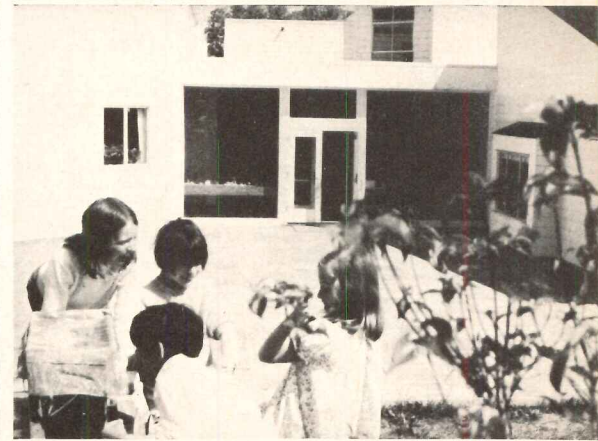
CORE AND RESEARCH LABORATORY LIBRARY, Northwestern University, Miller Campus, Evanston, Illinois. Architects and engineers: *Skidmore, Owings & Merrill, Chicago—Walter A. Netsch, partner-in-charge of design; Fred W. Kraft, partner-in-charge; Albert J. De Long, project manager; John Hartmann, project designer; Robert D. Kleinschmidt, project designer for interiors; Silvio J. Belmonte, project engineer; Contractor: Pepper Construction Company.*





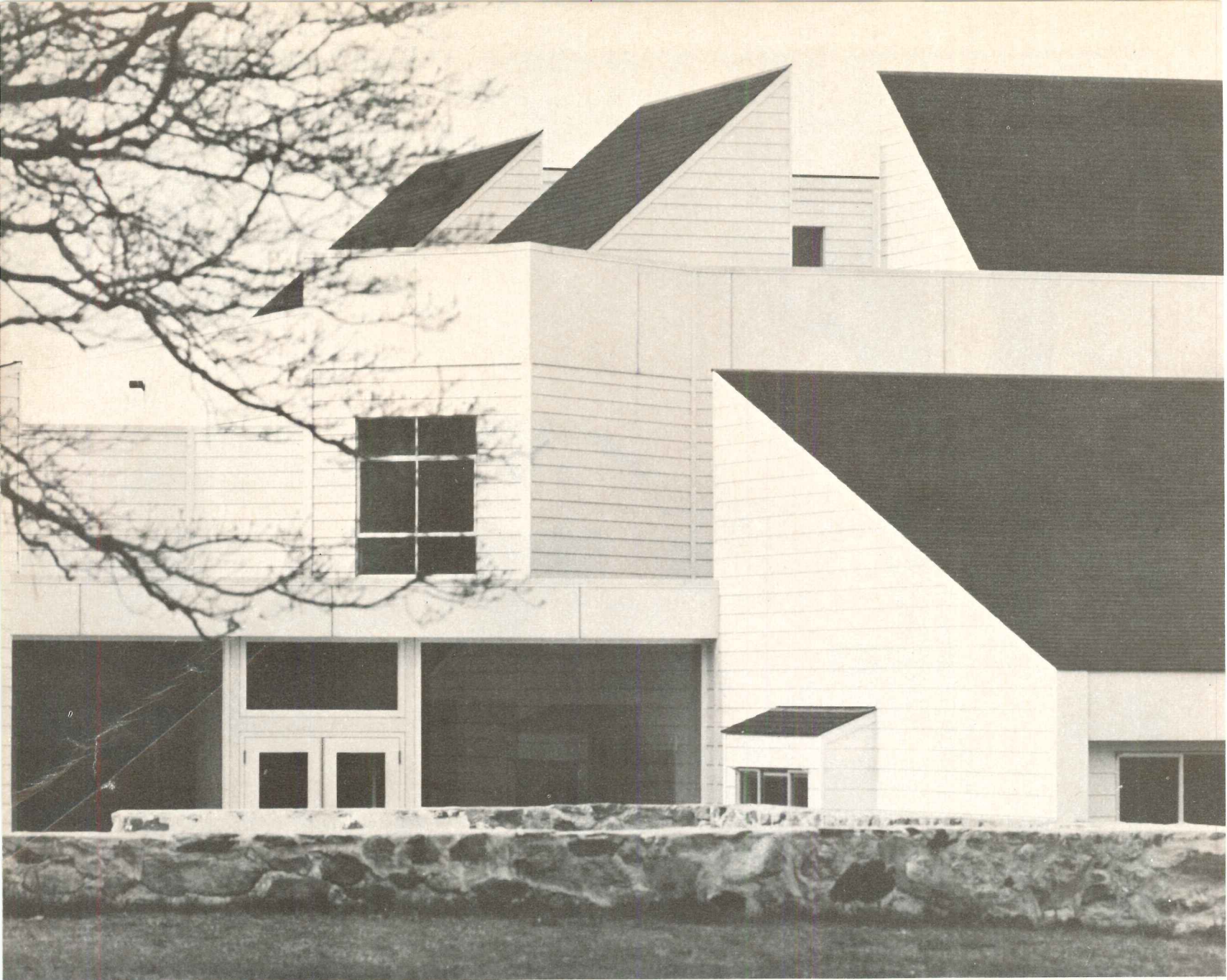
A SCHOOL FOR SMALL CHILDREN AS BIG AS ALL OUTDOORS

The new lower school (kindergarten through the third grade) building for the New Canaan Country School is full of light and well organized space and lots of happy laughter. The first two are due to the architect, Gary Lindstrom, and the third element is the appreciative response of the building's young users. A major requirement of the program was that each classroom have direct access to the out-of-doors so that the children could play immediately adjacent to their classrooms. This allows them to go in and out frequently and enables the teacher to keep an eye on their play; and it is only a few steps to the cool shadows of nearby sheltering trees and a couple of chapters of *Sylvester and the Magic Pebbles*. The building's white clapboard walls and shed roofs provide a comfortable domestic scale which the children can relate to. They also tie in the new structure with older buildings in the school's complex. Along these lines, the fieldstone foundations of the old building were incorporated by Lindstrom into the new design.



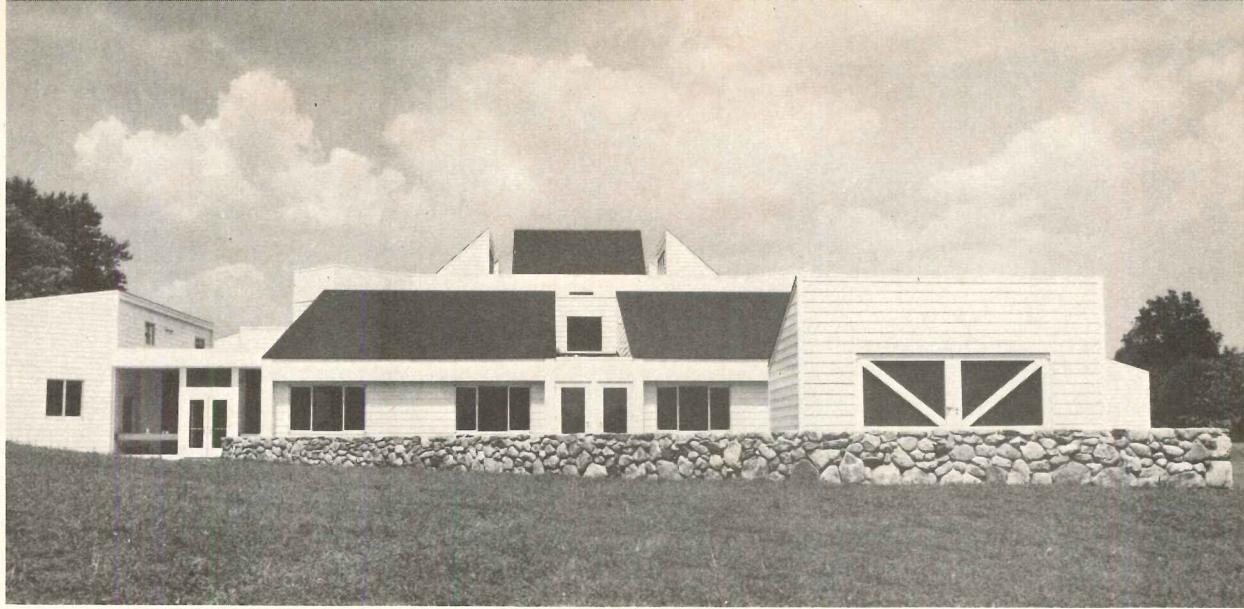
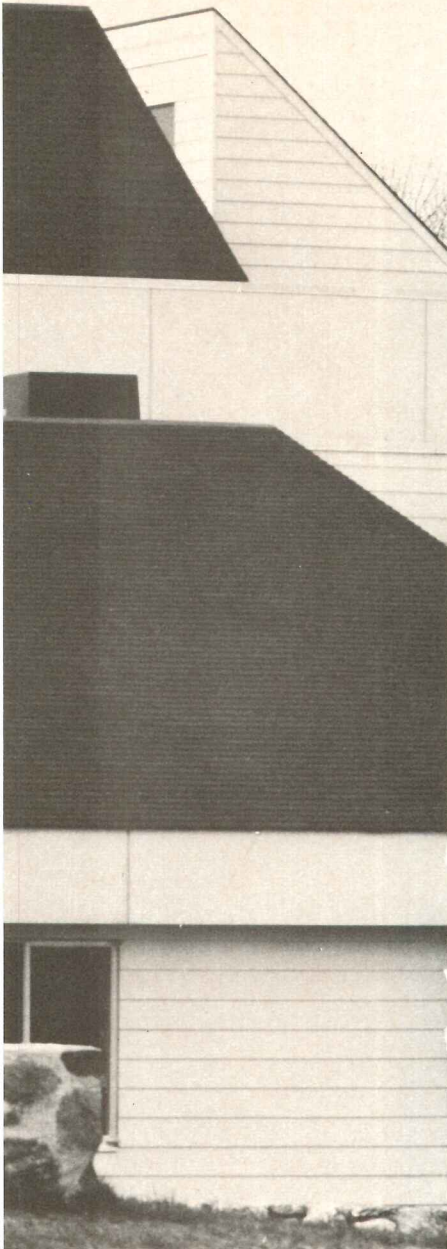
Jonathan Hale

WELLS (LOWER SCHOOL) BUILDING, NEW CANAAN COUNTRY SCHOOL, New Canaan, Connecticut. Architects: Gary Lindstrom & Associates—Herbert Graff, associate; structural engineers: M. Schupack & Associates; mechanical and electrical engineers: I. Shiffman; contractor: Louis E. Lee

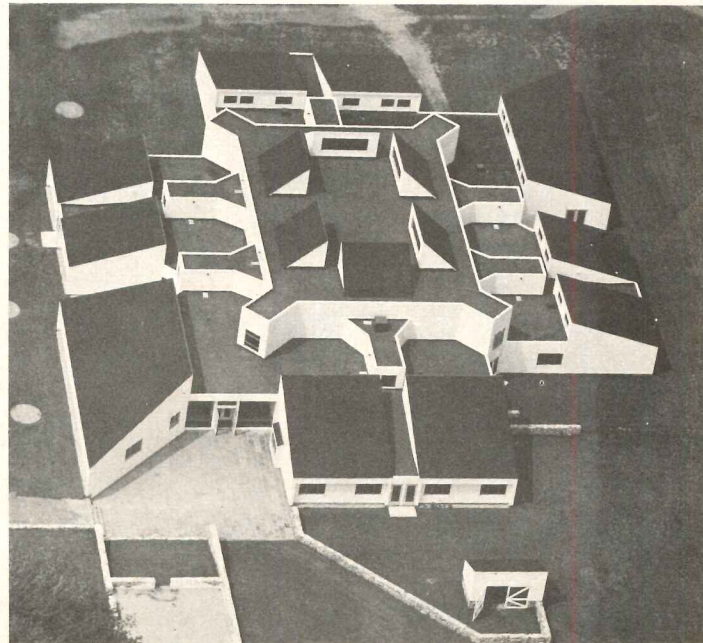
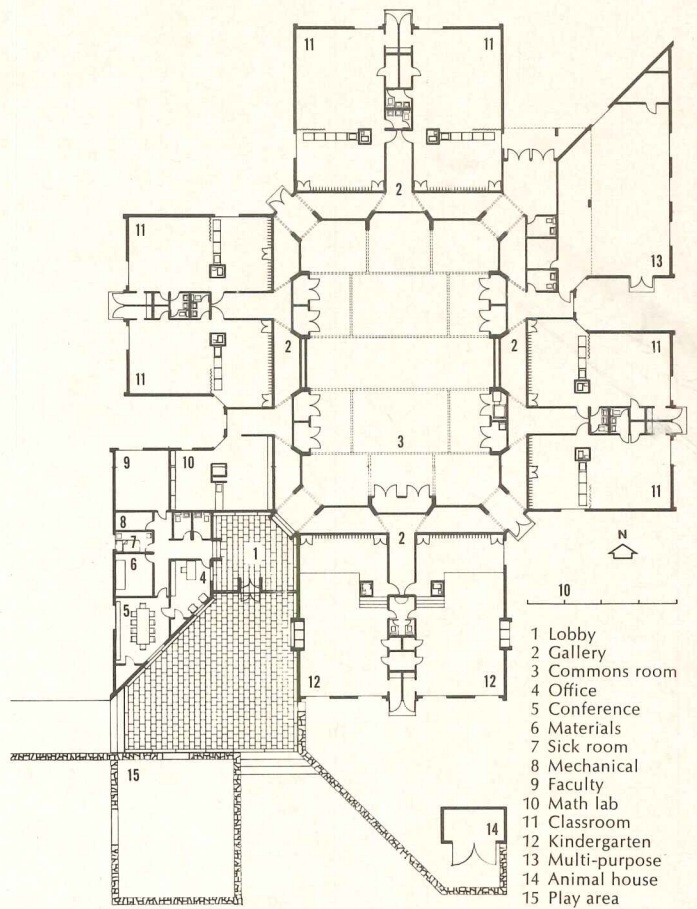


Gary Lindstrom photos





The Lower School program called for eight classrooms (two for each of the four grades), administrative offices, and a conference room which serves the latter while also accommodating individual instruction. The core of the building is a large multi-purpose commons room. It is used by the entire school and for extracurricular events as well. A rainy day play area for the smaller children, the room is large enough to hold school-wide assemblies and is also used for dance classes for various grades. The accompanying music filters into the surrounding gallery-corridor, but the latter, and carefully planned storage units, act as sound-proofing for the classrooms. Natural light is provided for both corridor and commons room by an articulated arrangement of inward-facing dormers containing clerestory windows. Seen from differing vantage points in the landscape, the constantly changing massing of the multiple shed roofs gives the building its particular character: playful but not cute, somewhat indigenous, essentially functional.





Stan Benham photos



Jonathan Hale

Interior areas of the building are unusually well lighted. Besides clerestory windows in shed roof gables, there are windows in the upper half of two-story entrances (one at each corner of the building where gallery/corridors intersect) and at intervals along corridor. In addition, cutouts in the upper half of wall dividing commons room and corridor add to lightness and openness of both areas without sacrificing privacy. All interior walls are plastered and painted off-white. Carpeting covers all floors except commons room which is oak flooring and main lobby which is the same bluestone as its outdoor counterpart.

IT'S NOT JUST THE CITIES

by Albert Mayer

In last month's article, the great issues essential to any program to enhance the environment were outlined, and the first—Land as a Public Resource vs. Speculative Commodity—was discussed. Here, Mr. Mayer argues for producing low-income housing through public corporations and public interest groups.

Part Five: Sloganese vs. the real action courses

To create a humane environment, it is essential to recognize and reverse obsolescent but still dominant trends, take a strong positive line commensurate with the toughness of the tasks. This takes imaginative decisiveness and determined action. The defensive tendency is to call on more of the same when it has already passed its zenith, or to call for reliance on devices or institutions that have been brought into being for other types of purpose and prevailing conditions. These are often the first reactions so that one can postpone fresh thinking and grappling, take refuge in the familiar, in an afterglow of inapplicables that once worked or were thought to have worked or work in other conditions. By analogy no longer valid, they evoke past triumphs, create the sedative and semi-comfortable attitude that it ain't really all that difficult, and as we did it before, we can do it again.

I propose first to take on the proposition of doing the job by hallowed methods or formulas old or more recent, or even current, show that we can't do the miracles in sloganese; and then to take on and adopt the second half: the exhilarating toughness of the real job, which is to hammer out new and burgeoning institutions.

Three slogans encompass the bulk of this kind of thinking, and anyway will serve as adequate indices:

Do it by private enterprise.

Do it like NASA.

Do it by systems analysis.

These evocations do have some partial validity, of course. Each one has some contribution to make, which should be analyzed, distilled, and brought to bear. For different reasons none of them, and no analogue, can be the central instruments.

Our job of creating the needed humane environments deals with living men, women, children in such diverse stages of development and background, habit, outlook, emotion, varying degrees of non-communication, that these instruments are just

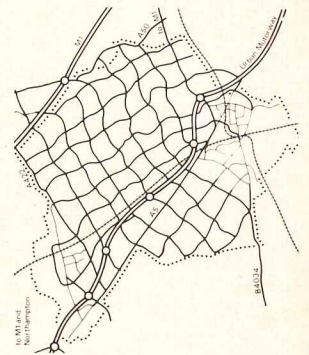
absurdly incapable of producing the fruitful processes and solutions. But the verbiage is simple, enticing, nostalgic. Unless they are realistically disposed of, they will keep fogging up the windshield, keep deflecting us from the real course or courses; at the minimum, delay us through detours in reaching the goals.

There is a sort of deification of business, of private enterprise, a feeling that it has a magic of accomplishment, that if only left unshackled from the stupidities and irrelevancies of government and of do-gooders, it could solve anything. The conventional confidence in its virtue and virtuosity is a danger. For that reason I have marshaled an array of both theoretic points and actual experiences from the most varied realms of private enterprise on various planes, to deflect this almost instinctive turning to a kind of father-image or rich successful uncle image.

1 Dealing with sloganese: is private enterprise actually suitable, let alone THE answer?

Consider first the suitability of private business, its potential within its own definitions and parameters; then, its record. We are talking now not of its essential role in economical fabrication, and in other and even more innovative ways reducing first costs of construction. We want to get all the help we can from it in its ingenuities and inventiveness in physical terms, in terms of more efficient production of homes and other construction, in systematizing distribution, in rising quality and in economy of maintenance.

What is being referred to here is the easy slogan that private enterprise should be the complete entrepreneur, to assemble, build, invest in, manage, buy and sell, living accommodations—including, and



Instrumentalities for tomorrow: The public corporation (government powers and controls, with the drive of private citizens). . . . England is developing Milton Keynes, its latest and largest new city (250,000 population) after 25 years' successful experience with this form of enterprise. See text, page 105.

"... the strength of private enterprise is in mass production, in producing and distributing commodities, equipment, machines, goods: hard and tangible. Its genius is in mass production in great quantity..."

perhaps especially, low-income housing. It should be enticed into this field by the potential of profits competitive with its customary opportunities. The late Senator Robert Kennedy, and the Kaiser Committee, pushed in Congress for a formula that by means of limited dividend plus accelerated depreciation would produce a 15 or 20 per cent return, or more. This accelerated depreciation is of course a form of subsidy that is not called subsidy. The question is whether such necessary subsidy should go to private business as the optimum and chosen vehicle, or whether there are far better instruments at hand for developing, which will do the job better, with less subsidy because they do not require such profits, and with more sensitivity and understanding.

2 Private enterprise is best at producing quantities — and must have a profit.

There are two ineluctable characteristics that are inherent in private enterprise—by its own definitions—which, to my thinking, make it basically unsuitable to undertake the essentially socially sensitive role in the homes and therefore daily lives and problems of the people—especially the lower-income people:

First, the strength of private enterprise is in mass production, in producing and distributing commodities, equipment, machines, goods: hard and tangible. Its genius is in great quantity. In producing and selling a car or a suit of clothes, or an airplane trip, there is no need or occasion for concern about family problems, about the lives of the purchasers, about the daily inter-relations among people in neighborhoods. These matters, all-important for daily living and community relations, are just not the scope or competence of business, of profit and loss.

Second: In essence the profit motive that is at the very basis of private enterprise is not on any broad scale suited to the required sensitivities and to the social supremacy of people and environment. Its basic loyalty and all its basic criteria are by definition geared to the profit of its stockholders. In any last analysis its decisions must be reached on that basis. In case of conflict, management's allegiance as such is always beyond question, however personally charitable individual stockholders or managers may be. This is an overall characterization of philosophy and practice. For some years I have been accumulating a number of situations to see whether the facts and patterns bear this out. Indeed they do, across the board, and in the most prestigious range of businesses. Consider instances:

The matter of air pollution, and the automobile industry which is by general acknowledgement and acclamation the *beau idéal* of private business. C. W. Griffin Jr., writing in the *Saturday Review* as long ago as May 22, 1965, quotes S. Smith Griswold, Chief of Los Angeles' Air Pollution Control District, that the automobile industry has been engaged in a "great delaying action."

"Everything that the industry has disclosed it is able to do today to control automobile exhaust was possible ten years ago," says Griswold. No new principles had to be developed, no technological advance was needed, no scientific breakthrough was required. Crankcase emissions have been controlled by a method in use at least half a century. Hydrocarbons and carbon monoxide are being con-

trolled by relatively simple adjustments of those most basic engine components—the carburetor and ignition systems.

Why has this action required ten years? . . . Control of air pollution does not make cars easier to sell; it does not make them cheaper to produce; and it does not reduce come-backs on the warranty. To people interested in profits, expenditures for the development and production of exhaust controls are liabilities.

More recently (1970) it has been noted that automobile manufacturers are making it virtually impossible for customers elsewhere to obtain the pollution-reducing equipment required of cars in California. So, a continuum of policy.

Within the well-established, long-recognized parameters of private enterprise, this is just how the game must be played by successful competitive management. Another instance: Under the heading "Noise Level Called a Peril to City Life," one of the chief culprits cited is the air compressor or drill. The regular noisy model sells for around \$30,000; the quiet model for 30 percent more. William L. Wearnly of Ingersoll Rand, the manufacturer, said that sales of the quiet one were "insignificant", "not a drop in the bucket".¹

3 Business fallibility in performance: a world of illustrations.

While on the subject of the automobile industry, consider this second aspect. After persistent exposure by Ralph Nader and subsequent legislation, the motor companies recalled millions of cars for inspection and repair. A report in *The New York Times* noted that as of May 10, 1969, General Motors had recalled 6 million vehicles since 1965; the entire industry a total of 13 million since 1966. The delays involved for car owners to have the necessary repairs and replacements made have constituted a saga in themselves. . . . One situation constitutes a particularly egregious chapter. Again, from reports in the *Times*:

March 28, 1969: "The March 18 recall included 10,400 school bus chassis with a potential brake system defect that was involved in at least two accidents and one death."

April 17, 1969: "The General Motors Corporation said today it was asking that 4000 school buses across the nation be taken off the road because an effort to repair a brake defect had created another brake defect. . . . But yesterday General Motors told its dealers to stop making the repairs and was asking that the 4000 buses not be used again until they were fixed again. . . . In the past, some vehicles have been recalled more than once to correct different defects, but this is the auto industry's first recall on top of a recall."

In the *Sunday News* (New York) of May 11, 1969, there is an advertisement: "Keep it dependable. KEEP your GM CAR ALL GM."

Many such instances illustrate that there are substantial flaws in the widely-held faith in business efficiency, know-how, performance infallibility. Consider also this case in connection with reports on the Long Island Railroad's delays and unreliability. Philip Scott, president of the Budd Co. of Philadel-

¹ By David Bird, *The New York Times*, January 13, 1970.

"... in essence the profit motive that is at the very basis of private enterprise is not on any broad scale suited to the required sensitivities and to the social supremacy of people and environment."

"The question is whether such necessary subsidy should go to private business as the optimum and chosen vehicle, or whether there are far better instruments at hand . . . which will do the job better..."

phia, "apologized for his company.² Budd tried to do too much too quickly, did not allow a long enough period for tests and put the cars into revenue service too soon!" Too bad.

And while dealing with the subject of non-infallibility in high private places, everyone has heard or experienced the grim humor of the A.T. and T.'s troubles in 1969 and 1970, especially in New York. A large part may have been due to explosive growth in demand, beyond predictability, as claimed. BUT consider items that can scarcely be placed under that rubric:

"As for Benton and Bowles, its problems persist. Last week the agency discovered that its listing was inadvertently left out of the new phone books!"³

And, "A representative of the (State Public Service) Commission asked newsmen not to report the names of stores listed where (burglar) alarm systems were out of action, for fear burglars might be encouraged to visit such concerns."⁴

Also "Delays beyond dates promised sometimes reached six months."⁵

Thus, in the very web and woof of private profit enterprise there are inherent characteristics that preclude it from properly handling the delicate environmental-housing-community complex—with of course some admirable individual exceptions— or much the less coax it on by attractive profits.

4 What can private enterprise show of low-income housing, or slum improvement? Answer: Nothing appreciable.

Before getting into the future situation briefly consider the present and the history of some of the more famous disreputables: the infamous "608's" by which for a number of years FHA-appraised-and-guaranteed mortgage loans were made which were later found to be in excess of the builder's total cost, he pocketing the difference. 608 became known as the windfall clause; not a few exceptional cases but many many cases and hundreds of millions of dollars of windfalls.

For a second group of disreputables, consider those who go in anew to purchase slum properties, not as going enterprises to furnish housing but to buy as cheap property, in expectation of land price increments later, for urban renewal etc. Meantime: minimum expenditures, maximum neglect. In a fascinating or horrifying series in the *Washington Post* of March 24-28, 1968, there is a story with chapter and verse, of individuals in the names of corporations buying hundreds of down-at-heel properties in the Shaw slum area where renewal was shortly expected (one, 300 properties; one, 60; etc., etc.) to hold for re-sale.

There was good reason to expect this, for as noted in the installment of March 26, in the previous Northwest I Renewal Area, just south of Shaw, "In several instances land records show slum real estate investors were able to collect profits of 25 to 100 percent in one to three years by buying, and later selling to the government." A number of specific cases are cited. One: In April 1962 a

dummy bought 33 M Street for \$8500. Two days later it was taken over by Mr. B. for \$10,000. In October 1964 B. sold it to the Redevelopment Land Agency for \$16,000. Thus about 100 per cent profit in 17 months.

I have no intention of equating these grimy skulduggeries with the "high-type core" group whom it is so eagerly sought now to get into poor people's housing. These are almost wicked caricatures of the ingrained habit of considering land-shelter-houses as a commodity. But this very syndrome will be seen to have the most fatal consequences for any level of private enterprise in poor people's housing; that quite different institutions are required.

This conception of commodity-without-ultimate-responsibility will now be seen to be prominent also in the high-type business and in government policy. Consider a case-type in housing. Already there has been noted the case of owners and mortgagees (savings banks heavily among them) "walking away" from slum buildings after letting taxes accumulate, maintenance and safety spiral downward. This merely shows in another way that slum and low-rent housing are just not suitable for the conventions and priorities of private enterprise, that we need new institutions. But, what is newly happening? This same ultimate walk-away syndrome is being offered as inducement for very high-level enterprise indeed to start the whole thing over again, freshly.

There is a very well publicized and highly praised case of a prominent utility helping to finance development of a very large slum rehabilitation in a ghetto, on the basis of 6 per cent plus accelerated depreciation which runs profit to some 15-20 percent *in the early years*. A letter of analysis from the company's counsel was later noted which says in part "It is the 200 percent double declining balance and the permissible 150 percent of straight line depreciation which gives the private businessman the satisfactory 15 to 20 percent profit for which he is looking. . . . After year ten, from a tax point of view the project should be disposed of, since there no longer exists any meaningful tax shelter." Again, the commodity-profit and profit-allegiance outlook, without ultimate responsibility.

In short, and again, this very crucial sector of the social-housing-community-environment area is just not the proper realm for private enterprise. This does not mean the office buildings, luxury apartments and homes, hotels, are not still suitable for these organizations. To sharpen the issue consider a recent headline which reads "What can private enterprise do about slums?", and ends thus: "But if the private enterprise system is to be preserved, a profit factor must be built into the welfare situation."⁶ While as part of our total system, the technical-industrial operation of creating physical buildings does involve a private profit, the operational and social aspects are of a quite different character, require different institutions.

Several other points need to be made as to the pace and sensitivity of private enterprise *qua* private enterprise, in the creation or recreation of environment and living community:

One of the most notable phenomena of the last decades is the decentralization of industry, and to a much less extent of office buildings, out of cities. This has accentuated an imbalance in that large



Instrumentalities for tomorrow: Public-interest, non-profit groups. In Brooklyn, Bedford-Stuyvesant Restoration Corporation has renovated hundreds of houses, created new super-blocks with internal parks and pedestrian ways. See text, page 106.

"While as part of our total system, the technical-industrial operation of creating physical buildings does involve a private profit, the operational and social aspects are of a quite different character."

² *New York Post*, August 7, 1969.

³ *Time*, July 25, 1969.

⁴ *The New York Times*, August 27, 1969.

⁵ *Ibid.*, Raymond Adams of an alarm company.

⁶ *The New York Times*, October 16, 1967.



Public interest group: in East Hills Park, Pittsburgh, construction is nearly finished on 326 rental apartments and townhouses. ACTION-Housing—the originator and interim-sponsor—has sponsored \$37 million in new and rehabilitated housing, comprising 2,200 units; has over \$10 million more in planning stages. See page 106.

numbers of workers can find no housing nearby that they can afford. They must commute from the low-rent rundown areas of the cities. Reasonably diligent investigation discloses no cases where the employer has made attempts to see these workers provided with good housing nearby, whether as a precondition to moving out when his position is strong, or afterward. Suburban and exurban attitudes being what they are, business chooses to let it go at that. If business really meant business, it could exercise enormous creative leverage. In another context, the specific case of Remington in Lonoke, Arkansas, has previously (Part 3, December 1969) been described (and deplored).

As for New Towns, all of which so far in the U.S.A. are being developed by straight private enterprise, I have at length in *The Urgent Future* (Ch.6), and in this article (Part 3), shown why this is the wrong instrument. One may grant that, as in Columbia and to an extent elsewhere, virtuosity in technical and traffic and recreational solutions and in some cases a degree of self-containment are achieved. The major motivation of land profit is universal and primary in this set-up, which immediately forfeits the main cost-social benefits available. And, the private entrepreneur has not yet and probably cannot afford to place serious income-and-racial mix high enough in his priorities so that he will "wait it out", place it at the top of his determination. This all-important part of the job as far as national well-being and social peace are concerned, he just cannot achieve. This requires the outlook and the financial strength of the "new" instruments to be discussed. One of these new instruments is in the course of being forged in the development of Columbia, where in 1969 the Columbia Interfaith Housing Corporation, an ecumenical group had under way the construction of a scattered site operation of 300 units for lower-middle income families in Wilde Lake Village. Others are to follow, but in toto, an excessively minor proportion.

Thus there are occasional exceptions to these inherent limitations, mentioned from time to time in this series. There are also examples of public-spirited undertakings by private business enterprises that are quite separate from the main profit operations. And businessmen are active with other community elements in forming public interest development groups which are becoming one of the key elements in housing and environment. These point a way to the dynamic and effective new instruments to be discussed more closely later.

5 Dealing with sloganese: NASA, systems analysis, computers . . . and limitations.

Originally, in speaking of Miracles by Sloganese, two other slogans were included: Do it by NASA, Do it by systems analysis. We will deal with these much more briefly, because they have much less of an historic and involuted background to be excoriated. Here, as in the case of private enterprise, the danger is through naiveté or disillusionment or unwillingness to think the problems through (in terms of new, suited means and solutions), to deflect ourselves into means that have been applied to enterprises with other characteristics. The trick is to abstract the elements of value and applicability, and use them to the extent possible, as adjuncts in a

basic process suited to our specific problems.

As far as NASA is concerned, the major lesson to be gained is that if you really want to get a major job done in a reasonable time like reaching the moon, give it plenty of money, to the amount stated by the informed protagonists to be necessary and increased as necessary, without any strings; give it the access to all needed resources as highest priority. Then hold the people responsible to whom you have given all this money and trust. Of course this lesson we knew before NASA, and we have been yelling for it. The moon effort proves it to the hilt. But, instead, in our case the initial legislation is struggled over, funds authorized are inadequate, they are later very sharply reduced by Appropriations Committees and Congress, still further reduced by the subsequent administration, and the rules changed. Not only are the resources altogether too small, but all concerned are discouraged and thrown into a tailspin, devoting much of their time to trying to get back to the original amounts, and much more to constantly adjusting programs to the vanishing sums. Therefore lesson #1 from NASA, and as long before enunciated by Winston Churchill on behalf of Britain when it was fighting alone against the Nazis: "Give us the tools and we'll finish the job."

So, the NASA lesson is not so much development of super-scientists and super-planners and super-processes as giving devoted, mortal, gifted men the necessary tools. Just imagine where the moon explorations would have been if the same fighting, delays, fund-pinching, fund withdrawal, changes in regulations had taken place in that effort as characterize our struggle for housing and environment! What a way to run a civilization!

A second lesson or a caveat. Facilely equating the moon job with our earth job is quite misleading and harmful. Except for training, equipping, nurturing the three human astronauts, everything else was mathematics, physics and hardware. This is not intended as derogation because the scientific thinking and experimentation, technical virtuosity and organization were no doubt of the highest. But our job deals with the quicksilver of human beings, human society and institutions. A very different kettle of fish. So, don't let's get ourselves mixed up by rhetoric.

The last relevance of NASA would seem to be that the special government corporation or Administration created is one of the kinds of chosen instruments that we need for these vast earth jobs, rather than private enterprise.

The other sloganeering instrument we have mentioned is *systems analysis*. Of course the contribution of systems analysis toward solution of our problems is relevant. But let us see what really knowledgeable people have to say, as of the present state of this field. A three-day Forum on "Systems Analysis and Social Change" was held in Washington, organized by the American Institute of Aeronautics and Astronautics and the Operations Research Society of America; reported in *The New York Times* of March 24, 1968. Excerpts:

"The systems analysts and engineers who have brought efficiency to global work came close to admitting defeat this week as they confronted the problems of social change. . . .

"We need to put all of our social scientists, sociologists, psychologists, all our *people-oriented* people to work on these problems. I see a very long and difficult road ahead.

"Some of these systems analysts and engineers

"There are also many special public-spirited undertakings by private business enterprises that are quite separate from the main profit operations."

"The trick is to abstract the elements of value and applicability, and use them to the extent possible, as adjuncts in a basic process suited to our specific problems."

have already explored the 'living' problems of riot control, slum removal, waste disposal, mass transportation—but they find little of the cool logic of mathematics or what one speaker called the 'inertness' of complex military machines. . . .

"Yet both Mr. Engel and some of the *people-oriented* Mayors, political scientists, sociologists and public administrators who attended the forum expressed some hope that systems analysis could help. . . . [Agreed. A.M.]

"A modern social system such as a city or the transportation complex in the Boston-to-Washington corridor has little of the arrangement and none of the harmony of the dictionary definition, and some speakers questioned whether either should even be called a system. . . .

"Mr. Coulter said the cause of today's social confusion was not inadequate governmental systems but a very poor immigration policy on the part of the American Indian. . . ."

A related matter of pat answering: the application of computers, and the hidden limitations. Jay Forrester in *Urban Dynamics* has attempted to cut through the urban tangle by using a computer to simulate the interaction of major factors that cause a city to act and react as it does. He draws conclusions and recommendations, many of which seem stimulating but in toto quite inadequate. The reason seems to me to be that his soft ware, probably of necessity, includes the city only; not the regional and national matrix in which it lives or doesn't live. The city is *not* a free-standing entity, and it just isn't in the cards yet to make an adequate national total and particulate model. So, though it may be irritating to have to admit it, the method falls down as of now and any near future at least. As of a remoter date, this could have great promise; as now presented, considerable danger. . . . Thus in all three cases: help and potential, not the single magic. In all these cases, potential tools; not the essential institutions, only aids to them.

6 What are the alternates? Public corporations, public interest groups.

As in the case of the previous analyses, consider the characteristics of the new, under two heads:

The basic suitability, the validity and drive of the underlying impulses, and the rewards.

The pragmatic record.

In these forms there are very powerful motivations that are released and gushing into existence and action, from initial trickles or flows that have always operated. These should be encouraged and centered on the vital environmental realms that are our concern. In the forms and frameworks we discuss here, there is the impulse to great achievement, great competitive achievement as in private enterprise. However, there is a sublimation. The primary measure is not wealth amassed for self and stockholders, not the enormous salaries and stock options of the top executive world, but public service, discovery, innovation.

On one's boards of directors one draws upon the benefits of great business brains and ingenuities, on detached service as it were; freed, in this capacity, from the business parameters, the stock options, the stockholder-as-god. One uses also the ablest people in social motive and invention, often of sci-

ence. These forms are already a serious factor, must and will become more so, in these action fields. Freed from the motivations of maximum profit, they are likely to develop complete rather than warring motivations.

It is not only the cream of the current college and university graduates who are now seeking non-business opportunities, but almost daily one reads of a mature business executive who is opting out for a service career (and not just spare time or tangential or "philanthropic"), establishment lawyers who are recareering in obscure submerged areas, educators leaving the Harvards for the Negro Miles Colleges. So, this is not just a question of mavericks and odd balls, but a strong new direction. The idea whose time has come.

So much for the inherent character of the new chosen instruments. Now, a brief examination of the types that are discerned, and that should proliferate to handle the jobs.

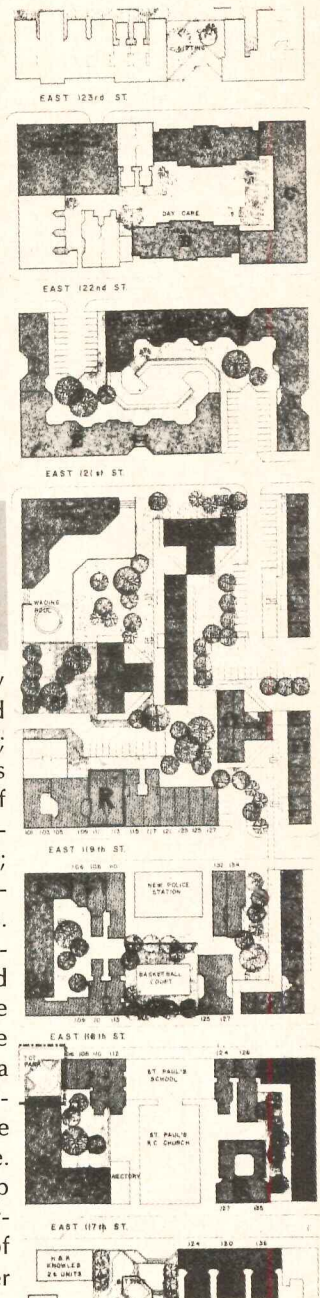
7 Public corporations—like the TVA—distill the concerns of government and people.

The British Development Corporations for New Towns (eminent citizens, usually seven, appointed by government, who select a general manager); Inter-State and other Commissions and Authorities here (e.g. New York Port Authority whose board of eminent citizens is appointed by the State Governors, select their manager or executive director); Housing Authorities; the recent New York State-Urban Development Corporation; State Universities. These combine the dynamics and the relatively unhampered directness of action that are often found in the private business enterprise, but with the sole criterion of the public welfare. Also, they distill the public concerns of government and people, to a considerable extent freed from the tyrannies of government procedures (red tape to you); and the dangers of ossification, of entrenched civil service.

As one illustration of the alertness of this group equal to anything in private enterprise, a recent article on containerization⁷ notes the great lead of the New York Port "Thanks to a 10-year lead over its rivals—the Port Authority began working on containerization in 1955—the port as a whole faces clear sailing ahead." The TVA illustrates another facet or summation of facets in the comprehensiveness of its continuing human-environmental adventure, the evidence of the forward-oriented harmony, the so many elements in which its pioneering has been leading the way or pointing a way—besides economics and prosperity—the quality of air and water, restoration of field and forest, big new dimensions and direction. Their *A Quality Environment in the Tennessee Valley* is guaranteed by me to fill the spiritual lungs with heady drafts.

8 Public interest groups—like United Housing Foundation— can operate where there is no profit.

Here, generally, there is no element of direct government interest or appointments. Citizens band



Public interest group: In East Harlem, Manhattan, rehabs and new units have been sponsored by many local groups, including this project sponsored by UPACA (Upper Park Avenue Community Association), and financed and guided by Bowery Savings Bank and New York Bank for Savings. See text, next page.

⁷ *Christian Science Monitor*, September 10, 1969.

together to create genuinely non-profit enterprise hospitals, "private" universities, foundations, cooperatives. In housing and environmental development such groups are more recent, but in the last decade there has been considerable proliferation and accumulated experience, even expertise; based on churches, labor unions, businessmen-citizens development groups; lately, locality and neighborhood groups.

Let us list a few. We have the example of ACTION/housing and AHRCO, a group of Pittsburgh and Allegheny County largely business leaders who have contributed and loaned substantial sums to a fund that offers seed money, technical help, loans to moderate and to a certain extent low-rental housing. Their accomplishments are on considerable scale, over the range of new developments and rehabilitation. Another notable example is the Metropolitan Detroit Citizens Development Authority consisting of businessmen, along with labor, civic, church and minority citizenry, leaders from ghetto neighborhoods. It is a non-profit enterprise which operates with a revolving fund of \$4,500,000, has energized greater funds from others, and works with local community sponsors in Detroit, Pontiac, Flint.

We note two more examples of church-based groups, a great and growing number around the country:

The Rev. Channing Phillips and a strong group in Washington forming the Housing Development Corp., had under way in 1969 or completed something over a thousand units in different areas, both their own operations and catalyzing other sponsors; and actively developing new ones. The Plymouth non-profit housing corporation in Detroit (Plymouth United Church of Christ) some 500 new and rehabilitated units, and moving rapidly ahead.

These have also additional dimensions. Basically local minority in composition, they have tenant representatives on their board, and several important businessmen. They now have considerable expertise and have formed management and consulting entities which help other sponsors, have now started to train local workers and contractors. . . . The Acorn Urban Renewal in Oakland, California (yes, Oakland!) includes 900 low and moderate income units in the minority area, sponsored by the Alameda County Labor Council. . . . These are not unique examples, but selected out of hundreds. AFL-CIO states that as of 1969, 230 housing developments are under way sponsored by labor unions.

The two large-scale cooperative organizations, Foundation for Cooperative Housing and United Housing Foundation, have done and are doing scores of thousands of units across the country. There is in these the added dimension of cooperator control, community and educational activities, generally self-propelled, a stretching of the people's sense of control or at least participation over a considerable area of their own destinies.

So, in all these groups there is not only the bread-and-butter of housing, but a whole gamut of what may be called integral and expanding by-products of physical-social development, and expansion of people. Somewhat the TVA principle. They are in quite different scale, context, particular applications. But they are similar in the sense of not being restricted to, but enhancing the original main purpose.

The great point is this: after the revelations and breakdowns we have seen and are going through at so many points in the environmental continuum, is

it conceivable to think of housing-environment as a private interest, or does it not overwhelmingly need to join the essentially social company or essence of the hospital, the university, open space-and-park, health center. There are private hospitals, private schools, private clubs for recreation, private camping grounds. But these are fractional, marginal, not the essence, not the grand diapason. Low- and some moderate-income housing-environment belongs here, not in the private sphere which has so broken down in the really critical areas, in the one-third to one-half of our people's living. This belongs partly in the realm of government, to a much greater extent in the realm of these "new" instruments. As has been seen, they are not so new really, but new in the sense of becoming the chosen instruments on the grand scale.

Before leaving these, in what may be felt is an aura or euphoria of accomplishment and future accomplishment, two major caveats must be heavily underlined.

First, the alarming headline "Non-profit Home Builders Fear Curbs by FHA." Eugene A. Gullidge, the new FHA Commissioner in the Department of Housing and Urban Development stated ". . . We found ourselves more and more working out ways to increase the role of the non-profit sponsor in housing production. I want to have that role reversed. The non-profit sponsor does not belong in housing production except under a very limited set of circumstances."⁸ It should be noted relevantly that he has served as president of the National Association of Home Builders.

Second, New York State Urban Development Corporation has been much applauded here, and rightly. But see its own note:

"UDC has been authorized by law to issue notes and bonds up to \$ 1 billion, but it is required to carry out its programs without any increase in State or local debt." *There are no direct grants or non-repayable subsidies*⁹ to finance its activities—with ultimate users repaying the bonded indebtedness. Magnifying and translating this fine print, it means that of itself with all its merits, the corporation can't create housing for low-income people on very considerable scale. It is still desperately incumbent on us to smash through to far, far greater than eyedropper subsidies, federal and state. This gigantic caveat applies, of course, to all these groups.

So, we have some very fine instruments, that should become the chosen instruments. The best succeed in both their main thrust and in their interest in collateral living elements—as the TVA states it, our multiple effort and contribution "to meet both kinds of human needs—a decent living and a living environment as well"; and as the cooperatives do. But the vital fine print says that to make these instruments really perform, we must vastly, vastly, increase the government's financial contributions for subsidies that equalize people's means with costs of meeting them.

It is devoutly hoped this kind of presentation is not just received as an abstruse exercise. Other lines may be juicier. But, unless we deal with these basic and institutional issues, we are just chasing our tails, debating hotly the spectacular visibles, stumbling and fuming over surface outcroppings, the underlying magmas untouched.

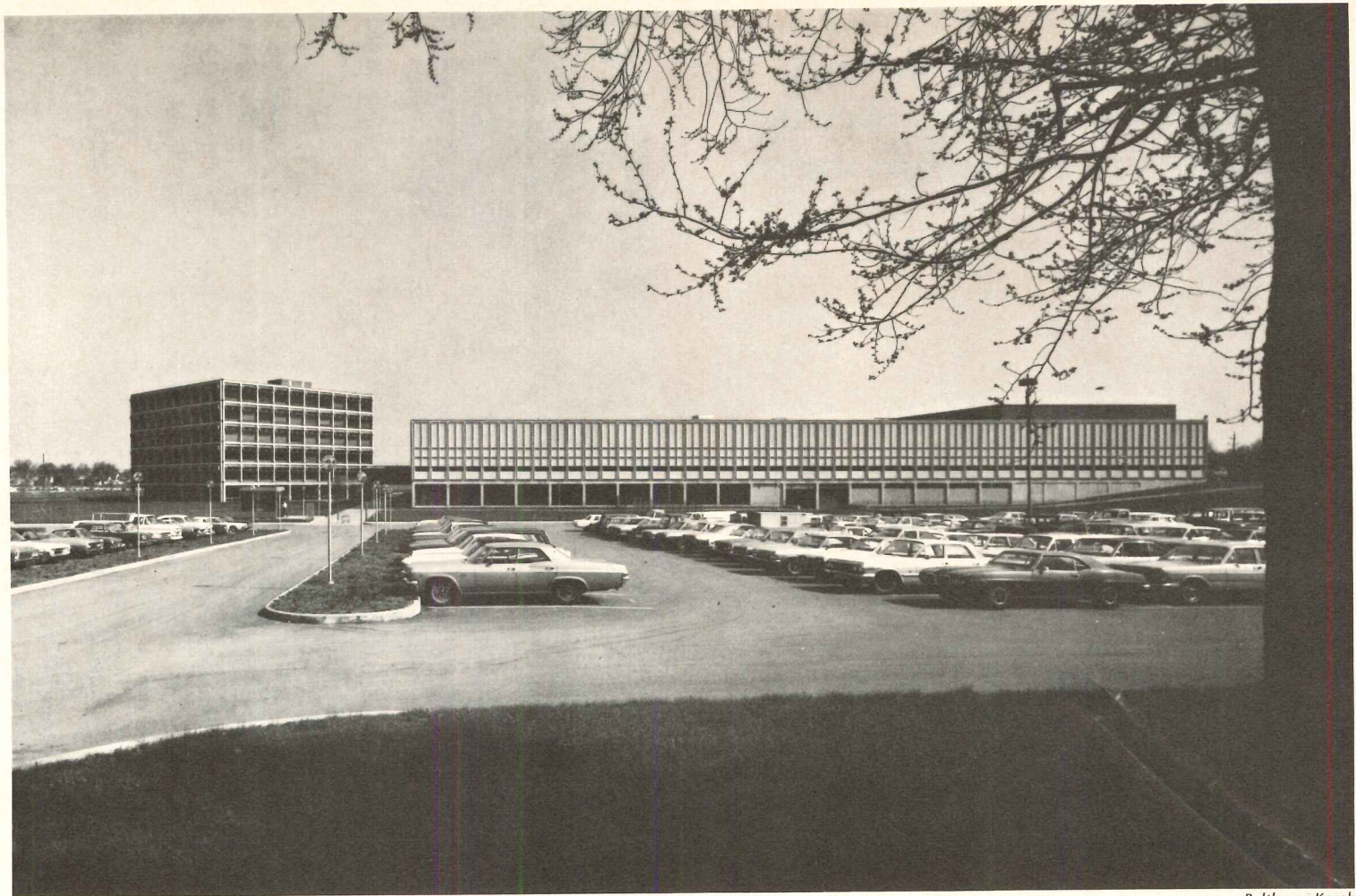
"Just imagine where the moon explorations would have been if the same fighting, delays, fund-pinching, fund-withdrawals had taken place. . . . What a way to run a civilization!"

"TVA's publication—A Quality Environment—is guaranteed by me to fill the spiritual lungs with heady drafts."

Unless we deal with these basics and institutional issues, we are just chasing our tails. . . ."

⁸ *The New York Times*, February 16, 1970.

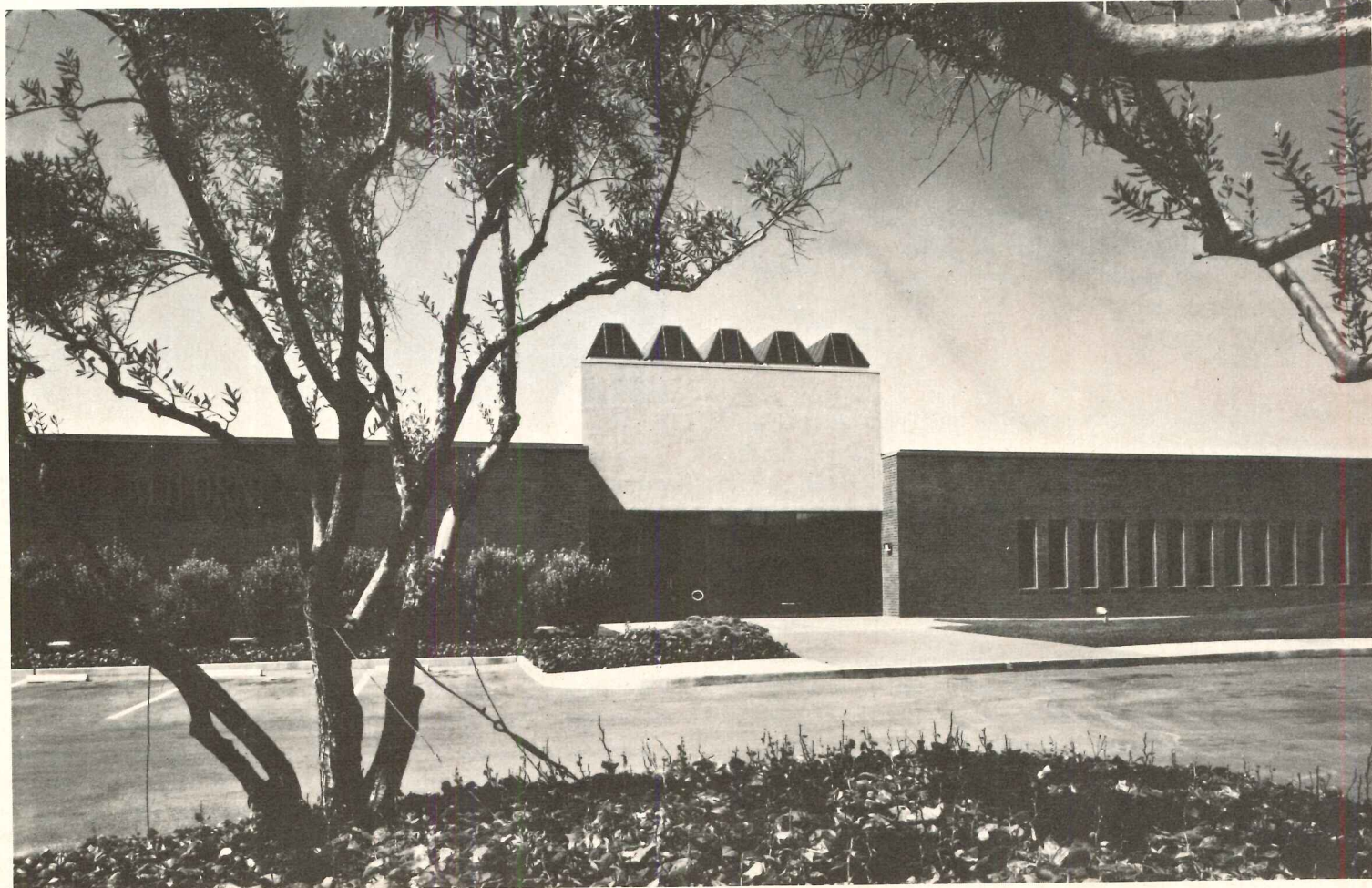
⁹ Italics by me.



Balthazar Korab

TWO INDUSTRIAL BUILDINGS

Robert Brandeis



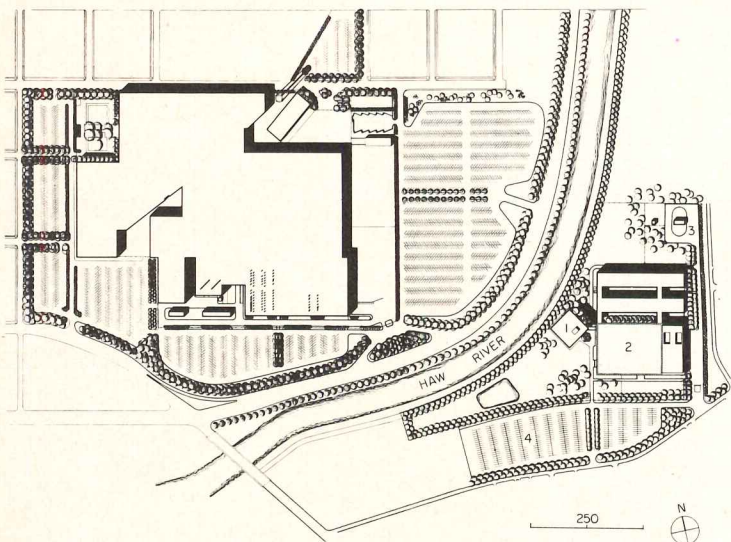
1. TECHNICAL CENTER

FOR CUMMINS ENGINE COMPANY, INC.

HARRY WEESE AND ASSOCIATES, ARCHITECTS

FISHER-SPILLMAN, ASSOCIATE ARCHITECTS

1. Office building
2. Research building
3. Pump house
4. Parking



This new Technical Center—known as Building Number 64—at the Cummins Engine Company in Columbus, Indiana, is the most recent structure in the company's building program, and a handsome addition to this industrial plant. A manufacturing plant for heavy engines is not the usual place to look for fine architecture, but Cummins is no usual company. Its president, Irwin Miller, is the one-man spark plug who has made Columbus a veritable museum of contemporary architecture through his initiative and the incentives he has provided the city to engage some of the country's finest architects to design its new buildings. (Among the famous names: Eliel and Eero Saarinen, Edward L. Barnes, John Carl Warnecke, Harry Weese.) Private enterprise and some institutions have likewise responded to his stimulus. In 1962 he engaged Harry Weese—whose design for Cummins' Engine Test Laboratory had already set a high standard for future development—to master plan the site of the company's operations, and

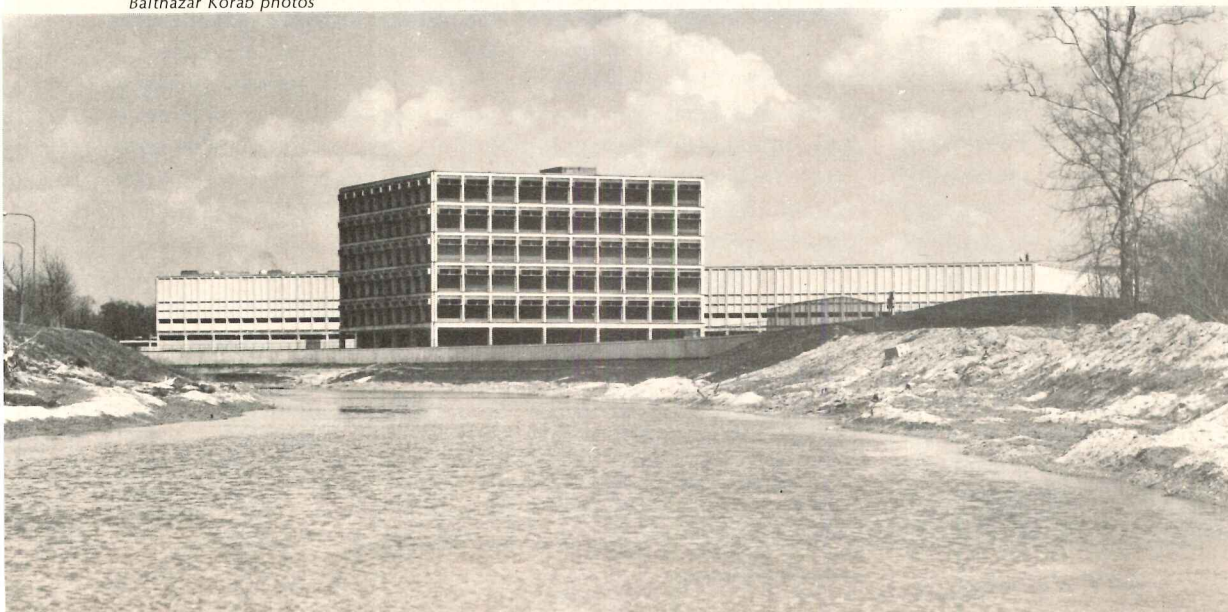


the new building, designed by the same firm, is located according to that plan. The importance of the master plan transcends the site, however, for it is the last link in the city's traffic plan, and calls for removal of the nearby New York Central tracks, rerouting and widening of the River Haw for flood control, and redevelopment of adjacent road systems.

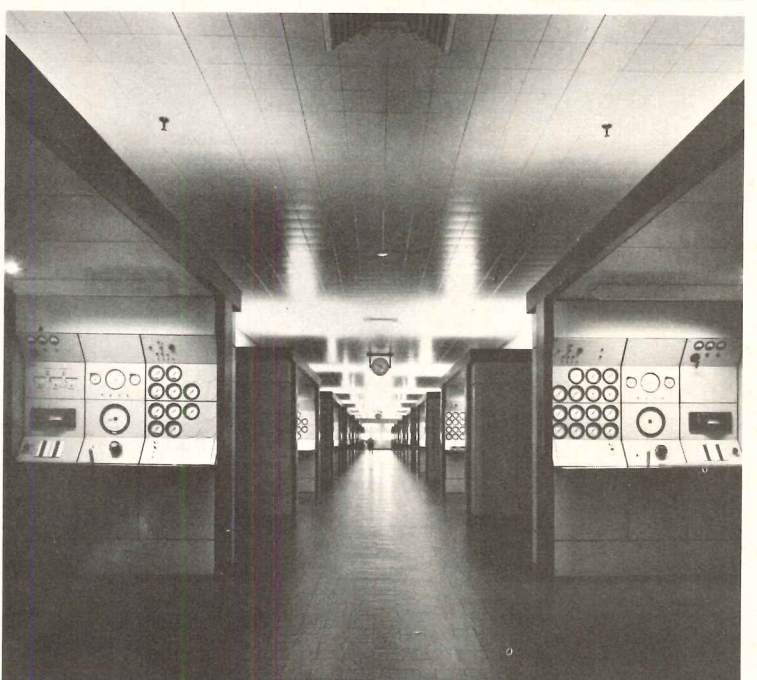
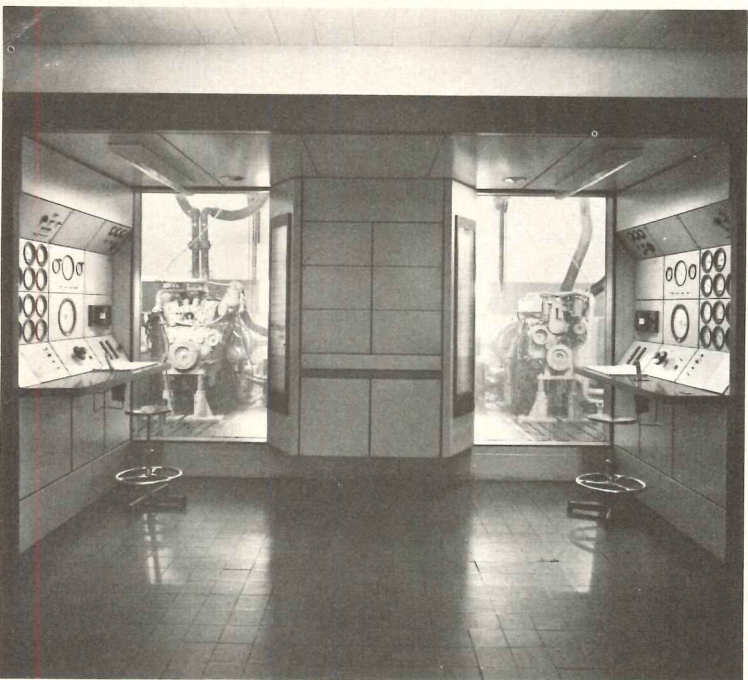
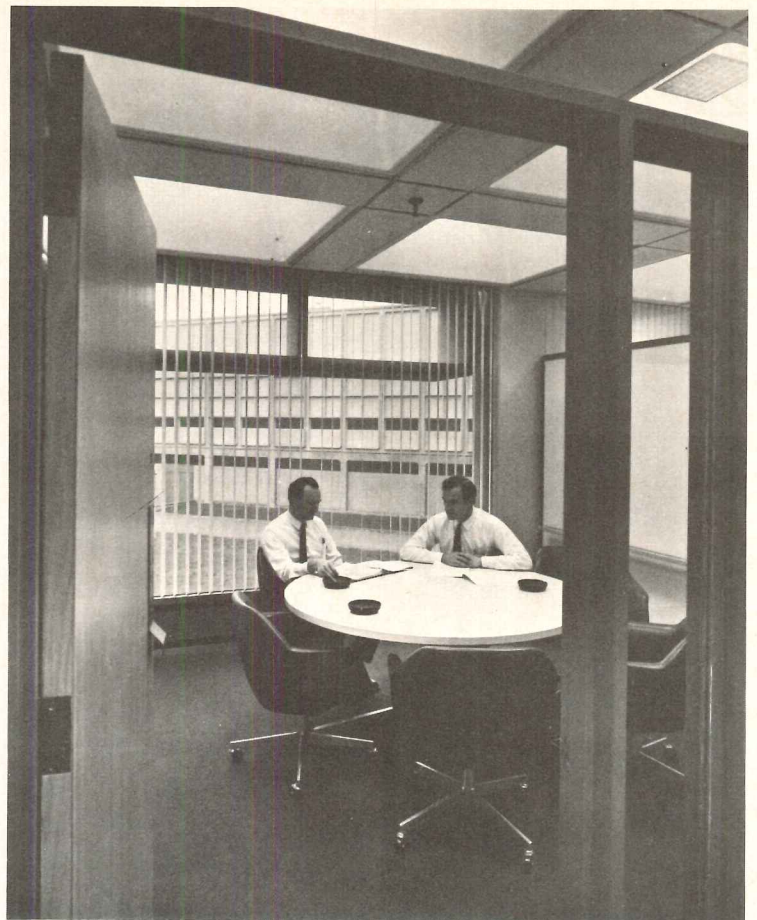
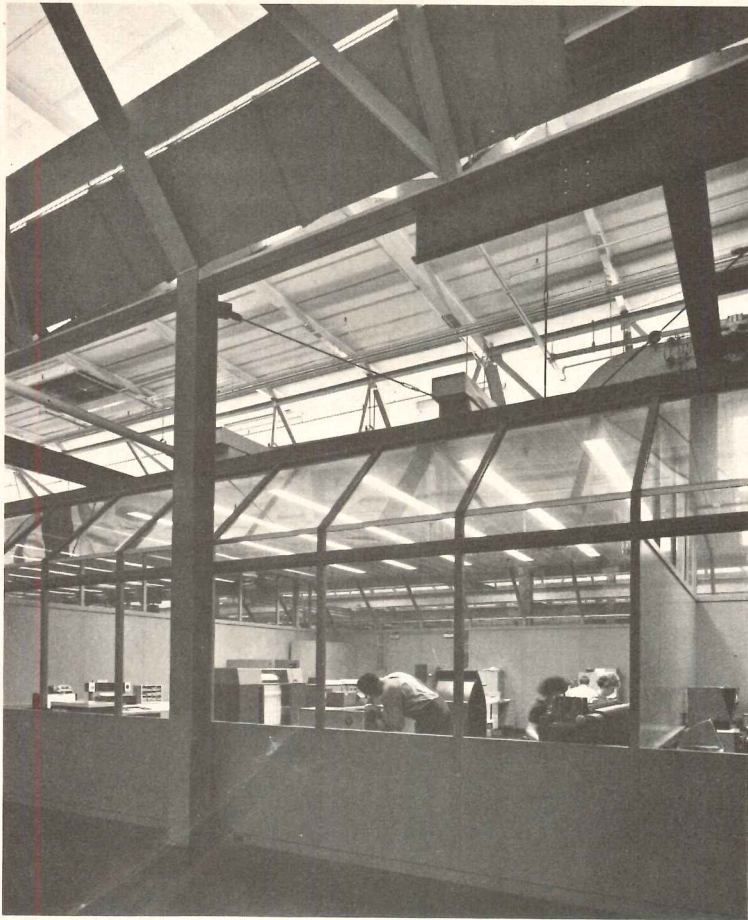
This Center, housing 600 engineers and supporting personnel involved in research and development of engines and of new forms of power, is actually two buildings, a large two-story research building, and a five-story office building, located midway along the facade of the research building and connected to it by a tunnel below grade and a glass-enclosed bridge at the second floor level, with main entrance at ground level. The two buildings were designed, Harry Weese says, "around the concept of highly integrated structural and mechanical systems, for the most part using standard components, and achieving improved functional



Balthazar Korab photos



Columbus is in a river flood plain, a disadvantage in certain respects, but an advantage in others. The Cummins master plan envisions re-routng and widening the river bed near the company property, and making of it a pleasant, tree-lined, naturally landscaped waterfront area. Removal of old railroad tracks and redevelopment of nearby road systems will further and very visibly improve the property.

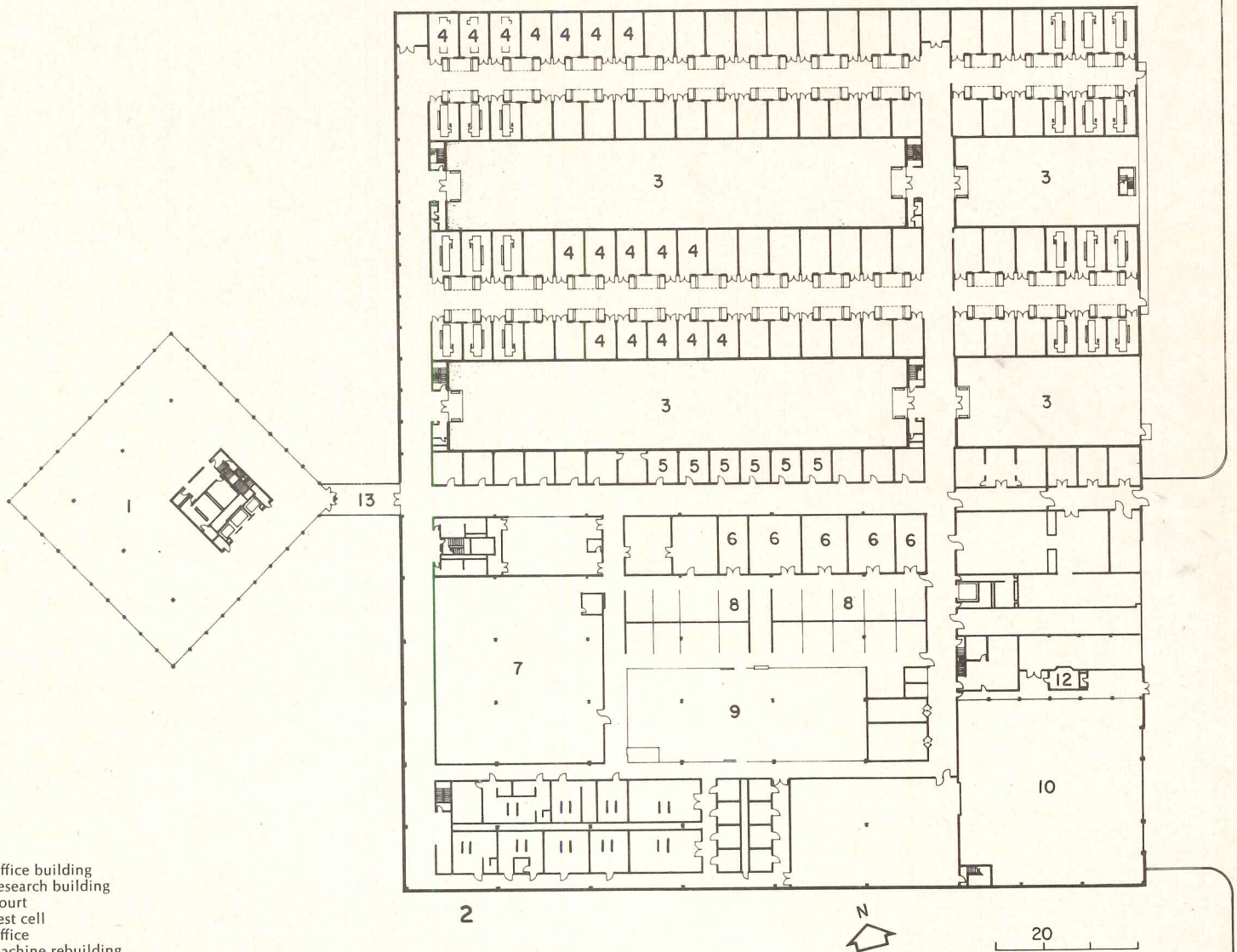


advantages and favorable costs. The delta truss in the research building, for instance, serves the overhead mechanical needs of general illumination, ventilation and specific piping. But beyond that it emphasizes the interior volume, providing an unexpected architectural quality to the space." The delta truss, set on steel columns in 32 by 48 foot bays, frames the ground floor structure of the research building, providing an open, flexible space within which are movable enclosures for use as shop areas, laboratories and offices, insulated from noise, dirt and grime emanating from adjacent engine test cells, bench test areas and other very noisy and dirty operations.

The research building is a steel framed structure, 450 by 386 feet in area, with enclosing walls made up of precast concrete curtain wall panels similar to those developed for earlier Cummins buildings by the same architects. It functions as two wings—one for test cells, the other for a Pilot Center—and general facilities.

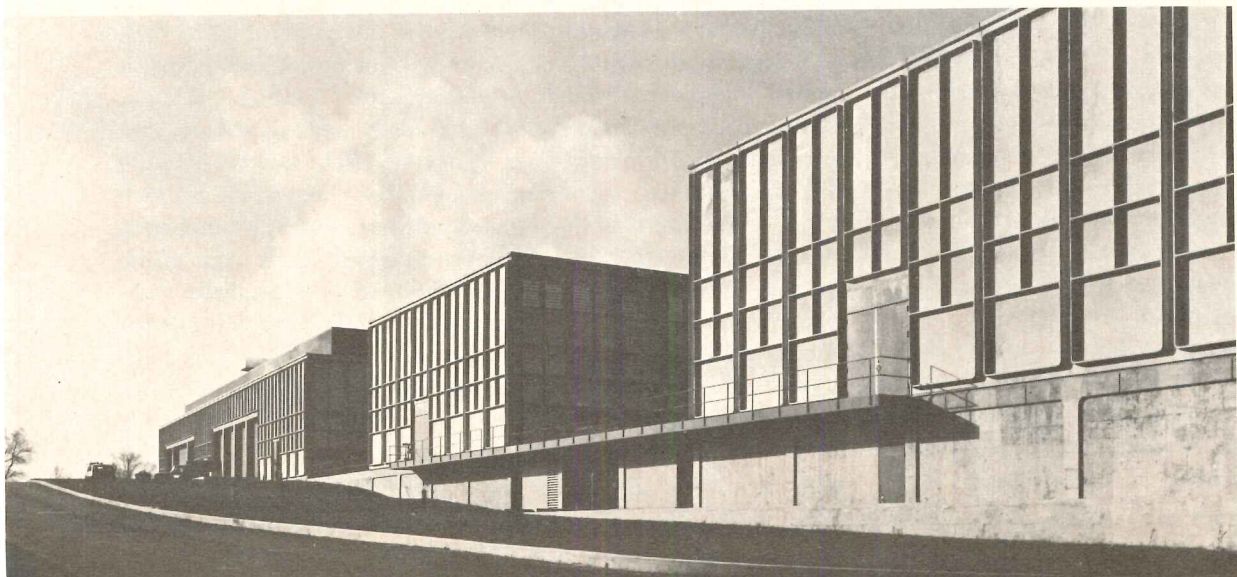
The office building is sited at a 90-degree angle to the research building elevation to open up the view for offices which otherwise would, in a parallel siting, face only the concrete walls of the research building. Its structure is reinforced concrete, with a two-way floor system in which ribs are paired to form channels for air distribution and deep coffers for lighting. Interior partitions are coordinated with this double waffle slab module. In contrast to the research building, the office building walls are more glass than concrete, but concrete is nevertheless the strong expression of the building, largely because of the handsome sunshade detail which is repeated on all four sides.

BUILDING NUMBER 64, TECHNICAL CENTER, Columbus, Indiana. Owner: Cummins Engine Company, Inc. Architects: Harry Weese and Associates; Fisher-Spillman, associate architects; structural engineers: The Engineers Collaborative; mechanical engineers: Cosentini Associates; electrical engineers: Eitengen & Schlossberg; landscape architects: Dan Kiley; contractor: Frank Messer & Sons, Inc.



- 1. Office building
- 2. Research building
- 3. Court
- 4. Test cell
- 5. Office
- 6. Machine rebuilding
- 7. Machine shop
- 8. Engine assembly & disassembly
- 9. Stock room
- 10. Installation garage
- 11. Laboratory
- 12. Control
- 13. Bridge

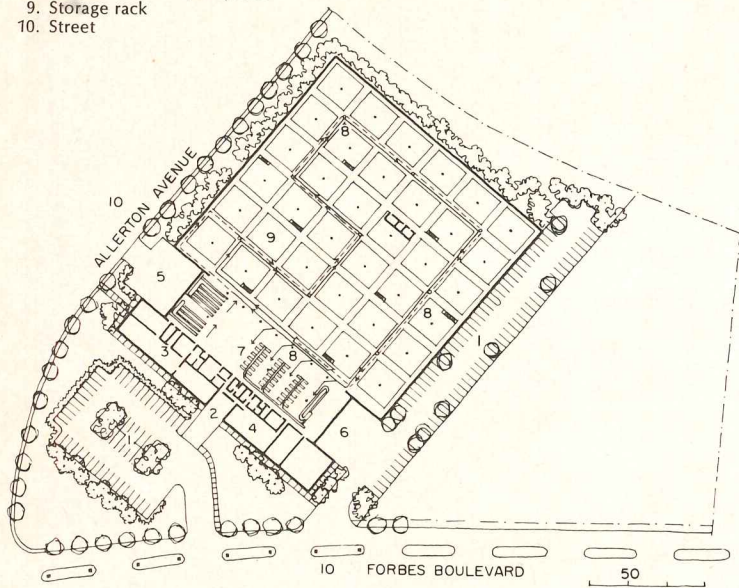
Orlando Cabanban



Since the Cummins plant is located within the town, the exhausts it produces are a problem of no small dimension to so civic-minded a man as Irwin Miller. Consequently, the research building exhaust systems have been carefully engineered to minimize pollutant emission. A larger than necessary volume of air is circulated to dilute the smoke; noise is muffled as much as possible. Within the building the test cells—where the greatest amount of noise is generated—are sealed for acoustic insulation.

2. DISTRIBUTION CENTER
FOR KORET OF CALIFORNIA
KNORR-ELLIOTT AND ASSOCIATES, ARCHITECTS

1. Parking
2. Lobby
3. Quality control
4. Cafeteria
5. Receiving
6. Shipping
7. Packing
8. Automatic conveyor system
9. Storage rack
10. Street



The interior of Koret of California's new Distribution Center in South San Francisco is "like a giant closet," say the architects, Knorr-Elliott of San Francisco, "full of bright-colored clothes." Because this is a very busy center, the racks don't stay full long. The center is completely automated; to handle the volume of garments that it does, it has to be. One million garments a month come in, are checked for quality and color control, automatically sorted, hung on their proper racks, and subsequently selected for shipment according to orders. The building that houses this impressive operation is a handsome one, located on a landscaped corner site in an industrial park south of San Francisco.

Good looks and function are inseparable here: even the landscaping, although used to enhance the site, works to control dust, in which this windy location would otherwise abound, and which is intolerable to the operations that go on within the building. The grassy mounds cut the wind and screen the parking areas. The



building is designed for expansion both vertically and horizontally: the central two-story element over the entrance lobby shelters what will be a circular stair to the second floor when that is added. The parapet is high for present actual needs, but was designed to act later on as the sill for second-floor windows, so that new and old brick facing would not be juxtaposed. Warehouse and shipping areas can expand laterally, independent of each other and of the checking-repairing department. The building is windowless except in the employee cafeteria at the front of the building. Although it is not air conditioned—the receiving shipping area is normally open at both ends, admitting ample air—the air that circulates to the warehouse is filtered to control dust, one of the major problems that this kind of building involves. Two other warehouse problems of major importance are lighting, which must not be too intense for too long a period on any one garment or batch (it causes fading), and ventilation. The lighting



Robert Brandeis photos

problem was solved—after much research with little resulting data—by using the simplest industrial fixture in a deep shield which throws light down on the edges of the aisles but not on the garments. Ventilation is a problem, not because of people's needs (only eight employees are actually in the warehouse at any one time), but because of the particular odor of stacked synthetic garments. By providing a large volume of air from an auxiliary system (located in the two small rooms at the back of the building) for the first floor and from the roof for the second level, and by the use of an open steel deck and frame system, ample air circulates to minimize the odor.

DISTRIBUTION CENTER, South San Francisco, California. Owner: Koret of California. Architects: Knorr-Elliott and Associates; structural engineers: Toft and DeNevers; mechanical and electrical engineers: O'Kelly & Schoenlank; landscape architects: Anthony Guzzardo and Associates; contractors: McDonald & Nelson.





The handsome daylit lobby with its unusual skylight serves the quasi public areas and will serve as entrance to the second floor when it is added. Beyond the lobby, the Center's operations go on: the flow of garments from check-in to shipment, over thousands of feet of conveyor belts, slide rails and tow-lines, is continuous in a one-way flow pattern. A 2800-foot long tow system carries 300 computer-controlled carts through both levels of the storage areas where they automatically pick up merchandise by order, routing it finally to the shipment area. Two major dust controls are successfully used (dusty garments are unsalable): a filtered air supply in large enough volume to keep the environment fresh, supplied at rear wall on first floor and from roof at second, and post-tensioned concrete, poured in 100-foot squares, in which a harder than usual aggregate was used to eliminate cracks and resulting dust. The building design expresses the three-part operation of the Center: checking, repairing and quality control, and employees' cafeteria at the front; directly back of this area, the brightly lighted receiving-shipment department; at the rear, the almost square, 250,000 square foot, two-level warehouse, with a storage capacity of 1.5 million garments. The building covers only one-half the site; the rest is open space. The Cabot, Cabot and Forbes industrial park in which it is located requires off-street parking, 40-foot setbacks, concealed truck entrances, and sign control. Knorr-Elliott have designed 17 buildings in the park.



Aero Photographers

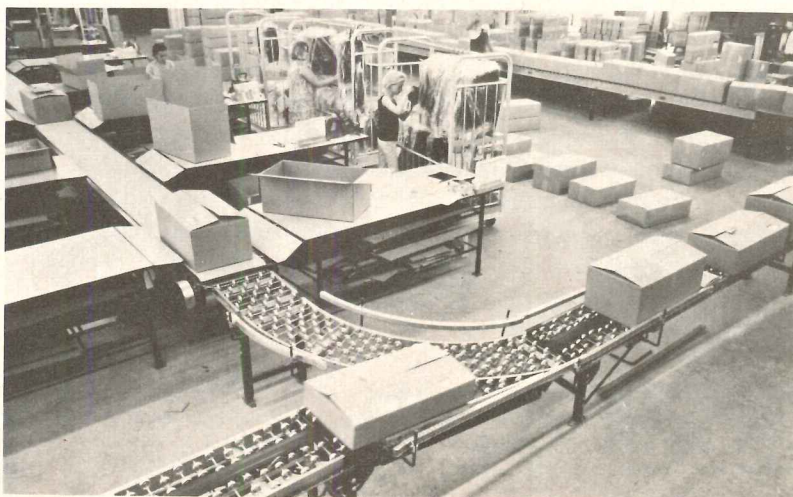
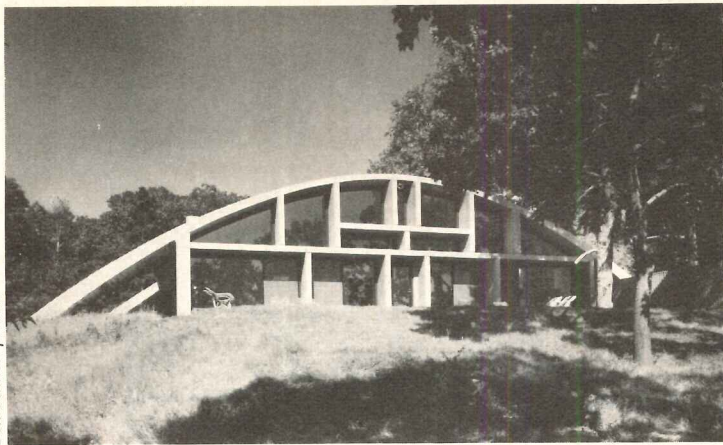


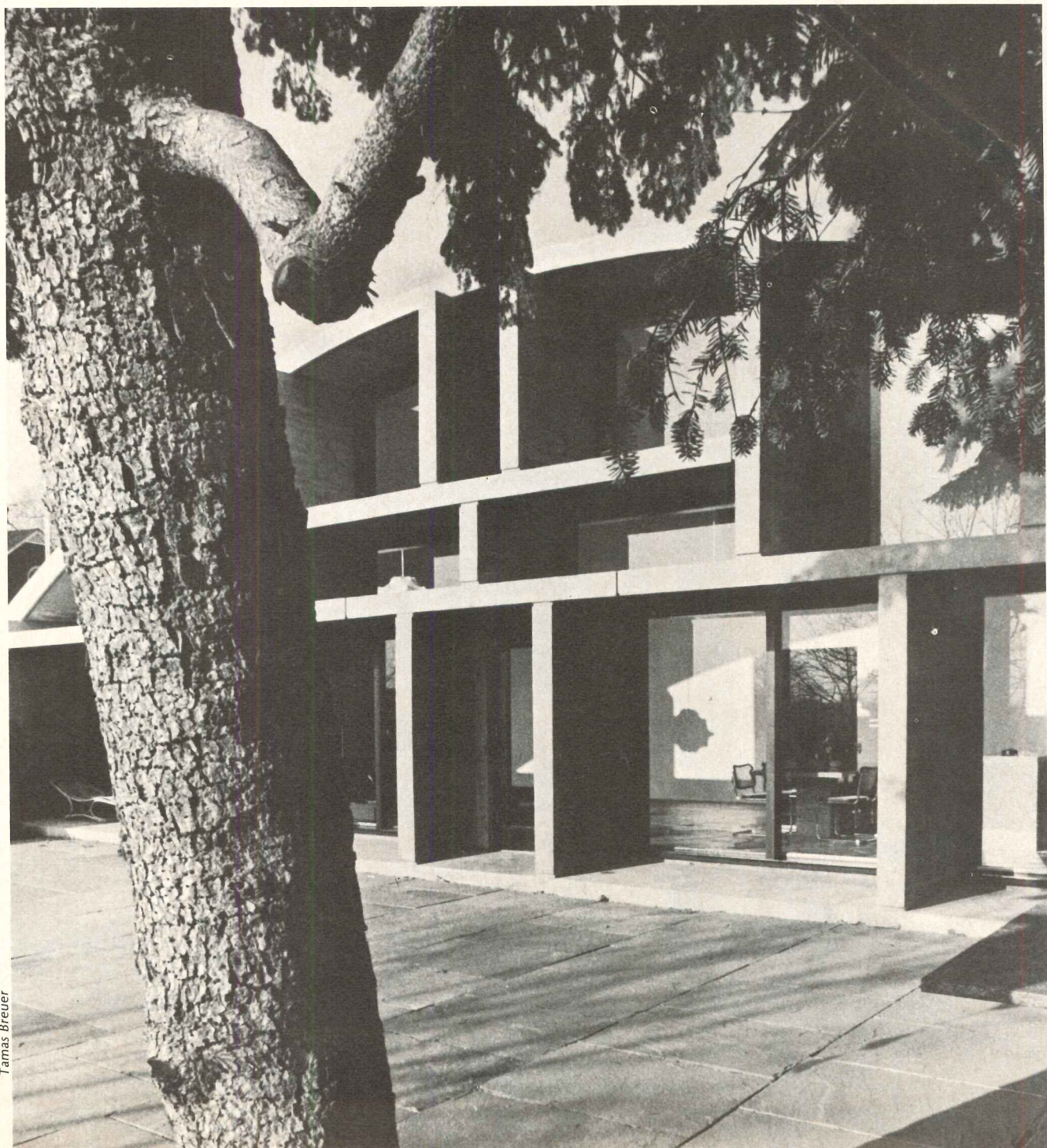
Photo courtesy of Koret

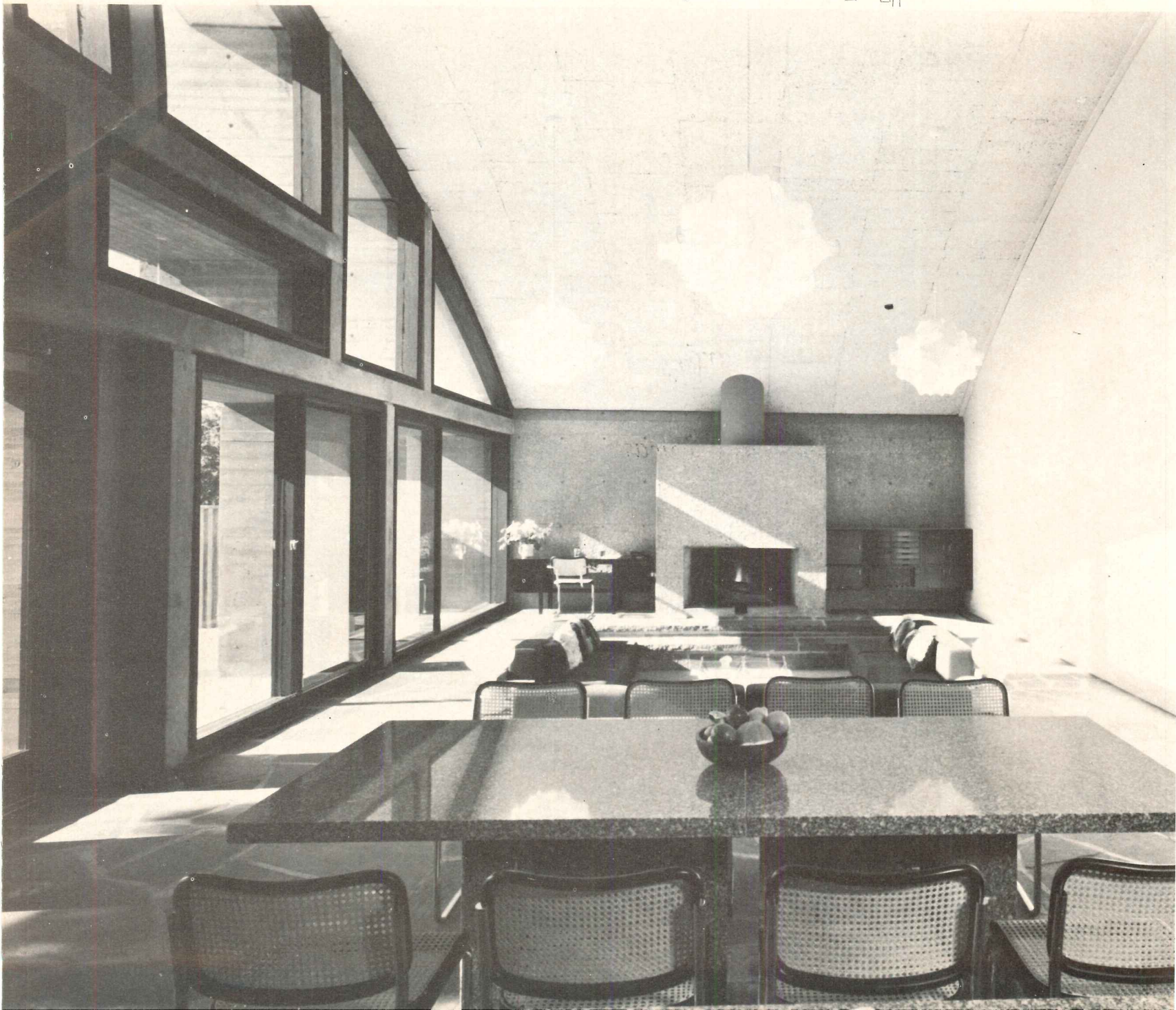
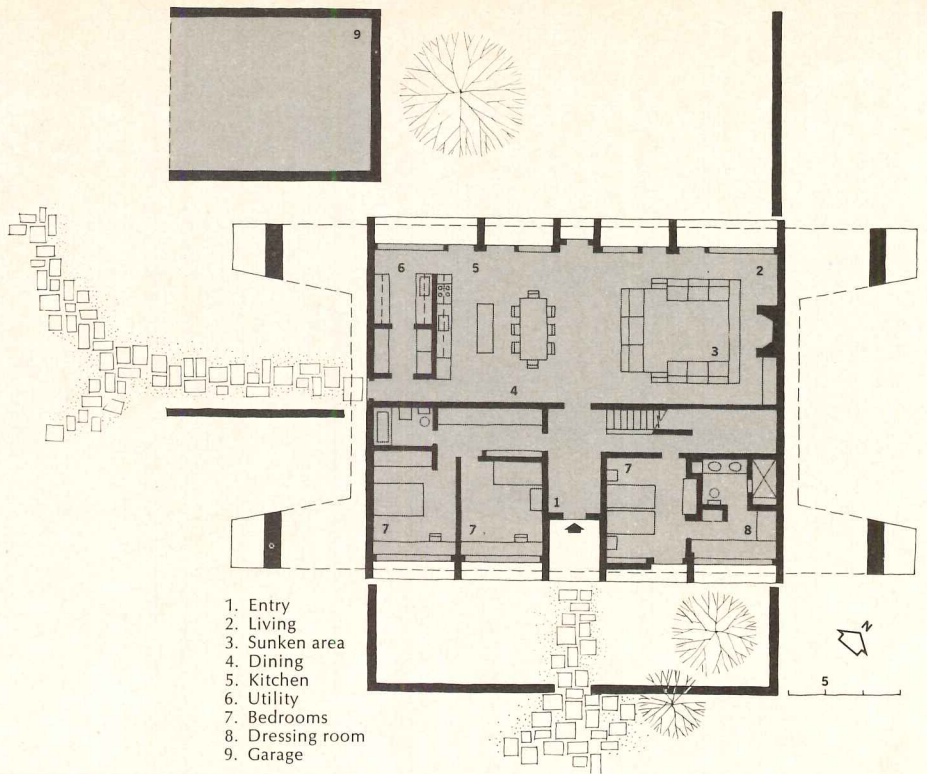
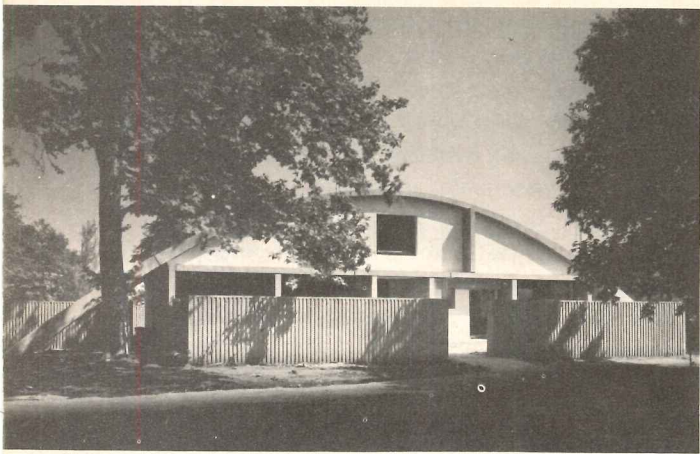


A PARABOLIC-ARCH HOUSE BY MARCEL BREUER AND HERBERT BECKHARD

A seemingly radical departure from Marcel Breuer and Herbert Beckhard's previous house designs, this recently completed house on Long Island nevertheless incorporates many familiar elements that give it the unmistakable stamp of the firm: the use and detailing of concrete; contrasting materials and textures; design for "sun and shadow." A beautifully worked-out parabolic arch structure (side-walls, sun screen and partitions are all free-standing and non-load-bearing) generates the design of expansive and dramatically varied living spaces. The use of a radical structural-formal concept is itself a consistent theme: "We still design one or two private houses a year," said Breuer in a November, 1966 RECORD portfolio, "for clients who are interested in experimental ideas." The clients were willing: this is their second Breuer-designed home (The original one, built in 1945, was one of Breuer's first H-plans, designed for a young family.) Now, with all but the youngest son married, the owners wished to enjoy an open, unzoned plan, with exposure to a fine view their new site had. The basic concept dates from a 1959 project for an Aspen, Colorado site carefully adapted to suit the owners' program and the land.

GELLER HOUSE II, Lawrence, Long Island, New York. Owners: Mr. and Mrs. Bert Geller; architects: Marcel Breuer and Herbert Beckhard; engineers: Zoldos and Meagher; landscape architects: Klonsky Associates; interiors: Marcel Breuer and Herbert Beckhard; contractor: Barnes Building Co., Azzone Construction Co. (concrete).



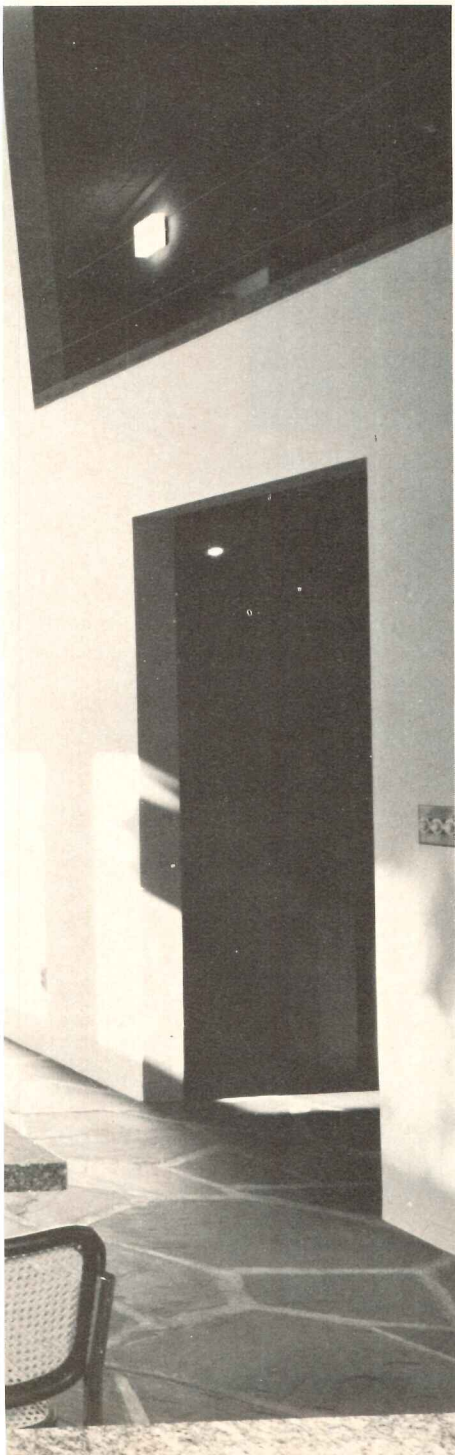


A parabolic form for the roof structure was used in large part, explains architect Beckhard, to orient and expose a spacious and open-planned living area to an unusual and sweeping view. A picturesque salt marsh stretches out to the horizon, with nearest buildings a great distance away. The entire area is a wildlife sanctuary and is thus protected from encroaching development. As frontage is on a relatively busy street, the entry side (photo left) is set back and blanked off with stucco. The house is for a family of three, with an extra bedroom as well as studio for visiting children and guests. Bedrooms are banked along the entry side. Their low, 8-foot ceilings permit the studio and a sauna on the second floor (plan not shown), providing a dramatic contrast to the main, full-height living area. The studio balcony overlooks the living area to share the view. All bedroom windows open onto the entry court, containing a sculpture garden and baffled by 5-foot, 6-inch walls.



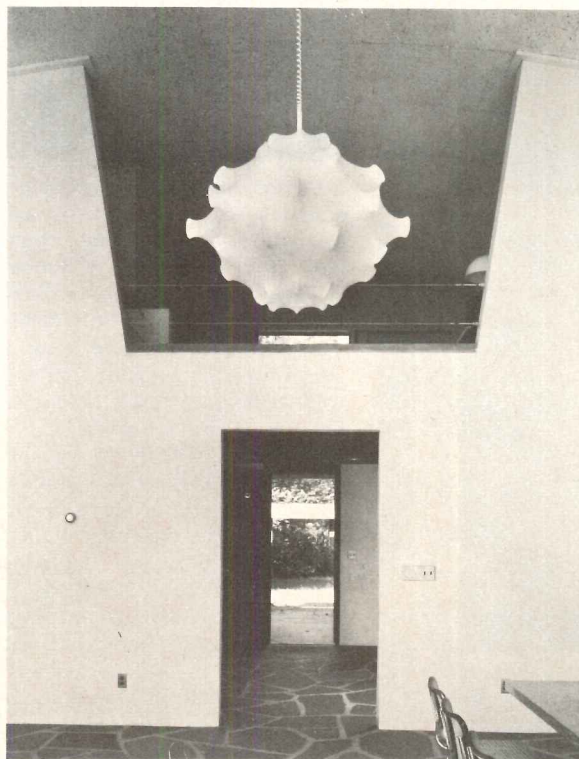
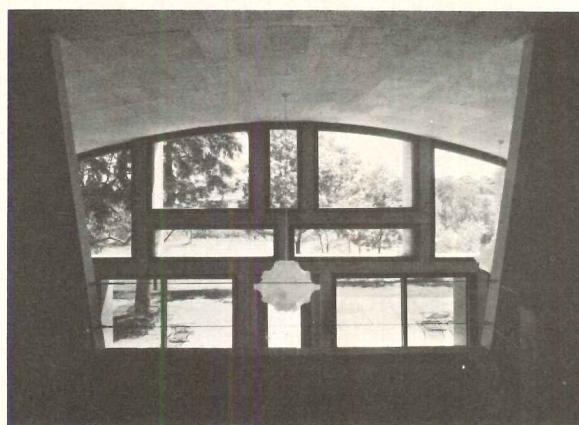
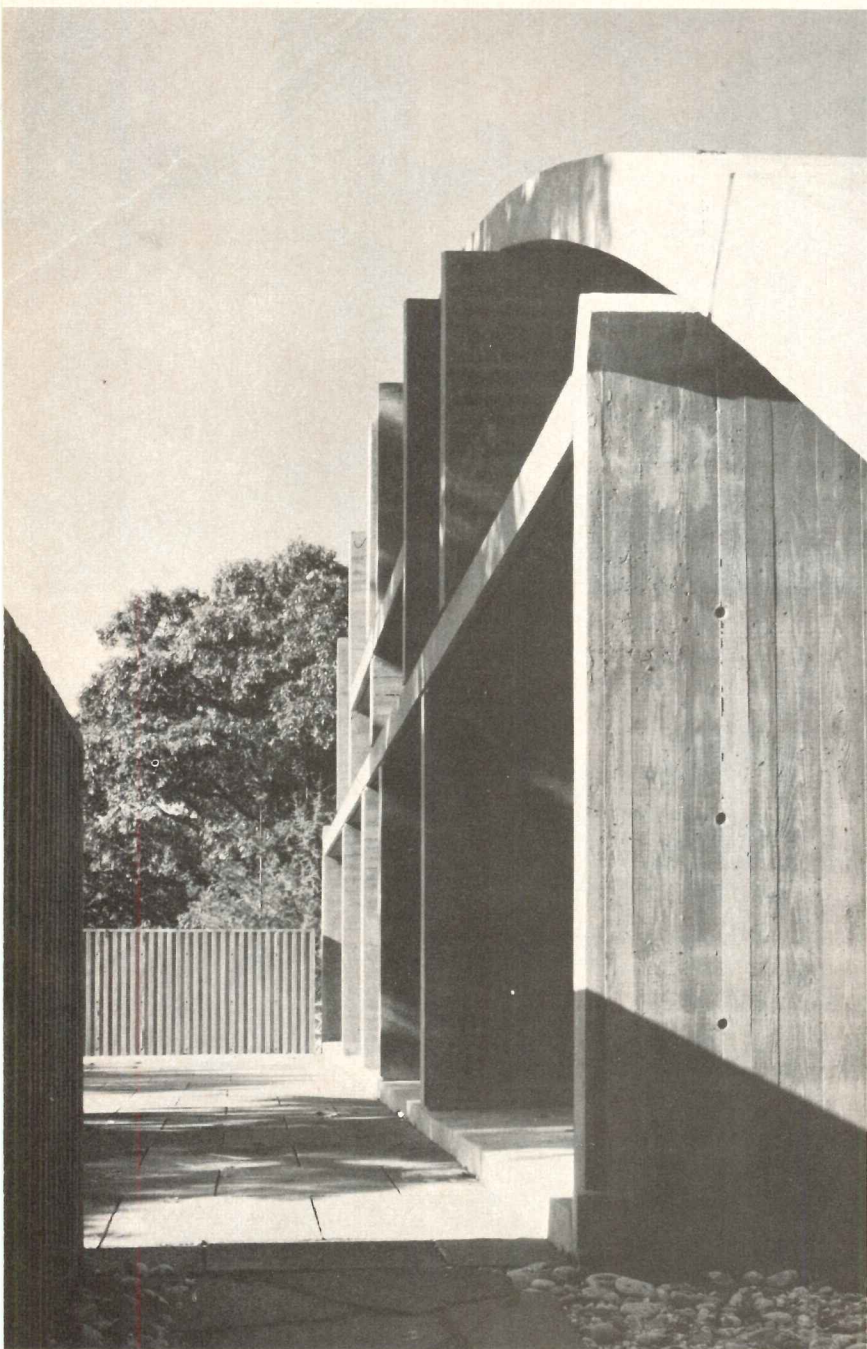
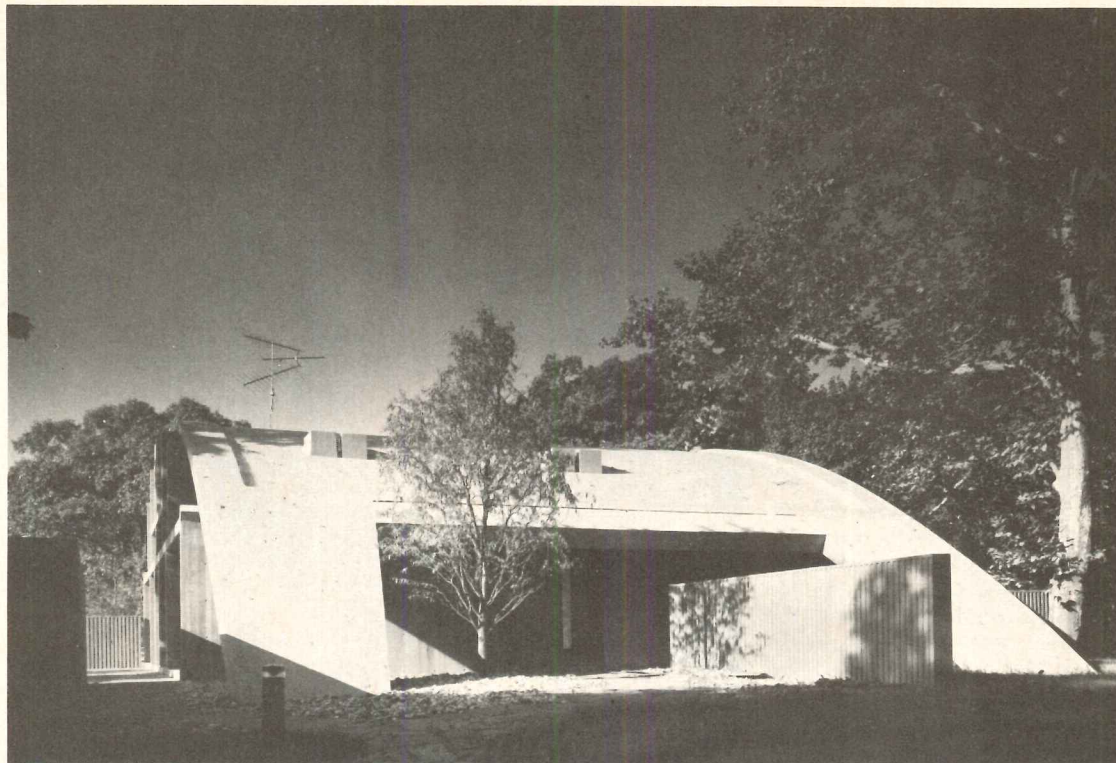
Tamas Breuer

The parabolic arch form permitted a main space of generous size and proportions shown in the photos here. The living area is sunken, gaining height for one low end. The emphasis is on informality, with kitchen, dining and living all free of partitions and contained within the one space. Materials, both inside and out, are beautifully detailed, chosen for practicality, and to articulate elements and emphasize spaces. Concrete texture for the arch and sunscreen comes from butt-jointed boarding; poured-in-place concrete for the fireplace and wall is bush-hammered to reveal the stone aggregate. Floors of main spaces are bluestone; bedroom floors are carpeted. Partitions are painted gypsum board; ceilings are textured insulating cork, painted white over the main space and studio, with bedrooms left a natural dark brown to further emphasize spatial differences. Neutral colors predominate, with bright color for the red-upholstered seating area.



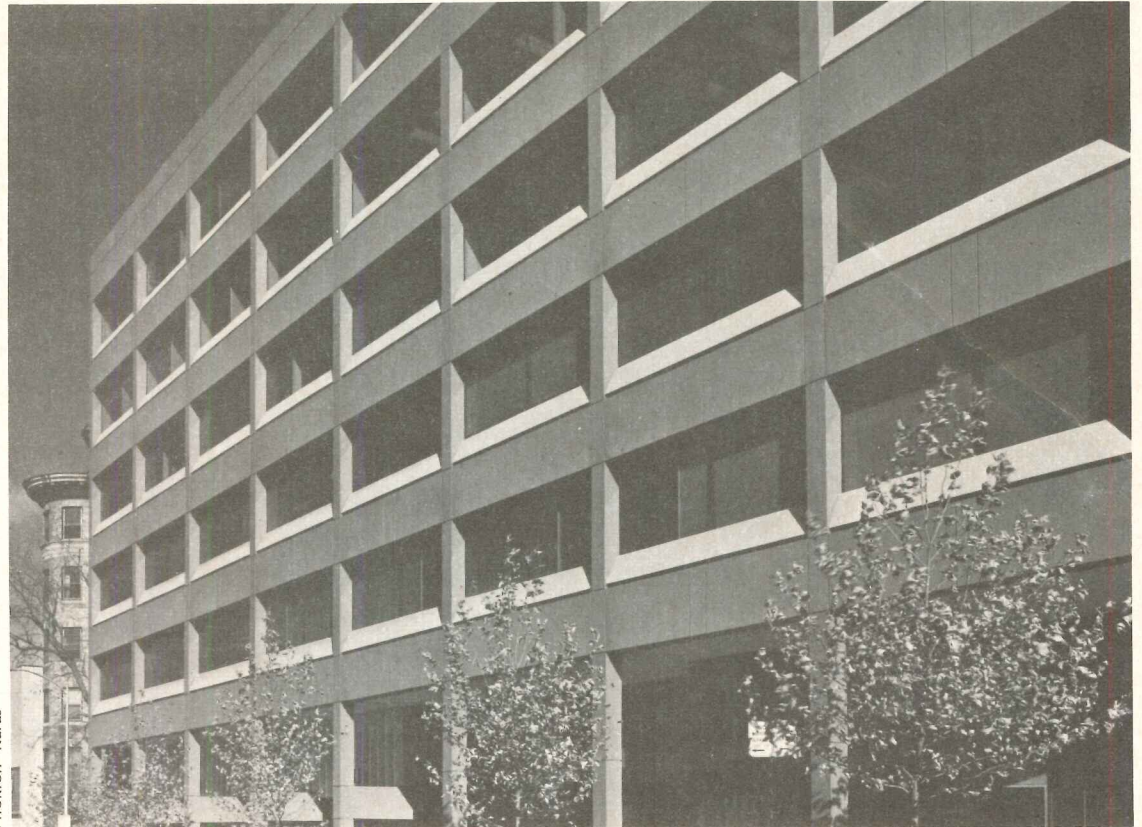
GELLER HOUSE

The arch is cut out at the sides for added openness (photo right) and terminates in point supports. Tension members to absorb thrust are cast in place under the floor. Slip connections for partitions permit vertical movement of the arch. Computer analysis was used to ensure free deflection. Garden walls (below) have a heavy concrete texture achieved using board and batten forms and were placed to protect the south-oriented terrace from winter winds, thus permitting year-round sunbathing while providing privacy from neighbors to the east and west. The depth and pattern of the sun-screen were in fact designed to let winter sun flood the interior while keeping out the sun in summer. The wall at left in photo below in fact is side of carport, which is partly sunken to maintain a 5-ft. 6-in. height. Views from inside are shown at right, with the main interior space opening both to the south terrace and to the north toward entry and upper-level studio.



THREE OFFICE BUILDINGS

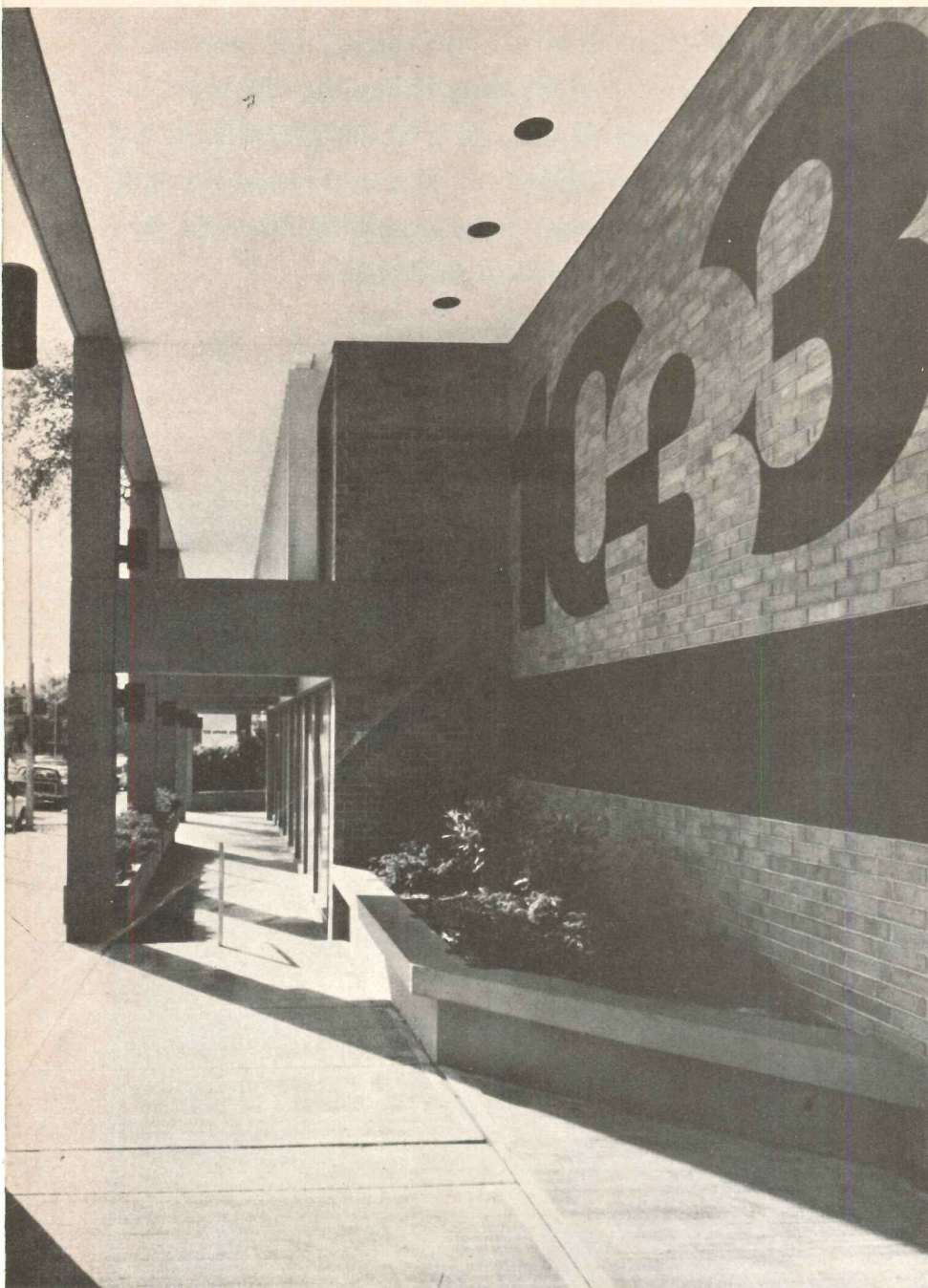
These three office buildings are different in size—one small, one “medium” and one large—but they show a common ability to enhance the city immediately around them. They make that part of the city a better place to be by providing additional closure for a fragmented street, or a new visual strength in the midst of crowded anonymous buildings, or by providing dramatic stylistic continuity with a whole region’s architectural tradition.



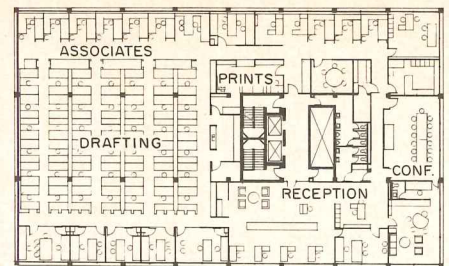
Phokion Karas

1 CLOSURE AND APPROPRIATE SCALE FOR A STREET IN CAMBRIDGE

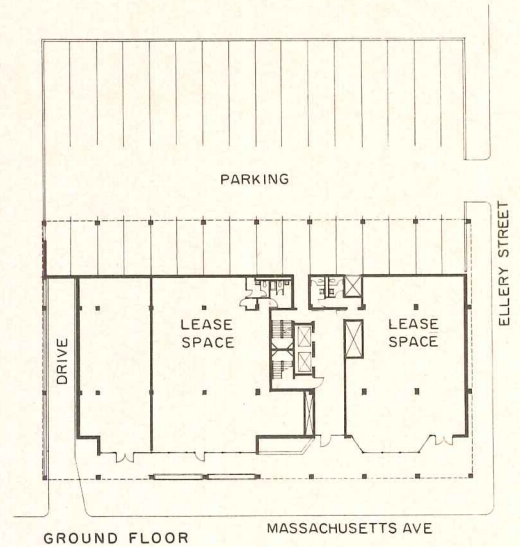
Though Massachusetts Avenue is the main corridor between Harvard University and Massachusetts Institute of Technology, it has remained an anonymous area, neither part of the academic communities nor a community in its own right. The office building above and on the following two pages (in part occupied and owned by its architect, Hugh Stubbins and Associates) is a new focal point for this street, enhancing it commercially while at the same time maintaining the scale and intimacy of Cambridge as a whole. The six-floor facade reflects the line of older buildings along the street and required parking is in the rear, off the street. The principal exterior material is concrete on both the poured-in-place columns and precast spandrel facings, all painted a light brown. The brown color is appropriate to the existing neighborhood, as exposed concrete might not be; paint eliminates water staining and the need for expensive formwork craftsmanship. The simplicity and cohesiveness of the facade is continued with the windows, which are straightforward spans of glass between the concrete. The facade as a whole gives a needed sense of closure to a fragmented but important street.



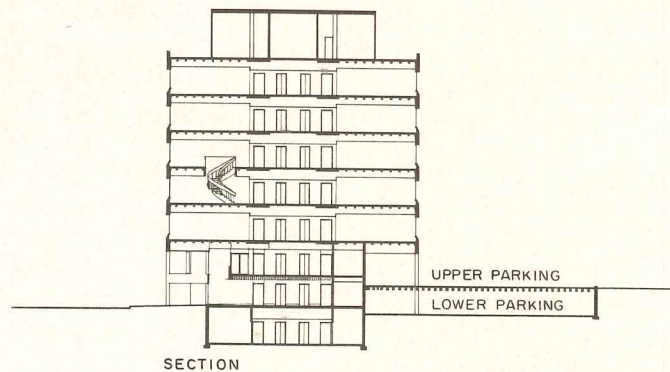
Jonathan Green photos



SIXTH FLOOR

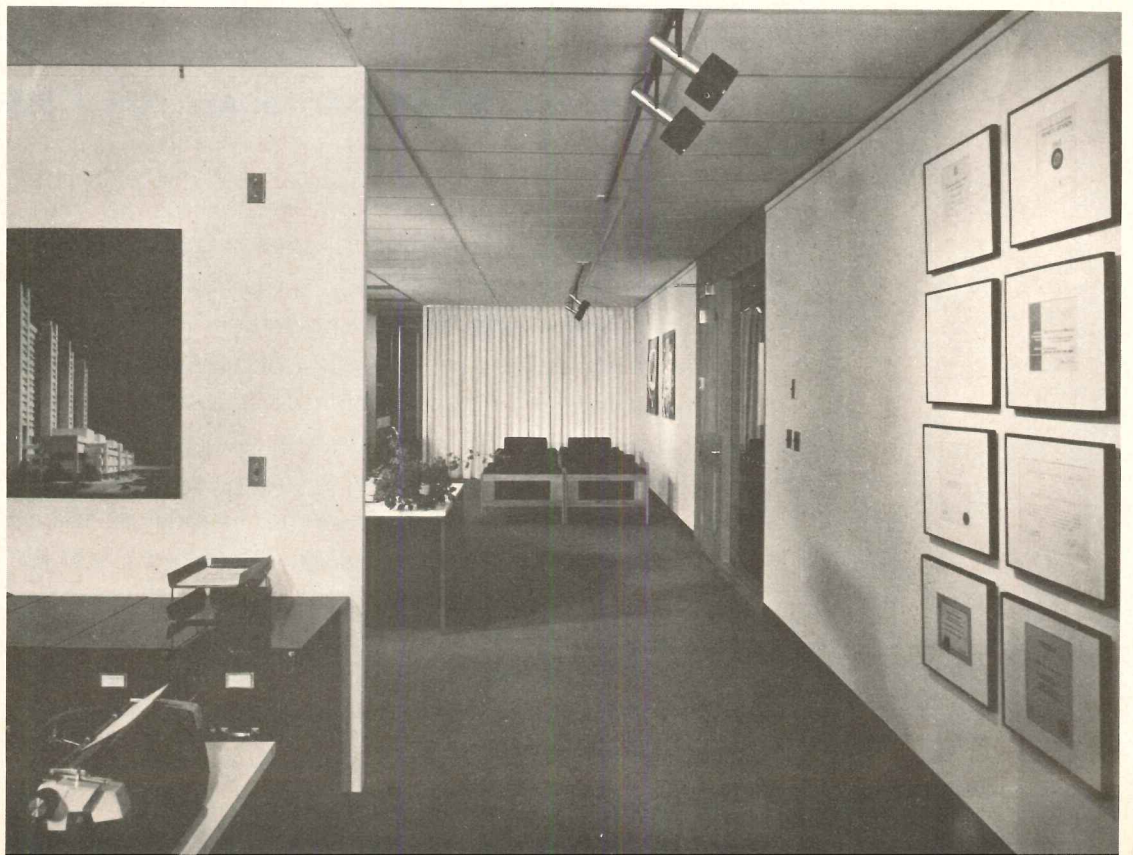


GROUND FLOOR



SECTION

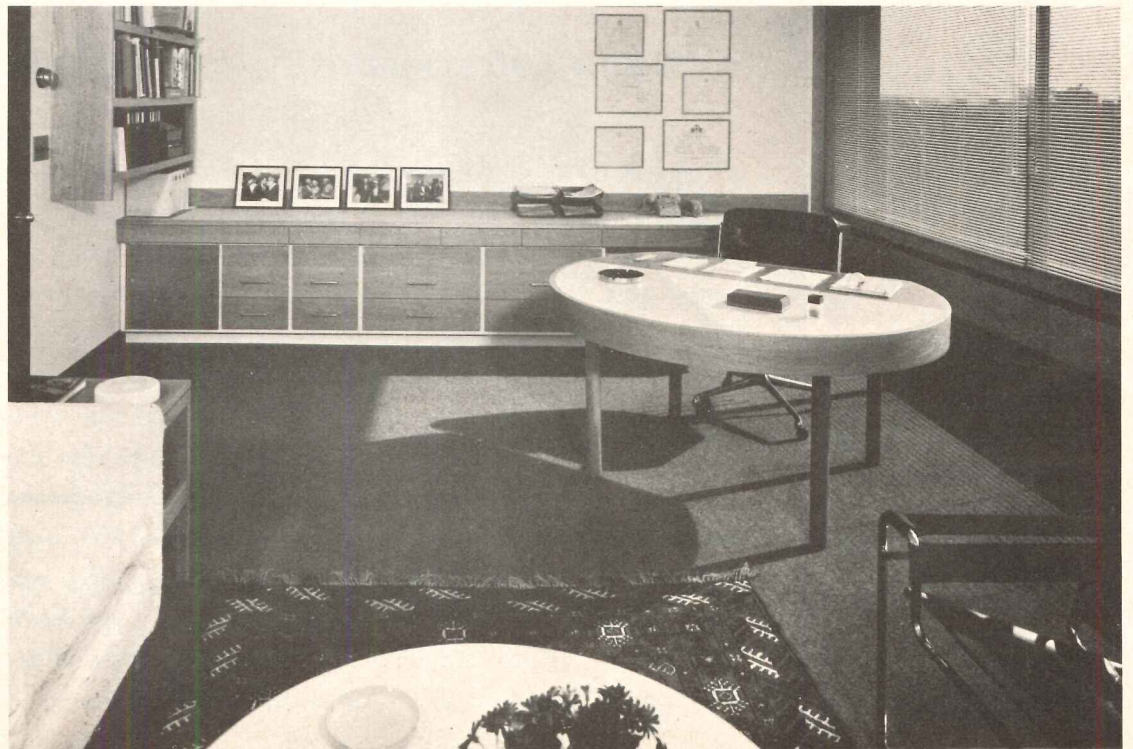
At ground level the office building is undercut to widen the sidewalk; there are lively planting areas, a row of trees, and a giant "1033" painted on the brick front. The offices of Hugh Stubbins and Associates occupy the sixth and part of the fifth floors. The sixth floor (right, above) contains the main reception area, associates' offices, the library, conference rooms, print room, and drafting areas. Associates' offices ring the drafting area, separated from it by glass partitions, so that the open plan provides views of the Boston-Cambridge skyline for everyone. There are two levels of parking in the rear, approached from either Massachusetts Avenue or an adjacent side street. LeMessurier Associates, Inc., a Cambridge structural engineering firm, occupies the third and fourth floors, with a private stairway connecting them (see section, above). LeMessurier was the structural engineer for the building itself and has a financial interest in it with Stubbins.

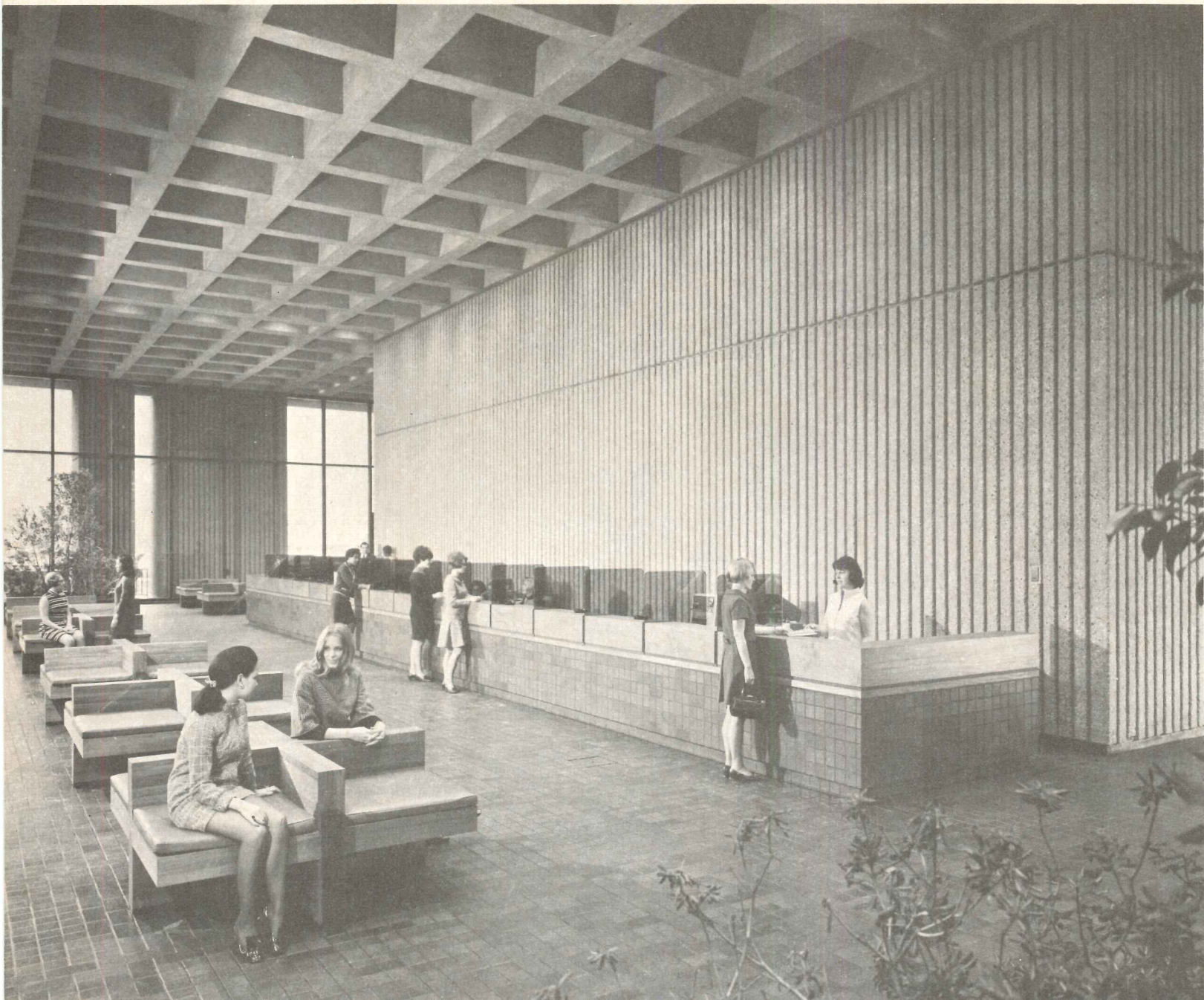




A standard partitioning system was used throughout the building, on a 2-foot by 4-foot module. The partitions do not always meet the exterior wall at a column or mullion; a typical window is 6 feet high by 18 feet wide, with only one mullion within. Where a partition meets this glass surface, they are simply connected by a neoprene gasket, which is not disturbing from the outside. Stubbins' office designed all its own furniture, including drafting tables and low dividers. The office at left shows a particularly handsome birch desk; a full circle with about one-fourth of it sliced off to form a flat face for the chair.

1033 MASSACHUSETTS AVENUE BUILDING, Cambridge, Massachusetts. Architect: *Hugh Stubbins and Associates*—*Hugh Stubbins*, designer; *Norman I. Paterson*, project director. Structural engineers: *LeMessurier Associates*; mechanical and electrical engineers: *Francis Associates*; contractor: *George B. H. Macomber Company*.

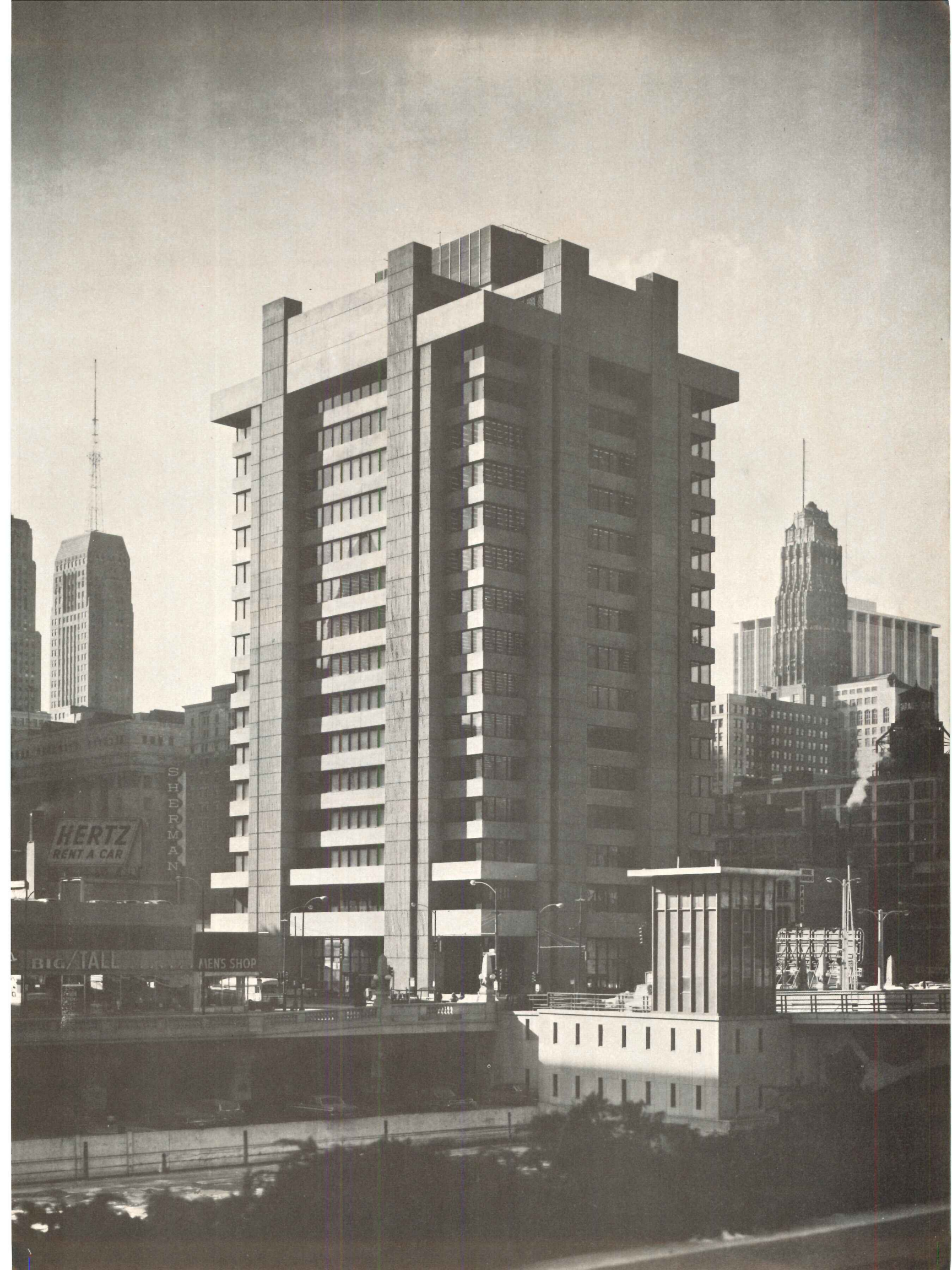




Hedrich-Blessing photos

2 STRENGTH AND COHESIVENESS FOR A CROWDED BLOCK IN CHICAGO

Designed by C. F. Murphy Associates, this new 15-story building on North Dearborn Street at Wacker Drive is the administrative center for Blue Cross and Blue Shield in Chicago. It is a muscular, positive architectural statement on a site crowded by parking lots and a river, within a rather chaotic mixture of high-rise residences, light industry, and commercial stores. Concrete is both its frame and its exterior finish, so that the building's major structural material is also its primary design element. The eight large vertical concrete shafts combine with the eight smaller concrete columns near them to act as structural members; shafts are also duct enclosures for the heating and air conditioning. Columns and shafts carry the eye skyward, counter-balancing the strong horizontal emphasis of the concrete spandrels and cornices. The perpendicular surfaces have directional and rhythmic bush-hammered corrugations, while the horizontal surfaces are smooth, with the tie-holes exposed. The concrete ceiling of the ground floor public service area (above) continues the strength of the building inside. The brick and teak of the counter and the teak of the seating units—room for some 40 people—maintain the unity and harmony of the space.

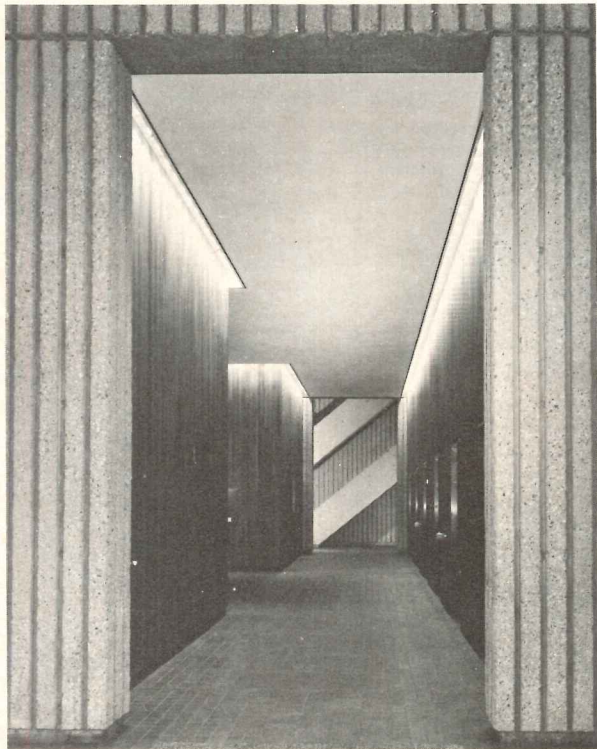
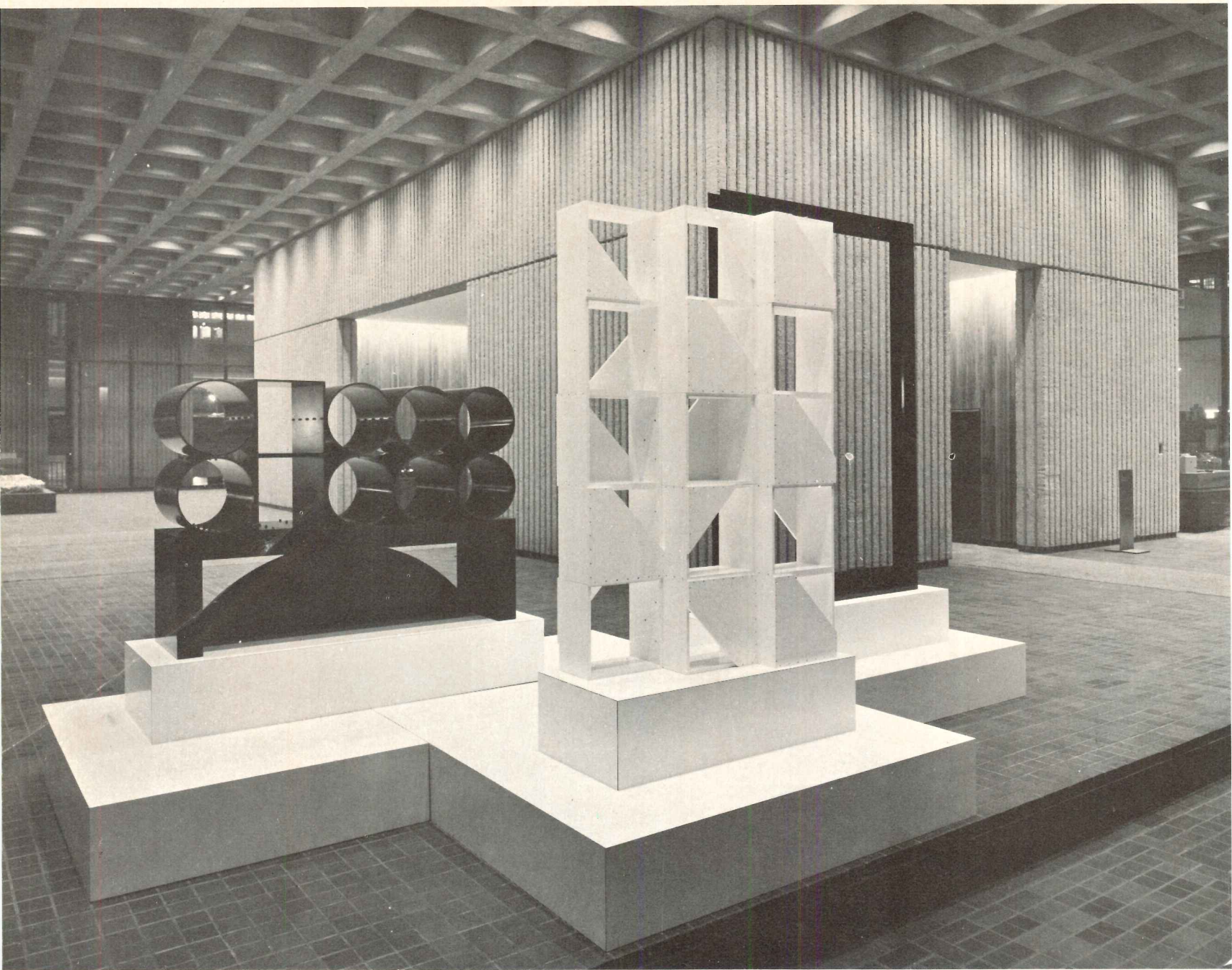


HERTZ
RENT A CAR

SHERMAN

BIG/TALL

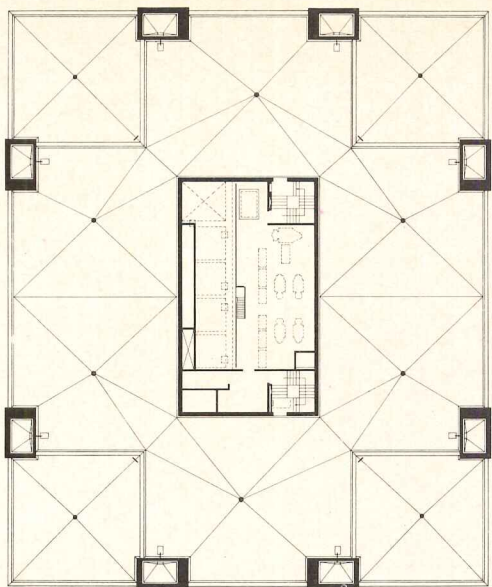
MENS SHOP



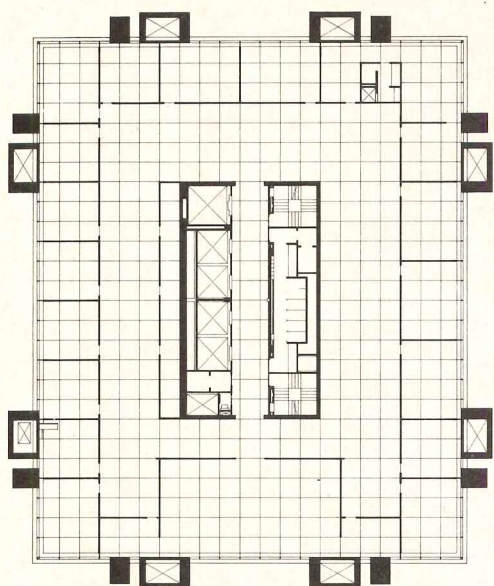
The spacious lobby (above) is enclosed by clear glass walls set back 12½ feet from the sidewalk. The burnt-faced brick floor extends five feet beyond the exterior walls, establishing continuity with the exterior perimeter. From the south side of the lobby a bold concrete stairway (opposite page) leads directly to the employee cafeteria on the second floor. As the photos indicate, the core of the building at the lobby level is exposed, bush-hammered concrete with solid teak planking in the elevator corridors.

The lobby sculpture above was designed for the building by Louise Nevelson.

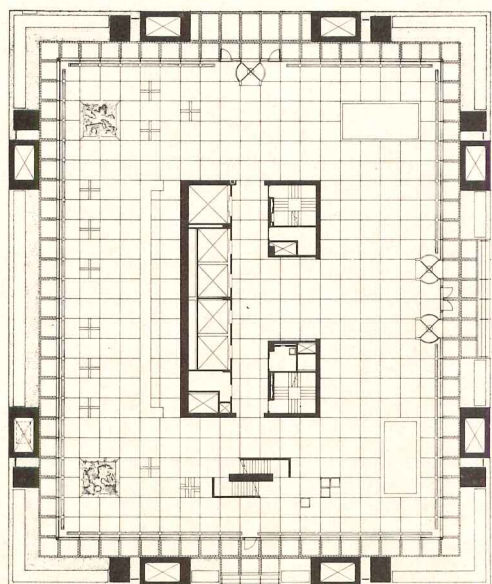
The employees' lounge (left) on the third floor is a warm, bright area with comfortable leather seating units, red cube tables, game tables and gay prints on the walls. Here again, teak was incorporated into the design of the furniture. In this space and throughout the building, air supply is integrated with the recessed air handling light troffers.



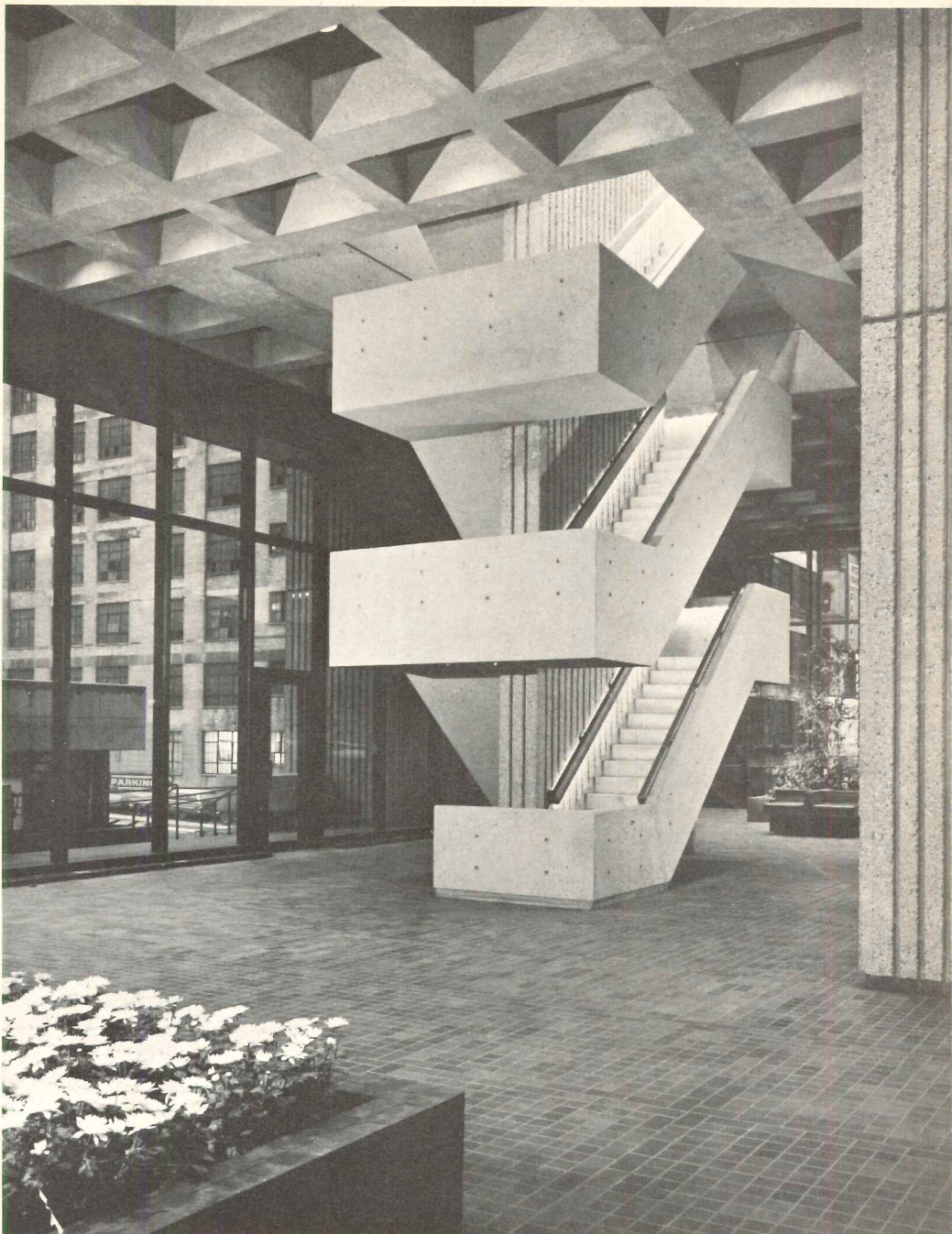
Roof plan



Typical office floor

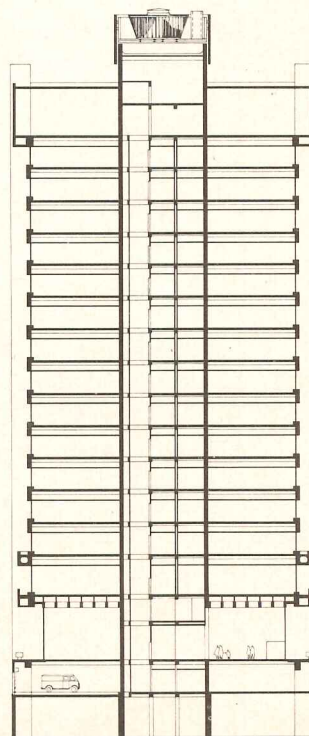


Ground floor lobby

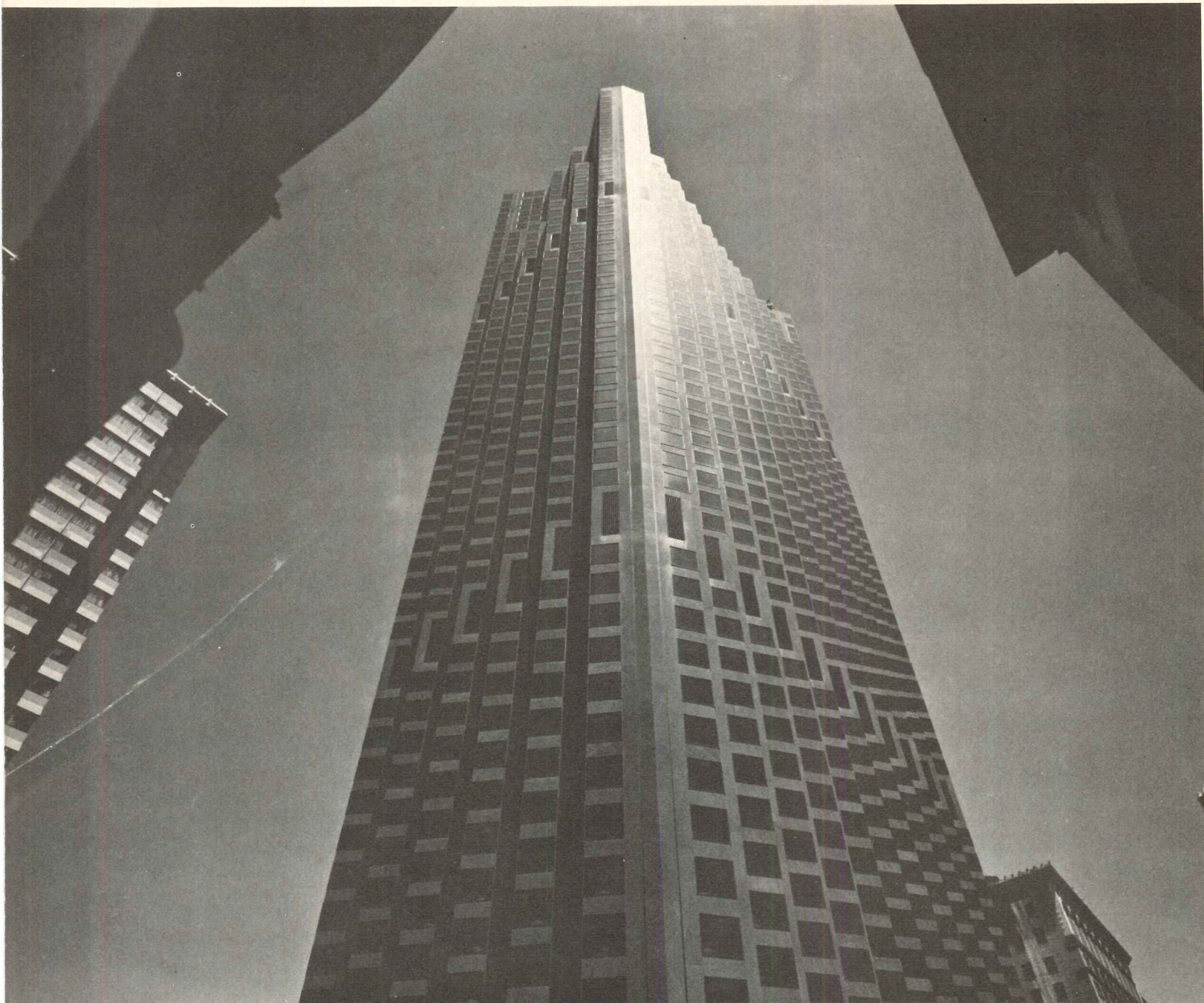


Typical floor plans (left), the section (right) and the lobby photos indicate that the floor area surrounding the central service core is column-free. Planned on a five-foot module with movable partitions which may be elevated in any line of the grid, the design exhibits consideration for maximum efficiency and flexibility throughout the structure. In the HVAC shafts are high-velocity air supply ducts which serve a four-pipe induction system which provides cooling, heating and ventilation to the perimeter of the building. The shafts also contain the main exhaust-recirculation ducts for the entire building, domestic hot and cold water and waste and vent risers for wet stacks.

OFFICE BUILDING FOR BLUE CROSS-BLUE SHIELD, INC. HOSPITAL SERVICE CORPORATION, Chicago. Architects and Engineers: C. F. Murphy Associates—Otto Stark, designer; William Wuerfel, project manager; contractors: Paschen Contractors.



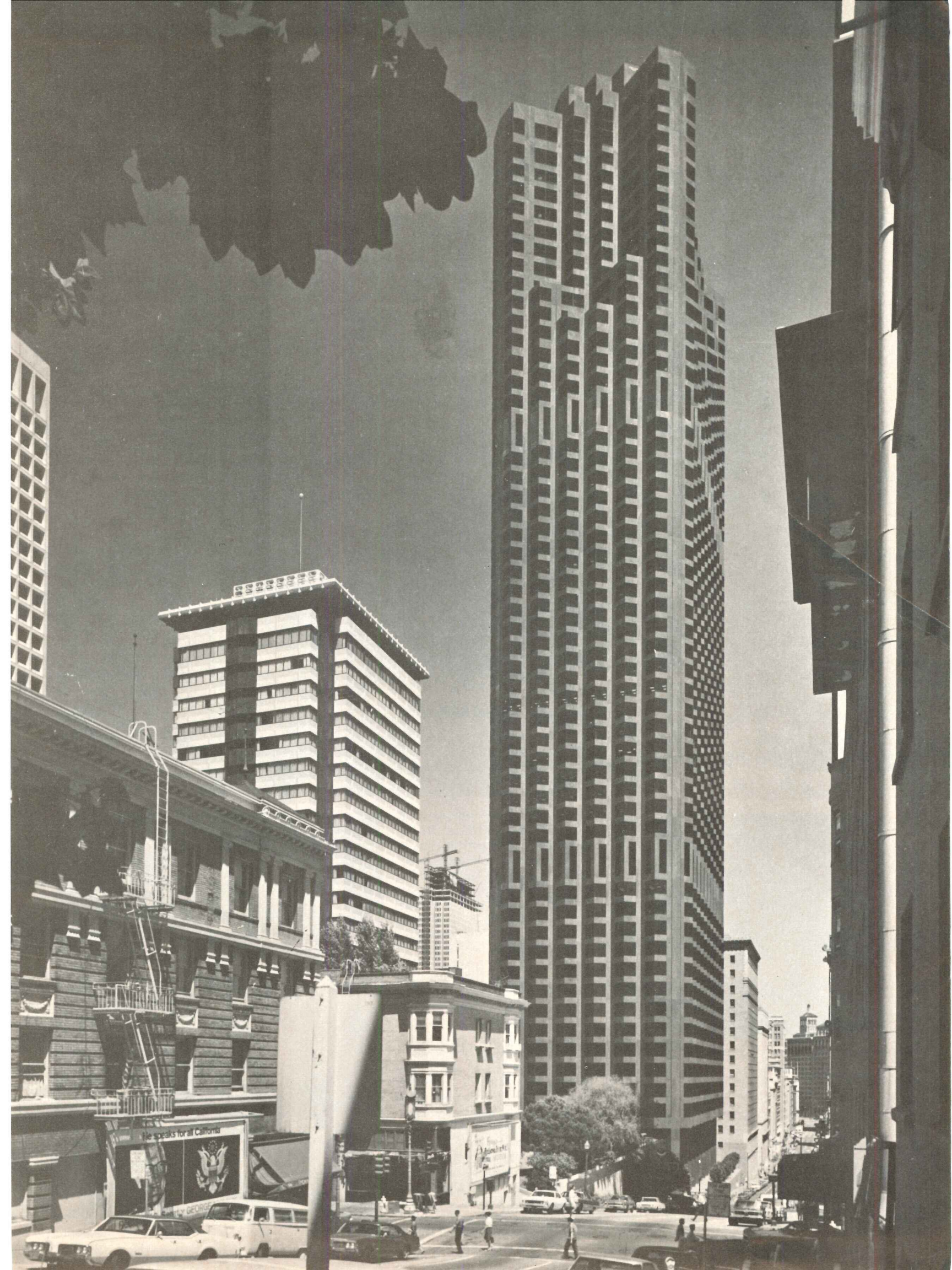
Section



Roger Sturtevant photos

3 THE SCULPTURAL EXPRESSION OF TRADITION IN SAN FRANCISCO

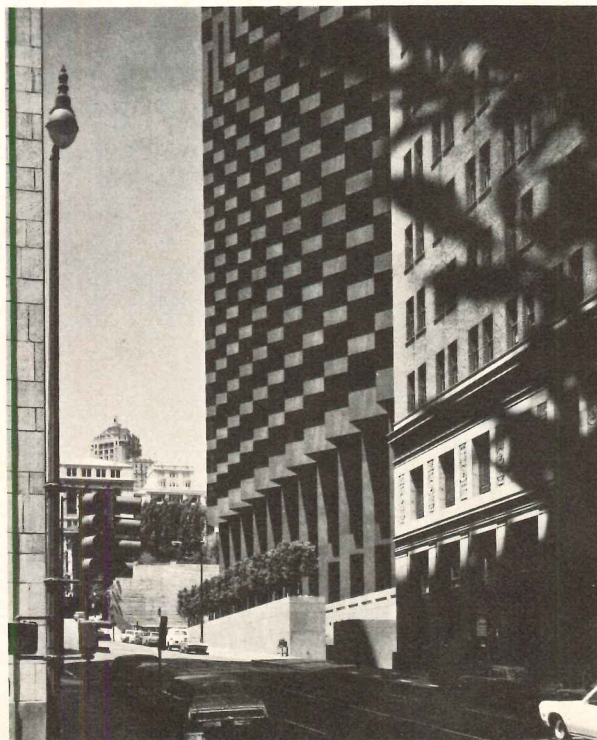
The new Bank of America tower in San Francisco—a joint venture of Wurster, Bernardi and Emmons, Skidmore, Owings & Merrill, and with Pietro Belluschi as consulting architect—is a delicately changing piece of sculpture to the pedestrian in the city. It is faceted, like finely cut crystal, into a thousand surfaces that change their patterns and color depending on the angle at which you see them; the facade can appear to be long, square tubing bundled together with the corners showing, or it is zig-zagging horizontal lines, or it is a checkerboard seen in perspective. It is a building that makes its transitions well, like San Francisco itself. The rhythm of constant corners along one facade prepares the eye for the real corner and the adjacent facade; one hardly knows where the 90-degree change in plane has been made. It has a top that ends assertively and in proportion to the whole; the building could not as successfully have been ten stories shorter or taller. As the eye moves to the ground a projected bay becomes an indented bay at the second floor, while the column faces remain in the same plane. The Bank of America tower is uniquely suited to a city where the bay window has been traditional since the 19th century. The tower has become, and will remain a key architectural monument in San Francisco.

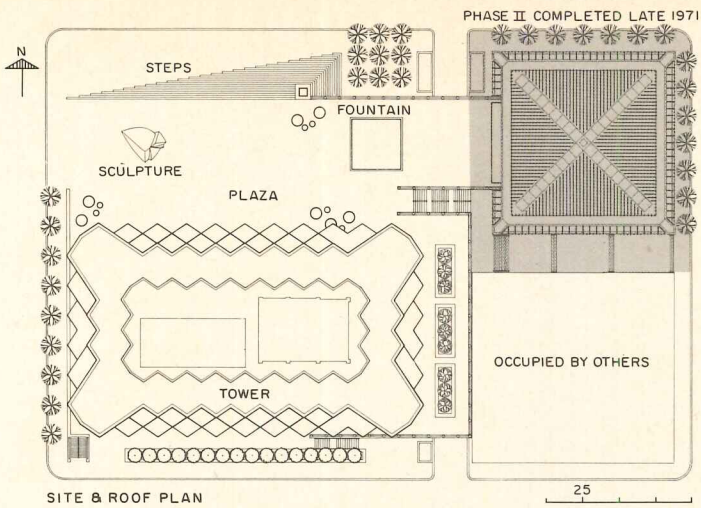




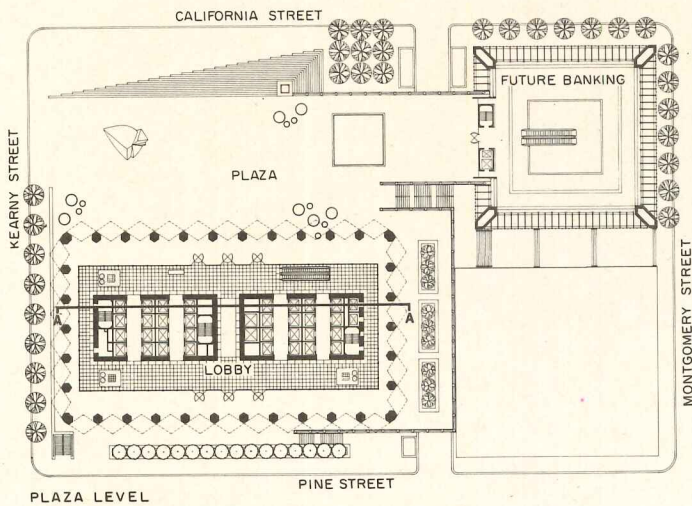
Two decisions were made almost at once by the architects—1) the building should be dark in color, 2) it should not be an austere rectangular box—and the results of these decisions are the tower's most significant attributes. Its faceted, flowing walls provide a continuous rhythm of interior and exterior bays around the facade, as these photos indicate. The bay window is a strong element in San Francisco's cityscape, variously explained as a way of bringing in more light on dark foggy days and as a means of obtaining more floor space than a building lot provides. The windows greatly enliven vistas along hilly streets and preclude monotony with their undulating rhythms. The Bank of America's walls are thus a modern, abstracted, version of a regional tradition, and are easily recognizable by citizens as a link with the best parts of their past.

The views looking east along Pine Street (above) and west along Pine Street (right) indicate the

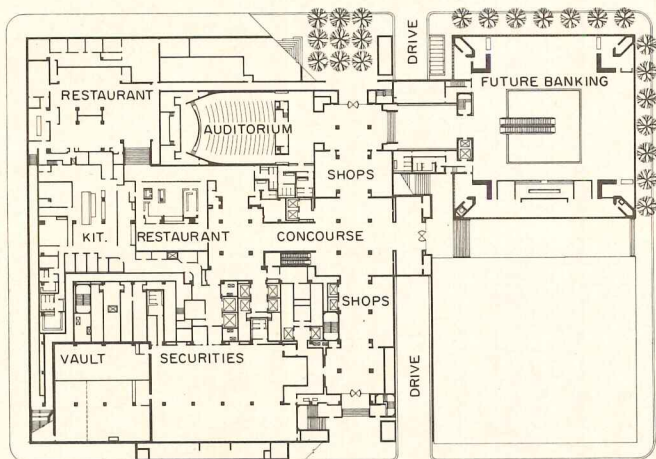




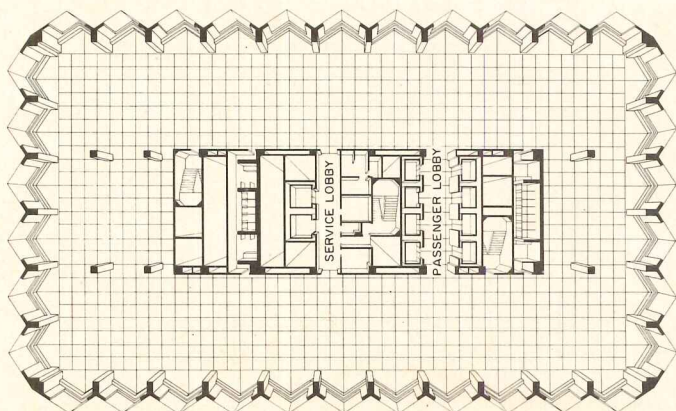
SITE & ROOF PLAN



PLAZA LEVEL

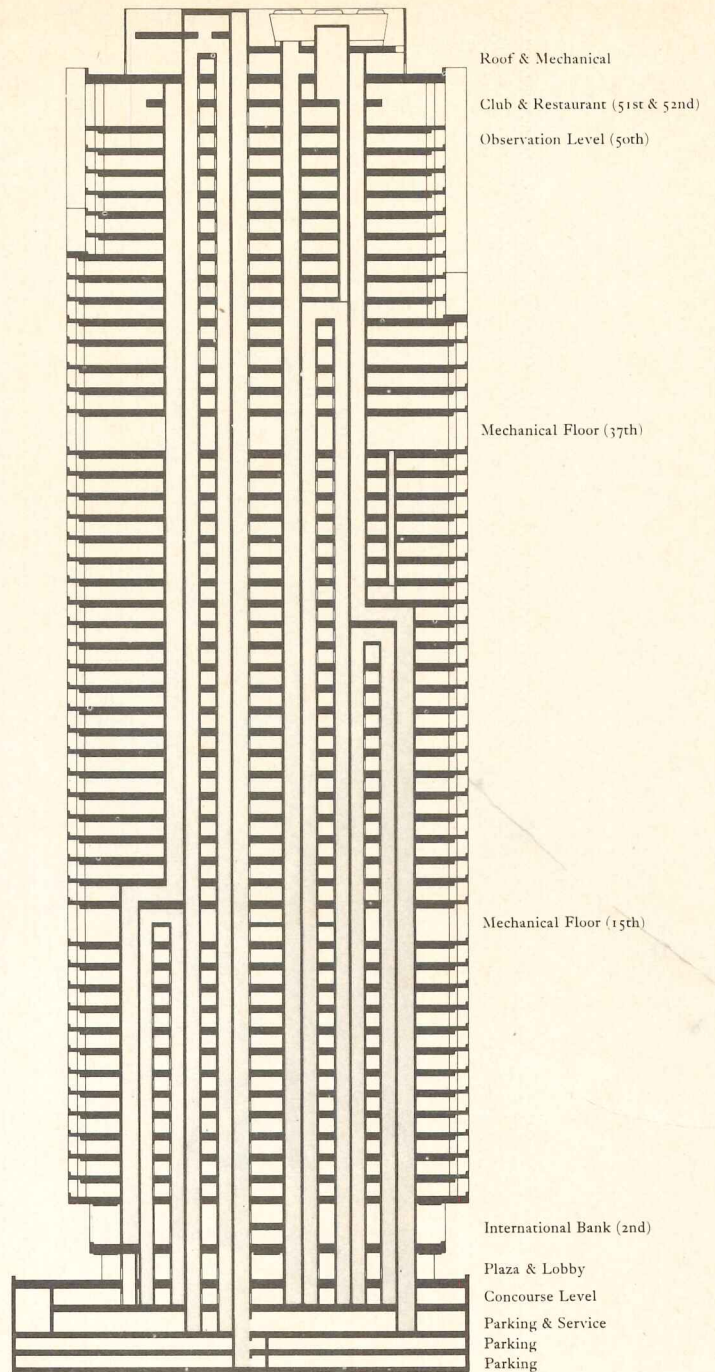


CONCOURSE LEVEL



TYPICAL FLOOR

SECTION

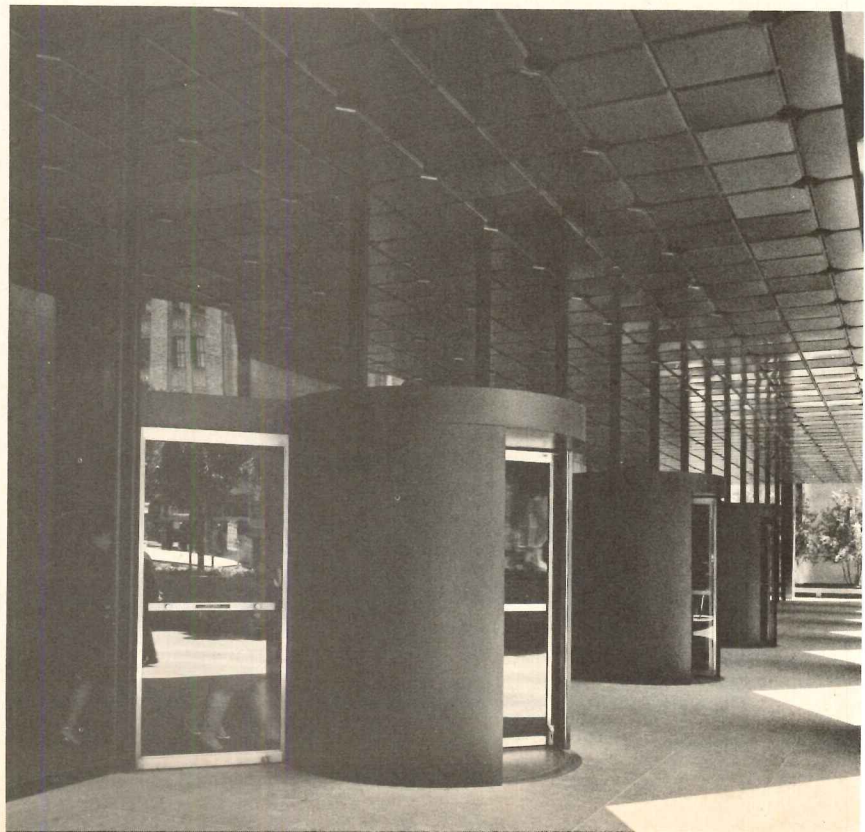
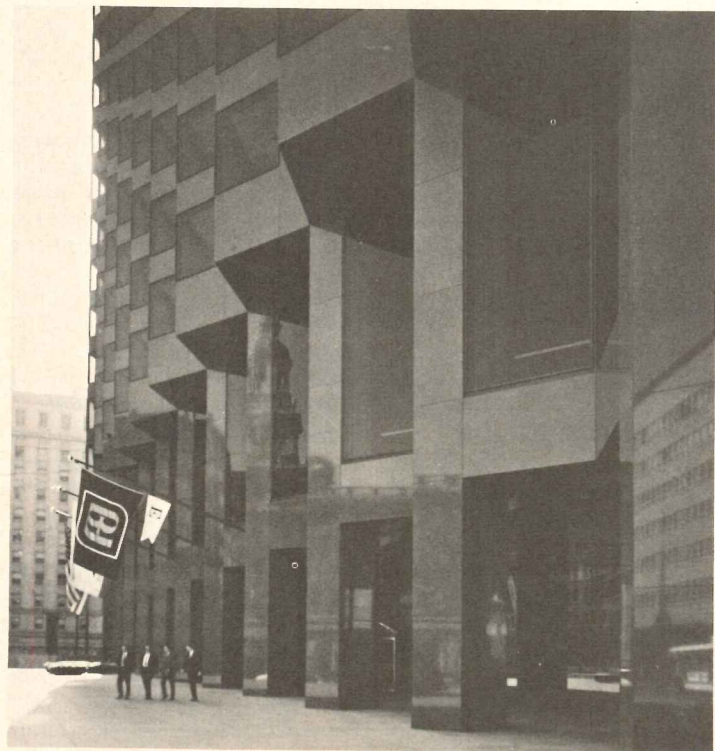


steeply sloping site and the extensive planting areas along the street. The placement of the building on the site was influenced by the slope of the site, which falls steeply from Kearny Street on the west to Montgomery Street—San Francisco's Wall Street—on the east. On-site parking was required, and it was put underground (below the concourse level); this dictated, with the sloping site, that the tower be on Pine Street. The main banking offices will be contained in the Phase II portion of the project, a broad, low building now under construction (shaded portion of plan, left).

The tower's color is dark red, with a polished surface that is highly reflective. San Francisco has always been a white city, when seen from any of the hills around it, and as dark buildings begin to appear, the citizens are becoming concerned about their effect on the whole. Both Don Emmons and Pietro Belluschi have given two principal reasons for the building's dark

color. One, white tends to make any object appear larger than it really is and black tends to diminish it. The large building is, in effect, contained by its definite color. Two, it is dark so the windows do not stand out as "holes" in the facade. This allows the walls to be the strong pattern-making element and the tower can be more easily read as a sculptural unity.

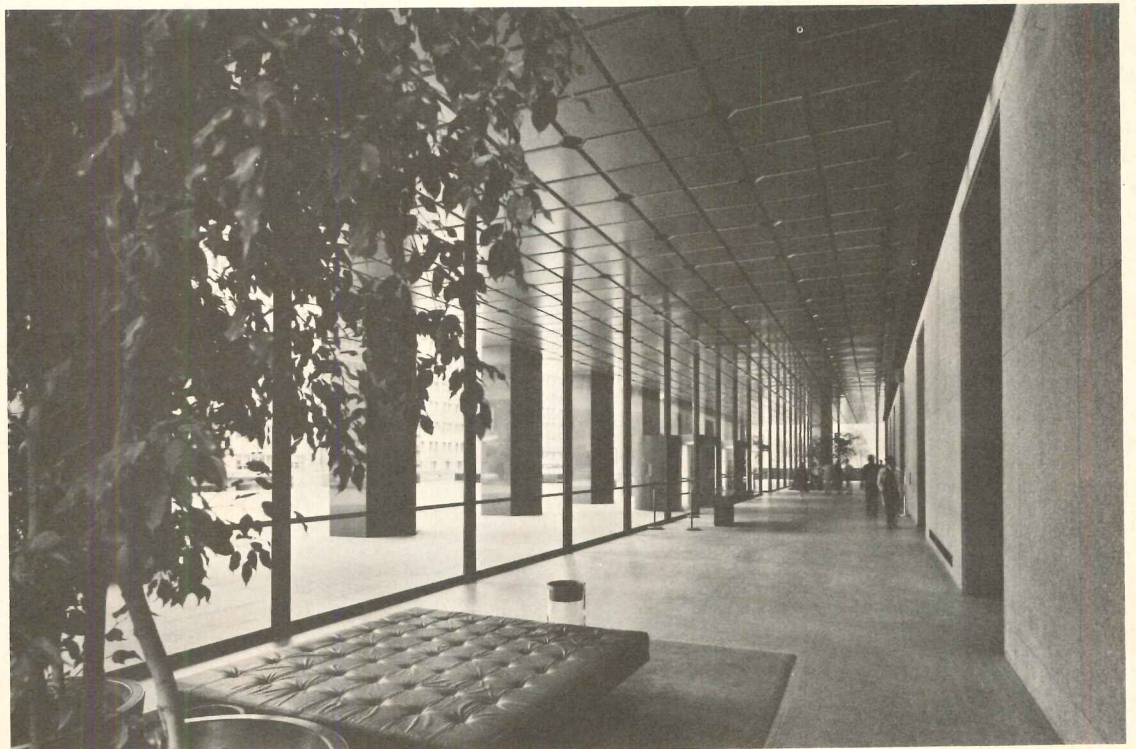
The setbacks and the building's profile make window washing an intricate procedure. Belluschi has said this issue influenced several decisions regarding the facade's detailing and its amount of undulation; the solution is certainly ingenious. A W-shaped basic work platform moves up and down the facade within permanent grooves set in the interior corners of the bays. The platform is at all times positively attached to the building, and it is computer controlled—it won't work until all switches are "go". The window-washing system was designed by Manning and Lewis, New Jersey.

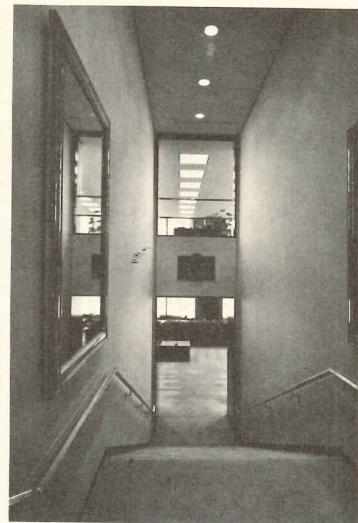




The monumental proportions and subtle changes in scale at the base of the tower can be seen best from the plaza side of the block (three photos at left). The International Banking Division of Bank of America occupies the second floor of the tower, and this has been set off from the leased office space above by inverting rather than projecting the windows at the second floor, and making the glass area larger. Inside, this International Banking floor is spacious and dramatic (photo, above).

The detailing of the building is exceptional in its craftsmanship and precision. This can be seen in the transition between wall and window in one plane, in the shape of the octagonal piers at the base, in the way the pier surfaces grow into walls, in the ceiling pattern which reflects the plan, and in the ceiling's carefully integrated downlighting. Such attention to detail is, of course, too rarely found in office buildings these days.





The concourse level of the Bank of America (above, left) shows the imaginative use of lighting to emphasize important crossroads, and again the careful attention to detail. A fortieth-floor executive's office (left) shows how a full bay of the wall system may be used within a partitioning pattern, and the panoramic view it provides.

BANK OF AMERICA WORLD HEAD-QUARTERS, San Francisco, California. Architects: a joint venture of Wurster, Bernardi and Emmons and Skidmore, Owings & Merrill—Pietro Belluschi, consulting architect. Landscape architects: Lawrence Halprin and Associates; structural engineer: H. J. Brunner and Associates; mechanical and electrical engineers: Skidmore, Owings & Merrill; acoustical consultants: Bolt Beranek and Newman; lighting consultants: Seymour Evans Associates; graphics consultants: Barbara Stauffacher Solomon; audiovisual consultant: Henry Jacobs; plaza sculpture: Masayuki Nagare; fountain consultants: Beamer/Wilkinson and Associates. Contractors: Dinwiddie-Fuller-Cahill, a joint venture.

Equipment that works on the refuse disposal problem

Presently, refuse from buildings such as apartment buildings, schools, and the like, is either burned or dumped. The problem is that incinerators can make smoke; further, solid waste has been taking up too much space. Incinerator smoke can be virtually eliminated with a type of collector called a scrubber. Solid waste can be shrunk in volume with a device called a compactor. This article tells how the equipment works, the quality aspects that should be considered, and how much space is required.

by Herbert Kaplan Research-Cottrell, Incorporated

Today's affluent, convenience-oriented society generates refuse at a daily per capita rate that now exceeds five pounds and is expected to hit eight pounds by 1980. At the same time, limitations on the disposal of such refuse are resulting from increasing intolerance of pollution and the decreasing area of suitable disposal sites. Restrictive legislation is already on the books in most large cities, affecting apartment houses, institutions, and commercial sources of refuse. Legal challenges and political problems have been holding up strict enforcement in many cities but this picture is changing rapidly, because the problems won't wait.

Already in most large cities it is extremely difficult to find space in which dumping of refuse is still acceptable. In most smaller communities the problem is not acute, but it is only a matter of time before the pinch is felt everywhere. Ultimately, there won't be any suitable space available within reasonable trucking range of communities of any substantial size. Already collection and transportation constitute 80 per cent of refuse disposal cost. Solutions proposed for that day range from railroad shipment to empty mines and unpopulated wastelands to processing plants that hopefully can convert refuse into reusable materials with little or no remainder to be dumped.

In the more immediate future, however, planning is directed to more efficient use of such disposal sites as are still available, to make them useful longer. This means reduction of the volume of refuse, and reduction of its unsanitary nature, before disposal.

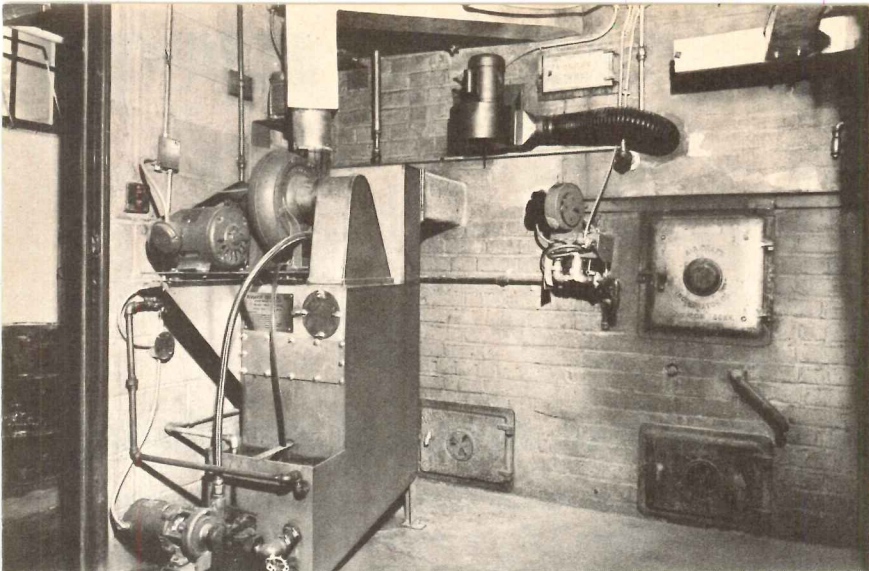
Both goals can be accomplished by suitable incineration, either in municipal incinerators or individual incinerators. The financial situation of most communities means that municipal incinerator capacity tends to lag well behind the growing rate of refuse generation. It is all cities and

towns can do to keep up with refuse from the individual houses and small multi-family units—it being impractical, technically and politically, to pressure them into changed disposal practice at this time. But owners of larger buildings are being, or soon will be, required to do their own refuse incineration or to compact refuse before it is collected.

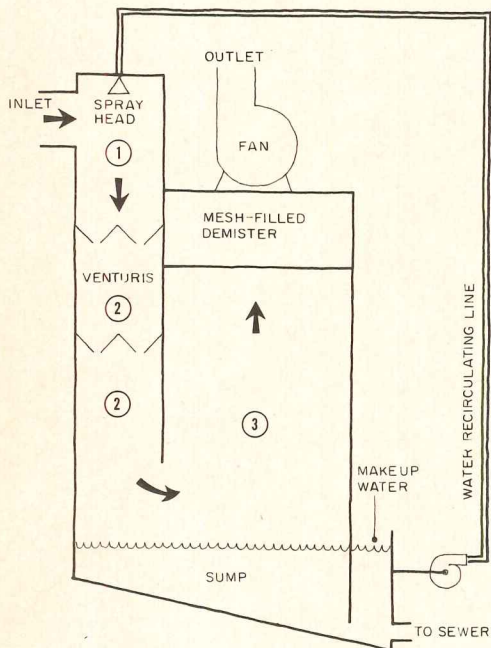
Incinerators need collectors to minimize particles emitted to the atmosphere

Incineration of course is not new. What is new is the requirement for incineration with minimum air pollution. Incinerators are notorious air polluters because their basic "fuel" and combustion conditions are far from optimum. It is recognized that incinerators cannot be expected to meet the pollution control standards being imposed on industrial furnaces, but the requirements now stated in legislation or being established by regulatory authorities are tighter than can be met by simply improving incinerator design and operation. The particulate pollutant content from a modern incinerator averages roughly one grain per standard cubic foot of gas (actual combustion gas conditions restated as dry gas at 32F). But the chimney gas limit under the legislation now coming into force in most large cities is 0.2 grains per standard cubic foot, and in some cases may be as low as 0.1.

It is not too difficult to design a collector for the 80 per cent efficiency required to accept gas containing 1 grain of pollutants per scf and discharge it with 0.2 grains. In some cities all that is required is demonstrated ability to achieve a 0.2 grain output. Once a particular design has been tested and passed, it is eligible for installation on any incinerator covered by the city's regulations. But it is becoming more common to require testing of each installation to demonstrate that the combined system of incinerator and collector does not exceed the



Many of the details of an upgraded incinerator, equipped with an air-pollution control scrubber, are visible in this installation in a large apartment building. The scrubber is at left in the photo. The outlet flue rises above the scrubber; the inlet leads directly into the scrubber at the rear. Above and to the right of the scrubber is the blower which has been added to supply over-fire air. Below this blower, next to the firebox door, is an auxiliary fuel burner. Both the blower and the burner are provided to aid complete combustion. At top right is an automatic stack damper operator.



Operating principles are shown for a typical venturi-type scrubber, designed especially for incinerator gas cleaning. Inlet gas is quenched by spray head (1), then is drawn through one or more venturi constrictions (2). Accelerated flow through the venturis causes violent mixing so that water droplets capture particles from the gas. Lowered gas velocity and upward gas travel in area (3) causes heavy particle-laden drops to fall to sump. In mesh-filled de-mister section, mist drops coalesce into larger drops, heavy enough to fall to sump. Fan produces enough pressure differential to draw gas through venturis and de-mister, and then discharges gas into chimney. Sludge from sump is discharged to sewer. Water is recirculated to spray head. Make-up water is added to replace that lost in sludge and from evaporation.

0.2 to 0.1 grain limit. In such circumstances, the less effective the incinerator's combustion is, the more effective the collector must be. A simple collector may be satisfactory on a new incinerator with dual chambers, direct outside air intake, modern combustion controls and other features of modern incineration practice, but more sophisticated collector design will be required for most existing incinerators and even for many rebuilt and upgraded older units. Also, the history of pollution control suggests that the pollution limits of today will not stand, but will be tightened in the future. Thus even in new construction, a high-grade collector is probably a good investment; what may be excess capability today may be required capability before its design life has been served out.

A scrubber does the best job for non-industrial-type buildings

The four types of equipment used by industry for removal of particulate pollutants from gases are the electrostatic precipitator, the mechanical or cyclone collector, the bag filter, and the scrubber. Of these, only the scrubber is suitable for incinerators of small and moderate size.

About 40 per cent of the particulate matter in typical incinerator combustion gas is less than 10 microns (1/2500 in.) particle diameter. The mechanical collector is only efficient in collecting particles larger than 10 microns, and the possibility of moisture condensation from the incinerator gas could mean problems of corrosion and plugging-up with wet particles. The fabric filter can collect very small particles, but it is also subject to fouling by wet particles, and its fabric cannot withstand gas temperatures as high as those at an incinerator exit.

The electrostatic precipitator is the preferred choice for true pollution control in large municipal incinerators, since it can tolerate the gas temperatures involved, can collect very small as well as large particles, need not present a moisture or corrosion problem, and has very low operating cost. But the "fuel" in a smaller incinerator at any given moment, particularly a flue-fed type as used in apartment or institutional buildings, may range from mostly wet

garbage to mostly dry paper. As a result there can be wide variations in gas temperature, moisture content and particle content. The electrostatic precipitator is so sensitive to operating conditions it cannot be designed to operate efficiently over a wide range of variation in such gas conditions. But a scrubber can accept hot gas and of course is indifferent to moisture content. Further, corrosion-resistant materials of construction can be used.

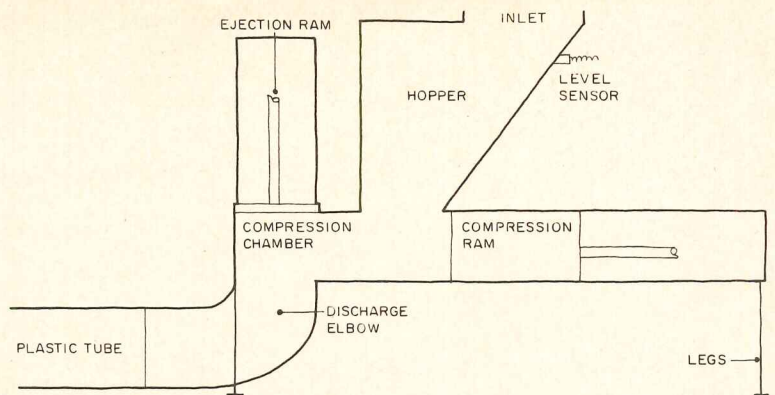
The term "scrubbing" is applied to a wide variety of operations, sometimes as elementary as simply spraying water into a flowing gas stream, or blowing the gas stream against a wetted baffle. But considerable sophistication is required to accomplish efficient particulate removal, at reasonable cost, in minimum space, without excessive water consumption.

For adequate performance it is necessary to be able to collect small as well as large particles. The smaller particles are, the more readily they are wafted to window sills, terraces, clotheslines, and other points. And, though the smallest particles may constitute a small proportion by weight of the total pollutants in a gas, unfortunately, the smaller the particles are, the more visible they are as they emerge from a chimney. This can be illustrated by imagining trying to see a falling penny from a block away, compared with an equal weight of talcum powder blown into the air.

It is also unfortunately true that the smaller particles are, the more difficult it is to scrub them out of gas. Small, lightweight particles can follow the gas stream around baffles, or even around water droplets. It is necessary to accelerate the gas, and mix the gas and water turbulently, so that particles will impact water droplets with sufficient momentum to penetrate and be captured.

Operation of the Research-Cottrell scrubber is typical of scrubbers designed by experienced manufacturers to incorporate the necessary features for small and medium-sized incinerators. Gas entering at as high as 1600F is quenched by a high-volume flow of water. Then it flows down through flooded venturis, accelerating the gas stream and causing the turbulent mixing necessary for impact between particles and

Operating principles are shown for a typical refuse compactor. Level sensor on hopper initiates cycle. Compression ram moves forward compressing material that has fallen out of hopper. Ram returns, allowing more material to fall from hopper, and moves forward again. Ram strokes continue until predetermined density has been reached, measured by the hydraulic pressure necessary to complete the ram stroke. Then the vertical ram forces compressed slug out of compression chamber. Slug may drop into can or other container which may in some designs be indexed into position by a "carousel" so that the custodian does not have to remove and replace each container as soon as it is filled.



water. Particles in the gas therefore become thoroughly wetted. Then the gas stream is made to flow up, the heavy wet particles drop into a sump.

The clean, wet gas continues through a mesh which causes mist droplets to coalesce into large drops which fall to the sump. Sludge moves down the inclined bottom of the sump and is periodically flushed through a sewer connection. A weir maintains sump water level, from which a pump recirculates water through filters to the quench spray and venturis. Water consumption is limited to that lost through evaporation and the periodic sump flush. The unit is shop-assembled and installed as a package occupying 6 sq. ft. of floor space, complete with sump, pump, and exhaust fan. Operation is automatic, requiring no attention beyond periodic maintenance.

The other current approach to refuse disposal—compaction

Compaction may be an acceptable alternate to incineration. It not only reduces volume substantially but reduces—though does not eliminate—odor and rodent attraction at dumps. Sanitary landfill techniques can minimize odor and rodent problems, though questions of the possible contamination of underground water supply may remain in many locations. Also, compaction may be advantageous to building owners in communities that do not yet require either incineration or compaction, if haulage and/or dump charges are based on volume rather than weight.

Where compaction is required, there is less agreement among communities on the desirable final density than exists on the standards for particulate content of incinerator gases. Inquiries received by Research-Cottrell from around the country mostly specify densities ranging from 500 to 750 pounds per cu. yd.

Most compactors now being utilized are to some degree automatic, and utilize hydraulic force for compaction. Some designs compact refuse by forcing it into containers. Others compact entirely within the unit, minimizing the possibility of container damage and spillage. In the Research-Cottrell compactor one or more strokes of a horizontal ram compresses the refuse into

a cohesive slug about 15 in. in diameter and 12 in. high. Then this ram remains in its forward position while a vertical ram ejects this compacted slug into an elbow attached to the unit. As additional slugs are ejected into the elbow, slugs are discharged from it into an expandable plastic sausage-type bag. The elongated bag is designed to permit tie-off to any desired length and weight.

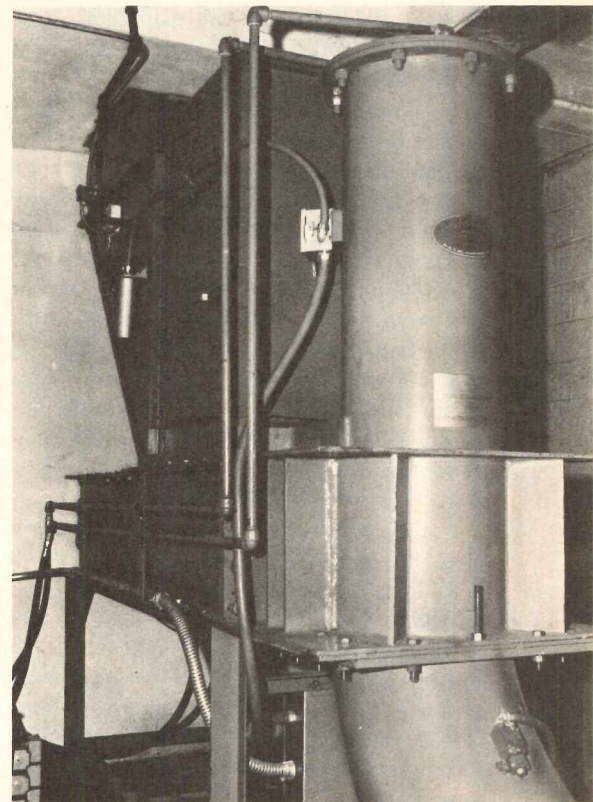
Because the refuse passes between the compactor directly to the plastic bags, odors, vermin and spillage, usually associated with cans, are eliminated. Operation is automatic, a cycle being initiated by a level-indicator in the hopper. Refuse slugs are compressed and forced into the expandable plastic bags—which can contain over 10 ft of slugs while the unit is unattended. A custodian only visits the installation periodically to remove and tie off the bags and place them for pickup.

Such a compactor can handle bottles, cans, broom handles, and similar items. If some unusually strong object should jam the compactor, the cycle automatically stops. Ram motion can then be controlled manually, to jog the object into more favorable position for compaction or to permit its removal. Various safety controls including automatic fire quenching are part of such a compactor installation, and, if desired or required, automatic spray devices can be included to dispense disinfectant, insecticide, and deodorant.

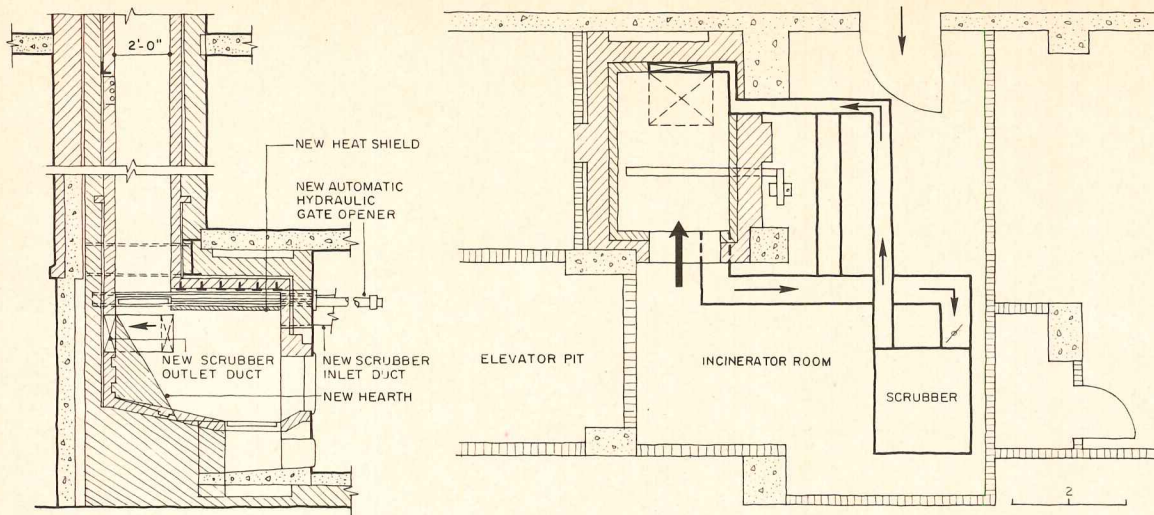
Some municipalities have shown preference for compaction rather than incineration plus air pollution control for an unscrupulous building owner or manager because it is physically possible to circumvent scrubber operation. A scrubber or other collector has to have a gas bypass for protection against excessive gas temperature, and it might be suspected that the bypass is being used at night when chimney emission cannot be visually detected.

Space requirements for scrubbers and compactors; quality considerations

A compactor requires somewhat less basement space than an incinerator and scrubber. Its installed cost is about the same as that of a scrubber. Operating costs are approximately equal. The water and auxiliary fuel cost of an incinerator and scrubber are



Installation of a refuse compactor of the type that completes compaction entirely within the unit. The refuse chute leads to the compactor hopper at the top left. Compression and slug ejection are accomplished by hydraulic rams, one horizontal and one in the vertical housing in the foreground. Hydraulic power is supplied by a separately-mounted pump, partially visible at the extreme left. In this design, slugs are forced through an elbow into a long plastic tube that maintains sanitary conditions between periodic custodial visits. When the custodian visits the otherwise automatic installation, he ties off the tube into individual bags containing one or more slugs, as dictated by handling methods, and installs a fresh plastic tube on the elbow.



Section shows details of an upgraded incinerator, as required by the New York City Housing Authority. Plan shows location of a scrubber in relation to the incinerator and other basement areas, typical of an installation in one of the apartment buildings operated by the Housing Authority. Drawings and specifications were developed by engineers Burns & Roe for the Housing Authority.

roughly balanced by the container handling when refuse is compacted rather than incinerated.

A typical compactor occupies floor space about 4 by 8 ft, exclusive of whatever provision may be made for automatic cycling of empty containers to its discharge point. It will fit under an 8-ft ceiling. Considering access space and provisions for separate mounting of its hydraulic motor and drive (which help reduce noise), automatic bag expansion and bag storage, at least 10 by 20 ft should be allowed. Compactors are only in one size, large enough for any non-industrial requirement. In small buildings, the unit simply operates less often than in a large building.

A typical scrubber is made in three sizes, the largest requiring less than 4 by 6 ft of floor space, plus clearance for access. Height to fan discharge is under 6 ft. The three sizes are rated 1500, 3000 and 6000 cfm of combustion gas at 1600F inlet temperature. These would conservatively handle apartment buildings of 400, 800, and 1600 rooms respectively, determined by New York City room count standards. Or they can handle buildings with 110, 220 or 440 bedrooms according to standards of the Incinerator Institute of America, based on burning three times a day.

Components are small enough to be carried through ordinary doors; then the units are assembled in place.

The best guarantee of good performance over a long life is an experienced manufacturer with a reputation for quality to be maintained. The general considerations involved in selection are performance, reliability, ease of maintenance, and trouble-free operation. Initial cost-cutting is almost certain to result in high operating costs, particularly with respect to custodial attention and repair labor and parts.

Important quality considerations for compactors are: Look for industrial-grade control and hydraulic components, products of well-known manufacturers. Compactor duty is rugged, so equipment designed for industrial duty is needed to assure long life. When service and parts are needed, downtime will be minimized if the components are those of a major manufacturer with extensive nationwide sales and

service representation.

Check provisions to avoid spillage. The optimum type of compactor is one which compacts entirely within the unit, rather than completing compression in the container. This allows use of paper and plastic containers and eliminates the danger of distorted or burst cans. A "carousel," "sausage tube", or other provision to automatically accept material from the compactor, reduces the frequency of need for custodial attention.

Automatically-actuated water spray or CO₂ fire extinguishing is a must, because fires in refuse chutes are common. An automatic deodorant dispenser is desirable.

The unit should be capable of compaction to at least 25 lb/cu ft, and should be ruggedly constructed, with generous hydraulic design, for years of service without distortion or excessive wear.

Look for design features to minimize operating noise. One of these is separate mounting of the hydraulic pump and its drive motor, with flexible hose connections to the compactor proper, so that motor and pump vibration are not transmitted to the sheet metal of the compactor, producing an airborne noise source.

Look for ease of access for servicing, cleaning, and dislodging of jams. A sufficiently powerful and rugged compactor will break up almost anything, but occasional jam-ups must be expected.

For adequate scrubber performance, turbulent mixing of gas and water via venturi- or orifice-plate devices is recommended to successfully remove small particles. A water recirculating system, while not essential, can significantly reduce operating cost. Generous sizing is important. Look for highly corrosion-resistant materials of construction, not only in the obvious areas but in details throughout the unit. Moisture is not the only problem; refuse contains sulfur which results in dilute sulfuric acid, and many man-made materials such as polyvinyl chloride plastics generate gases which result in dilute hydrochloric acid. As is true with compactors, rugged construction will pay off in long trouble-free life, and motors, switches, relays and similar components should be from well-known manufacturers.

IMPORTANT FEATURES OF INCINERATOR SCRUBBERS:

Excerpts from New York City Housing Authority specifications

1. The incinerator gas scrubber shall be based generally on the following operating principles:

- a) Thoroughly quench and wet the flue gas by means of low-pressure water sprays or a water bath.
- b) Increase velocity and turbulence of flue gas, entrained particulates and water droplets by constricting the area through which the mixture must pass.
- c) Impinge the gas mixture against a water surface, wetted plate, or against wetted walls of the scrubber.
- d) Reduce the velocity of the gas before passing mixture through water entrainment eliminators or mist separators.
- e) Discharge cleaned gas, free of entrained water and mists, through an induced draft fan to the gas exit duct.

2. The scrubber unit design and construction shall incorporate self-cleaning provisions to prevent plugging and minimize maintenance.

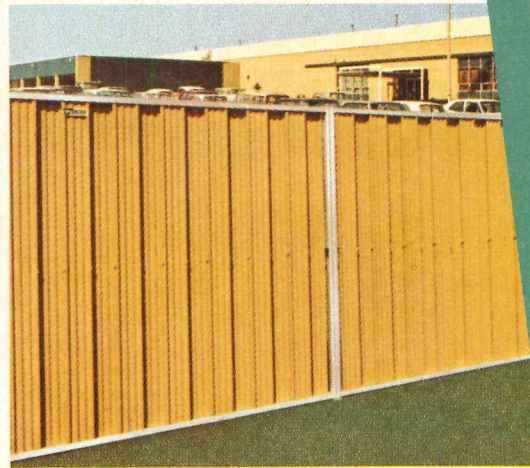
3. The scrubber unit and internal parts, including quench chamber, baffles, moisture separators, water storage tank, and all components in contact with water and/or incinerator products of combustion, except the induced draft fan, shall be fabricated from type 304 or type 316-L stainless steel of no. 14 gage minimum thickness.

4. Piping shall be stainless steel, flexible plastic or engineer-approved equal, specially selected for resistance to corrosion and erosion.

5. The induced draft fan shall be a heavy-duty, industrial, multi-blade, exhauster-type fan designed for maximum expected scrubber exit gas temperature. The fan housing shall be provided with a continuous drain return to the scrubber water tank. The fan shall be constructed of the following or engineer-approved equal materials: housing—type 316-L stainless steel or cast iron; hub—(same); blades and/or wheel—316-L stainless steel.

6. Vibration dampening mounts and supports shall be provided for the fan, pump and their drive motors.

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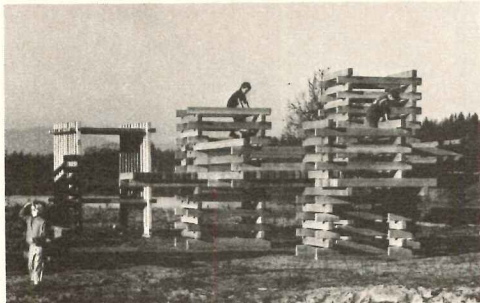
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For more information circle selected item numbers on Readers Service Inquiry Card, pages 195-196



PLAY AREAS / *TimberForm* modular pre-fabricated units can be attached to each other to form a large variety of total play environments (see photo above). They come in kits containing finished, preservative-treated Douglas fir and Malaysian hardwood members with chamfered ends and eased edges; all hardware is included. Sufficient weight and horizontal surface is provided to eliminate the need for footings or any foundation other than the mud sills included in the kit. ■ Niedermeyer-Martin Co., Portland, Oregon.

Circle 300 on inquiry card

"PROGRAMMED PILE" CARPET / *Allureau* is the first carpet to be made of "Programmed Pile," a new wool fiber designed to use less wool to get the same bulk, density and resilience. This is possible because of a recently developed machine that artificially produces extra crimp as a phase of the carding process before the fiber is spun into yarn. *Allureau* is intended for residential use, but 4 other carpets, including 2 contract carpets, using this specially processed wool are expected to be available in the Fall. ■ Karastan, New York City.

Circle 302 on inquiry card



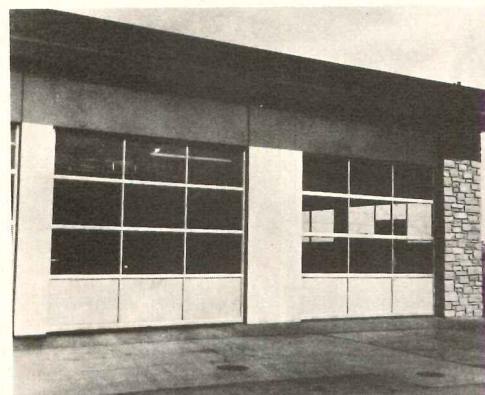
LIBRARY FURNITURE / Exposed structural end-frames of red oak accent this collection of library furniture which includes tables and chairs as well as such specialized items as card catalog assemblies, circulation desks and carrels. The cabinet surfaces are urethane coated for a tough, durable surface. ■ The Worden Co., Holland, Mich.

Circle 305 on inquiry card



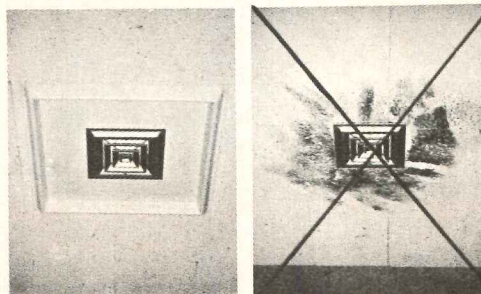
PLASTIC CAR BARRIERS / *Car Stop* traffic and parking control units made of polyethylene are corrosion resistant and easy to install because they are lightweight. They come with steel pegs for installation without need for special equipment, and are in 36 and 80 in. lengths. ■ Worden Co., Loudonville, N.Y.

Circle 303 on inquiry card



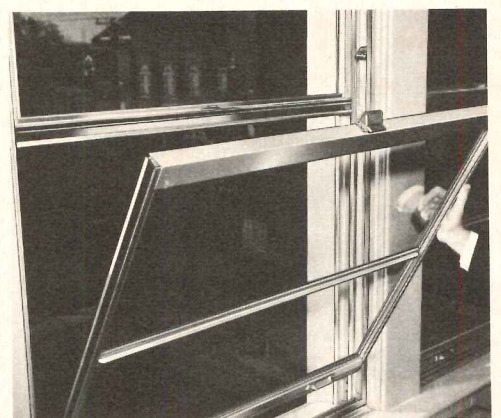
VERSATILE UPWARD-ACTING DOOR / This extruded aluminum upward-acting door is designed for adaptability and maximum strength for use in service stations and industrial and commercial buildings. The panels come in a variety of sizes, and combinations of glass, aluminum, fiberglass, louvers and exhaust port installations. The shape of the satin, anodized aluminum extrusions accommodates vinyl weather seals and gasketing to protect against leaks and rattles. Connections are double screwed, and all tracks, rollers, hinges, lift cables and other fixtures are heavy duty. The door easily accommodates hand chain and reduction gear for motor or mechanical operation. ■ Kinnear Corp., Columbus, Ohio.

Circle 301 on inquiry card



CEILING SHIELDS / These round or square protective shields are made to be installed around air vents. They are easily wiped clean and prevent dirt from becoming ingrained in acoustical or plaster surfaces. ■ Ceiling Protectors, Coral Gables, Fla.

Circle 304 on inquiry card

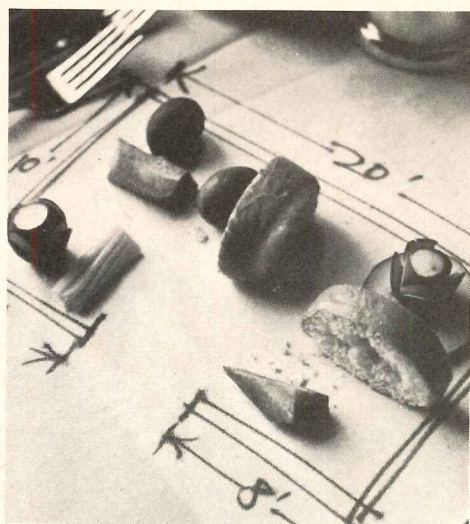


REPLACEMENT WINDOW / This aluminum replacement window can be installed in 2 hours, for it uses existing openings and does not require custom-hung millwork or remodelling. The double-hung unit is designed to raise on concealed balances and has permanently magnetized bars on both sash to make the window draft-proof. All exterior wood trim and sills are covered with heavy aluminum shielding. The window is made to tilt inward for cleaning from inside. ■ Georgia-Pacific Corp., Portland, Oregon.

Circle 306 in inquiry card

More products on page 142

continued from page 141



If your next project requires a laundry... why not plan and equip it on your lunch hour?

Simply have lunch with your American Sales Engineer. (Naturally, he'll be glad to buy.) Give him the necessary details. And forget it.

He'll be back in short order with complete floor plans, equipment recommendations and capacity data. And you'll find his recommendations reliable because American's complete line does not limit his choice of equipment to anything beyond, or short of, your client's needs.

He'll also supervise installation and see to it that your client's laundry stays in good working order. Parts, service and field engineering help are available . . . anytime . . . anywhere.

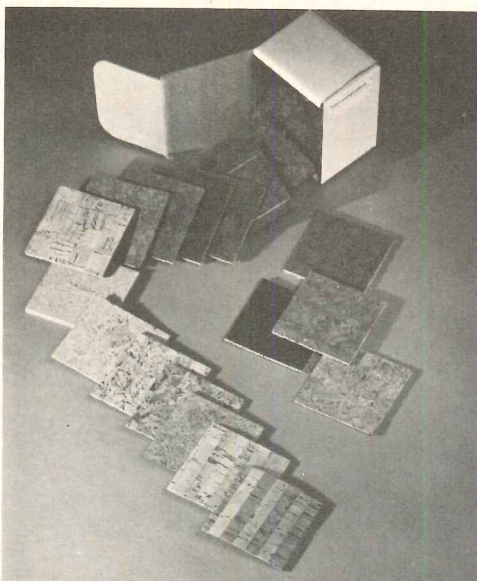
Put this professional on your staff. Just call your nearby American office or write: American Laundry Machinery Industries, Division of McGraw-Edison Company, 5050 Section Avenue, Cincinnati, Ohio 45212. And have an expensive lunch!

American
American Laundry Machinery Industries

For more data, circle 61 on inquiry card

WATER-BASED SEAMLESS FLOOR / This poured-on seamless floor consists of a pigmented base coat with vinyl chips throughout, covered with a thicker transparent acrylic plastic layer. Both layers are water-based and therefore non-toxic and non-flammable. The floor can be applied in one day and can take light traffic the next day and heavier traffic 24 hours after the last coat is applied. The fully hardened floor is slip-resistant yet high-gloss, non-static, stable to light, has a surface warmer than tile and resists common household chemicals. The system adheres to a wide range of materials including linoleum and vinyl-asbestos and asphalt tiles. ■ Morton Chemical Co., Chicago.

Circle 307 on inquiry card



CORK WALLCOVERINGS / 16 textures and colors of cork tile and sheets are available in different thicknesses and sizes to provide sound control and insulation as well as visual effect. All can be used as tack surfaces without affecting appearance. Samples are available. ■ Adam Cork Products, Northfield, Ill.

Circle 308 on inquiry card



DORMITORY FURNITURE / The *Astra* collection of dormitory furniture features surfaces of high-pressure plastic laminate for easy maintenance, and a 16-gauge steel center guide with nylon self-lubricating back plate and side guides on front rails. ■ R-Way Furniture Co., Sheboygan, Wis.

Circle 309 on inquiry card

R-WAY

OFFICE FURNITURE REPRESENTATIVES AND TERRITORY COVERED

WILLIAM J. CLANCEY, Eastern Sales Manager
EDWARD T. MOONEY, Representative
Space 1100, 192 Lexington Avenue—Showroom
New York, New York 10016 / 212—686-1424
Area: New York State (Albany To Port Jervis South, New York City), New Jersey (Trenton & North), Connecticut (Bridgeport & South)

JOHN VAN SICKLE, Midwest Sales Manager
Space 1100 Merchandise Mart—Showroom
Chicago, Illinois 60654 / 312—337-7736
Area: Indiana (Lake County Only), Illinois

JOHN BERWIND
Box 987—249 Cherokee Trail
Clarksville, Tennessee 37040 / 615—647-2028
Area: Tennessee, Arkansas, Northern Mississippi

WILLIAM M. BOLDING
22400 Norcrest Drive—Showroom
St. Clair Shores, Michigan 48080 / 313—771-7857
Area: Lower Michigan, Indiana (North of Hwy. 40)

LYNN P. CARLSON
3229 Anniston Drive
Cincinnati, Ohio 45211 / 513—922-5512
Area: Indiana (Hwy. 40 & South), Kentucky

TONY DEDIER
1355 Market Street—Showroom
San Francisco, California 94103 / 415—621-0159
Area: California (North of Santa Barbara), Nevada (Except Las Vegas), Hawaii

CHARLES EISEN
375 South Colorado Blvd.
Denver, Colorado 80222 / 303—388-0953
Area: Colorado, Wyoming, Utah, El Paso, Texas Only, New Mexico

ALBERT L. GOLDBLATT
11033 Westmore Circle—Showroom
Dallas, Texas 75230 / 214—361-4530
Area: Texas (Except El Paso), Oklahoma

KELLY-COSTELLO ASSOCIATES
Suite 1-B, Ryan Building
Wyncote, Pennsylvania 19095 / 215—885-1244
Area: New Jersey (South of Trenton), Pennsylvania (East of Altoona), Maryland, Delaware, Virginia & Washington, D. C.

HARVEY MILLER
15900 West 10 Mile Road
Southfield, Michigan 48075 / 313—352-1550
Area: Pennsylvania (Alltoona & West), Ohio (North of Route 40 Including Columbus)

WILLIAM JOHNSON
854-B6 Rue de La Paix
Cincinnati, Ohio 45220 / 513—541-8005
Area: West Virginia, Ohio (South of Route 40 Except Columbus)

WILLIAM J. MINTEN
3188 Camino Graciosa
Thousand Oaks, California 91360 / 805—495-6156
Area: California (Santa Barbara & South), Nevada (Las Vegas Only), Arizona

JAMES O'BRIEN
20 West 53rd Street
Kansas City, Missouri 64112 / 816—363-6711
Area: Missouri, Kansas, Nebraska, Iowa

ED PELLISSIER
3130 Paris Avenue—Showroom
New Orleans, Louisiana 70119 / 504—283-3456
Area: Southern Mississippi, Louisiana

JACK ROBINSON
P.O. Box 3784
7140 North Longacre Road
Milwaukee, Wisconsin 53201 / 414—352-5269
Area: Wisconsin, Upper Michigan

JOHN SCOTT
121 Boren Avenue North
Seattle, Washington 98109 / 206—623-1510
Area: Idaho, Oregon, Washington, Alaska, Montana

ROY MILBRAD
16701 31st Avenue, S.W.
Seattle, Washington 98166 / 206—243-0147
Area: Idaho, Oregon, Washington, Alaska, Montana

FRED SUMNER
2225 West 50th Street—Showroom
Minneapolis, Minnesota 55419 / 612—926-6371
Area: Minnesota, South Dakota, North Dakota

W. ALLAN WINSLADE
P.O. Box 11869
3125 Piedmont Road, N.E.
Atlanta, Georgia 30305 / 404—261-6414
Area: North Carolina, South Carolina, Alabama, Florida, Georgia

For more data, circle 62 on inquiry card

S.O.P.

Since 1881 the Standard Operating Procedure at R-Way has been to build the finest furniture possible. Styling and faultless craftsmanship are blended to create distinctive pieces that will enhance any office. The choicest woods, perfectly matched veneers and flawless finishes are combined to make R-Way a preferred source in the office furniture field. R-Way also produces a complete line of chairs, settees and occasional pieces to complement all desk styles.

S.O.P. at R-Way also means a large inventory for prompt delivery, blanket wrapped in R-Way trucks, plus custom designing in quantity orders. Write R-Way Furniture, Box 718, Sheboygan, Wisconsin 53081, for our catalog of contract furniture.

R-WAY



Showrooms in New York, Chicago, San Francisco, Denver, Detroit, Dallas, New Orleans, and Minneapolis.

SAVE 70% ON WASHROOM MAINTENANCE COSTS



"The installation of AllianceWall porcelain-on-steel panels will save us an estimated 70% in maintenance labor costs."

That's the prediction of the plant engineer at one of the world's largest manufacturing facilities who also made the following statement: "We tested these AllianceWall porcelain-on-steel panels for 10 months under the most punishing conditions and are convinced they are the most practical, economical material we could have chosen."

"These AllianceWall panels never require painting or

scrubbing and we proved to our satisfaction that steam cleaning won't harm their finish. We also found the panels are mar-proof, scratchproof and can't be written upon," he said.

AllianceWall porcelain-on-steel panels can be installed over existing walls by your own maintenance crew at a minimum of cost. The panels are fully protected under our standard guarantee. Panels won't corrode or appear to age. Choose from 107 standard colors that stay bright and new looking indefinitely.

For more information, including specifications,
check Sweets File or write to:

AllianceWall

AllianceWall Corporation

P.O. Box 247, Dept. PE, Alliance, Ohio 44601

For more data, circle 63 on inquiry card

FOR WALLS MEANT TO BE SEEN- NOT HEARD: NEW WALLCRAFT.

Wallcraft is the new soft wall covering from E. T. Barwick Industries. Unlike most wall coverings, Wallcraft is made of densely tufted or flocked man-made fibers on durable synthetic fabric backings. It can be applied to almost any wall surface of almost any shape. Application may be at the site or prefabricated on wallboard or partitions.

Wallcraft is ruggedly long-wearing and easily maintained. Vacuuming or simple detergent sponging are usually sufficient for cleaning. Sound absorption is unusually high,

too. Wallcraft absorbs up to 50% of the noise that hits it. It meets federal specifications for flame spread of less than .25.

Beautiful. Durable. Economical. Easily maintained. There's never been anything like Wallcraft, the quiet one from Barwick. Consider its advantages for schools, offices, hotels, shopping centers, nursing homes. For details contact: Wallcraft Contract Interiors, Division of E. T. Barwick Industries, Inc., Chamblee, Georgia 30341.

WALLCRAFT CONTRACT INTERIORS / A DIVISION OF E. T. BARWICK INDUSTRIES, INC.



Fashionwall. (shown above and below) Tufted loop-and-sheared pile of Acrilan® acrylic fiber. The ultimate in design and texture. 15 colors; solids, tweeds, and stripes.

Softwall. (background photo) Level loop nylon tufted on an olefin back. 3/16-inch pile height. Available in five solids, five pin stripes, and five tricolor stripes. Medium price. For areas of high-frequency noise: restaurants, hotels, offices.



Veltron. 17,000 nylon fiber ends per square inch electronically flocked on an olefin backing. Available in eleven colors in your choice of a velveteen or crushed velveteen appearance. Recommended for high traffic areas.

Textra for economy. Needle-punch pile of 70% olefin/30% PVC. Especially suitable for schools, office landscaping, and shopping centers. Available in ten coordinated colors.



WALLCRAFT

Wade DWV System Carriers are the very best that man and machine can make.

The industry bible for DWV systems is the Wade Specification Manual.

It tells you all about our Carriers. The specs, the types, everything you need to know in order to specify the Wade Carrier that's right for the system you're designing.

Our bible also gives you specification and product information on everything else we make. Everything from roof drains, to water hammer arrestors, to interceptors, cleanouts and floor drains.

All of these DWV system products are designed, engineered

and manufactured to the highest quality standards by the Wade Division of the Tyler team. The team that makes everything you need for a total cast iron DWV system.

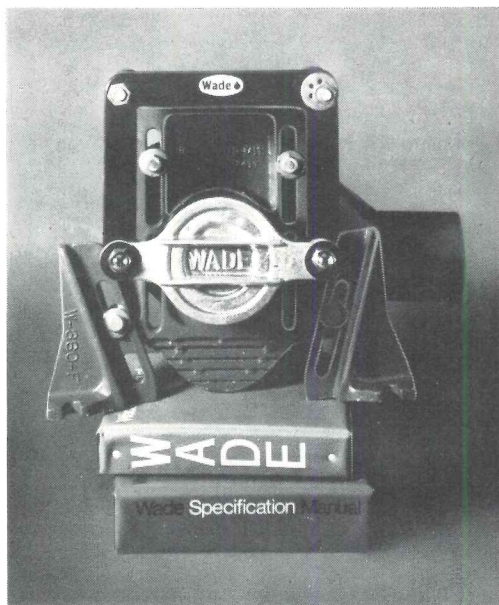
Things like cast iron soil pipe, No-Hub Couplings and TY-SEAL® Gaskets from our Soil Pipe Division and things like waterworks and municipal fittings from our Utilities Division.

Next time specify from the bible. To get your free, registered copy, simply write us on your letterhead.

If it goes into a cast iron DWV system, Tyler makes it.



Member, Plumbing and Drainage Institute



WADE DIVISION
TYLER
PIPE INDUSTRIES
P. O. BOX 1211 | TYLER, TEXAS 75701

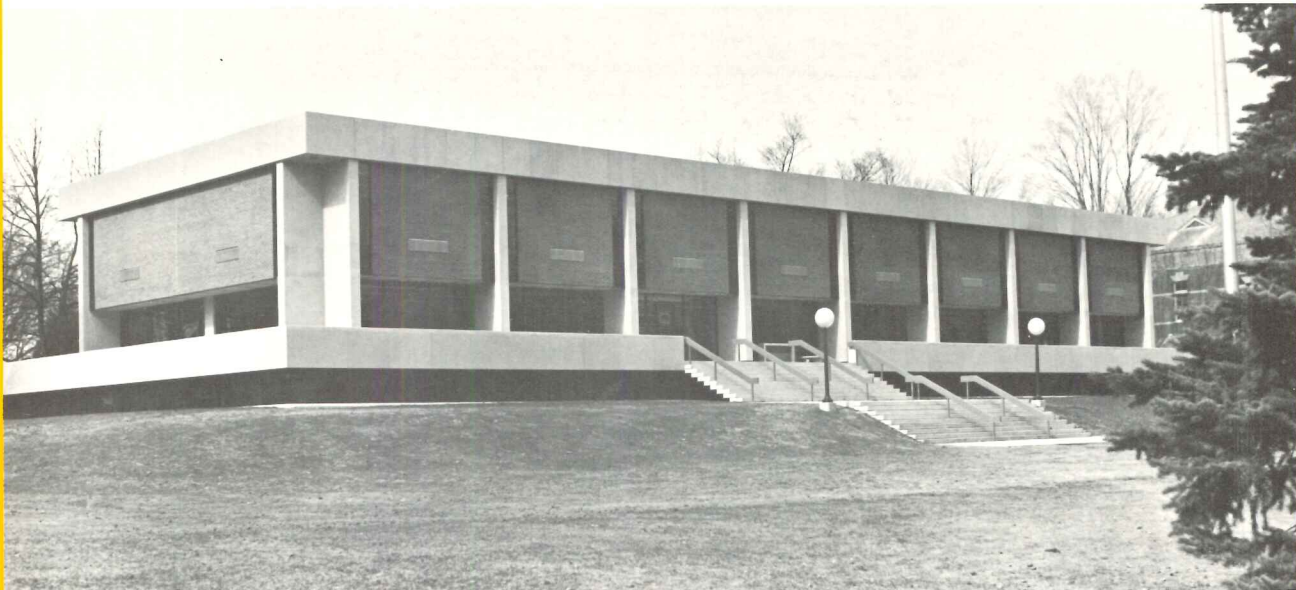


We swear to that on a stack of bibles.

Copyright Tyler Pipe Industries 1970

For more data, circle 65 on inquiry card

Versatile Electric System Provides Simultaneous Heating and Cooling in Dean Junior College Library



Dean Junior College Library in Franklin, Massachusetts—a handsome addition to the college campus.

PROJECT: Dean Junior College Library Building, Franklin, Massachusetts. **ARCHITECT:** Oscar R. Padjen, Beverly, Massachusetts. **CONSULTING ENGINEERS:** Anderson-Nichols & Co., Boston, Massachusetts.

DESIGN CHARGE: To design an “image” library building at the principal access to the campus, capable of accommodating 500 junior college students, 90,000 books, and 35 faculty offices for the Humanities and Social Science Departments.

DESIGN RESPONSE: Architect Oscar R. Padjen’s design is a handsome structure of Colonial red brick, limestone, and solar gray glass with 33,484 square feet of floor space on three levels. The middle floor, main entrance, and open promenade deck are just above campus level. The window areas are shaded from solar radiation by the overhang of the upper floor and the deep limestone column-piers. The lowest level, which is partly below grade, contains 35 faculty offices, numerous seminar and “team study” rooms, a media center for new techniques in learning, open random seating areas, and storage space.

The middle level contains a control and charging center, an all-night study room, reading areas, library offices, and book processing areas. The top level contains a periodicals center, reading, reference, and collection areas, and a kitchen and large multi-purpose room used for seminars, meetings, and social/recreational activities.

Electric through-the-wall heating/cooling units condition the perimeter areas of the two upper floors. The lowest floor and interior zones are served by independent ducted systems incorporating duct heaters and split-system air conditioning units with air-cooled condensers located outside the building. Electric baseboard units installed along exposed walls provide supplementary heating as needed.

Consulting engineer Ralph Trunfio says that the electric system was selected because it met the requirement of simultaneous heating and cooling, would be extremely quiet, would cost substantially less to buy and install than equivalent systems using flame fuels and as a result would cost about the same to own and operate. And, he adds, it is living up to all expectations regarding cost and performance.

Gentlemen:
 Please send the complete series of Electric Heating
 Case Histories as they become available
 to me at the following address:

Name and Profession:

Firm, University or other affiliation:

Address:

Zip Code:

1 CATEGORY OF STRUCTURE:
 Educational—Library Building

2 GENERAL DESCRIPTION:

Area: 33,484 sq ft
 Volume: 426,000 cu ft
 Number of floors: three
 Number of occupants: 500
 Number of rooms: 70
 Types of rooms: bookstack areas, reading rooms,
 faculty offices, study rooms, multi-purpose
 room, kitchen, technical resources center

3 CONSTRUCTION DETAILS:

Glass: double solar gray
 Exterior walls: brick and concrete block cavity
 wall, 1½" polyurethane insulation (R=11);
 U-factor: 0.06
 Roof and ceilings: built-up roof on 1" polyure-
 thane insulation (R=7), lightweight concrete
 on steel deck, suspended acoustical ceilings;
 U-factor: 0.10
 Floors: concrete slab and carpet
 Gross exposed wall area: 15,800 sq ft
 Glass area: 5300 sq ft

4 ENVIRONMENTAL DESIGN CONDITIONS:

Heating:
 Heat loss Btuh: 1,120,000
 Normal degree days: 6700
 Ventilation requirements: 9000 cfm
 Design conditions: - 5F outdoors; 75F indoors
Cooling:
 Heat gain Btuh: 1,400,000
 Ventilation requirements: 9000 cfm
 Design conditions: 91F dbt, 76F wbt outdoors;
 78F, 50% rh indoors

5 LIGHTING:

Levels in footcandles: 25-75
 Levels in watts/sq ft: 1-3
 Type: fluorescent and incandescent

6 HEATING AND COOLING SYSTEM:

Electric through-the-wall heating/cooling units
 condition the perimeter areas of the two higher
 floors. The lower floor and interior zones are
 served by independent ducted systems incorpo-
 rating duct heaters and split-system air condi-
 tioning units with air-cooled condensers located
 outside the building. Electric baseboard units in-
 stalled along exposed walls provide supplemen-
 tary heating.

7 ELECTRICAL SERVICE:

Type: underground
 Voltage: 277/480v, 3-phase, 4-wire, wye
 Metering: secondary

8 CONNECTED LOADS:

Heating & Cooling (150 tons)	440 kw
Lighting	65 kw
Cooking	12 kw
Water Heating	12 kw
TOTAL	529 kw

9 INSTALLED COST:*

General Work	\$539,720	\$16.10/sq ft
Elec., Mech., Etc.	204,800	6.13/sq ft
TOTALS	\$744,520	\$22.23/sq ft

*Building was completed 9/68

10 HOURS AND METHODS OF OPERATION:
 Building is occupied approximately 12 hours a
 day, seven days a week, the year around.

11 OPERATING COST:
 Period: 10/14/68 to 10/14/69
 Actual degree days: 6821
 Actual kwh: 826,800*
 Actual cost: \$12,855*
 Avg. cost per kwh: 1.55 cents*
 *For total electrical usage

Date Billing	Degree Days	kwh	Amount
11/14/68	581	69,300	\$ 1,114.00
12/16/68	1128	92,100	1,478.80
1/15/69	1324	120,900	1,796.20
2/13/69	1149	146,100	2,149.00
3/17/69	1221	23,700	382.80
5/14/69*	982	111,600	1,769.60
6/13/69	88	53,100	847.00
7/15/69	20	39,000	627.60
8/14/69		64,500	1,006.60
9/13/69	38	42,600	685.20
10/14/69	290	63,900	998.20
TOTALS	6821	826,800	\$12,855.00

*Two-month bill

12 FEATURES:
 Temperatures in each area are controlled by in-
 dependent zone thermostats and by a central
 clock programmer which turns off cooling and
 ventilation whenever the building is unoccupied
 during the summer and sets back temperatures
 for such periods in the heating season.

13 REASONS FOR INSTALLING ELECTRIC HEAT:
 The electric system was chosen to obtain the
 advantage of low capital expenditure, attention-
 free operation, simplicity of design and installa-
 tion, and completely flexible zone control.

14 PERSONNEL:
 Owner: Dean Junior College
 Architect: Oscar R. Padjen
 Consulting Engineers: Anderson-Nichols & Co.
 General Contractor: Fay Construction Co.
 Electrical Contractor: Balcom Electric Co.
 Mechanical Contractor: Boston Filter Co.
 Utility: Massachusetts Electric Company

15 PREPARED BY:
 John T. Casey, Local Sales Manager-Commercial,
 Massachusetts Electric Company.

16 VERIFIED BY:

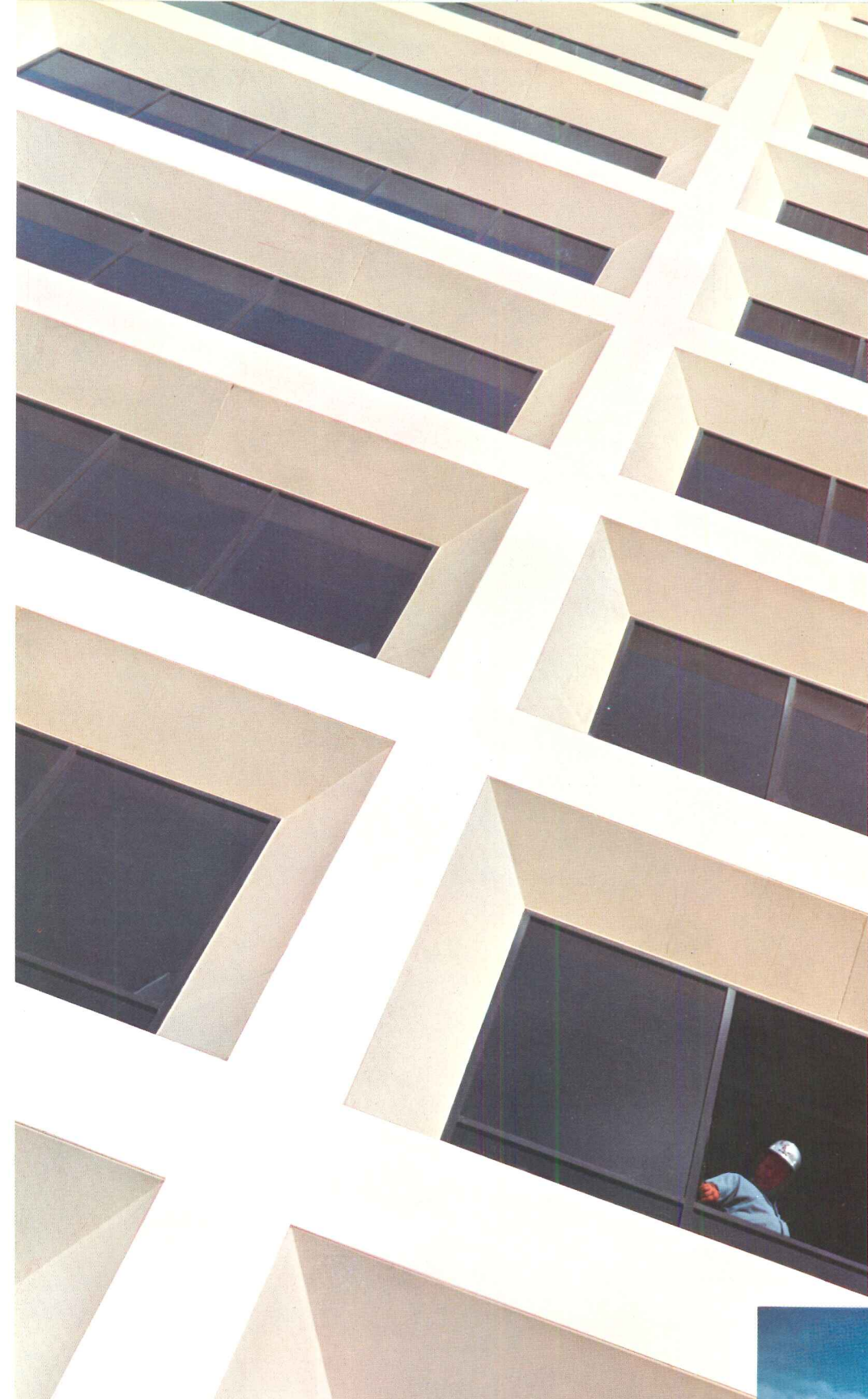


Oscar R. Padjen, AIA



NOTICE: This is one of a series of case histories of buildings in all structural categories. If you are an architect or consulting engineer; an architectural or engineering student; an educator; a government employee in the structural field; a builder or owner, you may receive the complete series free by filling out the strip coupon at the left and mailing it to EHA. If you are not in one of the above categories, you may receive the series at nominal cost.

ELECTRIC HEATING ASSOCIATION, INC. 437 Madison Avenue, N. Y., N. Y. 10022



Architects: Charles Luckman Associates,
Los Angeles
Engineer: Erkel/Greensfield and Associates,
Los Angeles
Wall Fabricator: Soulé Steel Co., San Francisco
General Contractor: Security Builders,
Beverly Hills

**These columns and spandrels
are covered with
porcelain-enameled steel**

Here is Century 21 Center, in
Los Angeles, a stately 15-story
structure with a subtle difference.

The difference shines out from the
crisp column and spandrel covers,
which were developed in
porcelain-enameled steel panels.
Porcelain-on-steel was chosen
because it offered better performance.
And it proved more economical
than other materials.

Porcelain-enameled steel is strong,
yet light in weight. It consumes a
minimum of space, is quick and easy to
install, stays clean and new-looking.
It can be designed in myriad colors
and textures and embossments,
permitting broad latitude in
architectural expression.

Bethlehem supplies special
enameling sheets to fabricators who
form and coat architectural panels.
Write us for a copy of the Porcelain
Enamel Institute's brochure on the
new matte-finish Nature-tone hues.
Bethlehem Steel Corporation,
Bethlehem, PA 18016.



**BETHLEHEM
STEEL**

**Porcelain-on-Steel
in Los Angeles**



Where there are lots of people, there's lots of refuse.



There's a better way to handle it and cut costs, too.

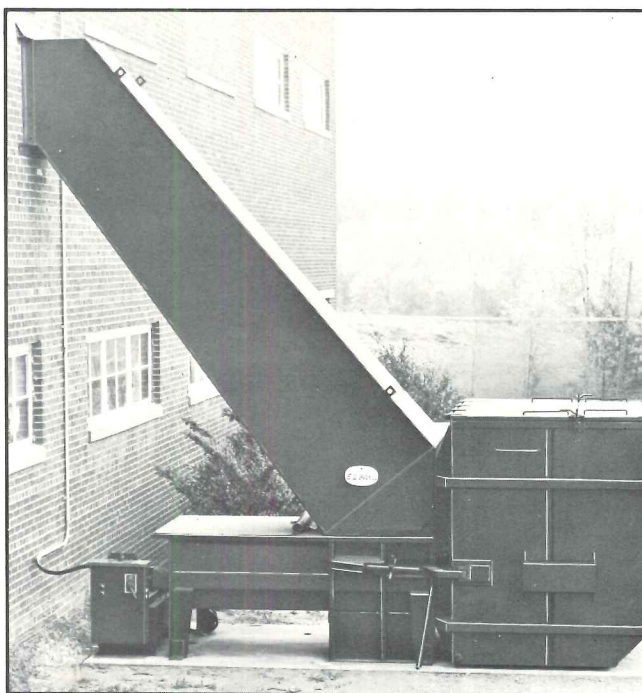
Hospitals, hotels, schools, restaurants.

An E-Z Pack Stationary Compaction system economically solves the problem of what to do with the growing amounts of refuse.

Refuse is simply dumped into the compactor hopper, then compacted to a fraction of its size in a closed, detachable container.

No more mess. No more unsightly, unsanitary trash areas. No more air pollution due to incineration. And since more refuse is stored in less area, added space is available for more profitable use.

Ask one of our experts to survey your building. He'll recommend the E-Z Pack collection/compaction/container system for the cleanest, most economical refuse handling. E-Z PACK COMPANY, Division of Peabody Galion Corporation, Galion, Ohio 44833



**THE AUTHORITY ON REFUSE REMOVAL
EQUIPMENT AND SYSTEMS**

For more data, circle 66 on inquiry card



Series 8100

Architectural simplicity is enriched with the warmth of tone and texture. Char Bronze, Mirror Chrome . . . walnut, rosewood, teak . . . mix the finishes as you will to complement the crispness of this design. The options are yours; so are the opportunities.

alma

See this and other Alma Series in our showrooms in High Point and Chicago (Space 1140, Merchandise Mart). You may consult our catalogs in Sweet's Interior Design File or write Alma Desk Company, Dept. AR-04, Box 271, High Point, N. C. 27261.

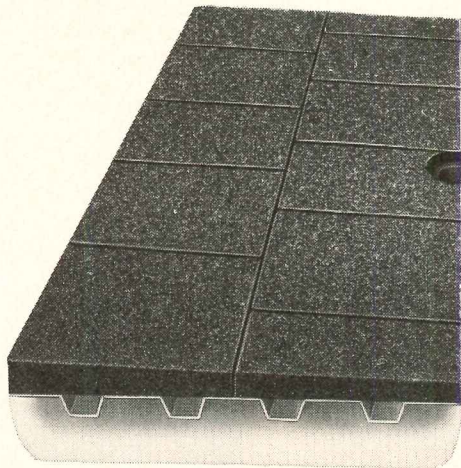


DON'T LET YOUR ROOF TURN INTO A POND.

**SPECIFY
TAPERED
FOAMGLAS[®]
INSULATION**

Tapered FOAMGLAS automatically slopes a flat deck for positive drainage. The roofer simply places factory-tapered FOAMGLAS and roofs over immediately. An added advantage: single-contractor responsibility.

FOAMGLAS is completely waterproof, strong and dimensionally stable, so it's an excellent base for built-up roofing. It's guaranteed. For further information, contact Pittsburgh Corning Corporation, Dept. AR-70 One Gateway Center, Pittsburgh, Pa. 15222.



For more data, circle 68 on inquiry card

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 195-196

HOSPITAL ELECTRICAL SYSTEMS / A 16-page specification guide for the design, specification and installation of hospital electrical isolating systems gives new standards and anticipated codes which will be required in operating rooms, intensive care units, coronary care units and portable X-ray locations. Model specifications are included. ■ Sorgel Electric Corp., Milwaukee.

Circle 400 on inquiry card

HUD CARTRIDGE / A cartridge featuring information from the U.S. Department of Housing and Urban Development contains 3,655 pages of material covering 42 booklets, pamphlets and brochures. Reduced to 16mm roll film, the cartridge carries its own index on film, permitting the material to be retrieved, viewed and reproduced instantly with a 3M reader-printer. ■ Showcase Corp., Detroit.

Circle 401 on inquiry card

WATER COOLERS / An 8-page brochure describes a complete line of pressure water coolers and accessories for commercial, industrial and institutional use. An application chart is included. ■ General Electric Company, Chicago Heights, Ill.*

Circle 402 on inquiry card

LOUVERS / Described in a 36-page catalog is a complete line of aluminum louvers, fixed and operating, for all air-handling requirements. Included is a 4-page section presenting information on a variety of aluminum screening systems designed for the sight-screening of cooling towers and mechanical equipment. Complete louver and screening specifications, detailed drawings and performance data are included. ■ Construction Specialties, Inc., Cranford, N.J.*

Circle 403 on inquiry card

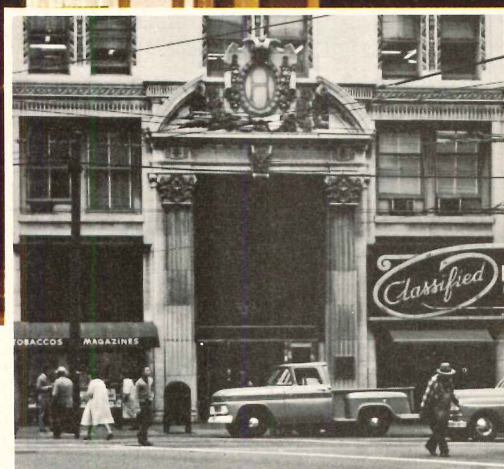
COMMUNITY DEVELOPMENT / "New Communities," a publication listing over 600 reference sources on new towns and cities, published by the U.S. Department of Housing and Urban Development, contains cross-indexed references to books, magazine articles, conference proceedings, studies, and documents. This 84-page bibliography may be purchased for \$.75. ■ Write Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

ROLLING DOORS / A 20-page brochure presents a line of rolling metal and fire doors, rolling grilles, rolling pass window shutters in standard and packaged units, fire shutters and sliding grilles. All products are available in galvanized steel, aluminum, and stainless steel in a wide range of sizes. ■ Cornell Iron Works, Inc., Wilkes-Barre, Pa.*

Circle 404 on inquiry card

* Additional product information in Sweet's Architectural File

more literature on page 170



The \$1200 face lift

Here's how M. Arthur Gensler, Jr. & Associates, Architects, lifted 60 years off the appearance of the Hearst Building in San Francisco. Instead of making costly structural changes, they used canvas to cover the multiple store signs that cluttered the street floor. The result: a fresh, clean, unified look in keeping with the character of the fine old building.

Steel tubing with welded connections provides all the

support needed, so there's greater design freedom at far less cost than with heavier building materials. The fabric is a 10.10 ounce, all-cotton army duck, acrylic painted and treated to weather any outdoor job.

Whenever one of your remodeling projects calls for a complete face lift, talk it over with a canvas products manufacturer. He has what it takes to handle the whole operation without a wrinkle.

AMERICAN CANVAS INSTITUTE AND COTTON PRODUCERS INSTITUTE
Memphis, Tennessee



For more data, circle 69 on inquiry card

LCN

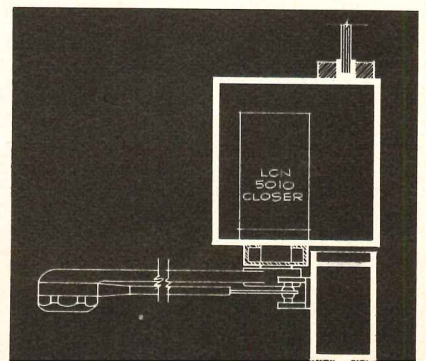



Photo: Builders Exchange of Rochester, New York, Inc. • Myron E. Starks, Architect, Rochester, New York.

A door closer doesn't have to be seen

to do its job with competence. The photograph shows a door that's controlled by an LCN 5010 Overhead Concealed Closer. The striking design of the entrance is fully protected by the hidden mechanism that keeps this door under full control. On your next building talk to your hardware consultant. He's fully aware of the products of LCN Closers, Princeton, Illinois 61356.

For more data, circle 70 on inquiry card



A close-up photograph of a man with blue eyes and a light beard, wearing a blue button-down shirt. He is holding two pieces of moulding material. In his right hand, he holds a piece of light-colored wood that is cracked and splintered. In his left hand, he holds a piece of smooth, light-colored PVC moulding that is curved and intact. The background is dark and out of focus.

Gossen's new
PVC mouldings
have an edge
over wood.

Gossen is introducing a new kind of material for mouldings to the residential and manufactured housing markets. And you can't blame the competition for cracking under the strain.

Gossen uses VYCELL® resin, Goodyear Chemicals' new *cellular* PVC compound. It gives mouldings the look, feel and workability of wood. But they won't crack, split, warp or shrink. Or support combustion.

Strong sales advantages. And VYCELL offers Gossen production advantages, too.

It takes six steps to extrude and prefinish a wooden moulding. It takes Gossen just *one* step with VYCELL. Sizes and shapes can be changed simply by changing dies. Length can be unlimited.

Inventory is reduced from a lumberyard of different woods to a convenient supply of VYCELL. And where wood prices are

high and variable, VYCELL is inexpensive and stable. It gives Gossen all the breaks.

Proof again of Goodyear Chemicals' track record in getting to market with technological advances. Why not put our experience to work for you?

Call Hal Allick, Manager of our Plastics Department, at 216-794-4867. Or write Goodyear Chemicals Data Center, Dept. S-84, P.O. Box 9115, Akron, Ohio 44305.

Get your selling edge from Goodyear Chemicals

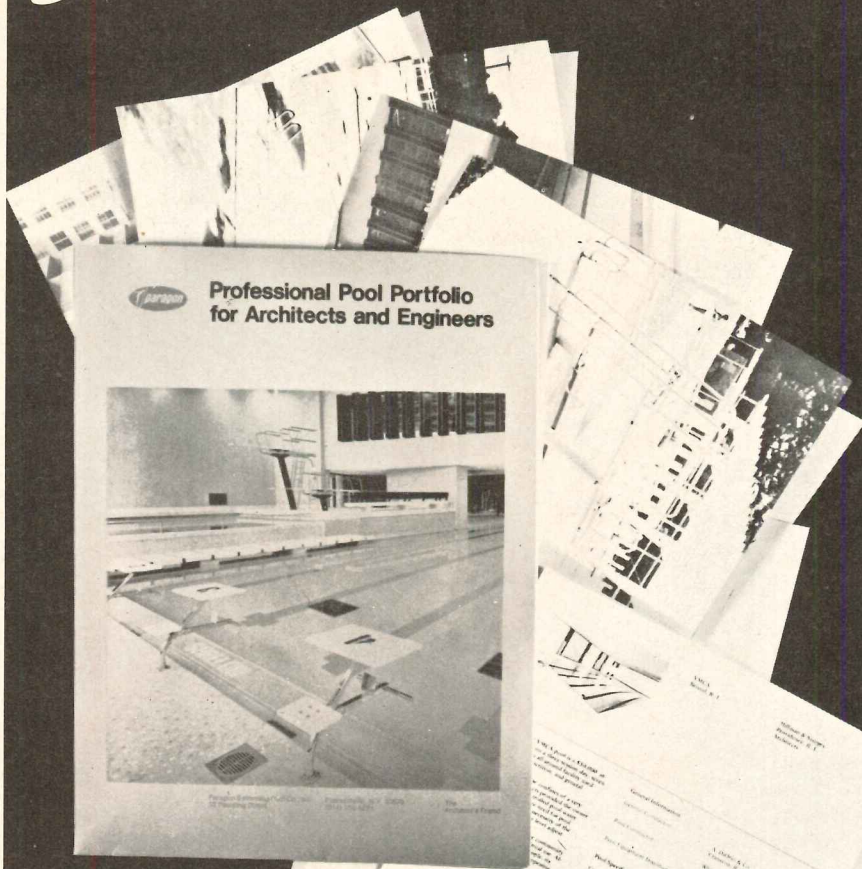
VYCELL—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

For more data, circle 71 on inquiry card

MUST READING

for Architects and Engineers who design

SWIMMING POOLS



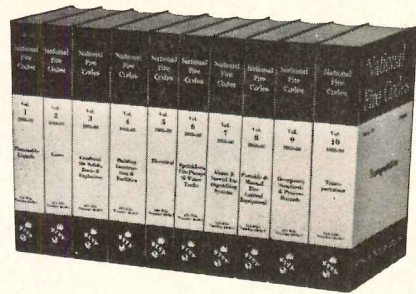
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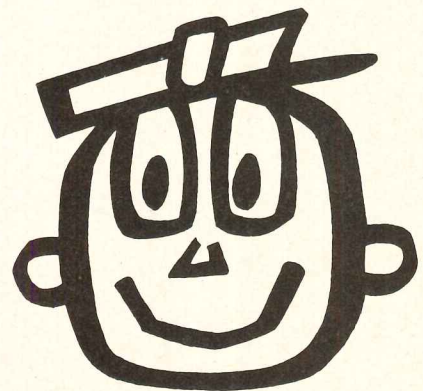


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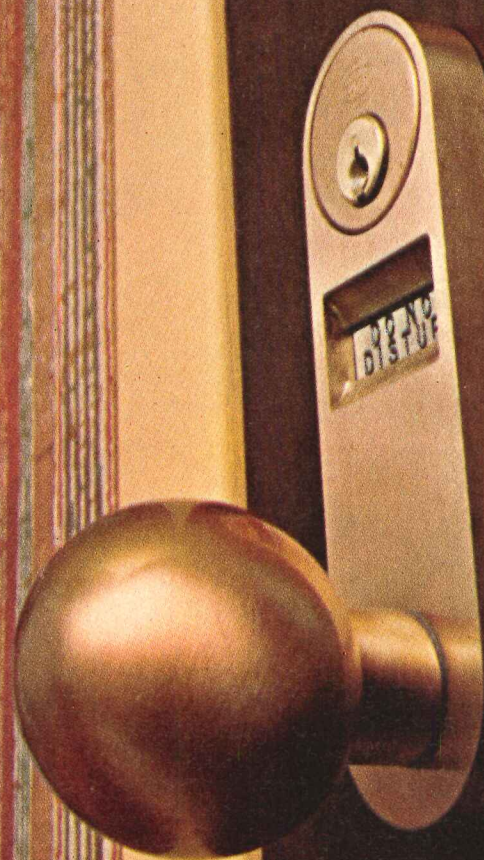
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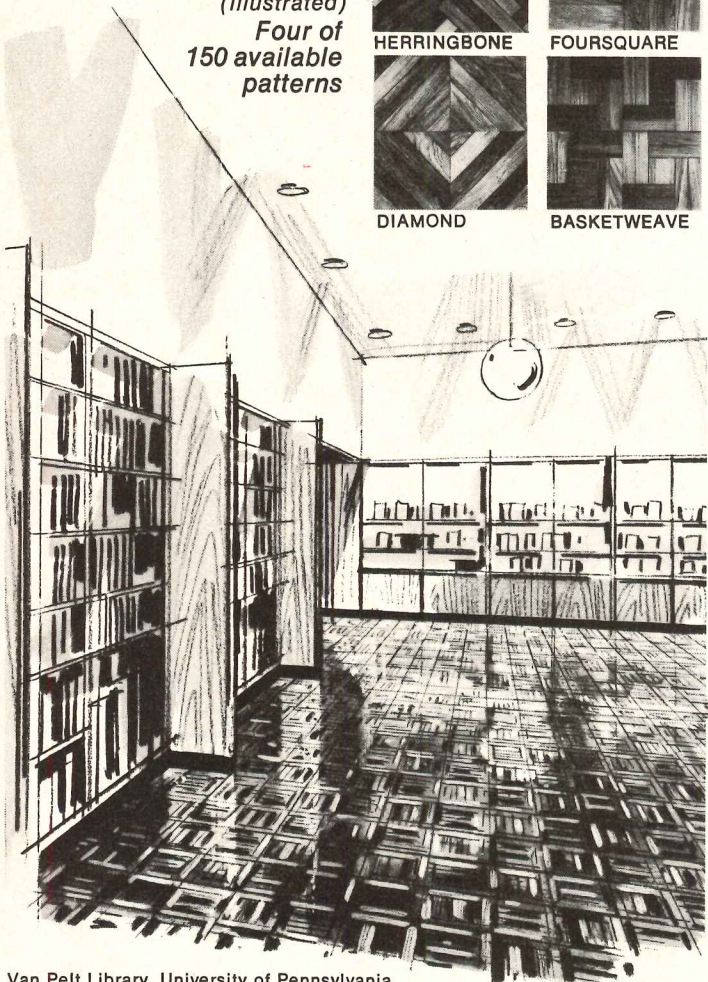
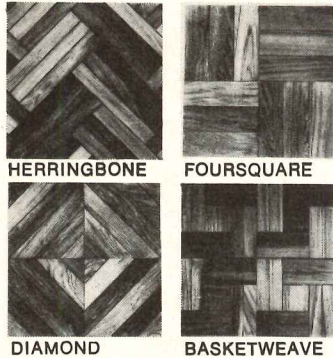
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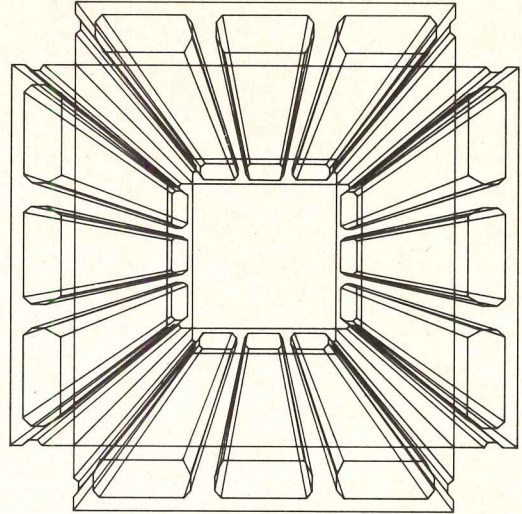
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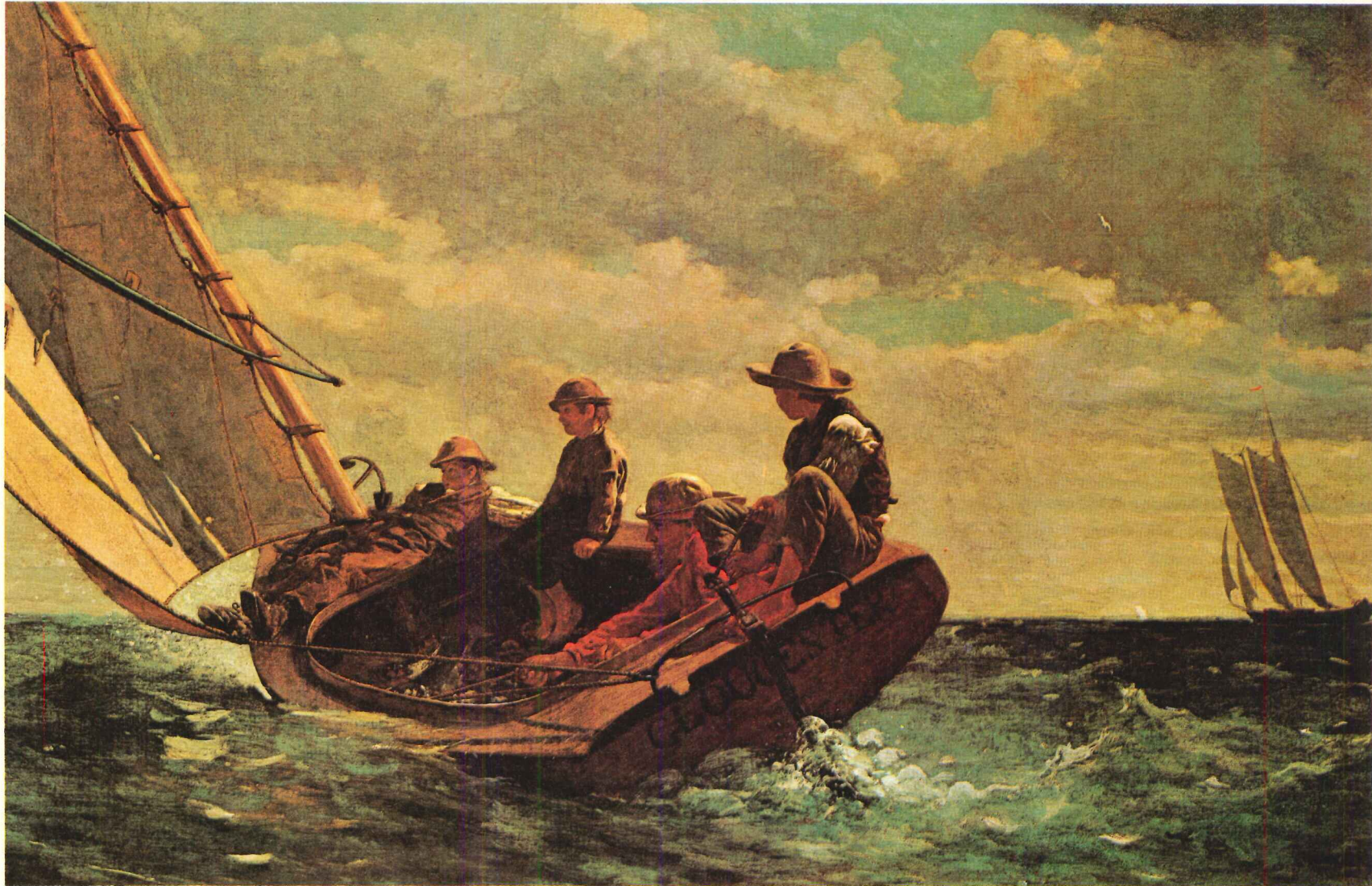


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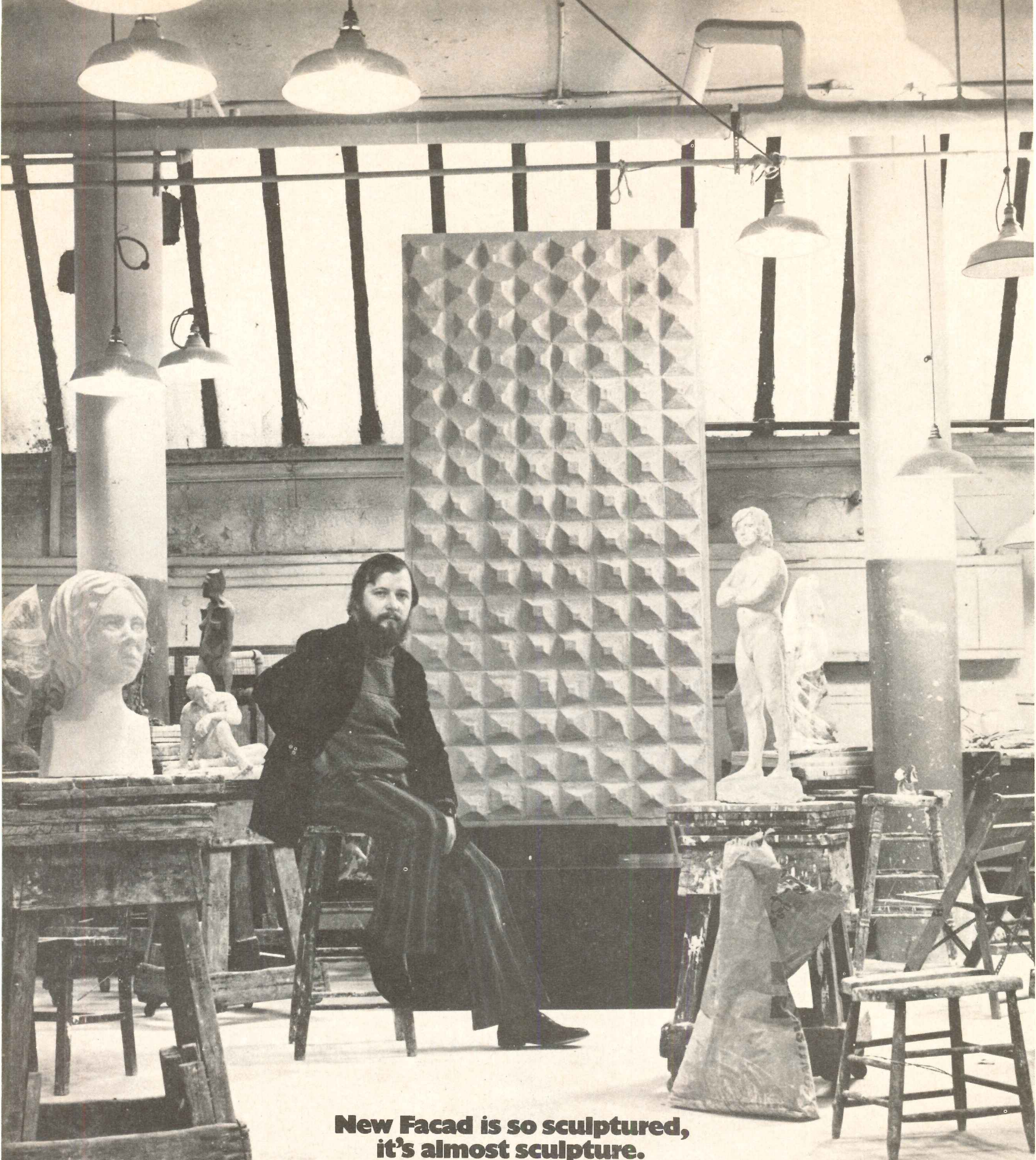


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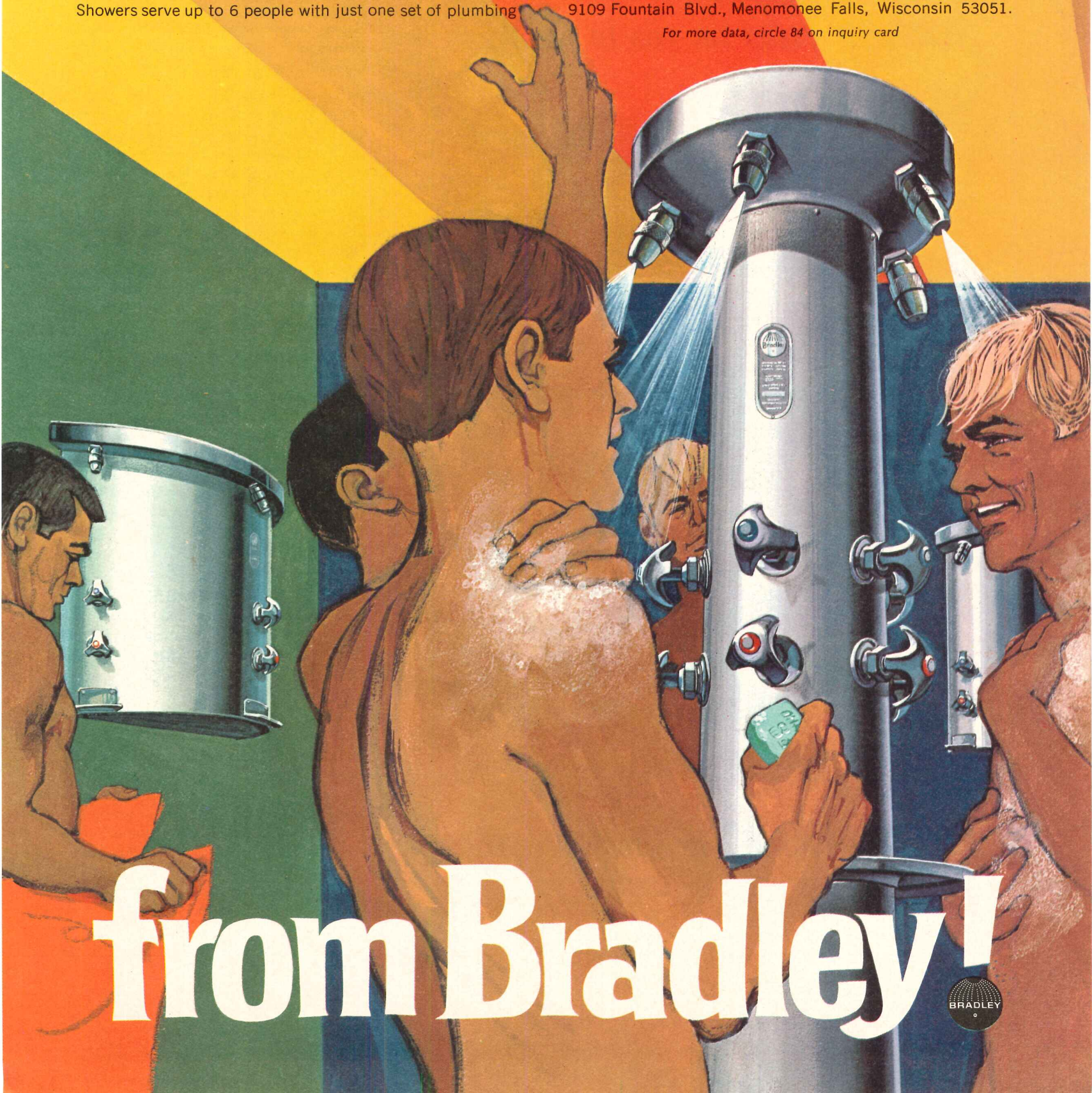
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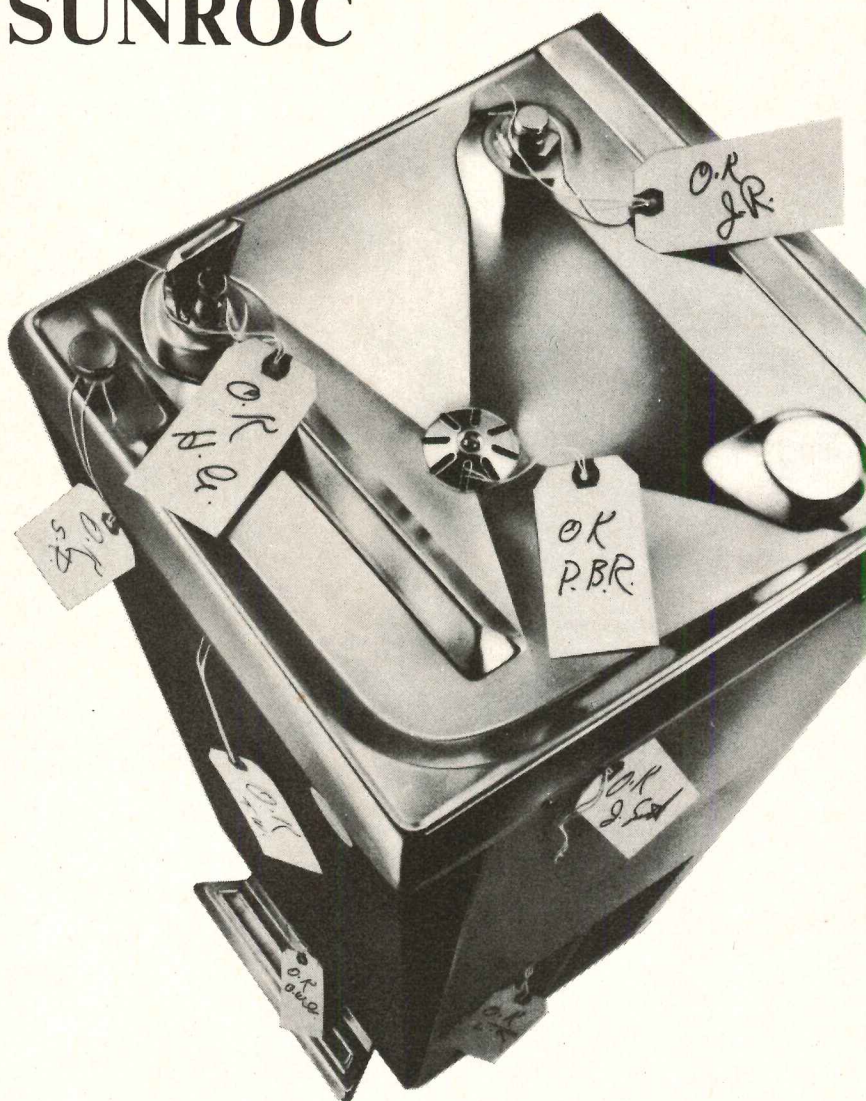




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SECURITY SYSTEMS / A 4-page brochure features a line of ultrasonic intrusion alarm equipment. Data on protection accessories which may be used as optional security devices on the ultrasonic sensors is given. These accessories include quartz iodine lamps, sirens and bells, heat sensors, key-lock switches and magnetic door switches. The brochure contains a section on security systems cameras. ■ Bourns Security Systems, Inc., Smithtown, N.Y.

Circle 405 on inquiry card

LAMINATED WOOD / A 6-page guide to the proper use of laminated wood over solid wood in the selection of structural beams describes a line of laminated wood beams, giving information on the species, grades and dimensions available. ■ Potlatch Forests, Inc., San Francisco.*

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RECREATION RESEARCH / The third outdoor recreation research reference catalog published by the Department of the Interior's Bureau of Outdoor Recreation and the Smithsonian Institution's Science Information Exchange contains brief descriptions of 371 completed outdoor recreation and related environmental research projects. Projects reported include those completed as recently as July 1969. \$1.25. ■ Write Superintendent of Documents, Government Printing Office, Washington, D.C. 20402

SCHOOL PARTITION SYSTEM / A 4-page brochure illustrates an operable partition system for schools. Designed to adapt to changing space requirements and provide sound control, the partition system is composed of acoustical operable walls featuring fixed horizontal seals and deep tongue and groove aluminum astragal, folding partitions with manual or electric operation and a self-supporting beam system. ■ New Castle Products, New Castle, Ind.*

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BATHROOM COMPONENTS / A line of toilet compartments, urinal screens and dressing enclosures is described in a catalog showing renderings, work scope and installation data. Also included are detail drawings, hardware and electrical information. ■ Formica Corp., Cincinnati.*

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AGGREGATE / Described in a 6-page brochure is a line of resin-bonded, exposed aggregate facing panels. Interior and exterior applications of the panels are shown and installation details are presented. Featured is a cut-away photo of a typical panel showing construction features. Ten standard quartz and granite aggregate colors are presented. ■ Martec Corporation, Erie, Pa.

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* Additional product information in Sweet's Architectural File



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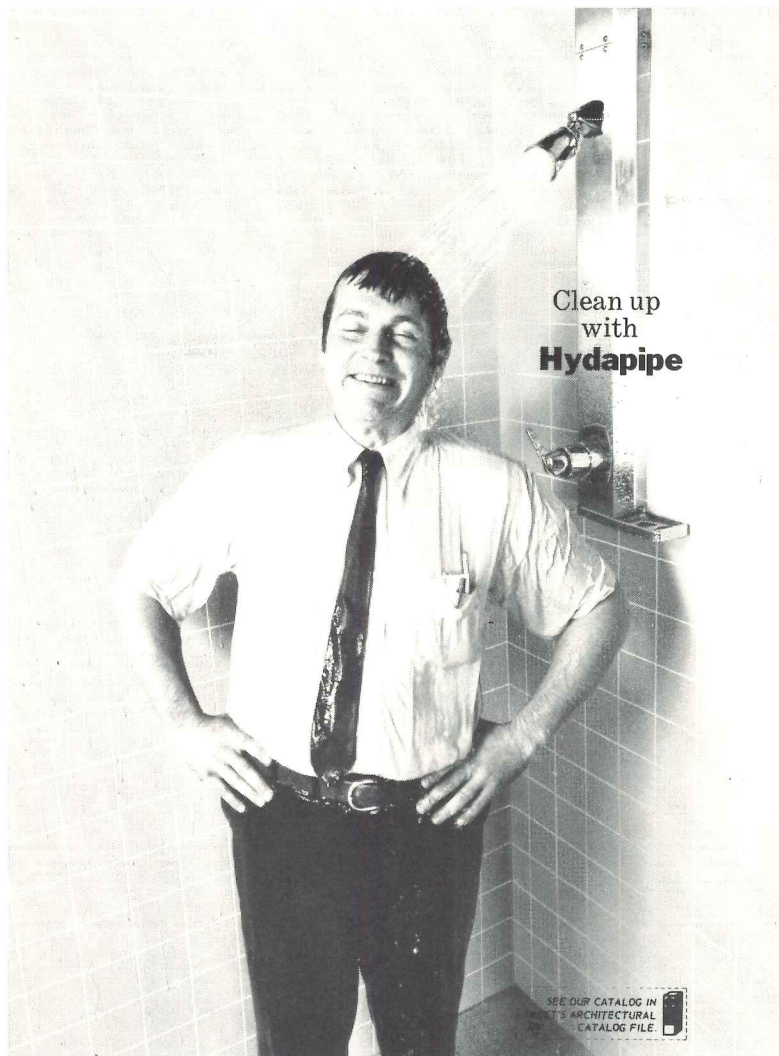
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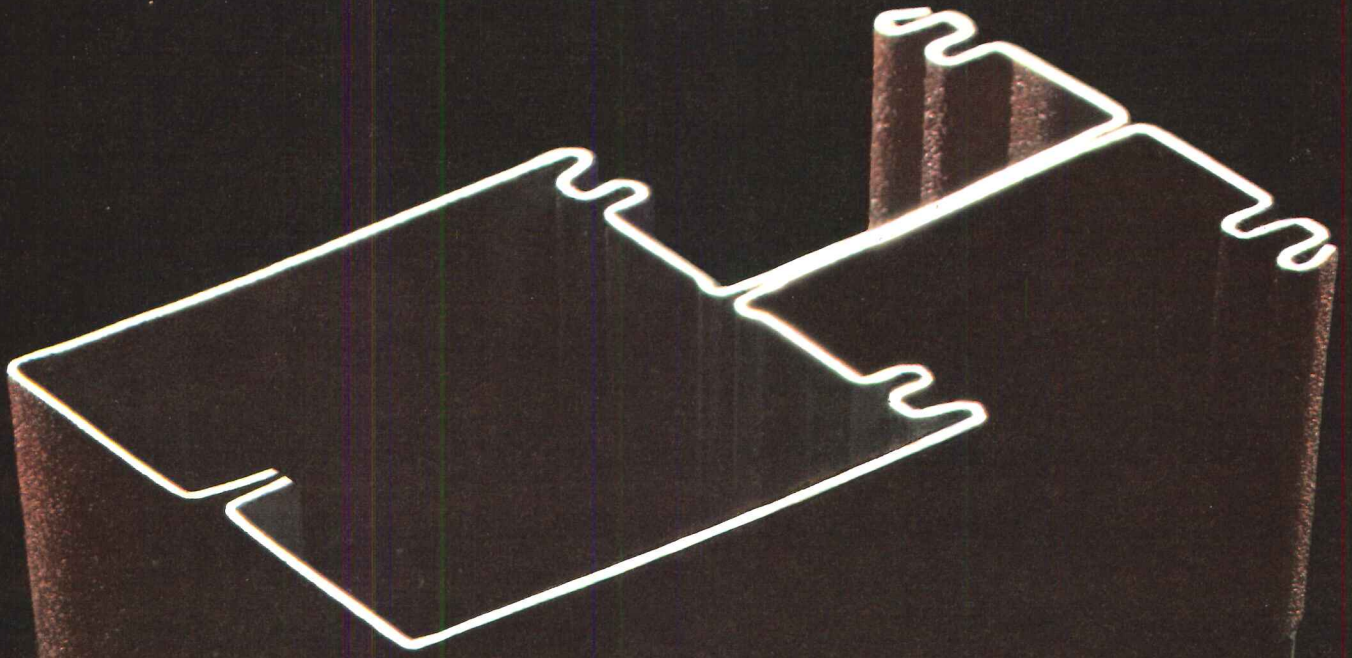
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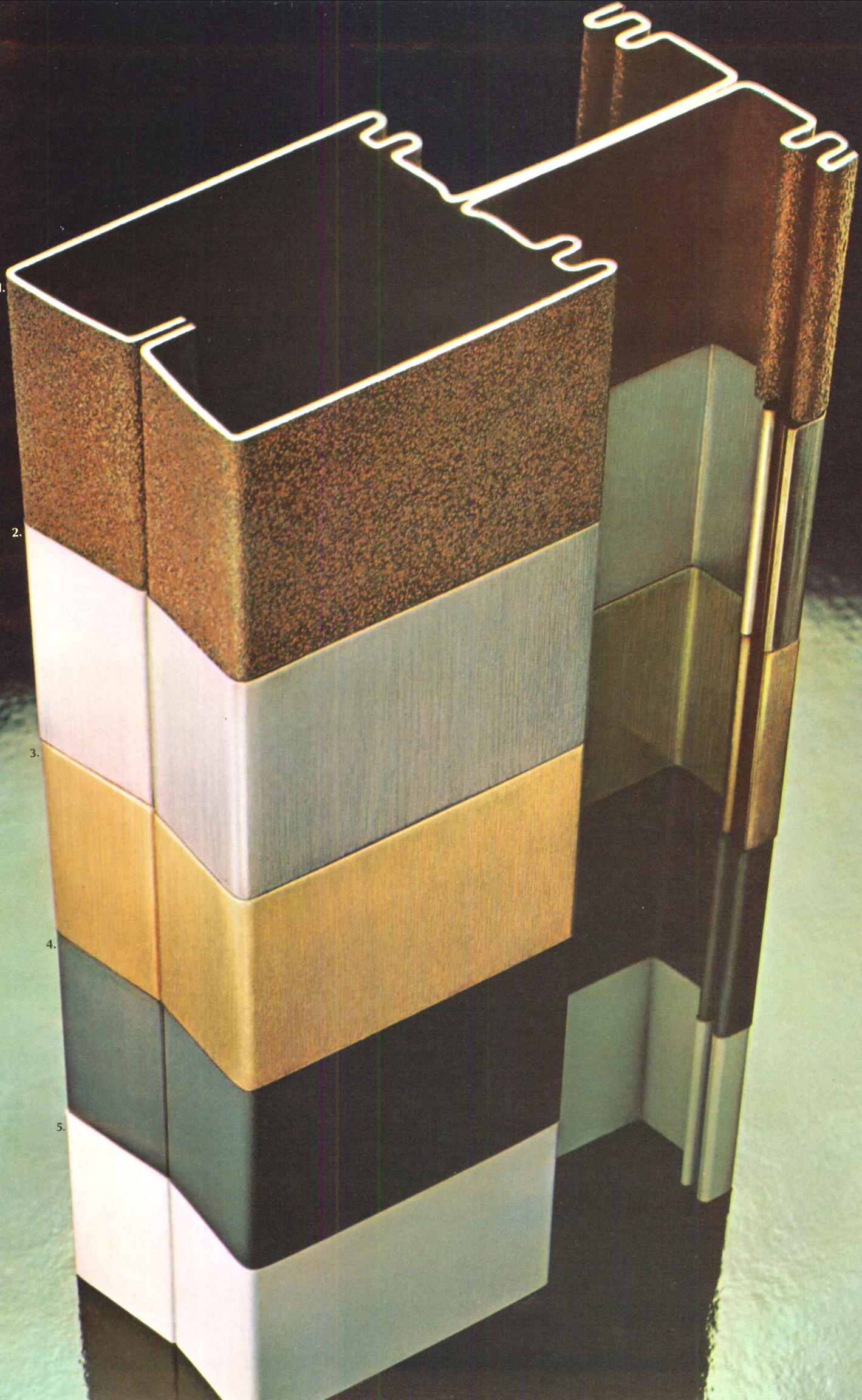
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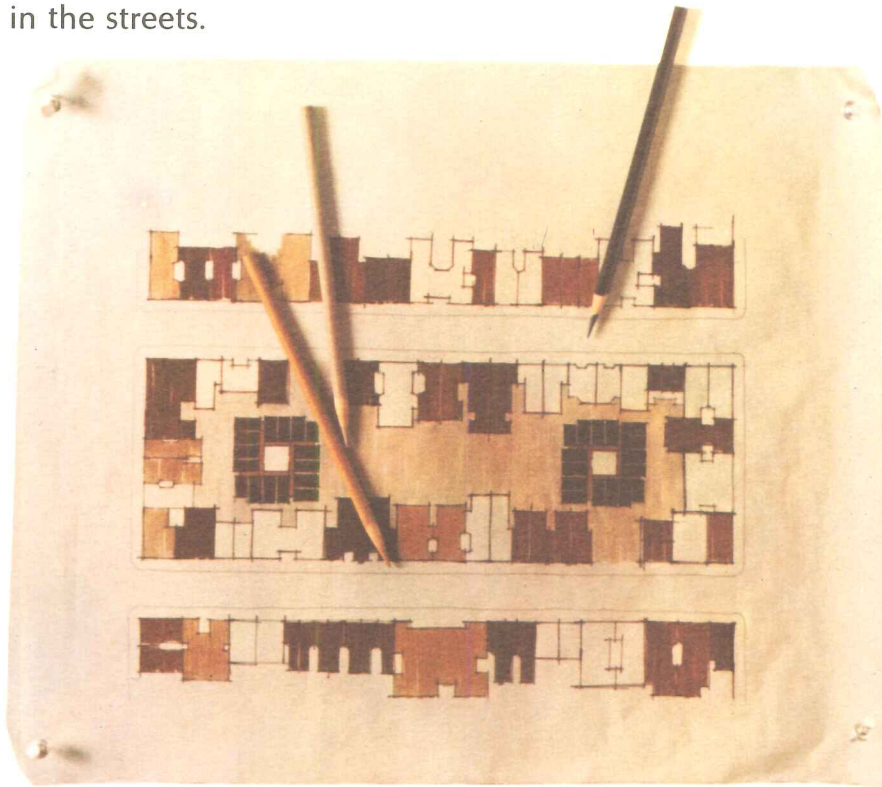
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Procedure:

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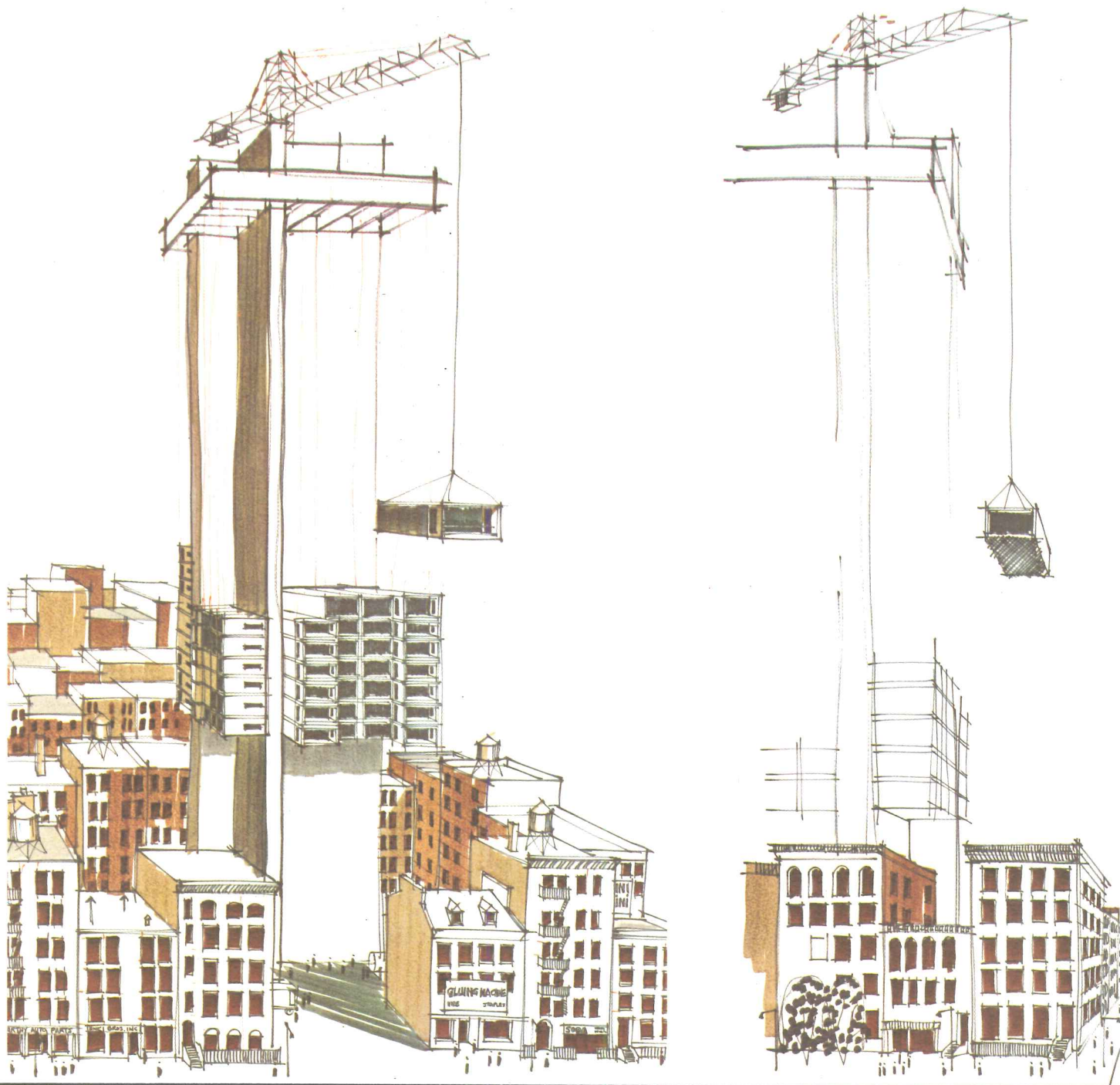
Relocate the occupants of *only* one or two buildings on street frontages if they have to be razed for access to the rear-yard site of new construction.

Pour the foundation and the slip form concrete core which will be the supporting structure and contain elevators, exit stairs and halls for the dwelling units which

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Construct a structure to support the dwelling units to be hung below.

While core construction is proceeding, manufacture the dwelling units in an off-site location using materials and methods most suitable for complete fabrication including equipment, built-in appliances and cabinet work,

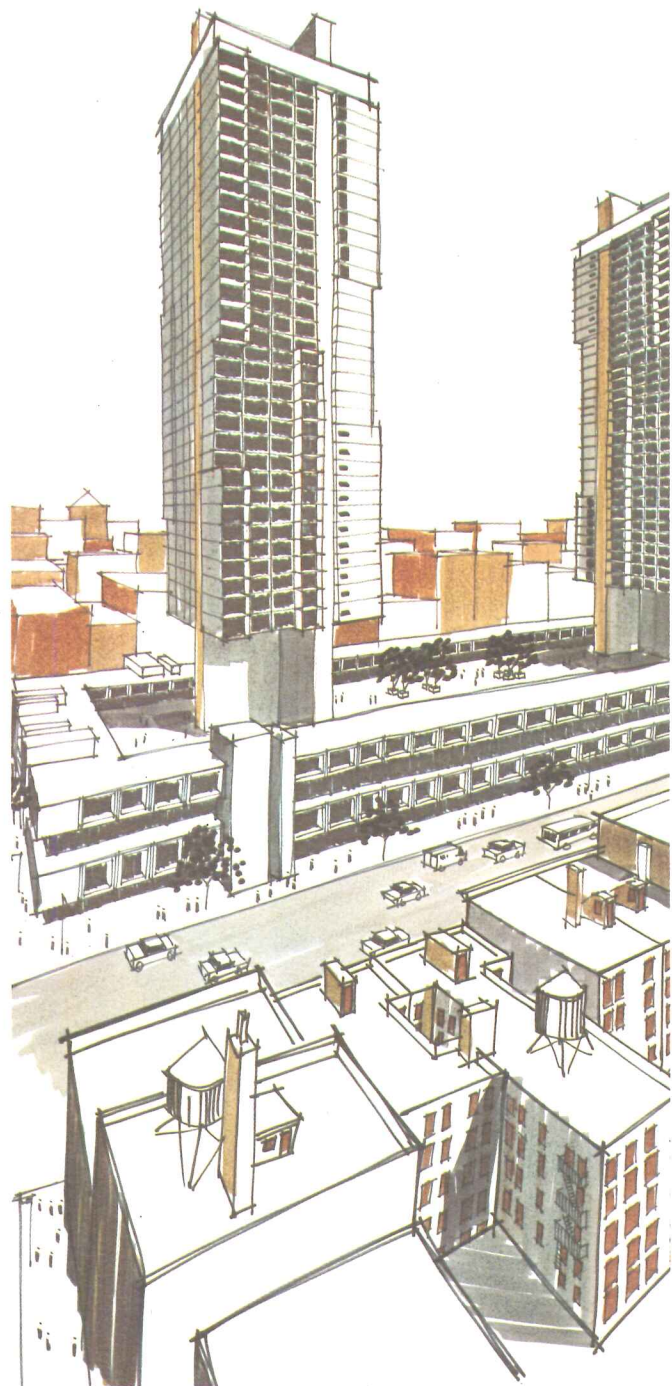
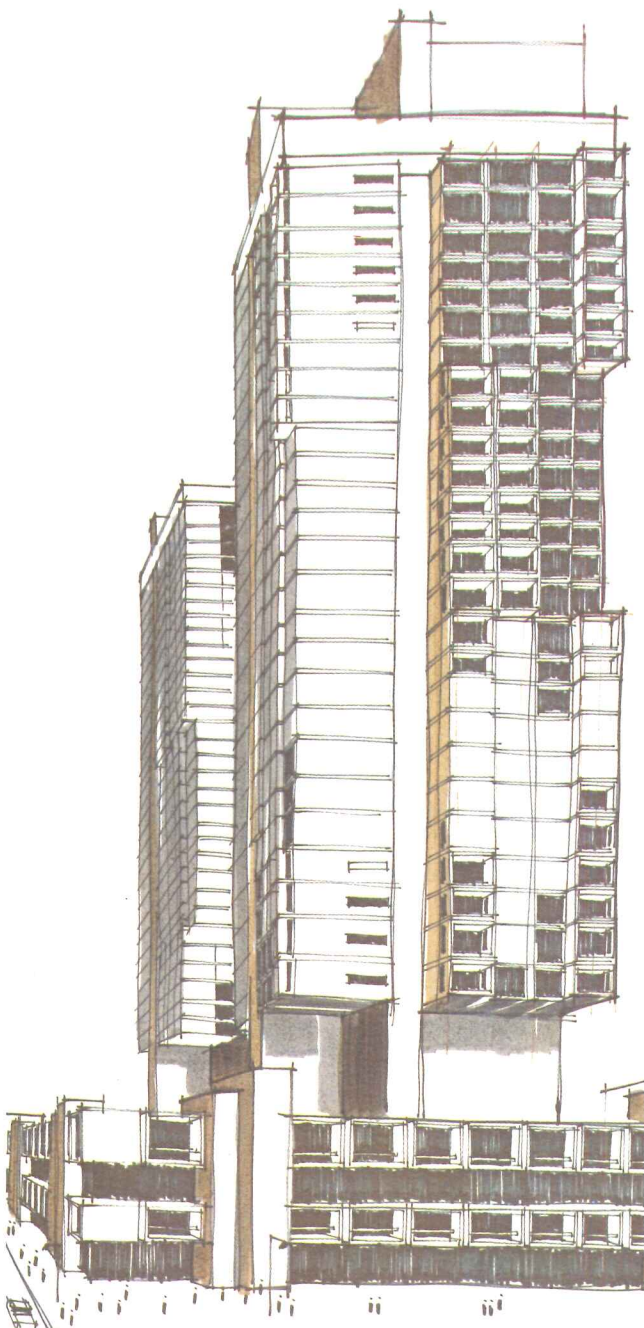


accessories, and interior and exterior finish. Deliver the completed dwelling units by truck and trailer to the building site, and put them in place around the core with a derrick on top of the core.

When the tower has been completed, move into it the families occupying existing residential buildings in the project block and relocate the businesses into vacant commercial spaces in the project block or nearby. Demolish the vacated buildings.

As about half of the area becomes available for the new industrial-commercial-community facilities, proceed with construction using materials and methods selected for maximum speed and minimum cost.

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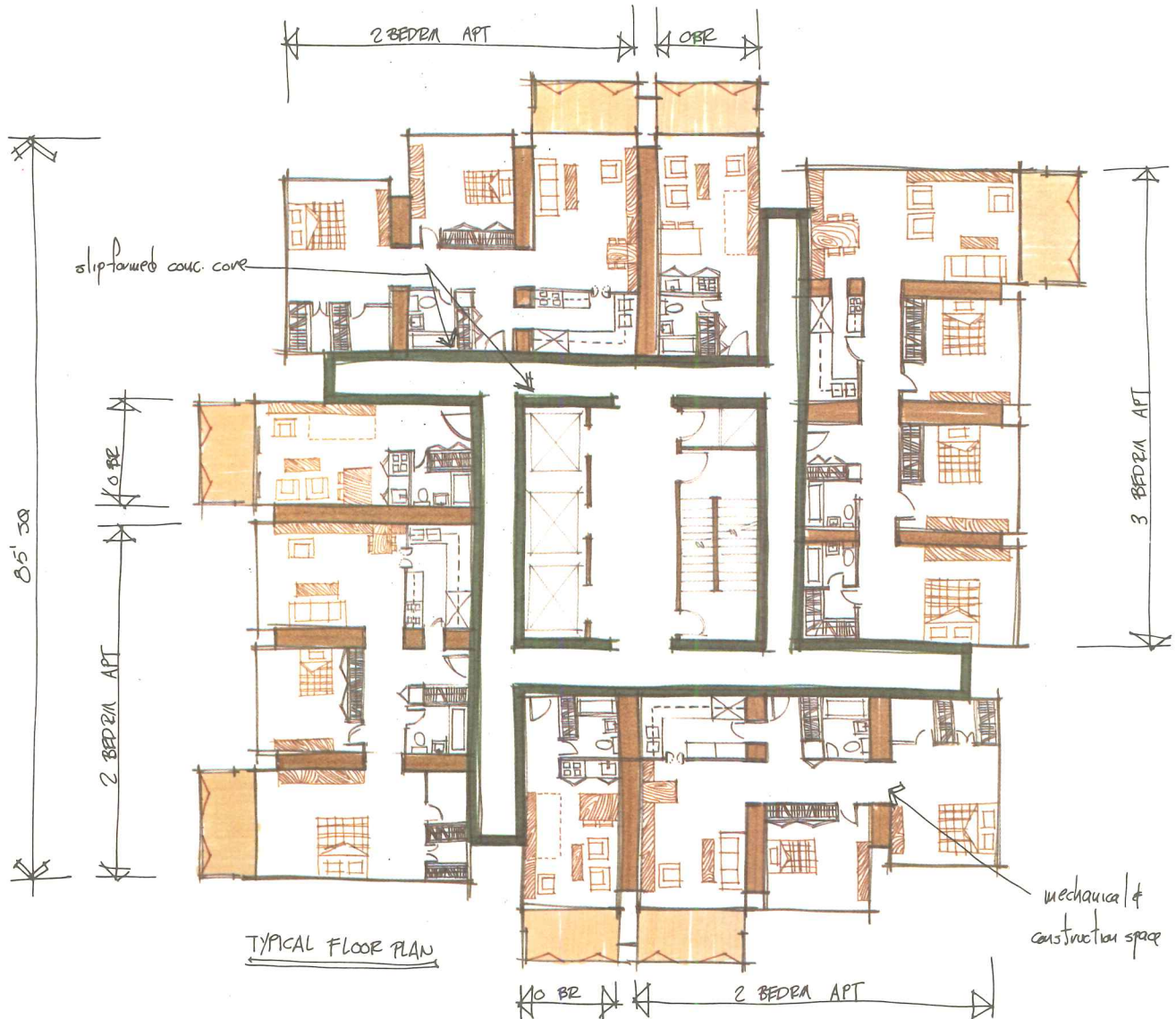
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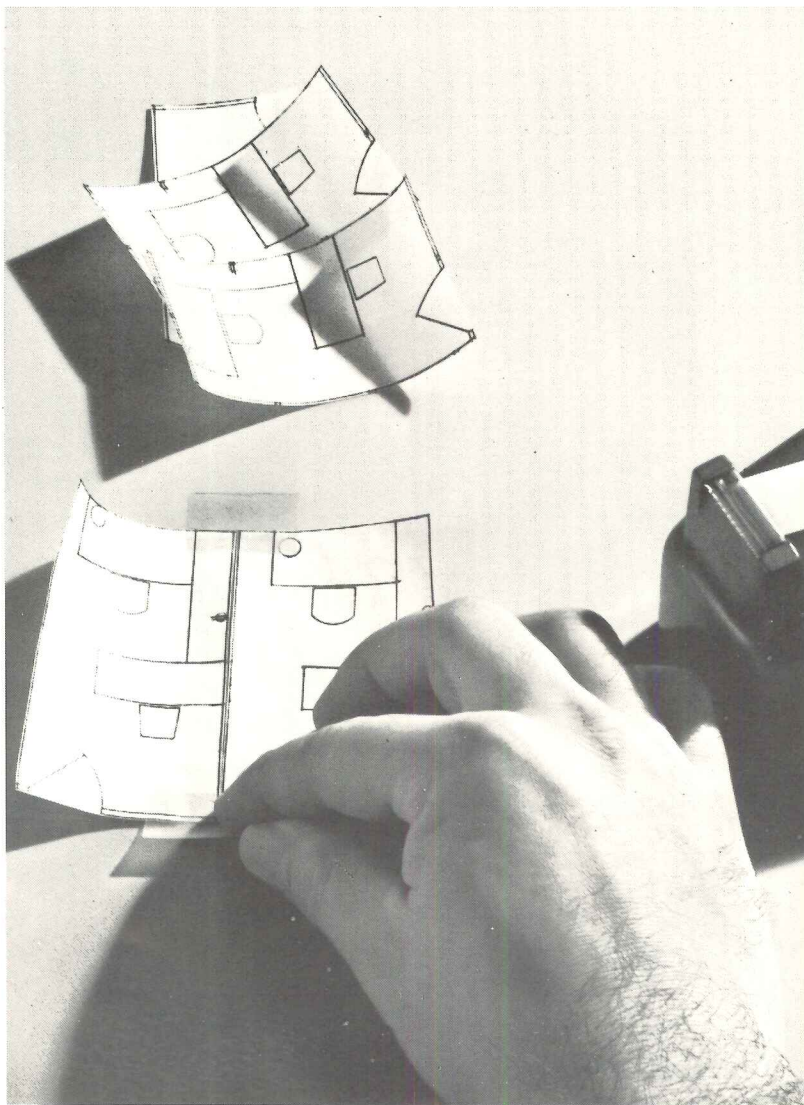
For information on Libbey-Owens-Ford hi-performance glass, contact an L-O-F Architectural Construction Specialist. Or call your L-O-F Glass Distributor or Dealer listed under "Glass" in the Yellow Pages. Libbey-Owens-Ford Company, 811 Madison Avenue, Toledo, Ohio 43624.



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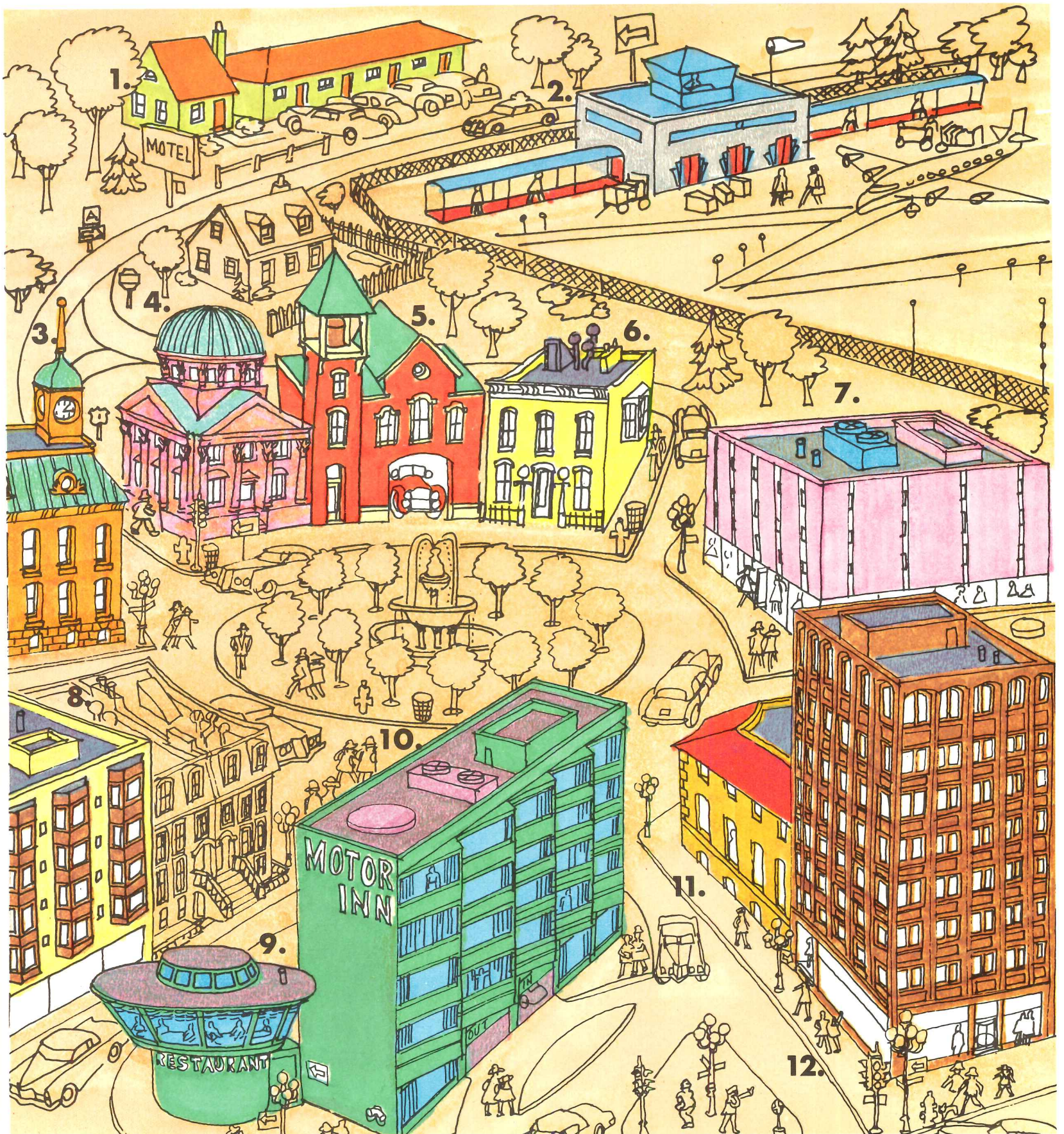
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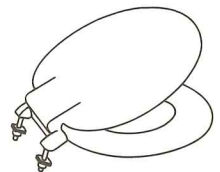
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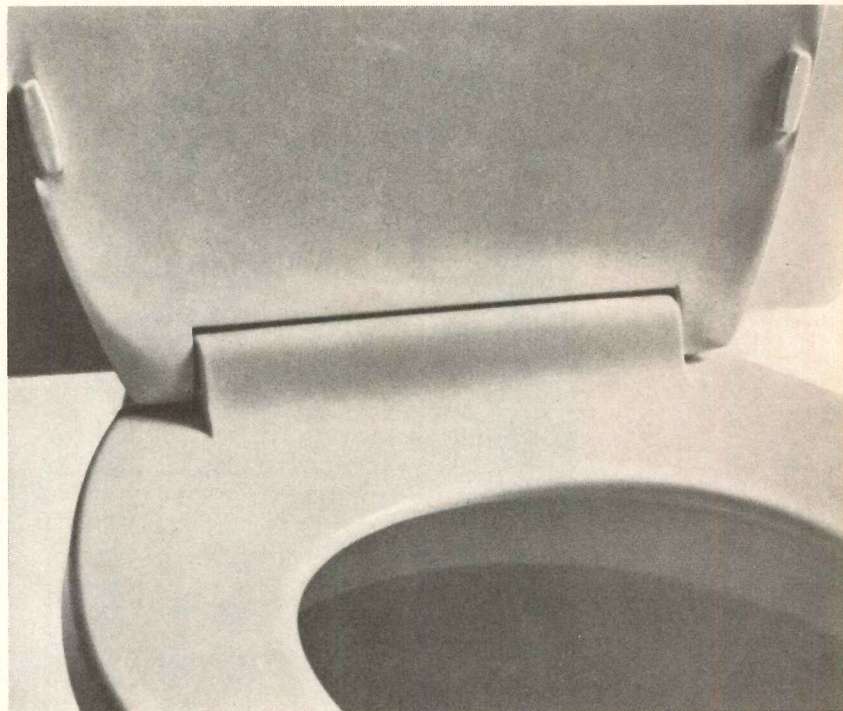
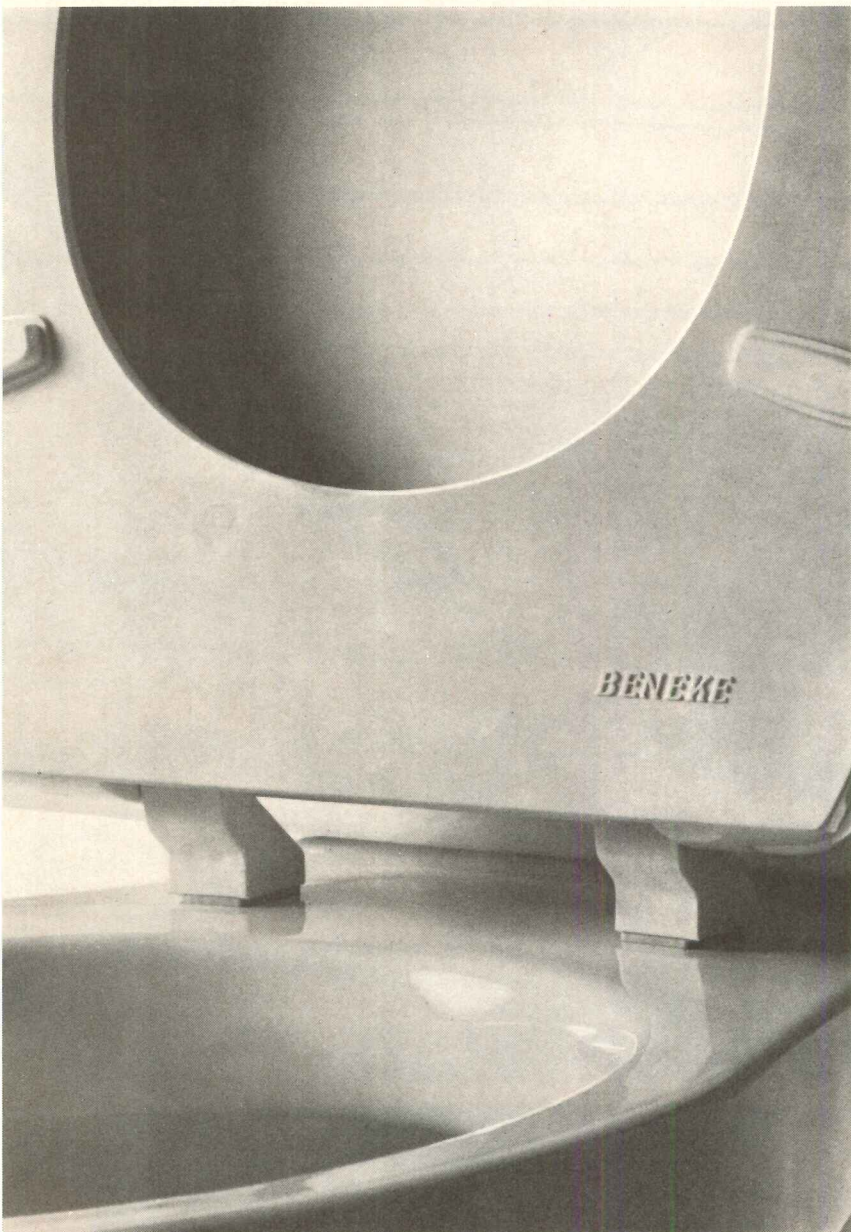
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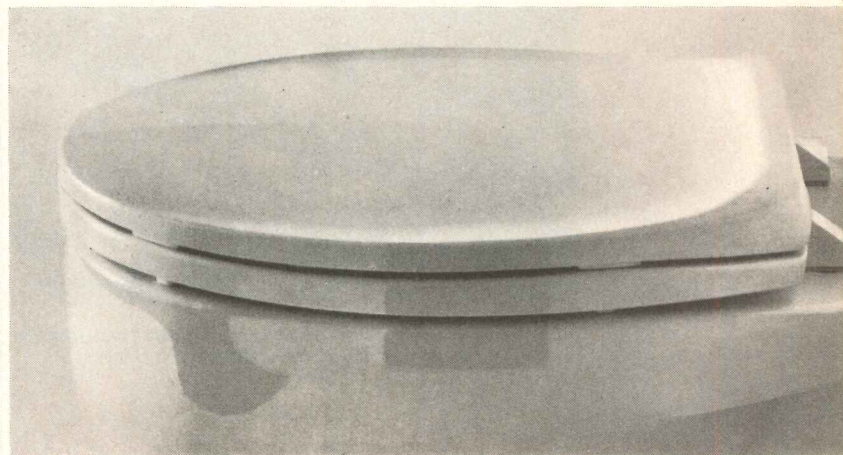
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The bowl and seat are cleaner because the hinge is higher. The Beneke HI-RISE[®] heavy duty plastic toilet seat is the first to feature this important sanitary breakthrough: the rotating mechanism is elevated well above the bowl, so thorough cleaning is accomplished quickly and easily without removing the seat. The best seat is the cleanest seat. The HI-RISE is the cleanest because it's the easiest to clean.

The Beneke HI-RISE is available in open front and closed ring models for both regular and elongated bowls.

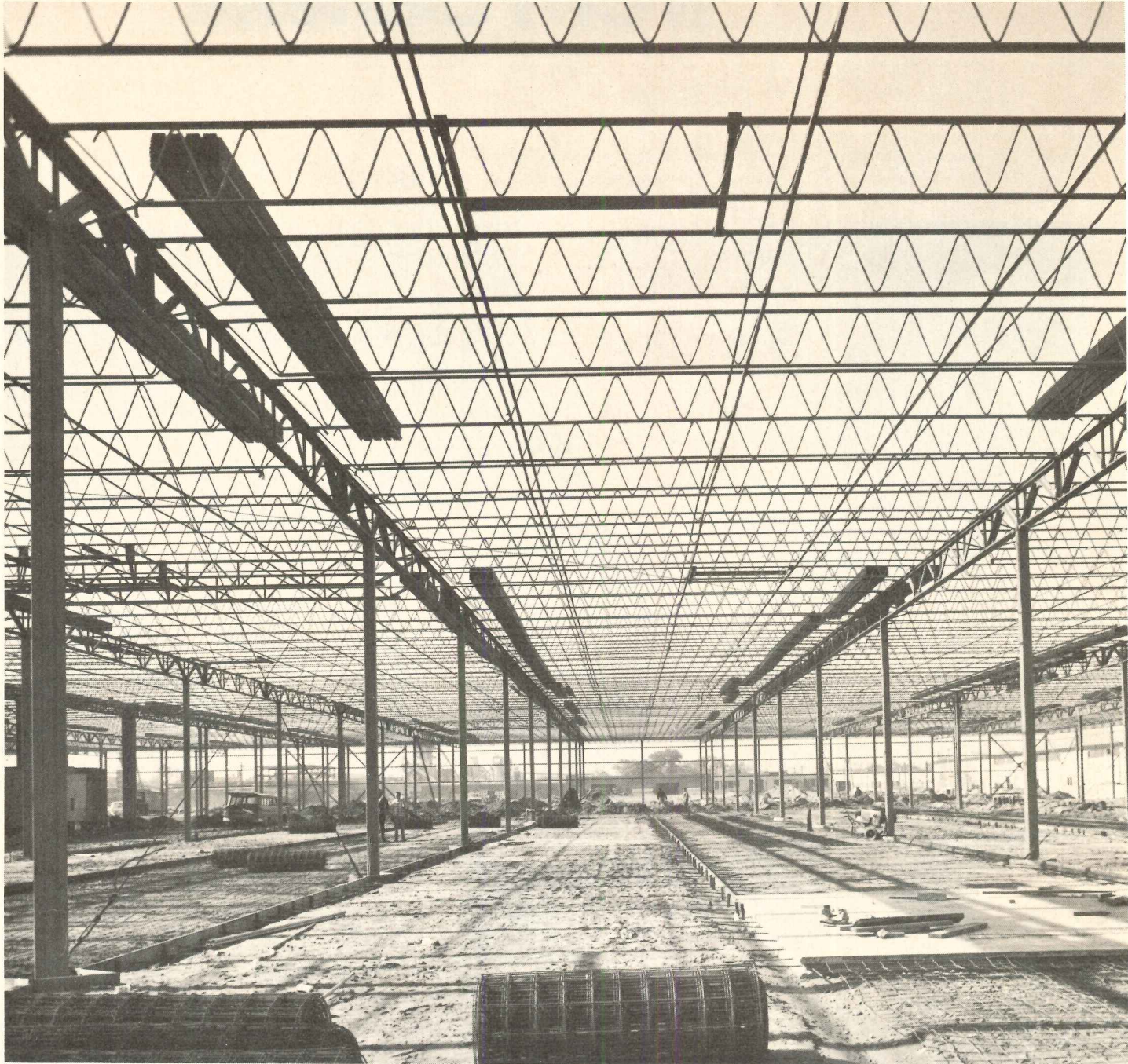
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Two more firsts for Macomber:



New York's First: Macomber open-web framing and tubular columns rise in Flatlands Urban Industrial Park.

Times Square Stores General Offices and Warehouse, Flatlands Urban Industrial Park, Brooklyn, New York. Architects and Engineers: Engineers Incorporated of Newark; Dr. Jacob Feld, New York, Consulting Engineer.



Open-web framing and the industrial park come to New York City

Flatlands Urban Industrial Park in New York City is the site of the first use of high-strength open-web steel framing and hollow steel columns under the new code of the City of New York. And the first supplier of these weight-saving framing members is Macomber Incorporated, the company that introduced the open-web steel joist to the building construction industry.

Flatlands was conceived and is being developed by Rentar Development Corporation of Rego Park, New York. It is, in effect, a privately-financed urban renewal project that is transforming 96 acres in the heart of Brooklyn into an ideal place to live and work.

Ten thousand modern apartment units — not a part of the Park but conceived in conjunction with it — surround a commercial-industrial complex of clean, modern buildings, pedestrian malls, walkways and fountains.

Some 9,500 people will eventually work in Flatlands Industrial Park. There will be an area hospital for their convenience, and a day-care center for children of working mothers.

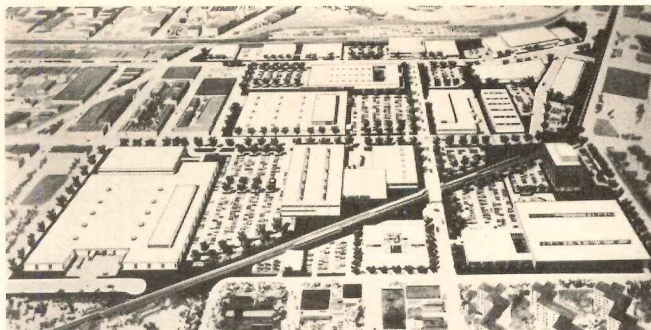
About 80 per cent of the available space has already been contracted for by such companies as Detecto Scales, Morse Electro Products Corporation, APL Plastics Corporation and Decitron Communications Corporation.

Newest major structure in the Park is the 265,000-square-foot home of Times Square Stores, built to accommodate executive offices, computer center and central warehousing for stores throughout Metropolitan New York.

For this portion of the Park, Macomber supplied open-web cantilevered girders, tubular columns, open-web joists and horizontal bridging, as well as structural steel framing for the mezzanine.

Arthur Ratner, President of Rentar Development Corporation, reports that his firm was so well satisfied with the quality of Macomber products and service that Rentar has awarded Macomber the contract for the largest building planned for the Park — the 425,000-square-foot future home of Detecto Scales.

Redhill Construction Corp., of Garden City, New York, served as general contractors for the Times Square project. Marvin C. Rothenberg, Redhill's owner-engineer, found that working with Macomber as a single-source supplier of framing and decking greatly facilitated the progress of construction.



Flatlands Urban Industrial Park, Brooklyn, New York
Sponsor: New York City Industrial Development Corporation.
Developer: Rentar Development Corporation.

"The whole Macomber system was perfectly engineered," Mr. Rothenberg said, "and delivery was so well coordinated, that we not only saved time on erection of the steel, but the other trades were able to follow up immediately. For example, the roofers were able to come in right on the heels of the steel erectors because both the framing and decking were scheduled in by Macomber. Tight scheduling and delivery also greatly reduced the problem of materials storage."

Framing was erected by Gem Steel Erectors of Brooklyn. According to Joseph M. Polito, Gem's secretary-treasurer, "Macomber was excellent to work with. The few problems we ran into were straightened out by Macomber immediately, right on the job.

"As for the Macomber framing system, we found it easy to use. Even though our men weren't familiar with open-web framing, they required no re-training whatsoever. Macomber engineering and fabricating helped us get the steel up fast, with a minimum of jobsite work."

Open-web steel framing, now that it has won city approval, promises to speed the development of many new areas in New York. If they are all as attractive and as serviceable to humanity as Flatlands Urban Industrial Park, the face of Old New York will take on a youthful, healthy look.

For your copy of Macomber's new Open-Web Framing Design Manual, write to Macomber Incorporated, P.O. Box 8830, Canton, Ohio 44709.



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In October, for the first time in years, Architectural Record will devote its entire issue to just one subject—a topic of such pressing importance that Record editors are willing to suspend all regular features in order to have the space and the time to devote to it:

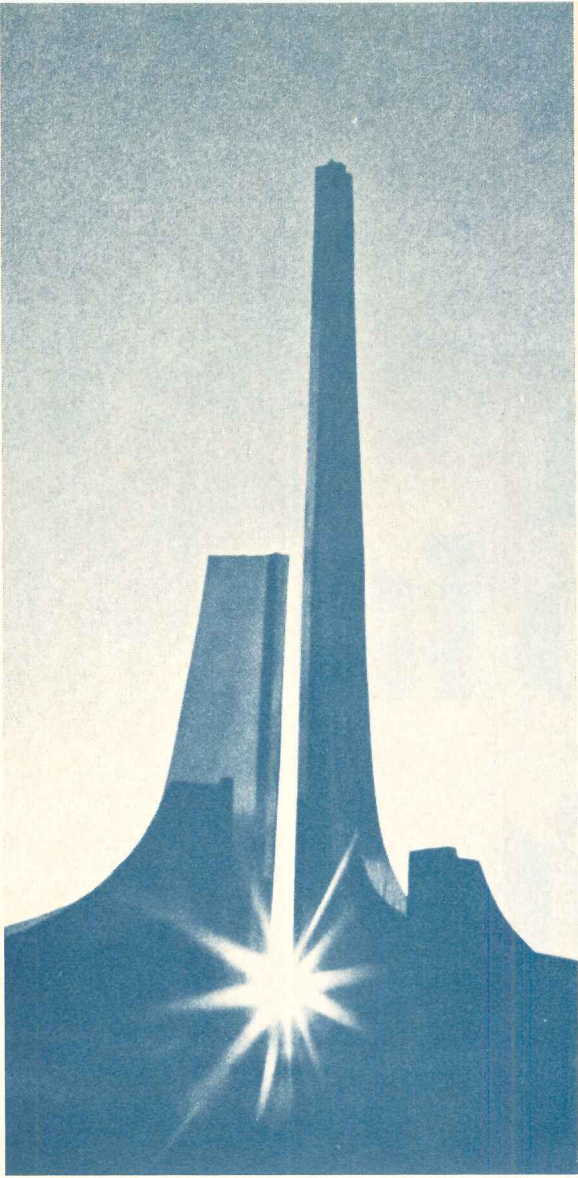
ARCHITECTURE IN THE '70's: GEARING PERFORMANCE TO MEET THE NEEDS

The building needs of the '70's are going to be tremendous. A trillion dollars worth of building will go up between 1971 and 1980 and architects and engineers will design most of it. There will be a greater need than ever before for the unique skills, knowledge and professional commitment of architects and engineers.

Architectural Record's October issue will be dedicated to helping architects and engineers bring their skills to bear most effectively on the problems that lie ahead of them—to take maximum advantage of the expertise that they alone can bring to the building industry.

The issue will put into perspective for them:

- *The needs*—What the client really wants and really needs
- *The means*—A clear explanation of what the professional architect and engineer alone has to offer a building client
- *The constraints*—An analysis of the cost and sociological problems that face the entire building industry



Among the titles of some of the provocative chapters are...

"What Makes A Great Architect Great?"

"The New Management Tools: The Computer, Information Retrieval Systems, Automated Specifications, The 'Systems' Approach"

"Clients. How Have Their Attitudes and Requirements Changed?"

"How Are Architects and Engineers Already Responding and Organizing to Meet the New Attitudes of Clients and Increasing Work Loads?"

"Is Labor Really the Villain it's Made out to Be?"

The October issue will present a wealth of information and, more importantly, *ideas*—ideas that architects and engineers can put to work in their practice, ideas that can help them realize the full potential of their profession.

Architects and engineers will read and re-read this issue, devoted in its entirety to a subject uppermost in their minds. It will work hard for them for a long time to come.

The October issue of Architectural Record will also work hard at selling your building products. It will gain the thoughtful attention of the people most vital to your building product sales—the men who design buildings and specify the products that go into them. It will reach more of these important prospects than have ever been available before...over 40,000 paid architect and engineer subscribers...the same people who, F. W. Dodge verifies, are planning over 90 per cent of the total dollar volume of all architect-designed building in the U.S.

Architects and engineers will be in a mood receptive to new ideas when they read the October issue. They will be looking to the advertising pages for product information and ideas they can put to use. Your advertising will have intensive readership and a long selling life. Ask your Architectural Record representative to tell you more about "ARCHITECTURE IN THE '70's." It could be your best advertising buy of the year.

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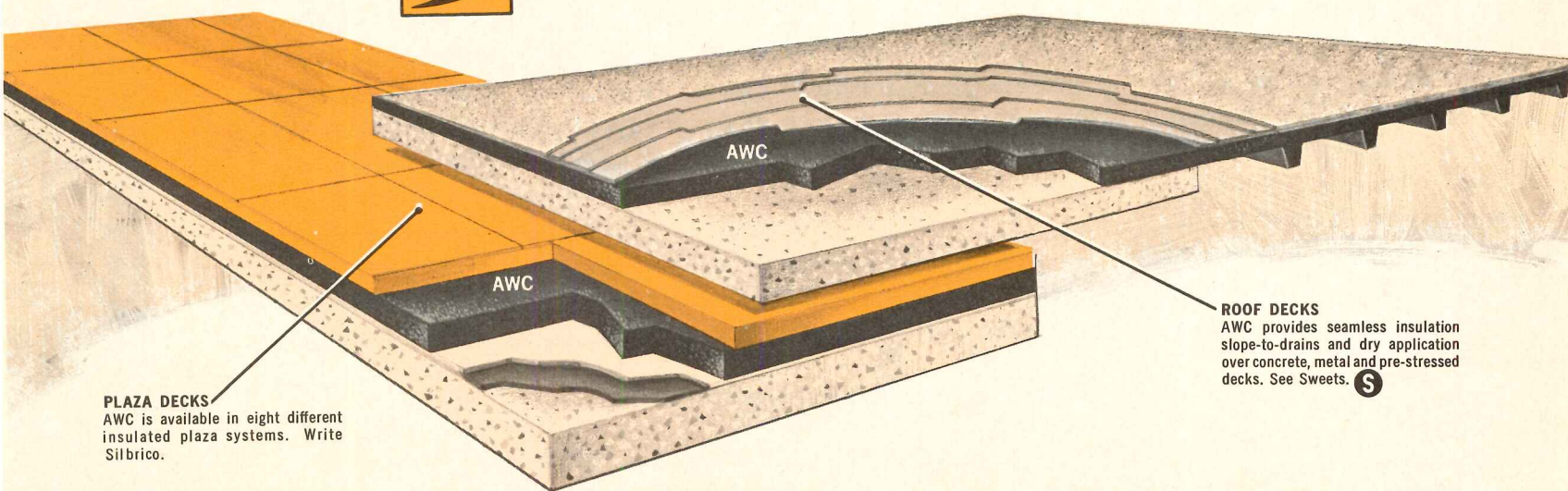




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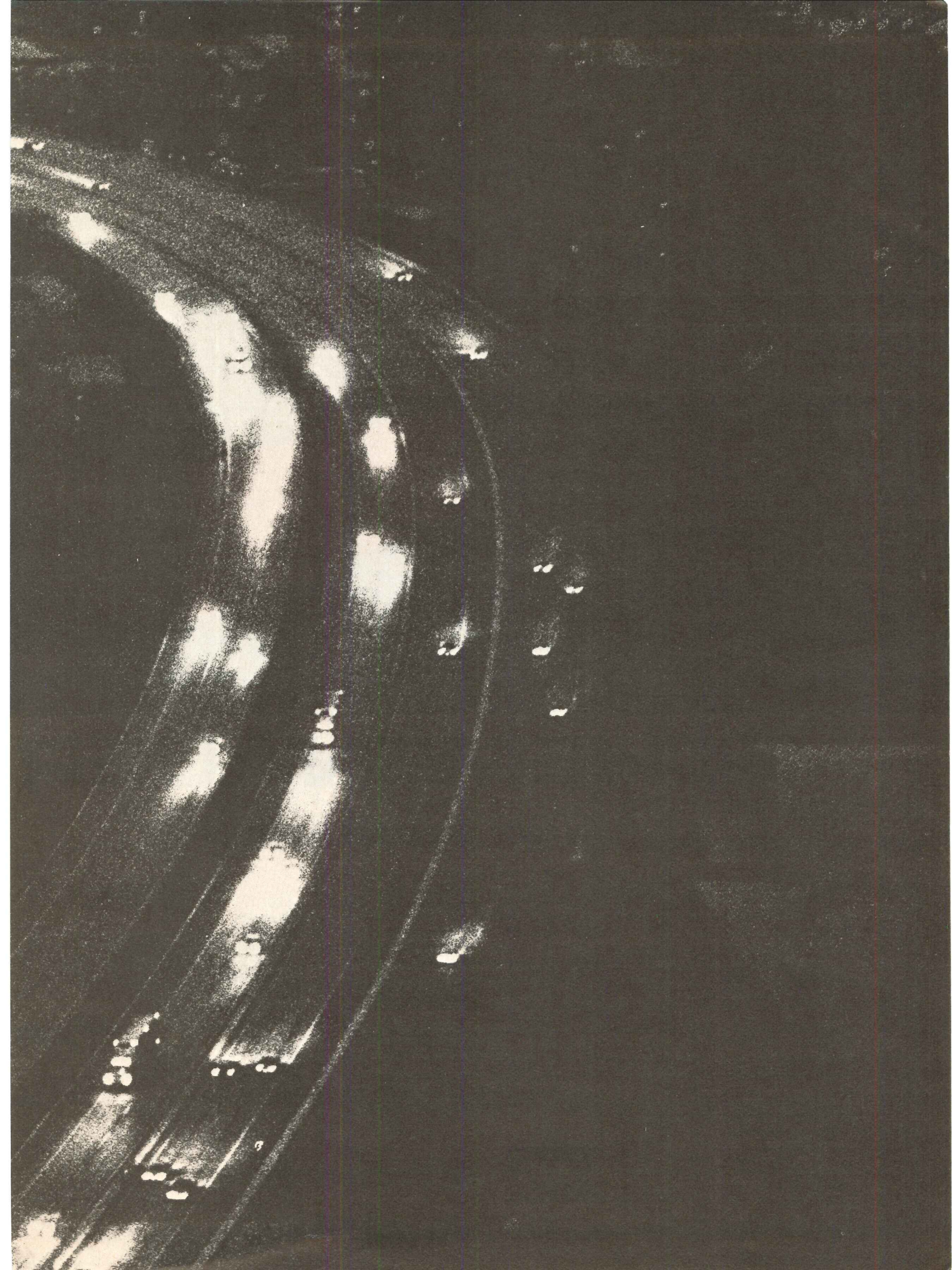
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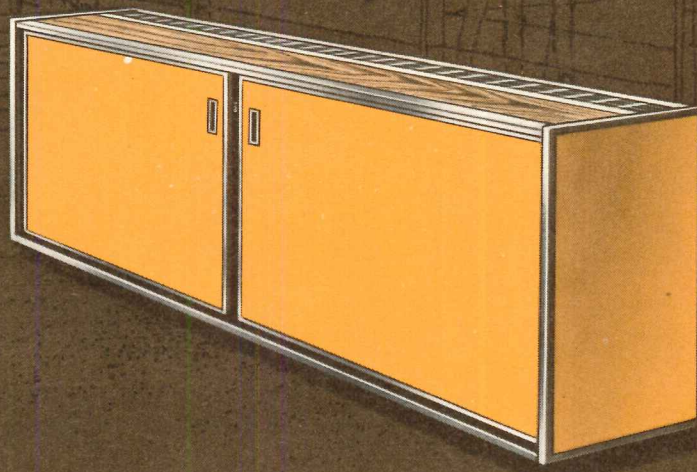

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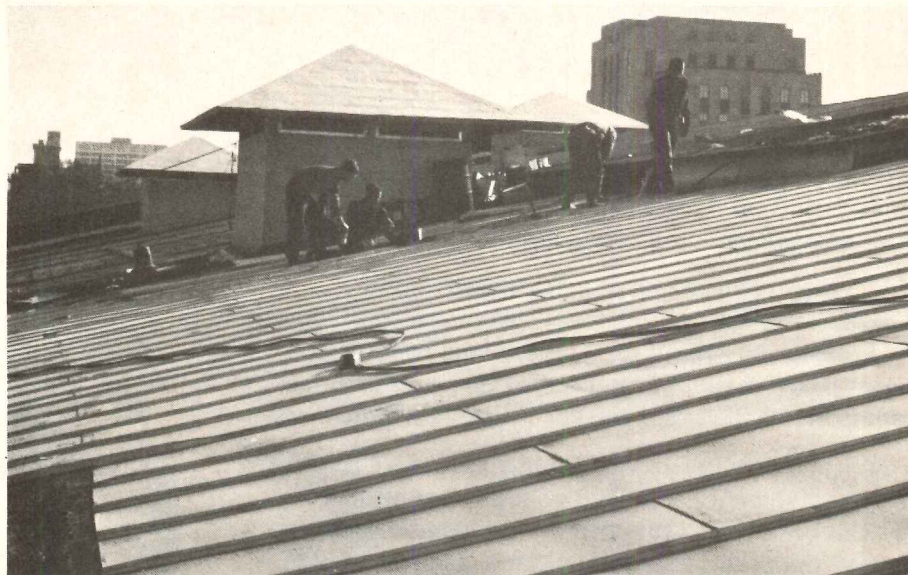
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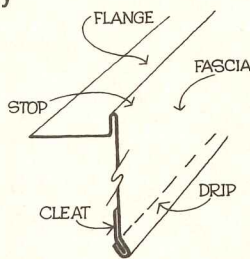
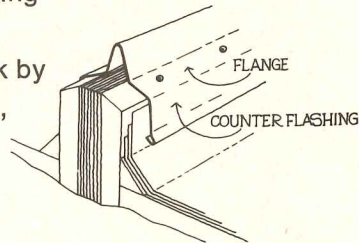
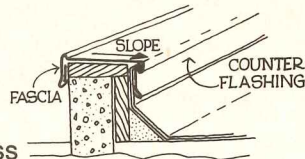
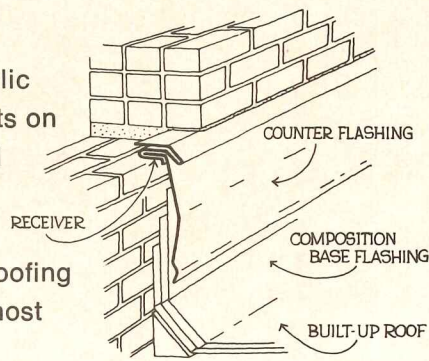
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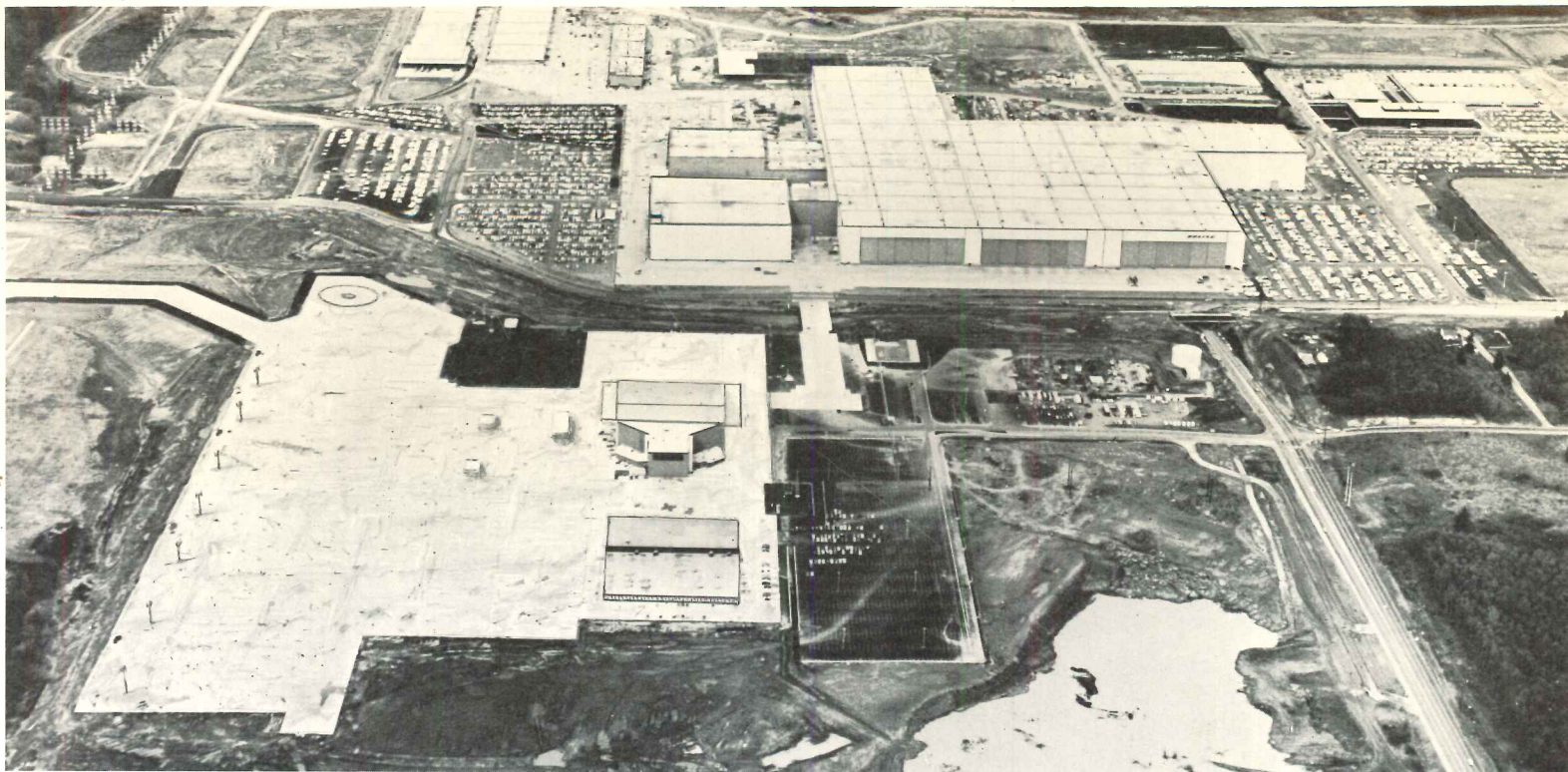
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