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FENCE DESIGNS FOR WIND CONTROL  
BUILDING TYPES STUDY: URBAN AND SUBURBAN STORES  
FULL CONTENTS ON PAGES 4 AND 5

# ARCHITECTURAL RECORD

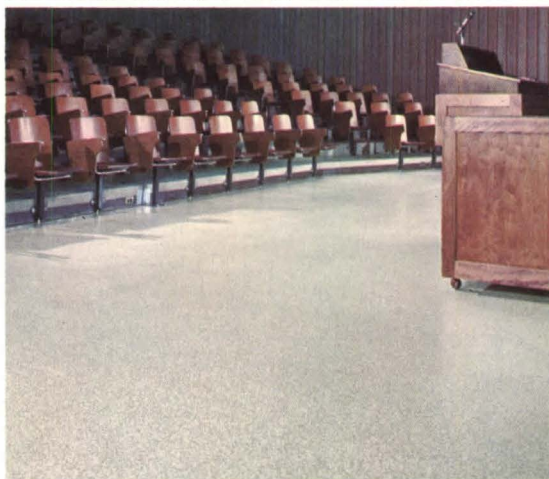
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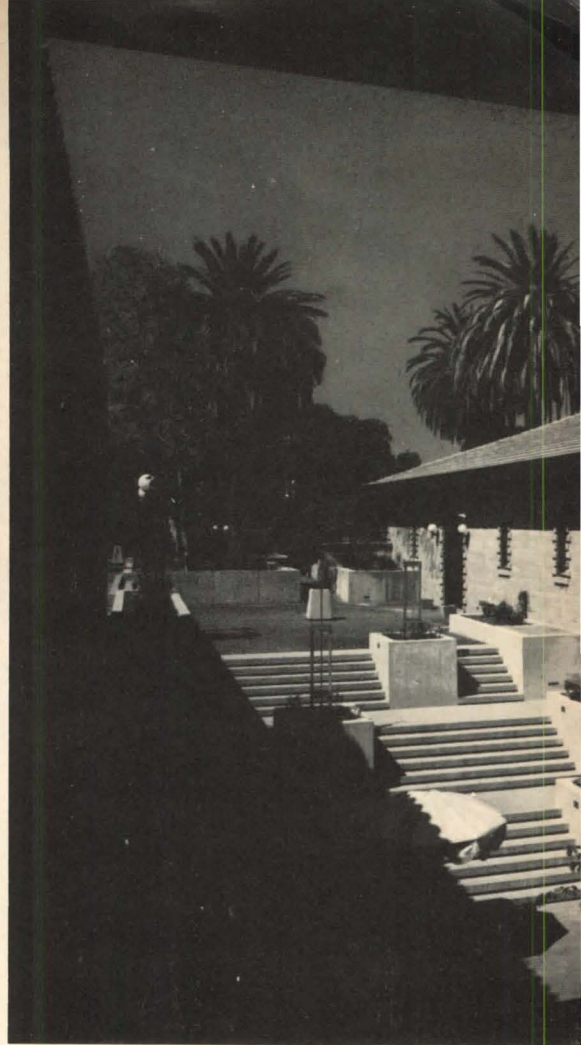
De Anza College is an all-new, fully accredited, two-year college in Cupertino, California. On the beautifully landscaped, 112-acre campus are over 50 buildings designed in the Early California Mission motif. **Architect:** Kump Masten and Hurd Architects Associated, Palo Alto, California. **General Contractor:** Barnhart-Dillingham General Contractors, Santa Clara, California. **Flooring Contractor:** Harry L. Murphy, Inc., Floor Covering, San Jose, California.

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## COMING IN THE RECORD

### BUILDING TYPES STUDY: RESEARCH LABORATORIES

Next month's Building Types Study returns to The Architecture of the Unpredictable, as we termed laboratory design in 1965. Of three projects, one explains a disciplined and innovative design methodology, capable of being applied to one room or a region, as well as to a science laboratory, one is a research facility in which ambience and symbolism are more important design criteria than any physical process, and one illustrates problems which occur when the architect is told nothing about what his building will house.

### HOUSING DEVELOPMENT AND SKI RESORT BY MARCEL BREUER

Industrialized building techniques are being incorporated more and more by architects—two recently completed projects in Europe by Marcel Breuer are good examples of these concepts. They are an urban planning project in Bayonne, France and a new ski town of Flaine, Haute-Savoie, France. In both projects standardized prefabricated concrete elements were used in apartment buildings, hotels and town center shopping areas.



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# Has the Coast Guard gone soft?



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U.S. Coast Guard  
Washington, D.C.

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## Reports of the profession's death are greatly exaggerated

The word is out: architects are obsolete. All small architectural firms will shortly be out of business. Package builders are going to take over the world. If they don't, the proliferating professional consultants will. If they don't, the giant corporations will. If they don't, the aerospace industry will, as soon as they have time to spare.

Nonsense.

The opportunity for architects has never been greater, the need for architects has never been greater, and the influence of architects has never been greater—at every scale of practice, in private and public work, at the community, city, and national level.

■ It is one thing to say that "architecture as it is now practiced is going to disappear" and quite another to say that "architecture and architectural practice are going to undergo great change." Of course architecture is going to change. Great change will also occur, I predict fearlessly, in the practice of medicine, the practice of law, in fine art, in music, in professional football, and in magazine editing.

■ It is one thing to say that there are new breeds of design-oriented consultants, and another to say that the profession is in danger of losing its role in the building process. There are indeed new kinds of programming consultants, working with the client and/or the architect to help the client develop the program. There are new construction-cost consultants, working with the client and/or the architect to develop hard figures on what the client can afford to pay and/or should pay for a new building, and working with the architect who needs that kind of help in creating design within the budget. There are interior-design consultants of all

degrees of professionalism that offer to the client and/or architect specialized knowledge of developed skills in that area of design. But let's remember:

Architects have long worked in a businesslike, professional, mutually-advantageous relationship with engineers, landscape architects, graphic designers, planners, traffic consultants, and other professional advisors—without the kind of anxiety that seems to accompany the rise of these "new consultants." Some architects and architectural firms are qualified to do—and choose to do—all of their own engineering work. Many small, and many large, architectural firms choose not to have that kind of in-house capability and farm it out. So it will be, generally, with the "new consultants."

For example: The programming for the great bulk of new buildings will be, as it is now, within the programming capability of their architects. And I cannot get upset or conjure the demise of the role of the architect if the architect or client wants to call in (as he has done for years) a qualified and experienced and professional consultant to advise on the programming of a complex hospital or urban office complex combining public space, retail space, parking problems, major tenant space, and speculative space—any more than I can get upset or conjure the demise of the architect if he calls in soils engineers for advice on a complex foundation problem.

In short, the relationship of the client to the architect to the new consultants will surely be simply a function of the complexity of the individual building job and the capabilities of the individual firm involved.

And one might note that most of the new consultants are themselves, or have as

key members of their staffs, architects.

■ It is one thing to see developing new consultants in the construction-management area, and another to say that most architects do not thoroughly understand the relative costs and merits of various building configurations, construction techniques, mechanical arrangements, and material and product options.

You don't need to be a construction expert to know which construction system is best for the job at hand—that, for example, in designing a New York City office building it will almost surely save money to use standard "stick" framing, or that most apartment buildings in New York are standard flat plate construction.

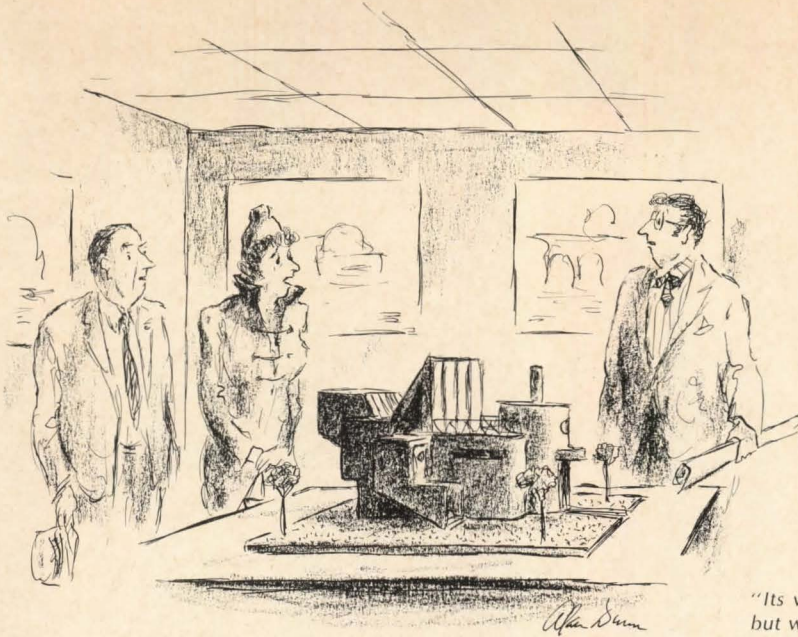
And you don't need to be a construction expert to know that it is generally cheaper in a tall office building to have a mid-building mechanical floor; but you do need to be an architect to consider whether or not to have a mid-building mechanical floor considering *all* of the factors (not just that part of the mechanicals cost) involved.

Further, it is one thing to see developing new construction-management consultants, and another to say that most architects are not qualified or capable of construction management on most jobs. For years, most firms (depending on the scope of the work they choose or are called on to handle) have been developing their expertise in management. CPM, PERT, and the use of computers are no mysteries to most architectural firms.

The emergence of the new construction-managers (and the best of them are very good at their work, of course) grows out of, to be sure, very real problems and unmet client needs. Too many buildings—from houses to giant urban complexes—do cost more than the architect said they were going to cost and take longer to build than the architect said they were going to take.

But it is of course true that many buildings "cost too much" because of unpredictably skyrocketing labor and materials costs, and that many other buildings "cost





"Its very 'todayness' is what I like—  
but what about tomorrow?"

too much" because in today's booming construction market many bids (quite properly if unhappily) are not based on any kind of estimatable costs but on what the market will bear. And it is of course true that many buildings "take too long" because of unpredictable strikes or weather or supplier delays that the "new breed" won't be able to control either. And there is, of course, no evidence that anyone else will be able to control these uncontrollables.

■ It is one thing to say that systems analysis is becoming more and more important in every phase of our lives, and another to say that the "systems people" will soon be designing everything we live in, work in, get cured in, travel in, and look at.

Let's admit that there are few architects with the same highly sophisticated problem-solving capabilities. And let's admit that their sophistication is needed in the face of some of the terrifyingly complex problems we face in urban planning, transportation, population, water, and air-pollution.

But let's remember that—while we should all hope and pray that "the systems people" can solve these problems—most problems are not that complex.

And let's remember that while systems technology can and has solved some exquisitely complex problems it can do only that: solve problems. It cannot define the problems—which is a terribly important role of the architect. It can answer questions, but cannot frame questions—which is a terribly important role of the architect. And it cannot create a design that offers something beyond the functional solution and responding to human needs—which is a terribly important role of the architect.

Computers can solve the trajectory problems of sending a rocket to Venus but they cannot play chess and they cannot design a house that meets all of my (or your) personal requirements. This terribly critical limitation of systems analysis has been analyzed in terms of our educational system by

Anthony G. Oettinger (who, among a distinguished list of credits, is former chairman of the Harvard University Computing Center and president of the Association for Computing Machinery) in his book "Run, Computer, Run." The following quotation from the foreword by Emmanuel G. Mesthene of the Harvard University Program on Technology and Society, has some implications for architects and architecture: "Cannot systems analysis contribute at least as much to educational policy as it has to our national security policy? Perhaps, but consider the staggeringly greater complexity of the educational 'system.' It comprehends the pupils, the teacher, the principal, the parents, the school board, city hall, the taxpayer, the foundations, and the Federal government, all of whom have different ideas about the proper ends of education. This is not to mention the neighborhood bookie, television, comic books, the local drug trafficker, Selective Service, the professions and disciplines, the hit parade, the nation's foreign policy, the Urban League and the John Birch Society, which must also be taken into account at some point. It is an extraordinarily complex system, and the techniques have yet to be developed that can subject it to a genuinely exhaustive systems analysis." So it is, I believe, with architecture.

■ How and why did this outside criticism and critical self-analysis by architects start snowballing?

Partly because of irresponsible journalism, which has reported some terribly important new developments without putting them in perspective.

Partly because of perfectly proper self-promotion by the new consultants who, in the manner of all of us, are looking for work and a chance to make a profit on that work.

Partly because many architects—to their great credit—are not only deeply and genuinely concerned with their part in the failure of society to solve its social and economic problems, but also ready to take too

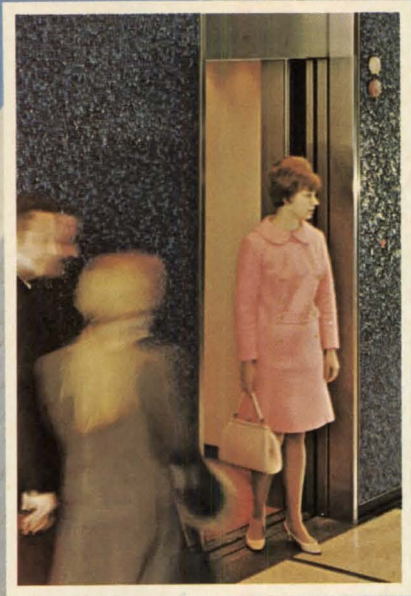
much of the blame.

Partly because, in this terrifyingly complex world, all of us have a perfectly human desire for simplistic solutions to our problems. In all areas of development (not just architecture) there is a penchant for wanting quantifiable measure of results—so before you make a decision you "have the facts" and do not have to take the responsibility for a quantifiable measure. But it is one thing to set up performance standards for the manned landing on the moon, and another (much more difficult, if you think about it) thing to set up performance standards for a house, or an office building, or a city. It is one thing to set up performance standards for air temperature and movement, vertical transportation, and efficient communication within a building, and another to set up performance standards for all the human conditions involved.

Let us, in considering the future role of the architect, agree that some architects (like some doctors, some lawyers, some artists, some musicians, some professional football players, and some magazine editors) are very, very good; and some are horrid. Let us agree that some buildings work, and some do not; some are beautiful and some are ugly; some raise the spirit, and some kill it. Let us agree that some architects are capable of solving the most complex problems and some are not. Let's admit that some architects have channeled too much of their effort in the creative direction and too little in the measurable areas of cost and time; and that many have become successful (as businessmen, not architects) by doing pedestrian work that scarcely contributes to the world we live in. But let's insist that most architects are very good at their work. And let's insist that the creativity that makes good architecture is critical in the process of building—and in that area architects stand alone and unchallenged.

—Walter F. Wagner, Jr.





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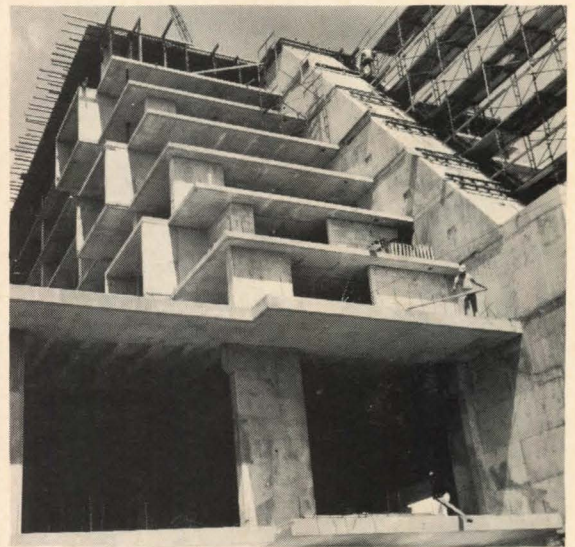
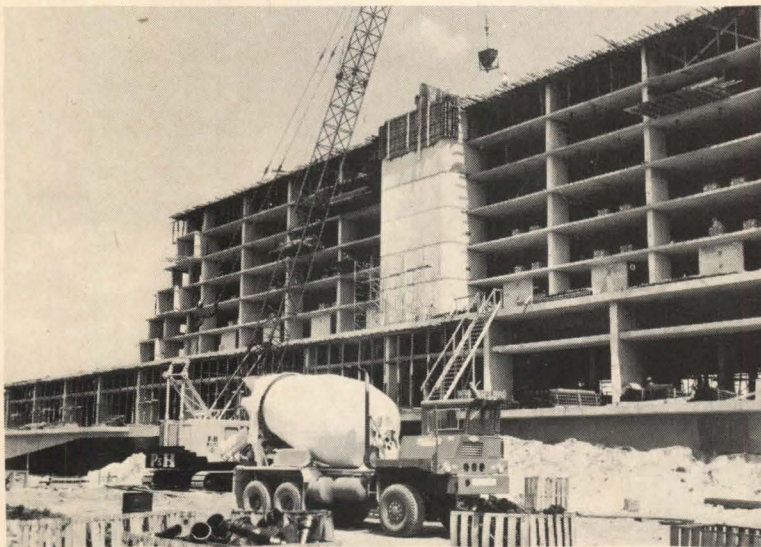
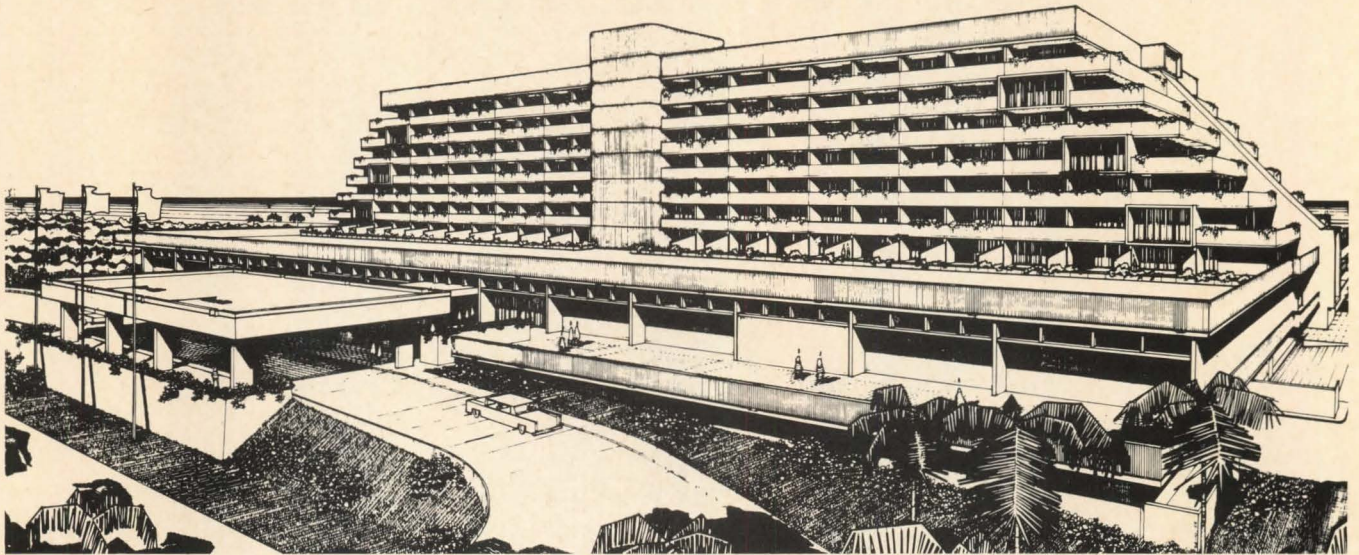


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# Seaside luxury on Key Biscayne



## Built with Lehigh Cements

The new Sonesta Beach Hotel will provide deluxe accommodations for vacationers on a 10-acre site at Florida's Key Biscayne. Every room will have a 12' long private terrace. And the unusual "step" design will provide an extra-luxurious treatment of the end suites on each floor. The entire structure is cast-in-place concrete with concrete masonry partition walls and features a corrugated concrete vertical center panel, running the full height of the main building. Lehigh Cements were used throughout the new complex. Lehigh Portland Cement Company, Allentown, Pa.

HCA's new seaside complex is a self-contained resort just 20 minutes from the Miami Airport. It is 10 stories high and will contain a specialty restaurant for 300, coffee shop for 85 and a night club for 200. Meeting and ballroom facilities for 550 persons are also planned as are four smaller meeting rooms.

The architectural design is a pleasing contrast with the sea on the one side and the semi-tropical landscape of the island on the other. And the natural color of the exposed concrete surfaces of the structure enhance the effect. Sloping sections of each end of the hotel contain the stair wells.

*Owner:* A. J. Andreoli, Akron, Ohio  
*Hotel Operator:* Hotel Corporation of America, Boston, Mass.  
*Architect:* Keith Haag & Associates, Cuyahoga Falls, Ohio  
*Structural Engineer:* Ernst J. Troike, P.E. & S., Cuyahoga Falls, Ohio  
*Contractor:* Associated Biscayne Companies, Inc., Miami, Fla.

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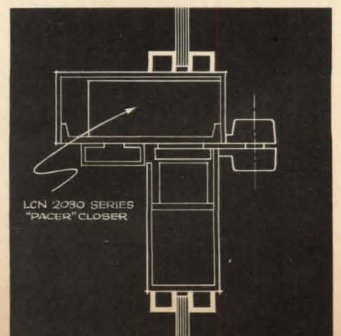


Overseas Operating Center, American Telephone and Telegraph Company—Long Lines Department, Jacksonville, Florida. Reynolds, Smith and Hills, Architects—Engineers—Planners; Jacksonville.

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THE LARGE SCALE REVOLUTION IN CERAMIC TILE  
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INTRODUCING...

# TERRA VITRA<sup>®</sup>

New 12" x 12" x 1/2" sculptured tiles for floors and walls

You're looking at an actual-size photo of a nominal 12" x 12" x 1/2" Terra Vitra tile, including an allowance for a joint approximately 1/4" wide. This is one of the 15 beautiful designs in American Olean's new line of large scale relief tiles.

Look closely. Here is the beauty of light playing over richly textured surfaces. Here is the soft glow of deep, translucent glazes. Here is a revolution in ceramic tile.

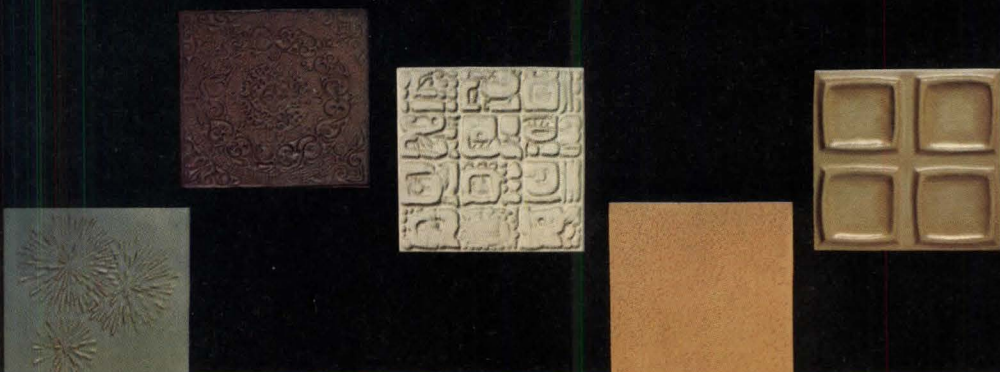
*Terra Vitra* gives you complete creative freedom. There are six high relief designs for walls, nine low relief designs for walls and light duty floors. And there's a palette of eight matte glaze colors. That means 120 color and design combinations to

choose from. Terra Vitra is also available in a 9" x 9" x 1/2" size.

*Terra Vitra* can be used indoors and outdoors. The body of a Terra Vitra tile has less than 1/2% moisture absorption. It's frostproof and won't crack or craze from sudden temperature changes. And Terra Vitra's durable glaze is highly resistant to wear and impact.

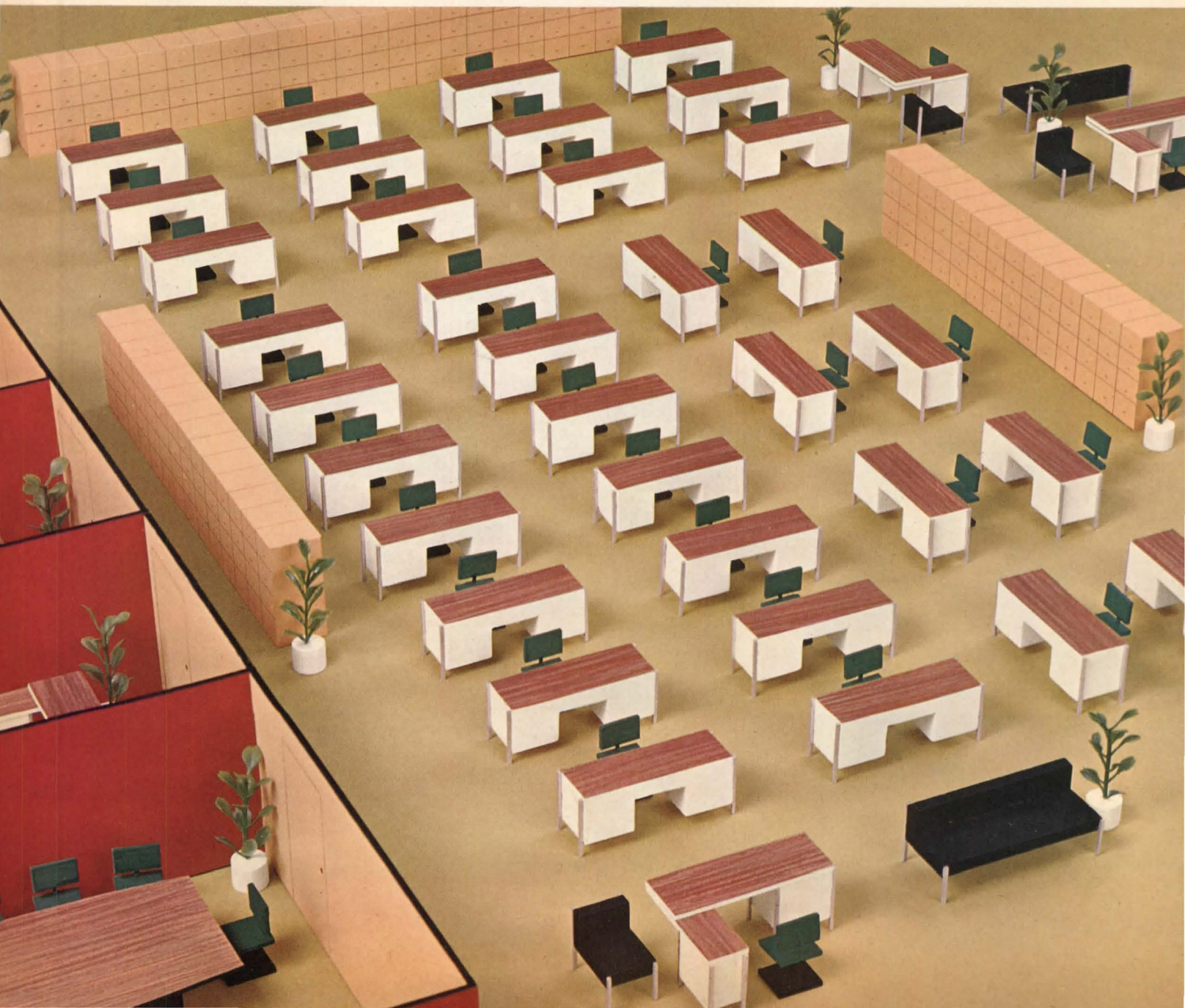
See for yourself the design possibilities of Terra Vitra. Send for our full-color booklet. It shows the entire Terra Vitra line and gives you complete specifications and technical information. Write: American Olean Tile Co., 1280 Cannon Avenue, Lansdale, Pa. 19446.

Ceramic tile by... **American  
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A Division of National Gypsum Company





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electrical distribution system  
for every need!*





Cel-Way in-floor electrification adapts itself to the whole spectrum of architectural ideas and construction techniques: high rise, low rise, concrete frame, steel frame, interior landscaping.

Here is *system* in the pure sense of the word. All electrical services—telephone, power, signal—are neatly sandwiched into a single slender floor slab. This floor fitting and in-floor electric cell system accommodates itself to any building module. It meets all electrical

requirements for the present, and anticipates changed or expanded needs for the future. It's the perfect antidote for building obsolescence.

Here is *economy*, with labor savings as much as 50% in some cases. Single, dual or triple electrical cells can be supplied in long lengths—up to 30'; new trench header design saves field labor over other types of feeding systems; electric, signal and telephone services can be supplied through a single-easy-to-install floor fitting.

Here is *versatility* which opens the way to innovations never before possible, like supplying partitions with all three electrical services through a single entrance.

For the complete Cel-Way story, including construction and installation details, specifications and other data, check Sweet's 1e/Gr, or write for Cel-Way product manual. Granco Steel Products Company, 6506 North Broadway, St. Louis, Mo. 63147. A subsidiary of Granite City Steel Co.

**IMAGINATION IN STEEL**  
For more data, circle 16 on inquiry card





# How to stay Open after Closing



# COOKSON Rolling Grilles and Side Coiling Grilles are the Answer.



This Cookson Side Coiling Grille protects 44-ft. of visual display on a 2-sided opening for this store.



Four 30-ft. Cookson Rolling Grilles, with 3 moveable mullions, provide security for this 120-ft. opening.

And an increasingly important answer to architects and designers involved with the trend toward open, controlled climate shopping malls where the need for weather-tight closures has been eliminated yet the need for security remains.

Combining round-the-clock merchandise display, tight security and great visual appeal, Cookson Rolling



and Side Coiling Grilles can close openings without diminishing air circulation or blocking light sources.

*For more complete information on Cookson Rolling Grilles, Side Coiling Grilles, "Servire" Fire Doors, Counter Fire Doors, Cookson Steel Rolling Doors and Counter Doors, write for Bulletin 6901, or see us in Sweet's.*

**"Best Way to Close an Opening"**

**THE COOKSON COMPANY**

700 Pennsylvania Ave.  
San Francisco, California 94107

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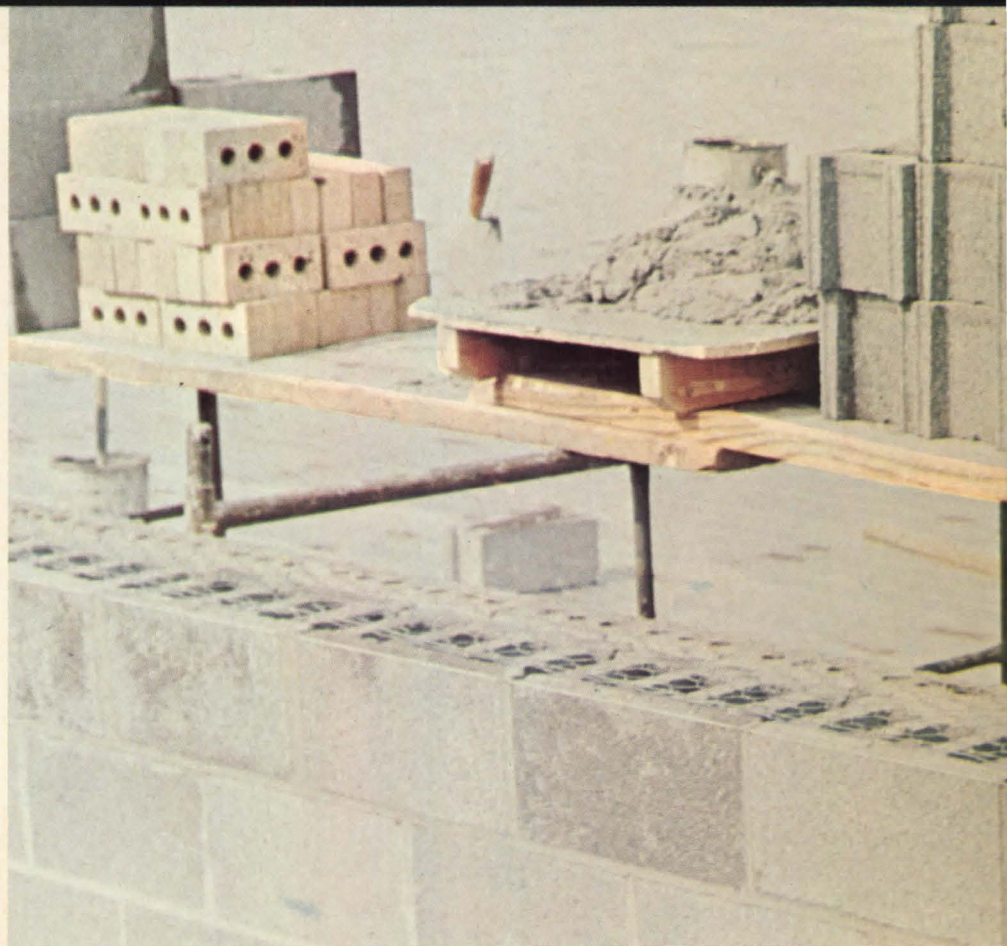
from Keystone

Columbian Elementary School, Kokomo, Indiana.  
Three additional school buildings in Kokomo by  
same architect, general contractor and masonry  
contractor: Maple Crest School, Haworth High School  
and Sycamore Jr. High School Addition.

Architect: Everett I. Brown & Co., Indianapolis  
General Contractor: Modern Structures, Inc., Indianapolis  
Masonry Contractor: B.E.C.T. Co., Indianapolis  
Construction: Concrete block and brick cavity walls  
alternate courses of blocks reinforced with  
Keywall Multibond (Roll-Type) Reinforcement.



# Only Keywall® Reinforcement is made to match the mortar strength

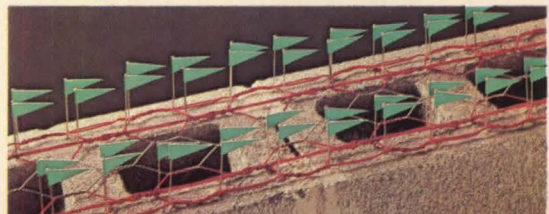


## Use Truss-Type Keywall with high strength mortar

In walls subject to high stress, it is good practice to specify high strength mortar and our Keywall Truss-Type Reinforcement every other course. The tremendous bonding power of high strength mortar makes excellent use of the extra steel in our truss-type reinforcement, as shown by lateral pressure tests conducted at the University of Toledo. Tests also showed that reinforcing every *other* course is as effective as reinforcing each course.



Keywall Multibond comes in rolls that are easy to hand carry, roll, convey, or wheel. One roll reinforces 200 ft.



Toledo University tests show that Keywall Multibond is unsurpassed when used with regular mortar. Multibond gives you 96% more bonding surface than 9 gauge truss, 55% more than 3/16" truss. Plus 28 mortar locks per 8" block.





**Use Keywall Multibond with conventional types of mortar**

Easily cut to fit any building situation with just a pair of tin snips. Snip to make cut-outs for structural framing. Snip to make pieces exactly the right length for corners and pilasters.

Conventional mortars need the extra bonding surface, mortar locks and mechanical anchors provided only by Keywall Multibond. Together they work to better control thermal movement and resist cracks.

For specific answers to any reinforcement problem, call your Keystone man or write Keystone Steel & Wire Company, Peoria, Illinois 61607.



from **Keystone Steel & Wire Company**  
Peoria, Illinois 61607

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# BREAKAGE AND SUNLIGHT... A DISPLAY WINDOW'S TWO WORST ENEMIES!

Conquer Both Hazards With Protectopane<sup>®</sup> U-V!

Breakage and sunlight, a display window's two worst enemies, leave store owners vulnerable to property destruction. Breakage can result in expensive window replacement and loss of merchandise; sunlight can fade expensive display material making it worthless for re-sale. Either way, destruction cuts into profits and store owners lose money!

This needless waste can be avoided with Protectopane U-V! This new glass, specially created for store front windows, provides break-through protection and prevents fading due to ultra-violet light!

COMPLETELY TESTED AND APPROVED BY UNDERWRITER'S LABORATORIES!

Protectopane U-V features a clear vinyl interlayer which acts as a repellent to ultra-violet light—lets through only 1% of the ultra-violet rays in the critical region of 380 millimicrons and below; whereas 1/4" clear plate glass transmits about 52% of these harmful rays! Protectopane U-V provides color fast protection for draperies, paint, furniture, clothing and other articles behind the glass.

Protectopane U-V is almost totally impervious to break-through. Repeated heavy blows may break or crack the glass, but will not cause it to easily shatter or fall out.

Provide a double shield against display window property destruction! Write Dearborn today for complete details and specifications on Protectopane U-V!

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**Protectopane<sup>®</sup>**



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INTRODUCING...THE BATH THAT HAS EVERYTHING!

# SPECTRA 70™

FROM AMERICAN-STANDARD

It has everything women want! New built-in conveniences. New safety features. New luxury styling. A brand-new high fashion color "Bone"...the go-with-anything color that makes decorating easy.

Three separate components make up the Spectra 70\* Bath Group...each loaded with features that give your clients' homes or apartment houses the best of the future right now.

**1. The Spectra 70 Tri-Wall\*.** Three classically styled walls and ceiling made of tough, high-gloss fiberglass. Trend-setting features include a convenient built-in storage compartment with a cover that becomes a drop-down table. Two soap dishes...a high one for showering, a low one for bathing. A drop-down seat at the end of the tub. Two safety grab bars attached through the walls to the studs. Two recessed lights included in optional ceiling.

\*Trademarks of American-Standard  
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**2. The Spectra 70 Shower Tower\* Column.** This beautifully styled unit combines all fittings, all controls into one central column. It's all pre-piped and factory assembled. Can be ordered separately. Deluxe features include high and low Stereo\* Shower Heads, pressure balancing valve, shoulder height controls, handsomely styled Hide-away\* Rinsing Spray in a revolving storage compartment.

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*For details on the Spectra 70 Bath Group and the UltraBath\* Group, see your American-Standard representative or write us.*

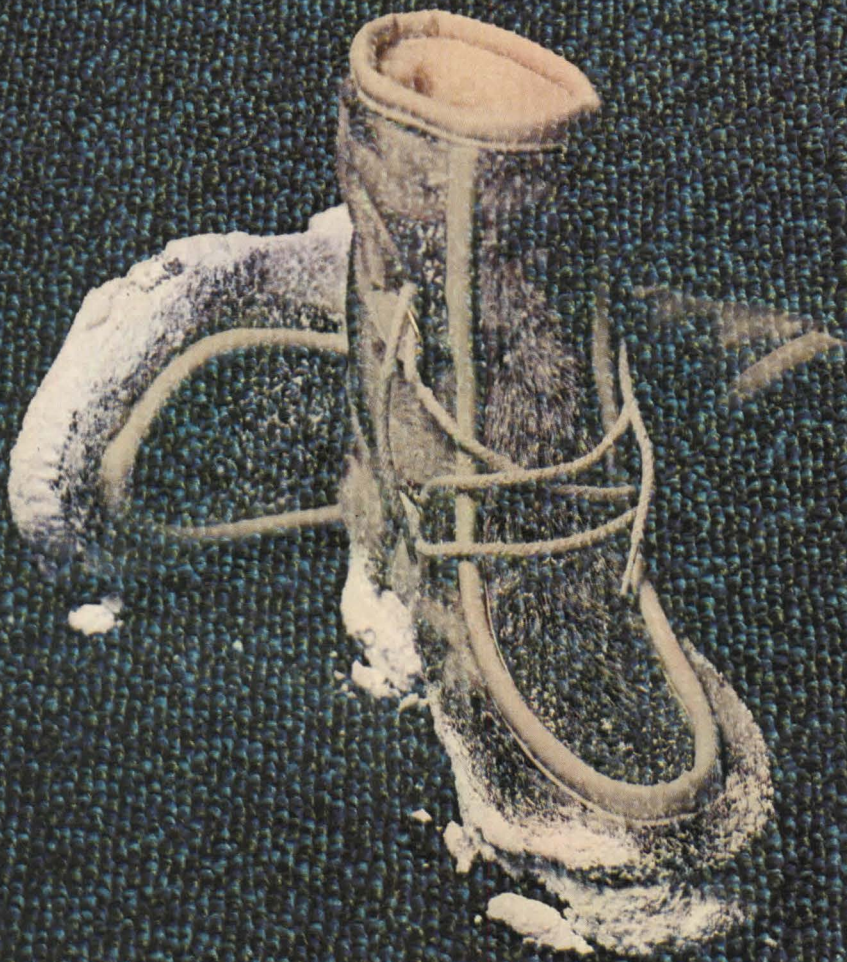
**AMERICAN STANDARD**

PLUMBING & HEATING DIVISION  
40 W. 40th St., N.Y., N.Y. 10018



# ANSO

The carpet fiber that makes dirt seem to disappear.



#### Why ANSO™ nylon?

Because ANSO does strange things with light. Turns it around to reflect the beauty, color, and texture of a carpet. But not the common dirt a

carpet has to put up with.

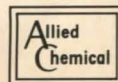
ANSO is specially engineered to resist ugly soiling and extreme wear, which makes it the ideal choice for commercial carpeting.

If ANSO happens to cost more than ordinary nylon, it's worth it.

Because ANSO keeps looking new. Longer.



The Nylon Fiber That Makes Dirt Seem To Disappear.

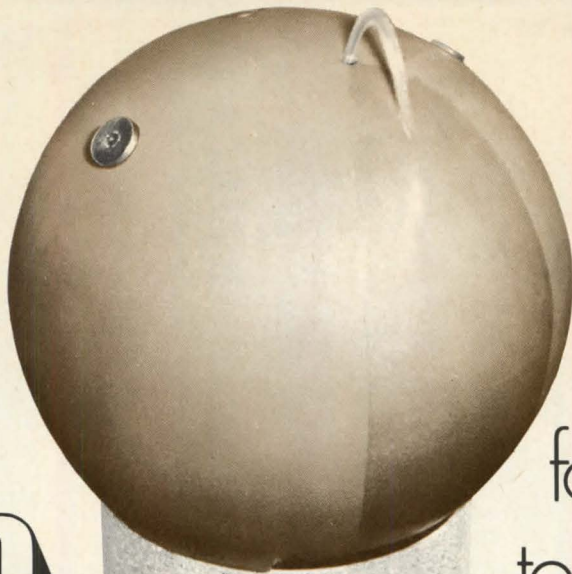


Carpeting of ANSO nylon available from these fine mills: Alexander Smith; E. T. Barwick Mills; Columbus Mills, Inc.; Firth Carpet Mills; Karastan Rug Mills; Laurelcrest Carpets; Mohawk Carpet Mills; Monarch Carpet Mills; Needleloom Carpets.

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to fit  
the shape  
of your  
ideas.



**The Aquasphere** Capillary attraction holds water to the surface of the aluminum alloy sphere. Water disappears inside pedestal of rugged fiberglass and resin composition. Separate pushbuttons operate the two drinking bubblers, concealed and protected beneath the shell of the sphere.

Haws smartly designed drinking fountains fit a wide world of architectural shapes. Grace a landscape or harmonize an interior today with a unique Haws design. Write for your free catalog now.

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drinking fountains and faucets, water coolers and decontamination equipment.

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by **ELKAY**®



MODEL SR-600

**Heart-stealing sink at a budget price!** Elkay stainless steel sinks cost so little more, for all they offer! Glistening stainless steel surfaces that blend beautifully with every change in the color scheme. Big oversize compartments for bulkiest broiler pans. Single-lever faucet. Remote control drains. Center compartment for disposer. And never a worry about stains or bleaching. Sink requires only occasional scouring . . . won't chip, crack, or wear. Wide selection of Elkay models in every price range. Write today for complete catalog (CS-4) just off the press.

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Stainless Steel Sinks

*Lustertone*® *Spacemaker*® *STARLITE*® *CELEBRITY*® Four quality grades by the world's largest producer of stainless steel sinks. Elkay Manufacturing Company, 2700 S. 17th Avenue, Broadview, Illinois 60153.

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see our catalog in Sweet's **S**

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## News in brief

**GSA's Meritorious Service Award has been presented to Karel Yasko**, Special Assistant to the Commissioner of the Public Buildings Service, "for exceptionally meritorious professional leadership, superior critical techniques, and unswerving devotion to the finest quality in the design of Federal public buildings throughout the United States." The award was presented on May 15 in ceremonies in the GSA auditorium in Washington, D.C., by the new GSA Administrator, Robert L. Kunzig. Mr. Yasko, a Fellow of the American Institute of Architects, has enlisted the enthusiastic support of architects around the country for GSA's efforts to elevate the quality of Federal architecture. He was instrumental in the establishment of the National Advisory Panel on Architectural Services, which supplies GSA with professional advice and support from the private sector.

**Delbert Highlands became head of the Department of Architecture at Carnegie-Mellon University** on July 1. Mr. Highlands, who has been an associate professor in the department, succeeds Paul Schweikher, who headed the department for 11 years. Mr. Highlands, who got his B.A. and M.A. in architecture at Carnegie in 1958 and 1960, is 34 years old. He is a painter as well as an architect.

**A large-scale program of new cities in the United States has been proposed** by the National Committee on Urban Growth Policy, a bi-partisan group of senators, congressmen, governors, mayors and county commissioners. The group advocated the building over the next 30 years of 100 cities of 100,000 population and 10 even larger cities in a three-pronged program—new cities within existing cities; "accelerated growth centers" (rapid but planned build-up of existing smaller communities); and the creation of entirely new communities of city size. The study was sponsored by the National Association of Counties, the National League of Cities, the United States Conference of Mayors and Urban America.

**The American Institute of Steel Construction** has announced the opening of its 1969 Architectural Awards of Excellence Program, tenth in an annual series intended to encourage "the creative use of structural steel in building construction." All registered architects practicing professionally in the United States are invited to enter steel-framed buildings constructed anywhere in the United States and completed between January 1, 1968 and September 1, 1969. For entry forms: A.I.S.C. Awards Committee, Suite 1501, 101 Park Avenue, New York, New York 10017.

**A. Lawrence Kocher, a pioneering modern architect and ARCHITECTURAL RECORD's** managing editor from 1928 to 1938, died June 6 at his home in Williamsburg, Virginia. He was 83 years old. Mr. Kocher, a distinguished teacher and historian and the author of several books, was architectural records editor of Colonial Williamsburg from 1938 to 1954. A graduate of Stanford University with an M.A. from Pennsylvania State College, he had studied also at the Massachusetts Institute of Technology and New York University. He was head of the Department of Architecture, where he had taught since 1912, from 1918 to 1926, and headed the McIntyre School of Art and Architecture at the University of Virginia from 1926 to 1928.

**Richard A. Richards, a June graduate of New England School of Art**, has been named winner in Royalmetal Corporation's seventh annual Student Design Competition. Mr. Richards received a \$500 award for his design conforming to the theme of the competition, "Furniture for Office Landscaping Areas." Contestants were invited to plan a small general office using the office landscaping concept of open space planning, with furniture and equipment of original design or proprietary manufacture. Second prize, \$300, was awarded to Ringo Yung of Kansas University, Lawrence, Kansas. Third prize of \$100 went to Terry F. Lewis, a student in the Department of Housing and Applied Design at the University of Maryland. Honorable mentions of \$50 each went to: L. Horne, Virginia Commonwealth University; Lawrence Imamura, Washington State University; and John E. O'Brien of Texas A & M. Judges for the competition were A. Gordon Lorimer, F.A.I.A., Chief Architect of the Port of New York Authority; Richard Meier, A.I.A., architect; and Herbert L. Smith, Jr., A.I.A., senior editor of ARCHITECTURAL RECORD. Presentation of the awards was made by D. Dadourian, president of Royalmetal Corporation.



## Arson suspected in fire at Yale Art and Architecture Building



Gene Corlick, New Haven Register



Art Dietle, New Haven Register



© Ezra Stoller (ESTO)



A three-alarm fire gutted the Art and Architecture building at Yale University on June 14. It broke out at 4:00 A.M. without tripping the school's alarm system and raced through the fourth to sixth floors before it was spotted by a passerby.

New Haven Fire Chief Francis Sweeney said: "I will consider this fire to be of suspicious origin until we prove differently." Mr. Sweeney reported that flames blossomed with unusual rapidity, intensified by the solvents and paints associated with the students' work. Although the fire was brought under control in 45 minutes, damage was estimated at from \$500,000 to \$1 million.

The floors that received the most damage (where the flames apparently started) were used for painting and architecture courses, and contained drafting tables and plywood partitions, according to Howard Weaver, dean of the school. The first

floor library containing thousands of priceless volumes was spared from heavy damage.

Relatively unaffected also was the top floor, much of which is used as a cafeteria and eating area. The heat was intense enough, however, to curl the plastic coverings to the lighting fixtures there.

Police and fire department investigators combed the fire-ravaged building for clues to the cause of the fire. Pending results of the probe, fire marshal Thomas Lyden declined to comment on the origins of the blaze.

The fourth and fifth floors were completely gutted with the exception of one small area on the lower floor. The sixth floor, which is partitioned off into small rooms, also was heavily damaged. Some water damage was done to the floors below, and heat damage penetrated to documents and records in files on the second floor.

Yale officials, in the mean-

time, have been girding for the problem of what to do when the fall term begins. Although the razed sections of the building will not be in service by September, the school will continue its programs.

The major problem for the university is the speedy reallocation of space for students. It is complicated by the entrance this fall of coeds on the campus.

Among the surviving spaces in the seven-story concrete building are the first floor library, the administrative spaces on the third floor, and the basement and sub-basement areas, used by graphic design and sculpture students.

It is not known at this time how many students lost tools and drawings in the blaze. One university spokesman said, however, that the personal loss toll would have been much worse if the fire had struck when classes were in session.

One student reportedly lost

five years worth of architectural renderings and plans.

Heat from the fire was of such intensity that steel beams were warped, floors above the fire's core. A structural engineer will be taking a survey of the building to check for any damage to the main supports.

In addition to instructors and staff, an undetermined skeleton complement of students remained at the school as part of an "evaluation school," which is to chart recommendations for school policy and administration in the future.

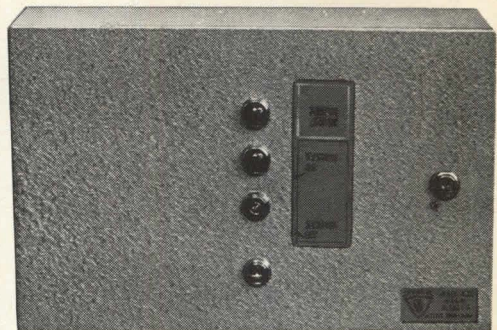
Controversy has marked the history of this building since its completion in 1963 to Paul Rudolph's "monumental" design (RECORD, February 1964). While no direct accusations have been made, one observer noted that on the day before the fire leaflets were being circulated among students stating that the building has no point and should be burned.



# If the guard doesn't show by the specified time —he's in trouble

## New fail-safe W.A.S. phones for help immediately —automatically

When a guard runs into big trouble — the kind that will prevent him from continuing his rounds — W.A.S. automatically dials as many as three phone numbers and sends a pre-recorded S.O.S. across regular telephone lines.



The proper authorities — police, fire department, maintenance chief, or others — are alerted to the danger as soon as they pick up their phones, even if the guard is unable to sound an alarm!

The W.A.S. (Watchman's Alarm System) is fail-safe. It goes off **automatically** unless the guard de-activates it **on-schedule**. An attempt at tampering will set it off. And once activated, not even the guard's special key can stop the call for help.

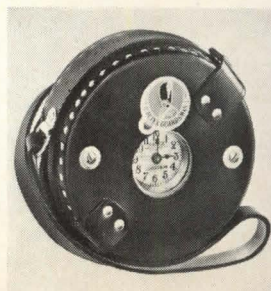
Install reset stations at sites spaced to require attention at any time interval from a few minutes up to two hours. Tailor W.A.S. to your specific security needs.

Send the coupon for complete details and specifications.

## Tamper-proof Detex watchclocks record any lapse—even over 4-day week-ends

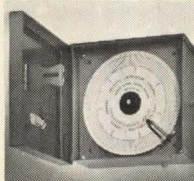
If a guard fails to punch in on time at any Detex watchclock station . . . his watchclock provides a no-nonsense, alibi-proof record. A minute-by-minute account of his activities is embossed on the tape or dial. Impossible to alter or forge.

That's why UL-listed Detex portable and stationary watchclocks are the world's best selling guard supervision devices.



**Guardsman** portable watchclocks deliver a continuous record for more than 96 hours without re-setting by supervisory personnel.

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**Safe-T-Chek** stationary watchclocks mount inside door. For areas requiring special attention.

Send for complete details on Detex watchclocks — and keep your guard up.



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53 Park Place, New York, New York 10007  
Rush me detailed, illustrated literature on:

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For more data, circle 28 on inquiry card



The Pan Am Building, N.Y.C.,  
Architect: Emery Roth & Sons, N.Y.C.  
General Contractor: Diesel Construction N.Y.C.

## What a difference the Seal makes...



\*The manufacturer warrants by affixing this label that this product is a duplicate of materials independently tested and approved by, and in accordance with standards established by Thiokol Chemical Corporation

**THIOKOL'S SEAL OF SECURITY means that the sealant product wearing it is supported by the industry's first and only full-service quality assurance program.**

When you choose sealant with the Seal of Security on the label, you choose total weatherproofing protection.

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The materials must provide steel-grip bonding, rubbery flexibility, highest resistance to weather, wear, and aging...must be capable of weatherproofing totally all joints, in all climates, under all service conditions, on a long-term basis. That's the difference the Seal makes. Get the facts. Write Thiokol.

**Only LP® polymer based sealant offers assurance of quality—for new and remedial work**

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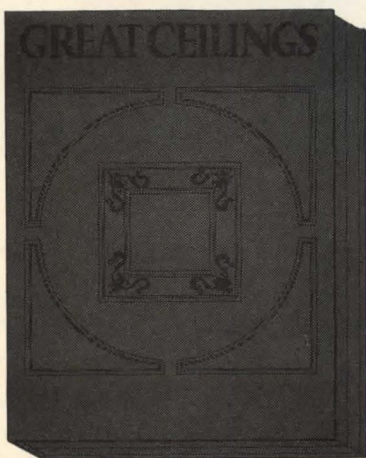
**CHEMICAL CORPORATION**

780 N. Clinton Ave., Trenton, New Jersey, 08607

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**Air conditioning  
that puts no ceiling  
on imagination\***



\*Bound to entice the imagination—Carrier's new Architect's Portfolio includes a dozen of the world's "Great Ceilings" suitable for framing.

Carrier's Moduline® variable volume air terminals are designed to give you freedom of design . . . to enhance rather than hinder your personal hallmark.

A showcase of what architects have accomplished in ceiling design with the Carrier Moduline is now available in a new portfolio entitled "Great Ceilings."

This handsomely bound reference book includes a variety of installations such as a school, hospital, municipal building, service center, and office buildings. Some are completely new, others are add-ons and/or renovations.

A new 7-minute companion film on the Carrier Moduline is also available for private showings. It clearly describes the unique features of this new unit and illustrates a variety of design-provoking ceilings. The name is the same, "Great Ceilings."

Registered architects who write in on their letterheads will receive a copy of the "Great Ceilings" portfolio and may also schedule a showing of the film.

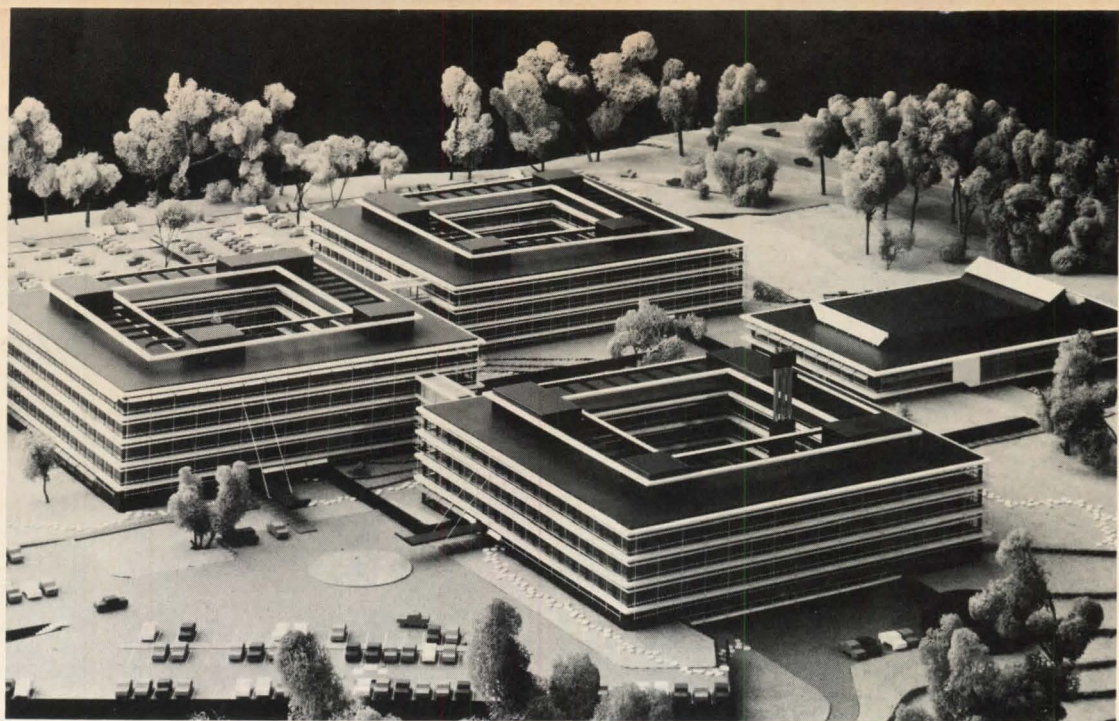
Write today to William Heck, Product Manager, Carrier Air Conditioning Company, Carrier Parkway, Syracuse, New York 13201.

Carrier Air Conditioning Company

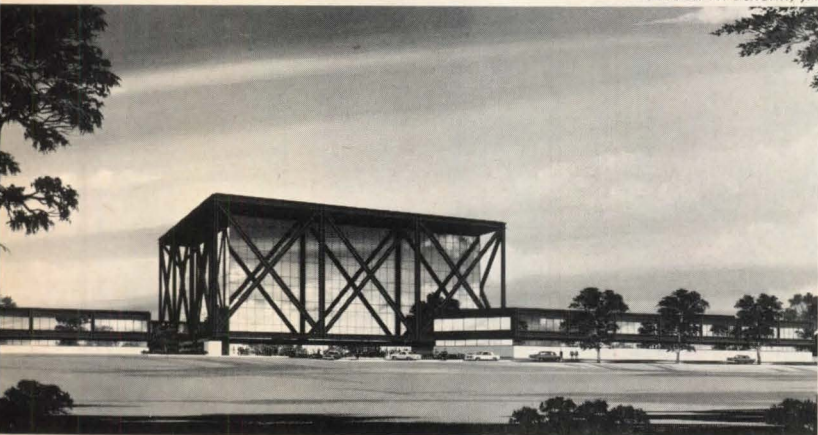




**IBM Headquarters**, Stuttgart, Germany, is to be comprised of three office buildings—two will be four-story, and the third, five-story—and a two-story employe cafeteria, which will seat 850. The \$16-million complex, designed by Prof. E. H. Egon Eiermann, will be located on a 27.4-acre plot and will employ about 2,000. Construction schedules are being plotted and controlled by means of a network technique using computers. The architect of the new complex, to be completed early in 1971, also designed Bonn's embassy in Washington, D.C.



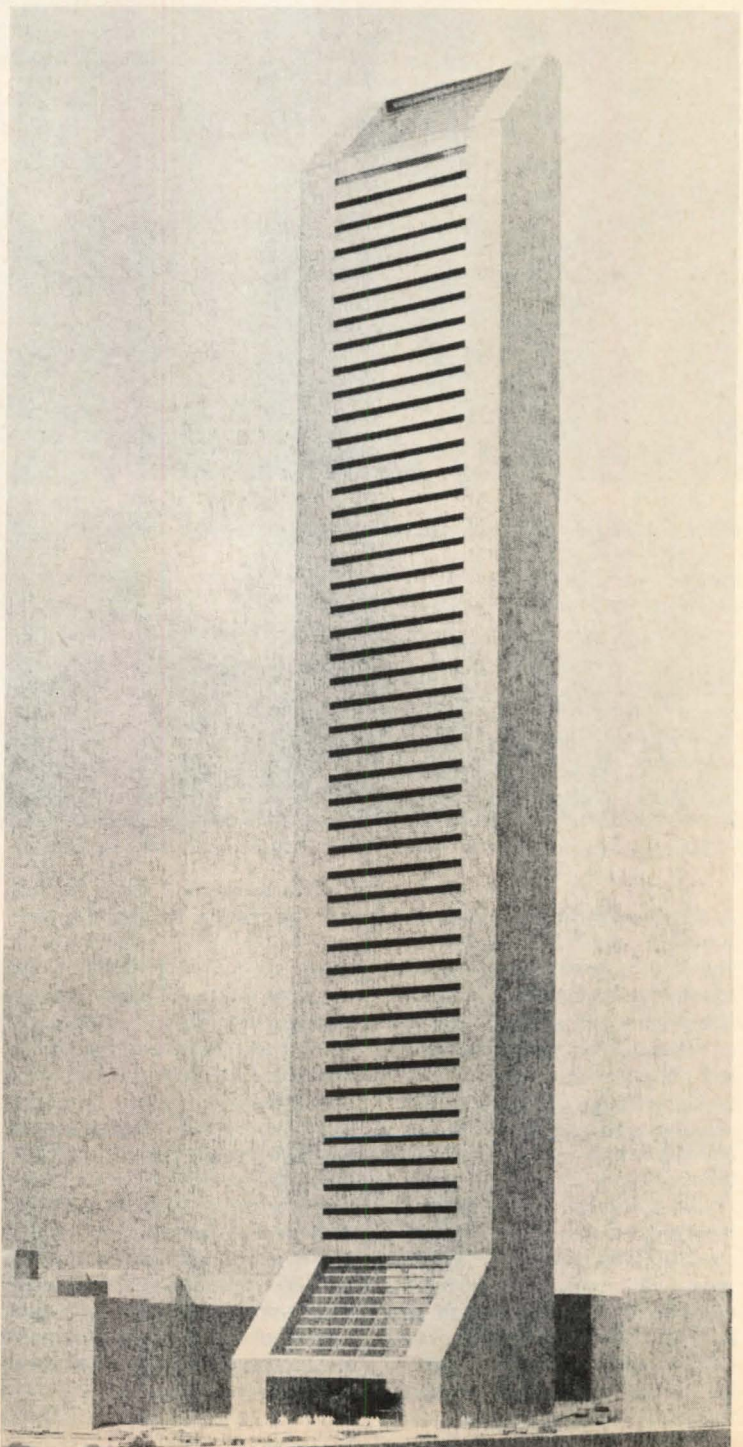
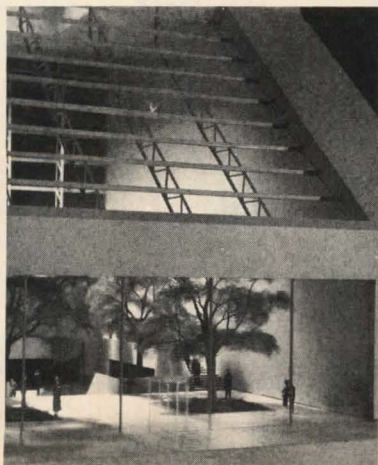
Gordon H. Schenk, Jr.



**Corporate Headquarters Building**, Burlington Industries, Inc., Greensboro, North Carolina, is a six-story central glass prism framed within diagonally braced steel trusses mirrored by the exterior glass walls. The exterior of palest topaz-tinted glass and rich sable-brown steel, will contrast with a white masonry base at ground level. The building will contain approximately 400,000 square feet of space for executive

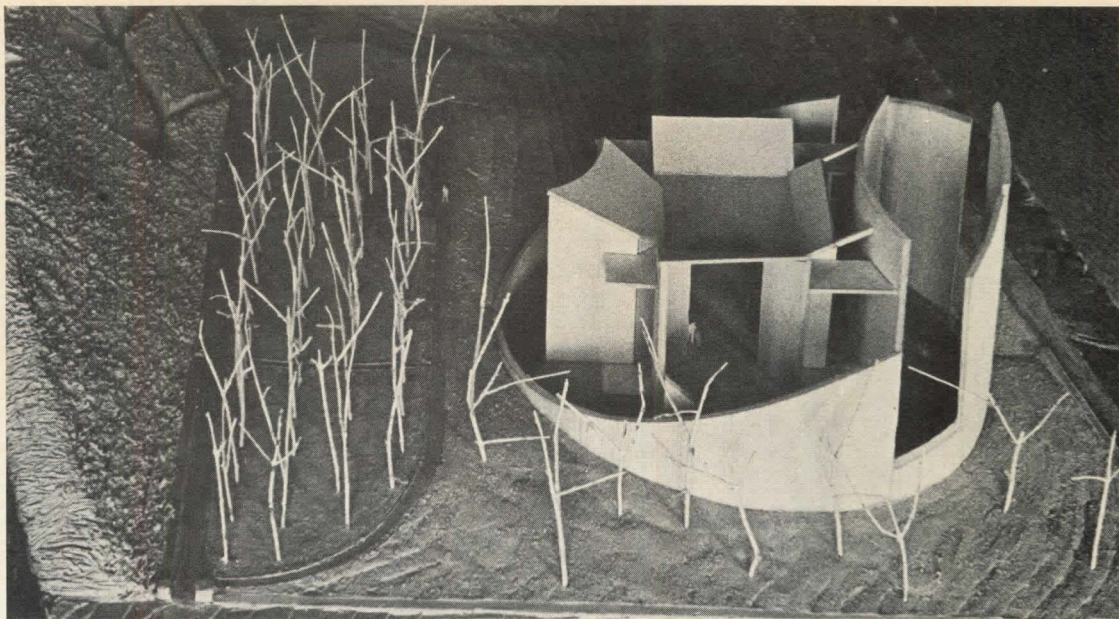
offices. A two-story steel and glass wing with large open floor areas will partially enclose three sides of the central building and its continuous landscaped court. Underneath the complex will be a lower level accommodating service and maintenance operations. Parking for some 700 cars will be landscaped and screened from the building and its neighbors. Architects: A. G. Odell, Jr. and Associates.

**Worcester County National Bank**, Worcester, Massachusetts, designed by Kevin Roche John Dinkeloo and Associates, will have a large enclosed, landscaped public space which is an extension of the plaza and forms the entry to the bank and office tower above. This 80-foot-high glass-roofed hall will provide access to the bank—the main banking floor extends beneath the plaza—and the tower elevators. The high and low bank elevator shafts and stair towers form bearing columns, one at each end of the 46-story, 695-foot-high building. Between these, the floor spans 75 feet without additional support.





**Interdenominational Chapel**, Carnegie-Mellon University, Pittsburgh, has a rough circular exterior wall enclosing gardens and water. Various openings in the wall serve to monitor sunlight into interior spaces, to produce moving light patterns, or to allow entry to the forecourt. Smooth concrete walls extend from a 36-foot central cube to form an entrance, side chapel spaces and apse. There will be areas for daily services, discussion groups and offices. Architects are Paul Schweikher, Robert Taylor, Troy West.

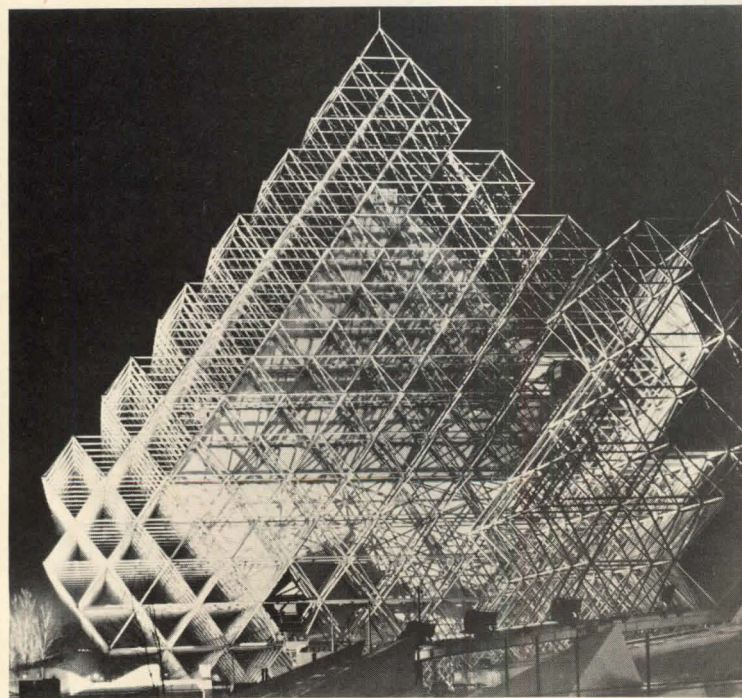


James H. Cook



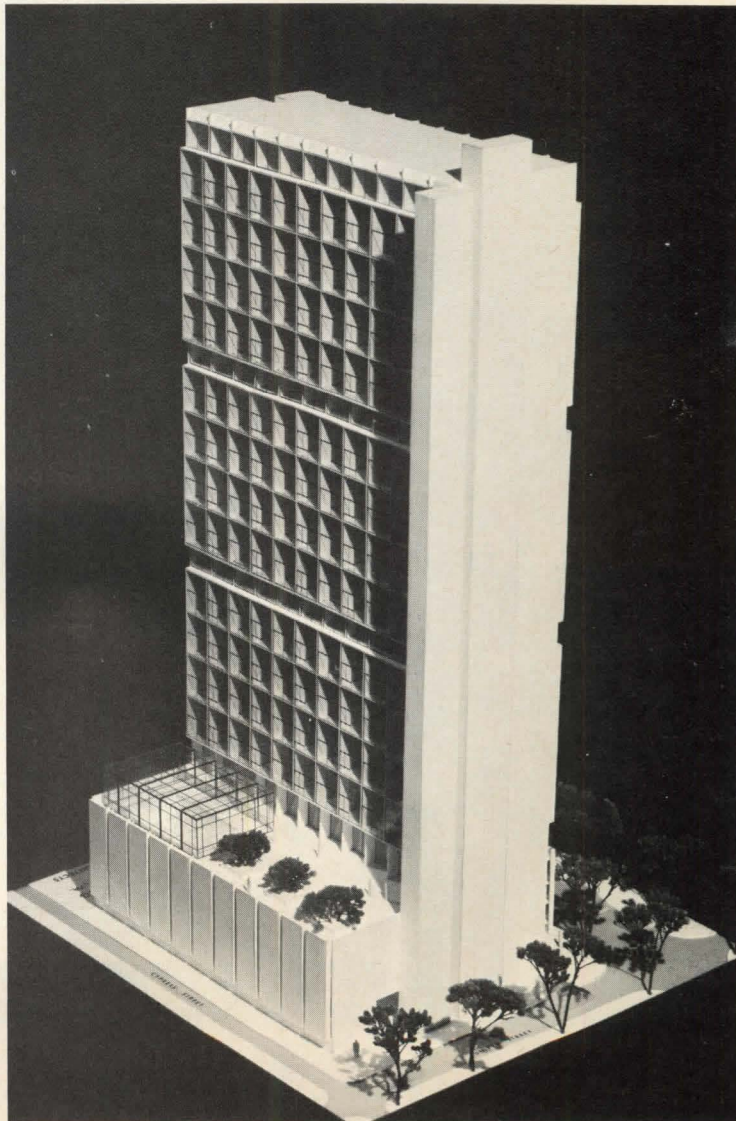
**Walled Lake Exchange Building** for Michigan Bell Telephone Company, Walled Lake, is a windowless building in a semi-residential area. The building, which houses telephone

switching equipment, is a reinforced concrete frame with sand-blasted, poured concrete walls and a painted terne fascia. Architects: Linn Smith·Demiene·Adams·Inc.



**Gyrotron structures** housing the major entertainment ride for the permanent Man and his World Exposition, Montreal, originally Expo 67, has received the R. S. Reynolds Memorial Award for 1969. English architect Boyd Auger has received

\$25,000, the largest monetary award in architecture. He was selected by an A.I.A. jury: David N. Yerkes, Chairman, Max Abramovitz, Ralph P. Youngren and Walter Eijkelenboom, who with Abraham Middelhoeck received the award last year.



**La Residence**, Philadelphia, a high-rise studio apartment project, will contain apartments comprised of three groups of duplex studio units separated by single floors of one-story apartments. The sixth floor, which will be devoted to social and recreational activities, will have an open-air patio and glass enclosed swimming pool atop part of the four-story garage. The first floor of the 21-story, reinforced concrete

structure will have a lobby, elevator foyer and commercial space. Said the architect, Milton Schwartz, "The vigorous rusticity is produced by the use of materials in their natural state without superficial adornment or concealment." To heighten the naturalistic effect, deep window frames in natural finished wood will be used for the two-story vertical windows. Occupancy is scheduled during 1970.





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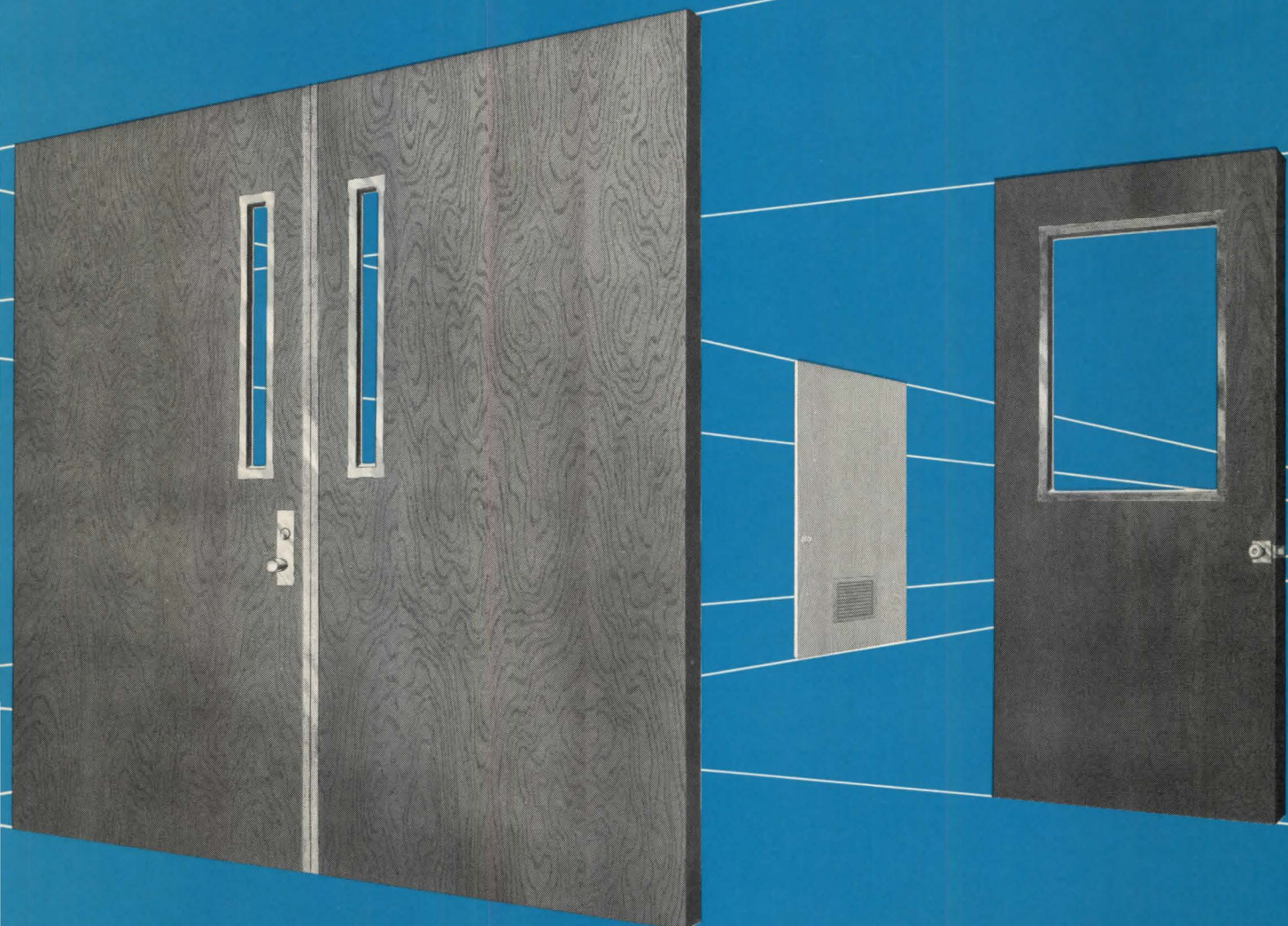
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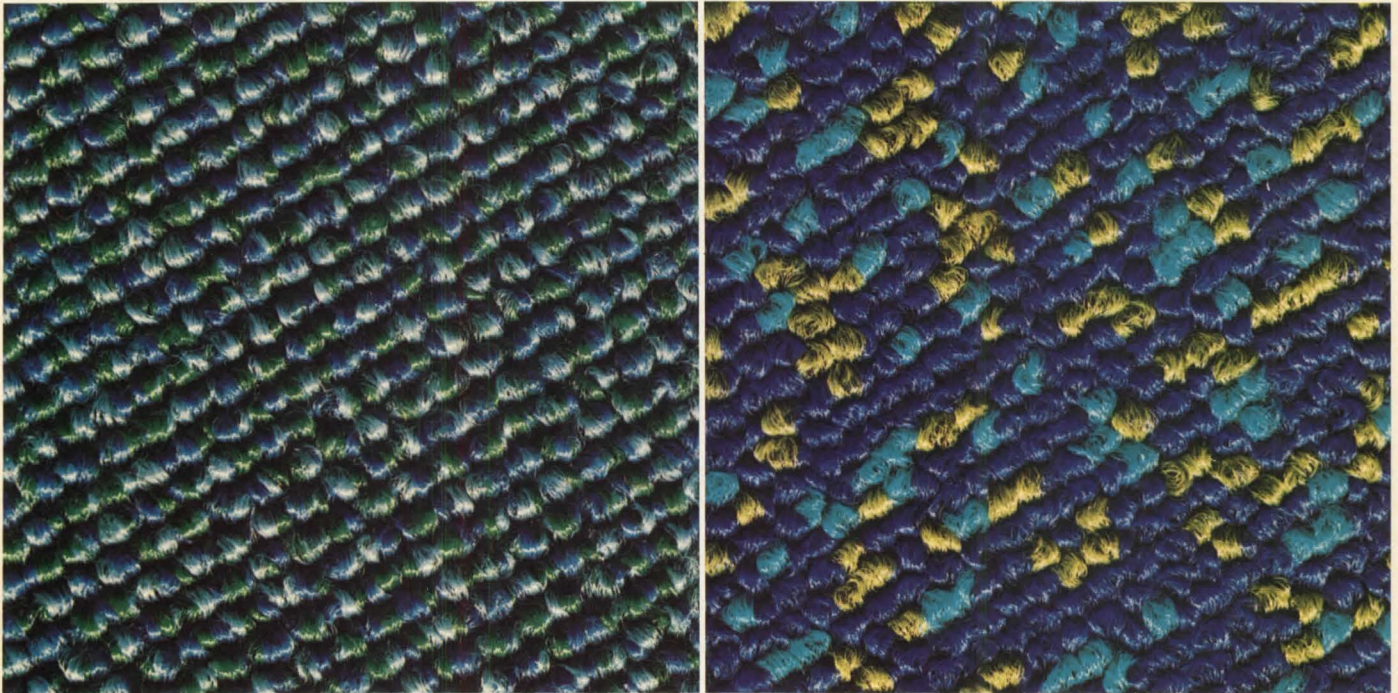
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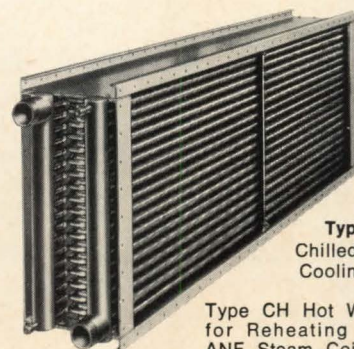
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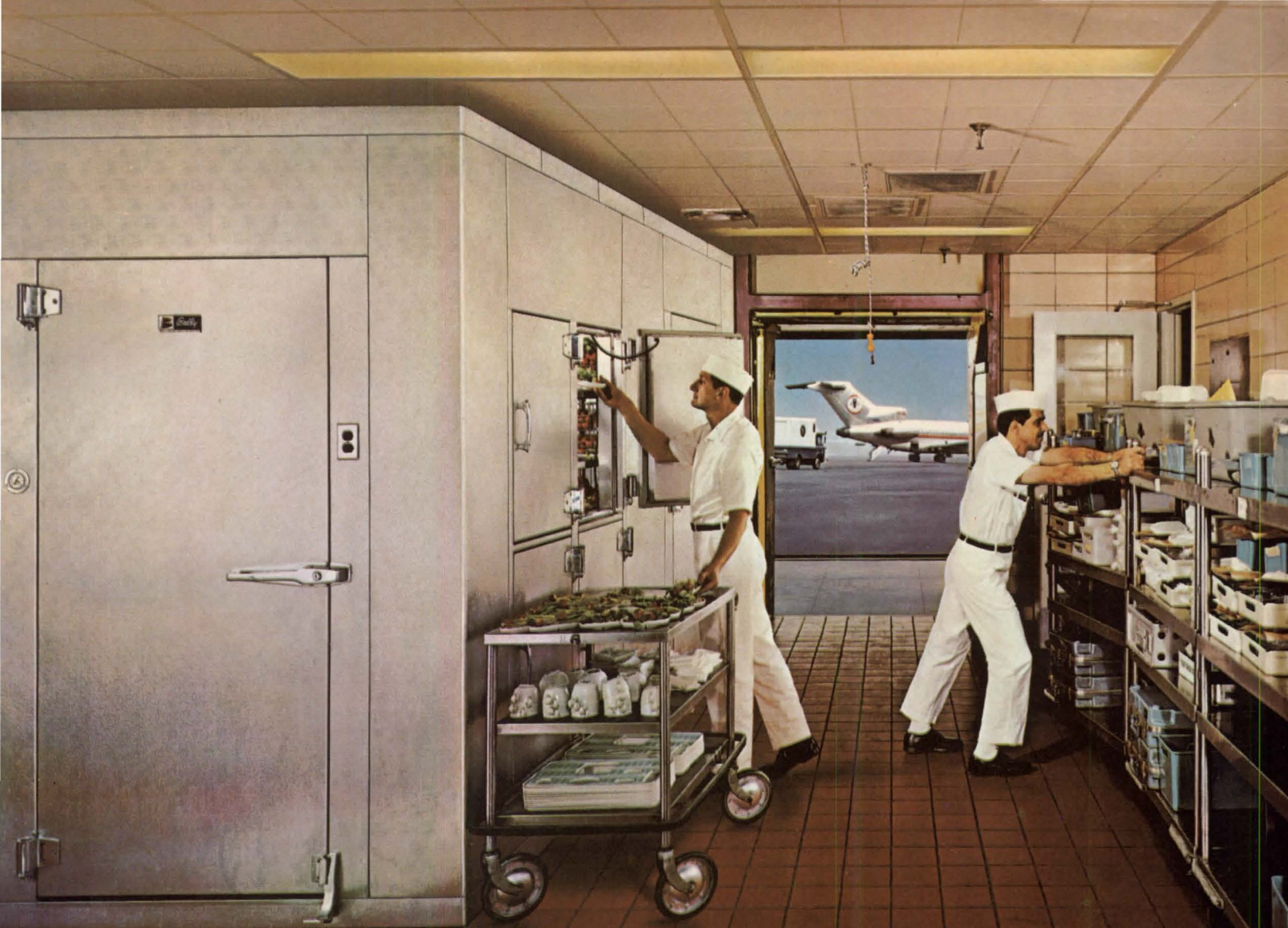
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kitchen



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That's why McGraw-Edison pioneered the development of outdoor lighting systems that complement building designs. You have the choice of a wide range of styled luminaires—from the most contemporary to Early American carriage lanterns. One of these styles can best complement your design.

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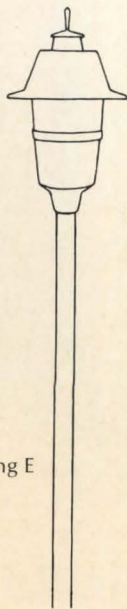
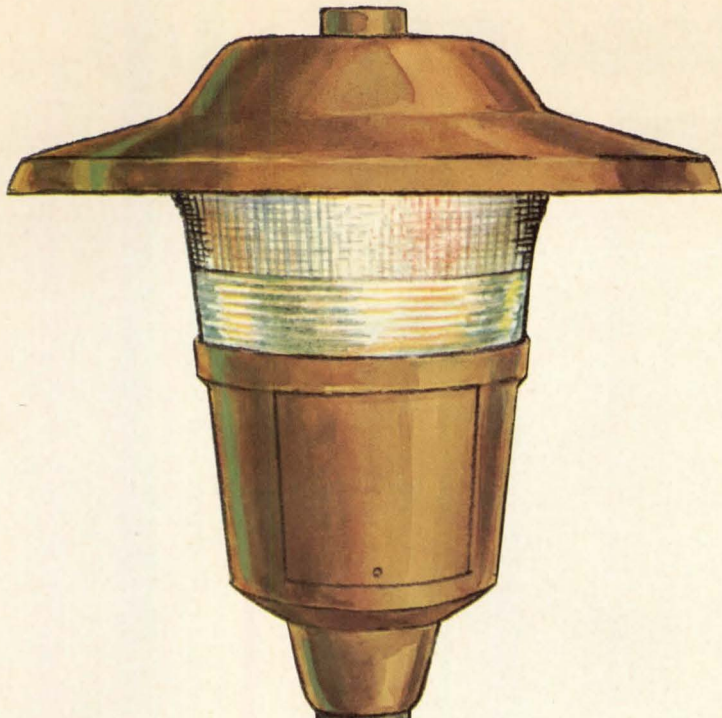
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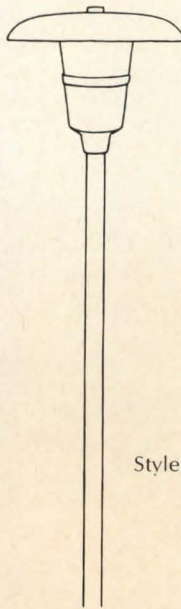


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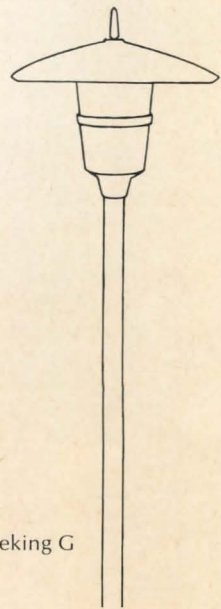




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### STRUCTURAL REPORT

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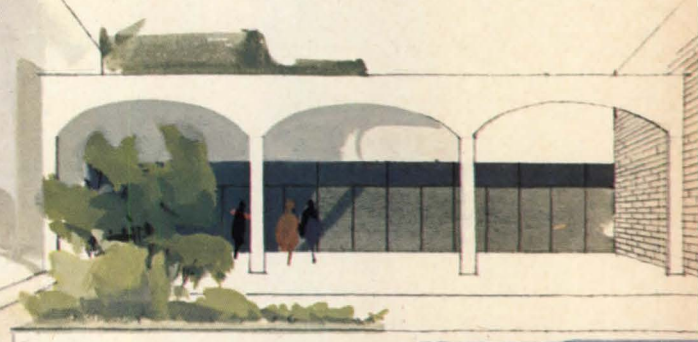


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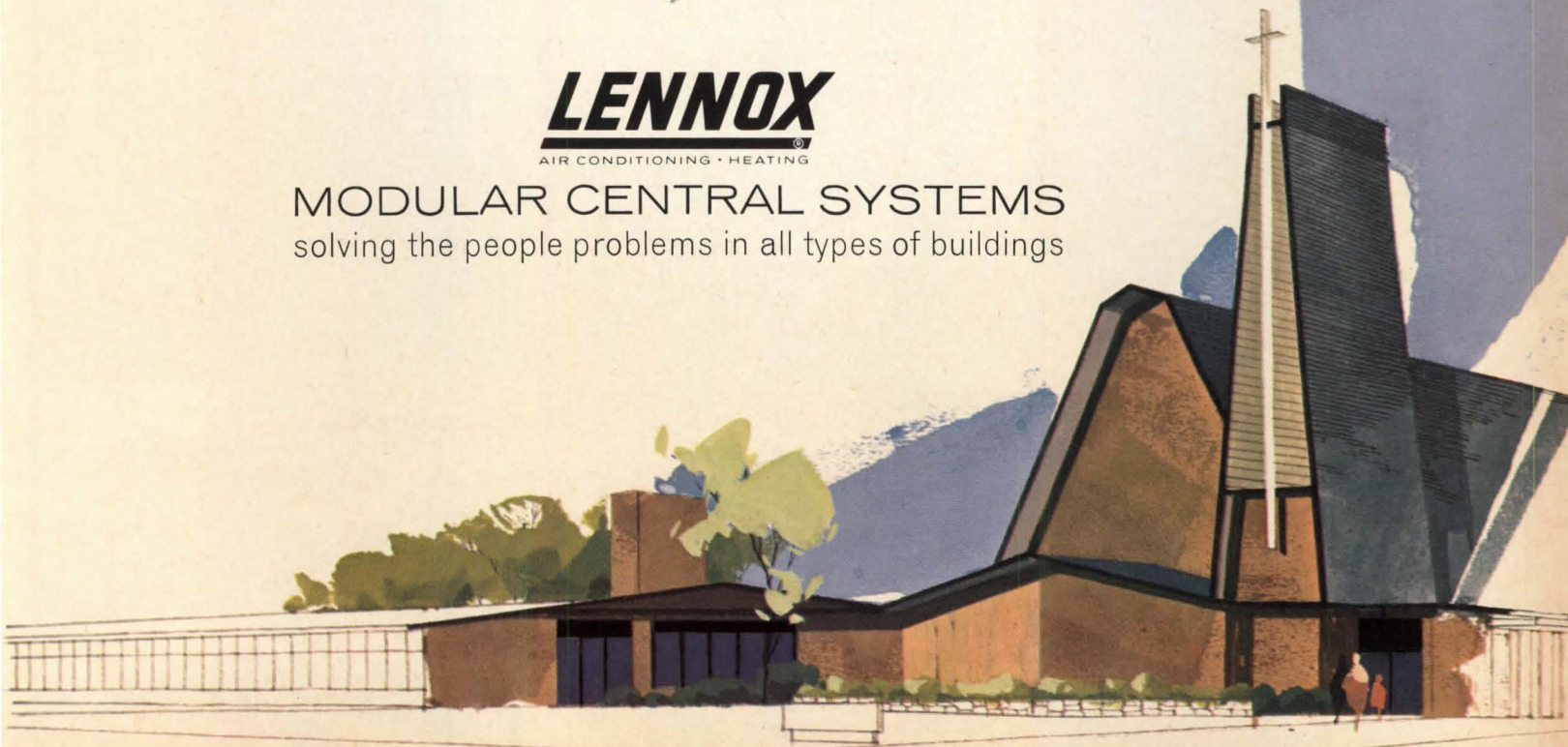


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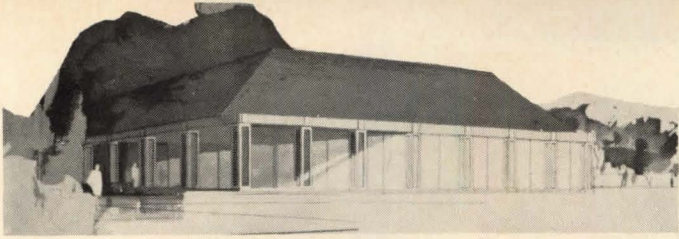
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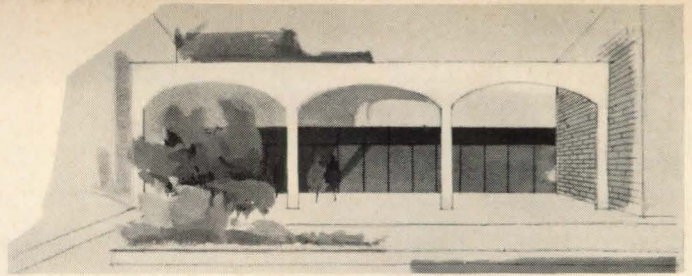
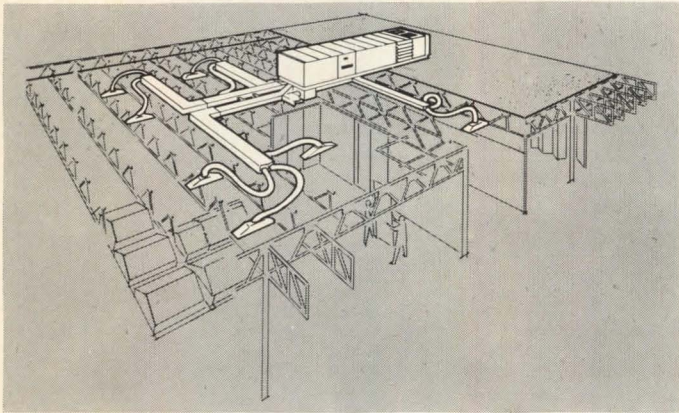
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flexibility combines people  
comfort, economy & designability.**





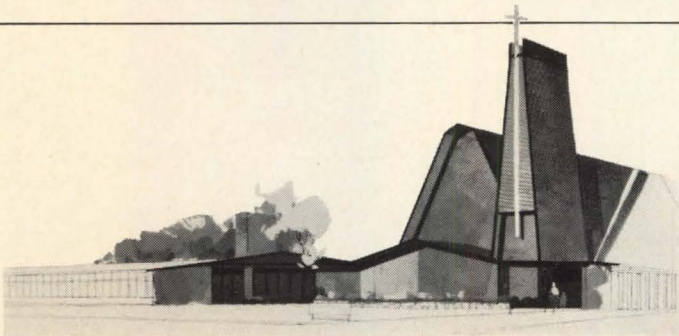
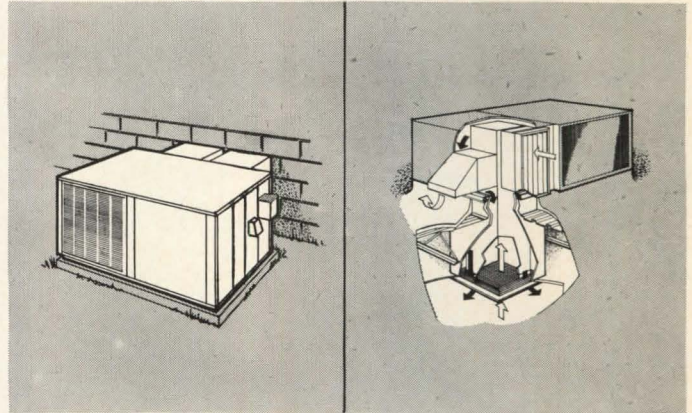
Spacious, beautiful country club provides members' indoor comfort with "micro-climates" from concealed rooftop installations of Lennox unitary central systems. Four individually-controlled comfort zones come from one DMS1 unit of 22 tons cooling capacity and 500,000 Btuh gas heating. A Lennox GCS3 furnishes heating, cooling and ventilating for the large single-zone area (capacity: 8 tons cooling, 250,000 Btuh gas heating). Kitchen and locker rooms are heated and ventilated by another unitary system.

*Direct Multizone units on roof serve many comfort zones through flexible duct which can be moved as zone boundaries change.*



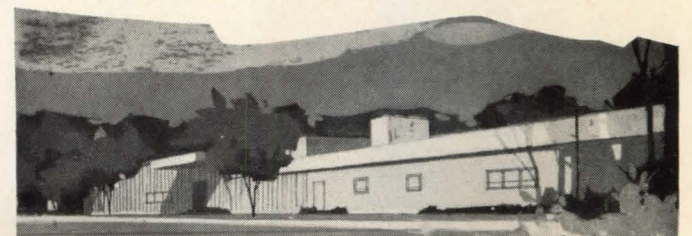
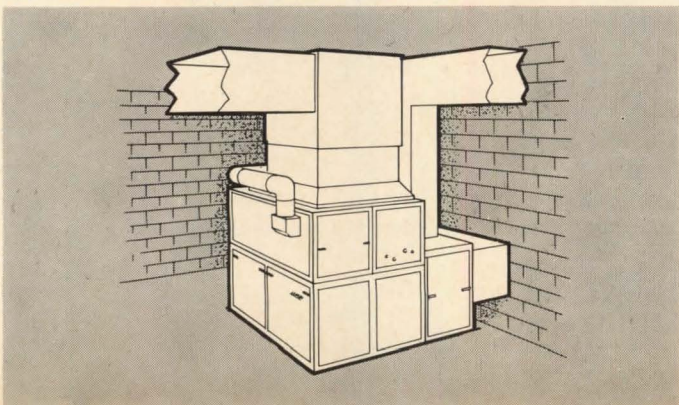
Patrons and employees of the 80 stores and theatre in this colorful, exciting shopping center will find the comfort right! Some 800 tons of cooling will come from a variety of Lennox equipment atop the center's 18-plus acres of buildings. Among the Lennox equipment supplying this large volume are: GCS single-zone combination gas heating/electric cooling units for large, undivided spaces; DMS units for the many individually-controlled comfort zones; condensing units coupled with coil/fan units; and other modular central systems.

*Lennox GCS3 all-weather combination gas heating/electric cooling unit serves single-zone areas from rooftop or grade level.*



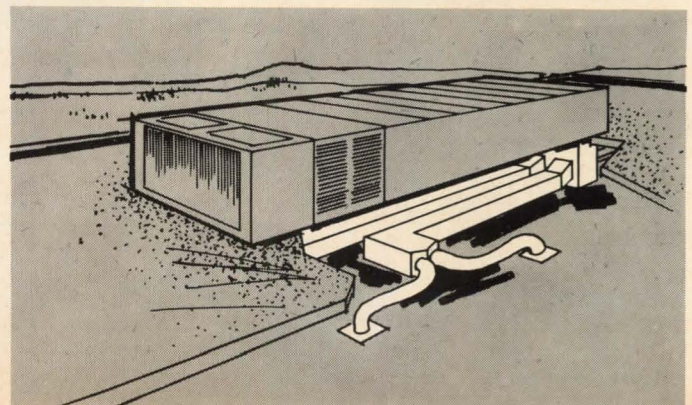
Comfort flexibility keynotes the gas heating/ventilating system of this striking new church building. To supply both upper and lower floors economically and efficiently, two new DMS2 units are installed in the equipment room. One unit serves multiple zones of the lower floor (Sunday School classrooms, etc.), the other serves the upper floor entrance hall, sanctuary and choir room. Provision is made for easy add-on cooling in future.

*A new Direct Multizone System now adds flexibility in multiple zone applications for single and multistory buildings.*



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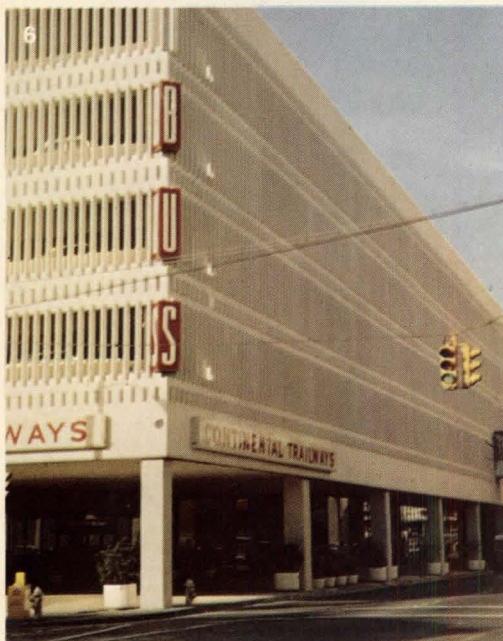
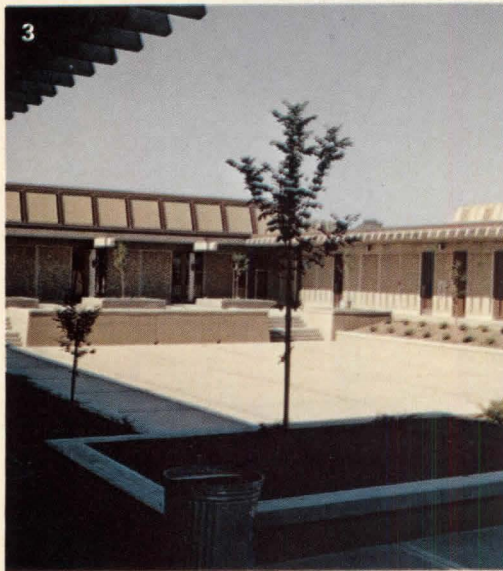
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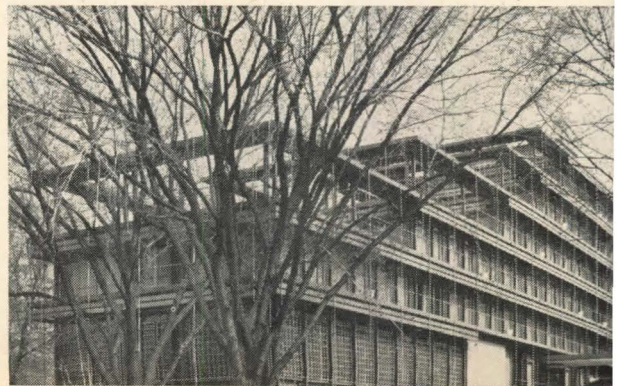
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## Construction Industry Foundation sets up shop

The Construction Industry Foundation held its first organizational meeting at A.I.A. headquarters in May. Architect Robert Cerny, who has been the force behind formation of the Foundation and is its president, reiterated the goals of the organization. As stated in the by-laws, those goals are:

"To provide a forum for the mutual review and understanding of the problems within the construction industry, and to clarify and improve relationships among all elements of the industry for the general benefit of the public and of the construction industry by the adoption and promotion of programs:

"to establish research programs;

"to establish educational programs;

"to advise and recommend clarifications and improvements in the relationships, documents, laws and customs applicable to the construction industry;

"to assemble legal precedent and other information as a guide to the construction industry and the public;

"to educate the professional societies, trade associations and others representing and serving the public and the construction industry for the development of fair and reasonable agreements and documents;

"to develop model laws affecting the construction industry."

Representatives from practically every segment of the industry attended the meeting. Homebuilders, subcontractors, bankers, surety bondsmen, insurers, materials manufacturers, engineers and architects were there—everyone, in fact, except general contractors and labor—two groups whose disinterest could greatly hamper the effectiveness of the organization according to some observers.

C.I.F., for which the A.I.A. national board in June of 1968 authorized launching funds and an advisory task force (RECORD, December 1968), is envisioned as a membership-funded repository of both money and talent from all segments of the industry. The Foundation is authorized to sponsor research—often through grants to legal authorities—to catalog areas of overlapping responsibility, confusion and inequities, and to provide a forum in which these problems may be negotiated. The Foundation seeks an equitable division of responsibility with neither special favor nor protection to any part of the industry.

### C.I.F. tackles problems via sponsored research

Short-range problems tentatively outlined as targets for reform include escalating litigation (particularly against third parties), survey and soil exploration errors, poor cost estimates, quantity surveys, etc. An immediate project will be a search for means to clarify plans and specifications with industry-wide consistency in order to eliminate bidding and liability hazards.

One first-priority long-range problem the Foundation hopes to solve is stated as "financial order and reform," i.e., the orderly transfer of a client's money to the contractors, subcontractors, materials suppliers, manufacturers, etc. Tentative suggestions to amend the withholding procedure without harm to either client or contractors were outlined in the agenda for the meeting: "The owner must demonstrate financial responsibility and agree to pay a penalty for delayed payments. Perhaps the Federal government must discipline itself to a reasonable compensation pattern rather than the 60 to 90 day delay common on Federal projects. Perhaps the retainage system must be reformed, possibly with escrow funds invested, interest accruing to the contractors. Perhaps the entire lien waiver process needs reform."

Another long-range proposal that met broad support is an industry-wide research

effort to clarify guarantees, and establish workable standards for products, applications and guarantees. The objective would be to clarify professionals' and contractors' responsibilities for the failure of materials, and help to check a growing problem of subtle dilution of quality through the "or equal" clause used in specifications. The professional often finds it difficult to reject products which are fractionally inferior, but there must be some standard of quality, fixed and established, which will allow for fair, competitive bidding, maintain representatives of the Foundation.

Professional and construction associations generally agreed to endorse the Foundation and encourage it, but some maintained that financial support at \$1000 per member for the proposed \$500,000 per year budget should come from individual companies and practitioners rather than associations. Cerny has already raised some \$13,000 from architects after speaking in three cities.

Incorporators include members of Armco Steel Corp.; Honeywell, Inc.; A.I.A.; the National Electrical Contractors Association; and Cushman and Obert, Esquires, Philadelphia law firm. Officers of the Foundation are: president, Robert G. Cerny; executive vice president, Robert F. Cushman; first vice president, Richard H. Oakley; second vice president, Bernard H. Trimble; secretary, J. W. Rankin.

### Engineers take direct action on liability problems

Liability insurance was among prime industry problems getting direct action at the annual meeting in May of the Consulting Engineers Council of the United States.

Released at the meeting was a *Professional Liability Loss Prevention Manual* published as a part of C.E.C.'s program to correct the problem of professional liability claims and losses. The manual was developed by Risk Analysis and Research Corporation in cooperation with the C.E.C. Professional Insurance Committee. Copies of

the manual are being offered for sale.

C.E.C. also adopted a resolution calling for the establishment of a C.E.C.-managed and directed insurance program with some self-insurance features. The Professional Insurance Committee recommended a program basically providing coverage up to \$50,000 with reinsurance included, and with excess insurance coverage provided for amounts over \$50,000. It also was recommended that the manual consultants be retained as the administrative agency.

The Board unanimously approved pursuing development of the proposed active insurance company and temporary financing. It also authorized renewal of the contract with the consultants for one year to update the loss abatement manual and to develop a new loss abatement and legal defense procedural program.

#### ARCHITECTURAL BUSINESS THIS MONTH

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## COMMENTARY

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

## Construction labor: Problems—and a partial solution

In recent testimony before a special House labor sub-committee, Mr. William E. Naumann, chairman of the A.G.C. legislative committee, stated his position about construction unions:

"How responsibly construction unions are exercising their great powers today should be looked into, before more time is spent in attempts to add more power to what they already have. Construction unions already have many special privileges and powers not accorded to other unions or other segments of society. These include the following: Construction unions have great power at the bargaining table, enabling them in recent years to lead the inflation parade. The construction industry at this moment is having many strikes over exorbitant wage demands. This year, a discernible hard-line pattern is emerging in the form of demands for 20 and 30 per cent wage increases per year, with the average wage, based on unimpeachable Labor Department sources, now reaching \$5.85 an hour. Construction unions have a special exemption from the ban on 'hot (hazardous) cargo' agreements, which are, for them, enforceable in the courts. Construction unions have a special exemption (which permits them) to have compulsory union shop agreements before their men are even present on the construction project (except in states having right-to-work laws). Construction unions have a special exemption to operate exclusive hiring hall systems. The NLRB and the Supreme Court have told these unions they can block the use of prefabricated products on construction sites to preserve customary handcraft work, or to recapture work their members used to do."

Mr. Naumann's last sentence can be documented by some chilling horror stories. The following appeared in a very perceptive and highly recommended article entitled "The Unchecked Power of the Building Trades" in the December 1968 issue of *Fortune*:

"The unions often cite historical work practices in construction to justify a veto of even the most elementary advances. The plumbers, for example, have long insisted that piping under two inches in diameter be assembled on the site. The most ludicrous example of this make-work mentality occurred at the Vandenberg Air Force Base, when pipefitters refused to handle a pre-

fabricated manifold, an assembly of pipes and valves used in the hydraulic system of an ICBM launching pad. The unions insisted that the unit be knocked down and reassembled. Since disassembly might have damaged the unit, the union agreed that it would merely charge for the time that would have been expended on the job, and insisted that an appropriate number of men squat around the object. At the end of this period, a welding bead or mark was ceremoniously added and the unit was then trundled off to the assembly site. This ritual became known as 'blessing the manifold.'"

### Union power manifested in high government circles

From the Washington Report on Labor:

"The AFL-CIO unions' power was on display in the ceremonial stand where Mr. Nixon took the oath of office, at the White House stand where he reviewed the parade units, and in the grandstands seating the spectators. A non-union construction firm was the original low bidder for the job of erecting the temporary reviewing stands. Enter: the Washington Building Trades Council, spokesman for the AFL-CIO construction unions in the District of Columbia. Complaining that the contract usually went to a union firm, the Council successfully demanded that the contract be increased \$50,000 above the original bid, and stipulated that it contain exclusive hiring hall provisions. Furthermore, the 'successful' low bidder—a small builder—was compelled to agree to use only union labor on all jobs for a full year."

Certainly, every practicing architect has his own collection of incidents similar to those described. But what effect do these privileges, incidents, and bargaining powers have on the industry?

First, of course, the cost of construction increases very fast. Today's construction labor costs are 400 per cent of 1941 levels. Another fact we all must get used to is that present labor costs are more than apt to double before 1975. In May, more than two dozen strikes were tying up some \$2.5 billion of construction, or approximately 4 per cent of all construction estimated for 1969. If construction labor was able to negotiate on a country-wide basis (unlike the local or regional arrangements at present), the prospect of a nation-wide strike

is awesome and difficult to contemplate.

### Can the architect help alleviate the labor cost problem?

Of course. The architect can omit from his design all sections, assemblies, and details that require complicated or large amounts of labor to construct, and thus lower the percentage of high cost labor necessary for completion of the building. If this surgery is too extreme, the National Association of Manufacturers suggests that the architect can influence amounts and cost of labor in other ways:

1. He can request, by specification, that he be kept informed of labor relations and the manpower problems of the contractor, so that he and his client can make appropriate decisions.

2. He should consider the contractor's labor relations competence when awarding contracts.

3. He can insist, by specification, that overtime work not be scheduled on a regular basis, and he and his client can assist the contractor in eliminating overtime except in emergencies. In cases where it is practical, bid invitations should specify that bids are to be on a 40-hour basis (or less, if certain trades work fewer hours before overtime is computed).

4. The scheduling of reasonable commencement and completion dates with a regard to manpower can aid in alleviating the shortage of skilled labor and the resulting pressure for overtime work, and can materially reduce construction costs.

Does the architect have a trump card? Not really. The contractor builds with labor that costs a predictable amount, and the owner pays with money that costs a predictable amount. The architect is in the middle and getting squeezed from both ends; he has played many of the cards in his hand. But he owes it to himself to become very familiar with partial solutions to the definitely construction-wage-related building cost problem: industrialized construction, systems building, modular construction, prefabrication, call it what you will. Clearly a mechanization of the construction process is overdue to reduce the labor cost as a per cent of the total cost, and to enable the construction industry to get more mileage out of more productive and less expensive labor in general industry.



# INDEXES AND INDICATORS

Dodge Building Cost Services  
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## BUILDING COST INDEXES

The information presented here indicates trends of building construction costs in 21 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, are used. Prices of four common building materials are included for each listed city.

Metropolitan area	Cost differential	Current Index		% change year ago res. & non-res.
		residential	non-res.	
<b>JULY 1969</b>				
U.S. Average	8.6	301.8	321.5	+4.72
Atlanta	7.4	349.4	370.6	+5.63
Baltimore	7.9	299.5	318.6	+3.06
Birmingham	7.4	273.4	293.9	+3.87
Boston	8.4	267.8	283.5	+3.55
Chicago	8.9	330.1	347.2	+3.67
Cincinnati	9.1	297.2	315.9	+6.64
Cleveland	9.8	321.5	341.7	+5.91
Dallas	7.7	282.3	291.6	+5.75
Denver	8.2	303.2	322.3	+4.22
Detroit	9.4	316.7	332.4	+5.97
Kansas City	8.3	270.4	286.2	+5.26
Los Angeles	8.4	304.2	332.9	+4.06
Miami	8.5	300.3	315.2	+5.89
Minneapolis	8.7	297.2	315.9	+3.82
New Orleans	8.0	274.7	291.1	+5.82
New York	10.0	310.9	334.4	+3.16
Philadelphia	8.6	295.2	309.9	+4.19
Pittsburgh	9.2	284.3	302.2	+5.18
St. Louis	9.1	295.0	312.6	+4.68
San Francisco	8.7	390.4	427.1	+5.03
Seattle	8.5	273.4	305.5	+3.69

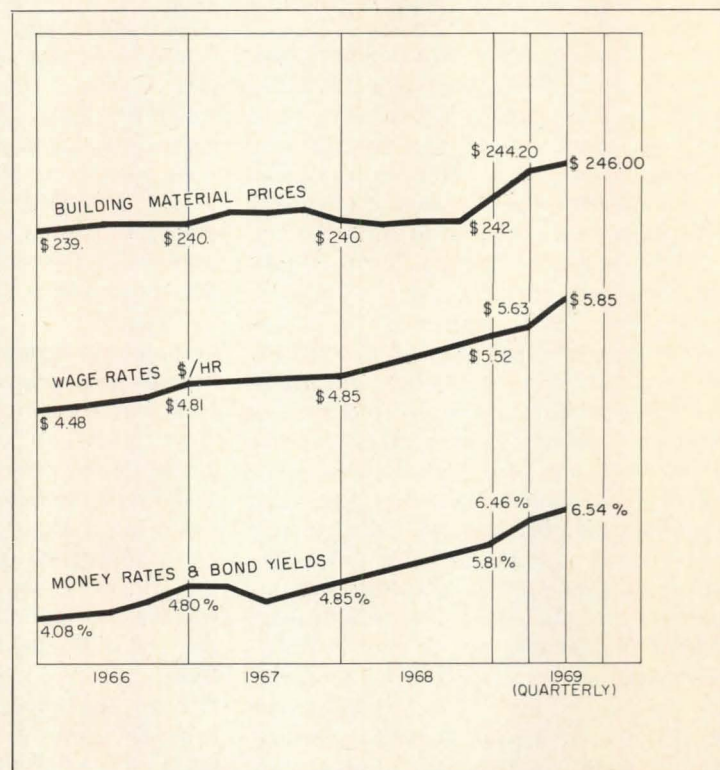
Differences in costs between two cities may be compared by dividing the cost differential figure of one city by that of a second; if the cost differential of one city (10.0) divided by that of a second (8.0) equals 125%, then costs in the first city are 25% higher than costs in the second. Also, costs in the second city are 80% of those in the first (8.0 ÷ 10.0 = 80%) or they are 20% lower in the second city.

## ECONOMIC INDICATORS

Indicators are intended to show only general direction of changes. **BUILDING MATERIALS**—The U.S. average price of a "package" of common materials.

**WAGE RATES**—The U.S. average wages of nine skilled trades and common labor. Fringe benefits are included.

**MONEY RATES AND BOND YIELDS**—An arithmetic average of the latest prime rate, short term prime commercial paper rates, and state and local government AAA bond rates.



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

Metropolitan area	1961-1967							1968 (Quarterly)				1969 (Quarterly)			
	1961	1962	1963	1964	1965	1966	1967	1st	2nd	3rd	4th	1st	2nd	3rd	4th
	1941 average for each city = 100.00														
U.S. Average	264.6	266.8	273.4	279.3	284.9	286.6	297.5	301.5	302.6	309.3	310.0	314.9	316.5		
Atlanta	294.7	298.2	305.7	313.7	321.5	329.8	335.7	345.6	346.7	352.3	353.1	364.2	365.9		
Baltimore	269.9	271.8	275.5	280.6	285.7	290.9	295.8	302.9	304.1	307.9	308.7	311.4	313.0		
Birmingham	249.9	250.0	256.3	260.9	265.6	270.7	274.7	278.5	279.5	283.6	284.3	288.4	289.9		
Boston	237.5	239.8	244.1	252.1	257.8	262.0	265.7	269.3	270.3	276.3	277.1	278.2	279.6		
Chicago	289.9	292.0	301.0	306.6	311.7	320.4	328.4	329.4	330.0	338.7	339.5	340.4	342.1		
Cincinnati	257.6	258.8	263.9	269.5	274.0	278.3	288.2	291.4	292.5	301.8	302.6	309.8	311.5		
Cleveland	265.7	268.5	275.8	283.0	292.3	300.7	303.7	316.5	318.3	330.7	331.5	334.9	336.7		
Dallas	244.7	246.9	253.0	256.4	260.8	266.9	270.4	272.3	273.4	281.0	281.7	287.2	288.7		
Denver	270.9	274.9	282.5	287.3	294.0	297.5	305.1	304.9	306.0	311.7	312.5	317.0	318.5		
Detroit	264.7	265.9	272.2	277.7	284.7	296.9	301.2	309.2	310.4	315.5	316.4	326.8	328.5		
Kansas City	237.1	240.1	247.8	250.5	256.4	261.0	264.3	267.5	268.5	277.2	278.0	281.0	282.3		
Los Angeles	274.3	276.3	282.5	288.2	297.1	302.7	310.1	312.0	313.1	319.3	320.1	323.7	325.4		
Miami	259.1	260.3	269.3	274.4	277.5	284.0	286.1	293.1	294.3	304.5	305.3	309.6	311.2		
Minneapolis	267.9	269.0	275.3	282.4	285.0	289.4	300.2	300.0	301.0	309.0	309.4	310.6	312.2		
New Orleans	244.7	245.1	248.3	249.9	256.3	259.8	267.6	270.6	271.6	273.9	274.2	285.5	287.1		
New York	270.8	276.0	282.3	289.4	297.1	304.0	313.6	315.9	317.0	320.6	321.4	324.9	326.6		
Philadelphia	265.4	265.2	271.2	275.2	280.8	286.6	293.7	293.3	294.2	300.9	301.7	304.6	306.2		
Pittsburgh	250.9	251.8	258.2	263.8	267.0	271.7	275.0	293.0	284.2	291.3	293.8	297.0	298.6		
St. Louis	256.9	255.4	263.4	272.1	280.9	288.3	293.2	293.7	294.7	303.6	304.4	306.8	308.3		
San Francisco	337.4	343.3	352.4	365.4	368.6	386.0	390.8	396.4	398.0	401.9	402.9	415.6	417.5		
Seattle	247.0	252.5	260.6	266.6	268.9	275.0	283.5	286.2	287.2	291.6	292.2	296.1	297.5		

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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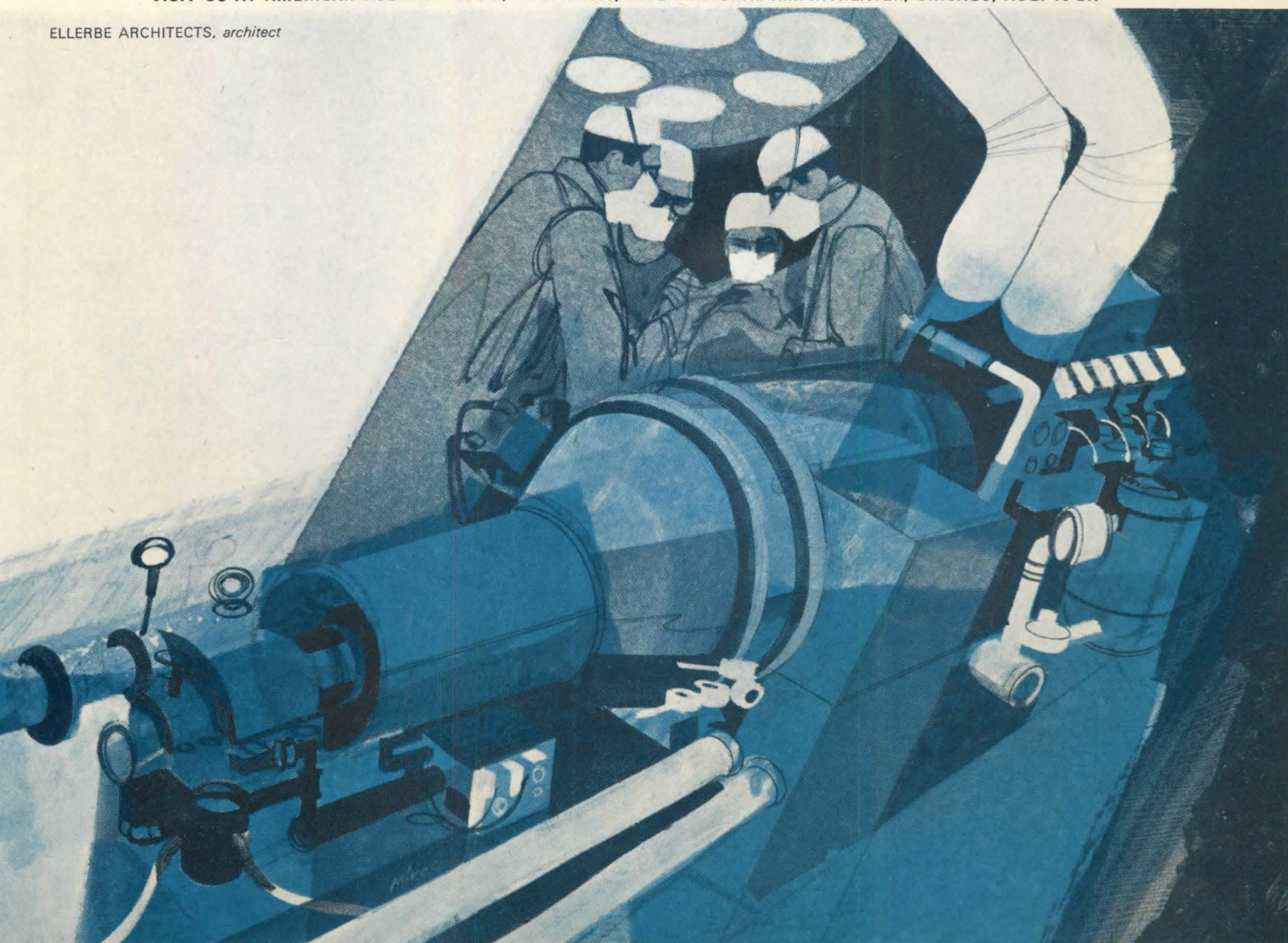
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## CURRENT TRENDS IN CONSTRUCTION

Robert M. Young  
Senior Economist  
McGraw-Hill Information Systems Company

## 1969: The construction outlook at midyear

The rate of contracting for new construction during the opening months of 1969 has been a continuation of the record pace set in the last half of 1968. Measured against the same months a year ago, total contract value through April was up a healthy 15 per cent, thanks largely to sharp gains in non-residential construction.

Early leads like this sometimes disappear as the year moves on, however, and there are good reasons to believe that this one will do just that. Last year was a lopsided one for construction, with a poor start and a big finish. On a seasonally-adjusted basis, then, the performance so far this year looks good compared with early 1968, but it is barely holding its own relative to the last half of the year. And as things look now, construction is due for some cooling off in the months ahead. For the year as a whole, the gain will be considerably less than the performance so far suggests.

The reason for this bearish outlook is not that there is any lack of demand for new buildings. On the contrary, an overabundance of demand, not only for construction but for most types of goods and services, has led to the inflationary spiral that is currently the number one economic problem. The lack of success to date in controlling soaring prices has led to an intensified use of anti-inflationary measures in recent months. There is little doubt that these renewed efforts at restraint will dominate the economic climate for the balance of 1969.

As the economy is squeezed into closer balance, it's hard to see how construction markets can avoid suffering some of the side effects. Each category of building reacts differently to a given set of economic conditions, however, so the outlook for the various types ranges over a fairly broad spectrum of reaction.

**Residential building faces an uneasy outlook**

The off-again-on-again monetary policy of the past several months has created a great deal of uneasiness about the outlook for housing. The relatively high volume of housing starts at the beginning of 1969 was supported by last fall's pronounced easing of credit. At the same time, high mortgage rates influenced the shift into apartment construction, where depreciation allowances, equity participation for lenders, and the ability to pass higher costs on to the

renter all help to minimize the importance of the interest rate. The outlook for the next few months is influenced by the revival of fears about a new "credit crunch" similar to the one that precipitated the housing collapse of 1966.

While there are some current similarities to the credit conditions that did so much damage three years ago, there are enough differences to take some of the worry out of the 1969 outlook. The single-family market, though not capable of much growth this year, is protected on the down side by pledges of support from both the FHLBB and FNMA to provide mortgage funds if a squeeze develops. Apartment construction is also in better shape to weather 1969's credit tightness. The widespread use of the "equity kicker" puts apartment loans on at least an equal footing with commercial and industrial financing, and the continuation of accelerated depreciation gives apartment building another push.

Taken together, these changed conditions mean that the housing market is now better equipped to compete with other users of credit for 1969's scarce funds than it was during the 1966 crunch. This suggests no collapse, but it doesn't guarantee against some further weakening of housing volume later this year. With several good months already on the books, the year's total of housing units can come out as high as 1.6 million units in spite of a weaker second half, though it's more likely to be closer to last year's 1,548,000.

**Investment plans support nonresidential building**

Business investment in new plants and equipment has proved to be one of the most difficult areas of the economy to get cooled off. Despite all manner of obstacles—higher taxes, record interest rates, and even a mild amount of excess capacity—businessmen plan to boost their investment outlays by 12 to 13 per cent in 1969. Contracting for industrial and commercial construction so far this year has been very much in line with these ambitious programs.

In fact, by early summer both commercial and industrial building had set a pace well beyond the rate needed to fulfill the goals indicated by this year's capital spending plans. Even in the absence of restrictive credit conditions, then, the pace of business construction would be headed for a slow-

down during the second half of 1969. For the year as a whole, the industrial-commercial contracting total is now estimated at \$13 billion, a distinct improvement over the original outlook despite the second-half softness.

This year's money markets will be the critical factor in the outlook for institutional building. Current interest rates exceed those that many municipalities are permitted by law to pay, and even non-government building in this category is sensitive to costly credit. Educational building has already slipped to about two-thirds the record rate set in January, and the year's total is expected to fall short of that for 1968. Religious building construction also seems to be feeling the effects of high interest rates. Public building, subject to budget cuts at all levels of government, is slated for a substantial decline. Only in the hospital/health facilities category is there any sign of improving over last year's peak level.


Total nonresidential building—the major category of construction for architects—is expected to top the 1968 value by seven per cent, with almost all of the gain coming from commercial/industrial building. Contract value of all construction, including nonbuilding projects, will increase by five per cent this year, reaching a total of \$65 billion.

(A fuller analysis of construction markets at midyear is available from McGraw-Hill Information Systems Company.)

DODGE CONSTRUCTION OUTLOOK  
1969 MIDYEAR REVIEW

Nonresidential building	Per cent change in contract values
Commercial	+18
Manufacturing	+ 6
Educational	- 2
Hospitals	+15
Public buildings	-10
Religious	-10
Recreational	+ 2
Miscellaneous	+ 4
TOTAL	+ 7
Residential building	
One- and two-family	- 2
Apartments	+16
Nonhousekeeping	+11
TOTAL	+ 4
Nonbuilding construction	+ 5
Total construction	+ 5





Halo turned this  
entire store into  
a display window

In Chicago's dramatic new Goldblatt's Home Center, Halo's *Power-Strip* track lighting system provides a single, sensible solution for *both* display lighting and general store-wide illumination!

Nearly a mile of track and over 800 display lights turn the entire store into an attractive display area. The lights snap onto the track at *any* point and can be changed in seconds.

Installation is equally simple. The track, which attaches directly to the ceiling, contains an integral wireway, allowing many circuits to be wired from a single outlet box.

Get all the facts on Halo's *Power-Strip* track system. Write or check reader inquiry card.



**HALO LIGHTING DIVISION**  
McGraw-Edison Company  
9301 W. BRYN MAWR • ROSEMONT, ILL. 60018

For more data, circle 50 on inquiry card





# What kind of an architect would use Tensiform?

EDWARD DURELL STONE, ARCHITECT  
7 EAST 67TH STREET NEW YORK 21, N.Y.

PRAEGER - KAVANAGH - WATERBURY  
200 PARK AVENUE

STRUCTURAL ENGINEERS  
NEW YORK 17, N.Y.

CAPITAL PL  
OFFICE BUILDING

PROJECT:



\*Edward Durell Stone architect for Phase I of the project in association with Lee Potter Smith, Pritchett, Hugg and Carter of Frankfort, Ky. Structural engineers for entire project are Praeger-Kavanagh-Waterbury, N.Y.



An architect who knows how to get the most out of a budget, because he knows how to get the most out of new building materials.

An architect like Edward Durell Stone and his associates.\*

When they designed the master plan for the urban renewal project in Frankfort, Kentucky, the budget for Phase I was \$23 million. So in the Capital Plaza

Office Tower—the largest building on the site—they used approximately 215,000 square feet of Wheeling Tensiform®; the permanent steel form for concrete floors.

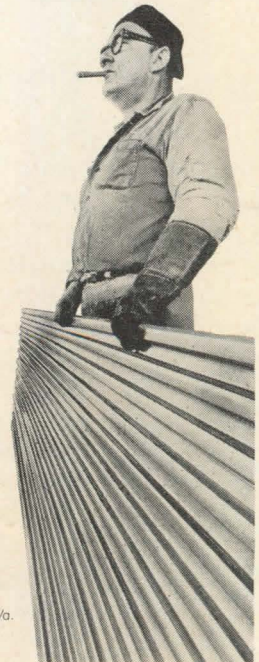
It's not hard to see why.

The contractor didn't need a team of carpenters to put up all the scaffolding that's needed for wood form. And what's more important, he didn't need them to strip the form and dismantle scaffolding once the concrete was poured.

When Tensiform is down, it stays down..

Another important plus about Tensiform is the way it comes—all carefully pre-cut according to detailed drawings prepared by Wheeling. There's no trimming to be done on the site. And tradesmen can walk on it as soon as it's down.

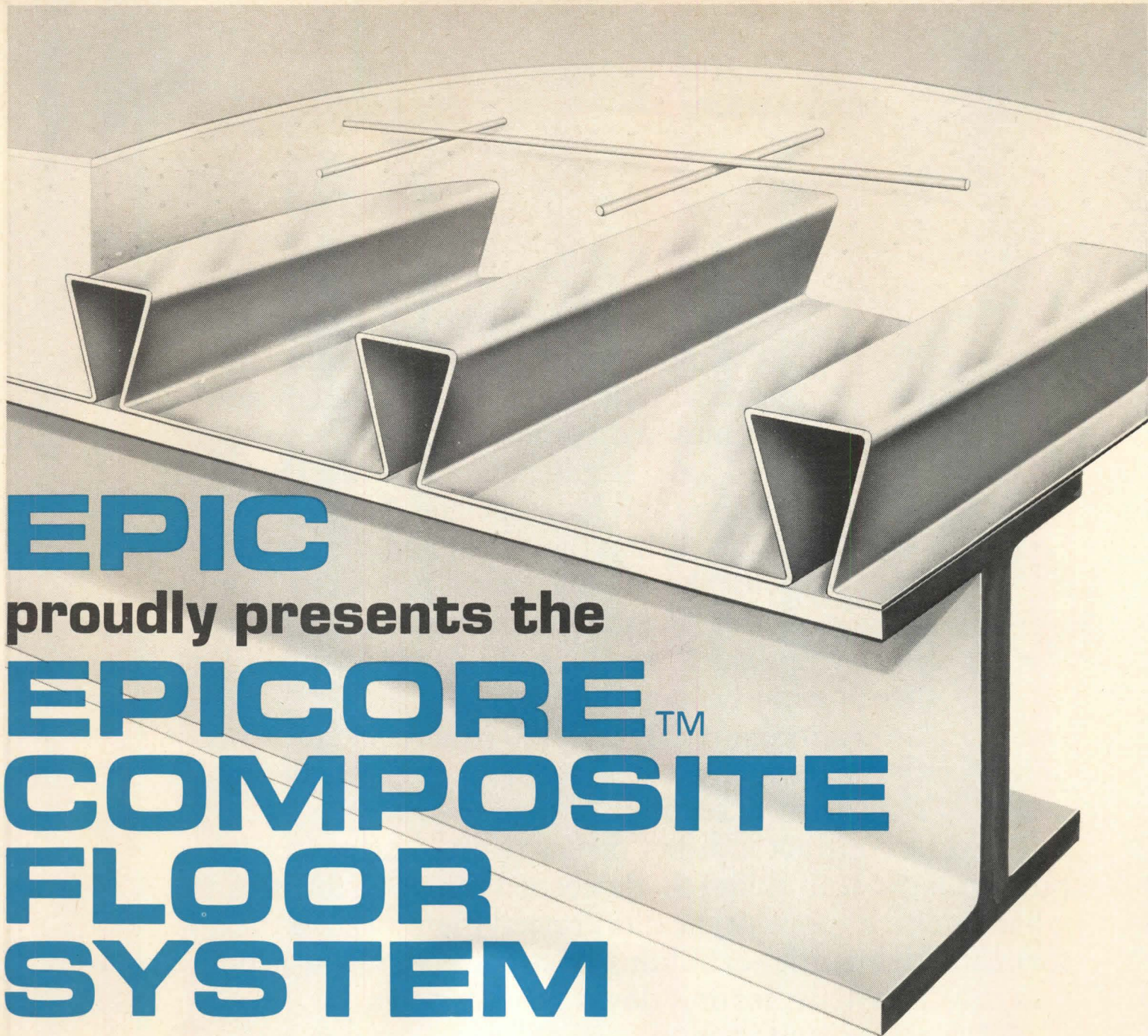
All this adds up to a pretty impressive cost story. But probably the simplest and most eloquent advertisement for Tensiform is the architect's name at the bottom of that drawing.



**Wheeling Tensiform.**

Wheeling Corrugating Co., Div. Wheeling Pittsburgh Steel Corp., Wheeling, W. Va.





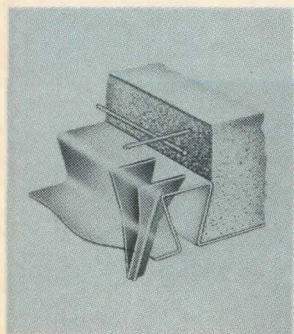
# EPIC

proudly presents the

# EPICORE™ COMPOSITE FLOOR SYSTEM

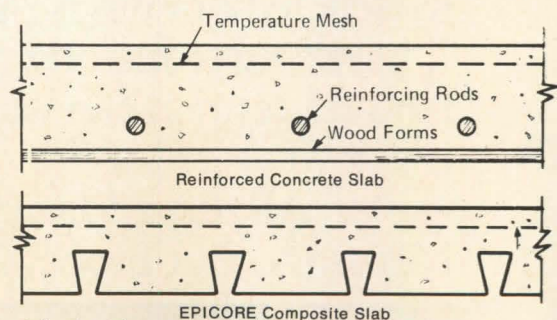
starring in today's best planned, most exciting buildings

The new EPICORE Composite Floor System is here, and progressive engineers and contractors are finding that its 2" depth and 24" width is the answer to complex and costly conventional slab construction. Whether it's a plant, apartment, office, school, hospital,



EPICORE makes it go up faster, easier and at less cost. EPICORE offers the industry's strongest most flexible hanging system for ceilings, lighting, piping and other utilities. The inverted triangular ribs key into

concrete, forming a lock which is unexcelled in bond strength. EPICORE's bottom plate acts as tension-reinforcing steel, working with the concrete's compressive strength at the top surface of the slab. Slabs are thinner, saving on concrete. Rod reinforcement is eliminated, saving on steel. EPICORE's big 2" depth, 24" width, and lateral bracing action reduce horizontal and vertical structural steel requirements. The final result is a building that saves you time, labor, materials and money. Why not ask us today for all the facts on EPICORE quality, advantages, service and savings?

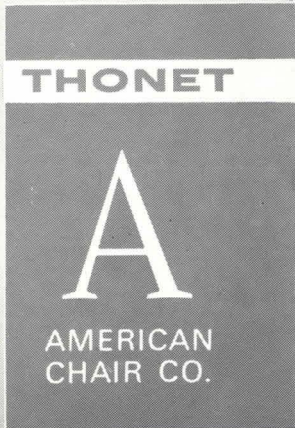


**EPIC**  
METALS CORPORATION

General Offices  
1844 Ardmore Boulevard  
Pittsburgh, Pennsylvania 15221  
(412) 242-8343

For more data, circle 52 on inquiry card





SINCE 1887



Wide selection of contract seating with complementary tables. See your dealer or write for our distributor's name.

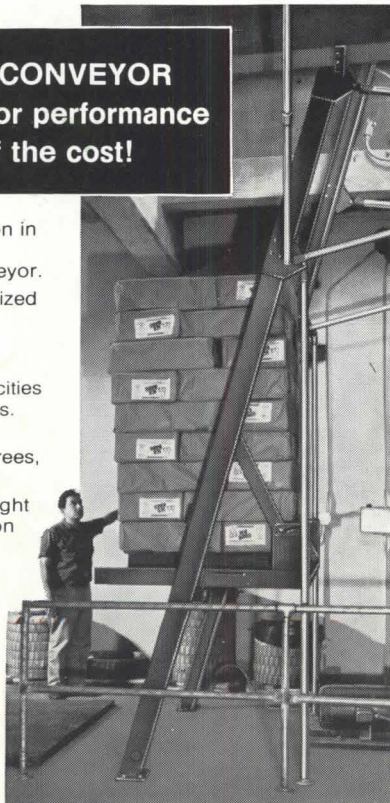
DIRECT ALL INQUIRIES TO: 1 PARK AVENUE, NEW YORK, NEW YORK 10016  
SHOWROOMS: Atlanta • Chicago • Dallas • Los Angeles • Miami • New York • San Francisco • Sheboygan

For more data, circle 10 on inquiry card

### *Moto Flow* CONVEYOR Freight elevator performance at a fraction of the cost!

- Approved for installation in new buildings or old; classified as freight conveyor.
- Moves bulky and palletized loads to and from mezzanines as well as between floors.
- Four models with capacities from 2000 lbs. to 6000 lbs.
- Operates at any angle between 30 and 70 degrees, indoors or outside.
- Does the work of a freight elevator at a small fraction of the cost.
- Optional automatic loading and unloading accessories for incorporation with present materials handling system.

SEND FOR CATALOG  
SHOWING VARIED  
INSTALLATIONS AND  
ENGINEERING DATA.



### M-B COMPANY

NEW HOLSTEIN, WISCONSIN 53061 • DEPT. AR-7  
Phone: (414) 898-4261

669

For more data, circle 53 on inquiry card

# Rada.

Always keeps its cool  
or its hot.



That's the beauty of a Rada Thermostatic Mixing Valve. Our dual controls for flow and temperature stay independent of each other. Always. Whether you're showering, bathing, shampooing or just rinsing off. So one can be adjusted without upsetting the other. Even the slightest.

And this unique thermostatic valve maintains precisely the temperature selected. Just set once—and the temperature never varies.

In addition, one little cartridge contains the entire works. It can easily be removed for cleaning or servicing.

Next time you specify thermostatic mixing valves for shower or in matching tub-and-shower combinations, think quality. Think Rada. Made by Richard Fife, Inc. The company that's made a big business out of controlling water beautifully.

A complete line of controls:

#### UNATAP

Spray  
Mixing  
Faucets

#### MIRA

Shower  
Mixing  
Valves

#### KELTA

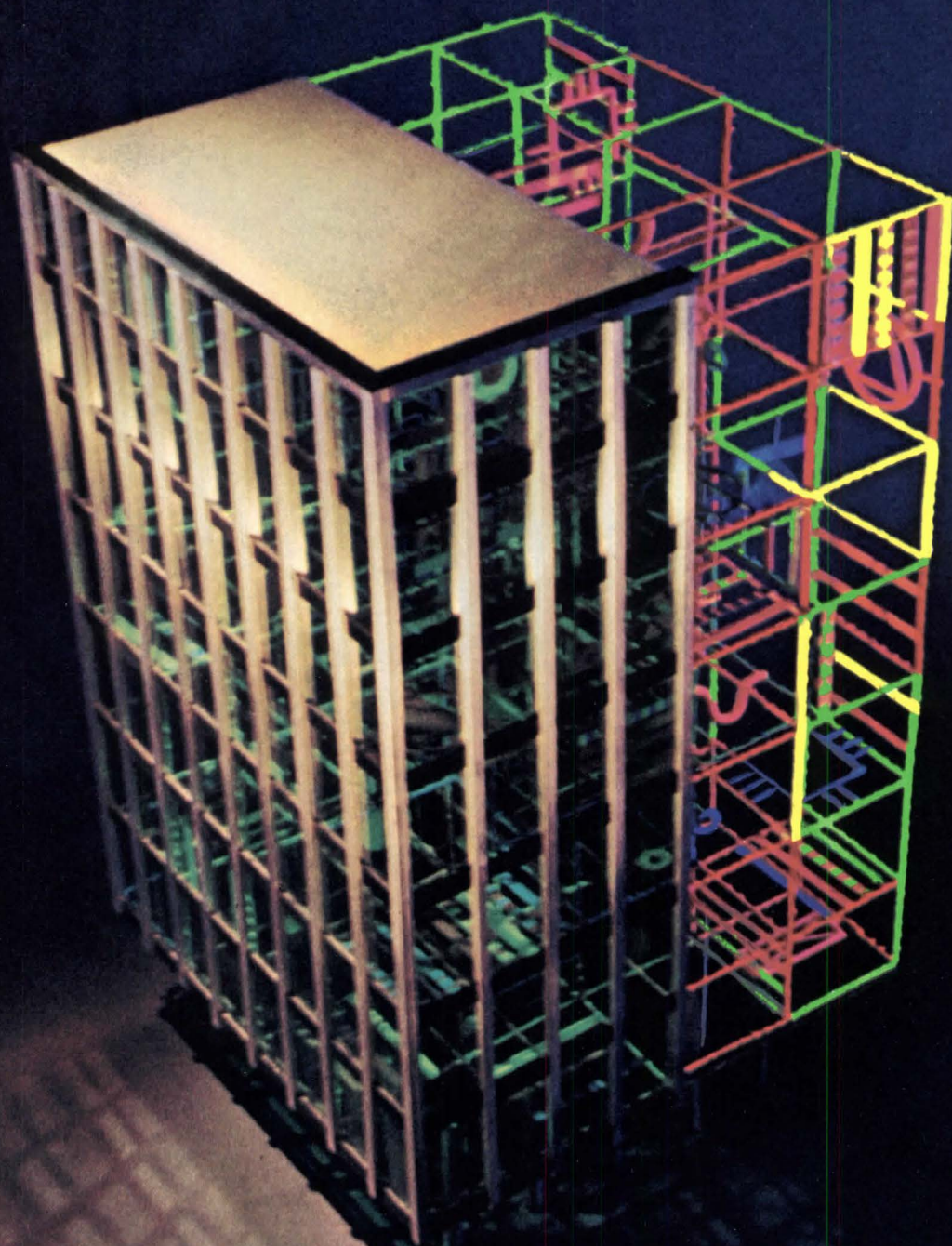
Shower  
Fittings

## Richard Fife, Inc.

1140 Broadway, New York, N.Y. 10001  
Phone: (212) 683-0745

For more data, circle 54 on inquiry card







Your building. More than a building. A vital, life-supporting environment, shaped by the design, energized by electricity—an Electro-environment.

Your design. More sophisticated than the last one because that's the nature of technology. Particularly electrical technology.

Your challenge. To profit from the benefits of the Electro-environment—and to make your design statement with the confidence that the industry is ready to support you.

The Qualified Electrical Contractor is ready. Ready to translate your ideas, your designs into a working, functioning reality.

Supplying, installing and maintaining the Electro-environment is his business. The Qualified Electrical Contractor advances with the state of the art.

Your challenge is his challenge.

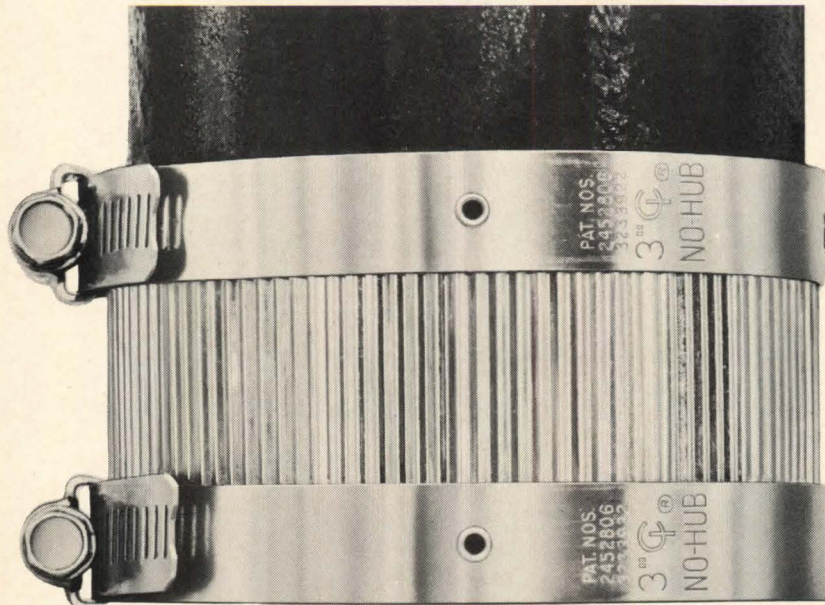
# The challenge of the Electro-environment


**The Qualified Electrical Contractor makes the Electro-environment work.**


NECA. National Electrical Contractors Association.  
1730 Rhode Island Avenue, N.W., Washington, D. C. 20036




# MORE NO-HUB<sup>®</sup> JOINTS SOLD IN 1968 THAN IN ALL PREVIOUS YEARS COMBINED



More than 20 million  No-Hub<sup>®</sup> joints were sold in 1968! That one-year total is greater than all previous years combined, and is solid evidence of its continued acceptance and popularity.

Builders and plumbing contractors know that  No-Hub<sup>®</sup> is quick and easy to install, fits neatly between studs without furring, offers the permanent quality of cast iron, and the neoprene gaskets reduce noise in the system to a minimum.

Specify  No-Hub<sup>®</sup> on your next job and see for yourself why it is fast becoming the most popular drainage, waste and vent material on the market.

 **CAST IRON SOIL PIPE INSTITUTE**  
2029 K STREET N.W. WASHINGTON D.C. 20006

*For more data, circle 55 on inquiry card*



Literally so, in the new Beneficial Plaza Building on Wilshire Boulevard in Los Angeles.

Designed by Skidmore, Owings & Merrill, San Francisco, the structure blends the warmth of bronze glass and the cool of classic California granite into a striking example of "contemporary renaissance" architecture.

L-O-F hi-performance glass plays a big part in this welcome

addition to the downtown skyline.

Besides keeping up outward appearances, the bronze-tinted plate glass softens sky brightness, keeps out approximately 44% of

sun heat transmission, and reduces the cost of heating and air conditioning.

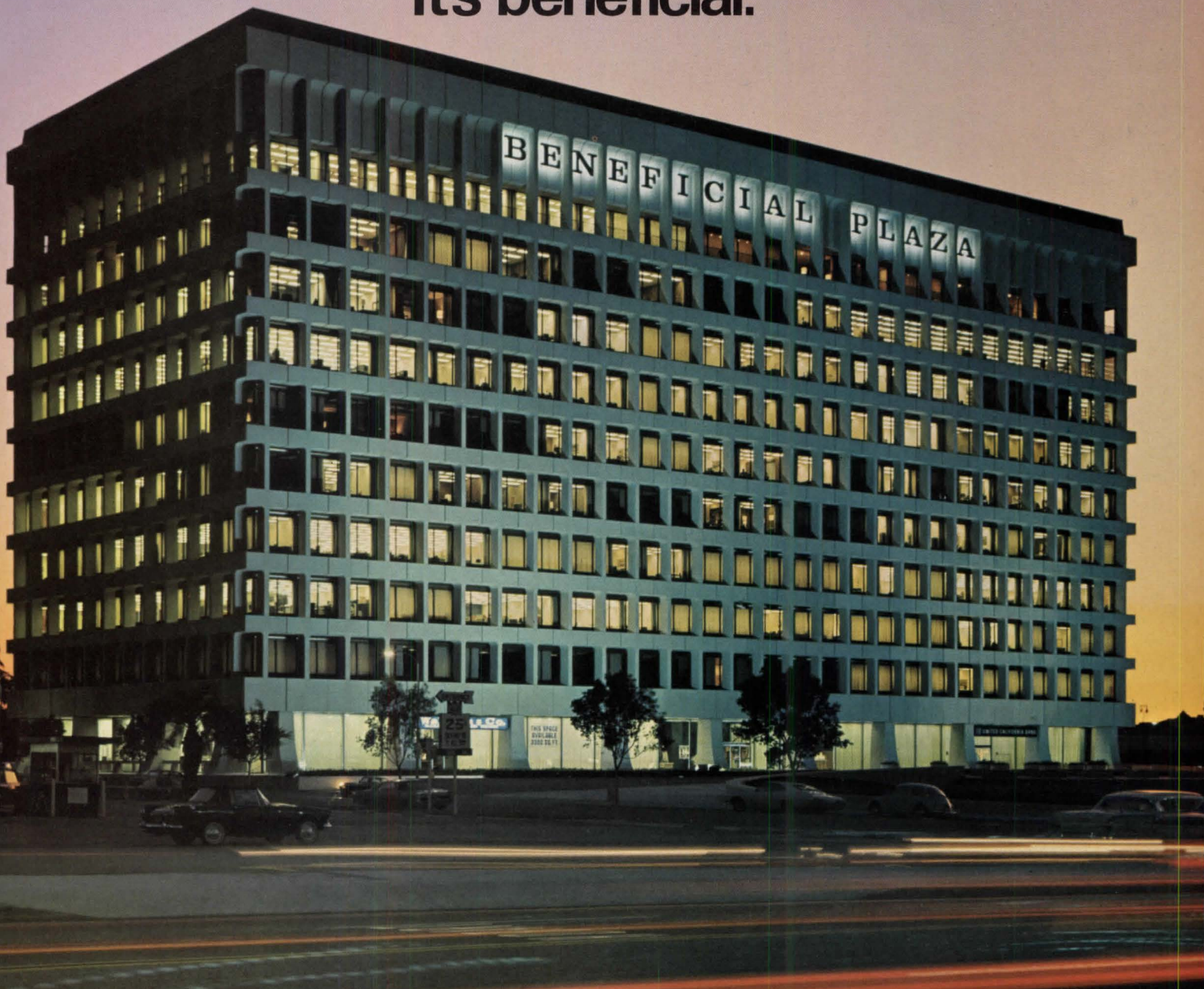
L-O-F has developed many kinds of hi-performance glass. We now offer such versatility in appearance and function that a look at Sweet's is hardly enough. Why not get in touch with an L-O-F Architectural Construction Specialist? Libbey-Owens-Ford Company, Toledo, Ohio 43624.

*For more data, circle 56 on inquiry card*



**L-O-F HI-PERFORMANCE GLASS**

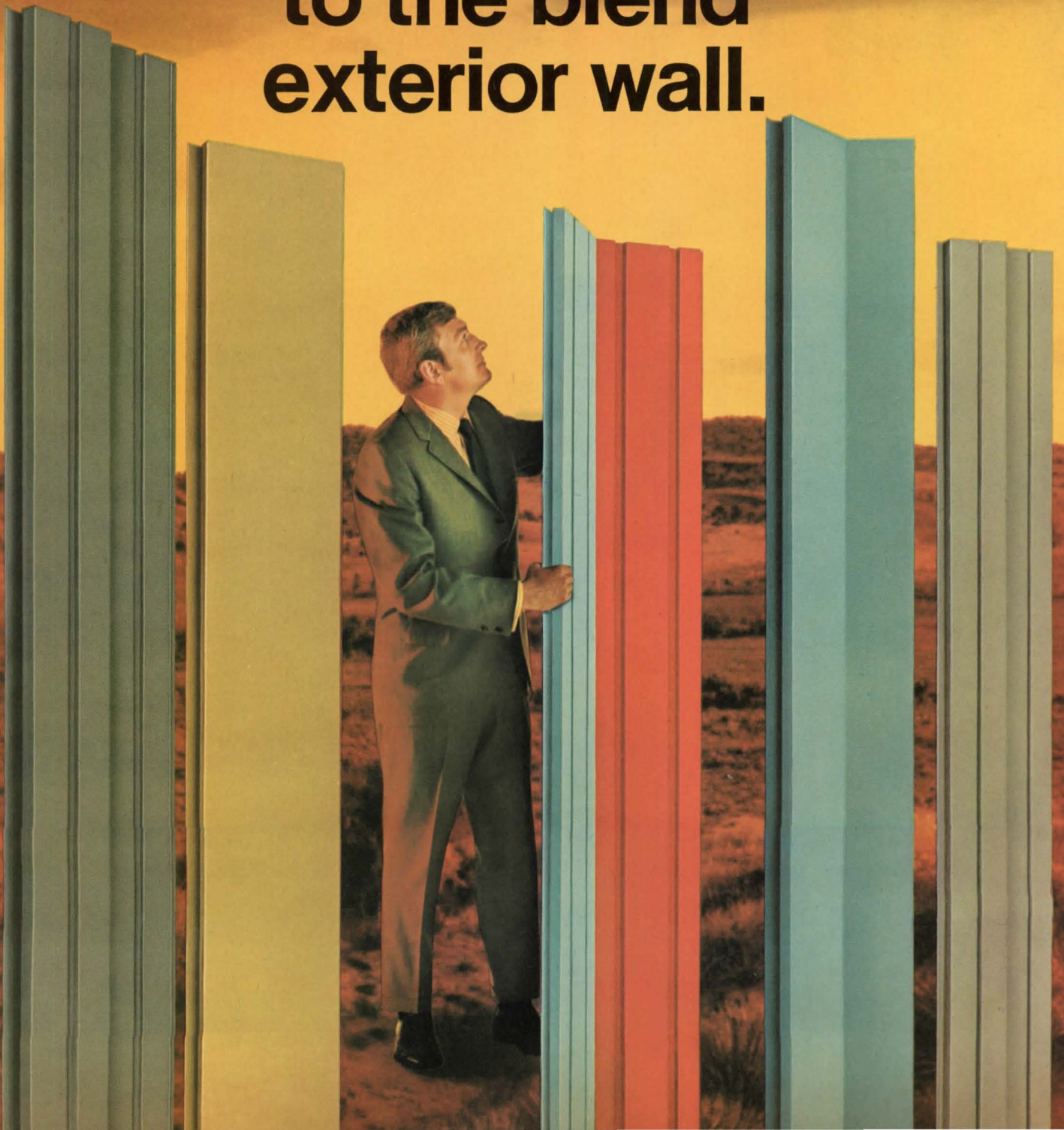
**To California granite  
add bronze glass.  
It's beneficial.**





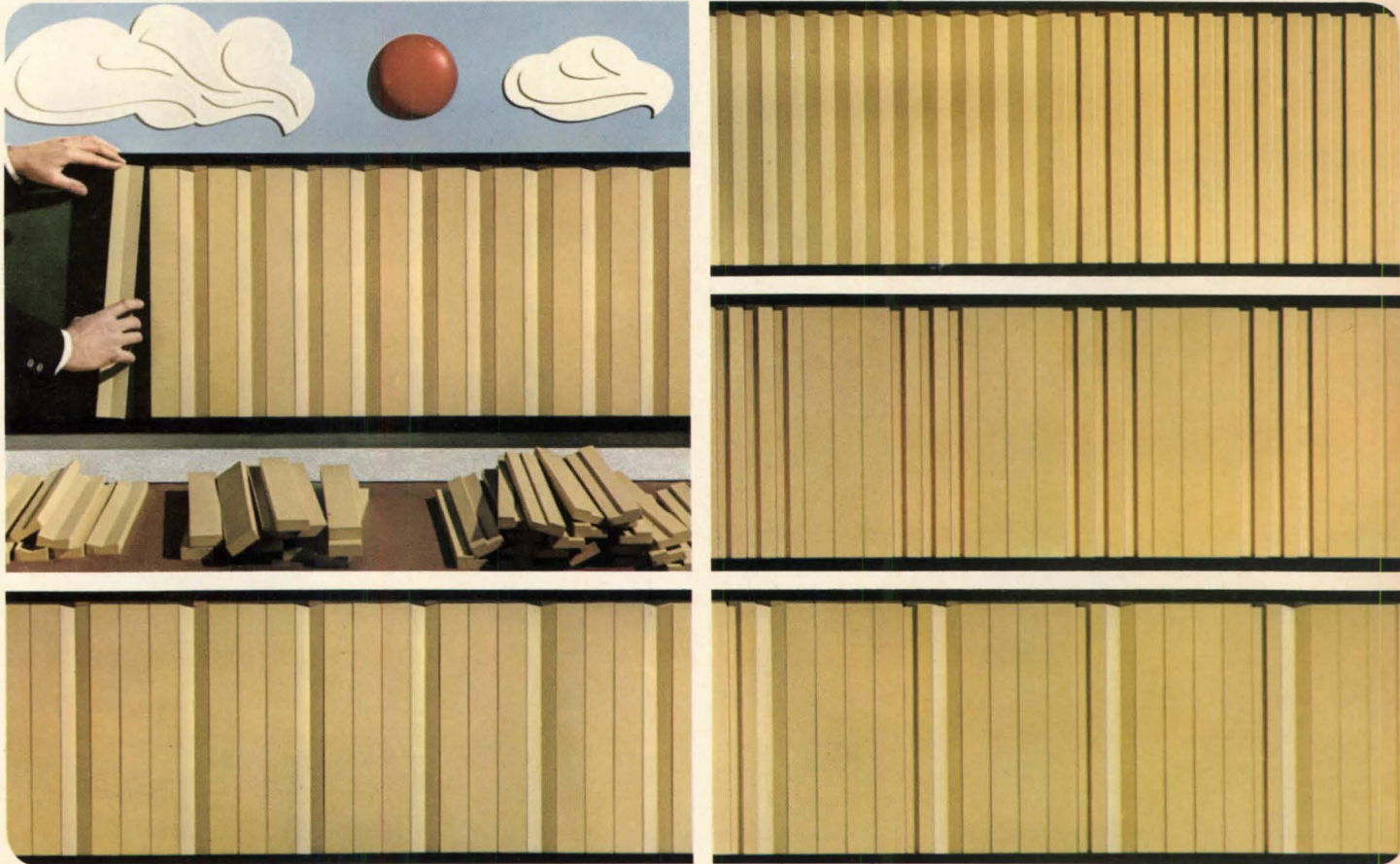
**say goodbye  
to the bland  
exterior wall.**

**say hello  
to the blend  
exterior wall.**





Inland-Ryerson introduces  
 six new wall panels with a common lock arrangement  
 that permits you to blend them in a wide variety  
 of textures, colors and shadow patterns.



Only three of the six new IW panels were used to achieve this variety of sculptured patterns. Many other effects can be obtained.

The day of the bland exterior wall is over. Inland-Ryerson has added six new profiles of the IW series which can be easily intermixed to form a seemingly endless variety of visual effects, giving you new design freedom to spark your creativity.




The secret: individual panels are just 12" wide, and a common lock system provides fully concealed fastening of any arrangement. The side seams are hard to find too.

The lock system also offers unmatched weather protection at the joint. The U-shaped design provides positive metal-to-metal contact at two points. Yet it completely covers the fasteners used, and the panels interlock quickly.

The IW series panels are available with Inland-Ryerson's famous double-coat weather protection. Duofinish™ offers the security of baked-on finish in a wide variety of colors. For extra-long life, specify polyvinylidene base Duofinish 500.™

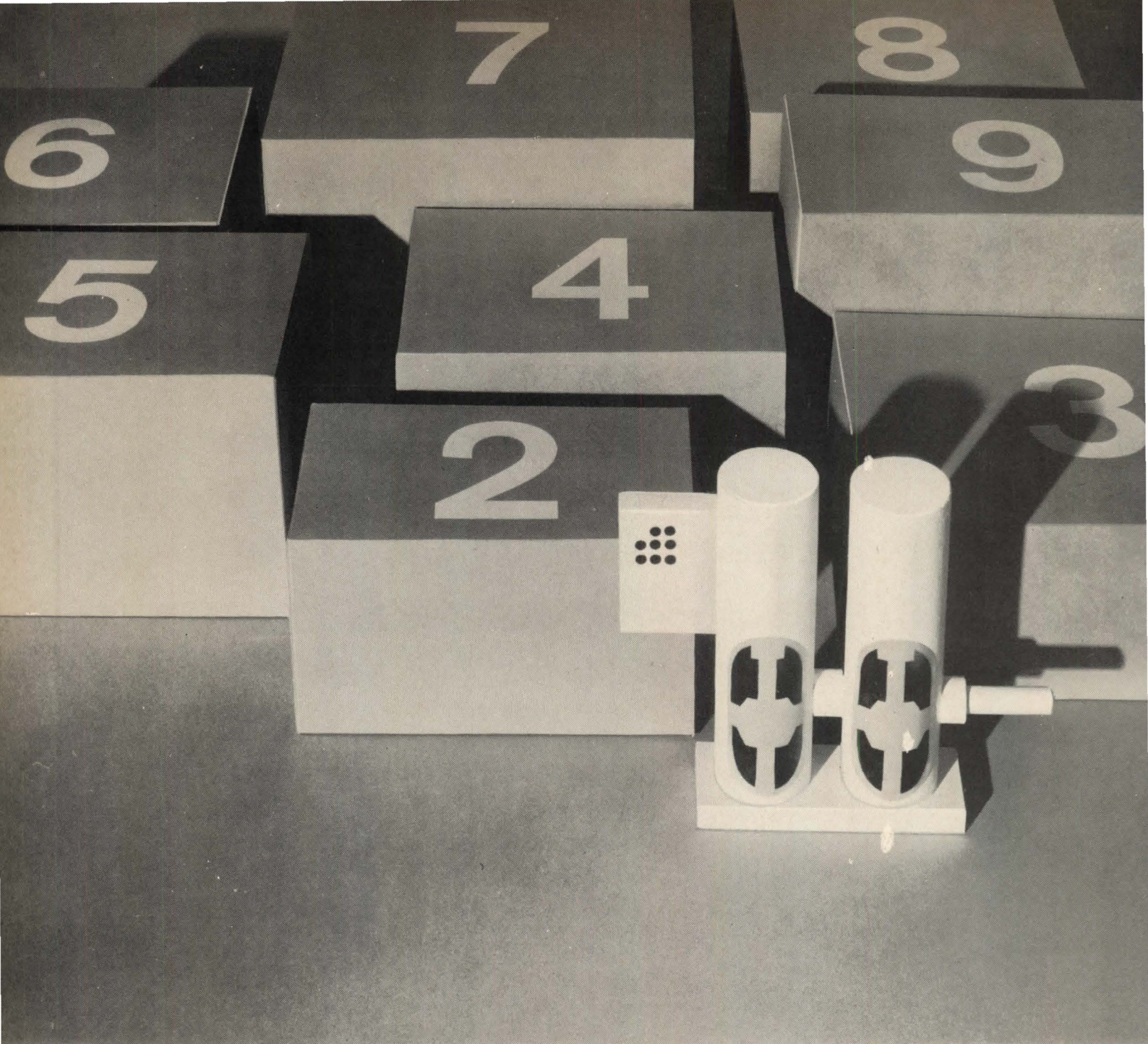
Ask your Inland-Ryerson sales engineer to show you these new steel wall panels. Or write for Wall Systems Catalog 243, Inland-Ryerson Construction Products Company, Dept. G, 4033 W. Burnham Street, Milwaukee, Wisconsin 53201.

**INLAND**   
**RYERSON**

General Offices: Chicago, Illinois

For more data, circle 57 on inquiry card





**Of the 12 other  
constant pressure pumping systems,  
not one has all the advantages of  
Aurora's Apco-Matic.**

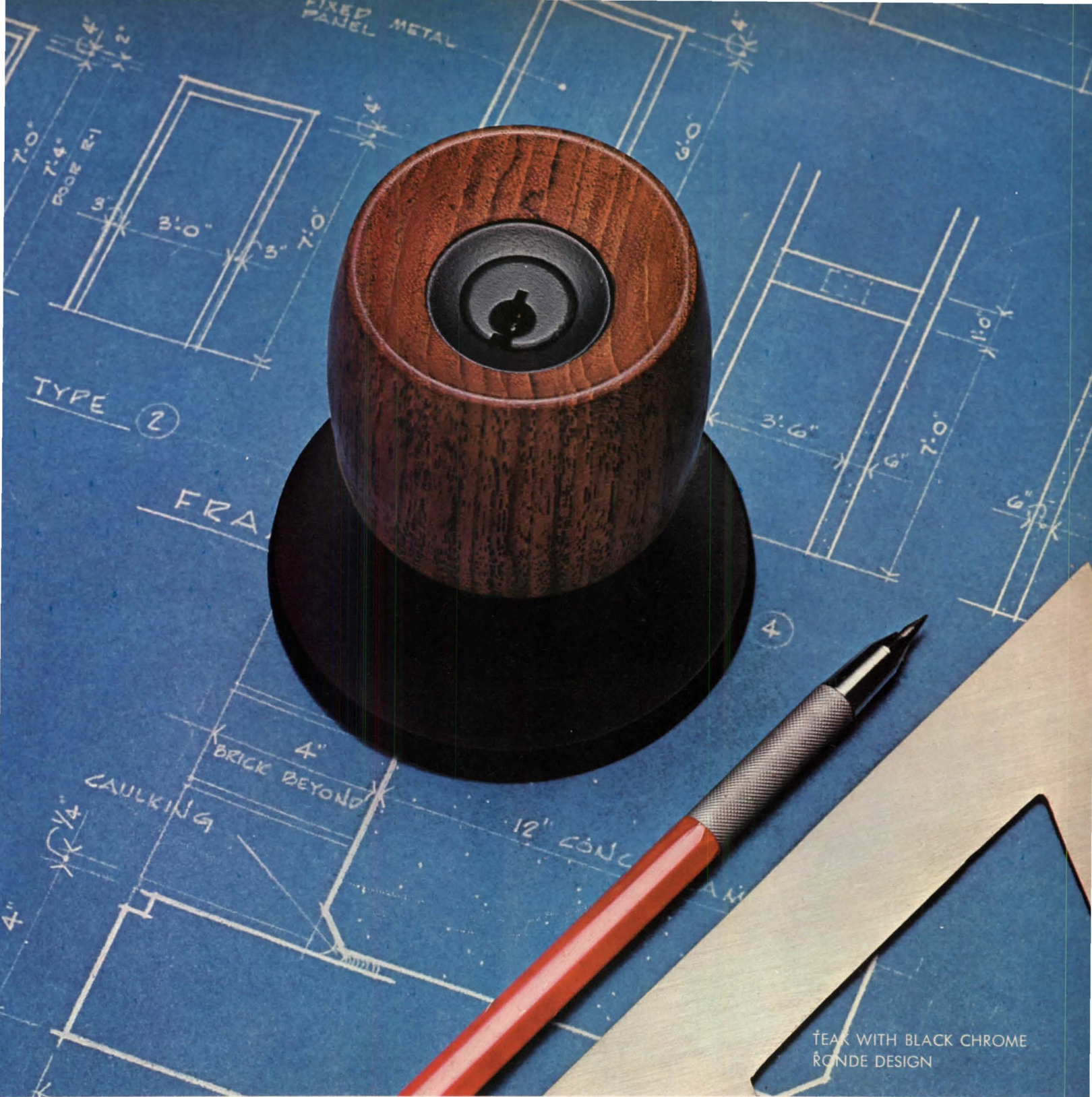
Seven don't have Apco-Matic's low initial cost (**none** costs less) • Eleven don't have Apco-Matic's low installation cost (**none** costs less) • Eleven don't have Apco-Matic's low operating cost (**none** costs less) • Five don't have Apco-Matic's instant response to system change • Eight don't have Apco-Matic's low maintenance characteristics • Ten don't have Apco-Matic's SCR control and squirrel-cage AC motors • Twelve don't have Apco-Matic's control bypass for emergency operation • Eight don't have Apco-Matic's compact dimensions (**none** is smaller) • Twelve don't have Apco-Matic's versatility that provides a built-in automatic standby, yet uses only two pumps! Need we say more? **Aurora Pump, A Unit of General Signal Corporation, 800 Airport Road, North Aurora, Illinois 60542.**



See Bulletin 710 for full details.

For more data, circle 58 on inquiry card



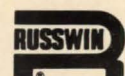


TEAK WITH BLACK CHROME  
RONDE DESIGN

## For the sake of distinction, plan ahead With Russwin Locksets

Modern building security demands the expert blending of beauty and heavy duty performance you get in Russwin Locksets. Precision-engineered to take the toughest use and abuse without showing the strain . . . creatively designed to improve any door decor. Many proven features for long, troublefree life.

Available in a wide choice of metals, woods, color tones and all desired functions. Contact your Russwin distributor or write for additional information. Russwin, Division of Emhart Corporation, New Britain, Conn. 06050. In Canada - Russwin Division of International Hardware.



For more data, circle 59 on inquiry card







# New Gold Bond Solitude Ceiling has absolutely no sense of direction.

Nondirectional Solitude avoids the linear look. No matter which way the acoustical ceiling panels are laid into the grid.

The high style of the richly textured surface helps add an air of elegance to any interior.

Panels are  $\frac{5}{8}$ " x 2' x 2' and 2' x 4'. With square edge detail.

They're noncombustible. Have a NRC range of .60-.70 and a 35-39 STC range.

Gold Bond® Nondirectional Solitude comes in two factory-applied finishes. A washable vinyl acrylic coating or a scrubbable acrylic plastic coating for areas where cleansing maintenance and resistance to staining is a factor. A special Self-Sanitizing feature is also available with both coatings.

## Keeping up appearances is a National responsibility.

Gypsum Company



The name Gold Bond identifies fine building products from the National Gypsum Company. For more information on Nondirectional Solitude, write Dept. AR-79C, Buffalo, New York 14225.

For more data, circle 60 on inquiry card

For more data, circle 61 on inquiry card



# Lead Lined Pool Combines Beauty and Function

Adjacent to Philadelphia's new Municipal Services Building is the John F. Kennedy Plaza, the focal point of which is a beautiful 90-foot diameter pool. Built over an underground garage designed to accommodate 800 cars, the new pool was lined with sheet lead waterproofing to keep the garage dry. The lead membrane was selected because of the ease with which it can be worked and its established integrity as a waterproofing agent.

The new pool, when filled to a depth of 12 inches, contains 40,000 gallons of water. Dominating the pool is a gigantic fountain that plays streams of water into

the air and down upon a grey granite, mushroom-shaped splash block 16 feet in diameter. From the five-inch smooth bore jet, among the largest in the world, the water is sprayed at the rate of 4,000 gallons per minute. A unique sensing device automatically keeps the height of the jets of water compatible with the wind velocity.

For information and detailed specifications on uses of sheet lead as a waterproofing membrane, write to Lead Industries Association, Inc., Dept. L-7, 292 Madison Avenue, New York, New York 10017.



## Lead Industries Association, Inc.

Architect: Vincent G. Kling & Associates  
General Contractor: McCloskey & Co.

Structural Engineer: McCormick Taylor Associates  
Plumbing: Edward A. Maguire, Inc.

Mechanical Engineer: Charles S. Leopold, Inc.  
Lead Work: National Lead Construction Co.





You don't have to specify **JAMISON**

but if you value VALUE, you will

There is a subtle value about Jamison cold storage doors that goes beyond quality materials, superior design and expert workmanship. Naturally, you expect these—the best from the oldest and most experienced company in the business.

But this subtle value we're talking about—it's the invaluable technical assistance and engineering help we are able to give you.

For example. Suppose you are designing a meat packing plant. Or a food distribution center. Or a bakery. Think of the time and effort you can be spared by using our layout sheets for typical installations of these kinds. Typical examples clearly marked out and coded to show you exactly the right cooler and freezer doors for the given circumstances.

We have for you a valuable book "How to Select and Specify Doors for Cold Storage Warehouses and Food Processing Plants." After you send for, and receive your free copy, you still don't have to specify JAMISON. But if you value VALUE, you will.

COLD STORAGE DOORS BY  
**JAMISON**

JAMISON DOOR COMPANY • HAGERSTOWN, MD.

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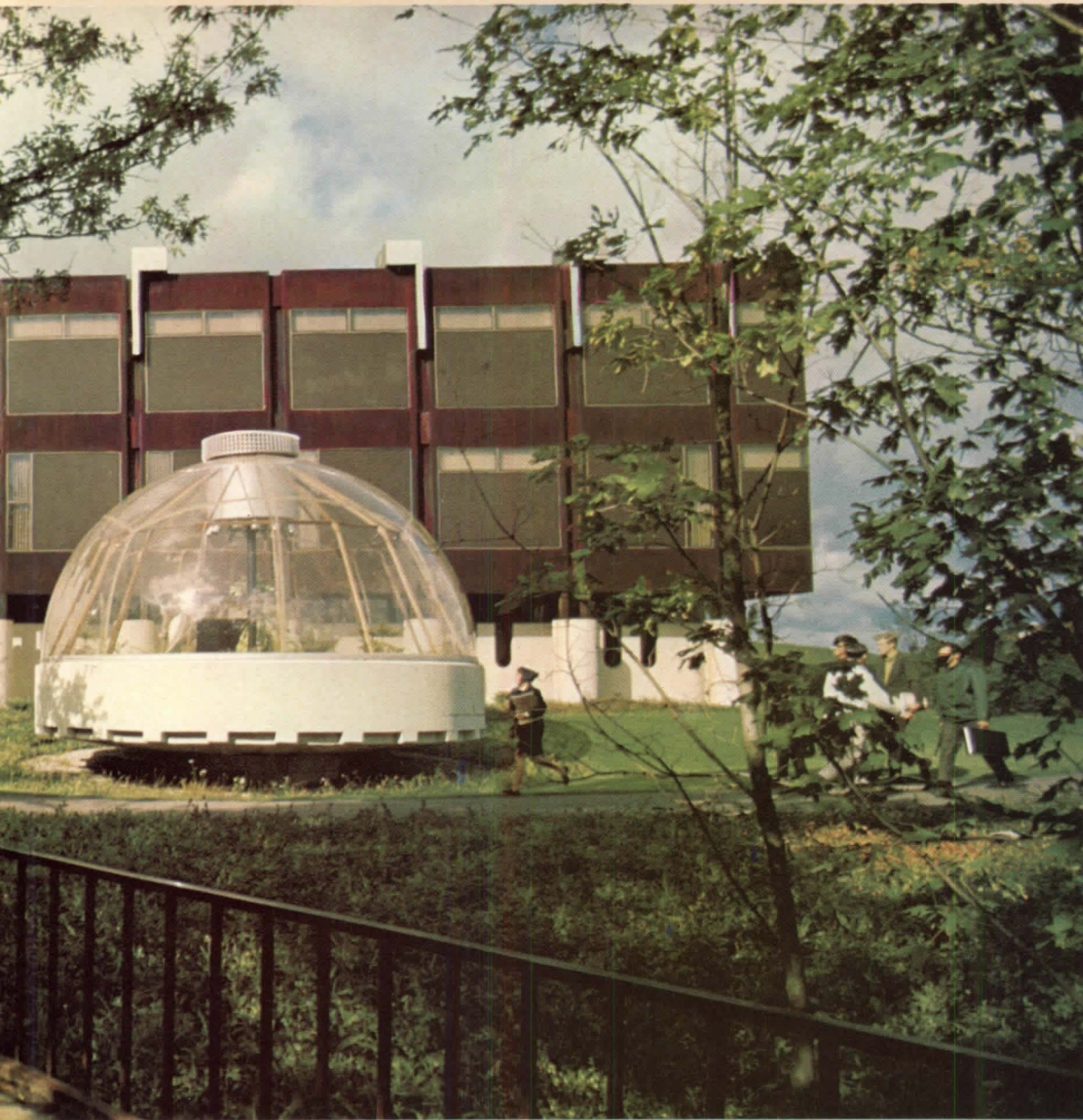




**USS** Cor-Ten Steel...naturally

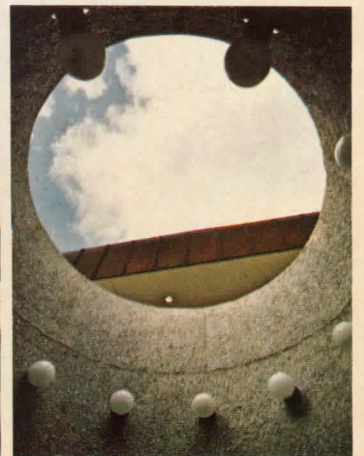
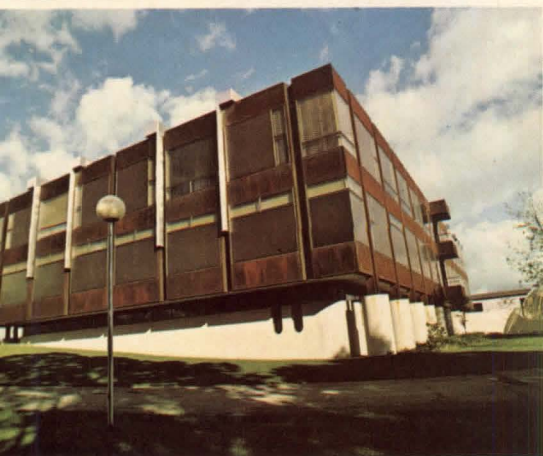






GRAND VALLEY STATE COLLEGE, ALLENDALE, MICHIGAN  
ARCHITECT: MEATHE, KESSLER AND ASSOCIATES, INC.,  
GROSS POINTE, MICHIGAN

For information on bare USS COR-TEN Steel, the original weathering steel, contact a USS Construction Marketing Representative through the nearest USS sales office, check your Sweet's Architectural File, or write to United States Steel, Box 86, Pittsburgh, Pa. 15230. USS and COR-TEN are registered trademarks.





## OFFICE NOTES

### OFFICES OPENED

**Edward N. Simon Jr., Architect**, has opened an office for the practice of architecture at 4320 North Kedzie Avenue, Chicago. Present offices remain located at 737 Barracks Street, New Orleans.

**Wilsey & Ham**, consultants in engineering, planning and architecture, has opened new offices at 42 Fir Street, Ventura, California. The firm also has offices in Los Angeles, San Mateo, California, Portland, Seattle and Honolulu. **Joseph H. Lipscomb** was recently named an associate, with responsibilities in Seattle and Portland.

### NEW FIRMS, FIRM CHANGES

The firm of **Ashley, Myer & Associates, Inc.**, has changed its name to **Ashley/Myer/Smith, Inc., Architects Planners**, located at 14 Arrow Street, Cambridge, Massachusetts.

**Donald M. Frothingham, A.I.A.** and **Philip C. Norton** have been named partners of **Fred Bassetti & Company**, architects of Seattle. Four new associates have also been named: **Donald E. Breiner, James F. Hamilton, Howard S. Petersen** and **Karlis Rekevics**.

**Henningson, Durham & Richardson** of Omaha has recently acquired the engineering-architectural firm of **Thomas B. Bourne Associates, Inc.**, of Washington, D.C. The firm now operates as the **Thomas B. Bourne Division of Henningson, Durham & Richardson**.

**Brown and Slemmons, Architects** and **Louis J. Krueger, Architect** have recently announced the merger of their offices as **Brown Slemmons Krueger Professional Association**. The new architectural firm's address is 701 Jackson Street, Topeka, Kansas.

Architect **Harold Carlson** has recently joined **Clovis Heimsath, A.I.A.** of Houston as an associate.

Two Sacramento architectural firms, **Caywood & Nopp** and **Takata & Hansen** have joined as a new firm under the name **Caywood, Nopp, Takata, Hansen, Ward, Architects and Planners**. Offices are at 1435 Alhambra Boulevard, Sacramento, California.

**Robert C. Cunov, P.E.**, has been elected vice president for production at **Harley, Ellington, Cowin and Stirton, Inc., Architects and Engineers** of Detroit.

**Dana Larson Roubal and Associates, Architects, Engineers and Planners**, Omaha, announce three new partners in the firm: **G. J. Zenon**, Director of Design; **A. D. Johnson**, Director of Architecture; and **R. Krhounek**, Director of the Pierre, South Dakota, branch office.

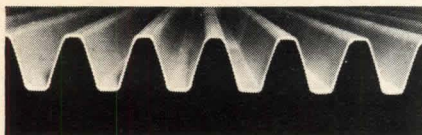
**Lynedon S. Eaton, A.I.A.** and **Lawrence L. Loporcaro, A.I.A.** have recently formed the partnership of **Eaton & Loporcaro, A.I.A., Architects**. The offices are located at 235 Danbury Road, Wilton, Connecticut.

*continued on page 222*

# NEW!



**SYMONS DEEP RIB  
TRAPEZOIDAL FORM LINER**

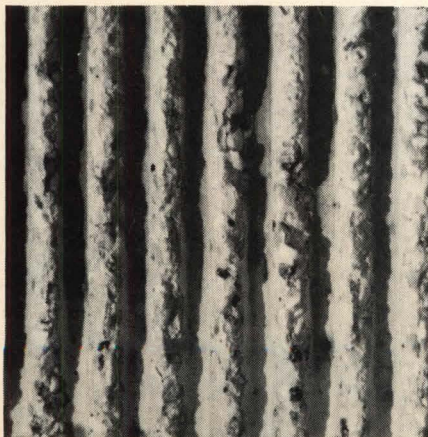


Now, deep and architecturally dramatic ribs can be easily cast into any concrete surface with this new Deep Rib Trapezoidal Liner. As the sun revolves throughout the day, distinctive shadows appear within the ribs, giving the concrete surface strong, clean lines.

The surface imparted to the concrete by the liner may be of a slightly textured finish, shown above, which is standard, or a smooth finish available on request. A rough finish, as illustrated below, may also be obtained by bush hammering or hammer blows.

Ribs are 1½" deep by 2" on center. The liner is made of special ½" plastic material which is highly durable and reusable. Either nails or a neoprene adhesive may be used to attach the liner to the form facing.

Complete information about Deep Rib Trapezoidal Form Liner available on request.



 **CONCRETE FORMING EQUIPMENT  
SYMONS MFG. COMPANY**  
© 122 EAST TOWHY AVE., DES PLAINES, ILL. 60018

**MORE SAVINGS WITH SYMONS**

*For more data, circle 63 on inquiry card*



## Let us do your laundry at our office

If your next job requires a laundry you can get the job done easily—and professionally by simply calling your nearest American sales office. Once you give our sales engineers the necessary details we'll do the rest. We can give you complete floor plans, equipment recommendations, capacity data, operating and staffing suggestions.

Further, our nationwide network of Service Engineers can supervise or handle the installation.

Whether your job calls for a small laundry or a high-volume, automated laundry system, you can depend on American for complete and competent assistance. Just call our nearest office or write: American Laundry Machinery Industries, Division of McGraw-Edison Company, 5050 Section Avenue, Cincinnati, Ohio 45212. Your laundry will be ready in short order.

**American**  
American Laundry Machinery Industries

ALM-1404

*For more data, circle 64 on inquiry card*





## The Designing Ones...by Glaverbel

Mod Patterns, Glaverbel's exciting new line of figured rolled glass that says NOW in every elegant line. TWIST (upper right) ...a weave as fresh as today's fabrics. BOTTLE (lower left) ... fluid full relief for complete privacy. MANHATTAN (upper left) ...light and rhythmic sophistication. Like all Glaverbel glass, Mod Patterns come in a wide range of decorative colors, and...an exclusive with Glaverbel...in widths up to 57 inches.

Mod Patterns by Glaverbel combine practicality and beauty to give any room—in home or office—the look of TODAY. Create a new dimension in all surroundings...with glass by Glaverbel.

Ask your distributor for TWIST, BOTTLE, or MANHATTAN...or any of the other sixty distinctive patterns...by Glaverbel.

# Glaverbel


*For further information, contact:*

GLAVERBEL (USA) INC., EMPIRE STATE BUILDING  
350 FIFTH AVENUE, NEW YORK, N.Y. 10001

DRAWN SHEET GLASS / TINTED GLASS / FIGURED ROLLED GLASS  
STOPRAY SOLAR GLASS / FLOATED PLATE GLASS / ENAMELLED GLASS  
DIFFUSE GLASS / DIFFUSE NON-REFLECTION GLASS

See Sweet's Architectural File 4a/GL





**After facing the  
problems of automating  
4000 buildings, we can  
tailor just the  
right system to yours.**

Actually, buying a Honeywell one-man control system is kind of like buying a car today.

Sure, we vary features, options and accessories to customize the system to your client's building. But the designs of the basic equipment have been pre-tested and proven in thousands of other buildings. You don't have to buy a costly, custom-built, one-of-a-kind system.

Advantages? Your client gets his system on time. You get it working on time. And there's 18 years of automation experience to help him operate and maintain it properly. An 18-year history of solving the kinds of cost and installation problems you're now facing.

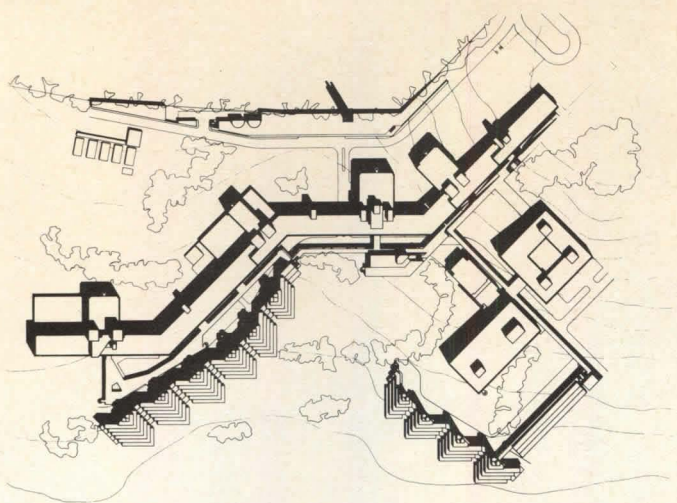
Want building automation help? Send for our planning guides: Honeywell, Commercial Division, G5118, Minneapolis, Minnesota 55408.

**Honeywell**  
AUTOMATION

*For more data, circle 66 on inquiry card*



JULY 1969



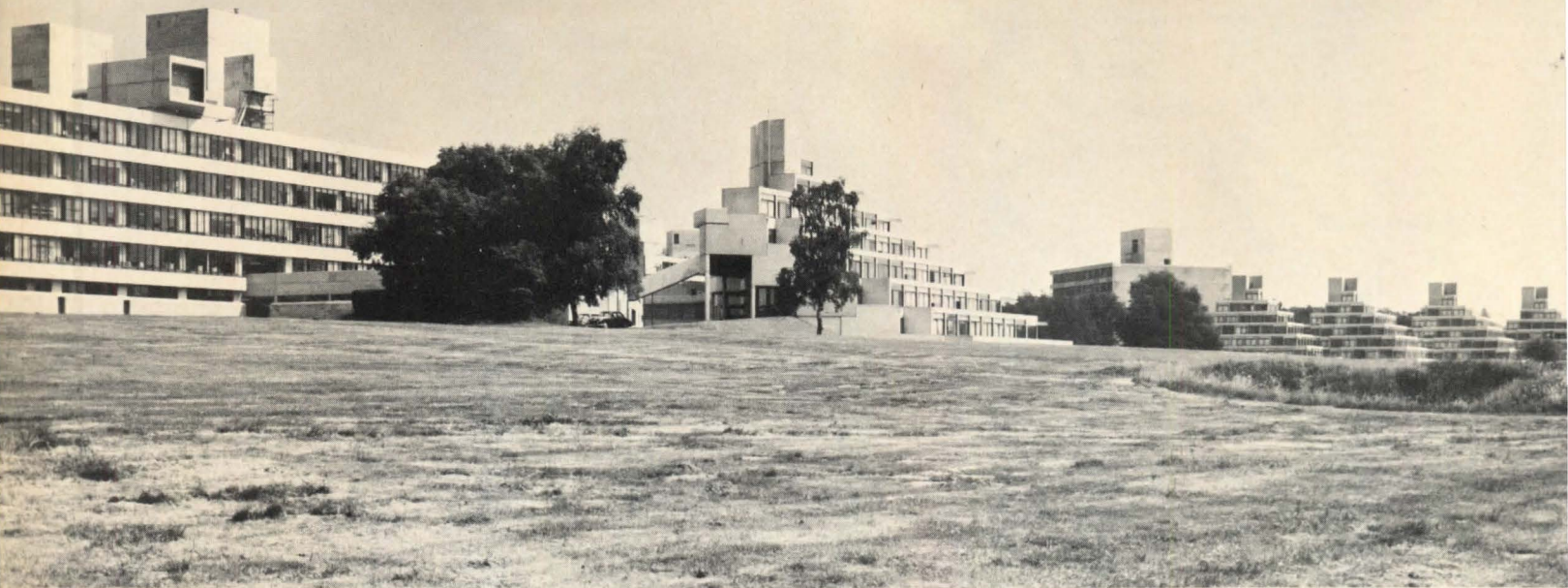
# University of East Anglia

*Ian A. Niamath*

In the recently completed first-phase buildings for England's new University of East Anglia, architect Denys Lasdun has established a physical nucleus which is a microcosm of the projected whole, and an architectural vernacular with which the fledgling institution can confidently meet the imperatives of growth and change, preserving through its inevitable (though unpredictable) evolution the powerful coherence of form that distinguishes its inception.







© Ezra Stoller (ESTO)

## DEVELOPMENT PLAN

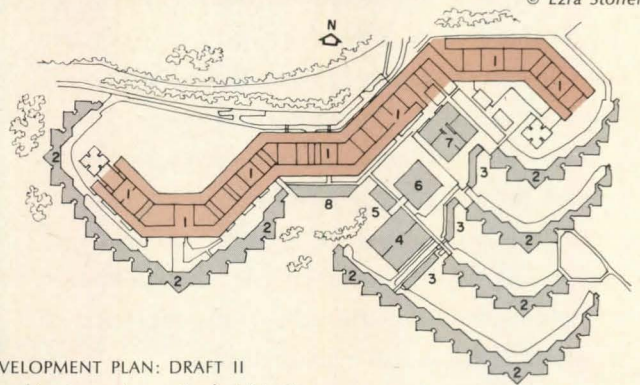
Simply stated, the charge to the architects for the University of East Anglia was to devise an over-all development plan that would enable the university to grow rapidly to a population of 3000 students over a ten-year period, with provision for further, paced expansion as circumstances suggested and resources permitted.

The resulting scheme is a faithful—almost literal—architectural interpretation of an educational approach that emphasizes the essential unity of learning, seeking to dissolve the often artificial barriers between disciplines. Related disciplines are grouped in broad-based Schools of Study conceived as social and well as academic communities, which provide the primary foci for the student's activities and allegiance while contributing, through the merging of their boundaries, to his sense of identity with the university at large.

This emphasis on student participation in the schools and, through them, the total university, also influenced the approach to student living arrangements, which are based on the premise that residences should not be independent social entities, but should be fully integrated with the larger university community.

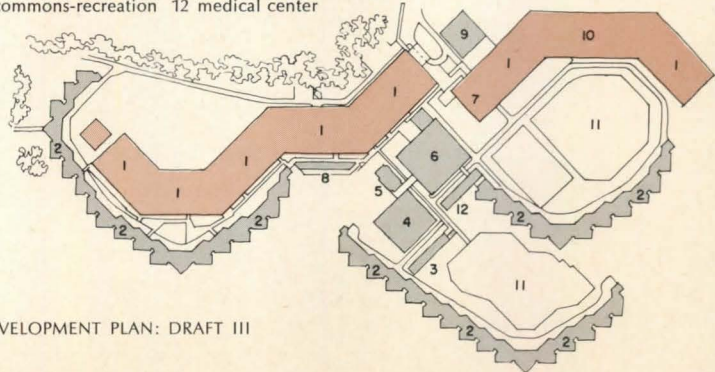
Allied to the underlying conception of the university as an organic continuum of living and learning is the recognition that it is neither possible nor desirable to contain its activities and influence within an arbitrarily designated bit of landscape. The university lies on a south-facing slope rising 70 feet from the River Yare, abutting the outskirts of the City of Norwich and less than two miles from the city center. It enjoys easy access not only to the city but also to a region noted for its research activities—activities the new university can be expected to intensify. Hence the scope of the development plan is extended beyond the boundaries of the site proper to define and anticipate the university's physical relationship both with the city and with the open landscape on the west, providing locations for long-term expansion, independent research institutes, and other specialized activities.

The development plan, flowing from academic decisions and structured by consideration of the site and larger environment, is now in its third draft. It provides for an ultimate student population of 6000—twice the enrollment anticipated at the end of the initial ten-year period—with opportu-



DEVELOPMENT PLAN: DRAFT II

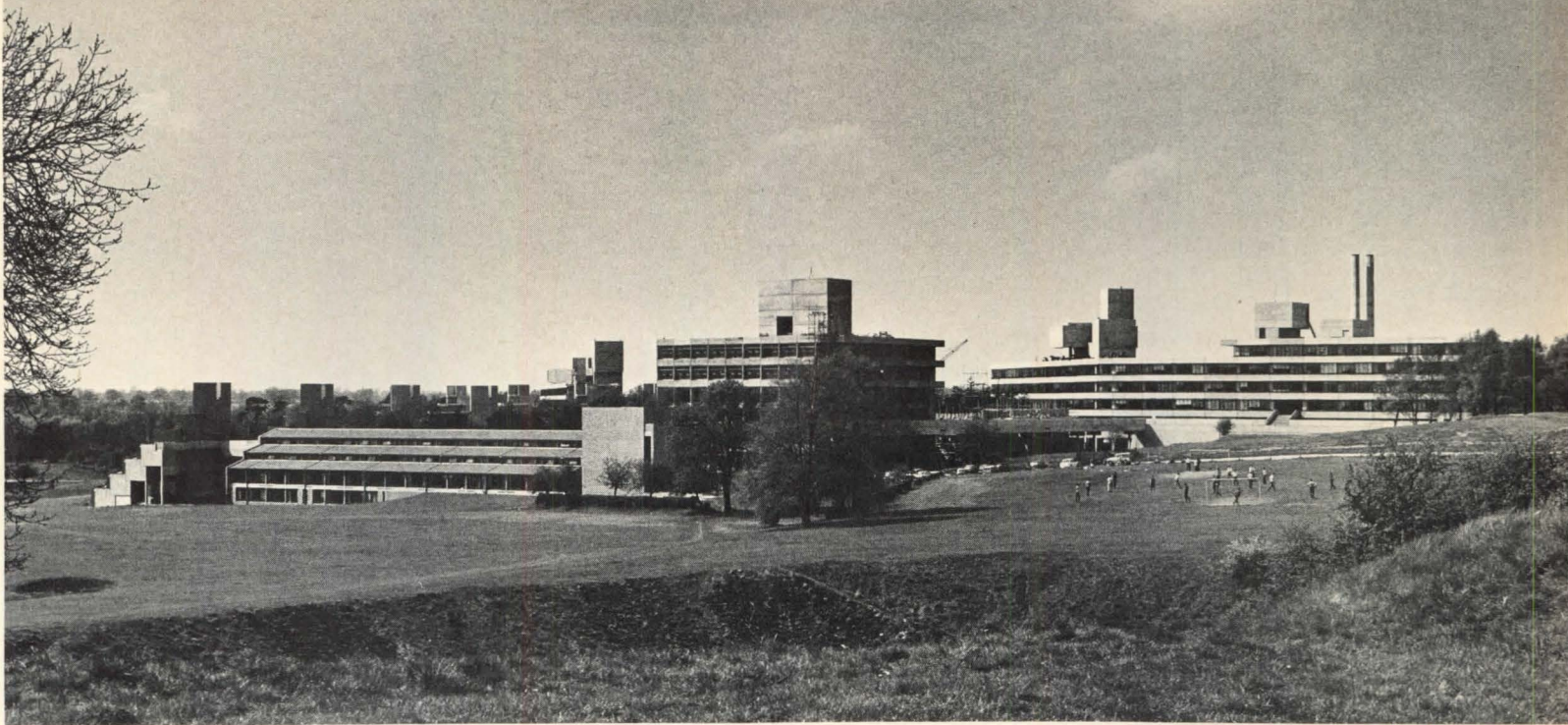
- |                      |                           |
|----------------------|---------------------------|
| 1 teaching-research  | 7 administration          |
| 2 student residences | 8 computer center         |
| 3 staff residences   | 9 concert-assembly        |
| 4 library            | 10 multi-story parking    |
| 5 lecture theater    | 11 future student housing |
| 6 commons-recreation | 12 medical center         |



DEVELOPMENT PLAN: DRAFT III

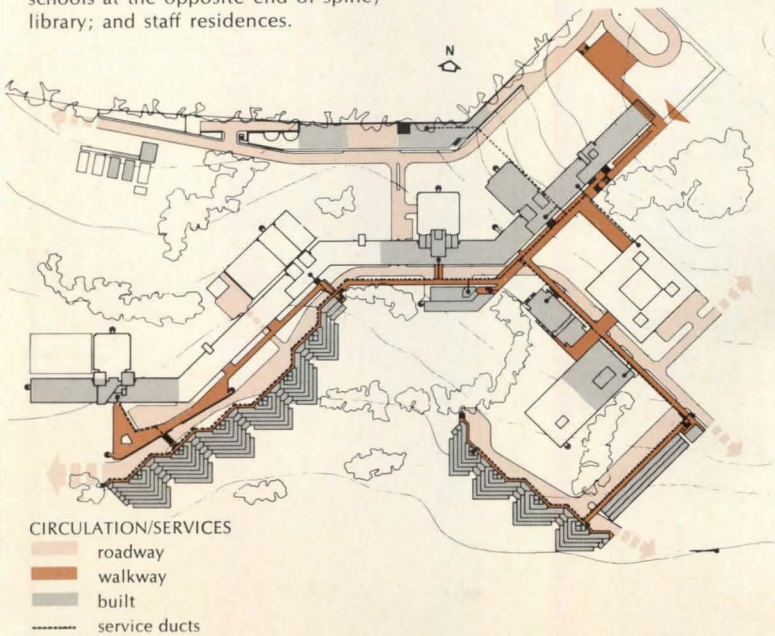






Richard Einzig

View from southwest (above left) shows school of biology at extreme west of teaching spine, with walkway linkage to adjacent residences, and beyond, the ziggurat-like profile of a second residential block. Southeast view above shows art and chemistry schools at the opposite end of spine; library; and staff residences.



Ian A. Niamath

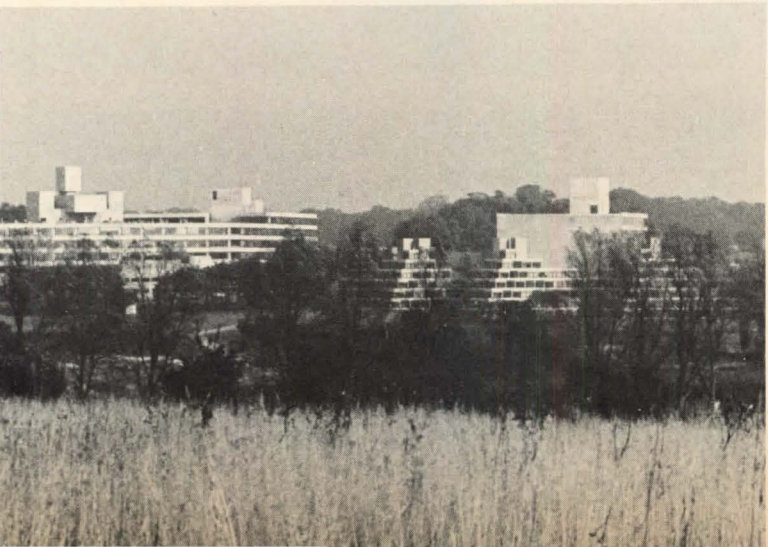
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A key planning principle was the development of a circulation system (diagrammed in the first and second phase construction plan at left) separating pedestrian and vehicular traffic—and affording buildings two access levels, thus minimizing the need for elevators. Cars and bikes circulate freely on ground-level roadways; elevated walkways, which also carry services beneath, form continuous pedestrian routes that bring all areas of the university within five minutes walking distance of one another. Photos above and right show two-level linkage between arts (left in photo above) and biology schools, along path of second-phase additions to the academic spine and existing residence clusters. Panoramic view at left shows the whole of the university in its first phase of construction, as it appears looking due north from the opposite bank of the River Yare, which forms its southern boundary.



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## DEVELOPMENT PLAN

nity for still further growth if desired.

In the first draft, based on consultation with the Vice-Chancellor and the Academic Planning Board, a mix of arts and science teaching and research facilities were grouped on either side of such central university buildings as library, administration, student union, and the like, with pedestrian routes linking residences to the campus center.

With the appointment of the academic staff, review of detailed needs and efforts to devise a viable first-stage building program resulted in a second development draft. This eliminated distinct boundaries between Schools of Study, as the first draft had eliminated them between disciplines. It placed all arts and sciences schools in a continuous serpentine spine, which contains small and large rooms with backyard space. To the south of the spine is a sequence of central open spaces cascading down the sloping site and culminating in a large, re-entrant, rough-grassed "harbor," from which the over-all disposition of buildings and pattern of growth devolves. These central spaces are bordered on the side opposite the academic spine by the corporate buildings. Beyond them, the residen-

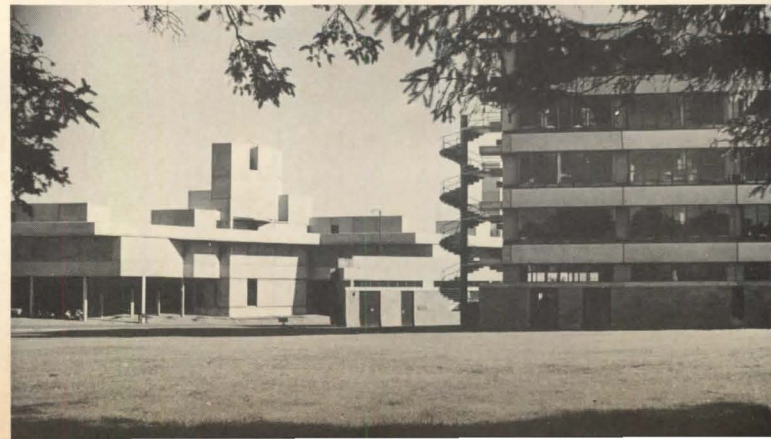
tial units terrace to the river, penetrated by grass swards which, like the harbor, provide a spatial transition from the open landscape to the more intimate spaces of the university itself.

Though only a fraction of the projected university, first-stage construction (plans, page 103), completed under the second development draft, contains parts of all elements of the ultimate plan and so introduces in microcosm its dominant themes: the continuity of learning and living, and the interlocking of open and closed space combining to form an architecture of urban landscape rather than a collection of disparate campus buildings.

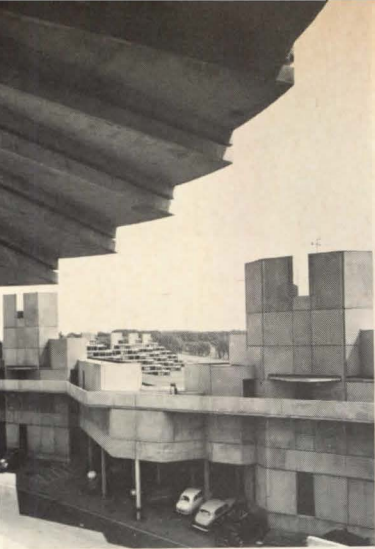
A third, and current, development draft, designed to see construction through the initial ten-year period and beyond, reflects changes in university requirements in two principal ways. The academic spine has been severed at the main entrance to accommodate within it the administration building, and to provide a location for a concert-assembly hall to be built later as a joint venture with the City of Norwich; and social activities previously conceived as centralized in a union-like building have been regrouped into separate restaurant, commons, sports, and commercial



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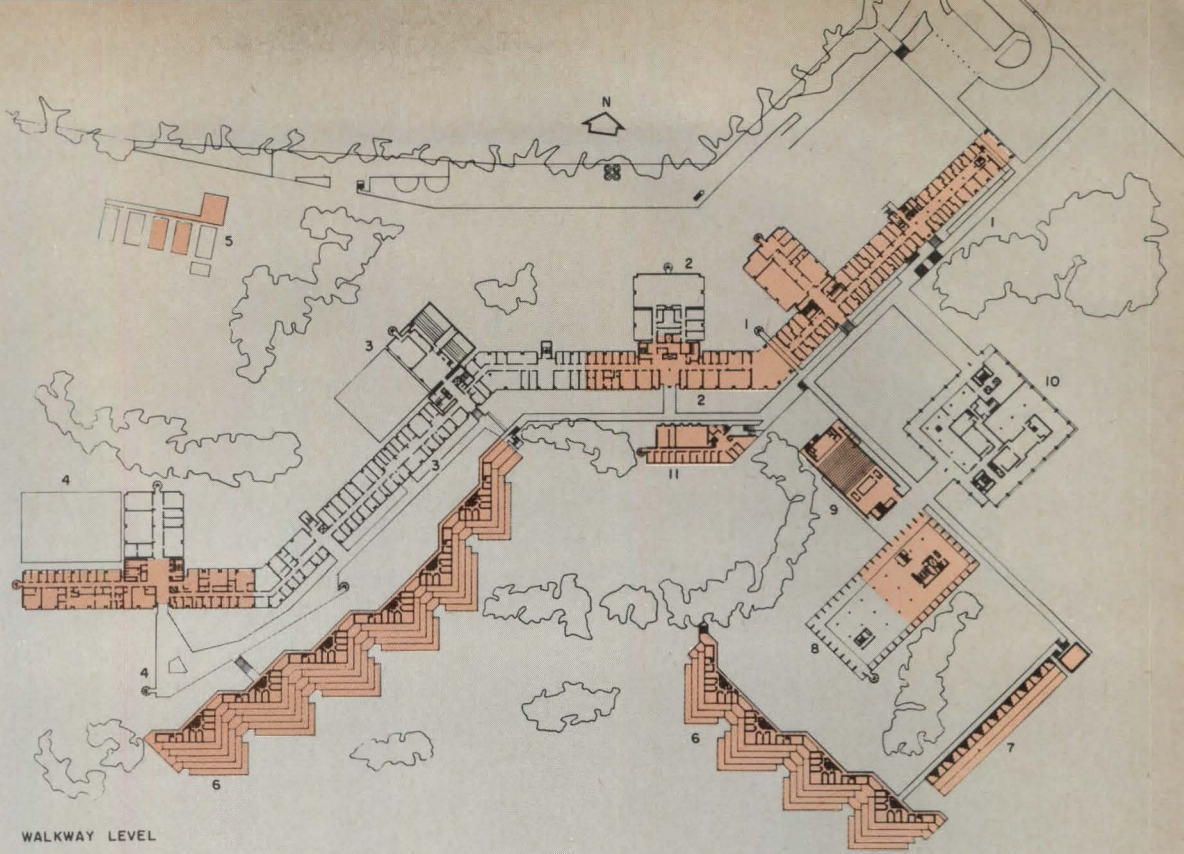
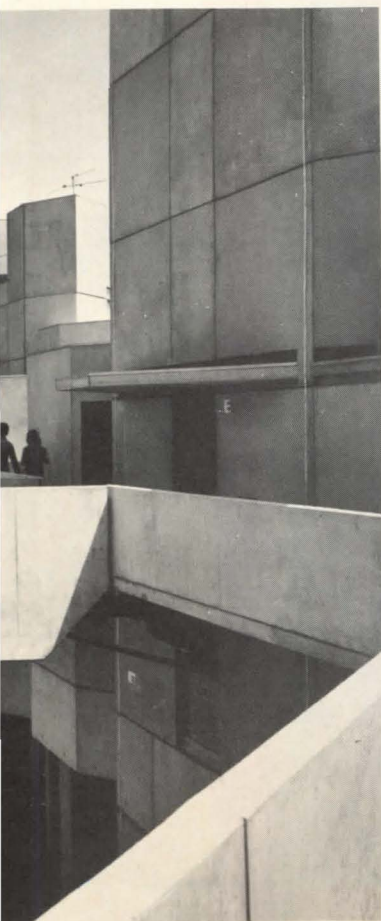




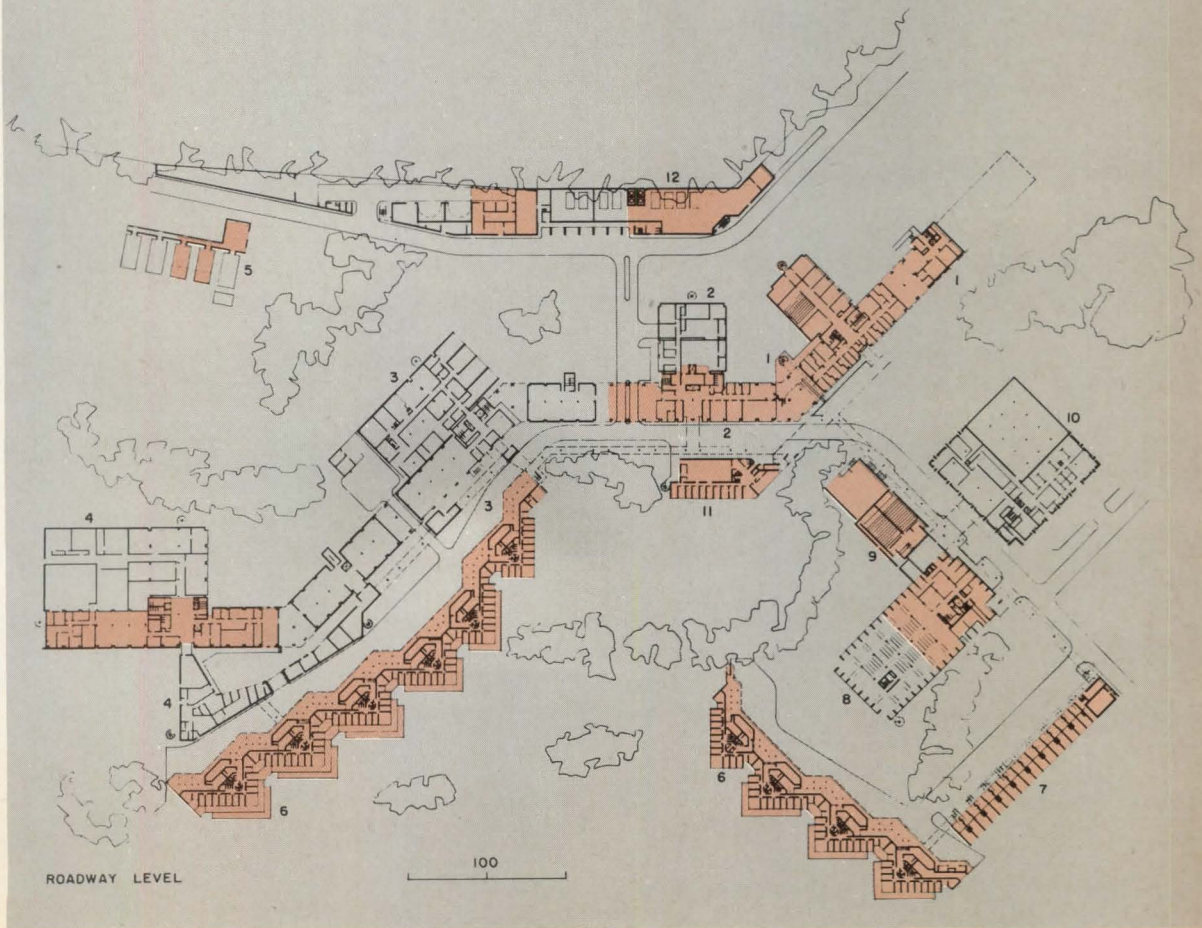


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Much of the impact of the university derives from its essentially urban quality, in sharp contrast with the bucolic sweep of landscape around it—a contrast deliberately achieved by limiting the spread of the university on its site, at the same time allowing the landscape to penetrate the campus through the re-entrant grassed "harbor" and central open spaces, and the swards between residence groupings.



WALKWAY LEVEL



ROADWAY LEVEL

The university's urban character can be attributed largely to the compactness which the architect felt necessary to permit the merging of diverse activities and to enable the individual to readily comprehend, and thus identify with, the whole as well as its parts. This concentration of plan, reinforced by the juxtaposition of academic and residential spaces, also helps assure that the university will present itself as a coherent entity at each stage of growth, as is evident even in its present state of completion.

DEVELOPMENT PLAN: PHASES I & II

- 1 arts
- 2 chemistry
- 3 mathematics & physics
- 4 biology
- 5 biology garden compound
- 6 students residences
- 7 staff houses
- 8 library
- 9 lecture theaters
- 10 student union
- 11 computer center
- 12 boiler house

Phase 1 (built)





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## TEACHING/RESEARCH BUILDINGS

facilities. In addition, new restrictions on residence hall funding required recasting the eastern part of the site, and allowance was made for more parking.

This modification of the plan while its earliest implementation was incomplete convincingly demonstrates its capacity to allow the university to grow freely, as well as the workability of the basic planning principles rooted in the academic program and site considerations. These include:

- **Concentration.** If the university is truly to be a place where activities merge, and where the individual is aware of his identity with the whole, it must be compact. All activities, accordingly, are to be within five minutes walking distance, linked by continuous pedestrian routes. The accompanying limitation of the spread of the university over its site also secures a recreated natural landscape distinct from the urban environment of city and campus.

- **Linkage.** Elevated walkways, carrying services, are used consistently to hold a horizontal level against the natural slope of the ground. This makes it possible for buildings to be entered one or more floors above ground level, thus permitting an intensity of concentration other-

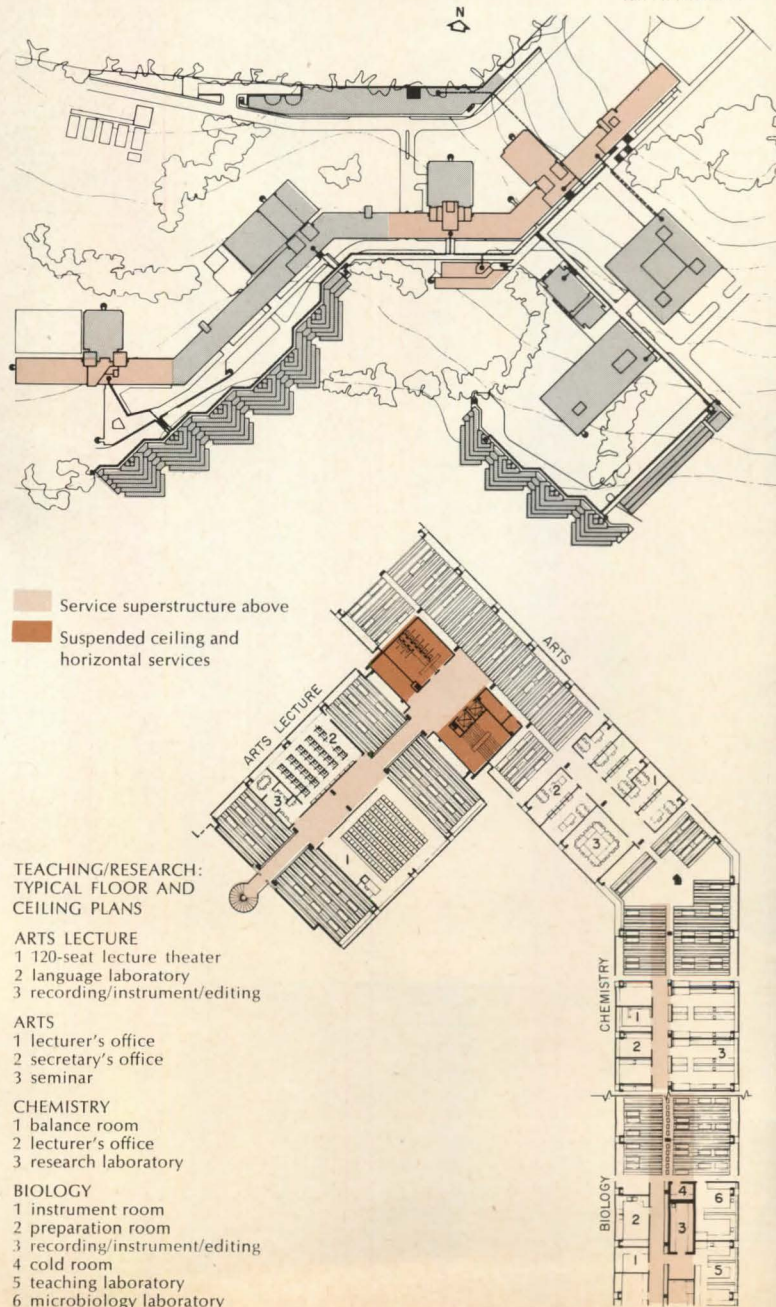
wise obtainable only through a more extensive use of elevators. It also allows the separation of pedestrian and vehicular traffic.

- **Growth.** Apart from the early establishment of a distinct nucleus, the plan must be able to assimilate the changing needs of the academic program not only by extension and expansion but also by modification within the basic system of structure and services.

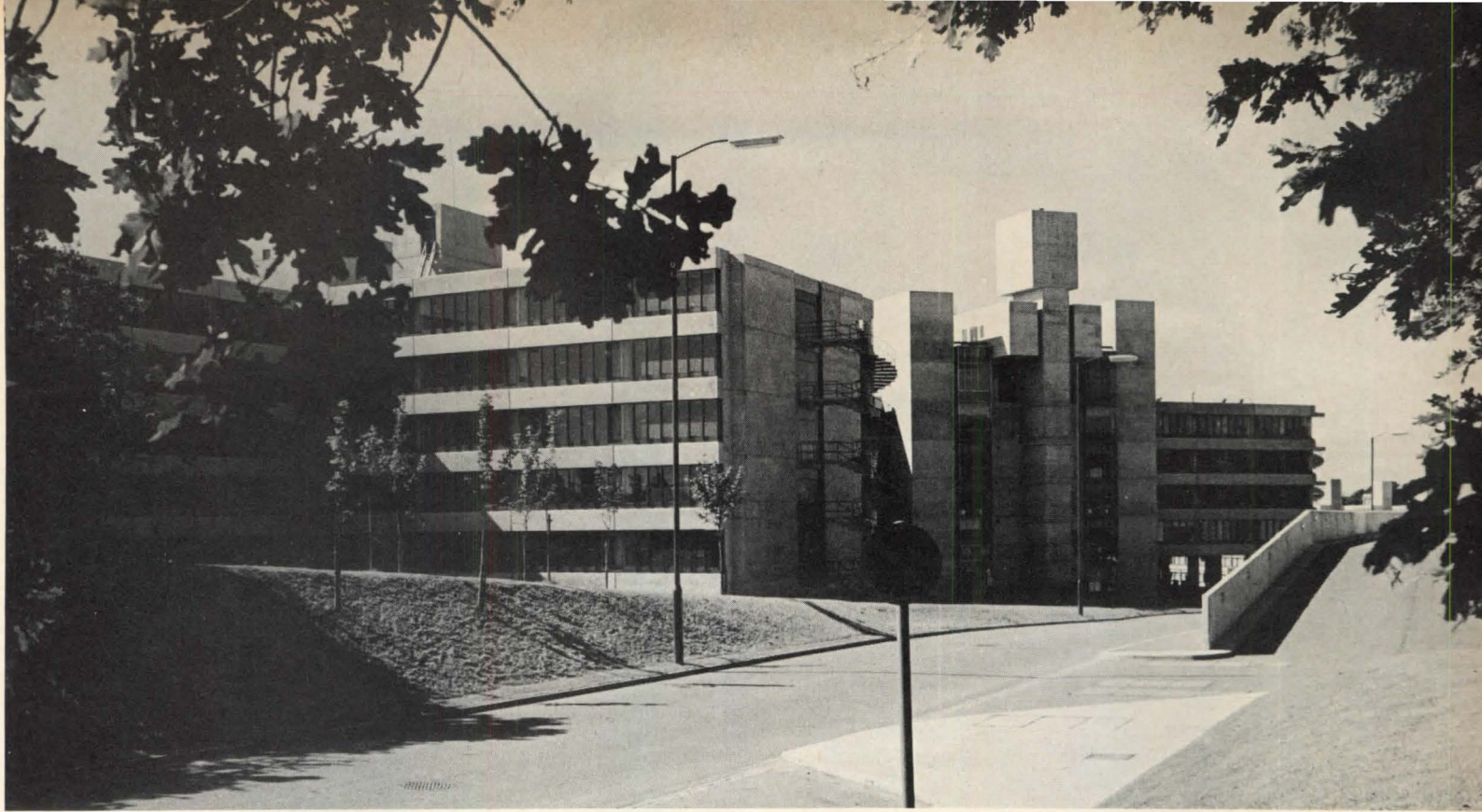
This guiding principle of providing options for growth over the short as well as the long run is, of course, particularly crucial to the development of the teaching and research area, which now includes schools of biology and chemistry and four arts schools. These will be followed in the second stage by schools of environmental science and mathematics and physics.

Each school was planned within an allocated space, but with the possibility of altering its internal arrangement or of being replaced by a different use. The aim was to achieve this flexibility economically and yet allow each school to grow within a concentrated plan without having to move repeatedly to allow others to expand.

Analysis of user requirements showed that needed spaces could be broken down into





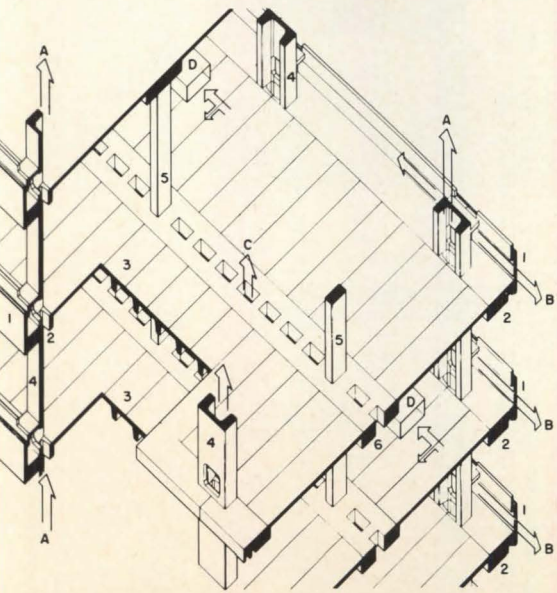


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TEACHING/RESEARCH: STRUCTURES-SERVICES DIAGRAM

- 1 precast spandrel panel
- 2 precast edge beam
- 3 precast tee beam
- 4 precast column
- 5 in situ column
- 6 in situ beam containing service ducts

- A vertical services duct
- B horizontal services duct
- C fume cupboard extract duct
- D air-conditioning duct



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To obtain maximum repetition of units and flexibility in the use of buildings, the same precast structural system (diagram above left) was used for both arts and science schools, thus also lending visual unity to the teaching-research spine. Facing photos at top show north side of arts and chemistry block, with projecting arts lecture wing. Above is a view from the residence walkway to the biology school and its approach deck, with animal houses and storage below deck level; at left, the open access route under the arts school; and at right, the entrance to the adjoining chemistry school across a bridge from the elevated walkway.



Ian A. Niamath





## LIBRARY/LECTURE THEATER

basic categories of small, medium and large rooms to be planned in close association at each floor level, with varying provision of special services. An arrangement was therefore established whereby two outer lines of 50-foot-wide buildings containing small and medium rooms were set 100 feet apart and linked together by groups of laboratories, lecture rooms and other large spaces. Permanent vertical circulation and service cores were placed at the intersections and, together with their roof superstructure, form pivotal points along the angled teaching wall.

Varying between four and six stories high, this system of continuous linked parallel blocks offers several advantages:

a) It affords maximum perimeter for naturally lit and ventilated rooms.

b) Each school can have its own entrance while sharing stairs and elevators with other schools.

c) Laboratories and lecture rooms are accessible to all departments at every floor level, and are convenient to lecturers' offices.

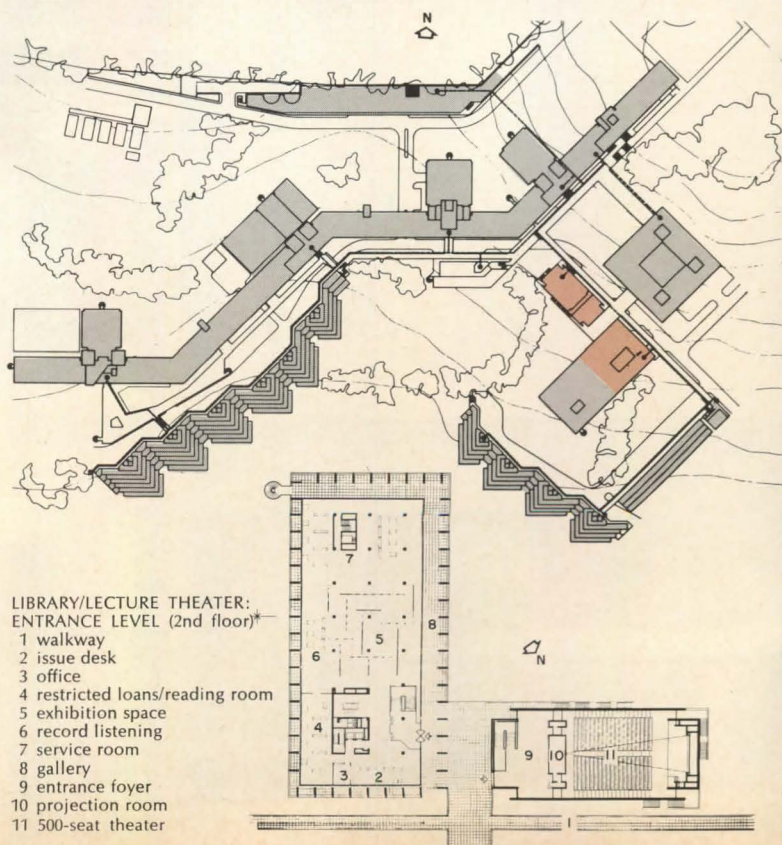
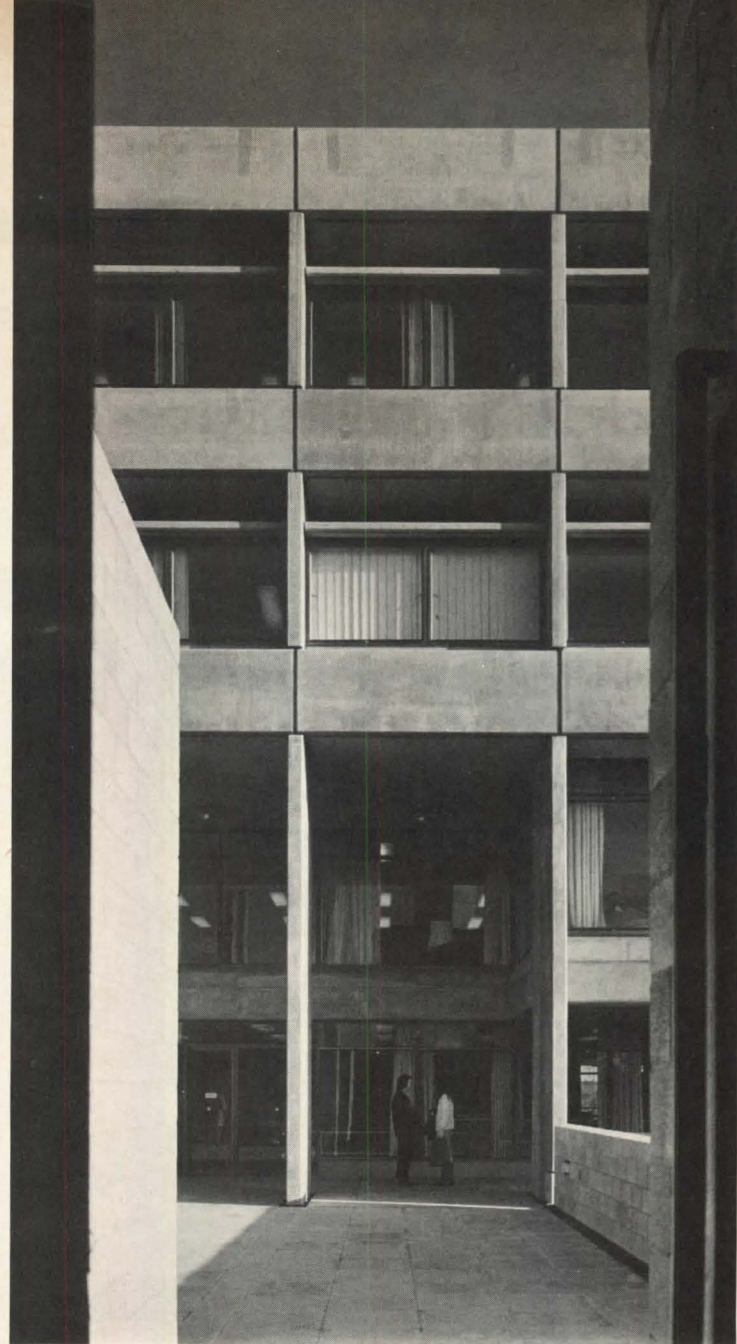
d) Schools can grow by staged catenation to form a complete circuit about a closed court, or to connect with other schools at each floor level.

The arrangement had the further advantage of making possible the development of a precast concrete structural system that allowed not only rapid initial construction but flexibility in future layout as well.

The structure, which has been used for both science and arts areas, consists of four large basic components—a U-shaped duct column, a duct spandrel, an edge beam supporting the spandrel, and a T-shaped floor beam—site-assembled with a rigid poured-in-place spine. A structural grid of 21 feet (derived from a minimum laboratory width of 10 feet 6 inches), is used throughout, with variations in the requirements of schools handled by adjusting the position of the corridor and the central poured-in-place columns and beams, as shown in the composite plan on page 104.

The library at East Anglia occupies a literal as well as figurative place at the heart of the campus, its location in the "harbor" and adjacent the main central spaces opposite the teaching-research spine allowing both ease of access from residential and academic precincts alike, and enough isolation for a high degree of amenity and quiet.

Designed to be built in two phases to shelve almost a half-million books and seat 1000

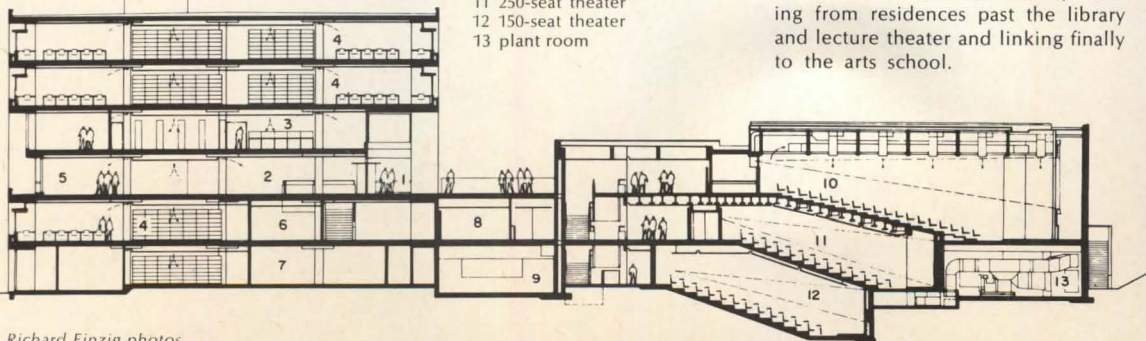




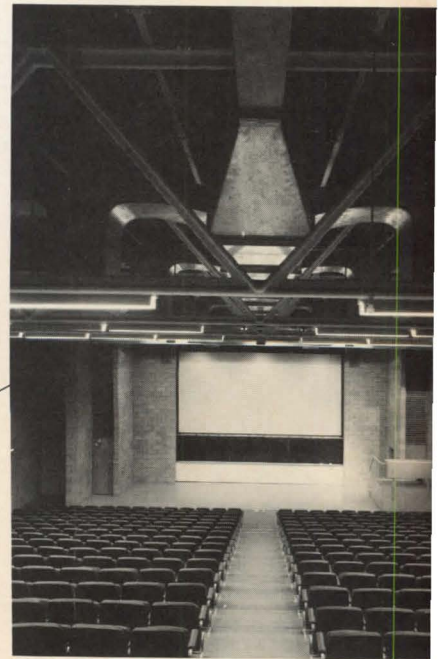


**LIBRARY/LECTURE THEATER SECTION**

- |                     |                              |
|---------------------|------------------------------|
| 1 entrance deck     | 6 library cloakroom          |
| 2 issue desk        | 7 calorifier room            |
| 3 catalogue         | 8 lecture theater cloakroom  |
| 4 reading and stack | 9 audio-visual center studio |
| 5 display           | 10 500-seat theater          |
|                     | 11 250-seat theater          |
|                     | 12 150-seat theater          |
|                     | 13 plant room                |



Photos on facing page show two views of the library entrance and gallery, one from the lecture theater across the connecting concourse. Above is the elevated walkway leading from residences past the library and lecture theater and linking finally to the arts school.



Richard Einzig photos



Typical library reading room (left) features paired carrels formed by deep precast concrete wall sections which carry increased loads at the perimeter of the reinforced concrete structure, and also serve as natural light diffusers. The 500-seat hall in the adjacent lecture theater block (right) doubles for musical performances, the front three rows of seats being removable to form an orchestra pit. Loadbearing walls of filled concrete block are left exposed on the interior, as are lightweight steel roof trusses and service ducts.





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## RESIDENCES

readers, with enough adjoining open space to double this capacity if required, the six-story building is entered from a pedestrian walkway at second-floor level. Two floors of reading and stack areas are located above the entrance and administration floors, with two more floors of reading and stacks below. Since services and vertical circulation are concentrated in an internal core, these floors are freed for permutations in layout, within the limitations of the 22-foot 6-inch two-way column spacing. The bulk of the structure is poured-in-place concrete, but increased loads at the perimeter are supported on precast concrete walls, 6 feet 6 inches deep by 8 inches thick, which are arranged to form pairs of carrels around the outer edges of the reading and stack areas, and which also serve as natural light diffusers.

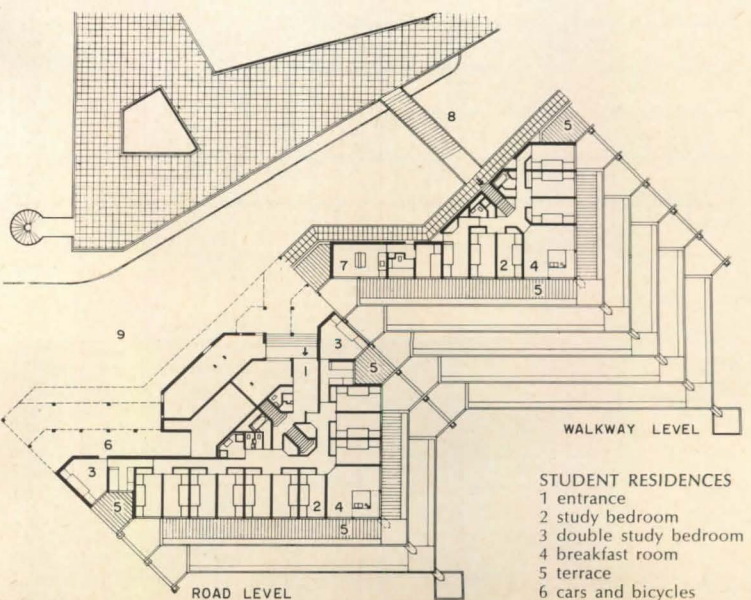
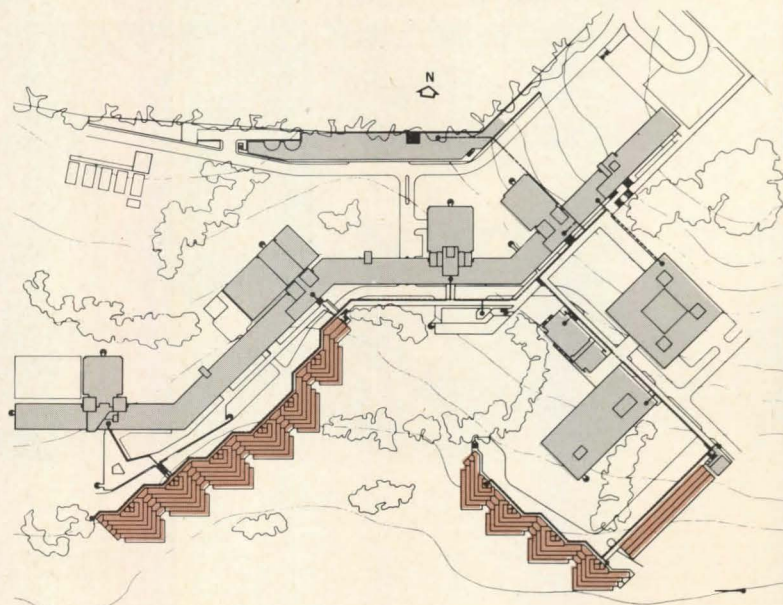
Between the library and the academic spine, and approached from the walkway opposite the library's main entrance, is a block of specially equipped large lecture theaters to be used by all schools. In addition to a main theater seating 500, which is also used for musical performances, the building contains a 250-seat theater that can take overflow from the larger hall, and two 150-seat

theaters located partially below ground.

An audio-visual center which provides studio and control facilities for a closed circuit television network links library and theater at road level.

Despite its desire to establish the Schools of Study and campus-wide facilities as the principal centers of undergraduate life, and so reduce the importance to the student of where he lives, the university administration felt strongly that where the student might live was of no little importance to the university itself. Since nearby Norwich is too small either to support a commuter institution or to supply sufficient housing for students drawn to the university from elsewhere, the university's growth would depend on its providing extensive living accommodations on-campus. The planning goal therefore was to house some two-thirds of the student body, and make eating and recreation facilities available to all.

As noted earlier, the residences were not conceived as large independent entities. Rather, the concept was to enable students to live in the small social groups they so overwhelmingly favor, and at the same time integrate the groups with one another and with the



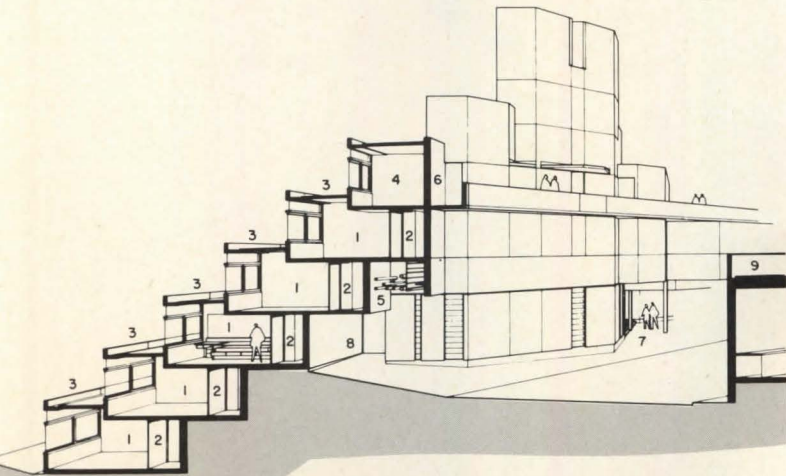
- STUDENT RESIDENCES
- 1 entrance
  - 2 study bedroom
  - 3 double study bedroom
  - 4 breakfast room
  - 5 terrace
  - 6 cars and bicycles
  - 7 single tutor's flat
  - 8 bridge to biology
  - 9 road





Richard Einzig

Western block of residences is seen from south in photo top left, and, above, across land-locked "harbor" from opposite residence group. The undercroft formed by the stepped section provides space for parking and common facilities as well as an entrance at road level. A second entrance is at walkway level.



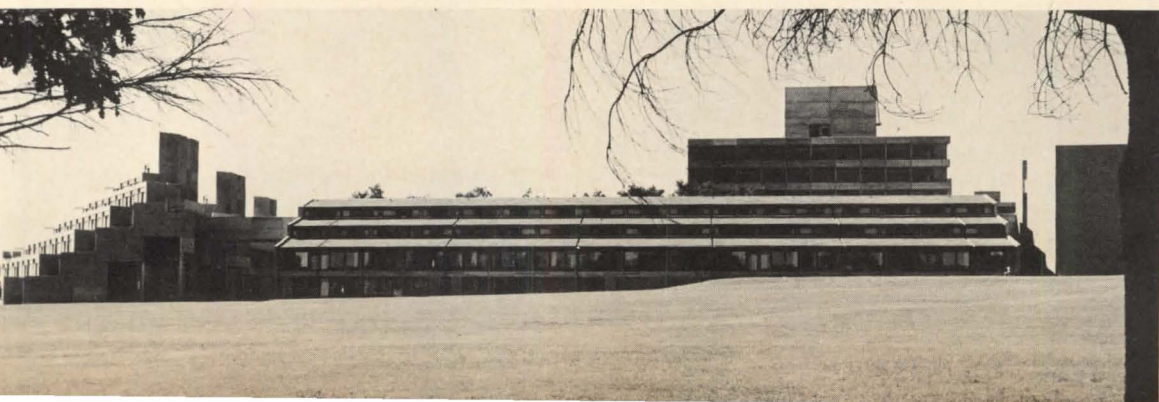
STUDENT RESIDENCES:  
DIAGRAMMATIC SECTION

- 1 study bedroom
- 2 corridor
- 3 terrace
- 4 single tutor's flat
- 5 services duct
- 6 access walkway
- 7 entry at road level
- 8 cars and bicycles
- 9 walkway deck to teaching building

Small groupings of student rooms are terraced up the sloping site in vertical clusters of six, with the lower two built into the slope. All living spaces face south, east, or west, opening to terraces formed by the roofs of the room groups just beneath. Housing for staff and married students is provided in the long, low apartment block below.

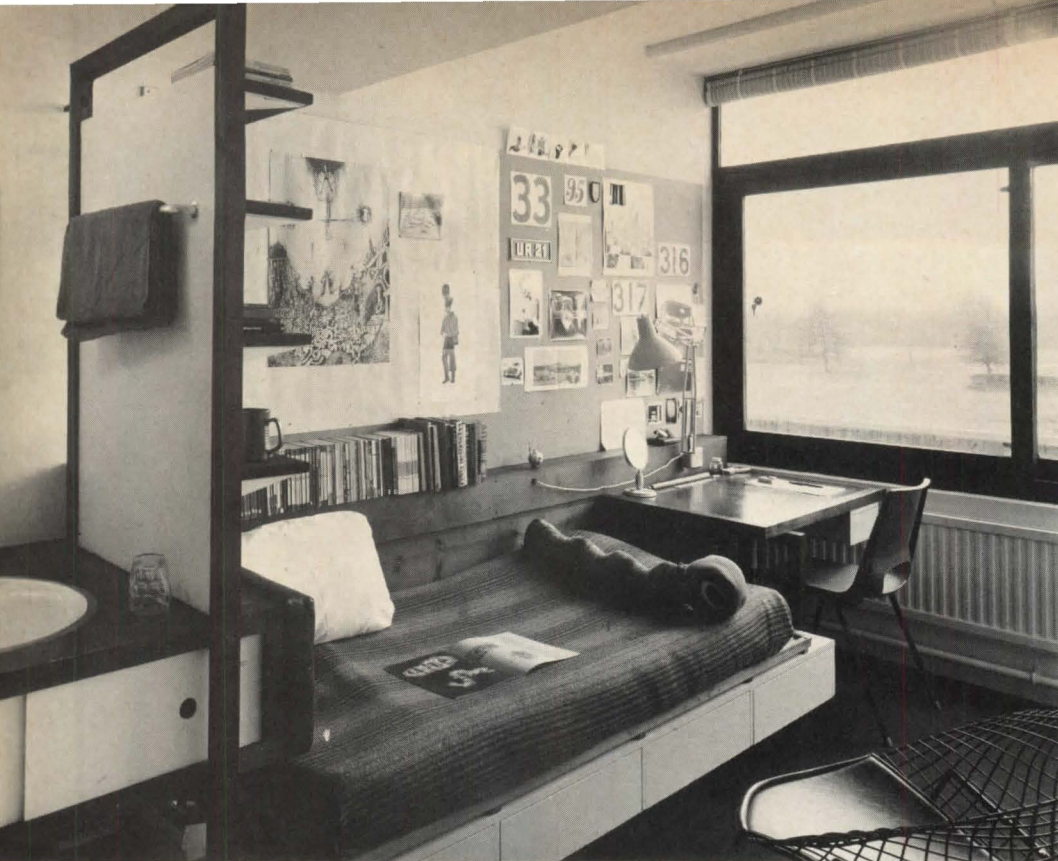


Ian A. Niamath



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Study bedrooms (left) have standard 8-foot 6-inch ceilings over main living areas, a lowered 6-foot 10-inch ceiling over utility areas to give an interlocking section which minimizes the over-all floor-to-floor dimension. To reduce clutter in the small rooms, major furnishings are all built in on one wall, leaving the opposite side of the room free. Social center of each room grouping is a kitchenette-breakfast room (below) where students can prepare light meals—or just relax.

university at large so as to create a rich and varied campus community.

Student rooms, accordingly, are arranged in units of 12 (ten single and two double), each with its own bath, utility room, and kitchenette-breakfast room, to form the basic student "habitat." Within each, all living spaces, including the breakfast room, are placed facing outward from the university to south, east, or west, while the utility-service core is located on the north side.

These basic living units, in turn, are stacked in vertical clusters of six, terraced up the sloping site and stepped back one over another to form an undercroft on the north side which houses game rooms, cleaners, storage, bicycle and car parking areas, and other ancillaries of undergraduate life. The lower two of the six layers are built into the slope, affording entrance to the third level from the roadway, with a second entrance off the pedestrian walkway above. All layers are then linked vertically by a staircase connected to the two entrances, while the walkway, which remains at a constant level, joins the residence clusters to each other and to other parts of the site.

The interlocking section of the stepped-back study bedrooms, built with a lowered ceiling over the interior portion, reduces the floor-to-floor height of the building, and together with the two-level entrance approach has eliminated the need for elevators. This split-level design of the student rooms also provides spaciousness over the greater part of the living area; at the same time it permits obtaining economy of structure through the use of minimum heights in utility-service areas.

The desired speed of student intake demanded a system of rapid construction, which was made possible by the suitability of the repetitive cellular design to prefabrication in large units. Walls and floors were cast on site in single concrete panels; roofs were constructed in planks, and rear walls in large panels, both of lightweight insulating concrete.

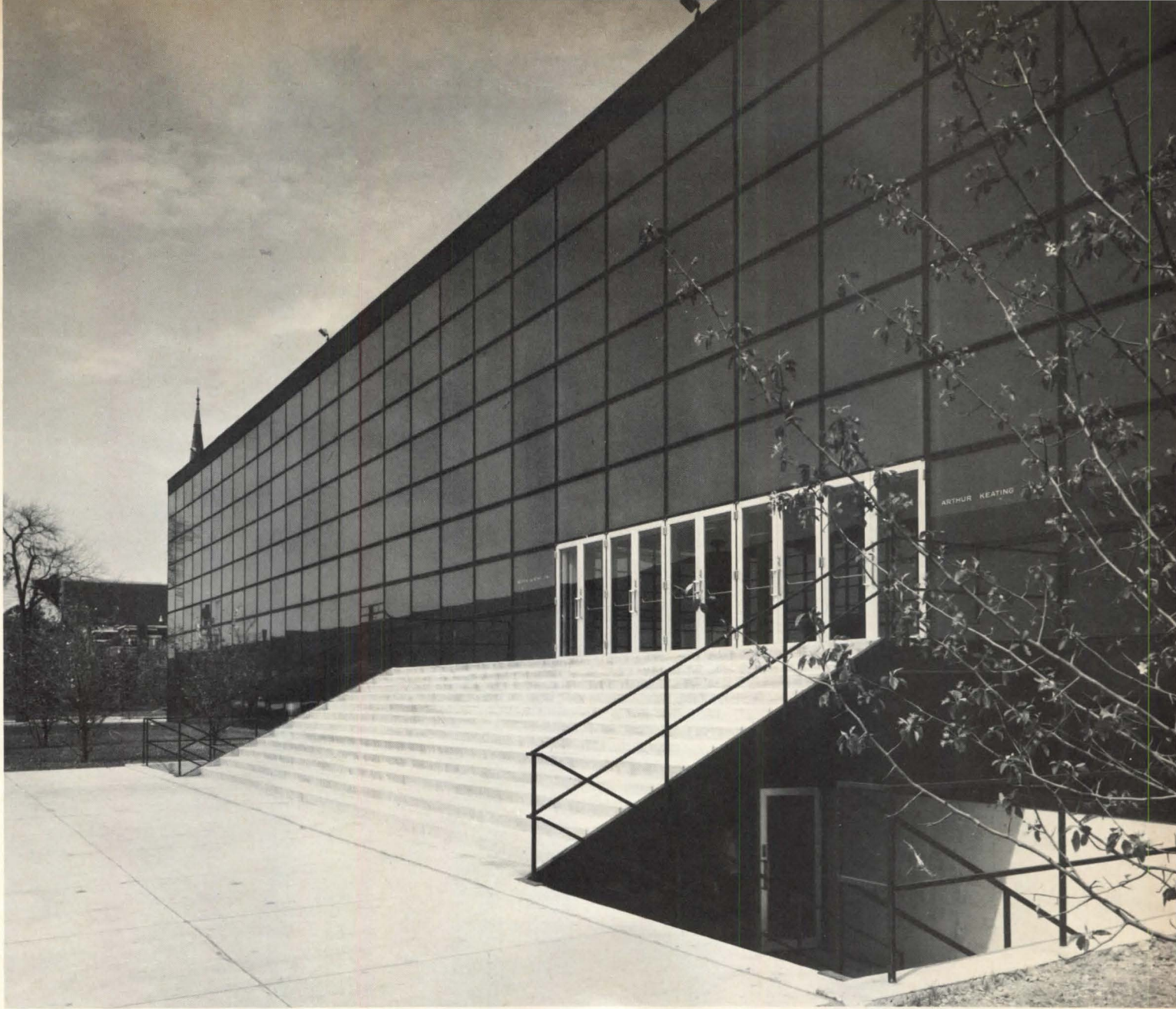
In room interiors, paint is applied direct to the concrete, as is the underlaid carpet. Built-in furnishings—bed, desk, bookshelves, tackboard, wardrobe and washbasin—are all grouped on one side of the room to minimize clutter.

UNIVERSITY OF EAST ANGLIA, Norwich, Norfolk, England. Architects: Denys Lasdun & Partners.



Edward Leigh





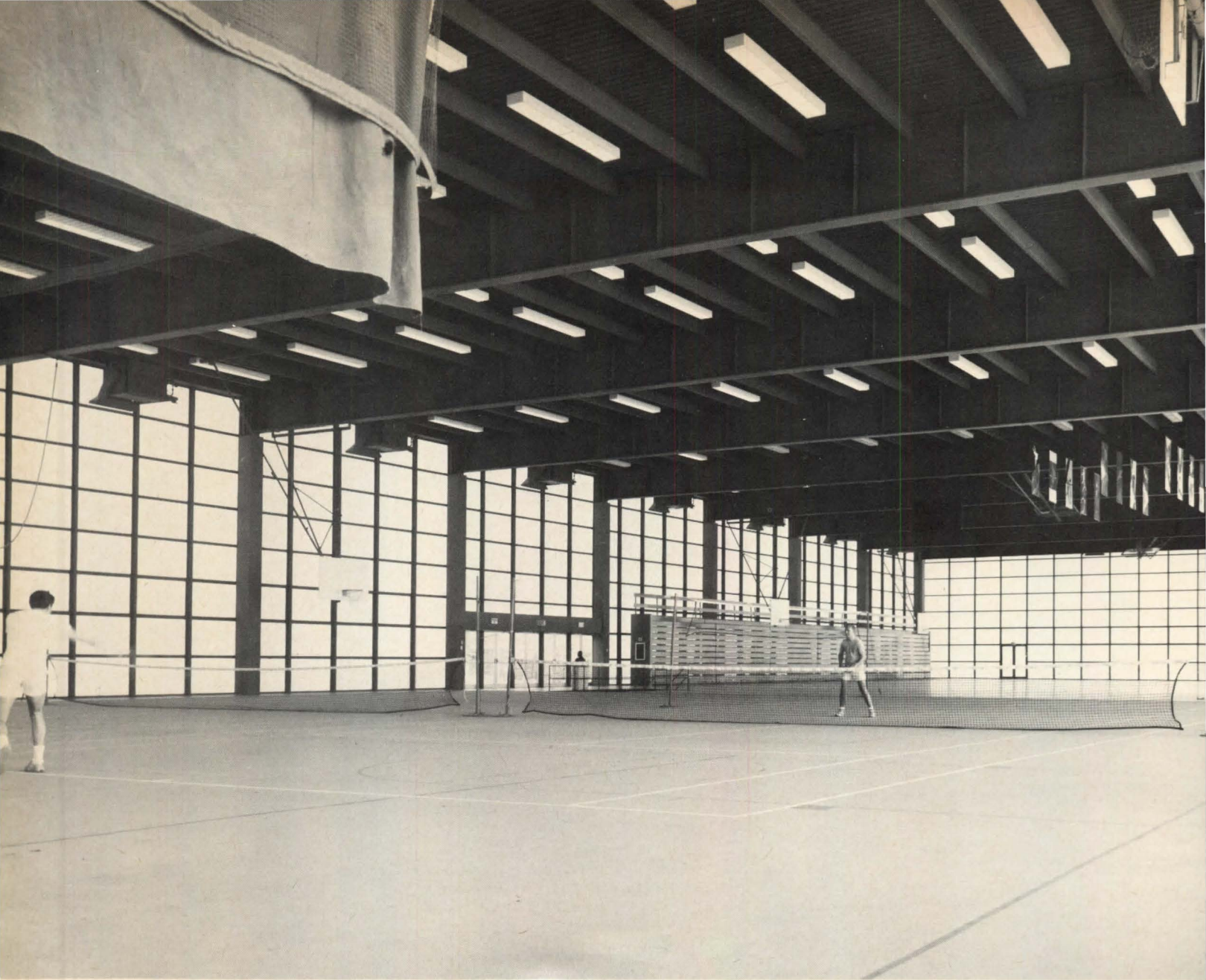
Two elegant new buildings by Skidmore, Owings & Merrill's Chicago office, with Myron Goldsmith partner-in-charge of design, use carefully detailed steel to reflect an existing college campus, and to demonstrate a steel company's products.

## 1 A NEW MULTI-USE GYMNASIUM FOR I. I. T.

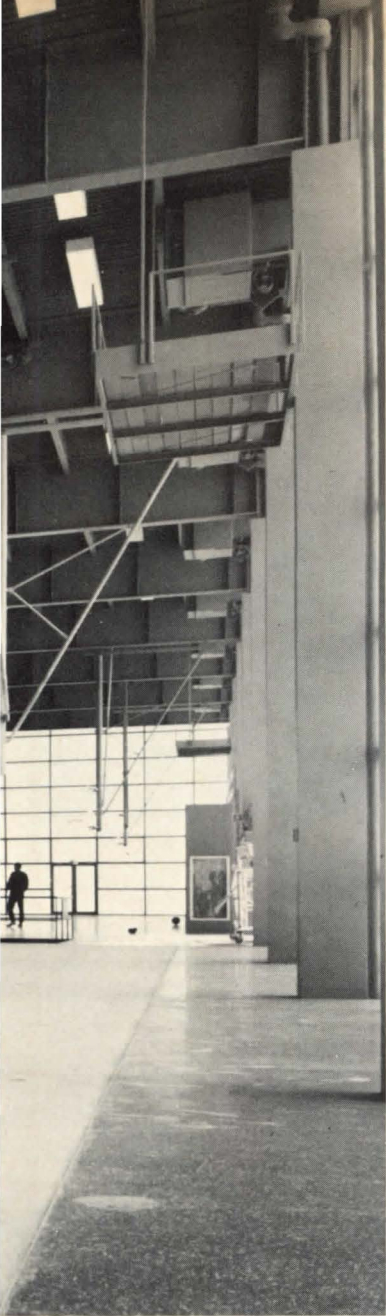
This shimmery, glass-skinned sports facility remarkably maintains its own individuality, yet wholeheartedly echoes the spirit of the well known steel and glass architecture which already exists on the Illinois Institute of Technology campus. A very small site posed some severe space problems to incorporate all the large recreation areas needed. This was solved by building up to three levels below grade: the lower levels contain all locker areas, swimming pool, handball courts and mechanical rooms; the upper level provides for many spectator sports and for convocations.

ARTHUR KEATING HALL, Illinois Institute of Technology, Chicago. Architects-engineers: *Skidmore, Owings & Merrill (Chicago)—Myron Goldsmith, partner-in-charge of design; Kenneth Mullin, project manager, Michael Pado, project designer; Paul Marxen, job captain; contractor: A. J. Maggio Co.*



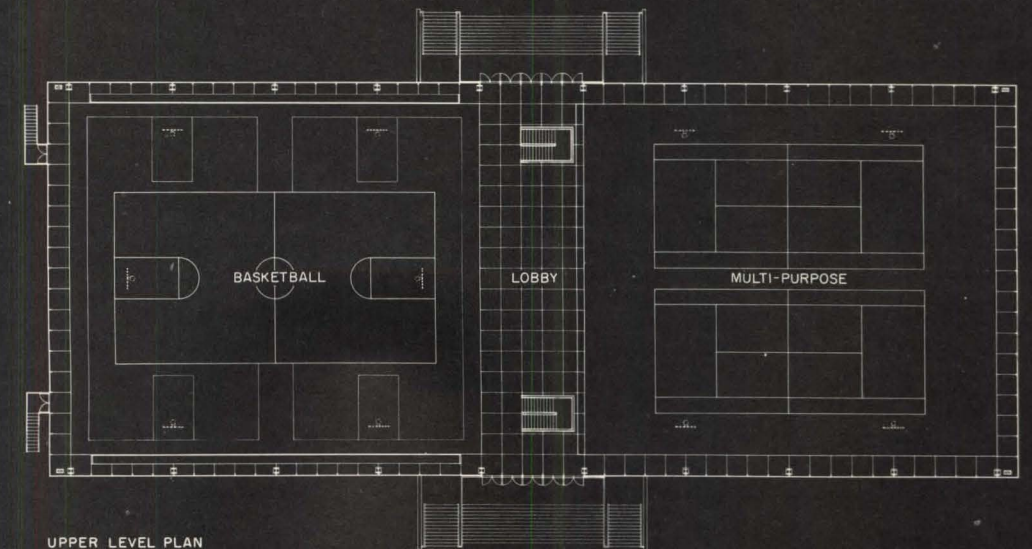
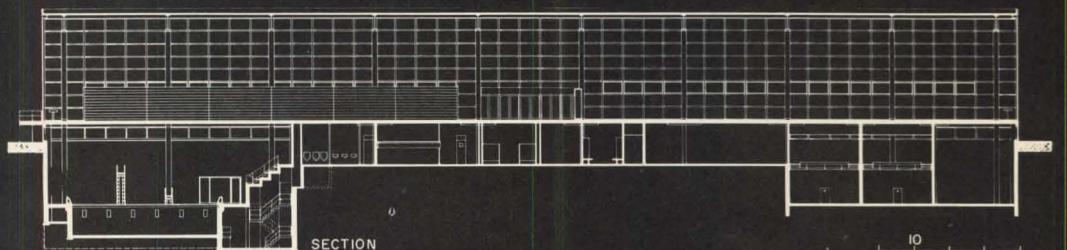
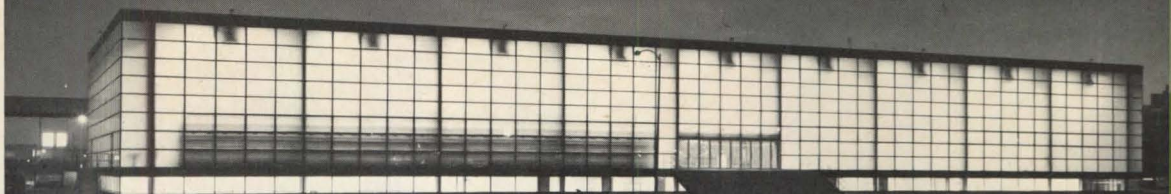




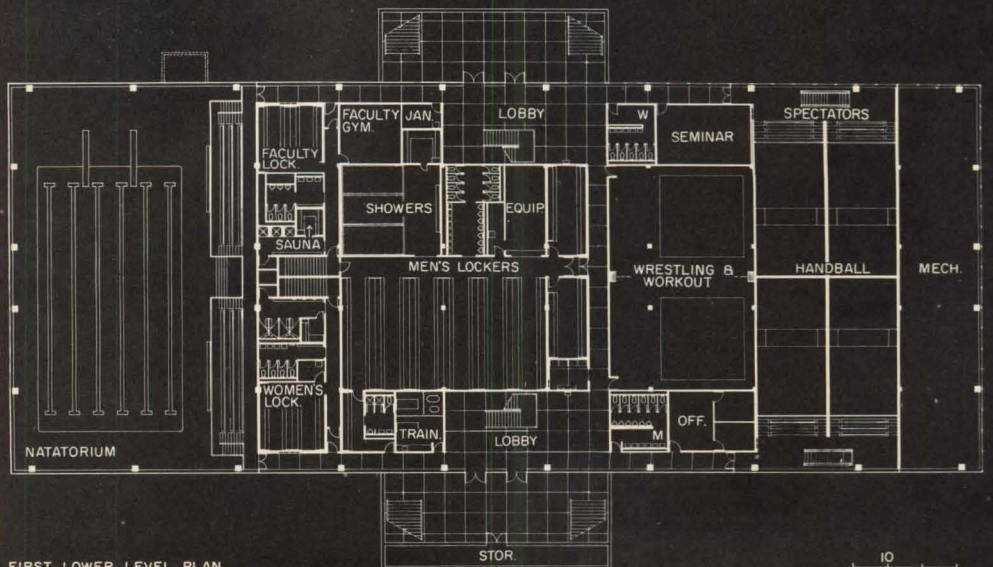


The big upper level of I.I.T.'s new multi-purpose gym uses a clear span (with all vertical mechanical and electrical risers either in, or adjacent to, the outside column jackets) to provide an unobstructed room of 228 by 114 feet. In addition to providing for such sports as basketball and tennis, there is spectator seating for 2,500. The glass walls provide excellent daylighting, and are made impact resistant and provided with some sun control by using a 1/2-inch laminate of gray and clear sheet glass with a frosted plastic interlayer. These panels are set into a standard steel window wall with operable sash to allow natural ventilation.

The lower floors are framed in reinforced concrete construction (flat slab with drop panels), and steel plate girders with a composite concrete slab form a clear span structure over the swimming pool. Lower-level walls are mostly painted concrete block with special epoxy finishes in the pool and shower areas. The pool tank and deck are unglazed ceramic tile.

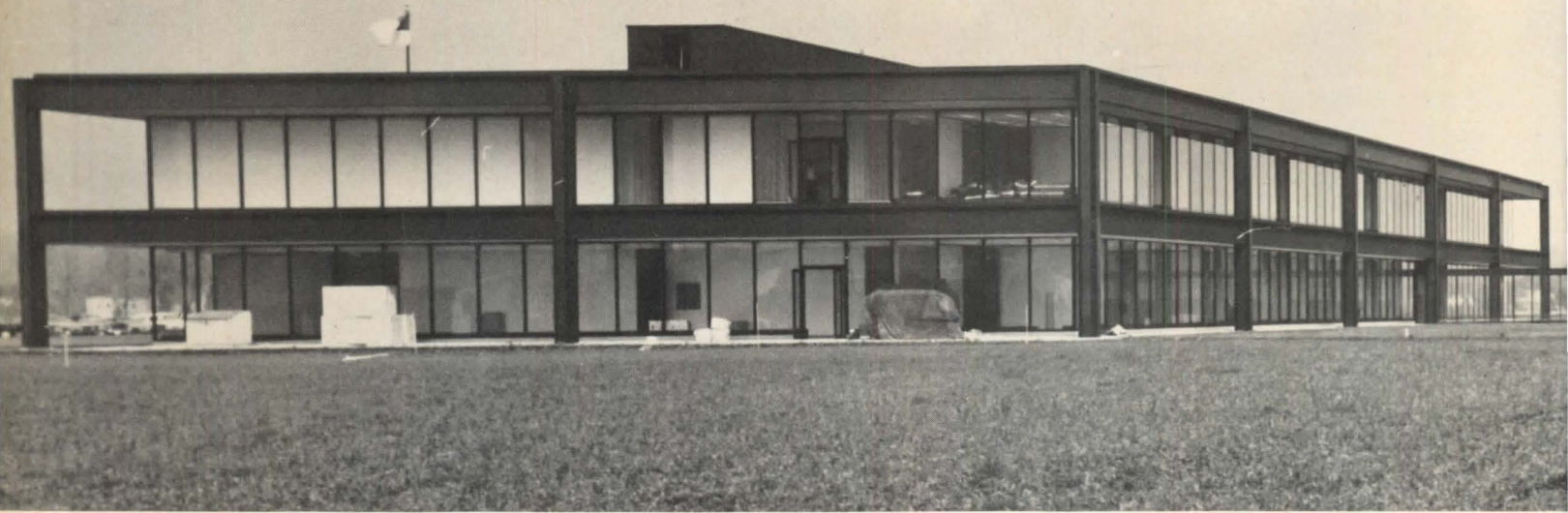


UPPER LEVEL PLAN



FIRST LOWER LEVEL PLAN

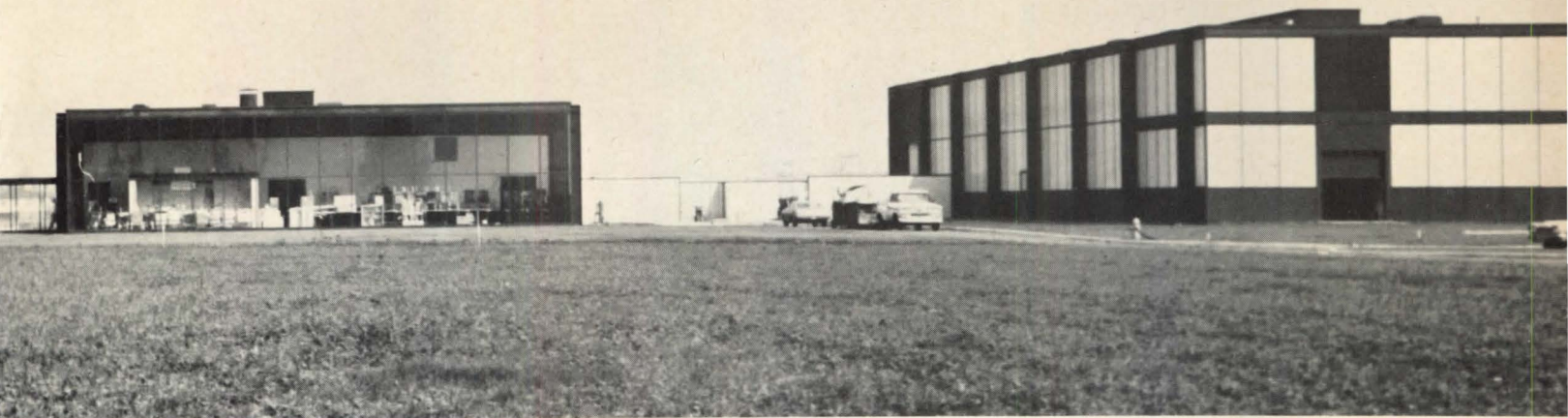




## 2 A FLEXIBLE RESEARCH LABORATORY COMPLEX







© Ezra Stoller (ESTO) photos

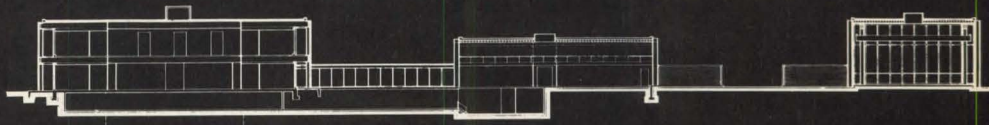
## FOR INLAND STEEL

Three different types of steel research functions are provided for in this pleasant, campus-like complex located on a 46-acre site in East Chicago, Indiana. Paramount in the owners' requirements were long, clear spans for space arrangement flexibility—with movable partitions in laboratory and office areas, and unobstructed work areas in high bay space serviced with overhead traveling cranes. A secondary and obviously appropriate requirement was a complex that would demonstrate, in a logical way, the use of structural steel and steel products.

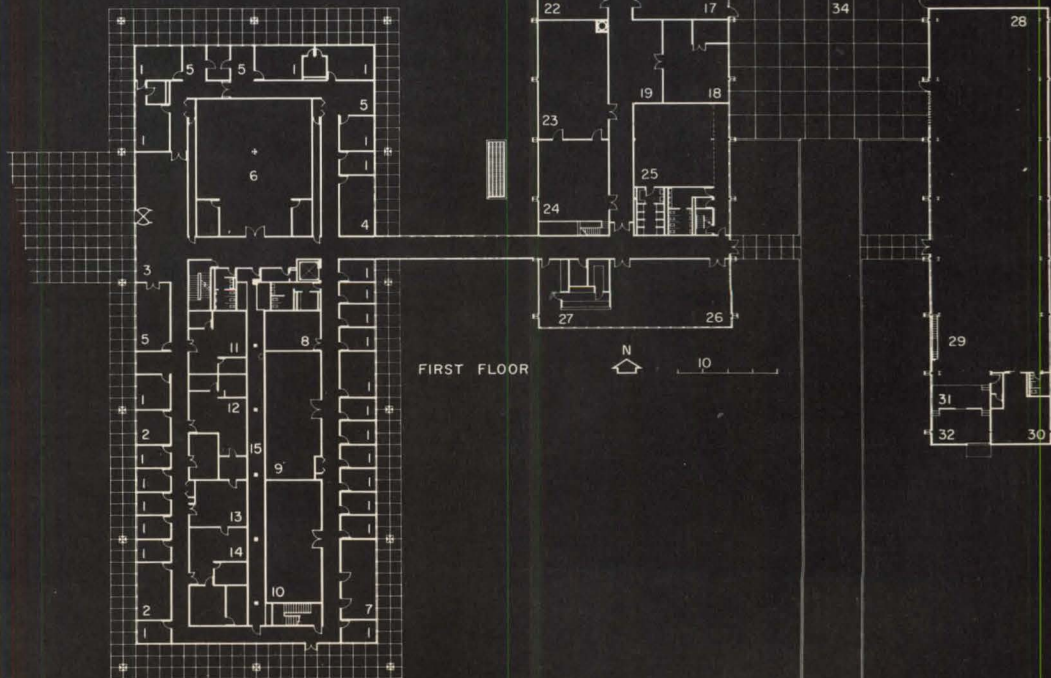
Three units were designed to house the required functions, and were arranged and linked to each other on the site in such a manner that later expansions or additions could easily be made.

Though all the units are designed with exposed steel frames, steel mullions and steel wainscot, each is carried out in a slightly different but compatible manner to best suit its function. Thus the ensemble becomes an elegant showcase for many of the varied refinements possible in steel detailing and in various framing systems.

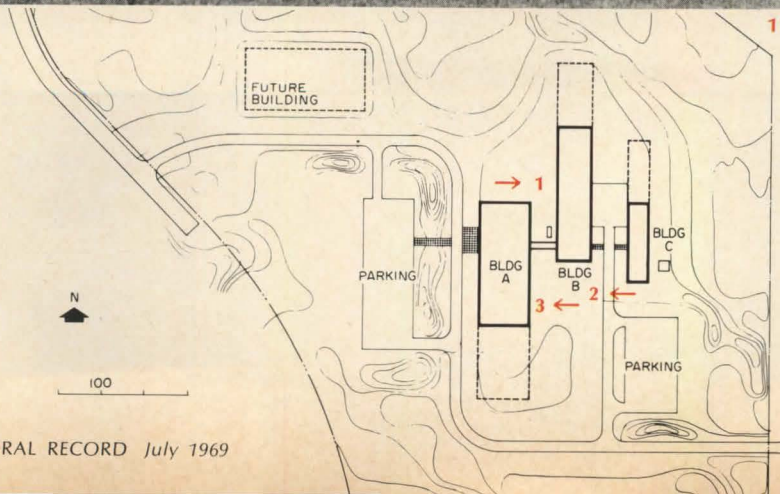
INLAND STEEL RESEARCH LABORATORIES, East Chicago, Indiana. Architects-engineers: *Skidmore, Owings & Merrill (Chicago)*—Myron Goldsmith, partner-in-charge of design; George Jarik, project manager; Frank Weisz, project designer and job captain; Charles Duster, structural engineer; Charles Mok, mechanical engineer; contractors: Power Construction Company (general); McAuliffe (mechanical); New Era (electrical).



- |   |                               |
|---|-------------------------------|
| 1 Office                                | 18 Fatigue testing lab        |
| 2 Misc. laboratory                      | 19 Apparatus assembly         |
| 3 Lobby                                 | 20 X-ray                      |
| 4 Conference room                       | 21 Welding lab                |
| 5 Secretarial space                     | 22 General storage            |
| 6 Library                               | 23 Boiler room                |
| 7 Electrical testing lab                | 24 Mechanical room            |
| 8 Chemical lab                          | 25 Locker room                |
| 9 Mechanical testing lab                | 26 Dining, conference         |
| 10 Clean furnace and heat treatment lab | 27 Food serving               |
| 11 X-ray lab                            | 28 Hot rolling                |
| 12 Metal lab                            | 29 Steel making               |
| 13 Final metal sample preparation       | 30 Corrosion lab              |
| 14 Electron microscope                  | 31 Furnace                    |
| 15 Mechanical corridor                  | 32 Electrical                 |
| 16 Model shop and heat treating         | 33 Flammable material storage |
| 17 Chemical storage and tool crib       | 34 Paved open storage         |

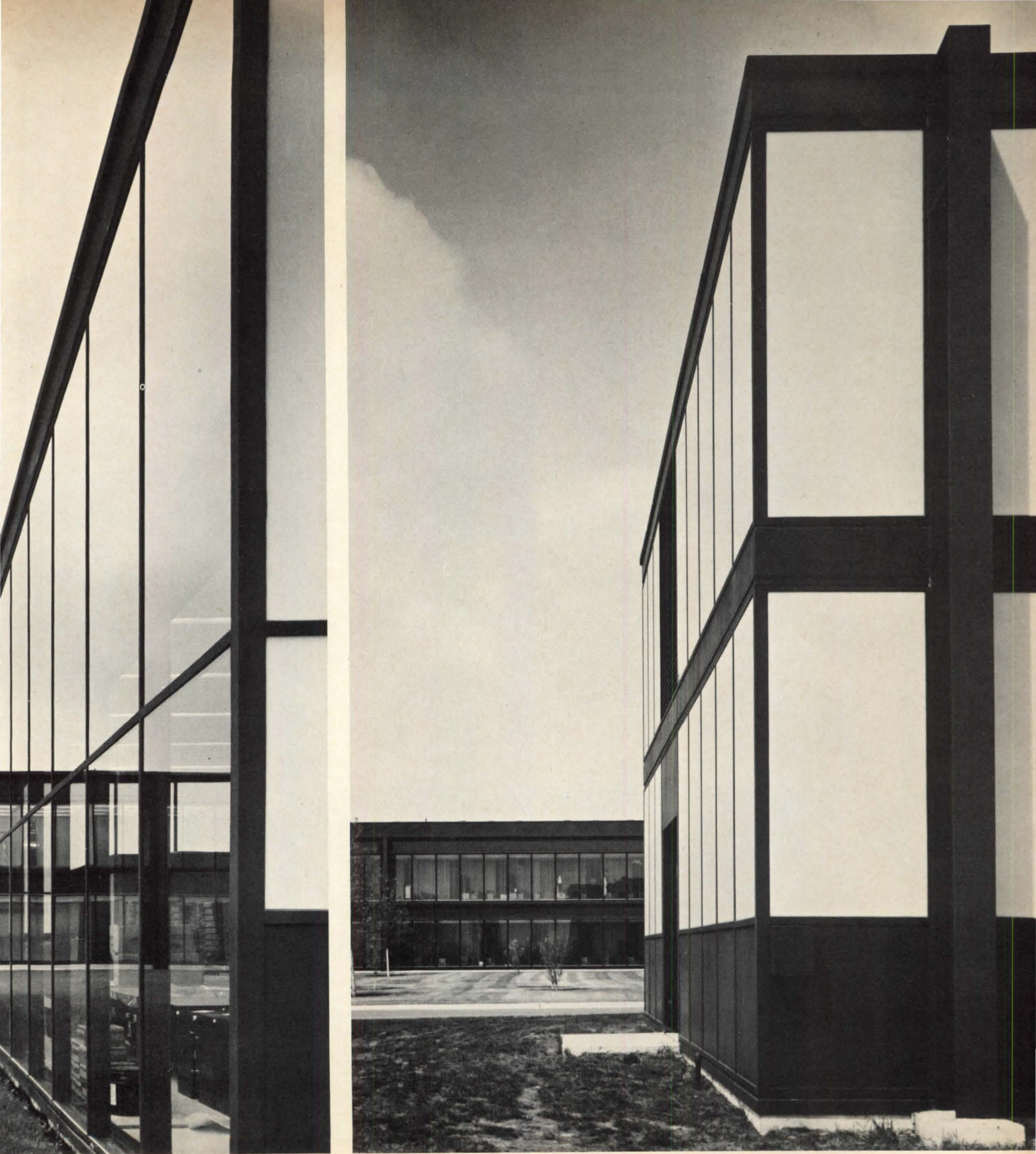






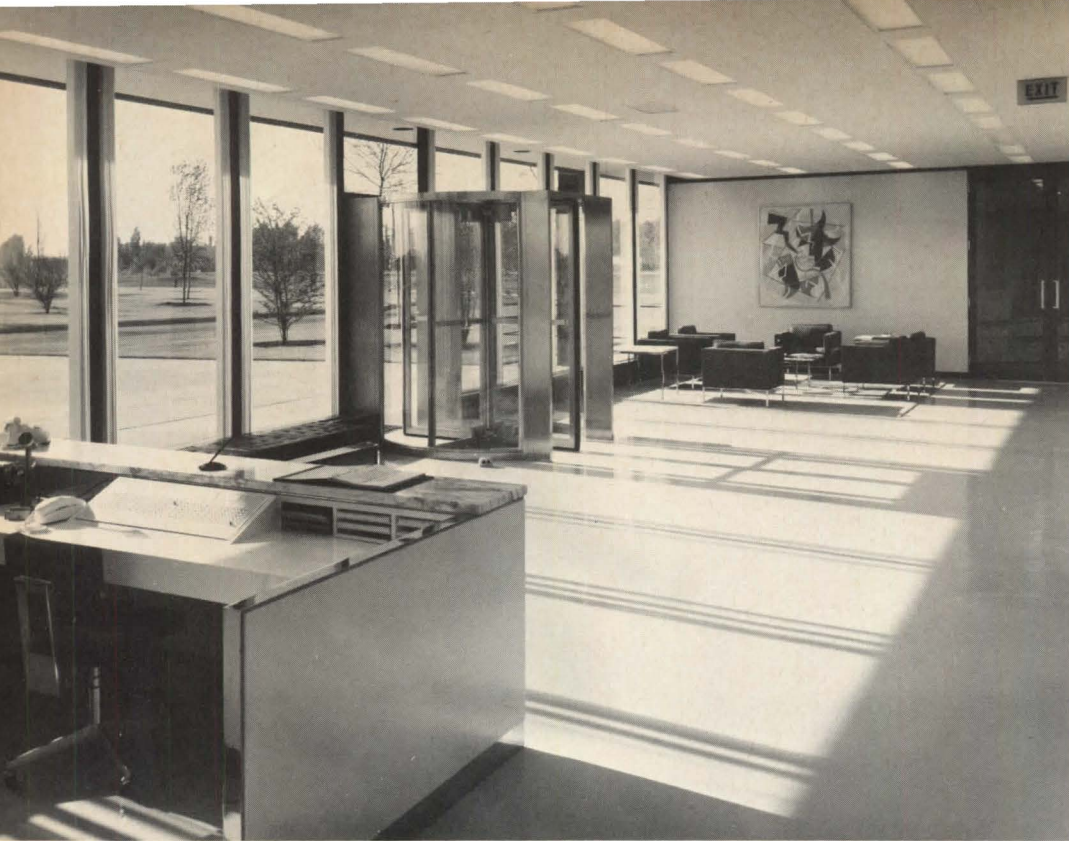
The individuality and the sympathy of design of the three buildings can readily be seen in these detail photos. The two-story laboratory and executive office building (building A) has cruciform columns framing a 55-foot bay and a continuous exterior gallery; the shop building (B) has a single-story high bay and uses an exposed rigid steel frame with a 25- by 80-foot bay; the pilot plant building (C) has a somewhat different rigid frame and 25- by 25-foot bays. Air conditioning, humidity control, heat and exhaust are provided as needed for each special function.



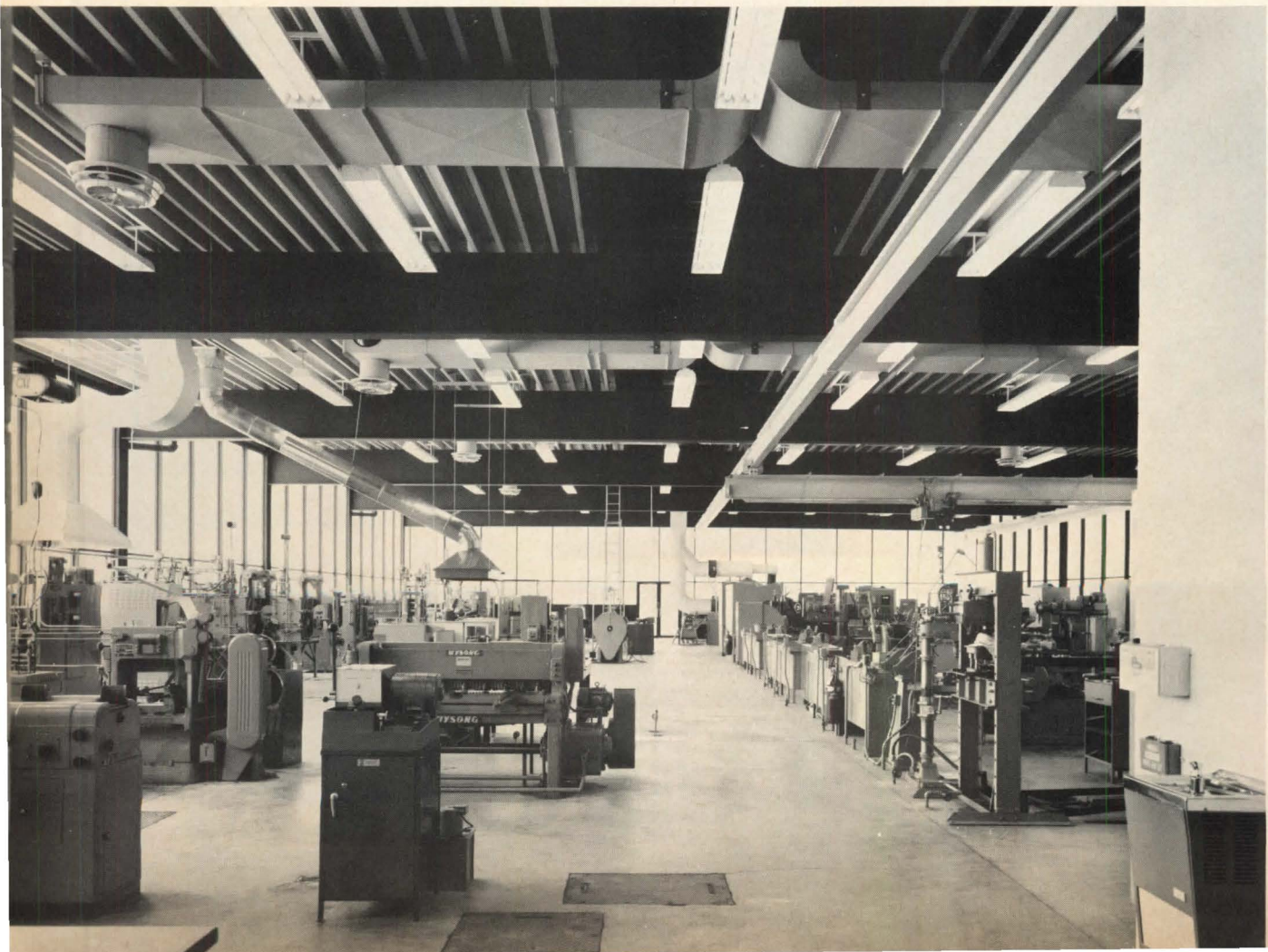


2 3





The interiors of the Inland Steel Research Laboratories also use a considerable amount of steel in movable steel partitions for office and laboratory enclosures, steel pan ceilings for office and corridor areas, and in a lot of the furniture and fittings. Floors are generally vinyl asbestos tile and concrete, and the walls of the mechanical corridor and in the shop and pilot plant are painted concrete.





A  
tent-like  
helix  
spirals up  
to create a

# TEMPLE SANCTUARY



Paul S. Kivett photos

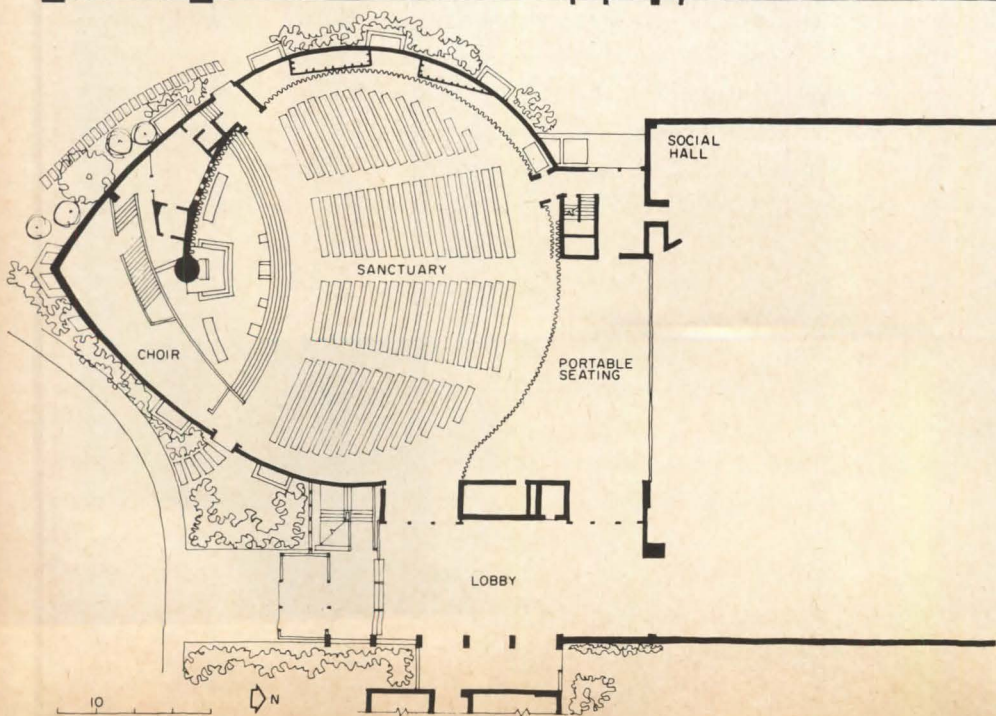
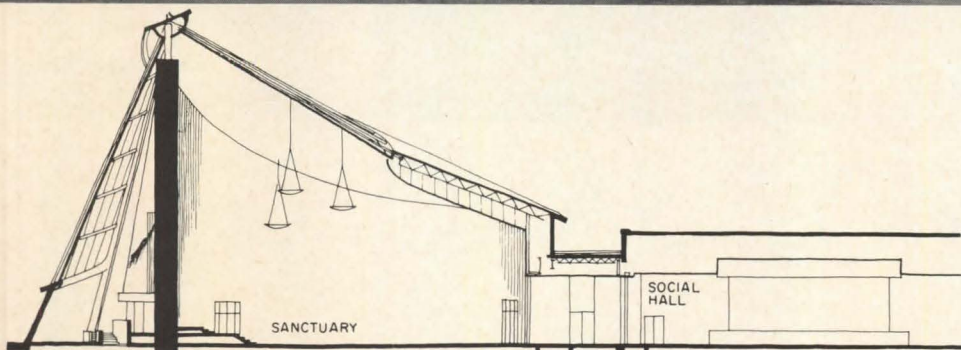
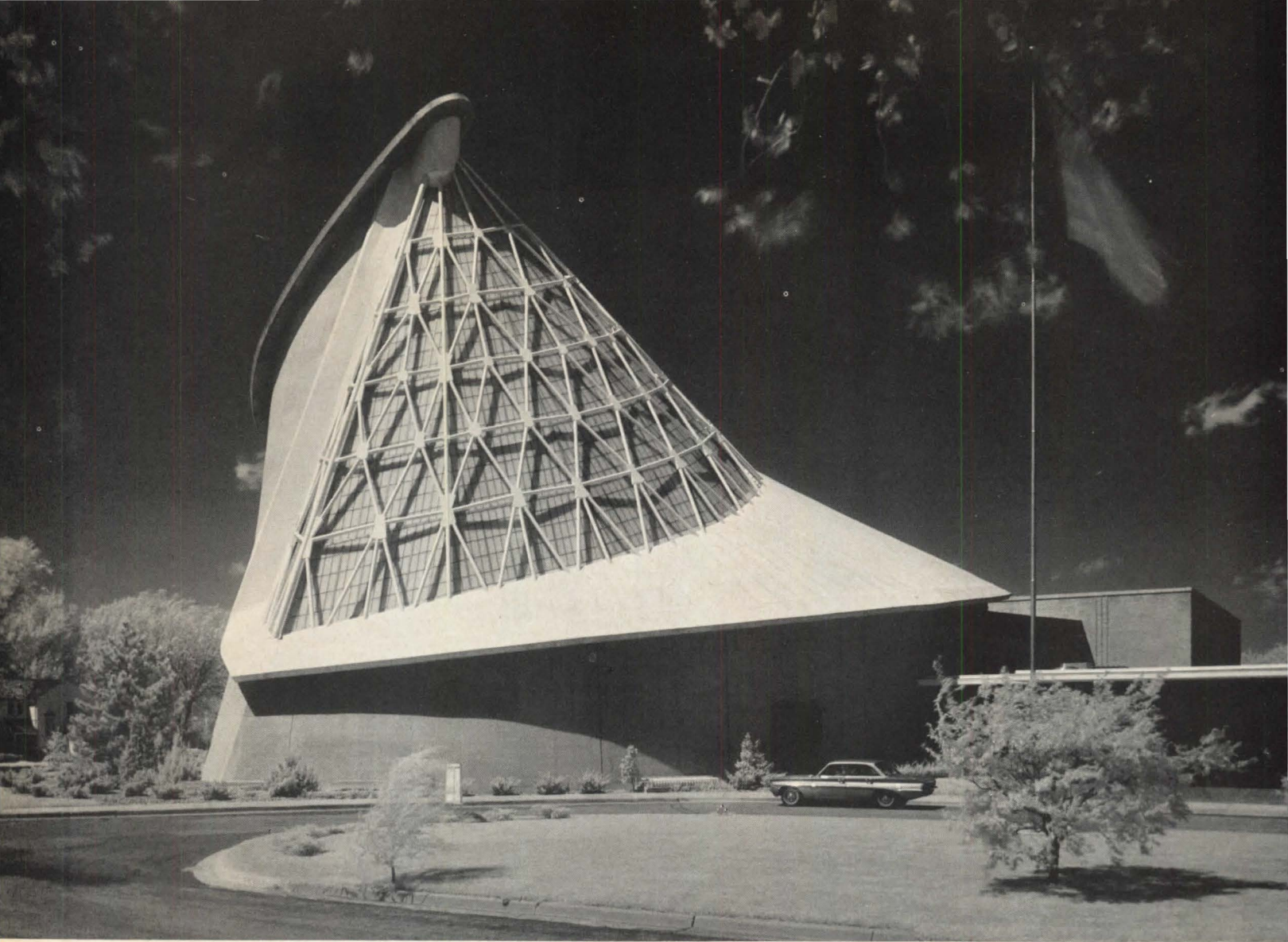


THE NEW SANCTUARY FOR CONGREGATION B'NAI JEHUDAH  
Kansas City, Missouri  
Architects: Kivett and Myers  
engineers: Bob D. Campbell & Company  
(structural), Richard Bradshaw (consultant), W. L. Cassell & Associates (mechanical and electrical), Bolt Beranek and Newman, Inc. (acoustics); contractor: Sharp Brothers Contracting Co.

A remarkably effective religious atmosphere has been created in this Sanctuary addition to the Temple B'nai Jehudah complex in Kansas City. The original buildings, designed by Kivett and Myers about ten years ago, included facilities for a small chapel, religious education classrooms, administrative offices, and a large social hall serving many functions, including banquets, meetings and musical concerts. The new Sanctuary, shown here, was designed in deliberate contrast to the other facilities—a separate space used only for worship and with a character that clearly states this.

The Sanctuary evokes one of the oldest structural forms, the tent, but translated into today's materials and methods. And the interior, punctuated by an 83-foot-tall concrete center pole, provides a big, serenely uncluttered space permeated by soft blue light from the spiraling plastic skylight. Sparkling within this quiet atmosphere are the bronze forms of the Ark, the Menorah, the Eternal Light and lettering for the Ten Commandments—all designed and built by Norman Brunelli, Kansas City artist and sculptor. Both the shape and lighting of the interior keep the eye focused on the altar and its furnishings; the rest of the space is kept very simple. A curtained-off area behind the Sanctuary can be opened to provide a considerable amount of added seating when needed. Fabric panels are continued around to the altar to unify the area visually and to help the acoustics.

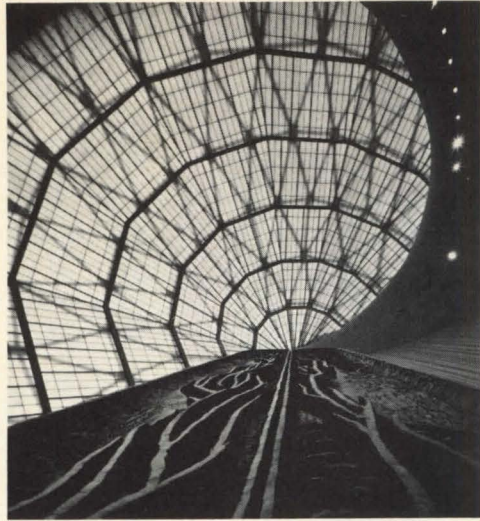




To create the desired visual dominance of the complex, the new Sanctuary differs not only in its strong shape, but in basic materials: the older units are brick, while the exterior supporting walls of the new structure are bushhammered concrete. Interiors are finished in plaster, exposed concrete and drapery. The building contains about 33,000 square feet, and cost approximately \$944,000. The curtained-off expansion area can be noted in plan and the photos below and lower right.





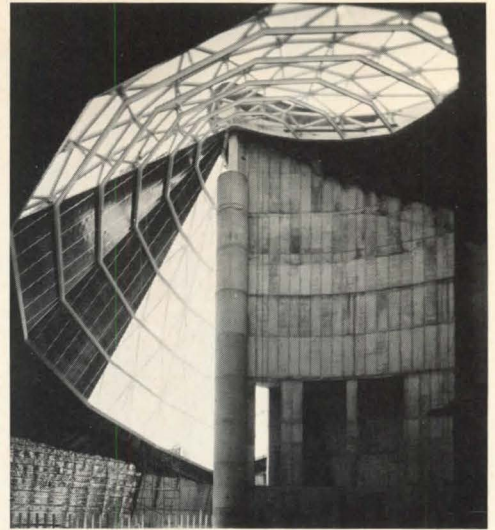


To avoid any possible glare from the attention-holding skylight, the plastic panels are of a translucent, deep-colored blue which transmits a minimum soft-hued light (see color photo, page 119). They are hung below the steel frame. The structural system provides an uninterrupted open space for a congregation of 1000. In spite of its drama, the basic success of the space is its straightforward simplicity in the use of materials and finishes, leaving the religious symbols to stand in high relief.

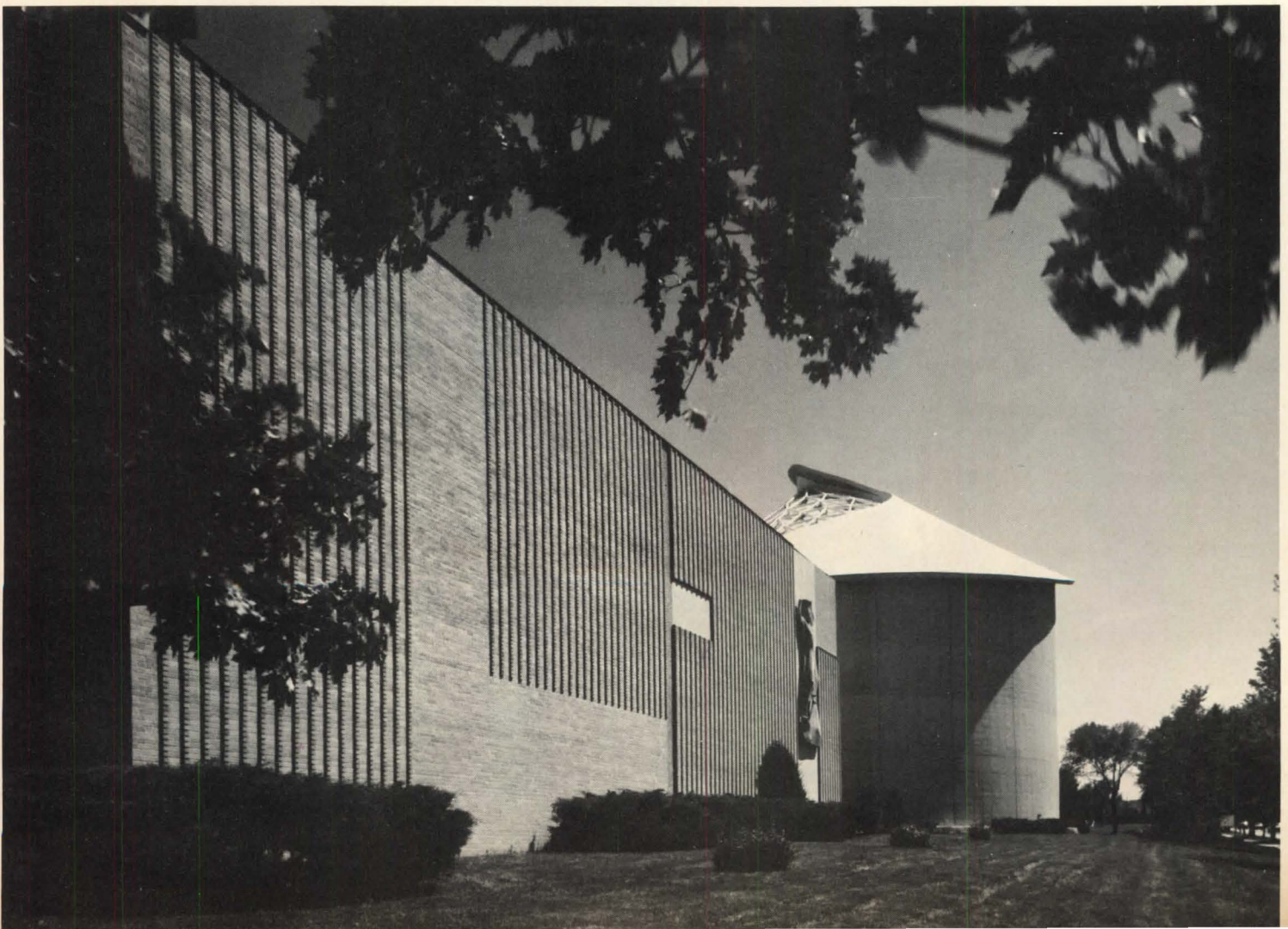




TEMPLE B'NAI JEHUDAH



*The major portion of the roof area is supported by 5-inch tubular cables hung from the concrete mast. The roof structure itself is of two parts. A rigid conical helix of about 6- to 8-foot maximum depth is formed of straight joists; space within contains air ducts and electrical and mechanical systems. The outer conical shape is formed of 5-inch tubular steel. Nine post-tensioned, tie-down cables stabilize eccentric loads, and are anchored 30 to 45 feet deep into bedrock ledges.*

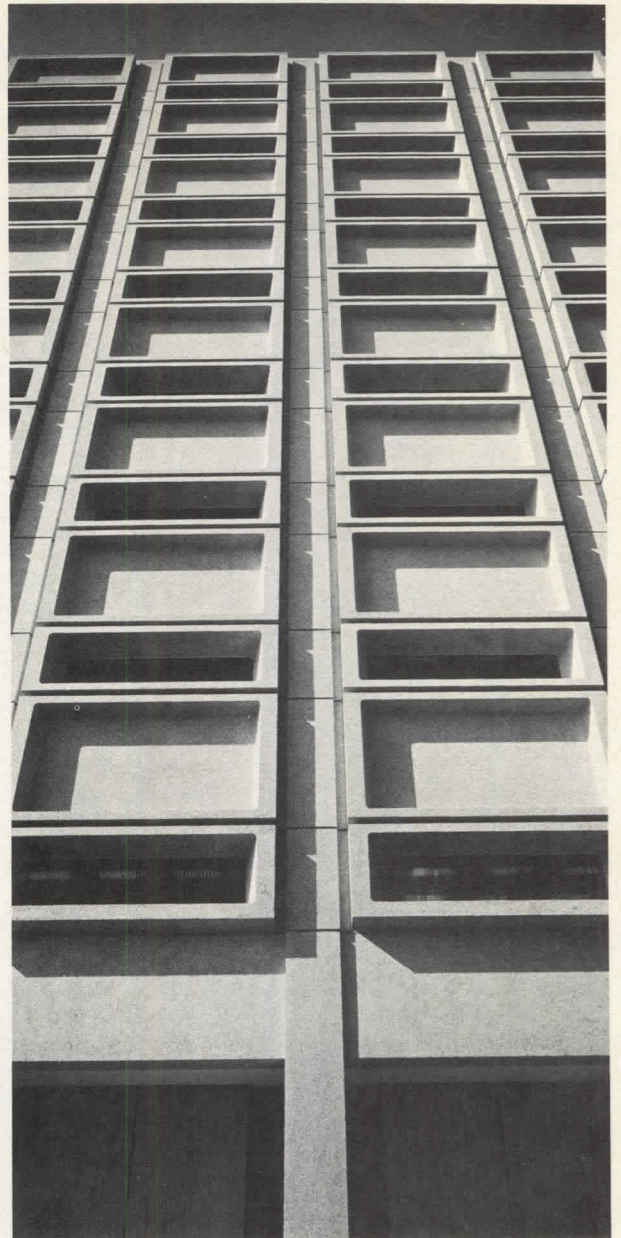
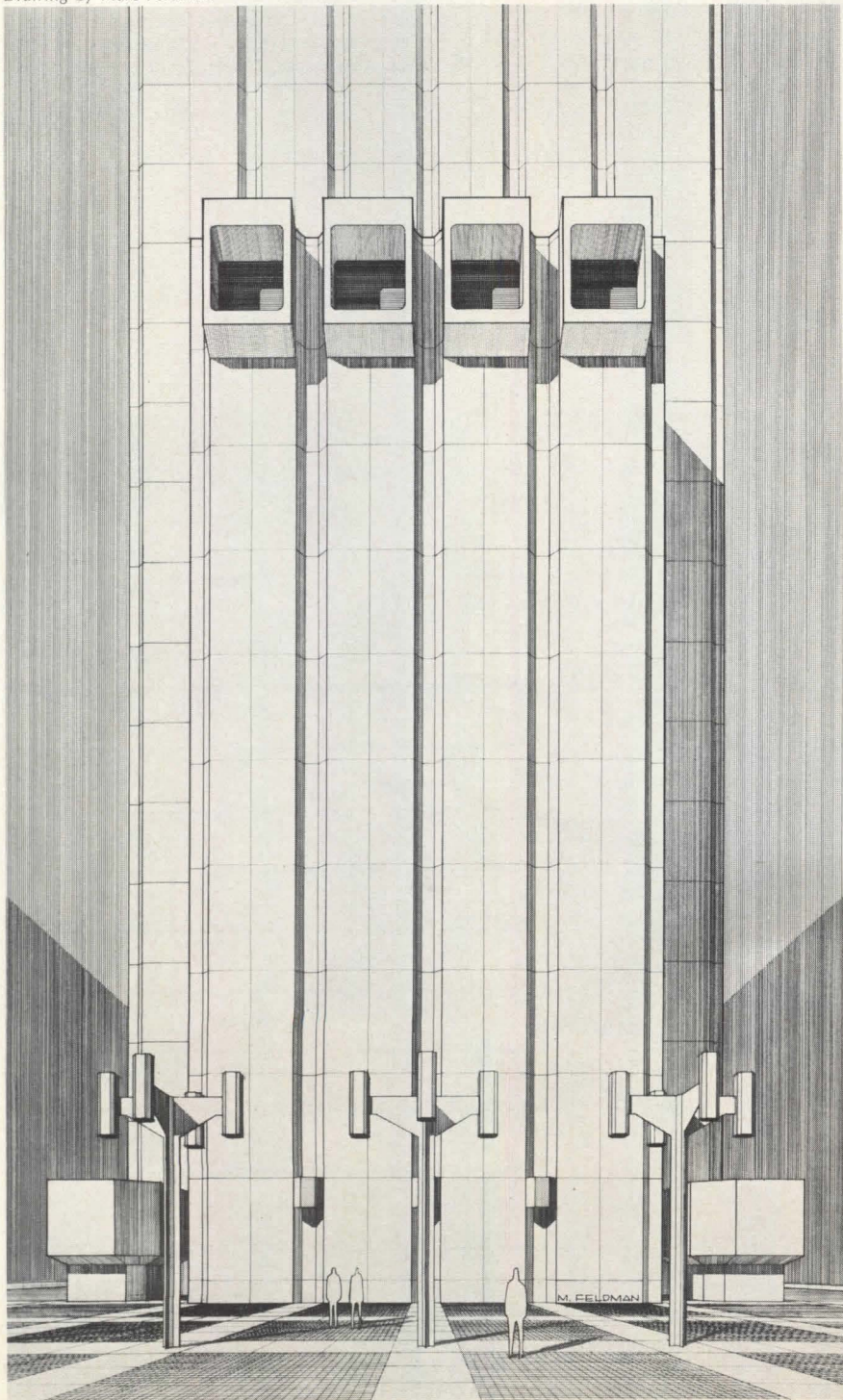




# Designed for machines but mindful of people

Equipment and machines, not people, will fill these two long lines telephone buildings, one in Oakland, California (right), the other in New York City (below). One is windowless, the other nearly so. How to relate such buildings, essentially for non-human use, to human-scaled streets and—more difficult—the people on the streets, is a design problem of increasing frequency as mechanization and automation take over major roles in business and industry. Designed with imagination and skill, and some new thought on handling the massing of tall buildings, these two buildings by John Carl Warnecke and Associates suggest a laudable concern by business for the visual impact of its buildings on the city scene.

*Drawing by Marc Feldman*



*Morley Baer*

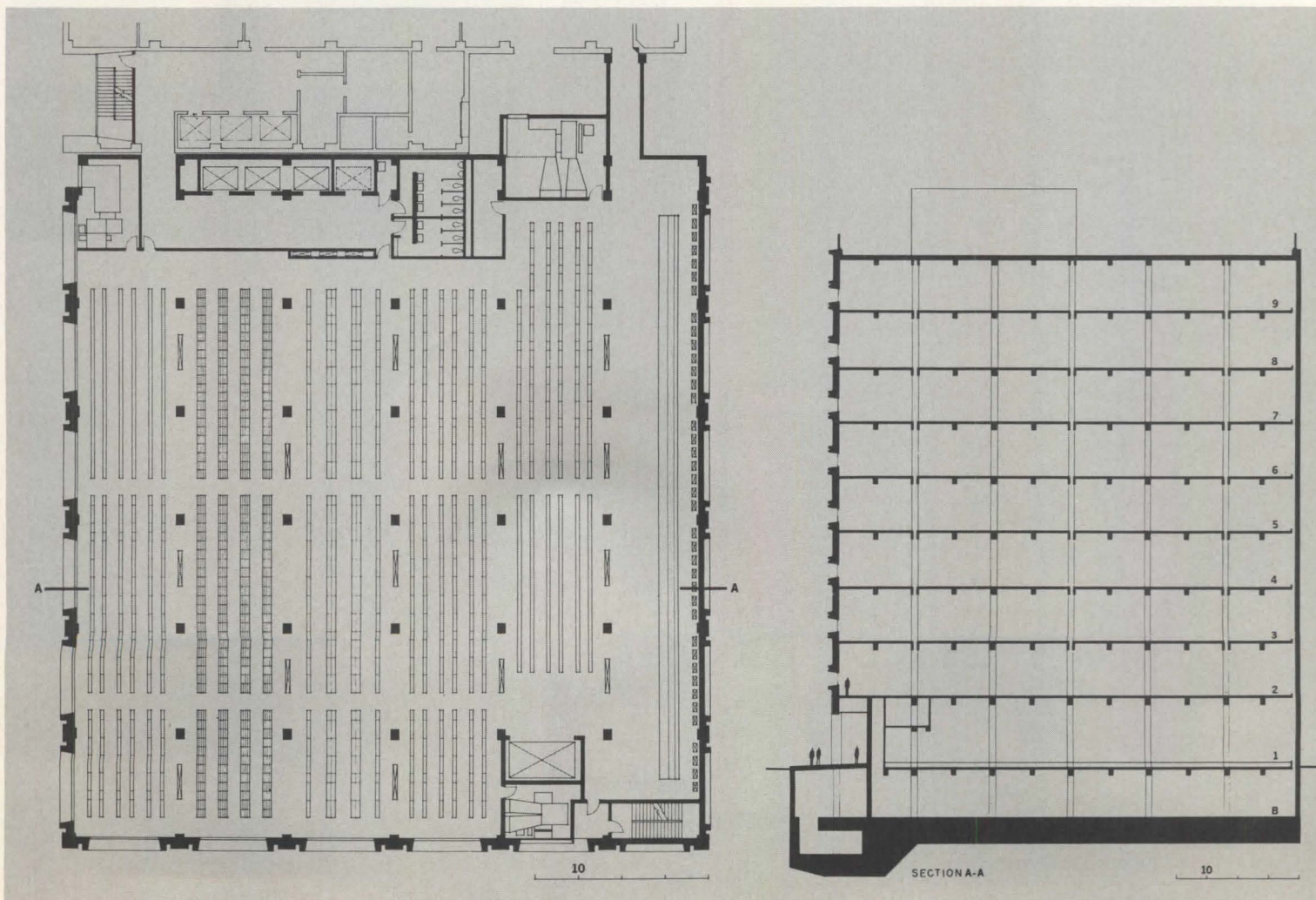


## In Oakland: simple mass, elegant precision

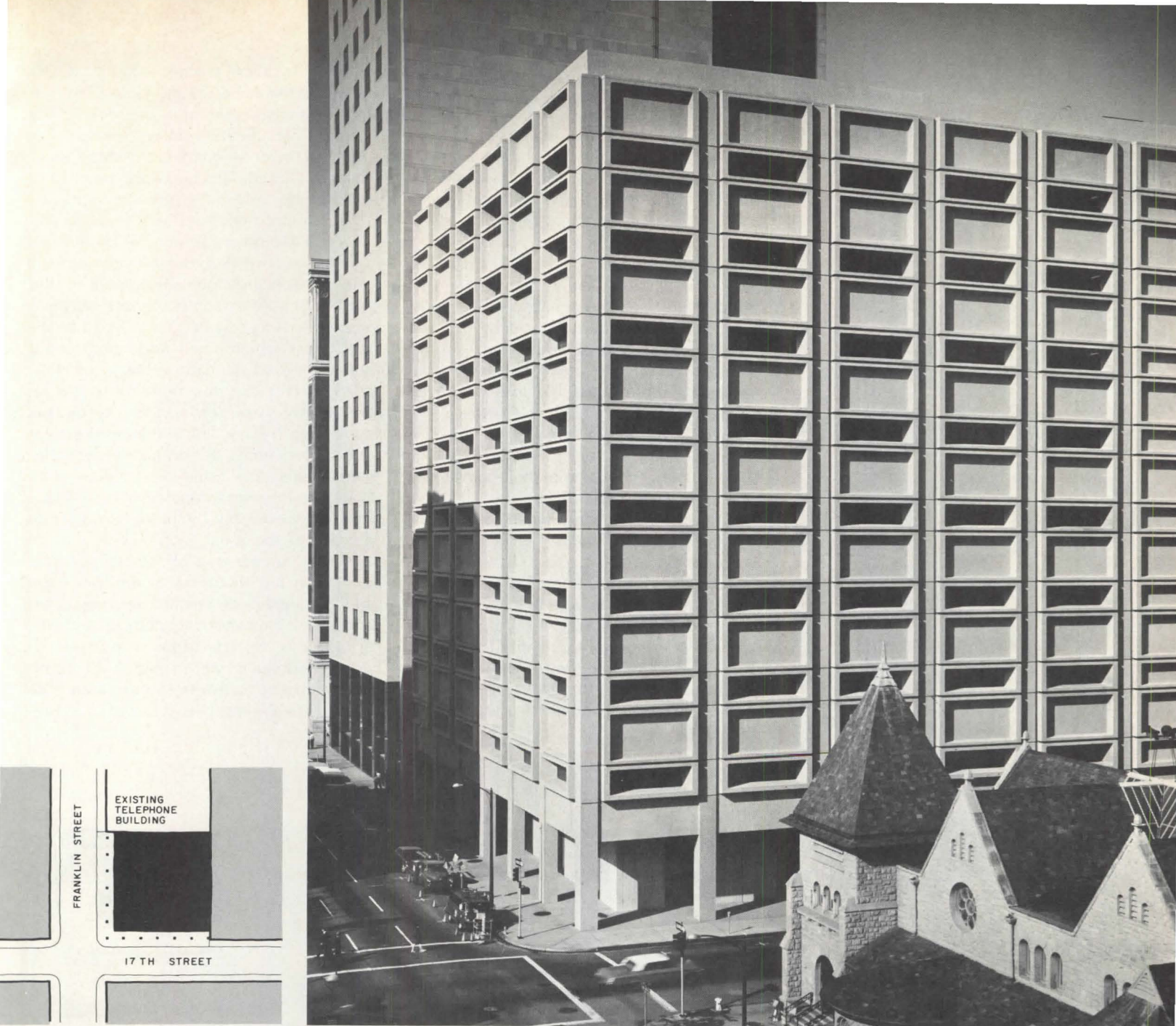
The new telephone equipment building in Oakland, California, is a large building but not so large as it will be when a six-story vertical expansion brings the structure to its ultimate size. Needless to say, as it stands now, on a corner in the downtown business district, its nine stories are impressive, and in their architectural presence add elegance and dignity to the otherwise undistinguished neighborhood. The building's architectural expression, uncompromisingly massive and strong, reflects its functions: to house switch-frames, telephone cables and auxiliary equipment, with a small amount of office space on the first floor for what is, in effect, a computer center. This floor relates closely to the street and to passersby through its arcade. The upper floors, however, where very few people are required for maintenance and operation, are only sparsely fenestrated, but the exterior walls (except in the rear) do have windows.

The massive exterior shell sets its protective role and suggests the loads the building has to support. Typical floor loads are 200 pounds per square foot; on the 10th floor, where batteries and other heavy equipment are located, live loads of 800 pounds per square foot are produced. Floor areas are open, in general, to take various kinds of equipment. Cables to equipment run vertically along exterior walls, branching out horizontally at ceilings. The exterior of the building is concrete with exposed aggregate in a warm color sympathetic to the color of the earlier adjacent telephone building to which the new building connects.

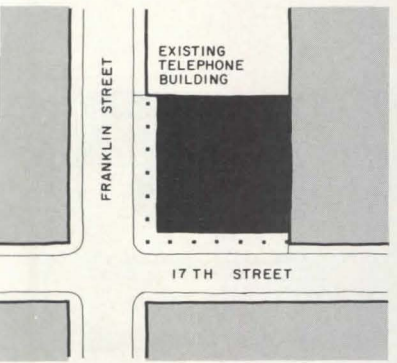
EQUIPMENT BUILDING ADDITION, 1587 Franklin Street, Oakland, California. Owner: Pacific Telephone & Telegraph Company. Architects: John Carl Warnecke and Associates—John Carl Warnecke, director of design; Marc Feldman, senior designer; Emery T. Hirschman, project manager; structural engineers: H. J. Degenkolb & Associates; mechanical engineer: H. S. Haley; electrical engineer: Lyle E. Patton; contractor: Huber, Hunt & Nichols, Inc.



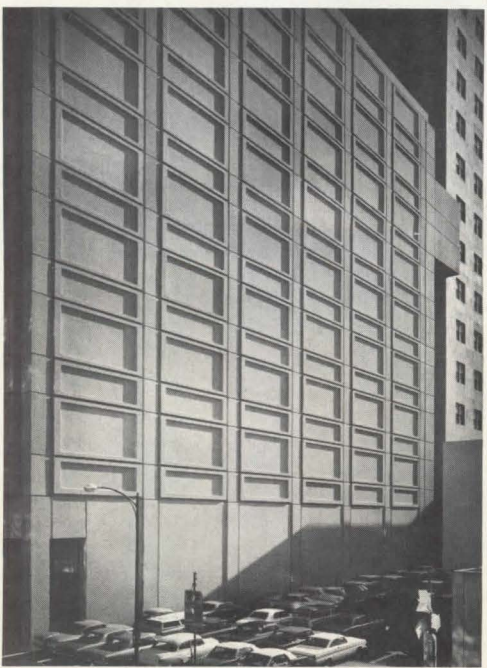




Morley Baer photos



Exterior walls of precast concrete panels with exposed concrete backed by poured concrete (for which the panels serve as forms) act as shear walls and take part of the seismic stresses. The architecture of these stresses is taken by the steel moment frame of the building; its columns are spaced 25 feet on center. The size and massiveness of the panels are clear in the picture at far left, taken during hoisting. The rear wall of the building has no windows, but the rest of the building is designed with precise detailing, using the same precast panel as on other walls.





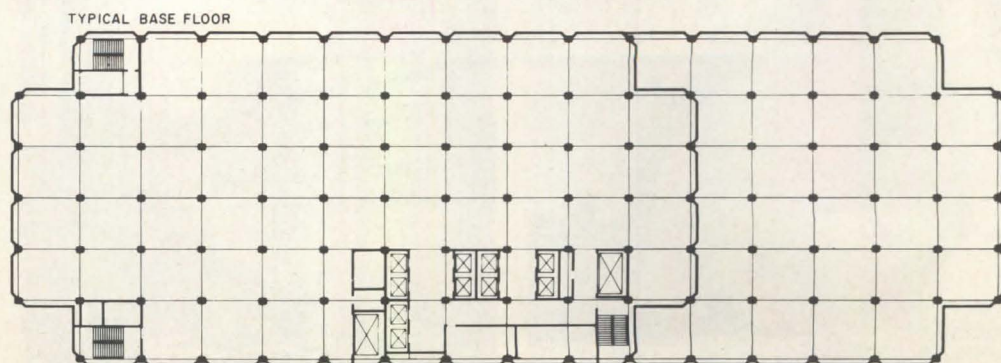
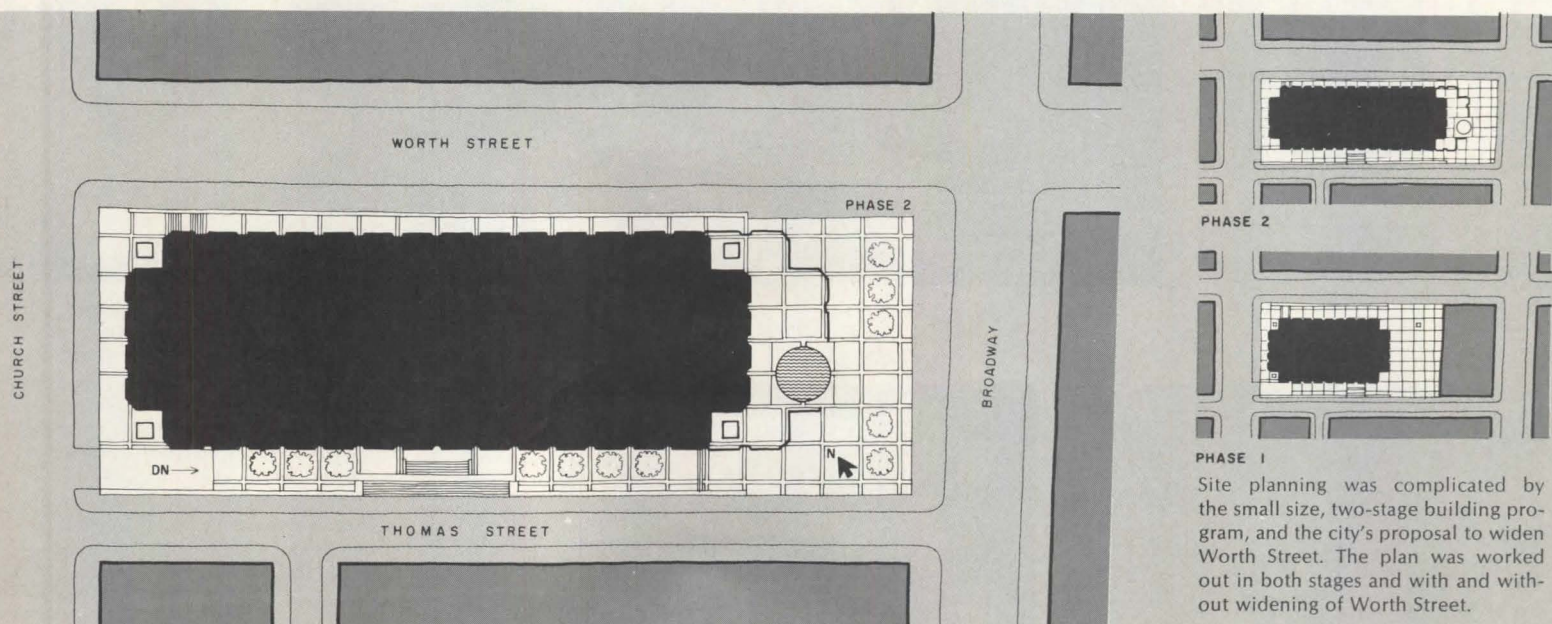
## In New York: a 20th-century fortress

Windowless and inhabited largely by the machines and equipment it was designed to house, this telephone building, now under construction in lower Manhattan, is nevertheless a building with a definite concern for its impact on people and on the city itself. "A twentieth-century fortress," its project design director, James T. Ream calls it, because it meets the major program requirement that it be radiation fallout resistant (hence no windows) and have a two-week capability of self-sufficiency. Protection for the communication system its equipment makes possible does indeed give the building the function of a fortress.

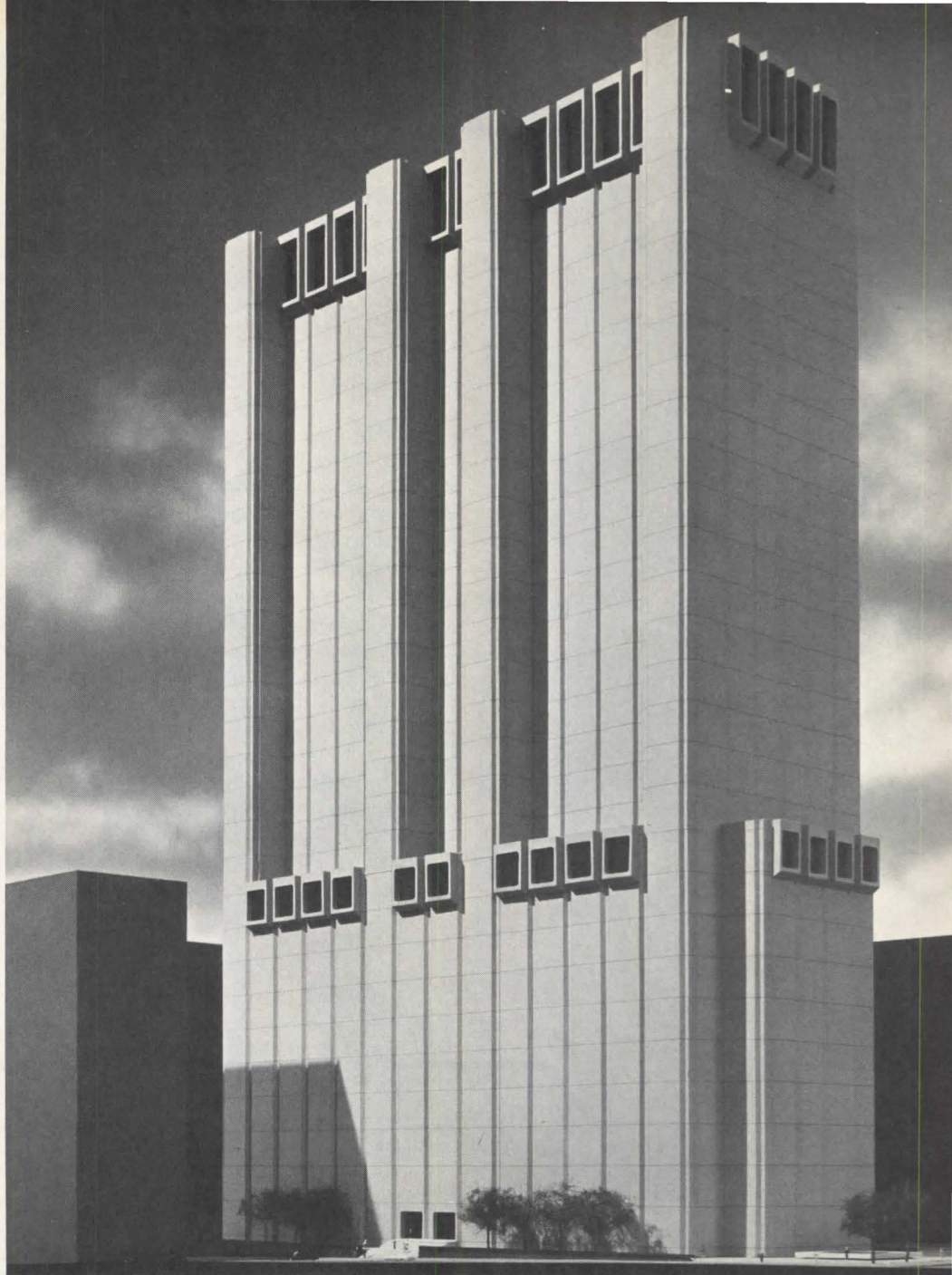
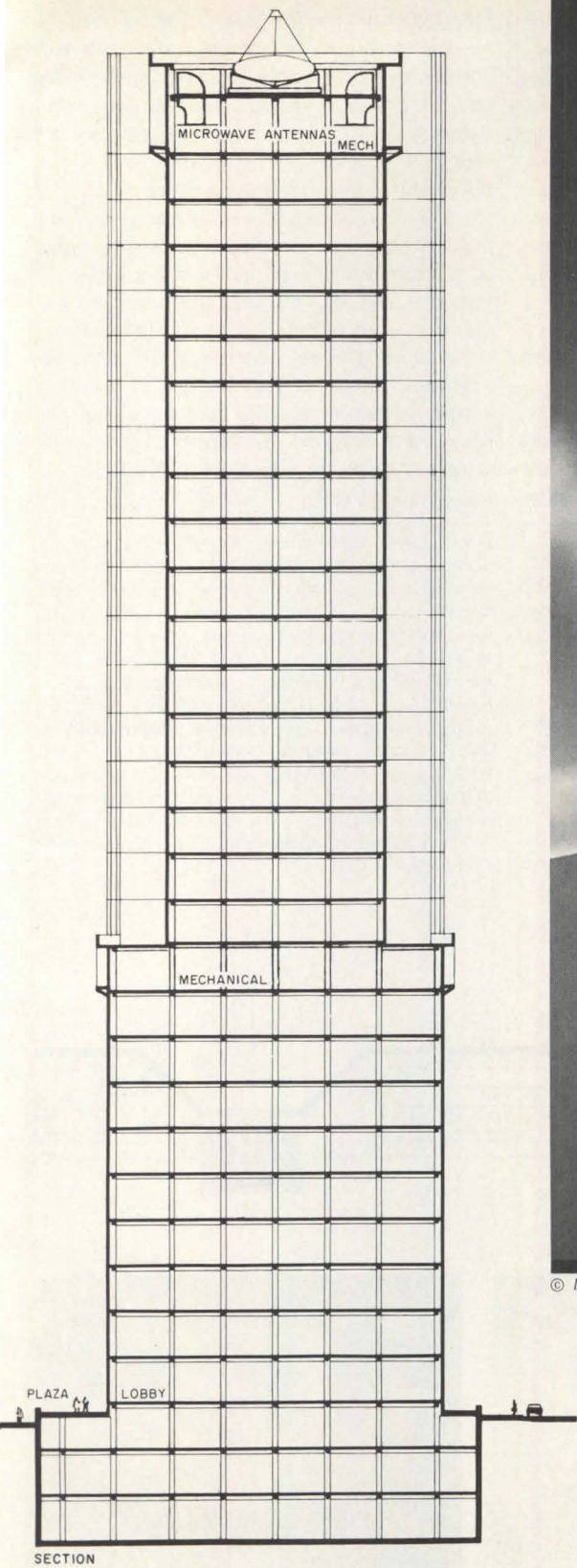
The site for this massive building—although it has 29 floors, its 450-foot height makes it the equivalent of the usual 45-story building—is one block 390 by 180 feet in size, small for the requirements of the telephone company. Complicating the use of the site even further was a city proposal to widen Worth Street, bounding the site on one side. Since no decision had been made when the design was under way, this possibility (which became a reality before construction started) had to be considered. The site was, however, suitable in other ways to the company's needs, since it was the best

available location within a radius determined by the A.T.&T. Long Lines Center in mid-Manhattan, and also because it was strategic for meeting heavy service demands in lower Manhattan. Ingenious planning and careful detective work in the city's zoning codes solved the problem of providing maximum floor area—for greatest efficiency in equipment layout—at every level.

The exterior design—the building's architectural expression—developed in the process of solving some of these practical problems: code research turned up a provision under which small floor areas could project beyond standard setbacks, and this, plus the fact that the building would be built in two stages and had to look equally good at each stage, led to the development of bays containing the primary vertical elements (elevators, stairways, ducts etc.). Code requirements dictated a base and a tower, however; but the design team would not accept the usual ziggurat solution. To avoid the appearance of the setback bays resting on the shoulders of the lower bay and the illogic of upward moving forms ending at a line whose actuality existed only in the code, two decisions of primary design importance were made: all forms should appear to rise from the ground (instead of beginning part way up), and pre-

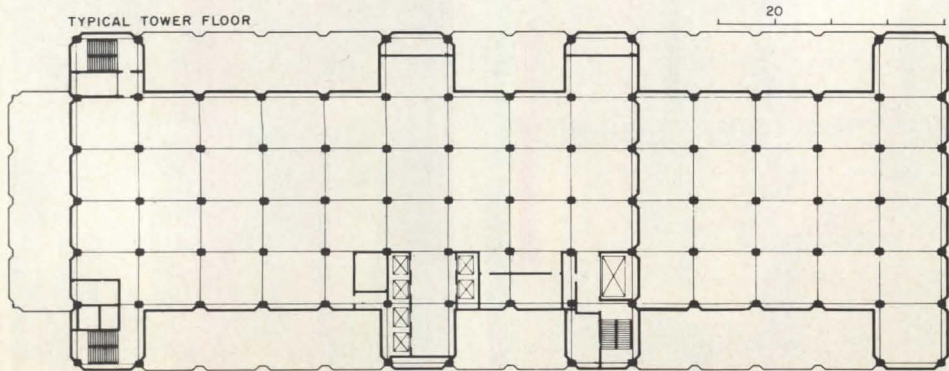






© Louis Checkman

Dimensions of the building are impressive: its 29 floors (above grade; there are three basements) are taller than average, adding up to a visible height of 450 feet. The precast hoods at the tenth floor, shielding mechanical equipment, are full story height (17 feet 6 inches). The hoods at the top of the building are 3-5 feet high, almost twice those at the tenth floor because they shield both a mechanical floor and the microwave and satellite communication equipment on the roof. When both phases of construction are completed, the building will contain 796,000 square feet of "productive" floor area, which will be used by 1925 maintenance and operating personnel—an exceptional occupancy in an office building in densely populated lower Manhattan.





maturely cut off forms (i.e. the building base) would end for a logical and functional reason. Thus the base ends at the mechanical floor where great hoods shield openings for air intake, and the building itself ends with a similar "gallery" of hoods which shield not only another floor of mechanical equipment but great microwave horns which beam messages to relay stations 30 miles away and to satellites hanging high above the city.

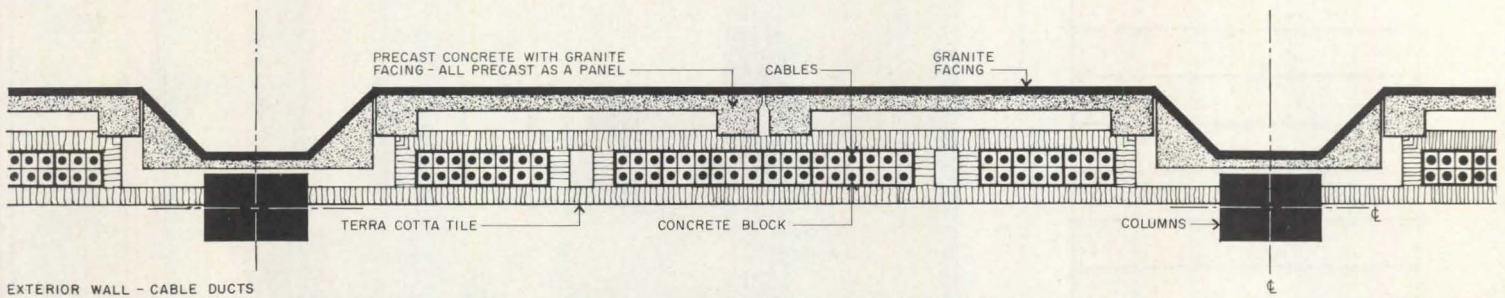
The bays which appear as clear projections from the tower start at ground level and modulate the long sides of the building. On the ends they are expressed in deeply incised indentations which repeat and are important and handsome—but thoroughly practical—detail: vertical slots for cables from under the street which had to rise vertically on the perimeter of the building (see detail below). This 45-degree indentation sets the design vocabulary for the building—the articulated bay and the cable slot—and gives three dimensional quality to the windowless walls.

The two-phase construction program led to intensive studies of the best way to solve the problem of expansion and it was decided that horizontal expansion, not vertical, would make possible a finished building at each stage. The selected rhythm of

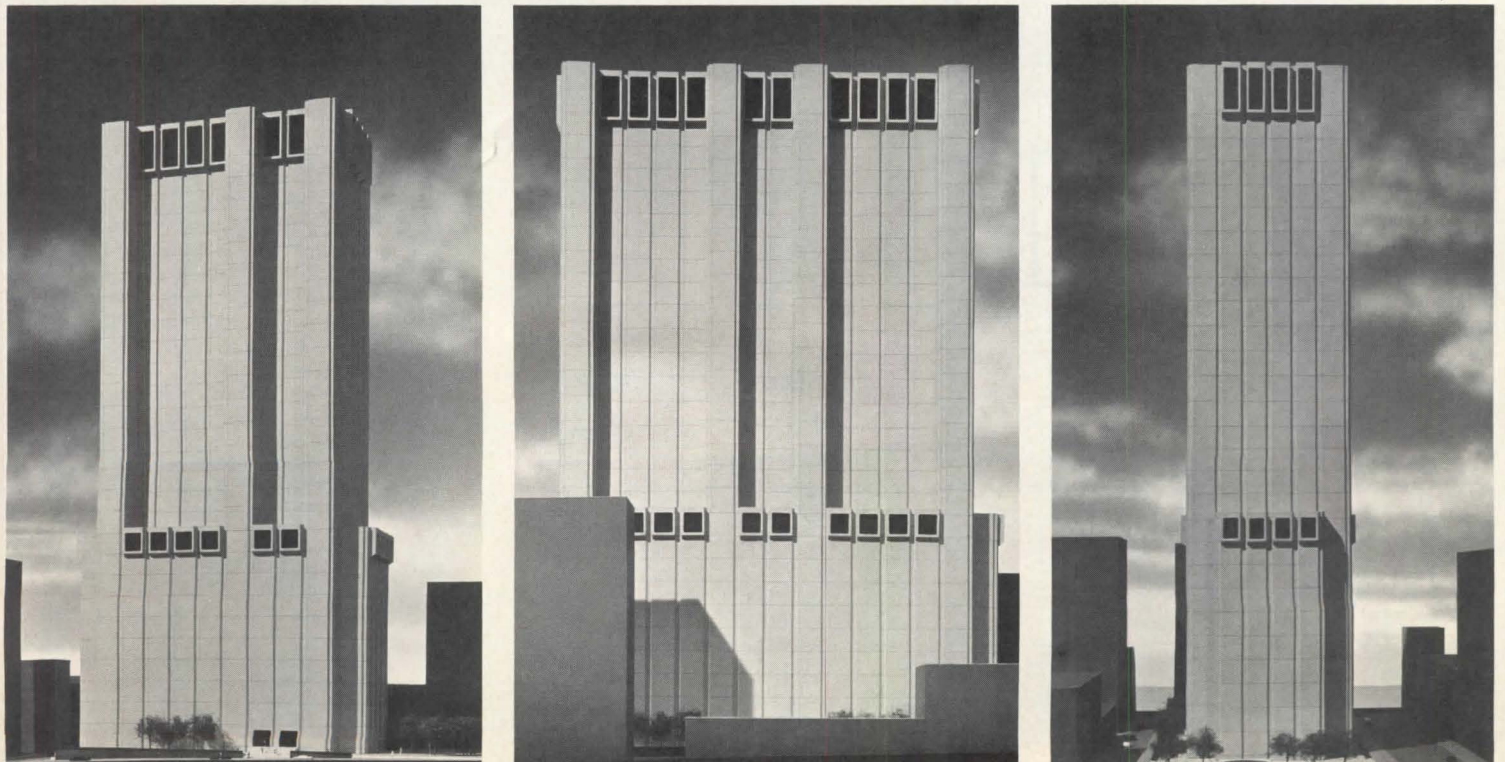
four-two-four for the final building permits an asymmetrical design solution, with the appearance of a completed building at the end of phase 1, which satisfies the company's current needs. Addition of another four-bay segment in five years will complete both building and rhythm.

The exterior of the steel frame is to be precast concrete panels faced with granite of a warm brown color. To determine criteria for use of this infrequently-used integral granite panel, a research team of architects, engineers, construction consultants and the client was set up. In order to assure the uniform color and texture of the building's exterior, the company has obtained enough granite for the entire building (Phases 1 & 2).

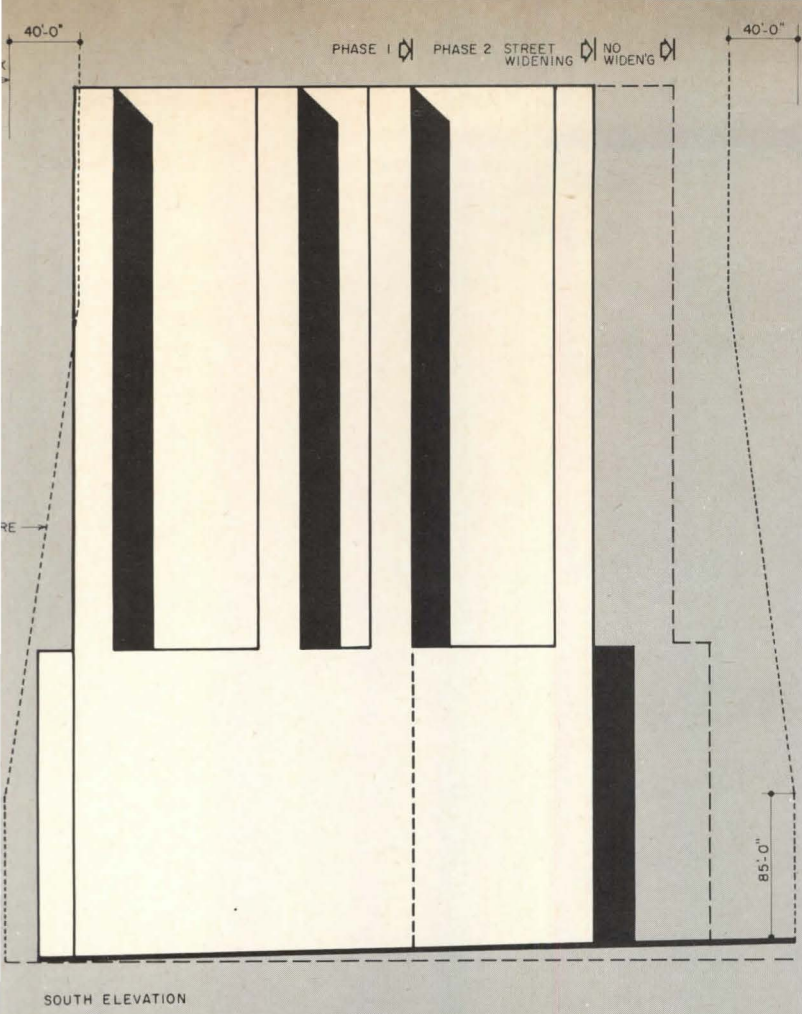
LONG LINES EQUIPMENT BUILDING, 323 Broadway, New York, New York. Owner: New York Telephone Company—John J. Collins, Donald T. Lyon, Thomas G. Boland, owner's representatives. Architects: John Carl Warnecke and Associates—John Carl Warnecke, director of design; A. Eugene Kohn, partner-in-charge; James T. Ream, project design director; Emery T. Hirschman and Lee Hamptian, project managers; Marc Feldman, senior designer; Eric Lundquist, Matthias Heller, designers; structural engineers: Weiskopf & Pickworth; mechanical and electrical engineers: Meyer, Strong & Jones; foundation engineers: Mueser, Rutledge, Wentworth & Johnston; contractor: Turner Construction Company.



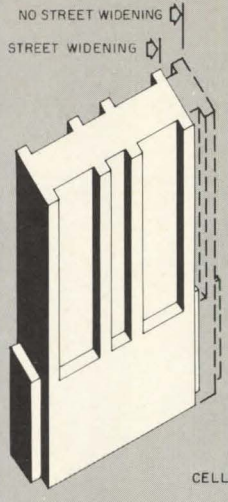
© Louis Checkman photos



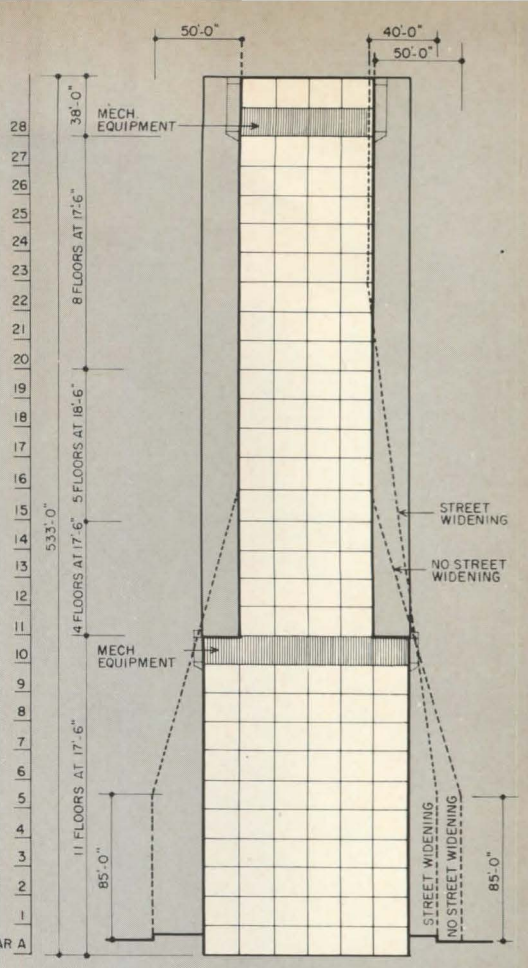




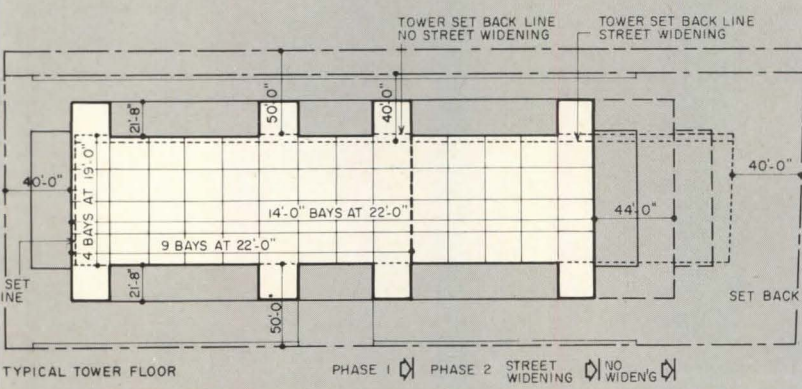
SOUTH ELEVATION



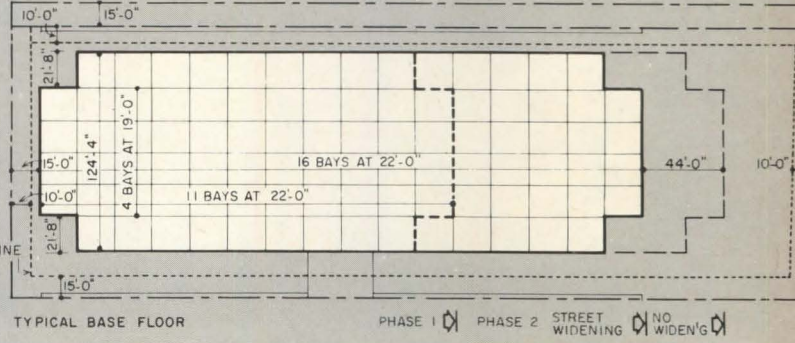
PHASE 2



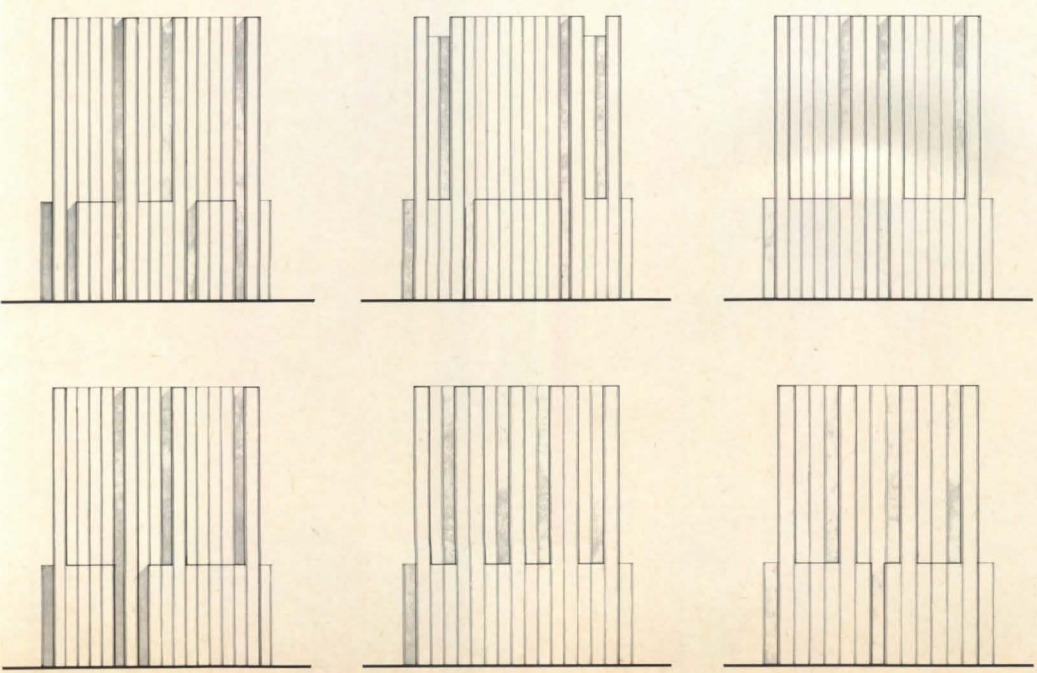
SECTION



TYPICAL TOWER FLOOR

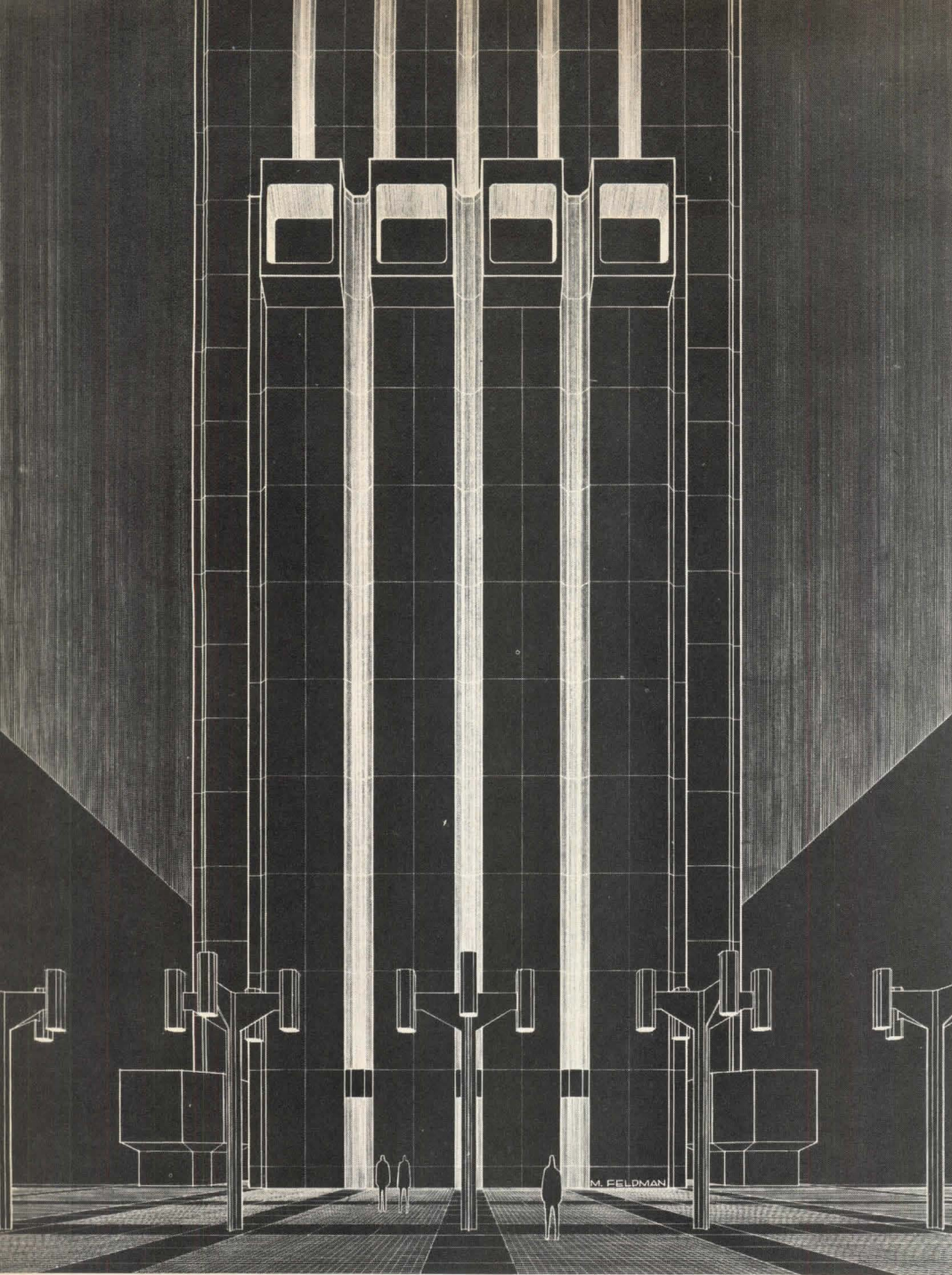


TYPICAL BASE FLOOR

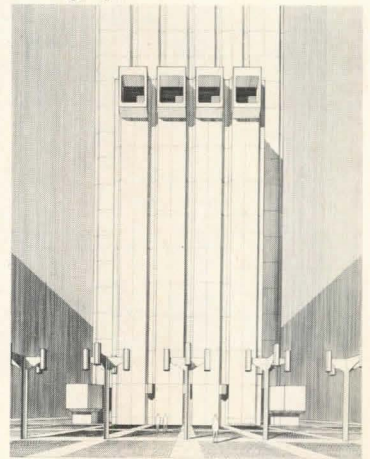


Handling of the building mass was a critical design problem on the small site, and many studies of existing tall buildings in New York City were made to determine how to avoid the "zigurat" look so often the result of zoning restrictions. Also studied were the effect of the proposed street widening on the mass of the building and its sky exposure plane (top row left and right, above), criteria for the building envelope (center), and the floor area and site coverage for each phase of construction (bottom), with and without street widening. Over 60 studies were made on spacing of projecting bays (left) before the four-two-four spacing was selected (four-two in initial stage with four bays added in final stage). Had Worth Street not been widened, the addition could have been six bays. Cables from under the street must rise vertically on the building perimeter. By providing for the cables outside the beam ends, the floor area remains uninterrupted. In addition to this practical advantage, the otherwise blank wall is given modeling through the deep incision between cable slots.

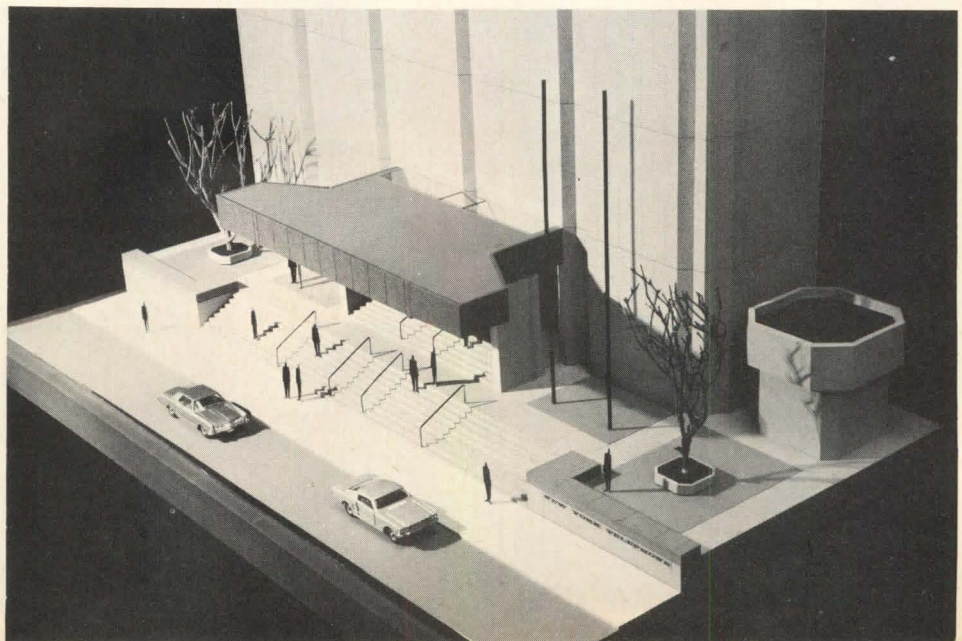




Drawings by Marc Feldman



By night the vertical recesses become long lines of light, stretching from the ground to the building top, interrupted only by the highlighted hoods. Thus the design premise—that all vertical elements should begin at the ground and end only for logical reasons—is pointed up during the day by shadows, and drastically seen in reverse by night. Bronze light fixtures set on walls in slots at entrance-canopy level around the building cast light up the recesses, down onto the plaza. Hoods are lighted by floods angled toward tops and sides. The plaza is lighted from bronze standards. The canopy over the entrance is also to be of bronze. When the building is completed, the entrance (with elevators opposite) will be at the center of the building. During phase 1 it will be at the end of the building. A sense of the building's great scale can be had from the 25-foot height of the exhaust stacks on the plaza (to be used only in an emergency, but essential to the building's self-sustaining capability).



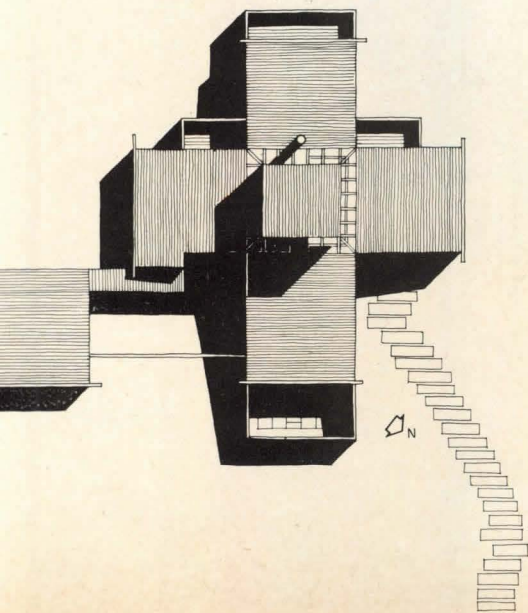


Morley Baer photos, by courtesy of House & Garden



## A cross-shaped house gives privacy, space and views

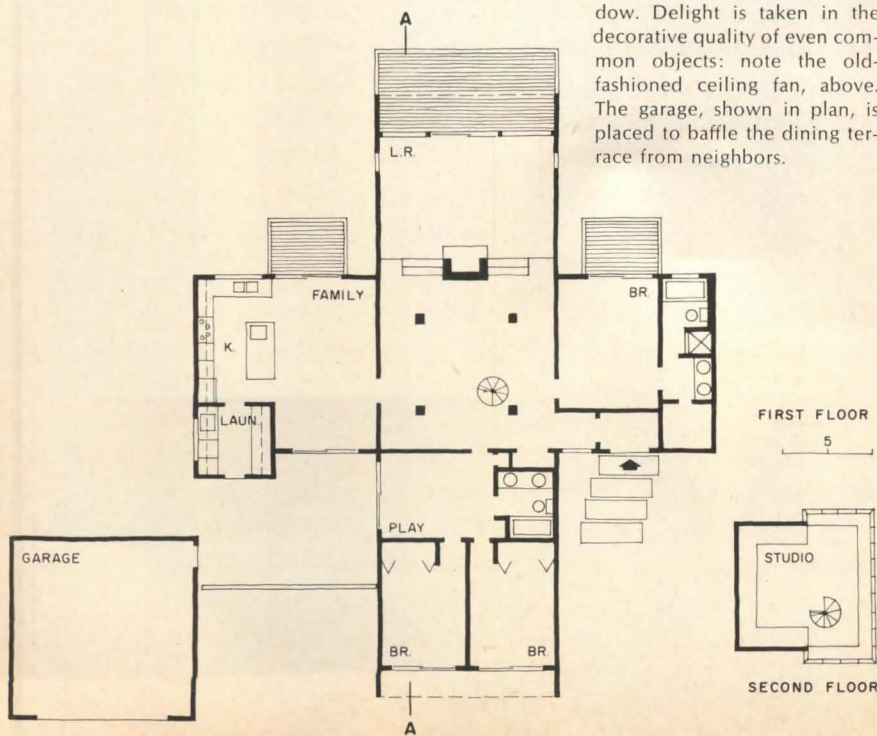
Vertical siding, shed roofs, cantilevered decks, and, especially, the turret-like look-out room—all elements of the house shown on these pages are in the current idiom. But this “sophisticated American barn” goes far beyond the merely fashionable, exuberantly exploiting the possibilities of its oak-tree-shaded, hilltop site, while gearing itself to both the general and special needs of the clients’ program. The house, designed by architects Robert Fisher and Rodney Friedman, is located in a California land subdivision, placed on a sharp ridge and a less-than-an-acre lot. Going two stories high to overlook mountains and valleys to the west and north, it has a cross-shaped plan to give unusual and varied exposure to the surroundings. And it is strategically positioned to create outdoor living spaces under the 60-foot-wide live oaks which have been left on the site. By cantilevering bay window, decks, and the house itself out over the edge of the slope, the architects were able to set the structure well back from the street, add living space to the interior and add drama to the view. While the house does look outward, it focuses inward on itself too, centering on a clerestoried gallery topped by the aerie-like second-level tower seen above. Special kinds of materials, finishes, spaces and objects are used to give special character to every room. The outline of the plan shown at left and the rustic exterior belie the excitement that the house reserves for the interior, which makes its own intriguing environment in close relationship to the outdoors.



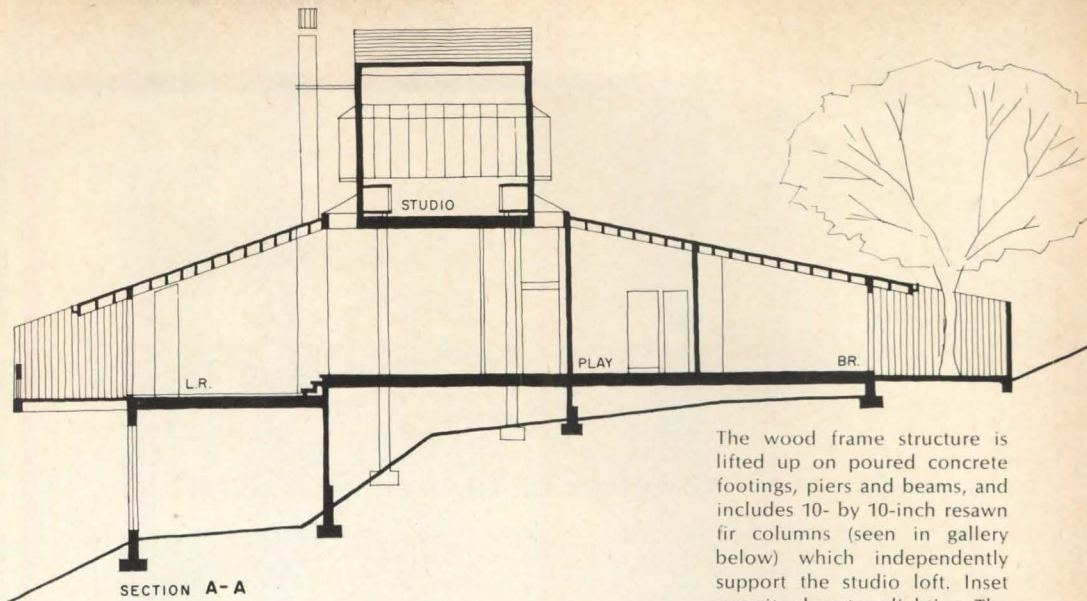




The studio loft is reached by a steel and oak spiral stair from the gallery, shown at right. Stained glass used for the entrance is an old church window. Delight is taken in the decorative quality of even common objects: note the old-fashioned ceiling fan, above. The garage, shown in plan, is placed to baffle the dining terrace from neighbors.







The wood frame structure is lifted up on poured concrete footings, piers and beams, and includes 10- by 10-inch resawn fir columns (seen in gallery below) which independently support the studio loft. Inset permits clerestory lighting. The living room, below, opens both to gallery and cantilevered deck (shown in section) for a 47-foot expanse of space.

The owner, a San Francisco graphic artist, required that the house include a work studio set apart from other family rooms. A cross-shaped plan was chosen to provide both space and the privacy the family required. Wings divide the first floor into four zones: living room (below right), kitchen-family room (next page), master bedroom and a special suite for the two daughters, aged seven and nine. Space between wings is put to work for family living as well, as in the outdoor dining space between kitchen and playroom. The central gallery (photos below) is, of course, pivotal, providing quick circulation and letting wings work together in a variety of ways for both general use and special entertaining.

The studio loft which dominates the design, shown in photo above left, forms a fifth, vertical zone off the gallery. Though set apart from the rest of the house as required, this element—which could have been a mere appendage to the living scheme—is instead a natural and very original elaboration of the basic plan.

PEASE HOUSE, Alamo, California. Owners: Mr. and Mrs. Robert Pease; architects: Fisher-Friedman Associates; engineers: L. F. Robinson & Associates; contractor: Silver Construction Company.







The house by Fisher-Friedman includes the kitchen-family room which extends onto a rear cantilevered deck (below) and onto the outdoor dining terrace (left). Fifty-year-old oak trees provide shade.

Most floors, with the exception of the quarry-tiled gallery, are laminated, sanded and stained wood. All cabinets are vertical-grained Douglas fir. The island kitchen counter has a chopping block surface. Color comes from red, green and blue rugs, upholstery and enamel cooking ware.

Decks shown in the rear view of the house, above, share a distant view with the horizon some 40 miles off. The tower shed-roof opens to the north to bring work light into the studio. Exterior materials are red cedar shingle roof and 1- by 6-inch resawn redwood siding. All exterior sheet metal is painted black. Dark anodized aluminum sash is used for sliding doors. Materials will weather and age to blend with the woodland.





# STORES in urban and suburban shopping centers

## BUILDING TYPES STUDY 399

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The trend toward multi-level shopping centers continues unabated—although not without some rude reminders to developers and tenants that square-foot costs for construction and operation increase as layers are added. Despite this, and the mounting increase in all construction and financing costs, developers are not radically curtailing their activities. Instead, they are taking harder looks at leasing and construction contracts. They are being more selective in choosing sites for larger and larger centers. And they are finding new opportunities in mixed-commercial urban redevelopment.

The multi-level trend derives partly from diminishing availability of desirable suburban tracts to accommodate increasing sizes of regional centers. In larger one-story centers, the point is reached where distances from parking to a given store become unmanageable. Multi-level design is also the economical form for downtown redevelopment, which is accelerating under the Urban Renewal program.

Architect Lathrop Douglass, an experienced practitioner in the shopping-center field, discusses some of these factors on the following pages—and some examples of current centers, urban and suburban, are also described and shown in this study.

The multi-level trend is of special significance to architects, since it imposes more demanding approaches to traffic patterns, graphics and amenities of the mall. And good solutions are vital to success of the project. Mall conditions are especially important, but amenities encounter mounting resistance under the increasingly stringent budget conditions in this field.

The architect's problem, however, extends far beyond the role of planning traffic solutions and designing the mall. Individual stores, frequently left for the tenants to commission for finishing and decoration, too easily escape architectural control. The result sometimes damages the ultimate success of the center itself. An outstanding example of where this has not occurred is shown in the feature presentation of the new Neiman-Marcus store in Houston's Galleria Post Oak. Here Hellmuth, Obata & Kassabaum, architects for the center, were retained by Neiman-Marcus for design of the store buildings. The program called for working closely to the predetermined interior designs of Eleanor LeMaire Associates. The results provide notable evidence of the architectural and commercial sense of this kind of cooperation.

—William B. Foxhall



# Revitalizing downtown shopping centers

by Lathrop Douglass

Encouraged by the dual forces of relatively cheap rural land and inadequate zoning, the proliferation of the so-called "urban sprawl" is certainly one of the more distinctive and disturbing phenomena of our age. Many of the shopping and other commercial facilities of the central city, following their customers, have, of course, moved outward. Less than two decades ago there were few suburban shopping centers. Now each city is ringed with complexes of stores and parking, their *raison d'être* being primarily their accessibility and convenience to the new sprawl. Indeed, all signs point to mutually competitive "megacenters" complete with stores, offices and motels dotting the peripheral and radial highways of all our cities, regardless of their size. To mention but a single instance: in a Midwestern city we designed a regional shopping center across a suburban highway from another center constructed the year before and of equal size. The two, together, have more square feet of retail area than the entire central business district. So perhaps we are heading for an entirely new concept of living, a species of unending suburbia punctuated by small islands of commercial activity.

But it would be hard to believe that the central city, as such, is doomed to rot away or that the 8,000-year-old tradition of a well-defined urban concept is coming to an end.

The basic fact stands out sharply and obviously: The central city with all its values, the hub of the wheel, the major concentration of all the aspects of the business and leisure life of the community, is being seriously threatened. It is being threatened with abandonment in favor of the urban sprawl and with resulting economic imbalance, social problems, and physical decay. Tax revenues are dwindling and may, in time, be inadequate to pay for even minimal municipal services. The ultimate loss in values will inexorably be staggering.

It is my belief that the American people should not and will not afford this widespread disintegration of any central city, regardless of what such city's politics, geographical location or size may be. The questions are: what is being done and what can be done to restore the central city to its former social, economic and physically dominant position as the hub of the metropolitan wheel?

Unquestionably, before any major reversal of the urban sprawl can occur, the CBD has first to become once again the magnet that can bring to downtown the buying power and business of the suburbs. The CBD must again, as in the past, compete successfully in range of merchandise and services offered, in excitement and in appeal. *In particular, it must compete successfully with all the centers on the metro-*

*politan periphery. Such a situation must, it seems to me, precede or at least be part of the resurrection of the blighted in-town residential areas and the restoration of the economic balance of the city's population. A successful core will lend impetus to the renewal of the immediately surrounding areas and add strength to the reversal of the outward population trend.*

## Criteria for redevelopment: accessibility, convenience and appeal

An analysis of what is needed to bring the suburban buying power back into the CBD would certainly focus primarily on several simple but outstanding criteria.

Foremost would be *accessibility*. In-town traffic congestion has been a potent factor in speeding the outward migration of population and its concomitant commercial needs. But the hub of a wheel, in theory, has the most convenient access to all points within its circumference. The question, therefore, is in what way to provide this accessibility. Curiously, perhaps, the solution appears to be completely different depending upon the city's population figures. For the smaller cities there seems to be little doubt that freeways leading directly into the CBD offer the most convenient as well as the most economical solution.

On the other hand, in the larger metropolitan areas (and it is admittedly hard to say just where the dividing line lies between a small city and a metropolis), the problem of accessibility is completely different. The greater density of people working in the downtown area of the metropolis and the greater concentration of shoppers make adequate parking facilities almost a physical impossibility; more importantly, the traffic congestion resulting from such facilities would easily defeat the whole concept of accessibility. In other words, in the case of the very large cities, freeways leading to downtown garages would compound the difficulties rather than solve the problem. The only practical solution foreseeable today, therefore, in the case of the metropolis appears to be use of efficient and comfortable mass transportation systems. However, not nearly enough is being accomplished or even planned today along such lines. Imaginative, truly forward-looking systems will be needed, not the routine up-dating of current ones, if adequate results are to be achieved.

After accessibility, the next criterion of importance for bringing the suburbanite shopper back into the central city is that of *convenience*. Without convenience, the customer, whether from the urban area or from the suburbs, will not shop downtown. It has been statistically proven that today's customers are willing to drive all the way to

distant rural locations or even halfway around a city just to enjoy convenient shopping. And this convenience involves many facets. It includes ease of parking, weather protection and short walking distances to stores or offices. It means climatized shopping malls—cool in summer, warm in winter; stores close to each other for easy cost comparison of merchandise; stores quick to find and convenient to enter. It may soon mean covered bridges over downtown streets so that one need not face inclement weather or traffic hazards throughout the day. In sum, it must become as easy and comfortable to shop downtown as to shop elsewhere.

*Appeal* is the next criterion, and it also includes a wide range of factors. Variety of merchandise in various types of shops—from major department stores with every conceivable type of merchandise to tiny boutiques, catering to special customers—from luxurious specialty shops to five and dimes. Restaurants of all types are essential, not only for the shopper but especially for the office building tenants. And last but not least are the amusement facilities—the cinemas, nightclubs, bars, and sport centers.

To compete with the accessibility and convenience of the suburbs, there must be downtown an excitement of personal experience, a glamour of surroundings. Special things to do and see, whether elaborate shows or just the glittering scene of lights and crowds.

Shopping facilities, however, can have difficulty supporting themselves if alone and dependent on a gradual winning over of the outlying population. A major part of the downtown renewal should, therefore, begin with the construction of related facilities such as office buildings, hotels and medical centers. If a downtown hotel is easily accessible, easy for parking, and glamorous, it should prosper—for in addition to these advantages it has the convenience of being at the hub, related to the largest possible complex of commercial and entertainment space. The same applies with office buildings, which, in turn, provide a clientele for the restaurants, shops and amusement facilities.

Ultimately, it would be logical to assume, this reawakening and revitalization of the downtown will do more than attract the daily office workers and the suburban housewives. It will also, hopefully, build up such an attraction in any city that the residential trend itself will ultimately change and a portion of the suburban population will begin to move back into the urban scene. Such a trend, of course, presupposes many other improvements such as better schools, greater safety, and more suitable urban planning.

After establishment of these basic criteria of accessibility, convenience and appeal, the major question nevertheless remains: how to physically accomplish this revitalization of the central city and the chain of therapeutic events that will follow chronologically and inevitably in its wake.



## Government and private capital must unite in renewal effort

If the rebuilding of the central city is left entirely as a function of government, the costs would doubtless be prohibitive and the time factor completely unacceptable. On the other hand, it is clear that private groups today generally do not have the funds or the legal power or the financial incentive to do this complex and hazardous job entirely through the private sector of our economy.

If it is true, then, that urban rebuilding is impractical by government alone and also impractical by unaided private enterprise, it would seem reasonable that the present concept of private investors working through renewal programs of local governments is, and would be, the more propitious procedure in this particular era.

But such a path, too, has its own problems and pitfalls. First of all is the problem resulting from land prices. It is hard to obtain rents in the average CBD that can compete with the suburban developments when the urban developer must pay the renewal agency 10 or 20 times as much for the urban land as he would have paid for land on the suburban periphery. This is true despite the higher downtown rents and the urban renewal agency procedure of offering cleared, ready-to-build-on land at substantially less than its acquisition cost.

Again, there is the parking problem. With cheap rural land the developer of a suburban center can put his "ocean of asphalt" all around the shopping complex, and this parking will result in only a slight increment in the unit cost of leasable space; but grade parking downtown is economically impossible because of land costs. Hence, except in very small cities, all cars in the downtown projects must be parked on decks or below grade, another and very substantial increment to the unit cost of leasable space and another item that must be compensated for financially in one way or another.

The third major difficulty for the developer is probably the time element. There are too many agencies, with too much time spent on negotiations with officials. Why

should a developer go through these time-consuming motions and risk adverse decisions when he can go out to a rural area and have everything his own way? In fact, why should a developer pay much more for land, more for parking, and have a more complex problem of planning and design while, at the same time, being subjected to delays of unpredictable duration when his whole operation would have none of these difficulties if he were building a megacentre on the periphery of town?

## The architect's problems are compounded in the city

The architect, likewise, has similarly greater problems. He may have an altruistic attitude toward improvement of the human environment, but he is up against a serious problem in frustration and monetary risk. The CBD sites are rarely large enough to allow the dimensions necessary for proper planning, especially of merchandising facilities. The architect, as well as the developer, experiences the financial burdens of the long delays in negotiations with multiple agencies. He has more problems, more work, more wasted time. Furthermore, the architect has to exert more planning ingenuity in finding ways of economically achieving such results as stacking stores on top of garages and large stores together into odd-shaped sites without loss of function. He has to contend with the rigid building codes and other regulations of the downtown area. He has to provide for the delivery of goods from subterranean truck concourses to multiple levels of storage; above all he has to, at all times, arrange the parking and group all the retail units in such a way as to give each unit an equal chance at the customer's business no matter how many levels of merchandising or how complex the project boundaries.

Assuming that the rebuilding programs for our city cores are vital to the preservation of our cities and that this rebuilding can best be done today by independent developers working through government renewal agencies rather than by government alone or by private enterprise alone, then it would seem logical to suggest that some basic improvements are urgently needed in

current procedures. The immediate goals would be the improvements needed to:

- ... achieve planning and design of long-range value to the city
- ... assure permanently competitive situations vis-à-vis the suburbs
- ... attract competent developers to undertake the necessary programs
- ... complete the programs without undue delays.

Based on my experience in the urban renewal field today, some of the more important improvements for substantially aiding the successful achievement of these goals, regardless of the city, would be:

1. An over-all renewal concept for the entire CBD, and not just isolated parts thereof.
2. A means of permitting lower sales price to the developer of cleared land regardless of cost to the agency, in order to provide a sounder basis for competition with the suburbs.
3. Larger individual projects, or at least sites large enough to permit planning techniques that would insure successful developments.
4. Simplification of government controls, that is to say fewer agencies for the developer to deal with and fewer approvals, so as to have substantial amounts of time without, however, allowing this simplification to jeopardize the renewal agency's proper insistence on long-range and suitable standards of design and materials.
5. Maximum effort to obtain advance endorsement of projects by all local factions involved so as to prevent the unexpected delays from community frictions that can be completely beyond any developer's control.

In conclusion, one could summarize by saying that the preservation and revitalization of Downtown America is a serious challenge. Without a large-scale solution of this problem, social and financial losses could easily become disastrous. Therefore, whatever can be done on a large scale and expeditiously to rebuild and vitalize the retail and commercial areas of our cities would surely be in the best public interest.



Lafayette Plaza  
Bridgeport, Connecticut  
Architect: Lathrop Douglass

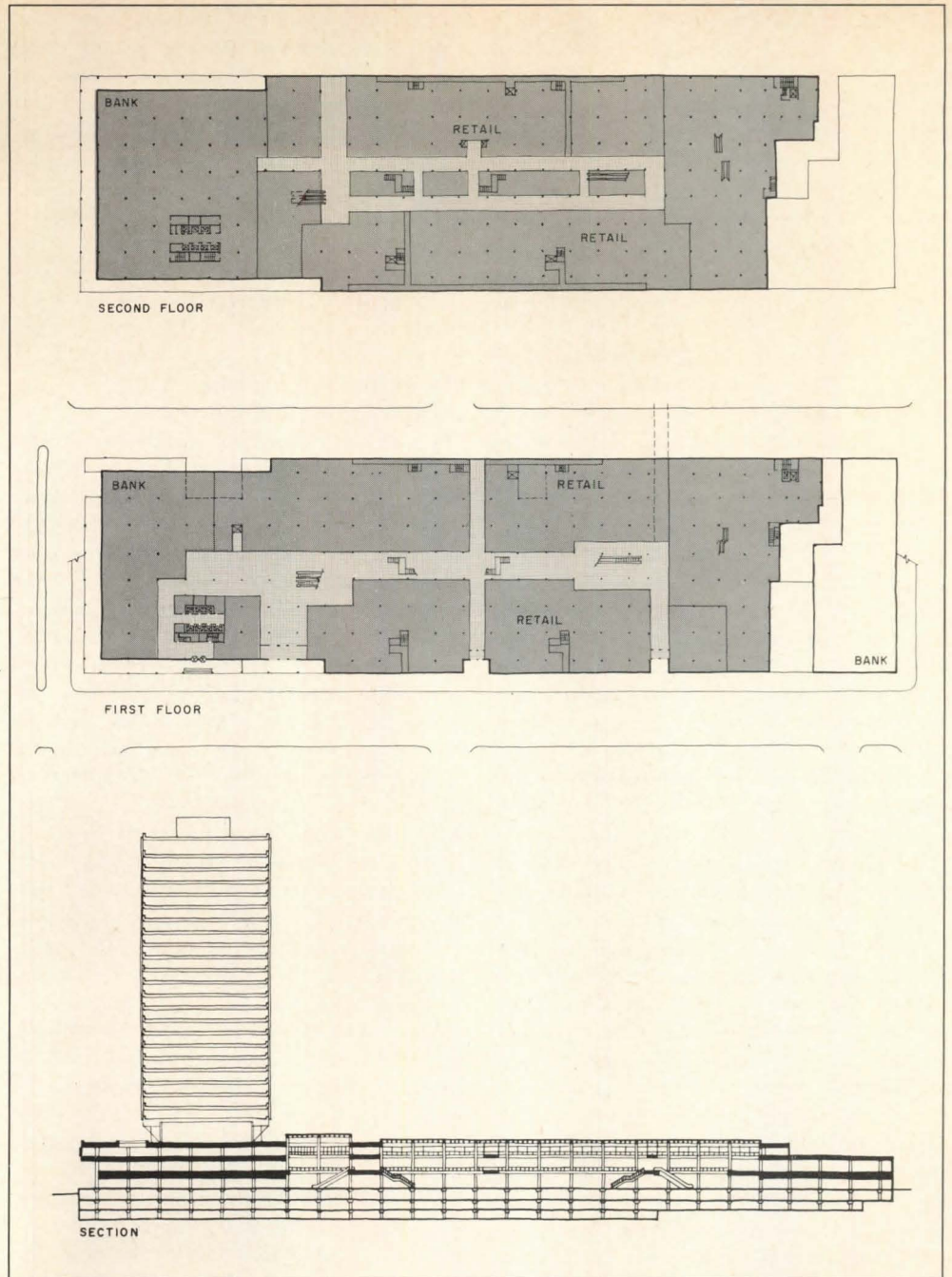




## Main Place Mall: private enterprise thrives where city traffic flows

Main Place occupies the 100 per cent location in downtown Buffalo. It is a major renewal project but was undertaken without Federal aid. It consists of a three-level air-conditioned mall with two levels of shopping and a third level of offices which overlook the mall. Parking for 900 cars is provided in a three-level underground garage beneath the project. A 26-story office tower occupied in part by the Erie County Savings Bank adjoins the mall at one end, and Kobacker's Department Store is at the other. Servicing of all facilities is beneath the mall, with storage both in the basement area adjacent to the parking and on the third level and peripherally around the offices overlooking the mall. A pedestrian bridge is under construction, joining the second level of the mall with the Erie County Building. Other pedestrian bridges have been under consideration for connections to nearby department stores and garages.

MAIN PLACE, Buffalo. Architect:  
*Lathrop Douglass.*



*George Szeberenyi photos*





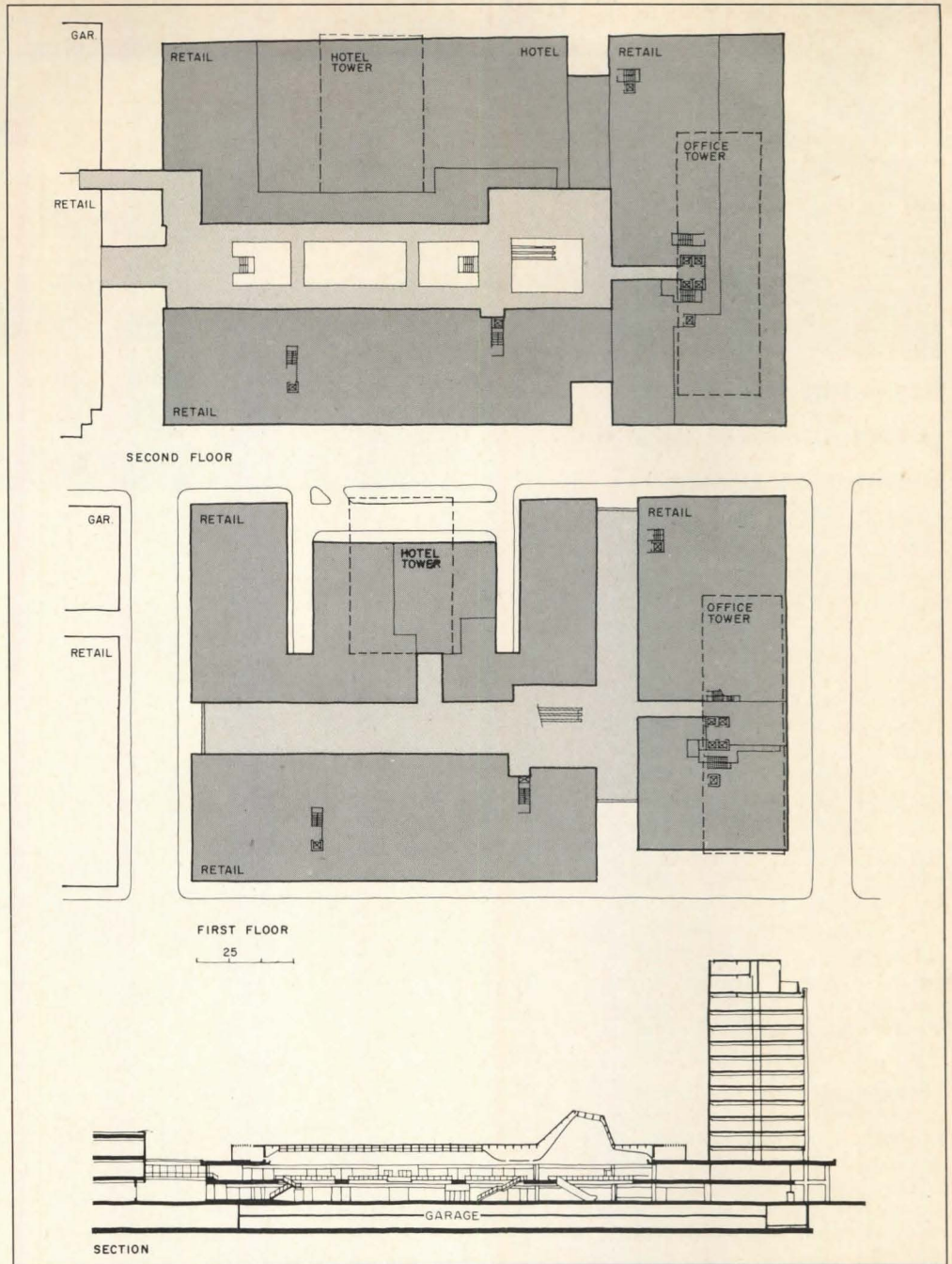


## Chapel Square: master planned for an urban site near Yale

This major urban renewal project, located at the main business intersection of New Haven, also faces the Green and Yale University. It consists of two levels of shopping facilities of varied sorts, a 140,000-square-foot office building and a 300-room hotel. A two-level basement provides parking and a truck-service tunnel.

Shops, offices and hotel are interconnected by a two-level air-conditioned mall with a central fountain plaza. Natural illumination from a raised skylight over the plaza supports a cluster of 40-foot tropical trees. To encourage patronage of the upper level of the mall, two glass-enclosed, over-street bridges connect it with the second floor of a Macy department store and adjacent multi-level municipal garage (see plan). Although the ground-floor shops face both mall and street, it is of interest that the major portion of their customers enter through the mall.

CHAPEL SQUARE, New Haven. Architect: *Lathrop Douglass.*



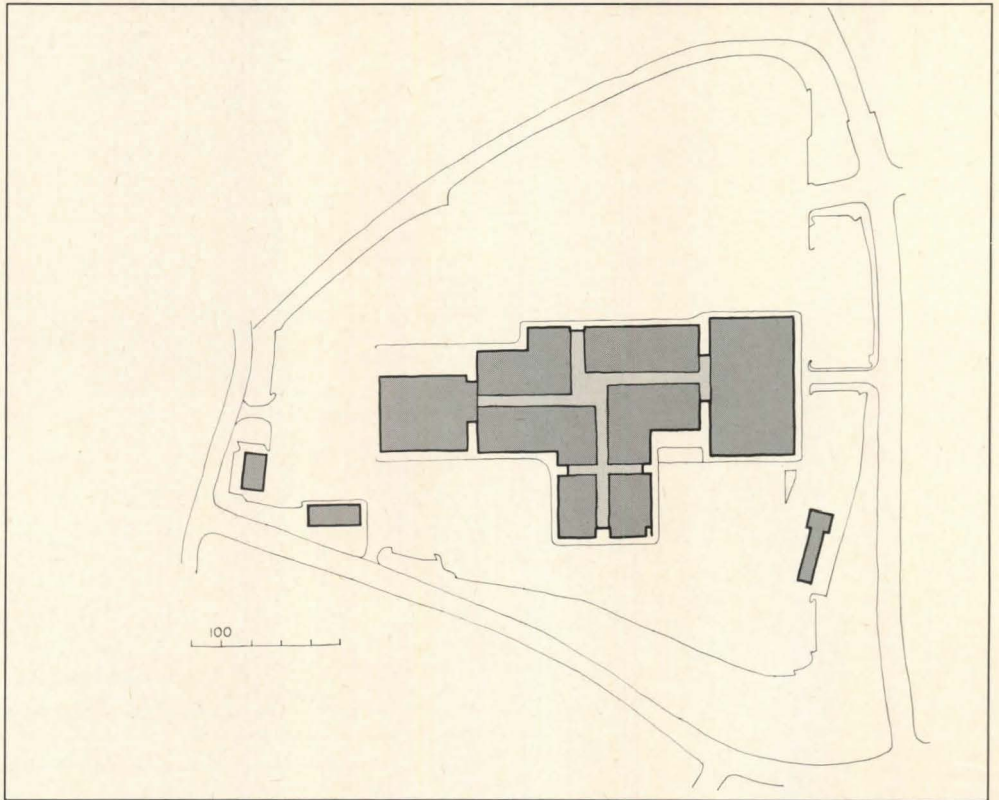




## Serramonte Center: regional scope planned for human scale

This regional retail development in Daly City, California, covers 800,000 square feet on a 75-acre site but retains the sense of human scale and market place. The pinwheel plan and deft handling of the air-conditioned mall control the visual distances. A massive 40-foot-high plastic skylight composed of faceted shapes illuminates the mall hub. A four-sided waterfall descends from the skylight into a sculptured concrete pool. Clerestory skylights along both sides of the mall arms add to daylight admitted by smaller replicas of the faceted plaza skylight. Cedar benches, planters and groupings of chairs on carpeted pads add color and comfort to the mall. Exterior walls are monolithic tilt-up panels of hard-fired ceramic shingles precast into concrete.

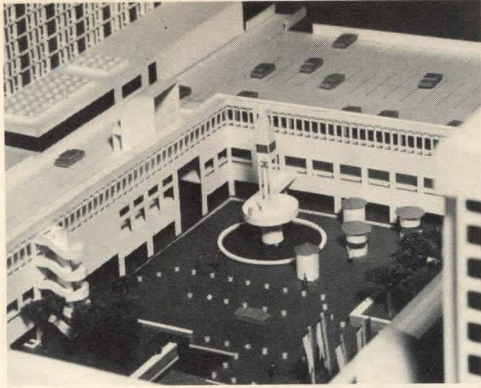
SERRAMONTE SHOPPING CENTER  
Daly City, California. Architects: *Welton Becket and Associates*; landscape architects: *Royston Hanamoto Mayes & Beck*; structural engineers: *Chin & Hensolt, Inc.*; mechanical and electrical engineers: *Bayha Weit & Finato, Inc.*; contractor: *Ernest W. Hahn, Inc.*



Wayne Thom photos







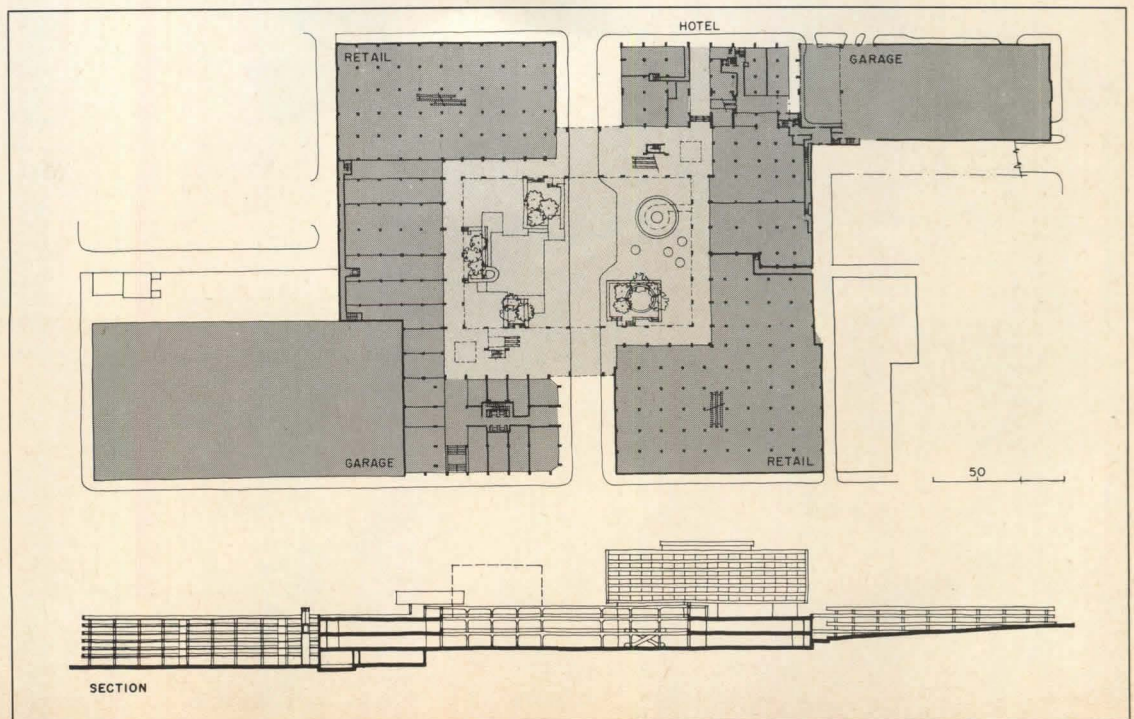
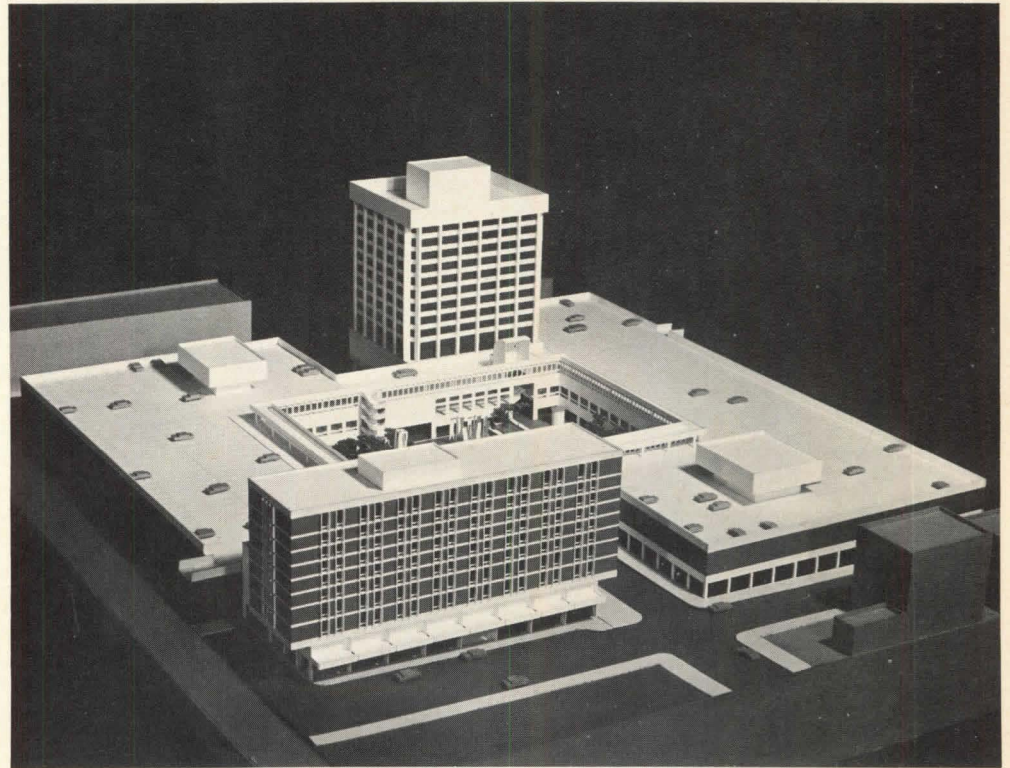
## Lancaster Square: new town plaza, urban-redevelopment style

The image of the old town square, an essentially pedestrian experience surrounded by shops, offices and leisurely amenities, will be recalled in the Queen Street Urban Renewal Project for Lancaster, Pennsylvania. A public square, bisected by a one-way street but carefully marked for foot traffic, will be the core of the 12-acre project. It will be surrounded by a three-level pedestrian arcade bridging the street and linking the surrounding shops, hotel, 12-story office building, two department stores and two municipal garages. The plaza features a skating and activity area, various kiosks and a round theater marquee which will serve as an outlook and pedestal for sculpture to be selected by competition. The Gruen-Buchart scheme itself was the ultimate choice among several submissions invited by the Redevelopment Authority of Lancaster.

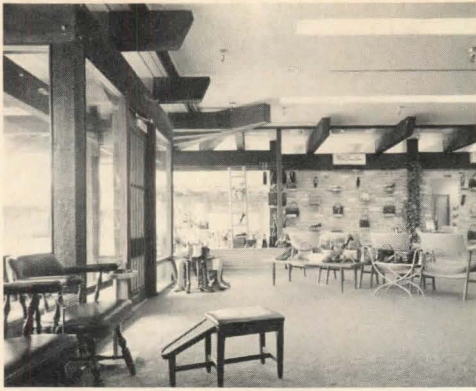
LANCASTER SQUARE, Lancaster, Pennsylvania. Associated architects and engineers: *Gruen Associates and Buchart Associates—Beda Zwicker, partner-in-charge*; landscape architects: *M. Paul Friedberg & Associates*; lighting: *Seymour Evans Associates*.



Patrick John Landi photos



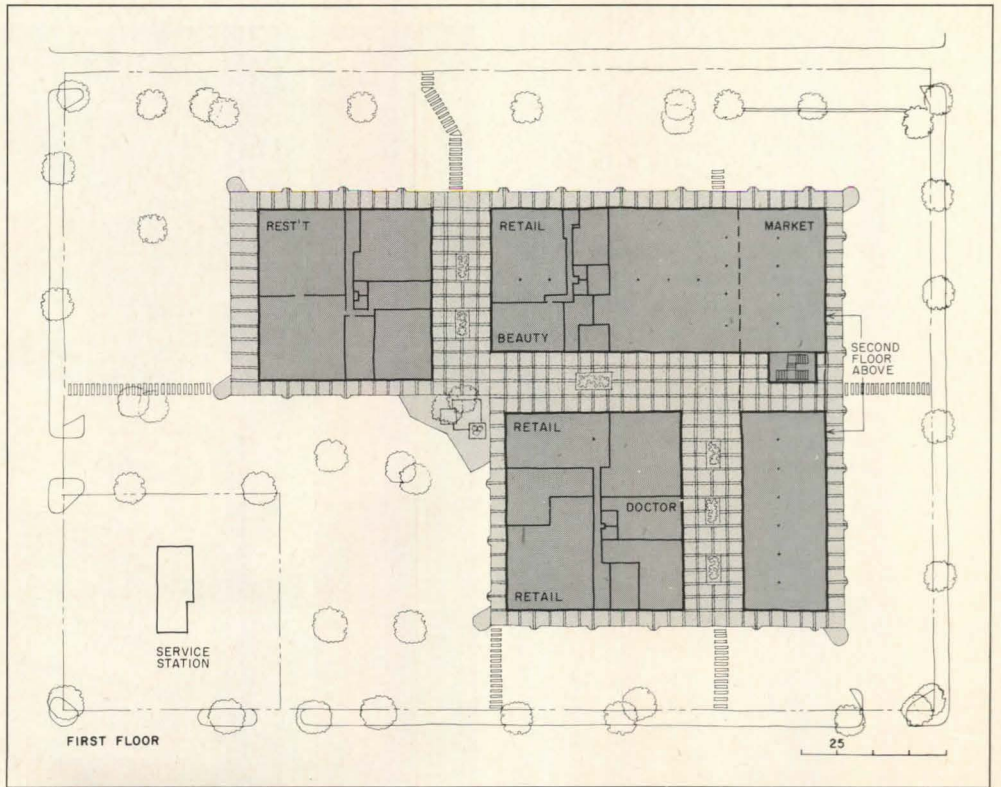




**Bellevue Village:  
a quiet enclave  
in a Northwestern suburb**

This informal grouping of specialty shops, market, and two restaurants responds to regional and urban patterns in rapidly growing Bellevue, Washington. Off-street parking is required, a major department store and other services are nearby, and timber is a regional force. The four-building group invites shoppers inward from surrounding parking for 408 cars to landscaped plazas, where heavy timber and glass facades with wide protective overhangs provide all-weather pedestrian convenience. Shop buildings are single-story with a long-span trussed roof system on post and beam frame. A narrow second level for offices bridges one plaza exit.

BELLEVUE VILLAGE SHOPPING CENTER, Bellevue, Washington. Architects: *Mithun and Associates—Robert L. Ramaley, partner-in-charge*; structural engineers: *Gerrard Torrence*; mechanical engineers: *Richard Stern*; electrical engineers: *Howard Johnson*; contractor: *Sunderland Construction Co.*



Charles R. Pearson photos





© Ezra Stoller (ESTO) photos

## Galleria Post Oak: Neiman-Marcus Houston store achieves quality identity in harmony with total-center architecture

Integration of design—inside and out—has been accomplished in this highest-quality statement for Neiman-Marcus; and it has been done well within the over-all vocabulary of Galleria Post Oak, Houston's giant new shopping center. The store is an outstanding demonstration of the fact that complete coordination of interior design with conceptual and—in this case—programming phases of architectural design can result in a total expression of harmony in a single building. Further, it shows that when all the component buildings of a commercial center are designed by one architect, each enterprise can emerge with its own identity without violating consistency of the whole.

The Neiman-Marcus store successfully merges the cre-

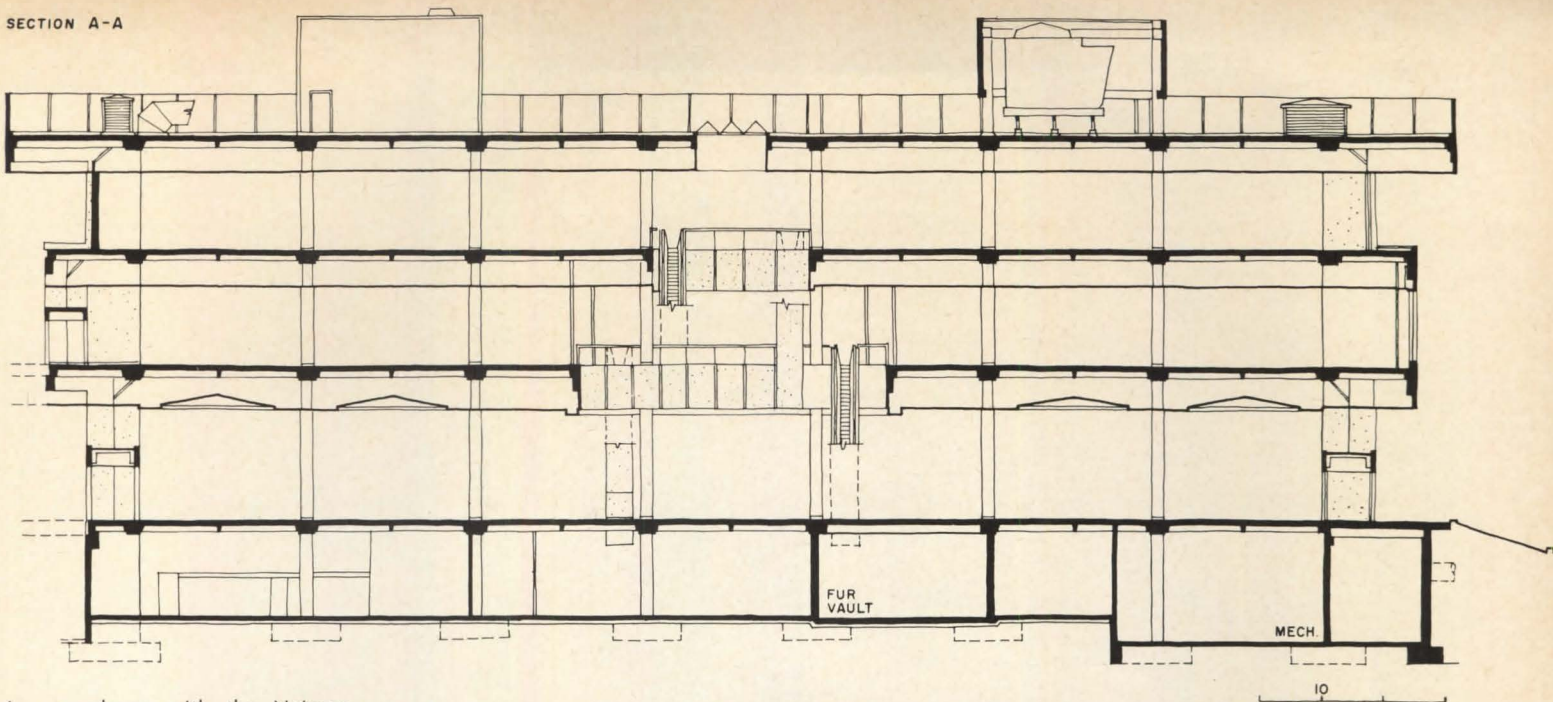
activities of its interior designers, Eleanor LeMaire Associates, and its architects, Hellmuth, Obata and Kassabaum. Eleanor LeMaire has had a close working relationship with Neiman-Marcus over 25 years, during which the merchandising principles affecting size and contiguity of departments, salons and specialty shops have been developed into imaginative designs without compromising those principles. For the Houston store, these criteria became program requirements for the architects. *Gyo Obata*, in charge of architectural design for both the store and the entire center, was in turn able to implement innovative interior concepts, such as the central well for moving stairs (above) that provides focus and enhances visibility through all three floors.







SECTION A-A



In accordance with the Neiman-Marcus principle that the store should present the aspect of a coordinated arrangement of separate, high-quality specialty shops, the client and Eleanor LeMaire Associates had fixed the size and relationships of shops floor by floor. In this programming process, the second floor was allocated more space than the main or top levels, and is cantilevered outward to accommodate that requirement. The store adjoins and is architecturally integrated with Galleria Post Oak, which is being developed as a commercial center. It will ultimately include an office tower, a hotel and many shops, all accessible to a four-level air-conditioned mall (right, below). The mall will be the chief circulation element, comprising a series of great, four-story spaces under skylights with shops along the exterior perimeter. Exterior walls for both Neiman-Marcus and the entire center are beige, exposed-aggregate, precast concrete panels. Translucent onyx panels are inserted around the second floor of Neiman-Marcus.







B

A

C



FIRST FLOOR

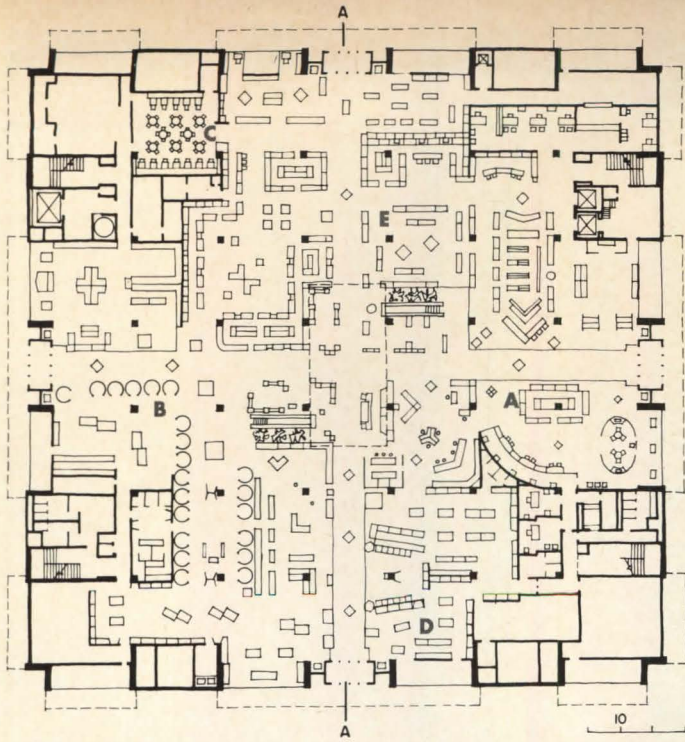


Photo key to plan

- A Precious jewelry
- B Men's clothing
- C Mariposa Cafe
- D Teen boys' clothing
- E Handbags

The first floor of the Neiman-Marcus store is designed as "an introduction to ultimate quality." For that effect, the ceiling height of 19.5 feet and the spaciousness of the central well of moving stairs supplements the calculated placement of visually open but functionally separable specialty shops.

Identity of the component shops, established by varied floor and wall treatment, is augmented by a ceiling of recessed domes which express the bay module but is modified to respond to the particulars of the merchandise. The ceiling height permitted general and spot lighting by high-intensity, 250-watt, iodine-quartz lamps which were originally designed for outdoor use. The store's application of the lamps was made possible by a specially designed fixture, and takes advantage of the natural color values inherent in the lamp.

Two major traffic aisles quarter the floor and serve centered entrances on each side. There are roughly diagonal patterns of traffic through the various shops.



E

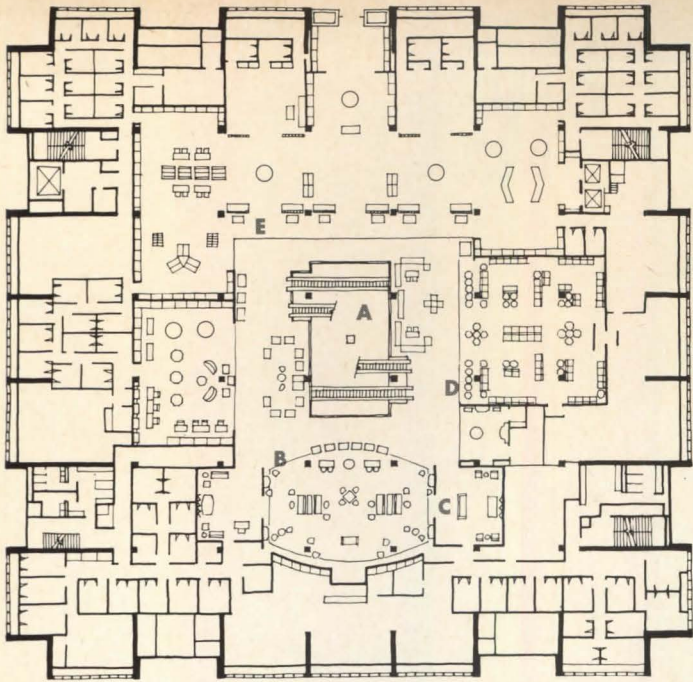
D







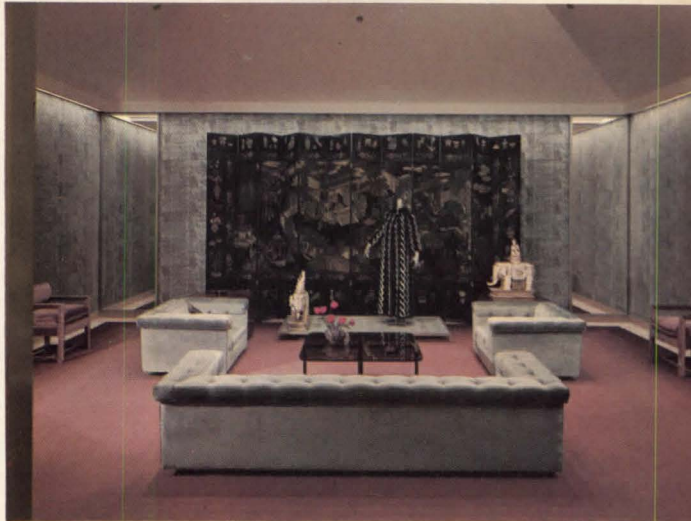
SECOND FLOOR



The second floor, called the fashion floor, is reached by moving stairs which pass the lower end of the hanging glass-and-light sculpture by Stanley Landsman (A, opposite). Fourteen fashion shops and boutiques surround the well. The traffic aisle flooring is Portuguese Rosa do Monte marble. Shop areas are carpeted in a blended apricot and beige, except for special treatment in some high-fashion areas such as the better apparel shop (B, above right). This oval shop is defined at one side by an arched row of bronze and Carpathian elm display fixtures and by a special marbled green carpet. The ovoid opens at one end to the bridal department and at the other to the fur salon (C, at right). Fur salon walls are of grasscloth in blue and taupe. The carpet is garnet, and an antique 12-fold Coromandel screen stands along one wall as display background. The women's shoe salon (D) has a ceiling of octagonal Rhodesian walnut panels. A collage in brown leather by Kristin Hotz is on the rear wall. There is a gallery at one side of the stair well (E).



B



C



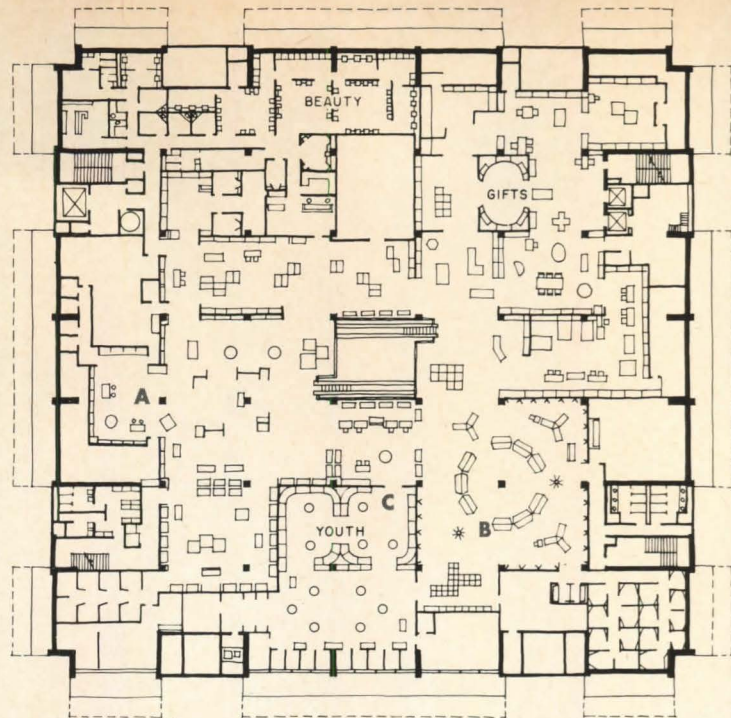
D



A

E





THIRD FLOOR

The third floor is divided into three major departments. Over half the floor caters to youth from infants to young juniors. A gift gallery occupies about one quarter of the floor and the remaining quarter is a beauty salon. The young children's area (A) is unified by a continuous green carpet. Various shop categories, such as children's wear, accessories, and toys, are identified by fanciful backgrounds and furnishings. For example, the Colony Shop (B) offers a collection of clothing for the young and is identified by a decorative central canopy and white bentwood furniture. Young artists were commissioned by Eleanor LeMaire to create the various fanciful backgrounds including the neon and glass tubing decorations of the Young Juniors' department (C). Papier mâché animals by Virginia Bascom enliven the various children's shops. All three departments on this floor are designed as a series of interconnected galleries with decorative focal treatments identifying the various categories of merchandise.

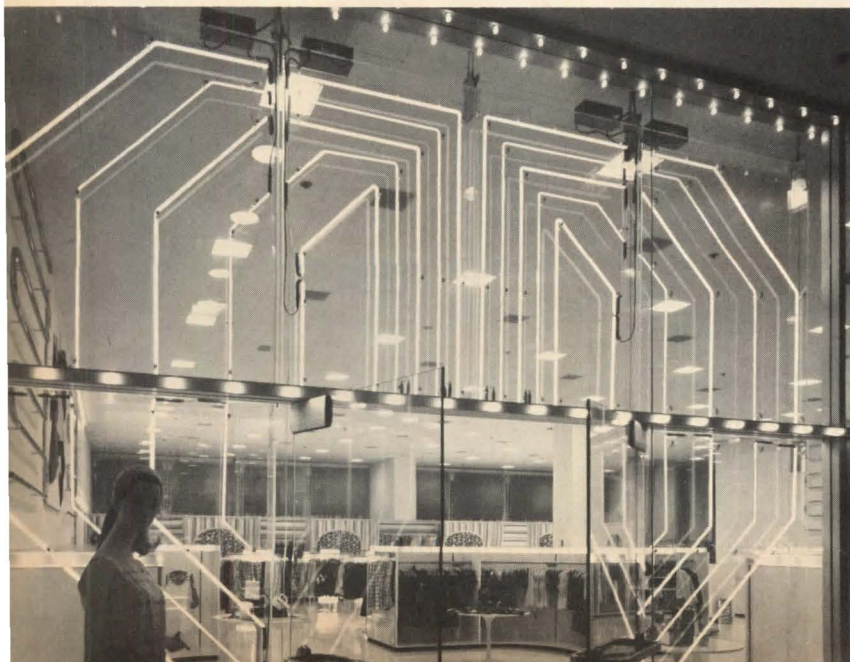
GALLERIA POST OAK/NEIMAN-MARCUS STORE, Houston. Architects: *Hellmuth, Obata & Kassabaum, Inc.* —Gyo Obata, principal-in-charge of design; Jon J. Worstell, Neiman-Marcus project manager; Alvin Lever, Neiman-Marcus project designer; Terry F. Cashen, Galleria Post Oak project designer; associate architects for Galleria Post Oak: *Neuhaus & Taylor*; associates on Neiman-Marcus: interior designers: *Eleanor LeMaire Associates—Eleanor LeMaire, Frank J. LaBianca, Vincent Caruso, Sanford L. Sabshin, Robert Maldarez, Charles Ball, Winifred Jacobus, project team*; landscape architect: *Sasaki, Dawson, DeMay Associates, Inc.*; structural engineers: *Elmer Ellis Engineers*; mechanical engineers: *Guerrero & McGuire* and *Leo L. Landauer & Associates, Inc.*; contractors: *Henry C. Beck Co. and Linbeck Construction Corp.*

A

B



C





## Fence designs to keep wind from being a nuisance

by Michael O'Hare and Richard E. Kronauer

As the relationship of local wind to over-all building geometry is becoming better understood, a growing consciousness of its importance has caused architects to look for methods of wind control that can be applied to existing buildings or included in a project without a major redesign effort.

For example, it is often desirable to protect a channel between buildings, or an open area like a tennis court, from an undesirable chronic wind without enclosing the space in a sealed structure. Rows of trees have historically been used as windbreaks, and they are usually excellent for the purpose, but in many cases time, location, or expense prohibits their use.

For this reason it was decided to test several designs for fences that might be used to control local winds efficiently (from an aerodynamic point of view) without requiring complete enclosure of the space to be protected. The results of this work are comparative data on 10 fences, the best of which seem adaptable to a wide variety of architectural applications.

Although windiness is usually an out-

Michael O'Hare is Junior Fellow of the Society of Fellows, Harvard University, Cambridge, Massachusetts. Richard E. Kronauer is Gordon McKay Professor of Mechanical Engineering at Harvard University. This research was supported by the Faculty Committee on Science Research Support of Harvard University.

door problem, local drafts can sometimes severely handicap the use of indoor spaces. As this is written, the authors, working with a team headed by Robert A. Gallant at Arthur D. Little, Inc., have completed a study of the interior of the new terminal at the Tampa International Airport. The building will have large bi-parting doors at either side which could cause vigorous interior jets across the ticket concourse under certain environmental wind conditions. In order to control this interior wind (without obstructing the flow of passengers, as revolving doors would) the results of the study described in this paper have been applied to the design of windscreens for the interior of the building. The results of the model testing (not yet published) indicate that the design arrived at was capable of diffusing and moderating the jet so that wind velocities at occupied spaces in the building were reduced to 10 per cent of those resulting from the unscreened jet, without seriously restricting pedestrian movement.

The problem of wind control exists where it is desired to protect an area on the ground, up to a certain vertical height, against absolute wind velocities greater than some maximum figure. Usually, one would like to do this with one device (at the upstream side of the area to be protected) that is small, uses material economically, and is

visually attractive.

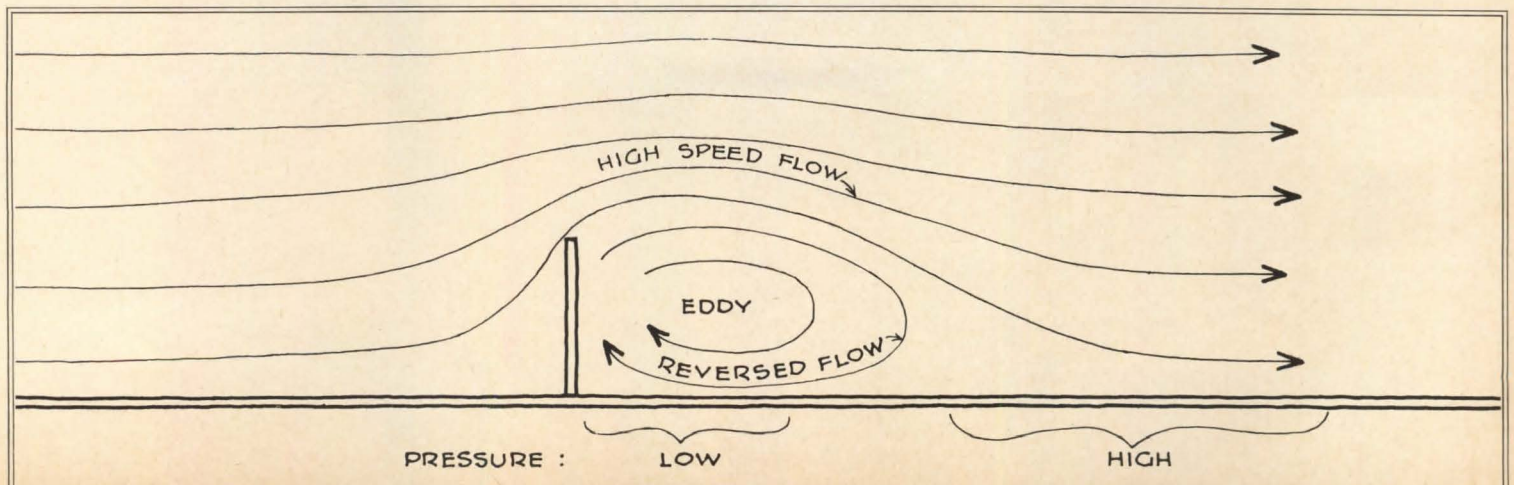
Our approach was to test fences of two basic types: the first (a-d, j, k) is made up of horizontal slats normal to the wind with variable widths and spacings; the second (e-h) has the slats placed at varying angles to the flow to redirect as well as obstruct the fluid movement.

After an experimental test series on eight fences, refinements were made to produce a second set of designs. The resulting velocity profiles (Figure 3, a-h) revealed that the criteria for a windbreak are somewhat complicated. Among the "simple" fences, for example, the lowest velocities at station IV, 11 fence heights downstream, were found with the 50 per cent open fence, c; the least flow reversal with the variable porosity fence, d; and the lowest velocities near the fence with the 25 per cent open fence, b. The choice of a "best" fence might then depend on the purpose to which it is to be put. In protecting a tennis court, for example, low over-all velocities might not be as important as absence of flow reversal.

The speed of the moving fluid at the edges of the wake behind a bluff obstruction is usually higher than the free-stream velocity of the undisturbed fluid flow, and as a result of the Bernoulli effect (roughly stated: as velocity increases, pressure decreases) the pressure immediately behind a solid fence is

Figure 1: A solid fence is unsatisfactory for control of wind because low pressure in the eddy area, resulting from the high-speed flow across the top of the fence, draws air upstream into reversed flow and the entire stream

back into the wake. For this reason, the authors decided to test slatted fence models in the wind tunnel. Objective was to choose patterns that would leak air near the ground to prevent the eddy from forming.





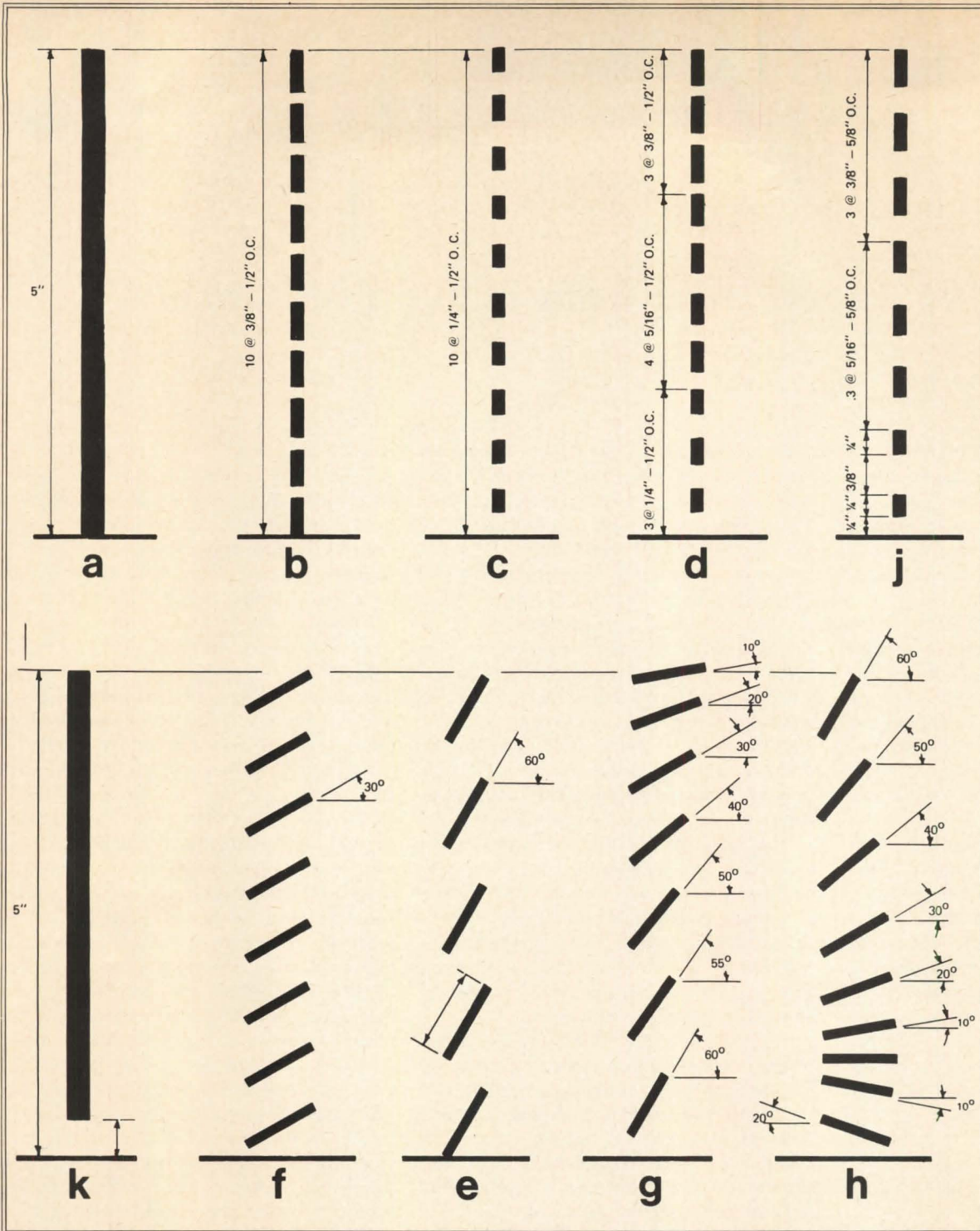
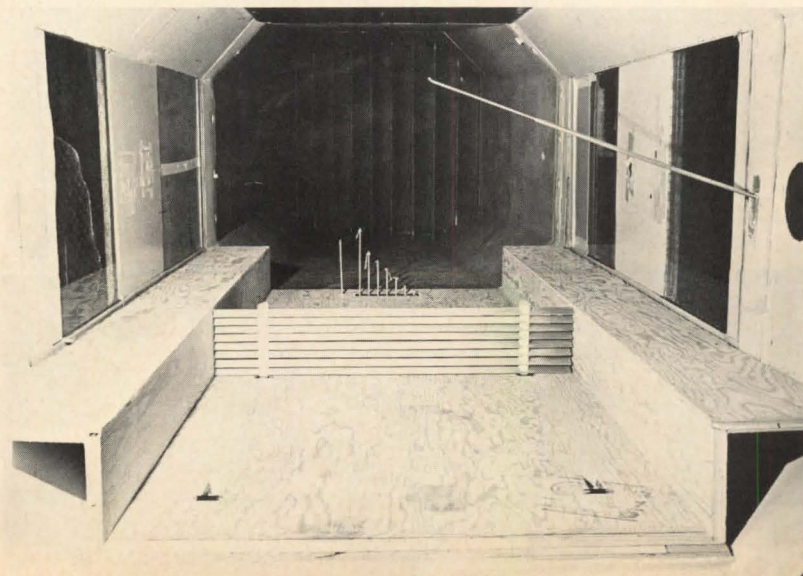


Figure 2: Models of fences tested in the wind tunnel were all 5-in. high with varying patterns of rectangular slats. Fences were of two basic types. The first had horizontal slats normal to the wind with various widths and spacings; the second had slats at varying angles to the flow of wind to redirect as well as obstruct wind movement.

With the simple fences (a-j) the lowest velocities 11 fence-heights downstream occurred with the 50 per cent open fence, c; the least flow reversal, with the variable porosity fence, d, and the lowest velocities near the fence with the 25 per cent open design, b.

Of the angled-slat fences, type h was superior, giving the lowest velocity at the farthest downstream position, and having no flow reversal at any position.



Interior of the wind tunnel looking downstream. Instrumentation is located at the far end of the test section. Fence f (30° inclined slats) is in position for testing. Free-stream velocity was determined by the pitot-static tube (top), while the Kiel probes and hot-wire anemometer (background) indicated velocities in the wake of the fence.



lower than the pressure further downstream where the flow has smoothed out. The fluid tends to flow from higher to lower pressures, and consequently the flow behind a solid fence is reversed for some distance downstream (Figure 1). The reversed flow behind such a fence is the bottom half of a fast circular movement of fluid called an eddy, whose low pressure (resulting from its high velocity) pulls the over-all flow back toward the wake as it travels downstream. This last effect of the eddy is the reason solid fences are so unsatisfactory for wind protection, and it was our over-all intention in designing the fences tested to choose patterns that would leak just enough air through the fence near the ground to prevent the eddy from forming and consequently not pull the high-velocity flow down toward the ground.

The tendency of simple fences to generate reversed flow near the ground also led us to include in our study four fences with slats angled to the wind to redirect the flow upwards from the protected areas. In two of these the slats were parallel to each other (e, f); fences g and h had their slats at varying angles. All four fences with angled slats were designed so that in projection on a vertical plane the fences represented a 25 per cent open area. Obviously since the air is not moving through these fences parallel to the ground, their effective porosities can be much higher.

Of the angled-slat fences, one was clearly superior: Fence h gave the lowest velocity at the furthest downstream position, 11 fence heights away, and there was no flow reversal at any position. Fence h was also generally the best windbreak in the whole initial series. For a distance of 11 fence heights downstream, it kept wind velocities below 30 per cent of the free stream velocity over a vertical dimension of one fence height. Closer to the fence, velocities were characteristically 10 and 20 per cent of the free stream velocity. It was noticed, however, that the best performance at 11 heights downstream was provided by the 50 per cent open simple fence, fence c, though it was otherwise compromised by high velocities closer to the fence and by flow reversal near the ground. Fence d, whose average porosity was about 35 per cent, provided the best near-field performance of the simple fences as far as flow reversal is concerned, though its far-downstream performance was not as good as the 50 per cent open fence.

It seems reasonable to assume that the "far-field" behavior of a fence is largely influenced by its over-all porosity, and that angling of the slats or changes in porosity across the height of the fence will affect mainly the "near field" velocities. While it might be possible to improve fence h slightly in the far field, perhaps by adjusting its over-all porosity and maintaining the same arrangement of angled slats, it seems very close to an optimum design of its type. The results of the simple fences, however, suggested that by combining the features of the best performers in this design we might achieve one such fence with good perform-

ance in both the near-field and the far-field. To reduce the near-field velocities without causing flow reversal, it was decided to use the variable porosity design, but since the far-field velocities seemed to be lowest, with an over-all porosity of 50 per cent, it was decided to open the spacing in the variable porosity fence sufficiently to achieve this figure as an average. It might appear that greater reduction in the far fields would be achieved with porosity greater than 50 per cent, but fences f and e (whose effective porosities were, as explained above, probably higher than 50 per cent) had downstream velocities higher than those found in the 50 per cent simple fence.

Accordingly, fence j was constructed whose porosity varied, from top to bottom, roughly from 40 to 60 per cent. A solid fence with an opening at the bottom was also tested to see if such a simple vent would prevent or limit the flow reversal and eddying characteristics of fence a.

Fence j produced, as expected, extremely low velocities 11 fence heights downstream, and further confirmed that performance at this distance depends primarily on the average porosity of the fence rather than on its detailed configuration, since the velocity profile far downstream almost exactly matches the profile obtained with the 50 per cent open fence without the variable spacing. The near-field performance of fence j represented a substantial improvement over all of the simple fences tested and slight improvement over fence h, the best in the first run. With no flow reversal, velocities in the near field were almost entirely less than 20 per cent of the free stream velocity, with a large area from five to seven fence heights away averaging half that figure. Performance of fence j was excellent because unlike fence h, it is clearly indifferent to a reversal of wind direction.

Venting the solid fence produced no significant improvement in its performance: velocities 11 fence heights away were almost exactly the same as without the vent, and in the near field averaged the same in magnitude, though the area of flow reversal was reduced.

Further small refinements in fences h and j might improve their performance somewhat; however, since the velocities over almost the entire tested field and one and a half fence heights above the ground are below 50 per cent of the free stream velocity, and up to one fence height above the ground are less than a quarter of free stream velocity, it seems that any improvement could at best be small.

The wind conditions modeled in the tests require some explanation. In a setting where a wind may have a long fetch over consistent terrain it is possible to speak of a boundary layer velocity profile above the characteristic objects (e.g., trees) in some standard form such as a power law diminution of "free-stream" velocity. However, in urban and suburban situations, fences comparable in height to the size of a man are immersed in a sea of objects distributed on

the natural ground plane (buildings, cars, trees, etc.) so that the concept of boundary layer on this scale is lost. For example, if one building extends above its surrounding clutter, on the sides of that building roughly parallel to the wind there will be local high velocity "jets" of wind extending to the ground with little loss of strength.

Since no boundary layer model has any useful generality in the great majority of applications, the fences were tested in a nearly uniform flow (the boundary layer of the Harvard wind tunnel is typically less than a tenth of the height of the fences tested). In the case of an application where the velocity pattern of the wind is consistent and known to be quite different from the uniform field used here (as in the airport terminal mentioned above) special tests are indicated. The physical principles disclosed in the current series of tests can be used as a guide to the choice of fence configurations for such special testing. If the flow field is highly variable, then the designs proposed here may be viewed as a kind of rational compromise.

The non-angled fences discussed in this paper offer an important degree of design freedom which may not be obvious: almost any pattern of perforated structure can be used as long as the average porosity of the fence at any given height corresponds to that of the fence tested. If the perforated structure is "slat-like" (relatively thin, flat and perpendicular to the flow, like a grid of discs) then porosity is simply the ratio of open area to total area. If the perforated structure is made up of more streamlined shapes (such as a grid of spheres) the effective porosity is larger than the projected hole area ratio and corrections must be applied. For simple grids, some data on which this correction can be based exist in the literature,\* but in general special tests would be required.

It should be noted that jets typically retain their full velocity for a distance downstream six to seven times as long as the opening generating them is wide. If large grid objects are used, with corresponding large spaces, the area immediately behind the fence may be locally windy. If the typical dimension of the openings is 1 ft, for example, the full jet velocities behind the fence will remain for more than 7 ft. But as long as the best dimension (perpendicular to the wind) of discs, slats, or whatever, and the spaces between them, is smaller than about 15 per cent of its height, their shape is immaterial to the effectiveness of the fence; only the average porosity at each point along the fence's height matters.

Effective windbreaks can also be built by combining two or more fences with very low porosities a short distance apart, but since there is no simple relationship between the individual fences' characteristics and the effective porosity of the ensemble, the problem is too complicated to discuss here usefully.

\* A primary source for data of this kind is Hoerner, S.F., *The Fluid Dynamic Forces; Part I, Vol. 1, Fluid Dynamic Drag*; O'Hare Books, Flanders, N. J., 1969.



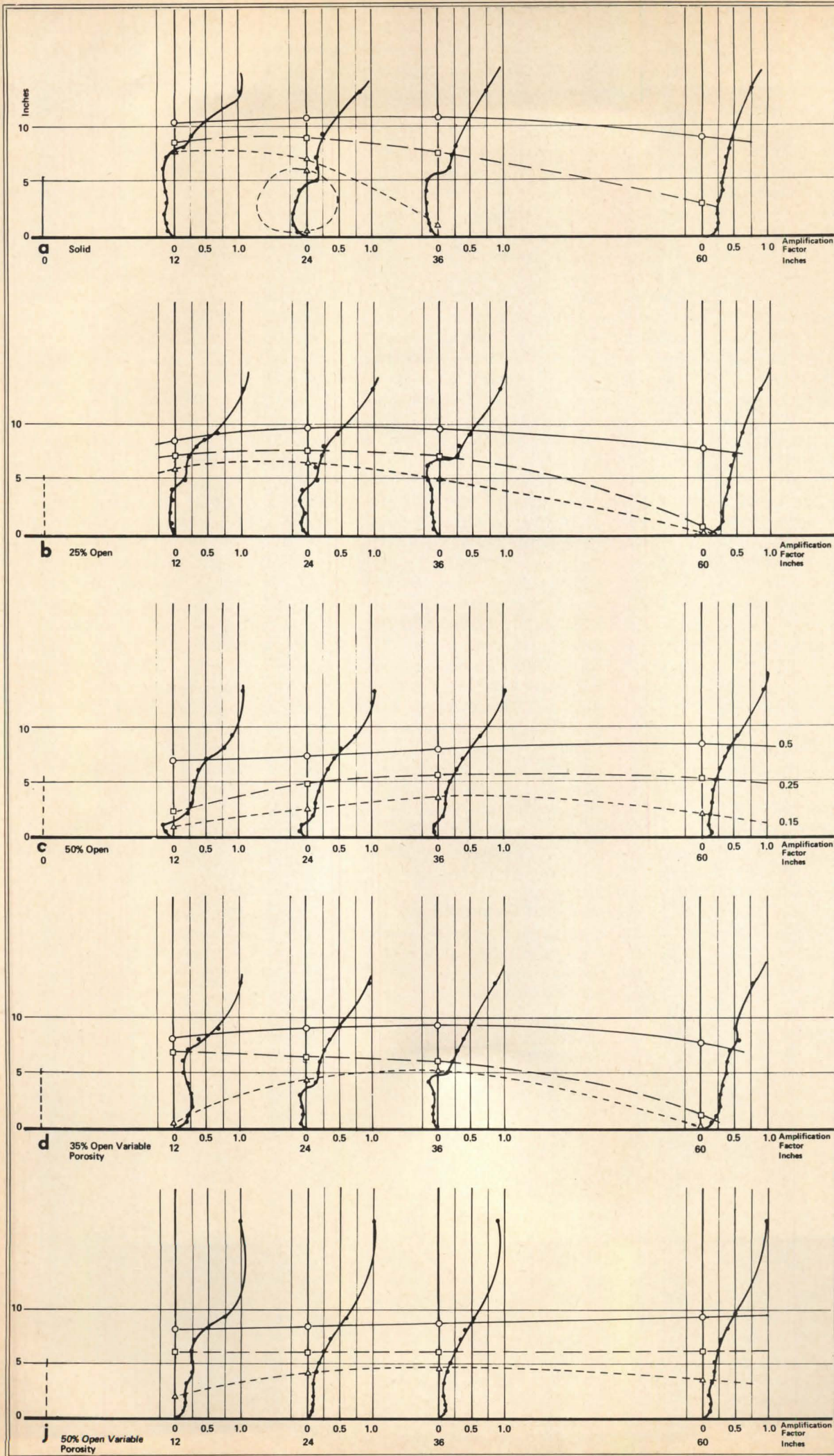


Figure 3: Velocities of the "wind" were measured at test positions 12, 24, 36 and 60 in. from the fence model, or about two, five, seven and 12 times the fence height upstream. At each of these stations, the observed amplification factors (ratio of local velocity to free-stream velocity) were plotted (black dots and heavy lines). Circles are 0.50 points, squares are 0.25 and triangles are 0.10. For example, the volumes below the long-dashed lines have velocities less than 25 per cent of the free-stream speed.

Among the "simple" vertical-slat fences (**a-d**) the lowest velocities at 11 fence-heights downstream (60 in.) were found with the 50 per cent open fence, **c**; and the lowest velocities near the fence with the 25 per cent open fence, **b**.

Of the angled-slat fences, fence **h** was superior, giving the lowest velocity at the farthest downstream position, and there was no flow reversal at any position. It also kept wind velocities below 30 per cent of the free-stream velocity.

The best performance over the full distance was provided by the 50 per cent open simple fence **c**, though it was compromised by high velocities closer to the fence and by flow reversal near the ground.



Fence **d** provided the best near-field performance of the simple fences as far as flow reversal is concerned, though its far-downstream performance was less good than **c**.

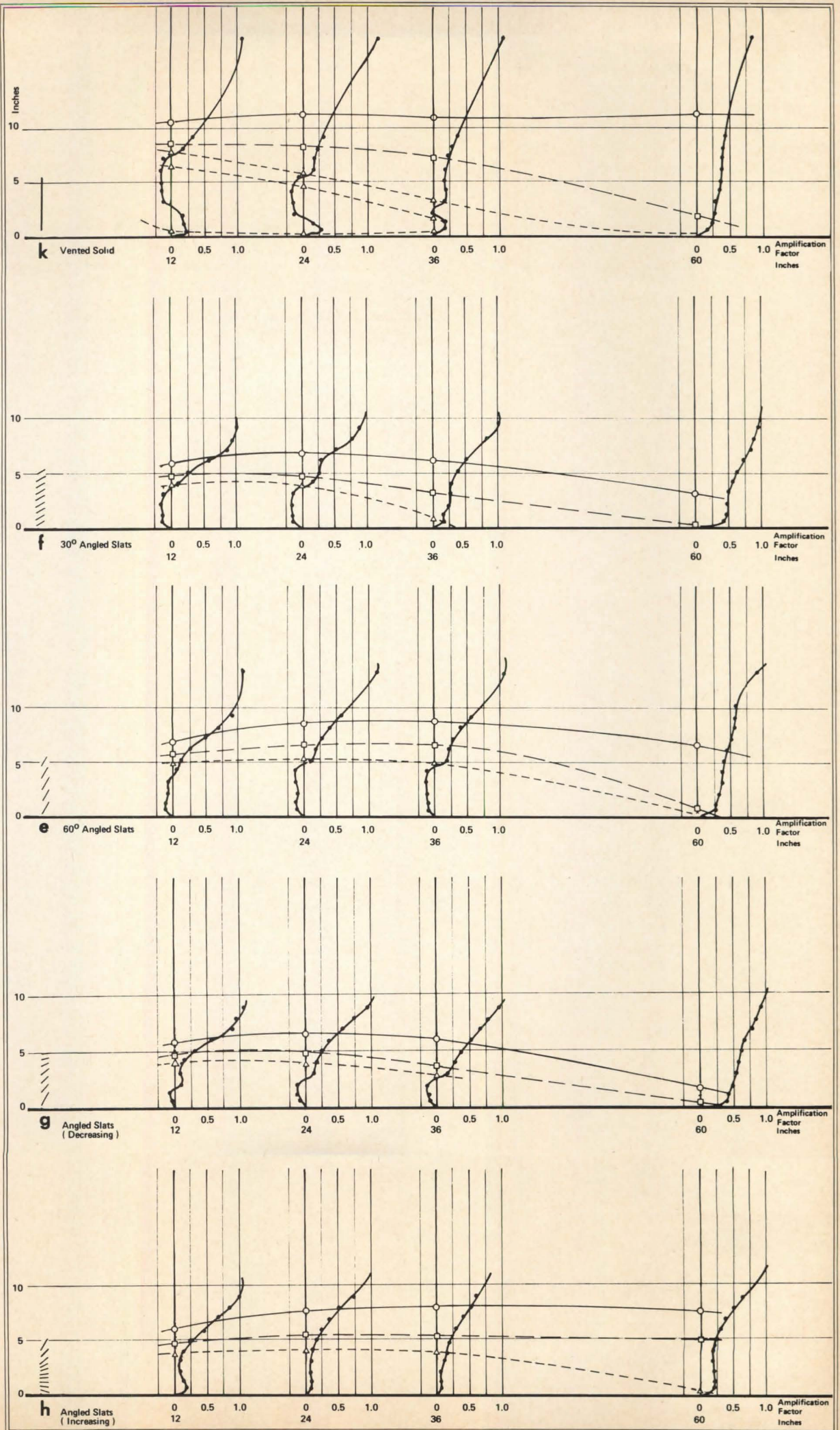
Fences **f** and **e**, whose effective porosities were probably higher than 50 per cent, had downstream velocities higher than those found in the 50 per cent simple fence.

Fence **j** produced extremely low velocities 11 fence heights downstream, and further confirmed that performance at this distance depends primarily on the average porosity of the fence rather than on its detailed configuration.

The near-field performance of fence **j** was better than any of the simple fences tested and a slight improvement over fence **h**.

Performance of fence **j** was excellent because, unlike fence **h**, it is clearly indifferent to a reversal of wind direction.

Venting the solid fence produced no significant improvement in its performance: velocities 11 fence heights away were almost exactly the same as without the vent and in the near field averaged the same in magnitude, though the area of flow reversal was reduced.





### How the tests were done

All the fences were tested in the Harvard University one-meter wind tunnel, suitably modified with a false floor and partial walls. The free-stream velocity was measured with a pitot-static tube 20 in. above the tunnel floor and 51 in. upstream of the other instrumentation, and the velocities at four positions downstream from each fence were measured with an array of Kiel probes and a hot-wire anemometer. Tufts on the probes indicated flow reversal, when it occurred.

The problem was treated as two-dimensional: the fence supports were streamlined, and the fences ran from side to side of the test section. Rotating the hot-wire sensor with the fences in place and removed confirmed that the flows were confined to a plane parallel to the incident flow and perpendicular to the floor of the tunnel. No attempt was made to idealize the slat cross-sections (with knife-edges, for example) since the fences chosen were intended to represent practical designs. (Though the results are applicable to fences

of a wide variety of design, the slots correspond to 2 by 10's when used in a fence 5 ft 6 in. high.)

Velocities were converted to amplification factors by dividing them by the free-stream velocity. The test positions were 12, 24, 36, and 60 inches, or about two, five, seven and 12 times the 5-in. fence height, upstream from the instruments, and the velocities (Table 1 and Figure 3) were based on measurements at 1/2, 1, 2, 3, 4, 5, 6, 7, 8, 9 in. above the tunnel floor; and for some fences, 13 or 18 in.

**Table 1**  
**Amplification Factors for Various Fence Designs**  
(All fences 5 in. high)

Distance above tunnel floor, inches	Distance downstream from fence, inches				Fence	12	24	36	60
	12	24	36	60					
<b>Fence a</b>									
1/2	-0.10	-0.17	-0.10	0.23	1/2	-0.15	-0.16	0.16	0.43
1	-0.11	-0.20	-0.13	0.23	1	-0.13	-0.16	0.16	0.46
2	-0.13	-0.20	-0.16	0.23	2	-0.15	-0.16	0.23	0.47
3	-0.11	-0.17	-0.16	0.26	3	-0.11	-0.16	0.23	0.50
4	-0.13	-0.14	-0.16	0.32	4	0.11	0.16	0.28	0.55
5	-0.16	0.17	-0.16	0.32	5	0.25	0.23	0.39	0.62
6	-0.16	0.17	0.16	0.36	6	0.59	0.29	0.49	0.71
7	0.11	0.15	0.20	0.39	7	0.85	0.52	0.65	0.81
8	0.16	0.19	0.23	0.42	8	0.85	0.52	0.65	0.81
9	0.29	0.24	0.32	0.49	9	0.92	0.75	0.82	0.87
13	1.01	0.81	0.72	0.72	13	0.98	0.88	0.98	0.96
<b>Fence b</b>									
1/2	-0.05	-0.10	-0.11	0.23	1/2	-0.06	-0.13	-0.12	0.39
1	-0.05	-0.11	-0.10	0.29	1	-0.08	-0.13	-0.13	0.42
2	-0.08	-0.08	-0.13	0.29	2	0.08	-0.13	-0.16	0.47
3	-0.07	-0.13	-0.13	0.32	3	0.08	0.13	-0.19	0.52
4	-0.07	-0.10	-0.13	0.36	4	0.13	0.15	0.28	0.55
5	-0.13	-0.13	-0.18	0.39	5	0.27	0.22	0.36	0.61
6	0.13	0.11	-0.18	0.42	6	0.58	0.34	0.49	0.65
7	0.20	0.20	0.26	0.46	7	0.88	0.54	0.65	0.78
8	0.32	0.23	0.28	0.52	8	0.94	0.71	0.79	0.85
9	0.62	0.42	0.46	0.59	9	1.04	0.91	0.94	0.91
13	1.01	0.98	0.92	0.88					
<b>Fence c</b>									
1/2	-0.11	-0.10	-0.07	0.16	1/2	0.15	0.05	0.05	0.20
1	-0.16	-0.07	-0.05	0.11	1	0.11	0.06	0.05	0.20
2	0.23	0.10	0.07	0.14	2	0.08	0.05	0.06	0.18
3	0.26	0.11	0.10	0.16	3	0.08	0.07	0.10	0.18
4	0.28	0.18	0.13	0.16	4	0.11	0.08	0.16	0.20
5	0.33	0.23	0.16	0.23	5	0.21	0.15	0.20	0.24
6	0.38	0.31	0.29	0.29	6	0.46	0.23	0.30	0.30
7	0.55	0.42	0.36	0.36	7	0.67	0.35	0.40	0.38
8	0.78	0.55	0.49	0.42	8	0.83	0.50	0.52	0.52
9	0.88	0.75	0.64	0.54	9	0.98	0.73	0.59	0.63
13	1.01	1.03	1.01	0.95					
<b>Fence d</b>									
1/2	0.20	-0.10	-0.07	0.20	1/2	0.13	0.05	0.08	0.11
1	0.23	-0.07	-0.07	0.23	1	0.14	0.06	0.09	0.11
2	0.29	-0.07	-0.08	0.28	2	0.13	0.06	0.06	0.09
3	0.26	-0.10	-0.08	0.29	3	0.17	0.09	0.06	0.13
4	0.23	0.13	-0.13	0.32	4	0.25	0.13	0.11	0.16
5	0.16	0.16	0.15	0.36	5	0.22	0.16	0.14	0.17
6	0.16	0.20	0.20	0.39	6	0.20	0.25	0.22	0.25
7	0.21	0.26	0.29	0.42	7	0.28	0.33	0.31	0.28
8	0.39	0.36	0.39	0.56	8	0.49	0.45	0.39	0.39
9	0.69	0.49	0.46	0.53	9	0.75	0.59	0.52	0.45
13	1.01	0.95	0.88	0.78	18	1.00	1.00	0.89	0.92
<b>Fence e</b>									
1/2	-0.13	-0.13	-0.10	0.26	1/2	0.22	-0.28	0.16	0.16
1	-0.10	-0.13	-0.10	0.29	1	0.17	-0.18	0.16	0.22
2	-0.09	-0.10	-0.12	0.32	2	0.16	-0.17	0.13	0.27
3	-0.07	-0.12	-0.12	0.36	3	-0.14	-0.16	0.16	0.28
4	0.09	-0.12	-0.13	0.36	4	-0.14	-0.19	0.16	0.31
5	0.12	0.13	0.17	0.40	5	-0.16	-0.16	0.16	0.33
6	0.24	0.17	0.20	0.45	6	-0.16	0.16	0.17	0.36
7	0.50	0.27	0.27	0.52	7	-0.14	0.16	0.22	0.38
8	0.70	0.40	0.40	0.57	8	0.16	0.22	0.27	0.39
9	0.90	0.57	0.54	0.59	9	0.31	0.31	0.35	0.44
13	1.07	1.11	1.07	0.93	18	1.08	1.15	1.07	0.81
<b>Fence f</b>									
1/2	-0.15	-0.16	0.16	0.43	1/2	-0.15	-0.16	0.16	0.43
1	-0.13	-0.16	0.16	0.46	1	-0.13	-0.16	0.16	0.46
2	-0.15	-0.16	0.23	0.47	2	-0.15	-0.16	0.23	0.47
3	-0.11	-0.16	0.23	0.50	3	-0.11	-0.16	0.23	0.50
4	0.11	0.16	0.28	0.55	4	0.11	0.16	0.28	0.55
5	0.25	0.23	0.39	0.62	5	0.25	0.23	0.39	0.62
6	0.59	0.29	0.49	0.71	6	0.59	0.29	0.49	0.71
7	0.85	0.52	0.65	0.81	7	0.85	0.52	0.65	0.81
8	0.85	0.52	0.65	0.81	8	0.85	0.52	0.65	0.81
9	0.92	0.75	0.82	0.87	9	0.92	0.75	0.82	0.87
13	0.98	0.88	0.98	0.96	13	0.98	0.88	0.98	0.96
<b>Fence g</b>									
1/2	-0.06	-0.13	-0.12	0.39	1/2	-0.06	-0.13	-0.12	0.39
1	-0.08	-0.13	-0.13	0.42	1	-0.08	-0.13	-0.13	0.42
2	0.08	-0.13	-0.16	0.47	2	0.08	-0.13	-0.16	0.47
3	0.08	0.13	-0.19	0.52	3	0.08	0.13	-0.19	0.52
4	0.13	0.15	0.28	0.55	4	0.13	0.15	0.28	0.55
5	0.27	0.22	0.36	0.61	5	0.27	0.22	0.36	0.61
6	0.58	0.34	0.49	0.65	6	0.58	0.34	0.49	0.65
7	0.88	0.54	0.65	0.78	7	0.88	0.54	0.65	0.78
8	0.94	0.71	0.79	0.85	8	0.94	0.71	0.79	0.85
9	1.04	0.91	0.94	0.91	9	1.04	0.91	0.94	0.91
<b>Fence h</b>									
1/2	0.15	0.05	0.05	0.20	1/2	0.15	0.05	0.05	0.20
1	0.11	0.06	0.05	0.20	1	0.11	0.06	0.05	0.20
2	0.08	0.05	0.06	0.18	2	0.08	0.05	0.06	0.18
3	0.08	0.07	0.10	0.18	3	0.08	0.07	0.10	0.18
4	0.11	0.08	0.16	0.20	4	0.11	0.08	0.16	0.20
5	0.21	0.15	0.20	0.24	5	0.21	0.15	0.20	0.24
6	0.46	0.23	0.30	0.30	6	0.46	0.23	0.30	0.30
7	0.67	0.35	0.40	0.38	7	0.67	0.35	0.40	0.38
8	0.83	0.50	0.52	0.52	8	0.83	0.50	0.52	0.52
9	0.98	0.73	0.59	0.63	9	0.98	0.73	0.59	0.63
<b>Fence i</b>									
1/2	0.13	0.05	0.08	0.11	1/2	0.13	0.05	0.08	0.11
1	0.14	0.06	0.09	0.11	1	0.14	0.06	0.09	0.11
2	0.13	0.06	0.06	0.09	2	0.13	0.06	0.06	0.09
3	0.17	0.09	0.06	0.13	3	0.17	0.09	0.06	0.13
4	0.25	0.13	0.11	0.16	4	0.25	0.13	0.11	0.16
5	0.22	0.16	0.14	0.17	5	0.22	0.16	0.14	0.17
6	0.20	0.25	0.22	0.25	6	0.20	0.25	0.22	0.25
7	0.28	0.33	0.31	0.28	7	0.28	0.33	0.31	0.28
8	0.49	0.45	0.39	0.39	8	0.49	0.45	0.39	0.39
9	0.75	0.59	0.52	0.45	9	0.75	0.59	0.52	0.45
18	1.00	1.00	0.89	0.92	18	1.00	1.00	0.89	0.92
<b>Fence j</b>									
1/2	0.22	-0.28	0.16	0.16	1/2	0.22	-0.28	0.16	0.16
1	0.17	-0.18	0.16	0.22	1	0.17	-0.18	0.16	0.22
2	0.16	-0.17	0.13	0.27	2	0.16	-0.17	0.13	0.27
3	-0.14	-0.16	0.16	0.28	3	-0.14	-0.16	0.16	0.28
4	-0.14	-0.19	0.16	0.31	4	-0.14	-0.19	0.16	0.31
5	-0.16	-0.16	0.16	0.33	5	-0.16	-0.16	0.16	0.33
6	-0.16	0.16	0.17	0.36	6	-0.16	0.16	0.17	0.36
7	-0.14	0.16	0.22	0.38	7	-0.14	0.16	0.22	0.38
8	0.16	0.22	0.27	0.39	8	0.16	0.22	0.27	0.39
9	0.31	0.31	0.35	0.44	9	0.31	0.31	0.35	0.44
18	1.08	1.15	1.07	0.81	18	1.08	1.15	1.07	0.81



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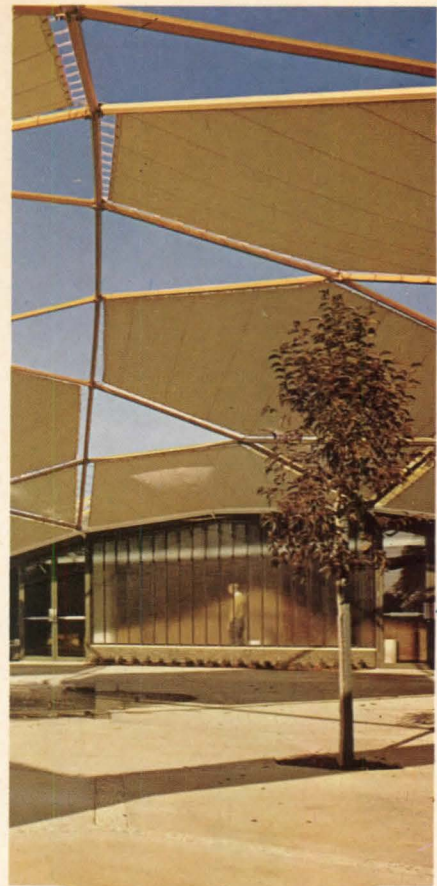
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## PROFILITE

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The adjoining flanges of the channel-shaped sections of Profilite eliminate the need for muntins . . . save this cost and provide attractive wall sections that are easily maintained. The vertical accent gives height emphasis to interiors and the glass helps distribute daylight for a more spacious feel in the environment. Each vertical line not only adds its heightening effect but also signifies built-in strength of Profilite.

## CHANNELED SECTIONS so easily handled two men can install

Profilite sections are just under 12 inches in width ( $11\frac{13}{16}$ ""). The stock lengths of 8, 10, and 12 feet are easily handled by two men without special equipment. Profilite weighs 4.34 lbs. per linear foot, so a ten-foot section could be lifted and set in place by one man if necessary and easily by a two-man team. Profilite is set in anodized aluminum sills supplied as part of the Profilite glazing system. Slip-in vinyl inserts seal the areas between metal and Profilite glass channels.





## CHANNEL MOVEMENT helps compensate as building shifts or settles

Profilite sections, because of their channel linkage, can move in relation to each other without tension. And there are no rigid metal members in between. Profilite's "flange joints" are cushioned top to bottom by non-hardening sealants or vinyl insets. The seal is positive, yet the glass is free to contract, expand, or move vertically. Profilite is thus especially suited for glazing buildings that may tend to settle.

## SO STRUCTURALLY STRONG

it's practically self-framing

Profilite has proved it withstands substantial wind pressures and suction forces. The structural configuration of each section forms extra strength every foot of the way. It is so resistant to lateral pressures that you do away with vertical members necessary in conventional glazing. You enclose vast stretches of wall areas, "channeling in" Profilite that builds in extra strength section after section.

## GIVES PLANTS CURTAIN WALL LOOK

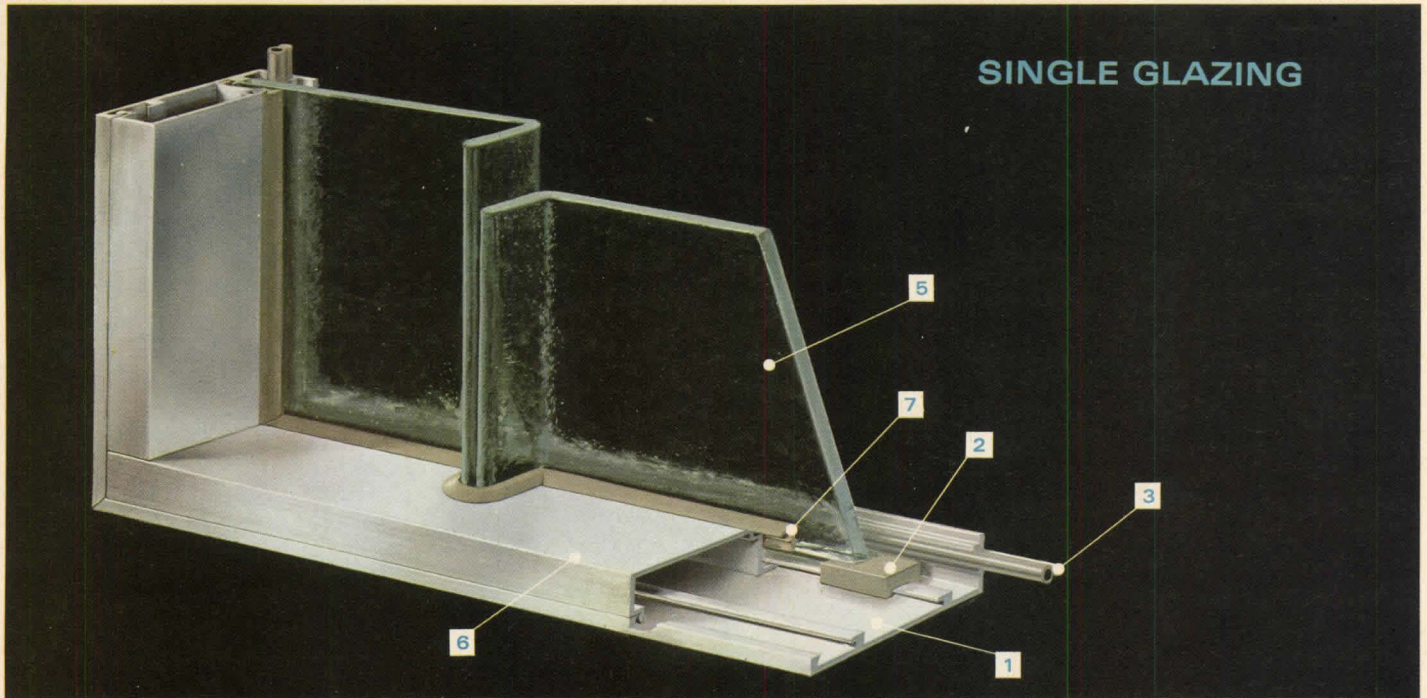
Profilite's biggest volume use at present is for exterior walls where its vertical lines give a curtain wall effect. Installed cost compares favorably with that of conventionally glazed areas. Double-glazed Profilite forms a 1½" air cushion between inner and outer channels for heat and sound insulation—U-value 0.55; visible transmittance 72%.



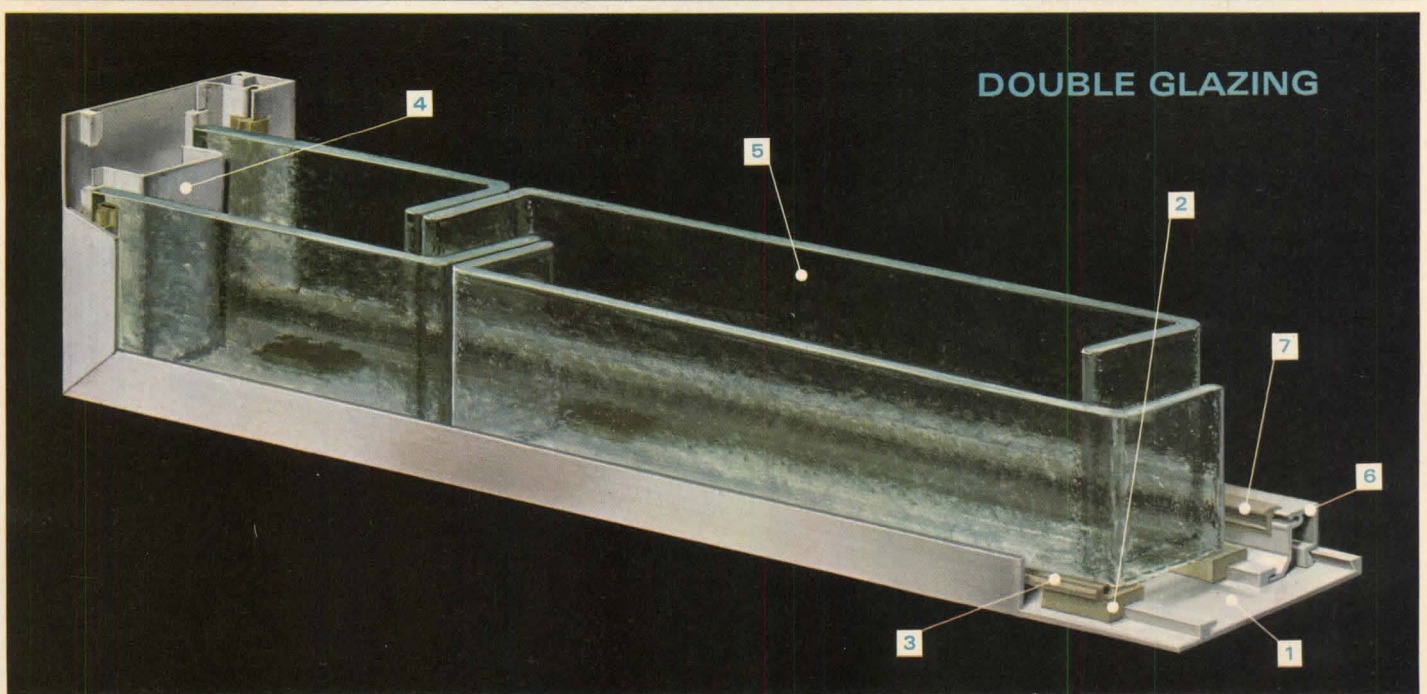


# PROFILITE EASY TO INSTALL

With Profilite you have a complete glazing system. Aluminium framing for periphery, jambs, heads and sill and vinyl setting blocks and slip-ins all supplied for double or single glazing.



SINGLE GLAZING



DOUBLE GLAZING

- 1 Extruded aluminum periphery frame. 2 Vinyl setting block. 3 Vinyl slip-in. 4 Bent aluminum section.
- 5 Profilite. 6 Extruded aluminum sill snap-on. 7 Vinyl roll-in.

Write for Profilite Installation Guide for detail glazing instructions.



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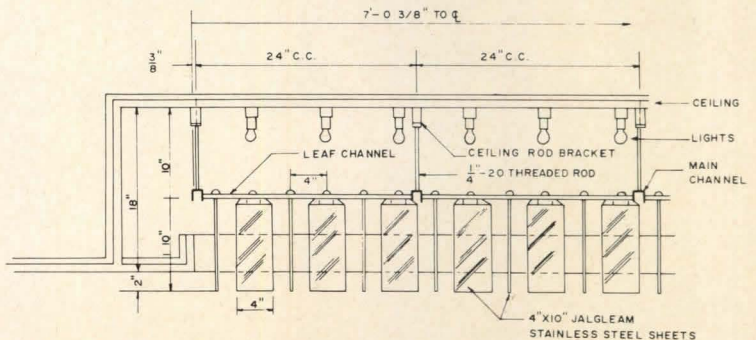
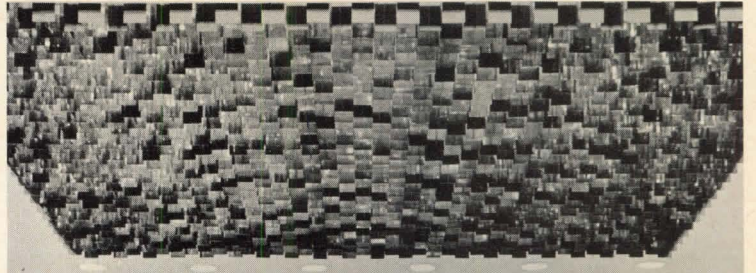
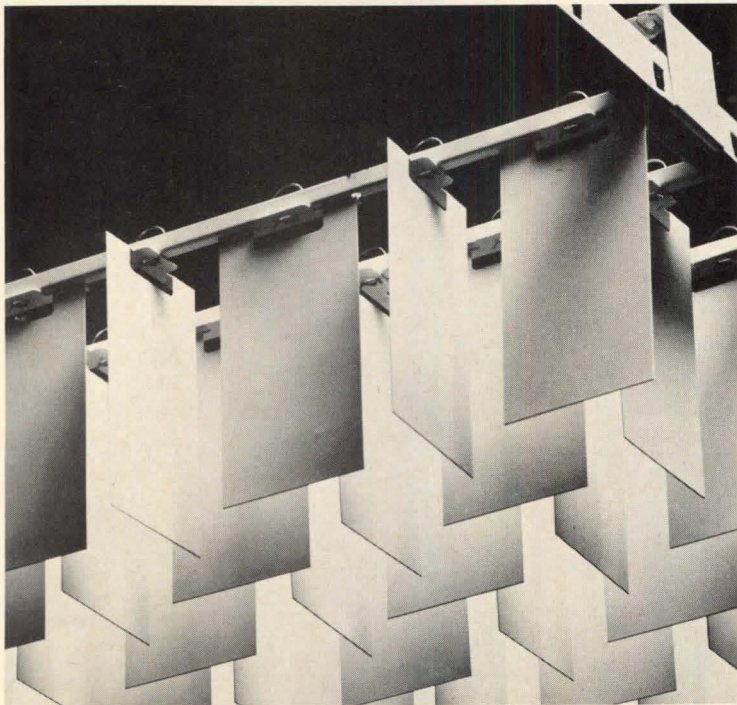
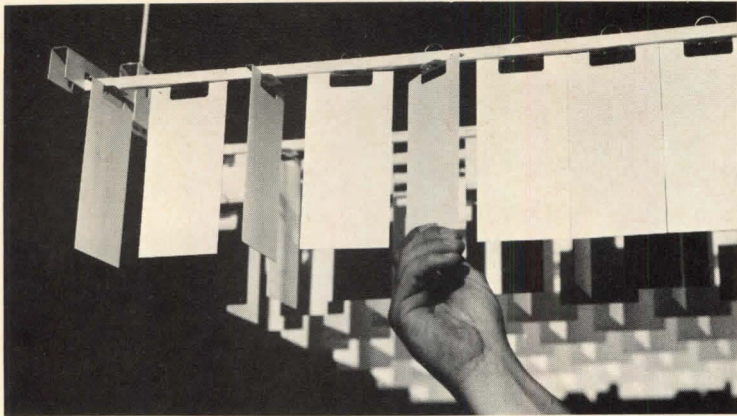
Largest Domestic Manufacturer of Rolled, Figured and Wired Glass



For more data, circle 67 on inquiry card



For more information circle selected item numbers on Readers Service Inquiry Card, pages 239-240



**Stainless steel ceiling glitters in the lobby of a \$30-million Miami complex**

A total of 4,536 highly reflective stainless steel sheets were selected to hang in the lobby of the new Sheraton Four Ambassadors, a 500-unit hotel-apartment complex in Miami. The 542-ft-long, 50-ft-wide lobby links and serves all four of the 20-story towers in the complex. Certain large public areas in the lobby are devoted to an exhibit of fine paintings. One of these areas is pictured above right.

The JalGLEAM stainless steel sheets, a product of Jones & Laughlin Steel Corporation, are said to be lightweight and easy to fabricate, while maintaining good reflective qualities and being corrosion resistant.

The basic assembly, called the Leaf-Lite design, consists of individual 4-in. by 10-in.

JalGLEAM panels or leaves hung separately to steel channels. There are three parts to this type of ceiling construction: the leaf channel, the hanger channel and the hanger-coupler. Photo bottom left shows how leaves hang on leaf channels and how these channels connect to a main channel.

The leaf channels with the stainless leaves were shipped flat. At the hotel, they were hung a row at a time in self-indexing slots, spaced 4 in. apart. A curved bracket was riveted onto one end of each leaf and then attached to a leaf channel (photo top left). Leaf channels were then hung between two larger main channels—leaf channels spaced 4 in. apart, main channels 2 ft apart. At intervals of approximately every 24 in.,

1/4-in. threaded rods were hung to carry the main channels directly from the building structure. Once the leaves were hung, alternate leaves were turned to lock tight and square. (Leaves can be turned flat again for cleaning.)

The Leaf-Lite system is hung below the lamps at a distance equal to the center-to-center spacing of the lamps (drawing). Everything above the Leaf-Lite is painted white and lamps are placed in rows at right angles to the main hanger channels. Thus, the light source is obscured beyond an angle of 55 deg. ■ Luminous Ceilings, Inc., Chicago.

Circle 300 on inquiry card  
more products on page 166





INTERNATIONAL  
CONFERENCE OF  
BUILDING OFFICIALS  
(ICBO)







# Testimonial to your good judgement and our reputation.

## These Code Approvals.

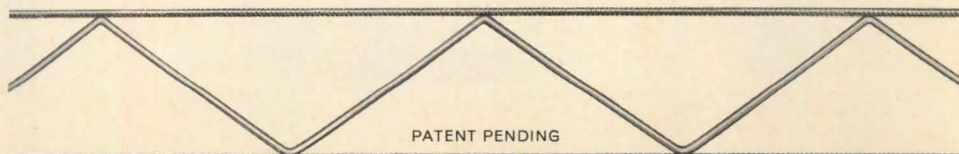
The three significant code approvals shown say a lot for both of us.

When you specify Dur-O-waL truss masonry wall reinforcement your clients get the assurance that a quality product protects the distinctive beauty and adds longer life to masonry walls.

When the Building Officials Conference of America (BOCA), International Conference of Building Officials (ICBO), Southern Building Code Congress (SBCC) and local codes give their materials approvals to Dur-O-waL, your good judgement and our reputation both benefit.

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For more data, circle 68 on inquiry card



Ellerbe Architects, Inc.  
H. G. Christman Construction Co., Inc.

# The Sargent Maximum Security System Protects Notre Dame Library



The new Memorial Library of the University of Notre Dame is the largest of its kind in the world. Its 750,000 volumes include many manuscripts, folios and volumes of priceless nature and one-of-a-kind editions.

The University decided on the Sargent Maximum Security System for the 782 locks which guard the library areas, exhibits and faculty offices.

The new lock system prevents unauthorized key duplication: the unique six-sided reversible keys with precision

milled indentations cannot be duplicated on "corner-store" key cutting machines.

In addition, the Notre Dame Library is acquiring in these locks a new degree of pick-resistance. Unlike conventional cylinders, which have a single row of usually five or six key pins, the new cylinder has 12 key pins located on three different rows. The pins converge on the key from three different angles, making the cylinder all but impervious to the usual professional picking or "raking" techniques.

The Notre Dame Library contains a large number of faculty offices in addition to its books. Area control was greatly aided by the many levels of master-keying available in the Sargent Maximum Security System.

Among the other out-

standing examples of Maximum Security installations are the new Loyola University of Chicago Medical Center; Pier 66 luxury motel-marina in Fort Lauderdale; Philco Ford, Western Development Laboratory, in Palo-Alto, California, which is typical of large manufacturing plants with proprietary security needs; the offices of the Secretary of Defense in the Pentagon; and Allstate Insurance Company's home office building outside of Chicago.

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

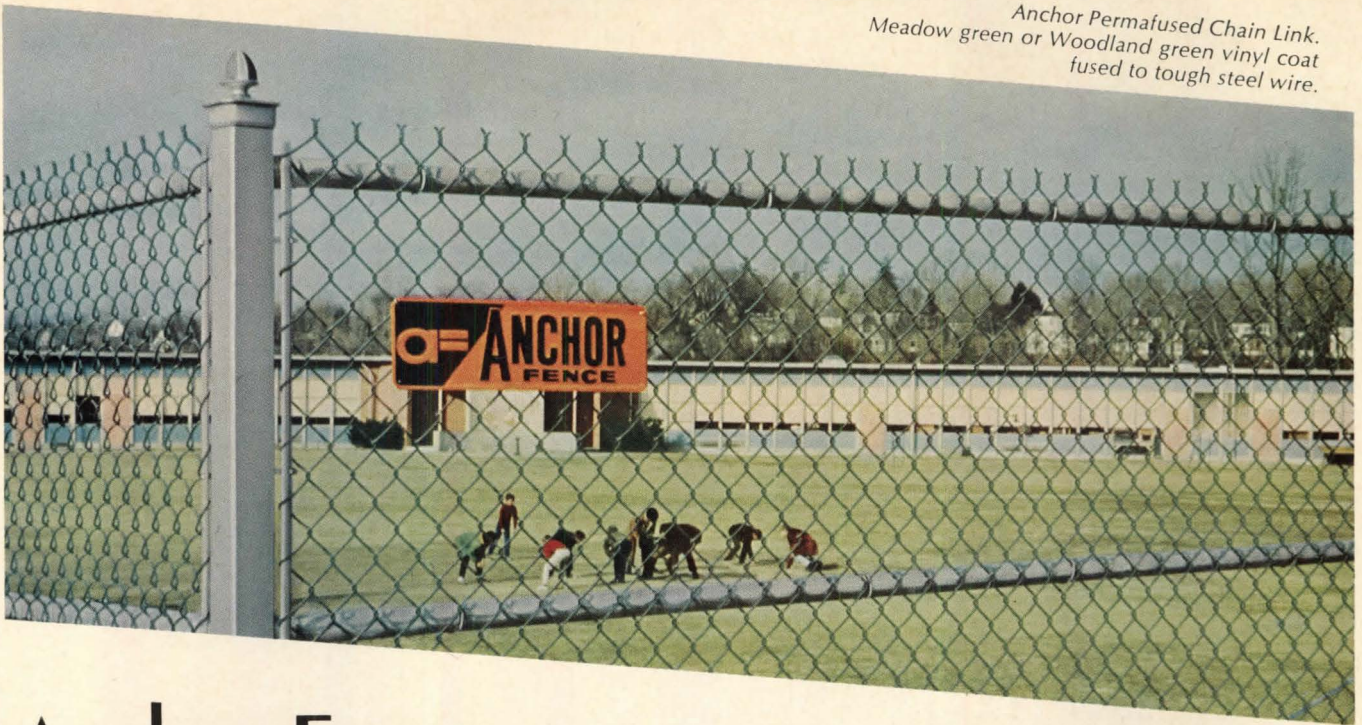


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 Please list applications that interest you: Chain link for \_\_\_\_\_  
 Anchor Privacy for \_\_\_\_\_ Railing systems for \_\_\_\_\_

Thank you.

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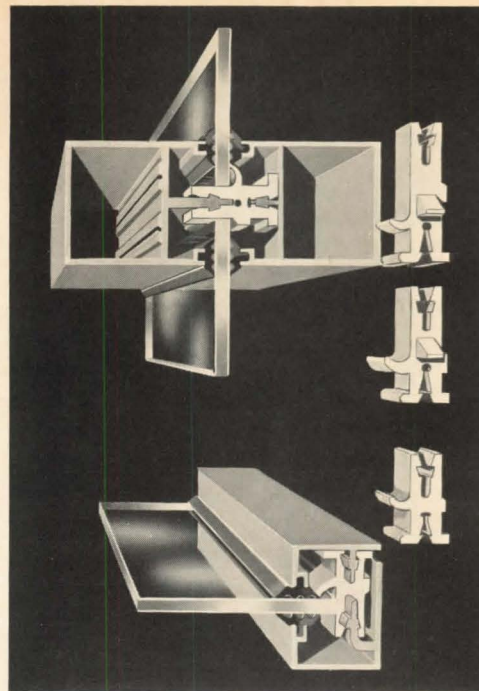
continued from page 161



**CONVEYOR SYSTEM** / A power and free conveyor system has been designed for business offices, manufacturing complexes and hospitals. The system, which is installed within walls and above ceilings, moves small items in compact plastic trays to any point in a multi-story building. ■ Jervis B. Webb Company, Detroit.

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**WINDOW WALL** / Thermo barrier aluminum window frames are comprised of faces and gutters that are joined and locked, but insulated from each other by a T-block. There is no metal-to-metal contact between the interior and exterior, virtually eliminating frost and condensation



with temperatures as low as -30 deg. F. ■ Cronstroms Manufacturing, Inc., Minneapolis.

Circle 302 on inquiry card

**BUTYL RUBBER POLYMER** / LM Butyl and LM Chlorobutyl, semi-liquid polymers that cure at room temperature, have been developed to meet growing needs of the sealants industry: improved aging, improved compression, reduced moisture vapor transmission, ease of application and lower cost.

The production process produces narrow molecular weight distribution, which maximizes tensile strength and minimizes viscosity for a given molecular weight. The system can be adjusted to cure in hours or weeks. ■ Enjay Chemical Company, New York City.

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**A WOMAN'S BATHROOM** / This bathroom for a woman offers the full range of make-up and grooming accessories—a private cosmetic counter equipped for hair rinsing and dyeing, and with a concealed hair dryer and recessed lavatory. There are multiple lights around the mirror for application of make-up. ■ Eljer Plumbingware Division, Wallace-Murray Corporation, New York.

Circle 304 on inquiry card

more products on page 178

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Swing with colors that suit both rooms  
...stand up to time and traffic.

Doors clad with FORMICA® laminate can be color coordinated to blend or contrast beautifully with both areas they face, at no premium. Choose from a multitude of colors, patterns and woodgrains to create the precise nuance desired. Specify doors clad with FORMICA® laminates and you'll get durable beauty and low maintenance. Your interior designer will get real freedom of color selection. Your client will applaud both. Contact your Formica representative or write Dept. AR-79 for the names of authorized manufacturers near you or your job site.

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Caution:  
Granite  
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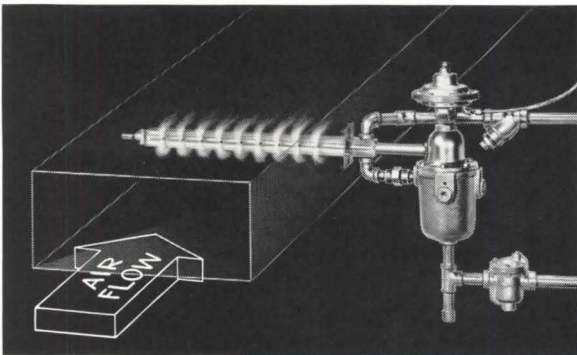


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**ENJAY**  
**NEVAMAR**  
*newest look in Laminates*

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continued from page 166



**ELECTRONIC AIR CLEANER** / A filter system, which operates on the electrostatic precipitation principle and is available in one-cell and two-cell models, is designed for central air conditioning installations. Operating costs are reported "negligible,

but efficiency in terms of the removal of airborne particulate matter is rated as high as 95 per cent." ■ Fedders Corporation, Edison, N.J.

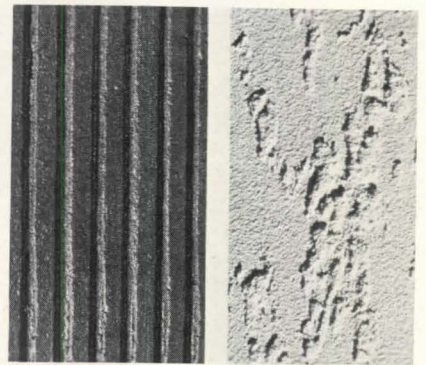
Circle 305 on inquiry card



**CENTRAL CLEANING SYSTEM** / Highlights of the system are said to be quiet efficiency, ultimate safety, low-cost installation and de-

lux cleaning attachments including a heavy-duty, air-powered revolving brush. Wall inlets turn the system on automatically when the 25-foot flexible hose is inserted. ■ NuTone, Cincinnati.

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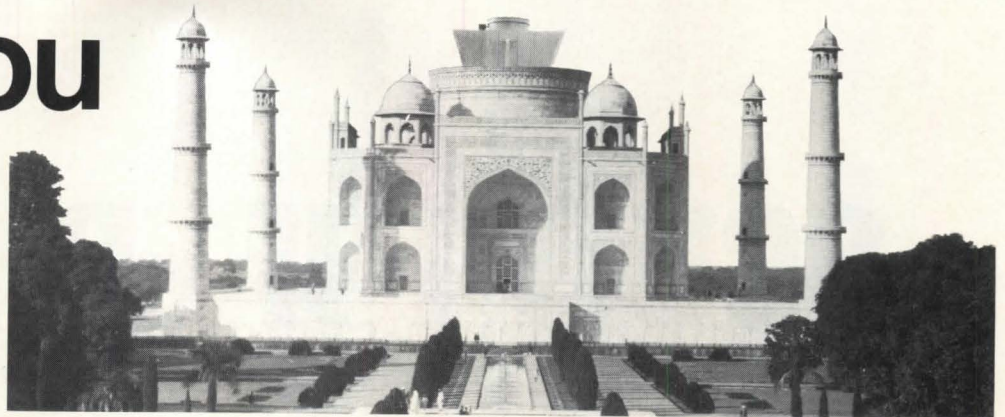


**SURFACING** / Pebbletex, a texture-controlled surfacing that uses no aggregate, can have widely varying appearances—either matte or glossy, in textures ranging from fine orange peel to coarse pebble. It can be gun-applied in the shop or on the job to almost any relatively smooth surface. ■ Finestone Corporation, Detroit.

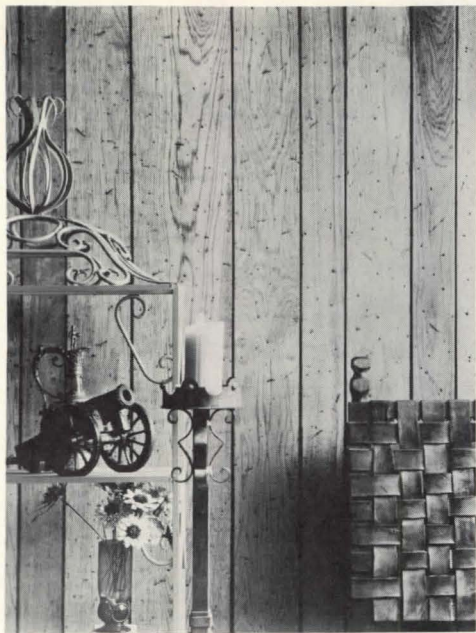
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**AGED LOOK** / Indentations of age can be felt as well as seen in this "antique" ply-

Now you see it.



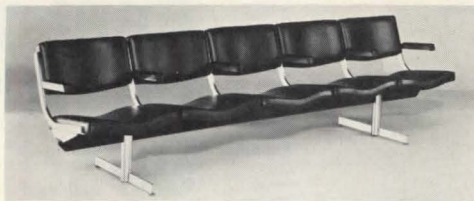




wood wall paneling. *Old World* is available in oak, pecan, cedar and birch. ■ Georgia-Pacific, Portland, Ore.

Circle 308 on inquiry card

**SEQUENTIAL SEATING** / Arm chairs, armless chairs, and benches, which can be specified on supporting T-rails from two to five units long, have been designed in response to the increasing need for com-



fortable, durable seating in fast-growing airport terminals. Heavy construction provides stability—even on polished floors—yet units can be moved to other locations as needed. Seats and backs are field-replaceable. ■ Harter Corporation, Sturgis, Mich.

Circle 309 on inquiry card



**VINYL UPHOLSTERY** / A collection of fabrics for contract and residential use stars 16 stylized hand-printed patterns in a total of 76 stock colorways. Shown is *Dhane*, a large-scaled contemporary outline floral with an unusual multi-colored effect. ■ Durawal Inc., New York City.

Circle 310 on inquiry card

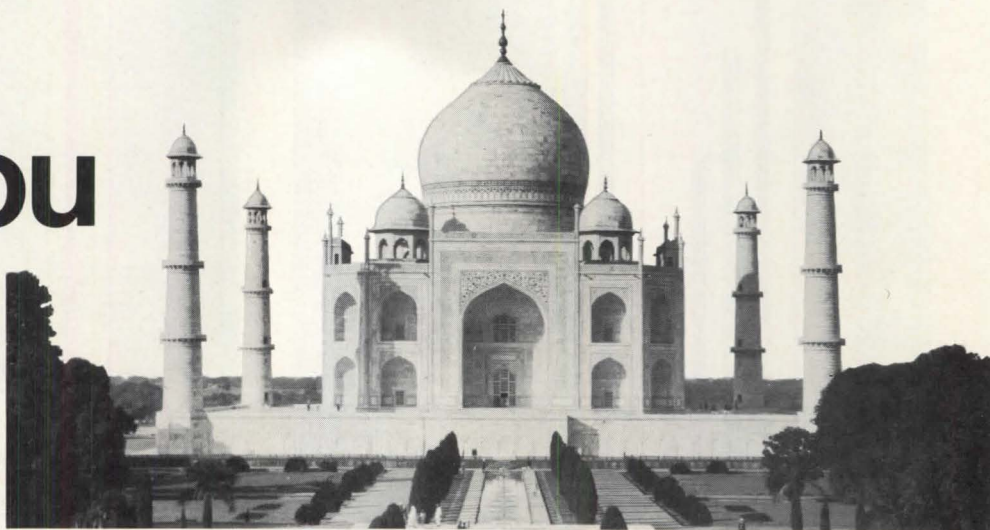


**WATER SAVER** / This unit uses 1/3 less water than conventional fixtures. The *Water Miser Radcliffe* closet incorporates an improved design of the siphon jet to provide less water usage with positive flushing action. The unit also uses a smaller tank to achieve a silhouette 2½ in. lower and 2 in. narrower than the regular model. ■ Crane Co., Chicago.

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more products on page 182

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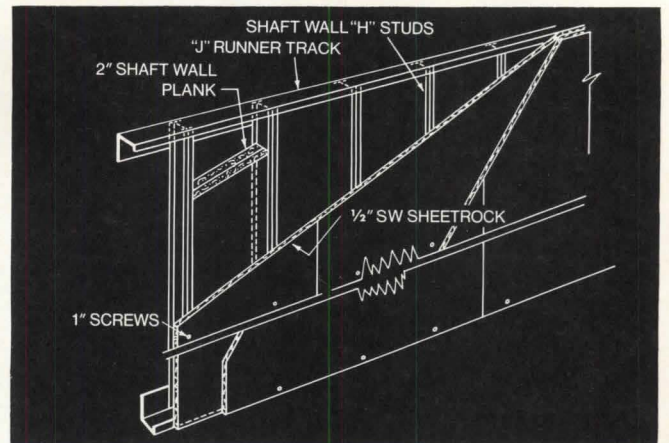
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## UNITED STATES GYPSUM

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**When it can't, he can.**



We know you'd like an all-purpose trouble-free construction joint sealant. □ So would we. But right now, MONO's as close as we can come . . . and it won't do everything, any more than any other types and brands we've tested. □ Sure, MONO's good and works so well under the kind of adverse conditions (dust and moisture) that are common to the job site, that we suspect many construction people actually look on it as an all-purpose sealant. □ But actually Tremco's business isn't based on selling *any* all-purpose sealant. Instead we're a single-purpose company. We're The Water Stoppers and we want to give you leakproof security in every joint on the job. □ So we make not one, but fourteen other sealants besides MONO, like a very good polysulfide (Lasto-Meric), a highly-regarded preformed tape (440) as well as a dozen others with special purposes. □ The only all-purpose item in our catalog is the Tremco Representative. He has been thoroughly trained to provide you the proper sealant for each application and is ready to give job-site assistance before, during and after each project. □ Why not give him a call next time you run into the sealant gap? He'll get you across every time. □

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**TREMCO**  
The water stoppers



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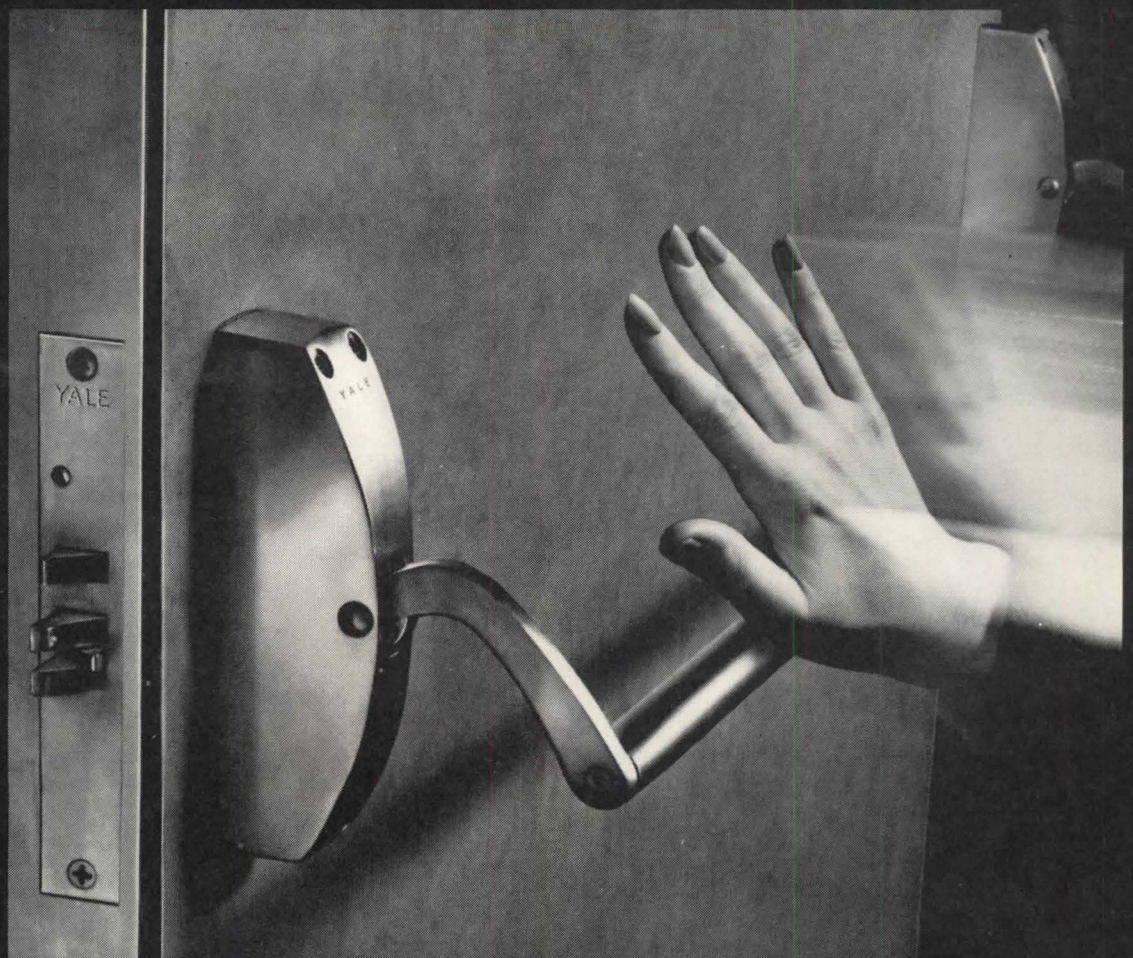
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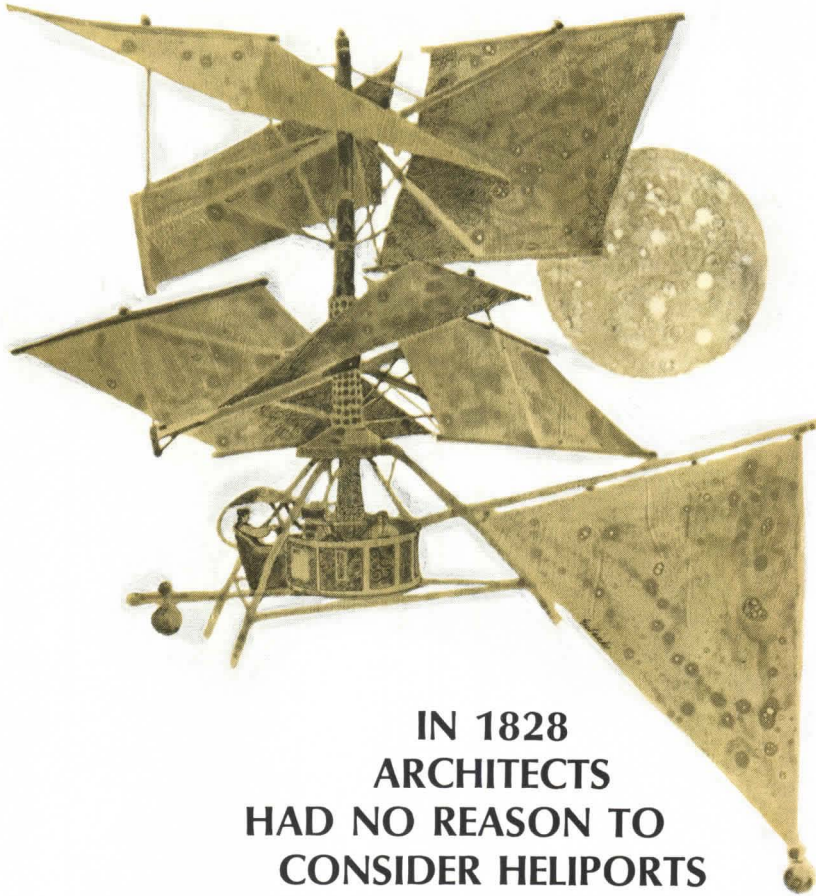
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Because, in 1828, Vittorio Sarti's helicopter was strictly a flying machine. There were no urban traffic snarls or airports far from city business districts. Today, the business use of helicopters is a growing reality. New twin-engine helicopters will eliminate flight restrictions over cities. If you are designing city centers, industrial plants, major building complexes and hospitals, now is the time to plan for heliports and helistops.

It costs substantially less to include a heliport in your original plans than to add one later.

### Free Heliport Design Kit

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For more data, circle 82 on inquiry card



**FIRE CONTROL PARTITIONS** / A metal folding partition promises to handle problems arising from large open areas in all types of public and private buildings. Besides opening and closing quickly and easily, the partition, available in unlimited sizes, provides a high level of sound control and has a fire rating sufficient to prevent fires from spreading. ■ Won-Door Corporation, Salt Lake City.

Circle 312 on inquiry card



**THEATER SEAT** / The P-2 seat, designed by Finnish architect Esko Pajamies, features seat that tips up automatically and a cantilevered wood arm. Padded seat and back are electronically glued hardwood plywood; frame is welded steel with black baked enamel finish. ■ J. G. Furniture Co., Inc., New York City.

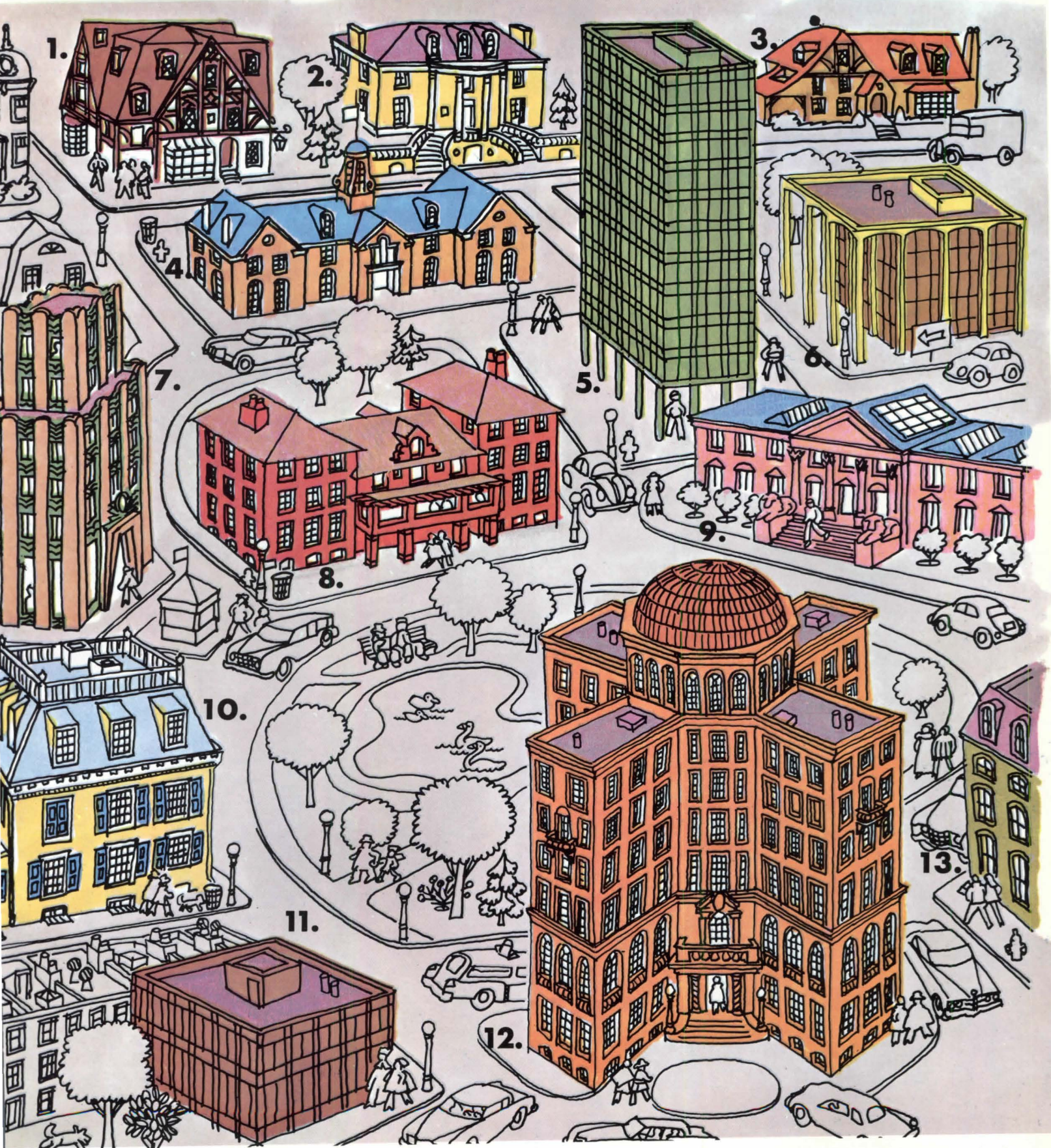
Circle 313 on inquiry card



**KITCHEN DESIGN** / An expanded collection of horizontal and vertical laminate design concepts is expected to make a strong penetration into the kitchen cabinet market. The new package of designs consists of 25 vertical grade cabinet surfacing laminates and 11 standard collection patterns for countertop and other horizontal installations. ■ Formica Corporation, Cincinnati.

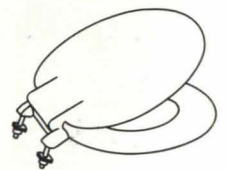
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# You're better off with Beneke on

Circle any city center. Count the buildings that count on Beneke. Beneke: not just the biggest in bathroom seats but best. Up there in every way down to the smallest bolt. Hospital. High Rise. Hotel. City. Suburb. Plane. Train. You can do it with Beneke best. **Beneke celebrating 75 celebrated years**



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## Make your ideas concrete . . . with Mo-Sai®

Whether you're planning a new office-plant in the Connecticut woods (like Torrington), a high-rise office building (like Hartford), a modest but distinctive headquarters office (like National Farm Life and Wausau) . . . you'll find it pays to ask your architect about Mo-Sai®.

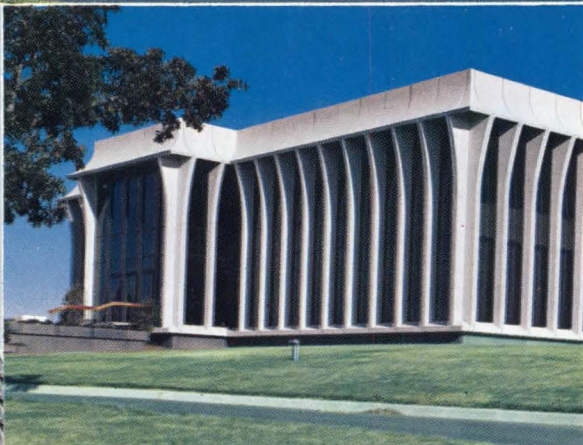
**What is Mo-Sai?** Your architect will tell you it's a very special kind of precast concrete product . . . made to rigid quality-control standards in licensed plants located in major cities of the United States, Canada, and Japan. He may tell you it's a facing panel . . . or a window wall . . . or a load-bearing structural unit . . . a curtain wall . . . a decorative material . . . or even a component building system . . . all with the unique Mo-Sai exposed aggregate finish that can be produced in a variety of colors and textures limited only by your own or your architect's imagination!

**The Cost?** You may be surprised when you learn how you can have all the aesthetic values of Mo-Sai and still save money with new Mo-Sai structural units. Savings continue on erection time, interim financing, and maintenance.

**Where can you see it?** There are examples of infinite variety in major cities across the nation. Call your local licensed Mo-Sai manufacturer, ask your architect, or write to the address below:

Mo-Sai Institute, Inc., / 110 Social Hall Ave.  
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You can do more with versatile . . .



Top: Employers Insurance of Wausau  
Wausau, Wisconsin  
Architects: Childs & Smith, Inc., Architecture-Engineering

Middle left: Hartford National Bank Building  
Hartford, Connecticut  
Architects: Welton Becket and Associates

Middle right: National Farm Insurance Company  
Fort Worth, Texas  
Architects: Grayson Gill, Inc.

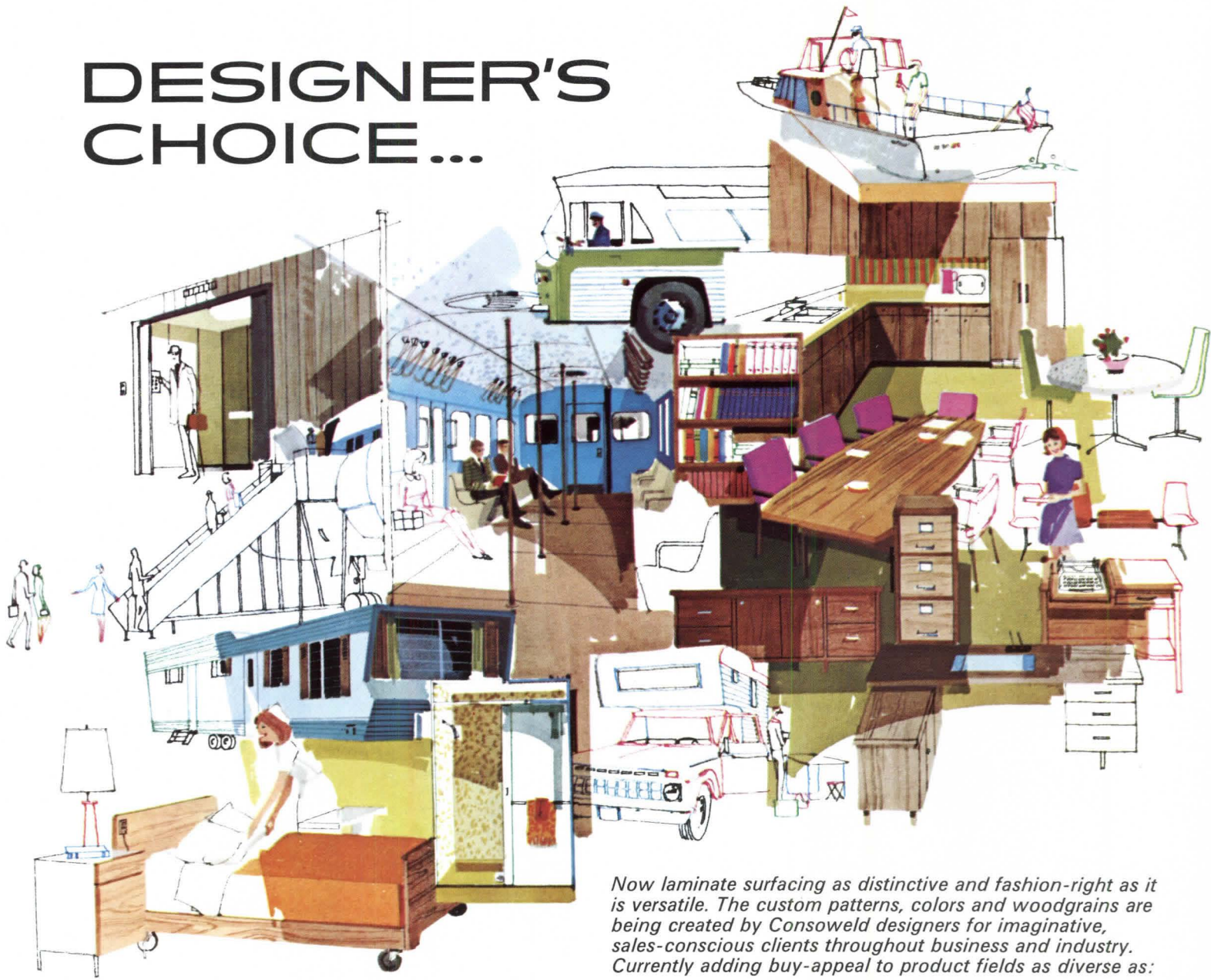
Bottom: Torrington Manufacturing Company  
Torrington, Connecticut  
Architects: Marcel Breuer and Herbert Bechard

For more data, circle 84 on inquiry card

For more data, circle 85 on inquiry card



# DESIGNER'S CHOICE...



*Now laminate surfacing as distinctive and fashion-right as it is versatile. The custom patterns, colors and woodgrains are being created by Consoweld designers for imaginative, sales-conscious clients throughout business and industry. Currently adding buy-appeal to product fields as diverse as:*

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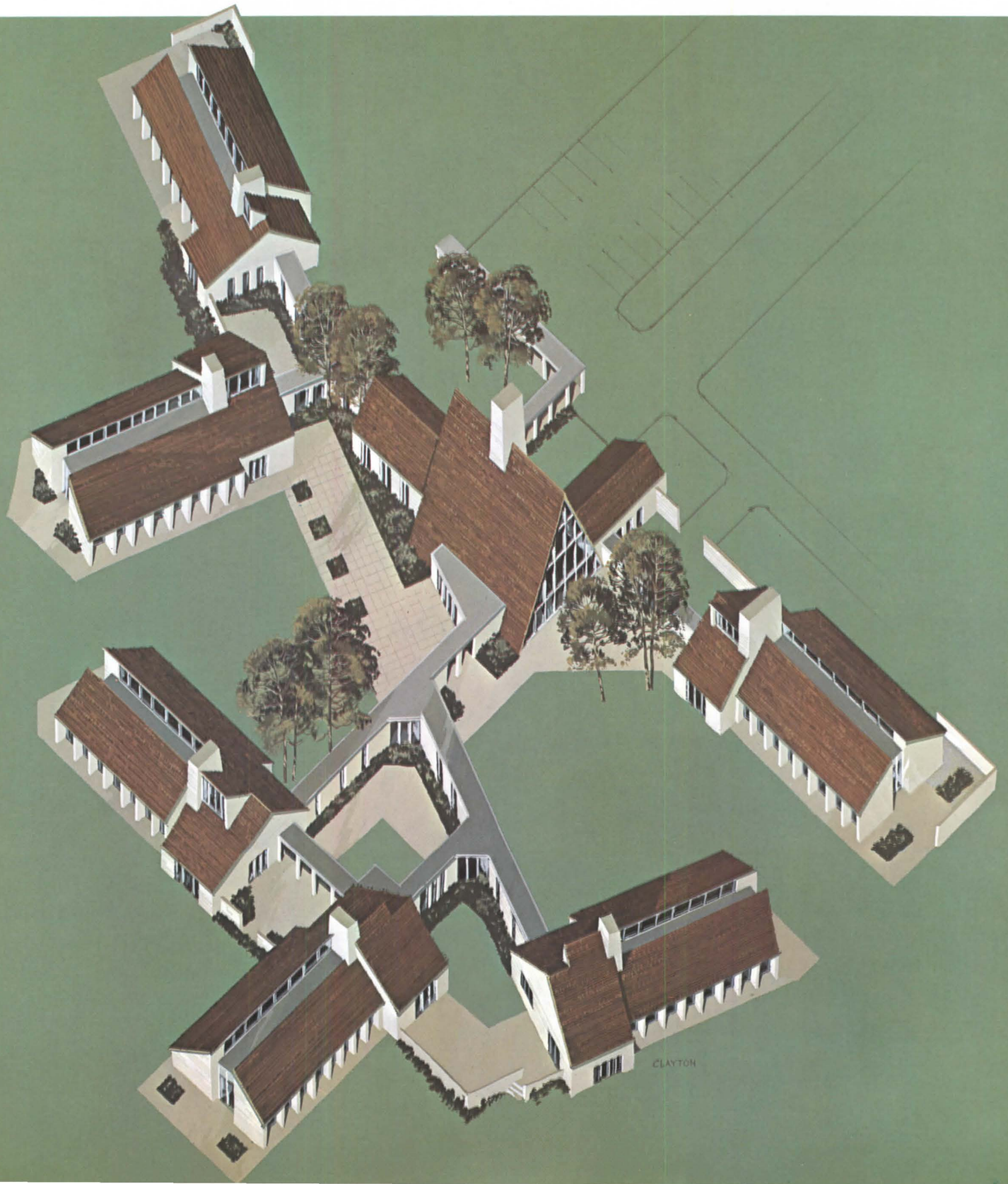






AN EXTENDED CARE FACILITY by CELLARIUS & HILMER, ARCHITECTS

Sponsored by *PHILIP CAREY CORPORATION*





# An Extended Care Facility

One of the immediate problems arising from passage of the MEDICARE program of hospital care for the elderly was massive congestion at already overtaxed hospital facilities. Today, however, extended care facilities are helping to relieve this congestion.

An extended care facility, like this one designed by Cellarius & Hilmer, provides care for the convalescing patient between the intensive treatment of hospitalization and his return to active life at home. A major advantage of the facility is reduced cost . . . rates are half those of hospitals. Construction cost is also halved.

Equipped and staffed for the special needs of the convalescent, an extended care facility affords the patient's personal physician a variety of treatment programs to draw on . . . physical and inhalation therapy, diagnostic X-ray, pharmacy and laboratory services.

This 200-bed facility is made up of six nursing units of 16 to 20 double rooms each. The clerestory-lighted corridor surrounds a core of service areas. Lounge, dining room and day room open out to patios which provide a variety of relaxing areas for the ambulatory patient.

Enclosed ramps leading to the administration building form open courts where even the senile or disturbed patient may enjoy the open air without constant supervision.


The residential-style buildings in a non-urban, non-institutional setting, agreeable textures, quiet colors and places to sit quietly . . . the security of enclosure and the serenity of vista . . . all contribute toward the patient's recovery and his return home.

Philip Carey Corporation is privileged to sponsor the presentation of this design study for the architectural and medical professions. The planning and development of such facilities promise significant social advances for the nation as a whole.

Throughout this extended care facility, many established Philip Carey building products can be specified with assurance. This is true of products used on the visible surfaces as well as those in hidden areas which determine the long life of a low-maintenance building.

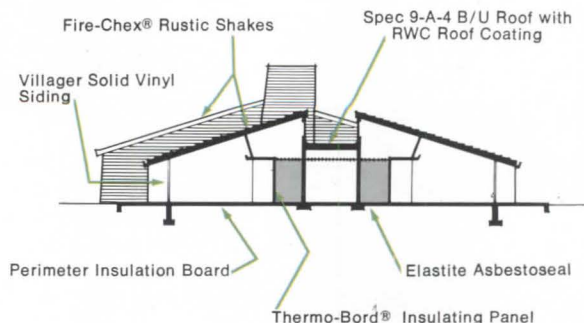
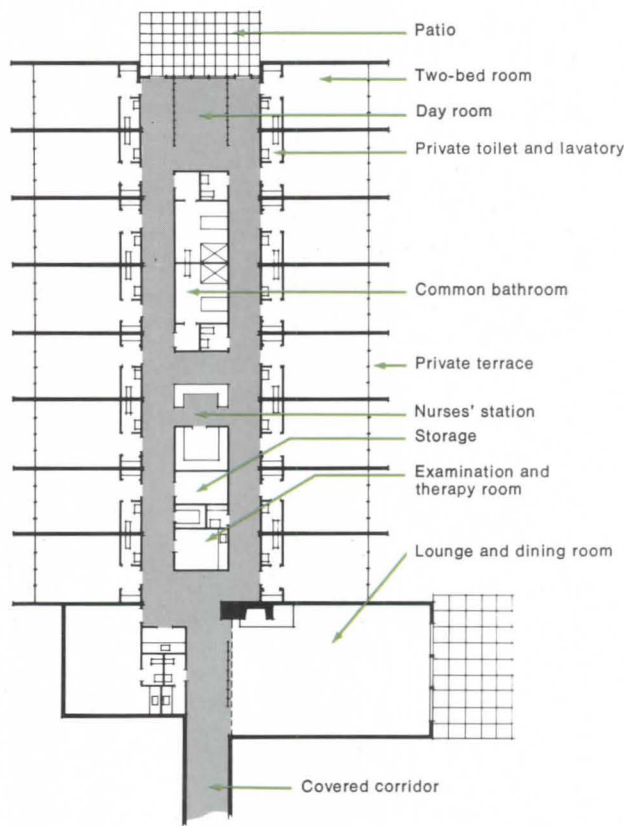
In addition to the Carey products listed at the right, further convenience can be built into these facilities with Miami-Carey bathroom cabinets and lights, framed mirrors and wide assortment of washroom equipment.

WRITE US for your personal file folder containing developed construction details of this Cellarius & Hilmer project.

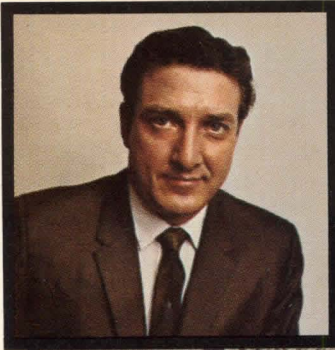
Detail Sheet for  
**AN EXTENDED CARE FACILITY**  
 Designed by  
 Cellarius & Hilmer, Architects  
 Cincinnati, Ohio  


**PHILIP CAREY CORPORATION**

Cincinnati, Ohio 45215







# The Commander.

He commands carpeting from Sequoyah.



His name: Dan Tipton, Administrator of the South Community Hospital in Oklahoma City. His assignment: Selecting 9,000 yards of a unique, functional, and performing carpet. His choice: Carpeting of A.C.E.<sup>®</sup> (Allied Chemical Engineered) nylon fiber from Sequoyah Carpet Mills, for high durability, low maintenance, and exceptional resistance to flame-spreading which qualifies it under the Hill-Burton Act. His pattern: Marathon in rich gold tweed for the patients' rooms and deep blue-green tweed for the halls. Allied Chemical backs carpeting carrying its A.C.E. label with a solid three-year guarantee. Become a Commander. Write Allied Chemical Corp., Fibers Div., One Times Sq., N.Y., N.Y. 10036.

**SEQUOYAH**

*Wear Guarantee*

This carpet is guaranteed by the Fibers Division of Allied Chemical. If it is properly installed and maintained and the surface pile in any given area wears more than 10% within 3 years it will be replaced at our expense. The guarantee does not cover tears, burns, spills, cuts or damage due to improper cleaning agents or methods.



For more data, circle 88 on inquiry card



# Water problems on your roofs? Solve them with FOAMGLAS® insulation.

FOAMGLAS cellular glass insulation is *waterproof*. It doesn't get wet from roof leaks and can't absorb vapor from inside the building. Dimensional stability and high compressive strength of FOAMGLAS provide a solid base for roofing. No other insulation has this combination of properties.

FOAMGLAS is available in FOAMGLAS-Board and the Tapered FOAMGLAS system, for a sloped roof on a flat deck. FOAMGLAS is the only roof insulation guaranteed for 20 years. For more information, write Pittsburgh Corning Corporation, Dept. AR-79, One Gateway Center, Pittsburgh, Pa. 15222.

The Insulation People



For more data, circle 89 on inquiry card

## OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 239-240

**CABINET UNIT HEATERS** / A 28-page catalog shows three basic models of which eight unit sizes and 30 options and accessories combine to offer hundreds of cabinet unit heaters with capacities ranging from 10,500 to 164,000 BTUH. ■ Modine Manufacturing Co., Racine, Wisc.

Circle 400 on inquiry card

**GIRDER** / A six-page brochure presents the *PANLWEB* girder which consists of top and bottom flanges joined by a ribbed web. It is designed to shorten engineering time and reduce weight, without sacrificing strength.

■ Macomber Incorporated, Canton, Ohio.

Circle 401 on inquiry card

**COMPUTER ROOM AIR CONDITIONER** / A downflow air conditioner specially designed for computer rooms is described in an eight-page brochure. The brochure tells how solid-state design and an exclusive bypass air flow system maintain precise levels of temperature, humidity, and cleanliness. Other features—including dual refrigeration and filtration systems, underflow air distribution, a water-to-air heat exchanger, and the fully front-accessible cabinet—are also described and illustrated. ■ Westinghouse Electric Corporation, Pittsburgh.\*

Circle 402 on inquiry card

**GALVANIZING INDUSTRY** / Highway, architectural, bridge, structural and other applications of hot-dip galvanized steel are discussed and illustrated in a 16-page, two-color booklet that "profiles the modern galvanizing industry." ■ American Hot Dip Galvanizers Association, Washington, D.C.

Circle 403 on inquiry card

**COPPER TUBE AND PIPE** / A 40-page, two color, illustrated brochure on the application of copper water tube (including DWV) and red brass pipe, in all types of commercial, as well as residential construction includes specifications and installation techniques as well as photographs and detail drawings. ■ Revere Copper and Brass Incorporated, New York City.

Circle 404 on inquiry card

**ADHESIVES** / A four-page, two-color illustrated catalog describes *3M Brand* insulation adhesives for bonding fibrous glass insulation to galvanized sheet, steel and aluminum in the fabrication of duct work, heating-air conditioning and refrigeration units. ■ 3M Company, Birmingham, Mich.

Circle 405 on inquiry card

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

more literature on page 198





Men who specify and install plumbing fittings know the real importance of quality. That's why Speakman has been growing for the past one hundred years.

1869 - 1969  
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## Therm-O-Proof insulating glass, naturally.

All three floors of this Neo-Classic Great Falls Library are visible from the outside. The natural light provided by the use of the window wall produces an inviting and welcome atmosphere conducive to study.

In addition, the utmost in protection was required for the large glass areas

against the natural harsh winters ( $-70^{\circ}$  at nearby Rogers Pass, 1954) and natural hot summers ( $117^{\circ}$  at Medicine Lake, 1937). To provide the finest in environmental control, Architects McIver & Hess, Great Falls, specified Therm-O-Proof insulating glass—made more ways to fit more ideas, naturally.

For more data, circle 30 on inquiry card

Full color insert  
in Sweets  $\frac{4a}{Th}$

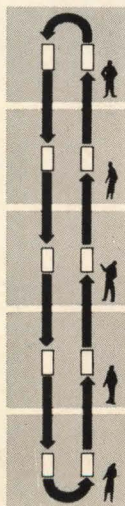
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Free illustrated booklet tells all about sound columns . . . how they can increase effective power of sound reproduction by 75% or more . . . even in most difficult structures. Write today!

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# The number is Menlo 921L

Your number for efficiency. Functional, contemporary beauty. Menlo captures the style, quality and security typical of each Corbin UNIT<sup>®</sup> Lockset. You'll also find these features in the complete line of Corbin exit devices, door closers and other types of locksets.

Your Corbin distributor can furnish you with complete data on this design, or write P. & F. Corbin, Division of Emhart Corporation, New Britain, Connecticut 06050. In Canada—Corbin Lock Division.



*For more data, circle 92 on inquiry card*





## TUFF-LITE® IS A BIG PUT-ON

It's big with people who put exposed aggregate on walls.

It's Tuff-Lite — an epoxy-based wall matrix that won't cop out: it has held larger rocks (and more of them) for a longer time than any other epoxy matrix! And its holding power has been proven in temperature cycles of  $-40^{\circ}$  F. to  $+135^{\circ}$  F. for periods of up to 8 years.

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*For more data, circle 93 on inquiry card*





# His Place

His locker. His own thing.  
His own place for the stuff  
of learning.

Now his place can be  
brighter, more cheerful than ever before,  
more conducive to learning.

Republic is here with "Decor 19" — school  
lockers in 19 decorator-selected colors at no extra cost.

Use them freely. Mix colors and styles.  
Make them as formal or as far-out as you wish.  
Make his locker work on his desire to learn.

And by giving him a Republic "Decor 19" locker  
for his things, you give him something tremendously important.  
You make his own place bright, you make him  
feel better, you make him want to learn.

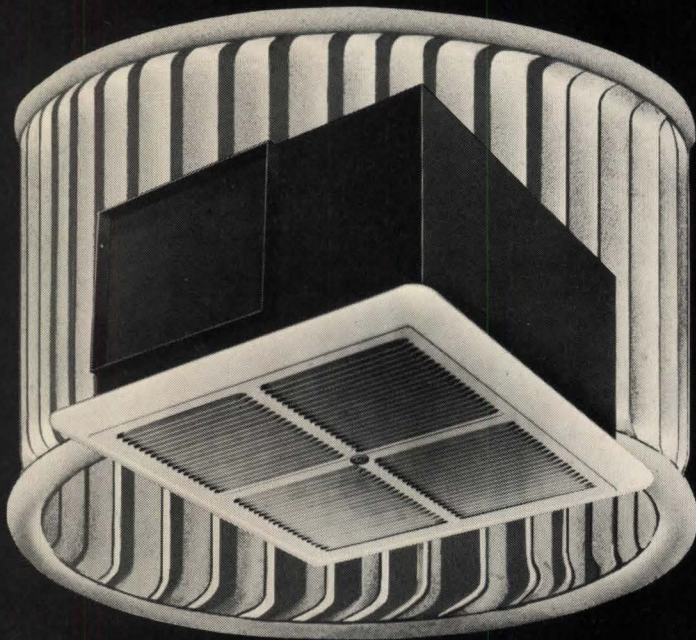
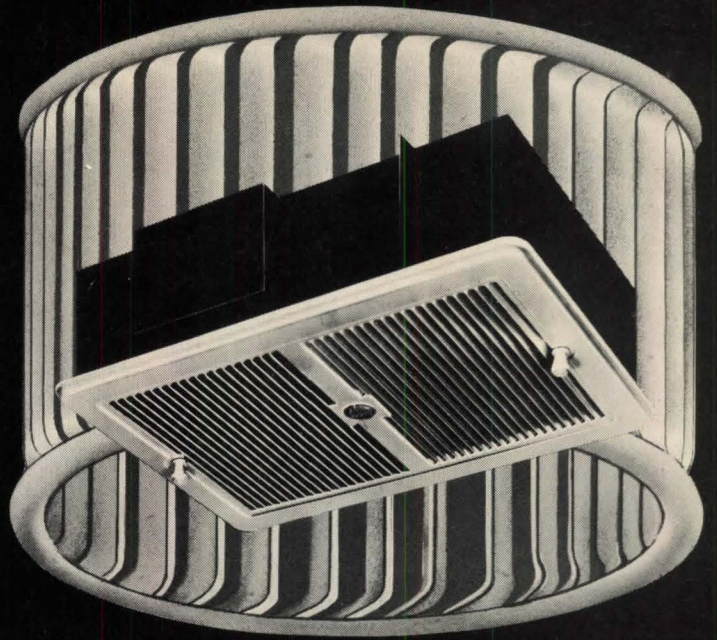
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YOUNGSTOWN, OHIO 44505



*For more data, circle 94 on inquiry card*



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*With*  
*Trade-Wind*  
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The quietness of the remarkable Trade-Wind QT Ventilators is achieved through the use of a single over-sized wheel turning at a low speed. The minimal motor vibration is dampened out at the source through the use of special motor mount assemblies. The heavy gauge housing is virtually free of vibration.

For maximum QUIET, specify QT:  
V-QT-90: 90 CFM at 0.1" static pressure  
Chrome grille.

V-QT-200: 190 CFM at 0.1" static pressure  
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Neutral beige enamel grille.

Write for details. *Trade-Wind by* **THERMADOR**

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*Division of Norris Industries*  
For more data, circle 95 on inquiry card



# Bright idea



## Beautiful way to cut building costs: Bradley Washfountains!

Bradley Washfountains come in a wide variety of attractive colors and compositions. But the real beauty of Washfountains is the money they save. For example, Washfountains serve up to 8 people with one set of plumbing connections, cutting installation costs as much as 80%. They use less space than ordinary fixtures (up to 25% less). They reduce water consumption 45-80%. And they cut maintenance costs, too. Wherever you specify Washfountains—offices, schools, plants, institutions, public and commercial buildings of all types—you secure a handsome saving! See your Bradley representative. And write today for complete information. Bradley Washfountain Co., 9107 Fountain Boulevard, Menomonee Falls, Wisconsin 53051.

# from Bradley!

For more data, circle 96 on inquiry card





continued from page 190



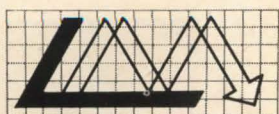
## See-through mirrors solve a problem at an unusual school.



How do you let student teachers observe training techniques used with insecure preschoolers without making them more insecure?

Here at the George Peabody College for Teachers in Nashville, they use see-through mirrors of *Mirropane*<sup>®</sup>. Student teachers sit in a semi-darkened gallery and watch experienced teachers work to dispel fear and uncertainty common among deprived children. The children in the brighter room don't know anyone is watching them because they see nothing but mirrors.

Use *Mirropane* wherever there's a need to watch people without being seen. Ask your L-O-F Distributor for booklet TM-2 for design data. He's listed under "Glass" in the Yellow Pages.



**LIBERTY MIRROR**

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8179 L-O-F Building, Toledo, Ohio 43624.

For more data, circle 97 on inquiry card

**MINNESOTA STONE** / A comprehensive technical handbook has over 200 working drawing details illustrating actual use of natural building stone on specific projects. The book has received two awards for excellence by the Building Stone Institute. ■ Vetter Stone Company, Kasota, Minn.\*

Circle 406 on inquiry card

**FOUNTAIN DESIGN** / A comprehensive catalog will aid in the selection of decorative fountains. The catalog points out the advantage of certain water displays and contains suggestions for alternate spray devices for special conditions. ■ Roman Fountains, Inc., Albuquerque, N.M.

Circle 407 on inquiry card

**FURNITURE** / A 65-page catalog contains over 200 items for offices, restaurants, schools, hospitals, etc. Besides informative articles on solutions to common seating and table problems, there is a fold-out color chart for easy reference. ■ Fixtures Manufacturing Corp., Kansas City, Mo.

Circle 408 on inquiry card

**SOUND DEADENING BOARD** / An expanded 1969 edition of the brochure, "Sound Great," details tested wall and floor assemblies with built-in noise control as well as fire ratings. Diagrams illustrate construction details using gypsum *Firestop* wall-board and 1/4-in. gypsum sound deadening board. ■ Georgia-Pacific Corp., Portland, Ore.\*

Circle 409 on inquiry card

**CLOSET DOORS** / A 12-page booklet includes architectural specifications, descriptions and installation photos in color. The by-passing and bi-fold doors have panels of Philippine mahogany or prime hardboard firmly set in a warp-proof steel frame finished in mellow gold. ■ Leigh Products, Inc., Coopersville, Mich.\*

Circle 410 on inquiry card

**HARDBOARD PANELS** / "New Adventures in Home Decor" is a colorful booklet on selecting predecorated panels and complementary color tones for furnishings. New and established patterns are shown in vignette room settings. ■ Masonite Corporation, Chicago.\*

Circle 411 on inquiry card

**DECORATIVE LAMINATES** / A ten-page fold-out color catalog shows woodgrains, patterns and colors of *Melamite* high-pressure decorative laminates. Several photos suggest such uses as countertops, walls, bookcases and cabinet faces. ■ Johns-Manville, Lawrence, Mass.\*

Circle 412 on inquiry card

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

more literature on page 204





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Pouring Zonolite® Masonry Fill Insulation into masonry walls doubles the insulating value of the walls. Prevents chills and sweats of the occupants while inducing a state of euphoria over low heating and air conditioning bills.

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Reduces sound transmission to a murmur.

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**GRACE**

**INQUIRY DEPT.**

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62 Whittemore Ave., Cambridge, Mass. 02140

Gentlemen: Please send me complete information on your comforting, quieting, saving, fire-resisting Zonolite Masonry Fill Insulation, with complete technical data and specifications.

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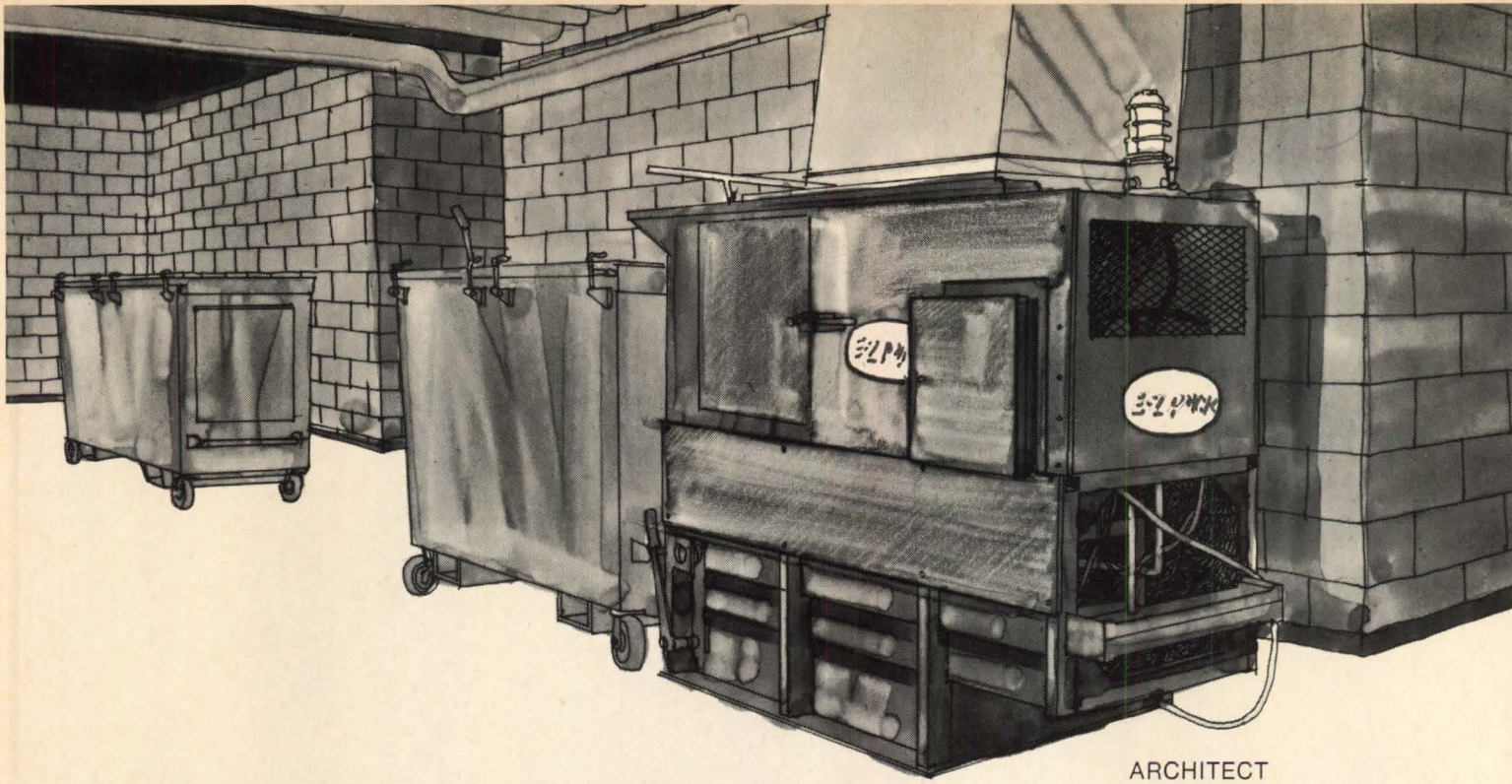
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**With E-Z Pack  
handling refuse,  
you get a better  
apartment building,  
and these people  
know it.**

**E-Z Pack has the answer** to refuse problems in apartments . . . from several points of view.

Tenants just drop refuse down a chute. E-Z Pack then automatically rams it into a standard roll-away container to await pick-up by the regular collection service. All refuse is compacted to a fraction of its original size.

This means E-Z Pack handles more refuse more efficiently with considerably fewer man-hours. Makes a cleaner, better operating, more rentable building.

Include E-Z Pack in new building plans. Or, install it when modernizing or converting older buildings.

Write for literature on E-Z Pack in apartment buildings, Or, if you wish, one of our experts will talk with you.

Either way, you'll learn how E-Z Pack simplifies refuse handling . . . automatically.

**OWNER**  
Economical, and it also does away with incineration, and those air pollution problems. Saves space, too.

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Gave me more design flexibility so I could create a more beautiful, efficient building.

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It's very convenient. And the building is neater and cleaner than a lot of others.



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Front Loader and Rear Loader Containers can be used with the E-Z Apartment Packer.

For more data, circle 99 on inquiry card





 **new**  
**space-saver**  
**WATER COOLER**

Choice of 5 Colors

**New appearance. New size.** GE's new wall mounted Space-Saver combines both to bring you the latest in water cooler appeal.

**Take appearance:** There are no louvers on the front to detract from the clean, modern lines. It's sleek, it's smart, it's stylish. Five beautiful cabinet finishes to choose from: Mocha Linen or Pebble Charcoal textured vinyl side panels with Ironstone vinyl front panel; Desert Mist or Regal Silver baked enamel side panels with Ironstone enamel front panel; or all stainless steel. A handsome combination for any decor.

**Take size:** It's 26 inches high, 15 inches wide and extends a mere 12½ inches from the wall . . . less than any other wall mounted cooler in the industry.

Available in 6, 8, 12 and 15 gallon capacities or as fountain only. Refrigeration system can be added later.

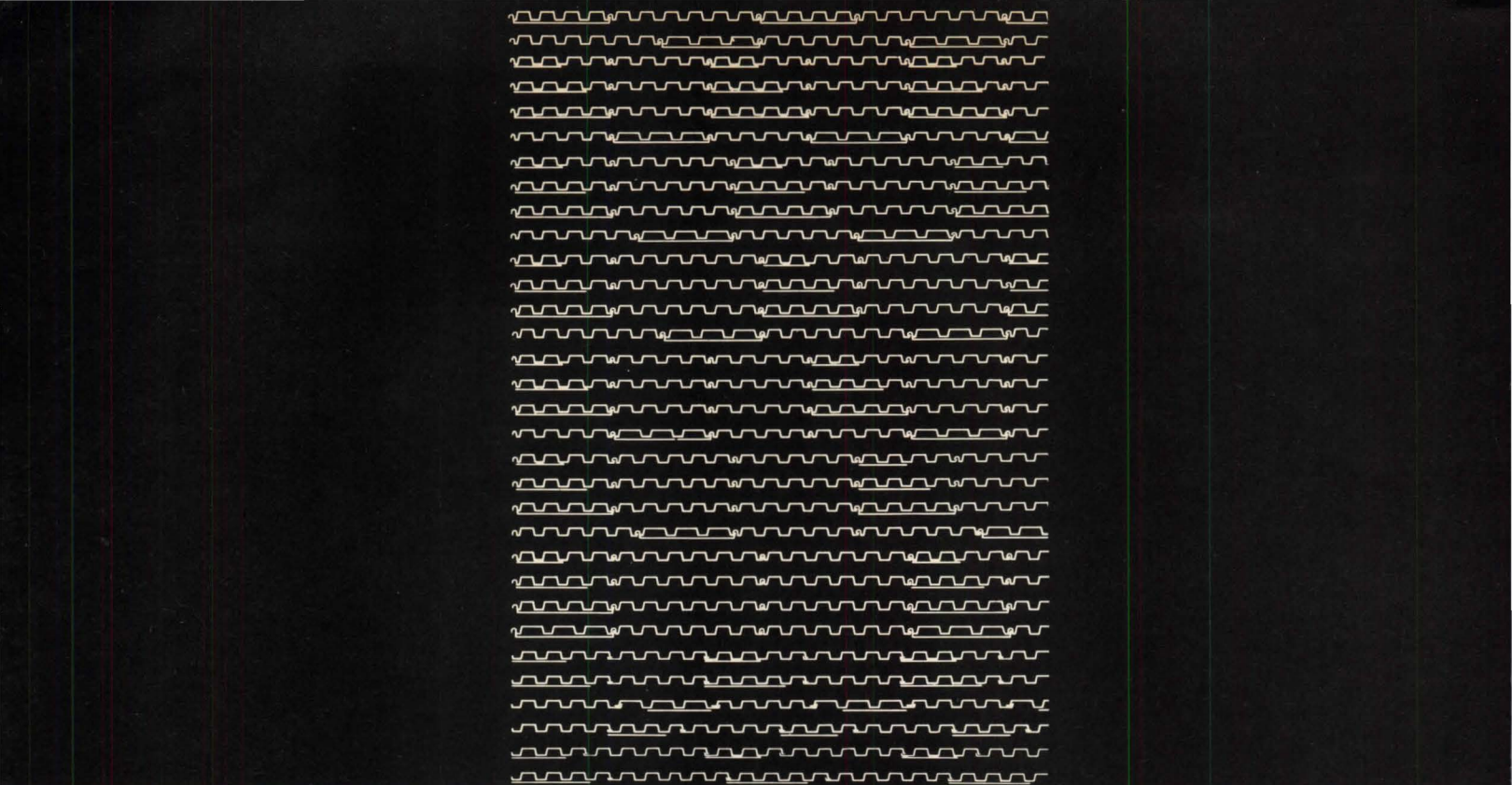
For more specifics on the sleek new Space-Saver, check the Yellow Pages for your local GE water cooler representative. Or write GE, Dept. 761-41, 14th and Arnold Streets, Chicago Heights, Illinois 60411.

**GENERAL**  **ELECTRIC**

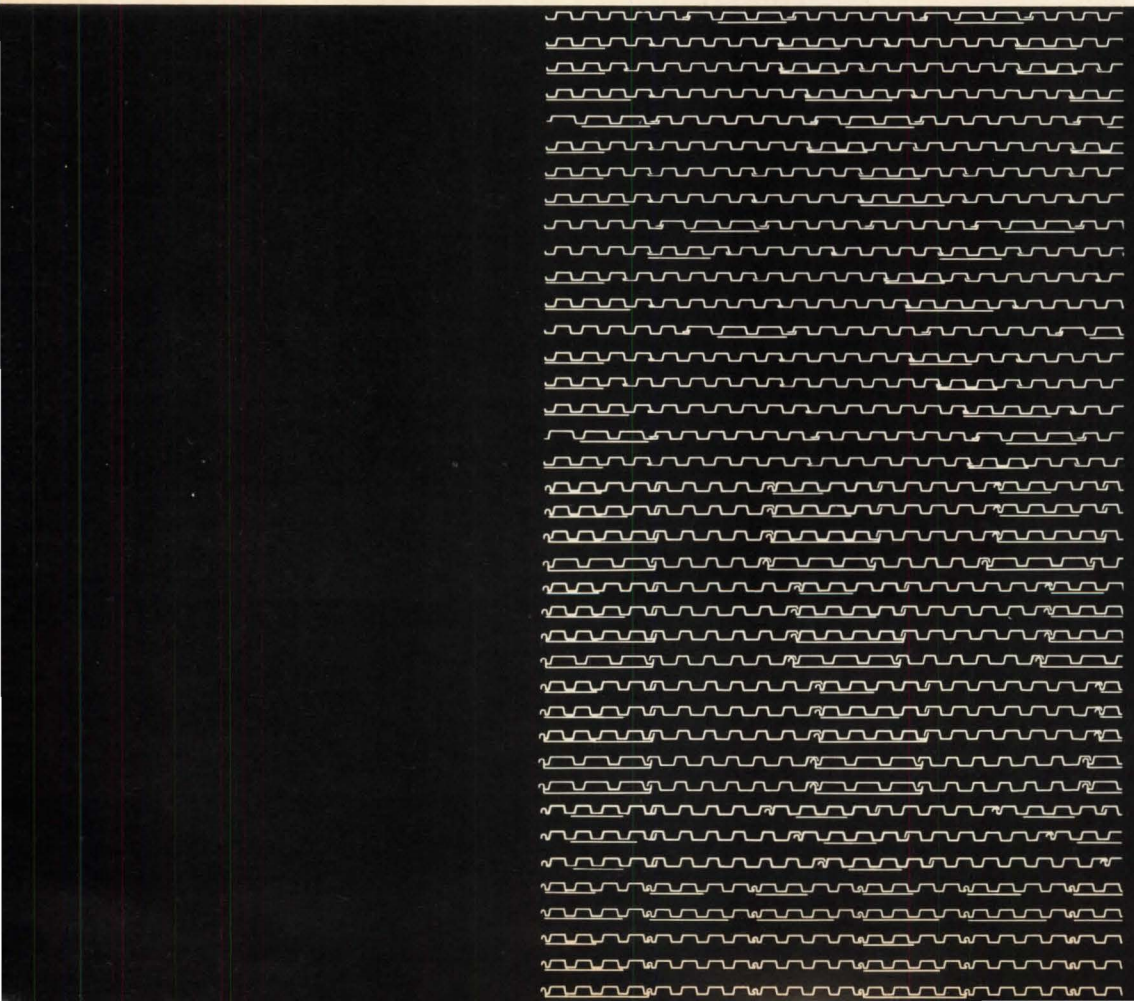
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electrification. Inland-Ryerson  
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## Robertshaw's new miniature thermostat—discreet elegance for distinctive buildings.



(Actual Size)

Robertshaw's new miniature pneumatic room temperature controller is a dramatic innovation in the art of climate control. The handsome brushed satin case is small enough to fit perfectly on a 2" partition divider. Using ultrasonic manufacturing techniques, the logic module is encapsulated in a tiny 2" x 2" package—smallest in the industry but big in reliability and performance. It's ready now, for your commercial, industrial or institutional building.

# Robertshaw



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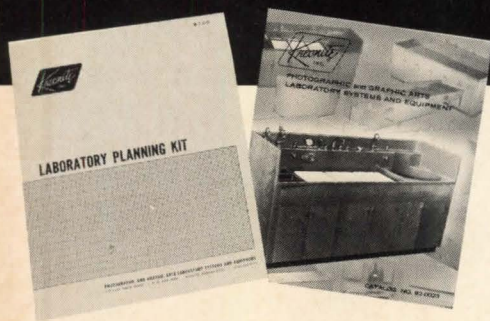


# THIS IS A DARKROOM

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## OFFICE LITERATURE

*continued from page 198*

**OPERATING ROOM PANELS** / Complete technical information on hospital operating room isolating panels is provided in "Bulletin D-4." The brochure describes a modular system that is factory engineered, wired and tested to provide safety, reliability and ease of installation. ■ Sorgel Electric Corporation, Milwaukee.

Circle 413 on inquiry card

**METAL ROLLING DOORS** / "Bulletin 154" details a complete line of rolling doors, fire doors, counter shutters, rolling grilles and other metal doors. Cutaways show construction and operation. ■ Kinnear Corporation, Columbus, Ohio.\*

Circle 414 on inquiry card

**PLASTICS PRICING GUIDE** / A 14-page guide contains 38 tables giving specs and prices for plastics in standard and custom shapes and sizes, plus fittings, tanks, fume hoods, and products engineered of corrosion-proof plastics to meet solution/temperature/pressure specifications in chemical and electronic applications. ■ Aztec Products Inc., Lyndhurst, N.J.

Circle 415 on inquiry card

**HIGH-STRENGTH STEELS** / A booklet on high-strength, low-alloy steels gives data on properties, chemical compositions and welding and fabrication practices. ■ United States Steel Corporation, Pittsburgh.\*

Circle 416 on inquiry card

**HEATING/COOLING/VENTILATING** / The 1969, 180-page heating/cooling/ventilating catalog provides information on both wiring and piping systems best suited to be used in conjunction with the company's three basic systems of climate control with hydronic equipment. Also covered are various system layouts, unit loads and a cost chart. ■ Edwards Engineering Corporation, Pompton Plains, N.J.

Circle 417 on inquiry card

**RED CEDAR PRODUCTS** / "Timeless Beauty," a 16-page color booklet, shows shingles and handsplit shakes for both interior and exterior uses. ■ Red Cedar Shingle & Handsplit Shake Bureau, Seattle.\*

Circle 418 on inquiry card

**BUILT-UP ROOFING** / A 24-page booklet introduces a system that is said to be "unequaled for ease of installation, thereby reducing labor costs to a minimum." The *Dual 80 System* requires only two plies in the average 20-year assembly and is "much less vulnerable to weather and physical damage during application." ■ Certain-Teed Products Corporation, Ardmore, Pa.\*

Circle 419 on inquiry card

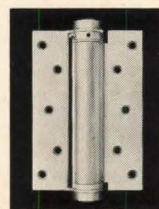
\*Additional product information in Sweet's Architectural File

more literature on page 214

◆ For more data, circle 103 on inquiry card

## Half of Chicago's newest landmark swings on the Bommer U-6"

Builder: Tishman Construction Co.  
Builders Hardware: Beck-Guttman, Inc.



Bommer is proud to have supplied the apartment section of the John Hancock Center with its UL-approved U-6" Spring Butt Hinges. 100,000 oscillation tests proved it rugged. Three-hour fire and hose tests

proved it fire-safe. The U-6" hinge's smart styling, efficient closing action, economical cost and dependable operation made it the ideal hinge for the world's tallest office-residential skyscraper. Write for more information on the complete line of Bommer spring hinges and apartment house mailboxes.



Sales Offices: 263 Classon Avenue, Brooklyn, N. Y. 11205;  
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Main St., Los Angeles, California 90031

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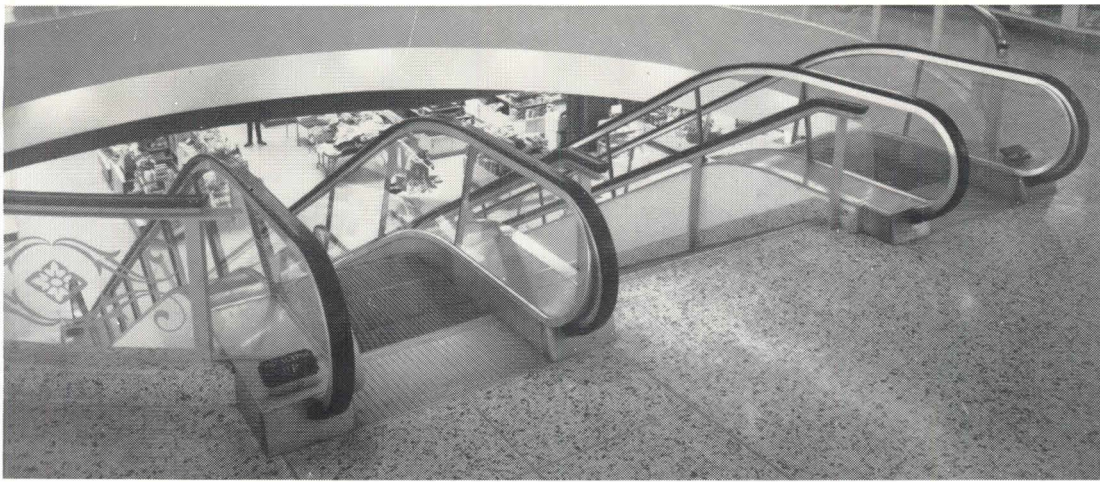
**These light fixtures are 2' x 4'.  
Picture them as 1' x 4'.**

**Or 1' x 1' or 2' x 2' or 3' x 3'. Fact is, any of these standard troffers fit the new C-60/60 Luminaire Ceiling System by Armstrong. So now a room can have special design and lighting effects or meet a variety of lighting requirements without sacrificing the advantages of an integrated ceiling system. With Armstrong C-60/60, all that need be changed is the lighting function. C-60/60 (the accommodating square) and other ceiling innovations are described in our folio. Please write for a copy. Armstrong, 4207 Rock St., Lancaster, Pa. 17604.**

**Or for more data, circle 1 on inquiry card.**

**Armstrong**  
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***Montgomery two-steps-level\* escalators move people at The Hecht Co., division May Department Stores***



The Hecht Co., Montgomery Mall Shopping Center, Montgomery County, Maryland

Architect: John Graham & Company, N. Y., N. Y.  
General Contractor: Baltimore Contractors, Inc., Baltimore, Maryland

Exclusive two-steps-level design of Montgomery escalators helps speed traffic flow, assures shopper's confidence, and safe transportation at The Hecht Co. store in Montgomery Mall. Two-steps-level at entry and exit reduces the momentary hesitation experienced by many people upon boarding other escalators, and makes exiting smoother, too.

In addition to the 48" Crystal Ballustrade escalators shown

here, Montgomery Elevator Co. has installed one oil-hydraulic passenger elevator, and one oil-hydraulic freight elevator in The Hecht Co. area of Montgomery Mall.

Montgomery Elevator Company offers you a complete range of people-moving machinery, plus design, installation, and service skills through more than 120 locations in the United States, Canada, Mexico, and the Caribbean.

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# In Pittsburgh's Chatham Center operable walls turn a 1,000 place dining room into 7 meeting rooms



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\* All STC ratings based on ASTM E90-66T with 14'0" x 9'0" opening.

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## at Bradley Field, Windsor Locks, Conn.

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## at Rolling Meadows, Ill. Holiday Inn

Outstanding performance from Acousti-Seal 51, Model 510 movable partitions in the original meeting rooms of the Rolling Meadows Holiday Inn made them a must in two subsequent expansion programs. Acousti-Seal provides better sound isolation than solid, permanent walls, assures the privacy that is the first requirement of good meeting rooms. The laboratory proven 52\* STC of Acousti-Seal 51, Model 510 partitions is the highest sound rating in the industry.

\* All STC ratings based on ASTM E90-66T with 14'0" x 9'0" opening.



Please send me:

- Hospitality Brochure
- Acousti-Seal Literature
- Soundmaster Literature
- New Product Information

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Firm Name \_\_\_\_\_

Address \_\_\_\_\_

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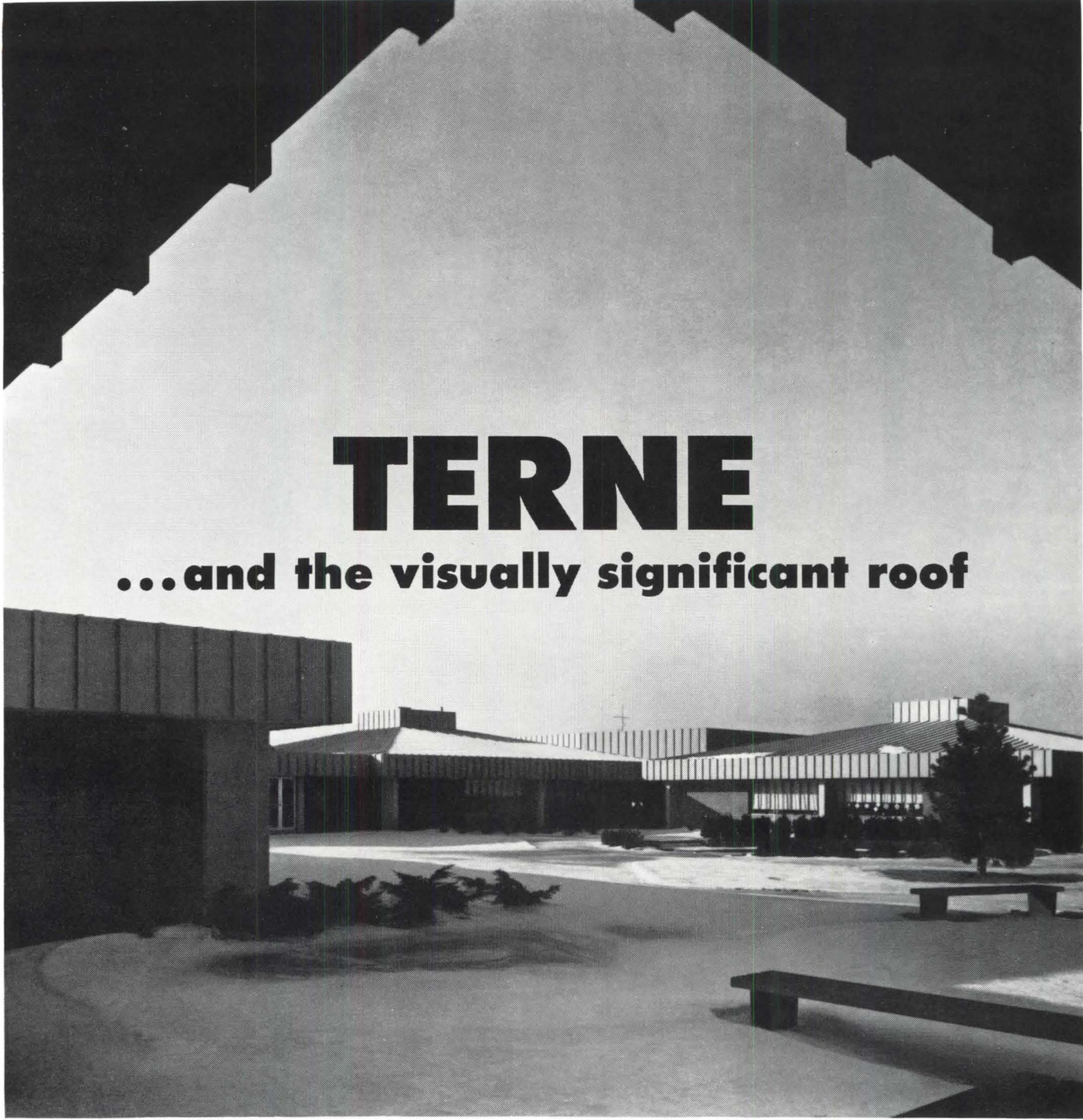
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# TERNE

**...and the visually significant roof**

The Annie Fisher Elementary School, Hartford, Conn., Architect: Russell, Gibson & von Dohlen, West Hartford, Conn., Roofer: Southern New England Roofing, Hartford, Conn.

Such roofs have recently become an element of major importance in architectural design, and whatever form they have taken—whether traditionally pitched or in some variant of the mansard concept or hyperbolic paraboloid or barrel vault—Follansbee Terne has been

specified for the majority of them where metal has been used. For Terne is a superbly functional material with an inherent affinity for color and unexcelled durability, yet one which is also relatively moderate in cost. We welcome your inquiry.

## FOLLANSBEE

Follansbee Steel Corporation, Follansbee, West Virginia

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*For more data, circle 106 on inquiry card*

*For more data, circle 108 on inquiry card* ♦



**PRECAST ON  
CAMPUS.  
THE COLOR IS  
UNIFORM.  
THE CEMENT IS  
ATLAS WHITE.**

*Co-ed Dormitory, Chadron State College, Chadron, Nebraska.* Uniform colored precast panels—made with ATLAS White Cement—help impart a monolithic look to this 11-story high-rise dormitory. The 1,250 sections (50,000 square feet) were cast with white quartz and given an exposed aggregate finish. The precast contractor used ATLAS White Cement because it has uniform color and uniform physical properties; and all precast would be the same white color—no matter how many pieces had to be cast. Precast Contractor: Benham Precast Co., Cheyenne, Wyoming. Architect and Engineer: Kirkham, Michael & Associates, Omaha, Nebraska. General Contractor: L. R. Foy Construction Co., Hutchinson, Kansas. For our new "White Concrete in Architecture" brochure, write Universal Atlas Cement Division of U. S. Steel, Room 6181, Chat-ham Center, Pittsburgh, Pa. 15230. ATLAS is a registered trademark.



**Atlas**  
WHITE CEMENT





**CAST-IN-PLACE  
ON CAMPUS.  
THE COLOR IS  
UNIFORM.  
THE CEMENT  
IS  
ATLAS WHITE.**

*Women's Physical Education Building, University of Nebraska, Lincoln, Nebraska.* Common building materials and uncommon design techniques were used to build this new facility containing a gymnasium, pool, dance studios and classrooms. The white cast-in-place columns shown here were made with ATLAS White Cement and sand, gravel and limestone aggregate; they were given a smooth trowel rubbed finish. But beauty is not the only function of the columns. They are also used as supports for post-tensioned beams which span the entire width of the building to provide a high ceiling and an unobstructed gym and pool area.

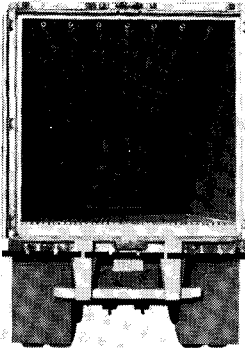
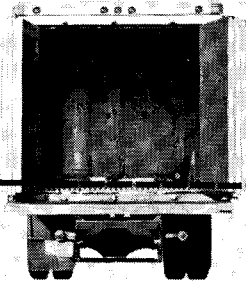
For beautiful *and* functional cast-in-place designs, use ATLAS White Cement. This supplier . . . uses it for everything because it has uniform properties and is consistent in color." Ready Mix Supplier: Ready Mixed Concrete Co., Lincoln, Nebraska. Architect: Leo A. Daly Co., Omaha, Nebraska. General Contractor: George Cook Construction Co., Lincoln, Nebraska. For our new "White Concrete in Architecture" brochure, write Universal Atlas Cement Division of U. S. Steel, Room 6181, Chatfield Center, Pittsburgh, Pa. 15230. ATLAS is a registered trademark.



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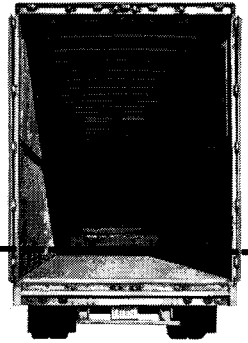






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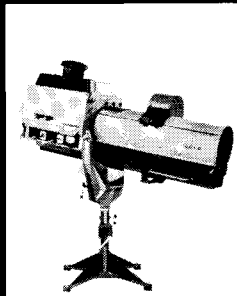
dle even the heaviest load; are always in place, ready to use.

Write or phone today for complete information. Ask for your copy of Modern Dock Design. It's the most authoritative source available on dock design. KELLEY COMPANY, INC., 6768 North Teutonia Avenue, Milwaukee, Wisconsin 53209, Phone: 414-352-1000.



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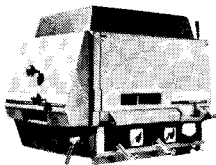
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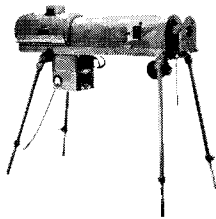
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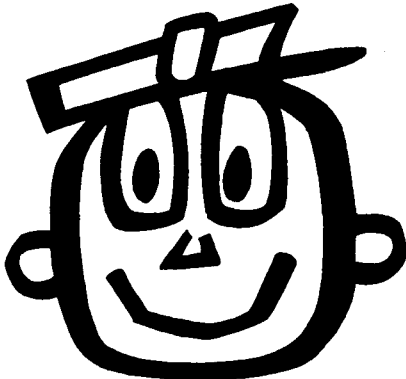
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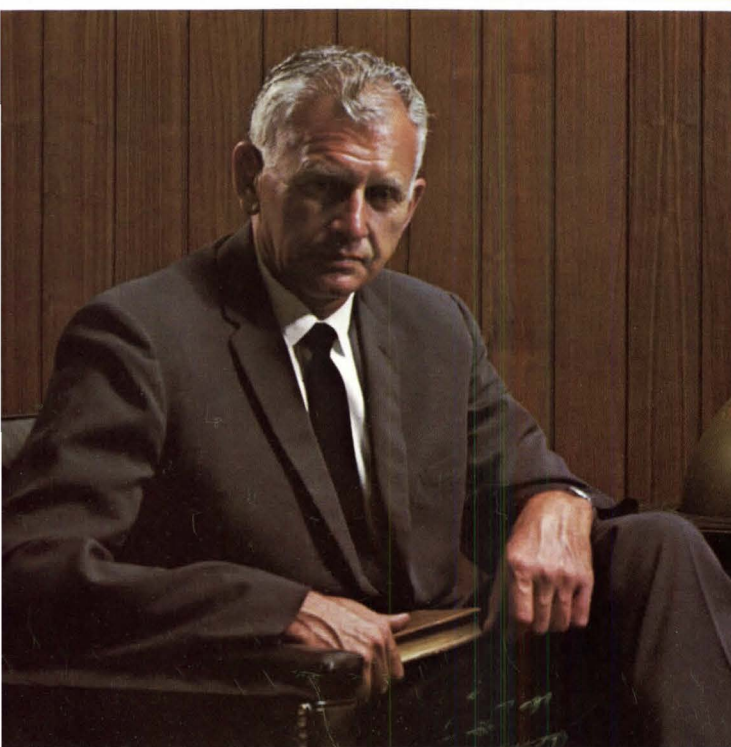
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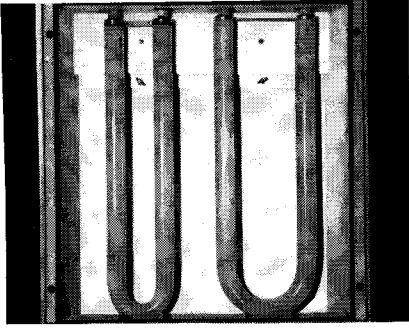




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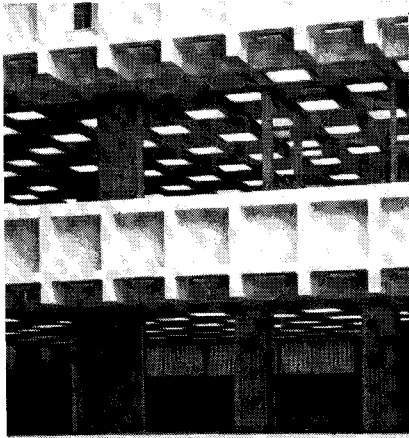
continued from page 204



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**ALUMINUM FINISHES** / "Architectural Finishes for Aluminum" is a 68-page manual that discusses chemical, mechanical, anodic and Duranodic finishes and applied coatings. Letterhead requests must be sent to company. ■ Aluminum Company of America, 1501 Alcoa Building, Pittsburgh 15219.\*

Circle 420 on inquiry card

**PRE-FINISHED METALS** / A pocket-size manual gives complete information on base metals of chrome, nickel, copper, brass, zinc and aluminum. ■ American Nickeloid Co., Peru, Ill.

Circle 421 on inquiry card

**NEW SEALANTS** / A new and up-dated "List of Tested and Approved Sealants Products" based on LP Polysulfide Polymer presents products that carry the company's "Seal of Security." ■ Thiokol Chemical Corporation, Trenton.\*

Circle 422 on inquiry card

**CERAMIC TILE** / A 12-page color booklet presenting *Franciscan Terra Floor, Terra Wall and Ceramic Veneer* includes installation photos of: flooring in banks, a residence and a plaza; veneer as exterior facing on the Courthouse and Federal Office Building, Phoenix, Arizona, by Edward L. Varney, A.I.A. and Associates and Lescher and Mahoney, A.I.A.; and wall used at Miami Beach Federal Savings & Loan by Herbert Mathes, A.I.A. ■ Interpace Corporation, Los Angeles.

Circle 423 on inquiry card

**METAL CURTAIN WALLS** / "Methods of Test for Metal Curtain Walls, NAAMM Standard TM-1-68<sup>T</sup>" establishes equipment and procedures to be used in testing metal curtain walls for air infiltration, water penetration and structural performance. ■ National Association of Architectural Metal Manufacturers, Chicago.

Circle 424 on inquiry card

**COMPRESSORS & PUMPS** / A 24-page booklet describes specially designed snap-on muffler caps for oil-less air compressors and vacuum pumps. Also included in the booklet is complete information on the oil-less air product line. ■ Bell & Gossett ITT, Morton Grove, Ill.\*

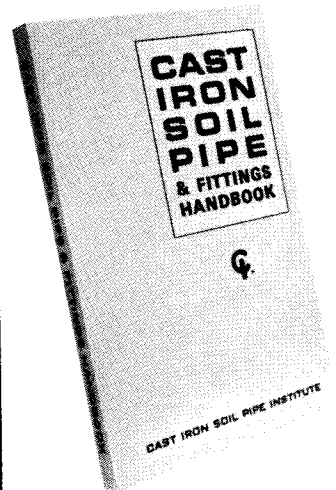
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**WOOD PRODUCTS** / An assortment of literature on various items includes: laminated/solid posts and beams; machine-rated lumber; structural framing, sheathing, decking; concrete forms; interior paneling; siding; and exterior uses. ■ Western Wood Products Association, Portland, Ore.\*

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

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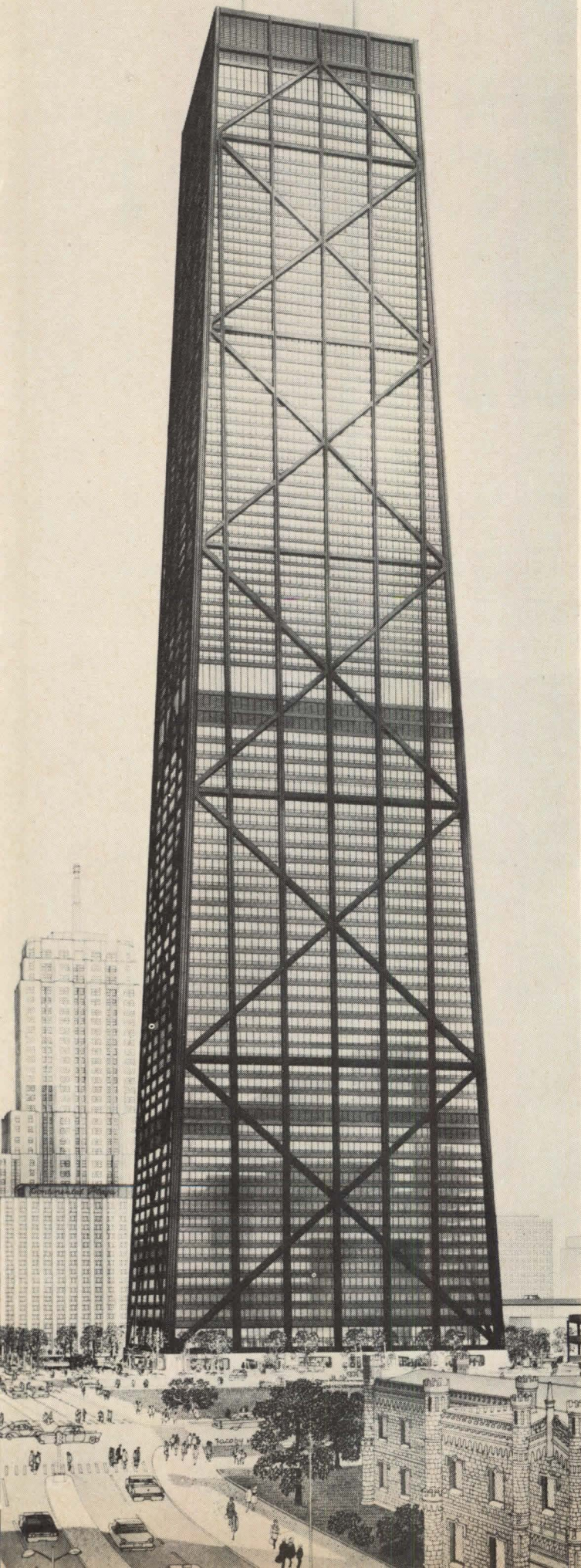
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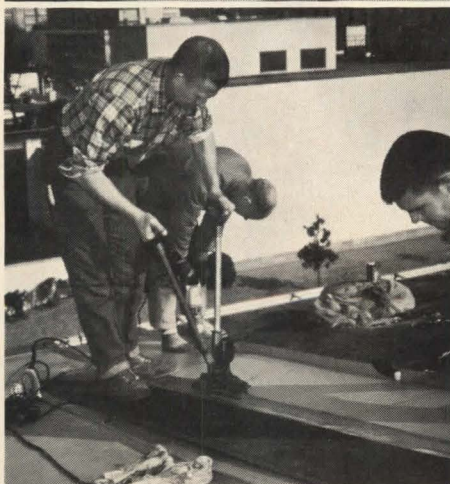
Architects & Engineers: Skidmore, Owings & Merrill, Chicago.  
Contractors: R. B. Hayward Co. and Universal Sheet Metal Corporation. Owner-Developer: John Hancock Mutual Life Insurance Company.

*For more data, circle 112 on inquiry card*



# Sure cure for overhead overhead... Republic DUROFLASH stainless steel roofing sheets

The Municipal Auditorium, Birmingham, Alabama, has a replacement roof of Republic DUROFLASH stainless steel covering 37,500 square feet. Installed over a concrete slab roofdeck. Former roofs had presented almost continuous leakage problems for more than 45 years. Complete satisfaction with the stainless steel roof has led city authorities to reroof an adjoining addition with Republic DUROFLASH stainless steel.





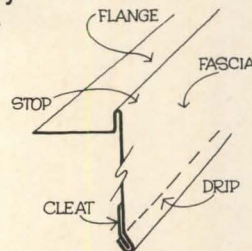
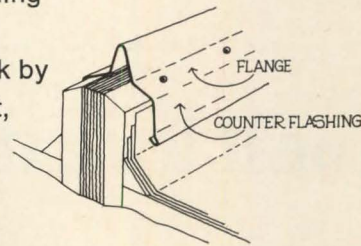
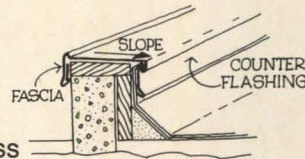
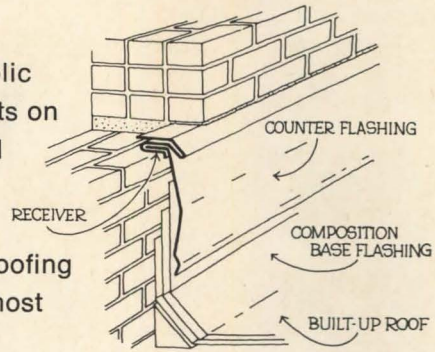
Costly roof maintenance and repairs are practically eliminated by installing Republic DUROFLASH® stainless steel roofing sheets on industrial and commercial buildings. Ideal on new construction. Or for reroofing older structures.

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MIXERS • CUTTERS • PEELERS • DISPOSERS • SAWS • SLICERS • CHOPPERS  
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KitchenAid Products for the Home

For more data, circle 114 on inquiry card







# Start with sprinklers, for wider choice of finishings.

Increase your range of interior finishing materials.

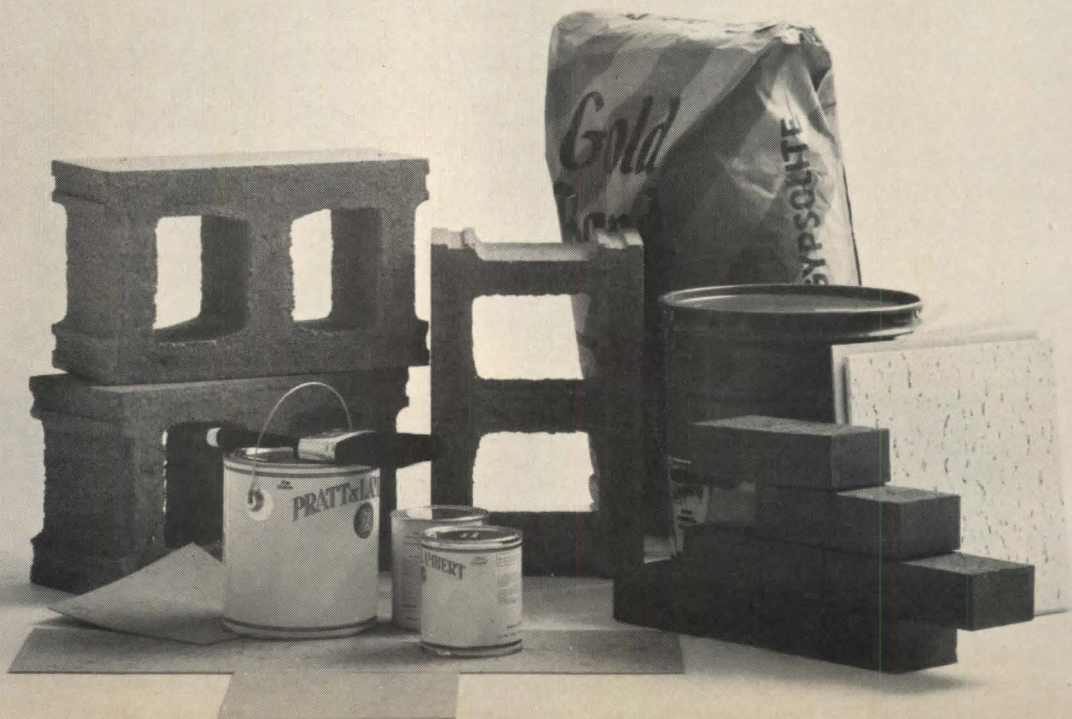
When sprinklers are installed, you can use interior finishing materials of higher flame spread classifications.

Who says so? The codes say so.

You can design with woods (birch, mahogany, even Douglas fir), fabrics, paints, carpeting, cork and plastics. With sprinklers, you can be more flexible in choosing interior finishings and fabrics which meet the aesthetic or economic needs of the owner.

And more. By designing-in an "Automatic" Sprinkler system, you can get:

1. Increased building area.
2. Increased building height.
3. Increased exit distance.
4. Savings with light roof framing.
5. Savings with metal roof decking.
6. Savings with fewer fire walls.
7. Increased fire wall openings.
8. Decreased exit widths.





Take a few minutes to scan your local building codes for the many specific advantages you can gain when you design-in an "Automatic" Sprinkler system. To help, we have compiled some of the permissive clauses from the

Here are quotations from the four major building codes regarding "interior finishing materials":

**The Uniform Building Code: (SEC. 4203)**  
"Class I finish materials shall be used except where the finish materials are protected on both sides by automatic fire-extinguishing systems . . ."

**The National Building Code: (SEC. 810.3)**  
"Interior finishing materials in buildings

four major building codes, and put them into a booklet called, "The Code Book."

For a copy, simply mail your request to Mr. R. L. Pardee, Manager of Marketing Services, "Automatic" Sprinkler Division,

. . . shall not have flame spread rating greater than 75 in exit stairways, exit hallways . . . all portions of buildings more than 75 feet in height . . . or in all portions of buildings used for institutional occupancies, unless the building is sprinklered."

**The Southern Standard Building Code: (SEC. 704.3)** "In every building except one and two family dwellings, and sprinklered buildings, flame spread ratings for walls and ceilings using ASTM

Dept. 769, Box 180,  
Cleveland, Ohio 44141.



Standard E 84, shall not exceed the following . . ." (Check this section for non-sprinklered requirements.)

**The Basic Building Code: (SEC. 925.6)**  
"In buildings of all types of construction and in all use groups, combustible wall and ceiling finishes may be used without hesitation in any room or area except required exitways, provided the building is equipped with an approved automatic sprinkler system . . ."

For more data, circle 115 on inquiry card





continued from page 96

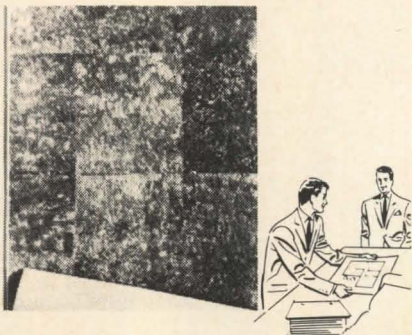
The "or" in  
"or equal"  
usually ends  
up in...

# "inferior"

Those two words — "or equal" — in your specifications section can lead to considerable disappointment in a finished project. Particularly in vinyl wallcoverings. A moment of inattention, a persuasive salesman, a rash attempt to save a few dollars and you agree to a substitute for Vicrtex. Sometimes, the substitution is even made without your knowledge.

There's only one way to guarantee that you get superior stain-resistant finishes, attractive textures, unique patterns and lustrous colors of Vicrtex vinyl wallcoverings. By tight specs and double-checking along the way.

✳ If you know enough  
about vinyl wallcoverings  
to specify VICRTEX,  
make sure you get Vicrtex.



Write today for our helpful booklet:  
"A Practical Guide to Specification, Selection and Use of Vinyl Wallcoverings."



**L E CARPENTER**  
AND COMPANY



A DAYCO  
COMPANY

Empire State Building, New York 10001  
(212) LOngacre 4-0080

The Los Angeles firm of **Erkel/Greenfield & Associates, Inc., Consulting Structural Engineers** has merged with the **G. O. Dyer Company**. Mr. Dyer has been named partner in the expanded corporation. Headquarters of the firm remain at 8201 Beverly Boulevard, Los Angeles.

**Dean McClure, Seymour Katzman, Richard W. Dickinson, Joseph Gates and James F. Balsley** are now associates of **M. Paul Friedberg & Associates**, landscape architects and urban designers of New York.

**Brooks H. Godfrey** is now chief of design of **Louis G. Kingscott & Associates, Inc.**, Kalamazoo, Michigan architectural firm.

**J. Stuart Todd, A.I.A.** has recently been named a principal in the Dallas-based firm of **Harrell and Hamilton, Architects/Planners**. **Stanley Gene Watson, A.I.A.** has joined the firm as a design group leader.

**Holforty Widrig O'Neill King & Associates, Inc., Consulting Engineers** announce that **James G. Nast, P.E.**, and **Altan Y. Hatay, P.E.**, have been named associates of the firm.

**William G. Irvine, A.I.A.** has joined the California firm of **International Environmental Dynamics** as chief architect.

**Nelson Fay, architect**, has recently joined **Edward C. Jenkins, A.I.A.** as an associate. The firm, located at 14401 Sylvan Street, Van Nuys, California, is now **Edward C. Jenkins & Associates, Architects**.

**Howard Kessler, A.I.A., William Merci, Walter Bronkhorst** and the Chicago firm of **H. W. Lochner, Inc.**, have organized a new firm, **Kessler, Merci, Bronkhorst and Lochner, Inc.** for the general practice of architecture, engineering and planning with specialization in park and recreation planning and development. The new firm is located at 6330 North Cicero Avenue, Chicago. **H. W. Lochner, Inc.** continues its consulting engineering practice at 20 North Wacker Drive.

**Suren Pilafian, F.A.I.A., Roderick E. Warren, A.I.A.** and **Harold C. Cunningham, A.I.A.**, formerly a principal of **Strong, Drury and Cunningham**, have joined the Detroit-based firm of **Albert Kahn Associated Architects and Engineers, Inc.**

**Parsons, Brinckerhoff, Quade & Douglas**, New York-based firm of consulting engineers, architects and planners, recently named civil engineer **James O. King** an associate of the firm.

**Richard Leitch & Associates** has announced the formation of the partnership of **Richard Leitch/Sam Kiyotoki and Associates, Architects & Land Planners**. The new firm is located at 1730 West Coast Highway, Newport Beach, California.

The formation of a new firm, **Little, Lair, and Pilkington, Architects**, formerly **Robert M. Little and Associates**, has recently been announced. Principals are **Robert M. Little, F.A.I.A., David E. Lair, A.I.A.**, and **Edward Pilkington, A.I.A.** The firm's address is 2180 Brickell Avenue, Miami.

continued on page 232

Did your mother  
take you for  
your last checkup?



What is it about grownups? Don't they know annual checkups are the first line of defense against cancer? It's nice to find out you're as healthy as you feel. See your doctor. You'll find that peace of mind beats lollipops any day! Help yourself with a checkup. And others with a check.

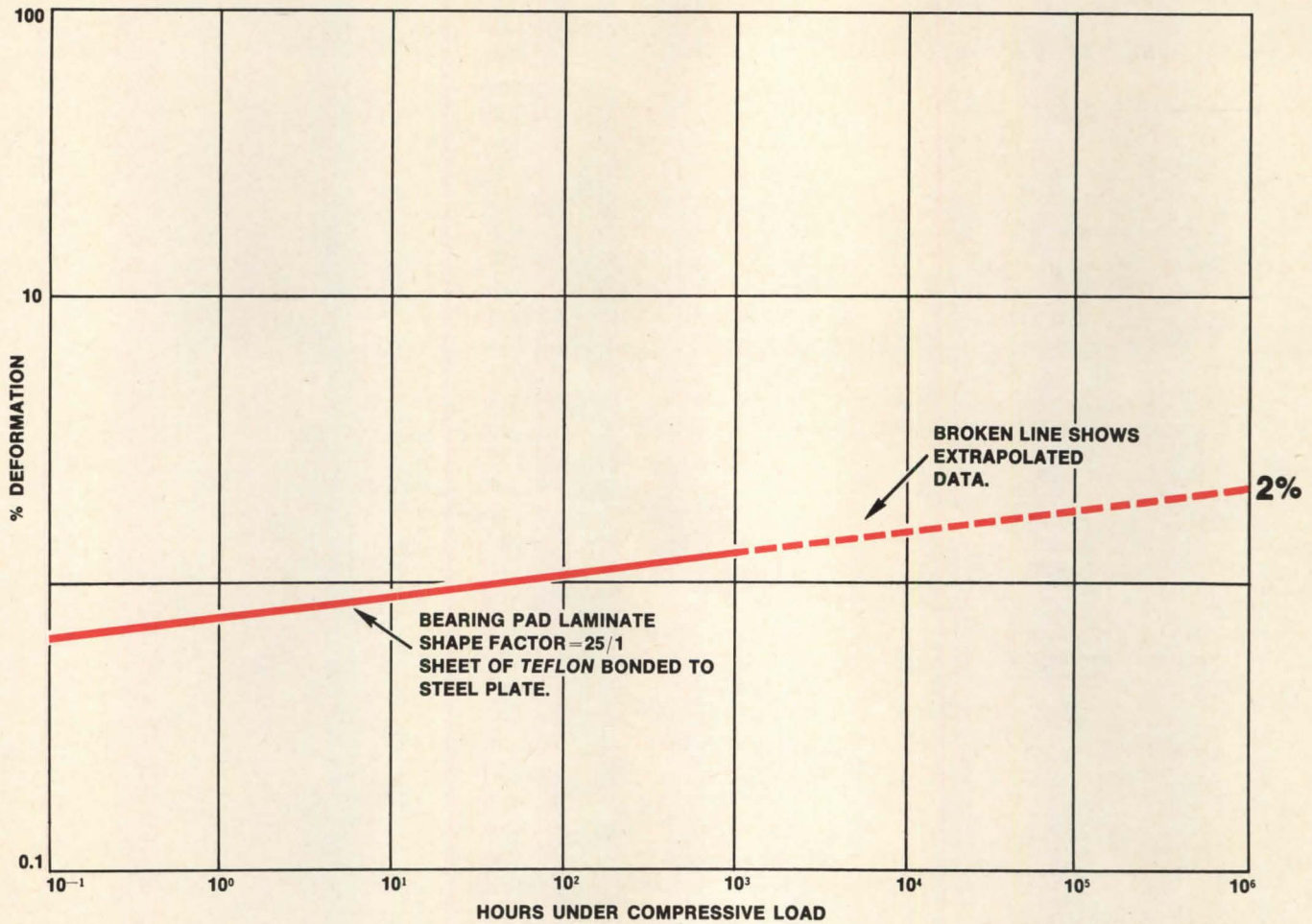
**American Cancer Society**

THIS SPACE CONTRIBUTED BY THE PUBLISHER

For more data, circle 116 on inquiry card

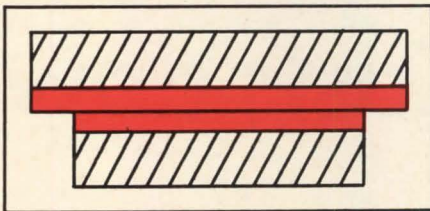


# After 114 years under 2,000 psi compressive load, bearing pads made with TEFLON may show 2% creep:



## If that's not good enough, go to filled TEFLON.

The simplest standard construction of bearing pads made with Du Pont TEFLON fluorocarbon resin is illustrated below: It consists of sheets of TEFLON bonded by adhesive to steel plates. With this construction, as



with other specialized constructions offered by experienced bearing-pad manufacturers, the problem of long-term creep is—to put it bluntly—negligible.

This conclusion is backed up by

compressive creep tests in Du Pont laboratories, by theoretical stress analysis and by actual field experience with bearing-pad installations going back to 1963.

You will note that by extrapolation of creep tests under 2,000 psi load (see chart above) the deformation to be expected after 10<sup>6</sup> hours amounts to only 2%. This actually amounts to 2.5 mils for TEFLON 1/16 inch thick or 5 mils for a 1/8" thickness. Bearing pads made with filled compositions of TEFLON can exhibit an even higher degree of creep resistance.

Thus, you can take advantage of the unsurpassed low-friction properties offered by TEFLON to solve sliding and expansion bearing problems, with complete assurance of long-term satisfactory performance

under load. Sheets of TEFLON in well-designed bearing pads provide exceptional resistance not only to creep, but to wear, to weather and to virtually all chemicals.

Economical bearing pads surfaced with TEFLON are being used in a variety of architectural applications, including bridges and roads, and in tank supports and pipe slides. If you are faced with any design problem involving accommodation to thermal expansion or contraction, or to movement caused by wind and weather, get in touch with an experienced fabricator of bearing pads made with TEFLON. For complete information—including a recently delivered technical paper on creep resistance—write: Du Pont Company, Room 7643A, Wilmington, Delaware 19898.



For more data, circle 118 on inquiry card



# Concrete is good for you



## Cars up. Costs down.





**Construction costs: rising. Land costs: rising.  
Real estate taxes: rising. The inevitable answer: roof deck parking.**

The logic of this simple concept is overpowering.

Less land is needed. Therefore land costs are cut.

The need to build large parking areas is eliminated.

Therefore total construction costs are cut.

There is less improved land. Therefore taxes are cut.

There are other advantages as well.

Greater employee and customer convenience.

Lower fire insurance rates. A stronger, sturdier building  
in which concrete is the basic material.

You see, concrete is good for you.

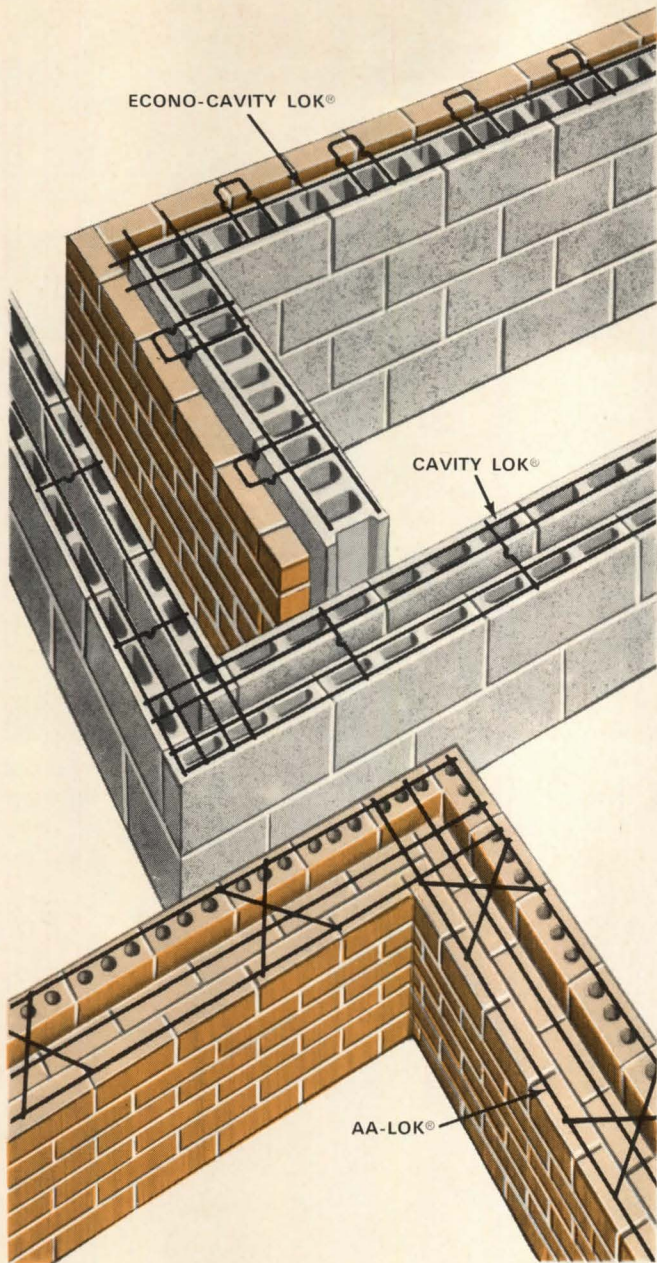
For complete information on the roof parking concept,  
write us. Portland Cement Association, Dept. A7-8  
Old Orchard Road, Skokie, Ill. 60076.

PCA—IMPROVING AND EXTENDING THE USES OF CONCRETE

PORTLAND CEMENT  ASSOCIATION

For more data, circle 119 on inquiry card

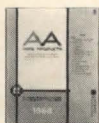




## Which AA cavity wall reinforcing do you need?

ECONO-CAVITY-LOK® for wind load restraint in vertical span—CAVITY-LOK® for maximum effective horizontal steel—or AA-LOK® for wind load restraint in horizontal span? All are designed to provide maximum wall strength, ease of construction and economy. Select the AA Wire reinforcing that fills your requirements best. Let AA solve your special wire problems.

Manufactured in Chicago,  
Dallas and Ontario, Canada



Send for **FREE**  
Reinforcing Guide.  
Reference  
CSI File Div. 4  
Sweets 6h  
Aa



**AA WIRE PRODUCTS COMPANY**

6100 South New England Avenue • Chicago, Illinois 60638 • Phone (312) 586-6700

For more data, circle 120 on inquiry card



If you only knew  
how often I think  
of you, Horace,  
Hutch & Sinkwell,  
A. I. A.

Never heard of Horace, Hutch & Sinkwell, A.I.A.? Well, maybe the girls in that new office building aren't so good at remembering architects' names. But like the gal above they do appreciate it when an architect goes to the trouble of specifying one of Bobrick's attractive and convenient stainless steel, built-in dual vending machines for dispensing both feminine napkins and tampons.

And since about half the gals now use tampons, there's more than beauty involved in their appreciation of Bobrick's recessed dual-vend machines.

So how about it? Send for our free catalogue or see Sweet's File No. 23<sup>o</sup><sub>Ki</sub> (or Bobrick, File 25<sup>e</sup><sub>Bo</sub>) for a description of vending machines available for dispensing Kotex® napkins and tampons.

True, your name may be forgotten but your good deed will live on in the hearts of all the girls.



**Kimberly-Clark Corporation**  
Commercial Department Neenah, Wisconsin

For more data, circle 121 on inquiry card



announcing a

# rooftop revolution



**Mammoth's  
new, advanced Adapta-  
Zone provides the most  
sophisticated multi-zone  
heating, cooling and  
ventilating available  
in the industry**



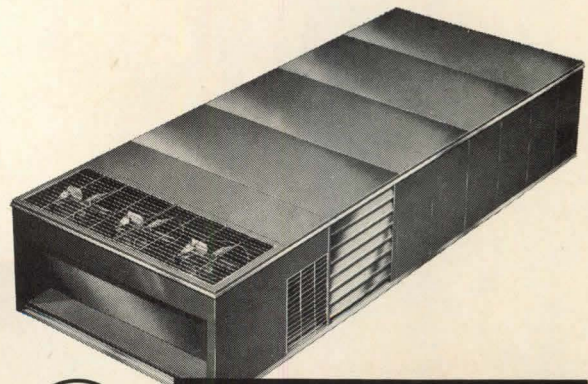
*When it comes to  
rooftop environmental air  
control, ask your  
Mammoth man.  
He's an expert!*

The new Mammoth Adapta-Zone represents an exciting revolution in rooftop multi-zone heating, cooling and ventilating, exemplifying Mammoth leadership in the design and engineering of equipment for total rooftop environmental air control for institutional, commercial and industrial buildings.

The Adapta-Zone serves up to 14 zones, with eight models ranging in capacity from 250,000 through 500,000 Btu of heating, 18 through 35 tons of cooling. Units are available in two engineering concepts—one incorporating the conventional hot deck-cold deck system with mechanical dehumidification confined to the cold deck area, the other providing constant dehumidification with a companion reheat system for balanced operating economy.

The Adapta-Zone features a low silhouette (only 44" high), with all aluminum acrylic finished exterior panels, "weatherlock" panel and louvre construction, and extruded aluminum framing with an exclusive panel lock design. Units are available with convertible bottom or end zone discharge, a choice of four air filtering methods, and two powered return and exhaust air options. An indirect gas-fired heater with micro-temp control is standard, while electric, hot water or steam coils are optional. And an advanced roof curb design makes installation of the factory assembled units fast and easy.

Ask your Mammoth representative for full information on the rooftop revolution created by the new Adapta-Zone, or write for Bulletins AZMZ-69-S and AZMZ-69-E.



**MAMMOTH**

TOTAL ENVIRONMENTAL AIR CONTROL

**Industries, Inc.**

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For more data, circle 122 on inquiry card



# Keene versatility structural

**Architect:** Brodnax—Phenix & Associates  
**General Contractor:** J. A. McDermott  
**Owner:** Dan M. Moody





# expresses itself in Speed-Steel.™

The seventy-four buildings of this Town and Country Shopping Center range in design from French Provincial to Early Spanish to English Tudor to contemporary. Each has the look of permanence that is real. A look that suggests solidity and a long time a-building.

Yet it took only three men three days to raise the skeleton, shown here, on which the building was formed. The secret: Keene Speed-Steel. Lightweight and easy to handle, this framing system has the highest work to weight ratio of any building material available. So designs can easily incorporate exterior walkways, balconies, cantilevered roofs.

Competitive in cost with wood, this steel system can be erected faster. And there are the added advantages of being vermin and fire-proof. What's more, Keene Speed-Steel framing studs are nailable. So any conventional material can be used for interior or exterior surfaces. Here at the shopping center, for example, the mansard roof has wooden shingles.

But this versatility of design is not confined to one-story structures. At the recent San Antonio Fair, Keene Speed-Steel proved the ideal material for the soaring Confluence Theatre, Federal Pavilion as well as 15 other buildings.

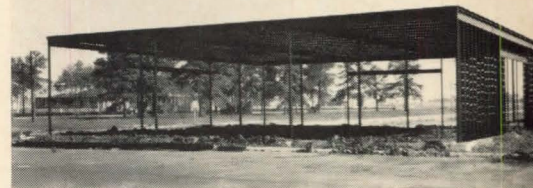
And Speed-Steel is even being used in town houses and garden apartments. In nursing homes. In sports arenas. All-in-all its uses are limited only by the imagination.

To find out more how our versatility can help your imagination, write: Keene Corporation, Metal Construction Products Division, Parkersburg, West Virginia 26101.

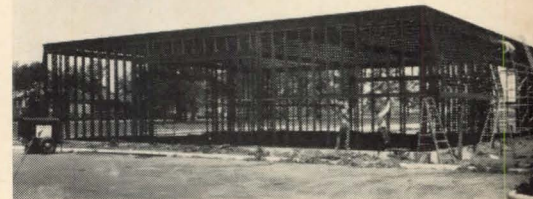
**KEENE**  
CORPORATION

Erection of structural steel framework for building 54 of the Town and Country Shopping Center, Houston, Texas took only three days. This is one of 74 such buildings in the Center using Speed-Steel.

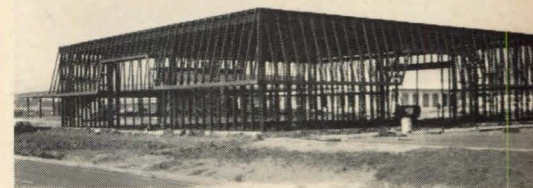
## FIRST DAY



## SECOND DAY, NOON



## END OF THE THIRD DAY



## READY FOR THE NEXT PHASE



**We've just begun to grow.**

For more data, circle 123 on inquiry card

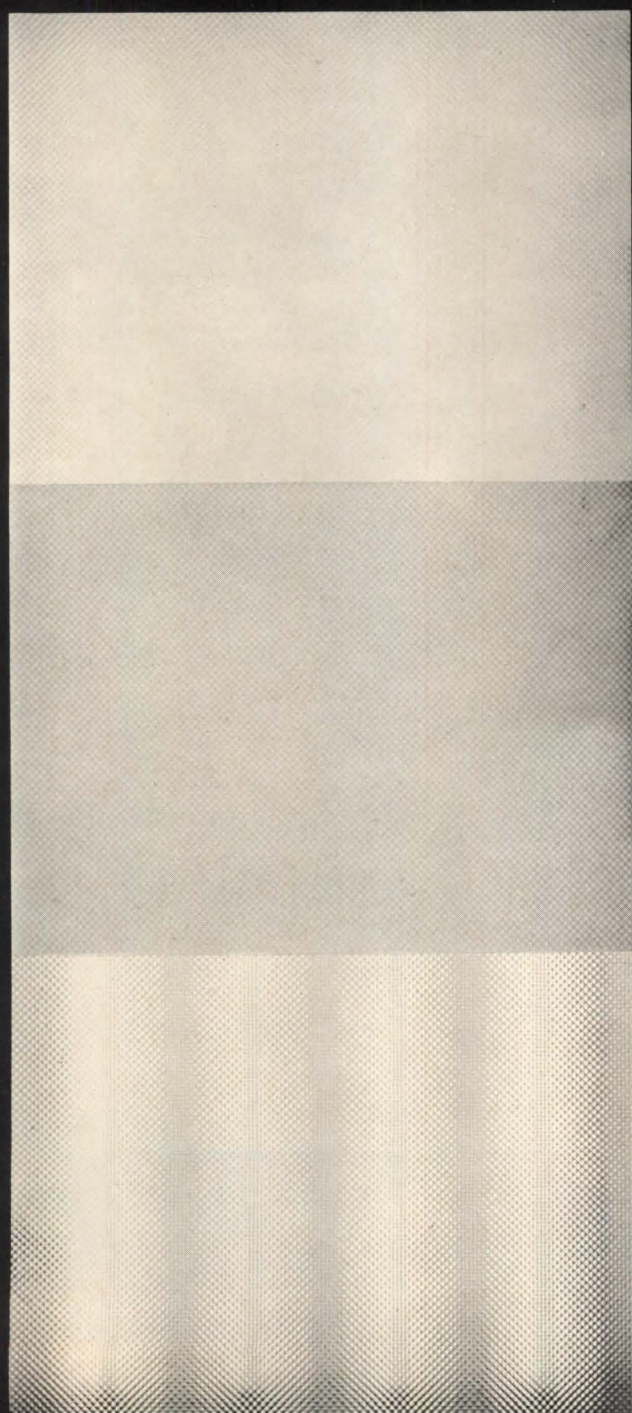


**NOW! FOR THE FIRST TIME-**

# **Control reflected glare**

0°

30°



←  
good

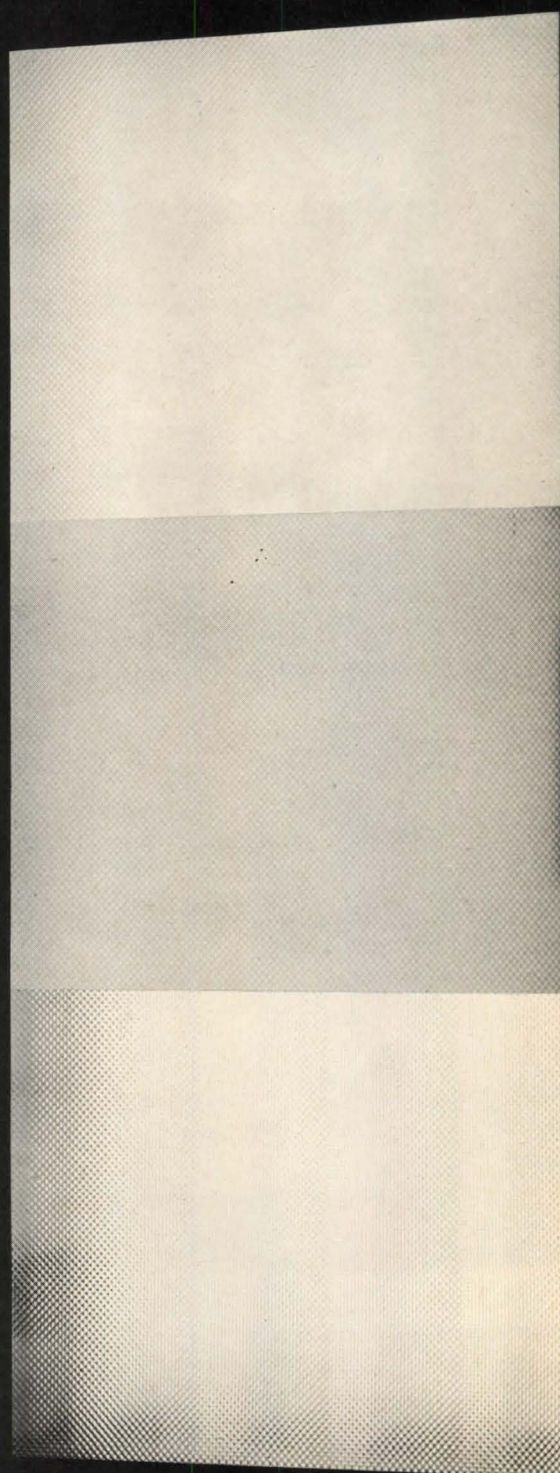
→  
good

←  
good

→  
good

←  
bad

→  
fair



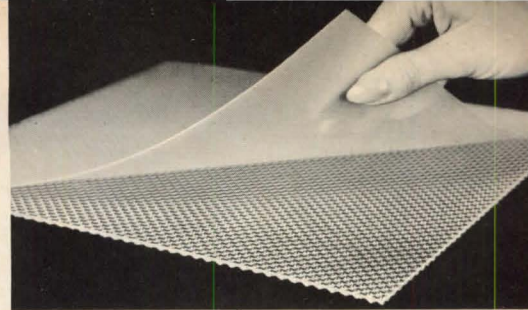
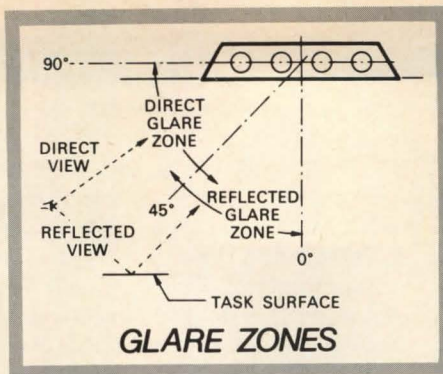


Until now — the big emphasis in lighting has been on *high footcandles and control of direct glare*.

Now — research has shown the importance of emphasizing *visual efficiency and control of reflected glare*.

**Note:** Reflected glare occurs in two forms: (1) veiling reflections with the task or (2) annoying reflections adjacent to the task.

K-16 is the first panel designed to put this new thinking into your lighting plans.

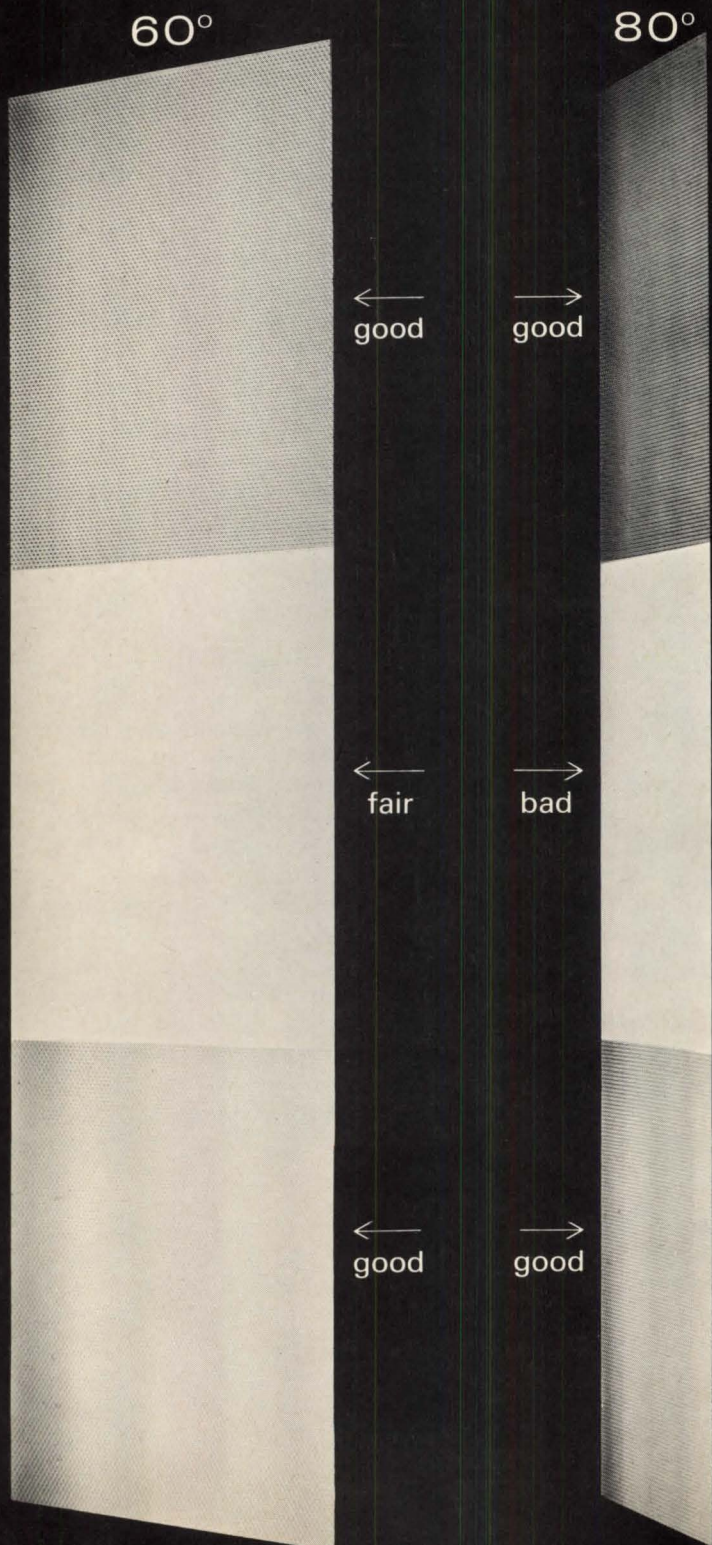


K-16 is a composite panel. A thin sheet of acrylic on top of a high-quality KSH prismatic panel. The edges are sealed together to make it moisture-proof.

For more data, circle 124 on inquiry card

# K-16\* by K-S-H — a new generation of prismatics

\*Patents Pending



## The New K-16 prismatic panel

is the first lighting panel that controls both reflected and direct glare at all angles. It's also a "no show" panel — provides lamp-hiding power equal to an opal panel. And K-16 still maintains high efficiency and full prismatic control.

## The white opal panel

hides the lamps. But as the viewing angle becomes greater it becomes very bright and produces harsh direct glare. Efficiency of this panel is low.

## Prismatic panel

shows lamps clearly from directly below. It produces reflected or veiling glare at the working surface. This is the basic problem with ALL prismatics except the new K-16!

WRITE FOR K-16  
BROCHURE NO. KI-444

**KLITE**<sup>®</sup>

K-S-H, INC. / 10091 MANCHESTER / ST. LOUIS, MO. 63122



continued from page 222

**Peeter Mannik**, registered professional engineer, has been promoted to membership in the Columbus, Ohio, consulting engineering firm of **Fling and Eeman, Inc.**

The office of **McDowell-Goldstein, Architects** of Madison, New Jersey, has announced the appointment of **Emanuel J. Criscione, Raymond Nadaskay** and **Conrad R. Remick** as associates in the firm.

**Frank W. Munzer, A.I.A.** has been elected a partner by **Eggers & Higgins, Architects** of New York City. Two new associates have also been appointed: **Robert L. Bien, A.I.A.** and **John B. Hayden, A.I.A.**

**Ronald C. Turner, John A. Glen, Morton Goren** and **K. Jan Jaworski** are now senior associates of the Philadelphia firm of **Nolen,**

**Swinburne and Associates.** **Robert N. Rummings** and **David C. Birdsell** are now associates of the firm.

**P & W Engineers, Inc.** has named five new senior associates in the firm's Chicago office: **Charles E. Mok, Fred W. Rohr, John J. Trutwin** and **Howard R. Verduin.** New associates have also been named: **Thomas R. Ruppert, Donald W. Smalley, Edward P. Strama** and **George Zevkovich.**

**Paul Rogers** has been named to the post of vice president of structural engineering at **A. Epstein and Sons, Inc.,** Chicago-based architectural and engineering firm. **Paul Finfer,** architect and urban planner, is now director of urban planning for the firm.

**Wayne R. Nordgren, A.I.A.** and **Peter**

**Kramer, A.I.A.** have been named associates of the Minneapolis architectural firm of **S. C. Smiley and Associates.**

**Jack Greenberg** and **Henry Repinsky,** both engineers, are now associates of the Detroit-based architectural, engineering and planning firm of **Smith, Hinchman & Grylls Associates, Inc.**

**Thomas F. Sturr** is now a partner in **The Perkins & Will Partnership.** Mr. Sturr has been based in the firm's Chicago office.

**Robert H. Thompson, Jr.,** architect and urban designer, is now an associate with **Robert E. Alexander and Associates,** Los Angeles architects and planning consultants.

The Flint, Michigan architectural firm of **Gibbs, Tomblinson & Harburn, Architects, Inc.,** announces a change in corporate name to **Tomblinson, Harburn & Associates, Architects, Inc.** The firm's address remains at 705 Kelso Street, Flint, Michigan.

**Harold S. Scholfield & Associates, Architects** of Gahanna, Ohio have appointed **John L. Ulietti, A.I.A.** as an associate.

**Emery Roth & Sons,** architects of New York, have announced the appointment of **Joseph R. Vassallo** as an associate.

**Walker & McGough, Architects** and **Lyerla and Peden, Consulting Engineers,** announce the consolidation of both firms to provide comprehensive architectural, engineering and planning services. Partners in the new venture are: **Bruce M. Walker, John W. McGough, Walter W. Foltz, Jack M. Lyerla** and **Lawrence H. Peden.** Offices are at North 120 Wall Street, Spokane, Wash.

**Jay Zubkoff** has recently been appointed a junior designer for **Charles Luckman Associates.**

#### NEW ADDRESSES

**D. J. Daniel, Jr., & Associates, Architects,** 1670 Santa Ana Ave., Costa Mesa, Calif.

**Eckbo, Dean, Austin & Williams,** 7440 North Figueroa Street, Los Angeles. The firm's San Francisco and Honolulu offices remain at their present addresses.

**Pfisterer, Tor & Associates, Consulting Engineers,** 42 West 39th Street, New York City 10018.

**Bodrell Joer'dan Smith, A.I.A. and Associates,** 6061 West Third Street, Los Angeles 90036. The firm also maintains a Honolulu office.

**Edwin Wadsworth, A.I.A.,** Suite 6, 1300 University Drive, Menlo Park, California.

#### ADDENDUM

ARCHITECTURAL RECORD regrets an error in its description of the Thomas Jefferson Memorial Foundation medal in architecture, News in Brief, May, 1969 issue, page 35. The medal was, in fact, first awarded in 1966 to Mies van der Rohe. In 1967 it went to Alvar Aalto and in 1968 to Marcel Breuer. This year's award went to John Ely Burchard, as reported.

◆ For more data, circle 125 on inquiry card

# Compatible Beauty... Rough Sawed Siding P & L Rustic Stains



**PENETRATING** Rustic Stain is semi-transparent, lets the rugged charm of rough sawed lumber and wood sidewall shakes show through. Comes in a wide range of dark, medium and pastel wood tones.

**SOLID HIDE** Rustic Stain covers the natural grain and adds the extra beauty of color to the textured surface. Choose from over 20 modern colors that resist fading and bleeding.

BOTH TYPES are alkyd base and incorporate a fungicide for protection against mold and mildew. Consult your P & L Architectural Representative for full details.

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# FOR CORROSIVE WASTES...



## SPECIFY A **GSR FUSEAL** ACID WASTE SYSTEM

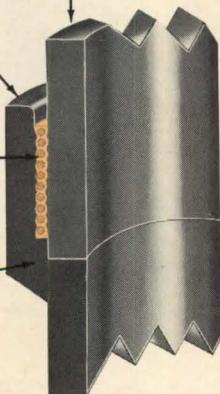
### THE "INSIDE" STORY

GSR FUSEAL fittings and polypropylene pipe offer a unique combination of physical and chemical properties for safe handling of corrosive fluids.

Precision-molded GSR FUSEAL fittings assure perfect fit and easy assembly—available in all standard configurations.

Plastic-sealed resistance coil applies heat to the interface between pipe and socket—fuses 95% of socket area.

Exclusive countersink socket design assures easy seating of pipe—prevents melted plastic from obstructing pipe line.



**90 SECONDS** of controlled heat—applied by the exclusive, patented GSR FUSEAL process—joins GSR FUSEAL polypropylene fittings and pipe into a leakproof, distortion-free, homogeneous unit. Add the superior chemical resistance of polypropylene and the certainty of this improved joining technique—and you have the ideal method of handling corrosive wastes.

The GSR FUSEAL process applies exactly the right degree of heat for exactly the right time—right where it is needed. An electrical resistance coil, imbedded in polypropylene to form a fusible collar, imparts a "full circle" of heat to fuse the interface between pipe and socket.

The exclusive design of GSR FUSEAL fittings makes it almost impossible to seat the pipe improperly or misalign the joint. In the rare event of a misalignment or a leak, the GSR FUSEAL process "forgives" the mistake. Detailed operating instructions are included in GSR FUSEAL Brochure, Form FS101, available on request.

Pipe corrosive wastes the modern way—with GSR FUSEAL Fittings and polypropylene pipe joined by the GSR FUSEAL process. Write today for complete information. R. & G. SLOANE MFG. DIV., THE SUSQUEHANNA CORP., 7606 N. Clybourn Ave., Sun Valley, Calif. 91352.

**GSR FUSEAL** JOINT FUSION PROCESS

For more data, circle 126 on inquiry card





Crystal City, Arlington, Va.  
Charles E. Smith Construction Company, Inc., contractors  
Weihe, Black, Kerr & Jeffries, architects  
Heinzman & Clifton, structural engineers  
Concrete contractors: Moses-Ecco Company, Inc.;  
Kirk Lindsey, Inc.; the Knollman Company

**\$120,000,000 'total' city  
uses Ceco**

# experience

You're looking at the Crystal City residential-commercial complex, a private development that makes effective use of Ceco's service and experience in Steelforms, Reinforcing Steel, and Aluminum Windows and Curtainwalls.

Ceco Steelform Service provided a waffle flat-slab reinforced concrete floor system on three levels for underground parking to accommodate 4,000 cars. All structural systems in the entire city complex were designed for reinforced concrete, and for economy. Ceco's local warehouse stocks of rebars assured concrete pours on schedule. In Steelform Service, one reliable, firm quotation from Ceco eliminates all guesswork for owner or contractor. Cost variables—labor,

forms, lumber, insurance—are taken care of by Ceco.

Curtainwall construction, furnished mainly by Ceco, was also specified for economic reasons. Ceco aluminum windows and curtainwalls with bronze and black anodized finish call for little maintenance. The wall systems effectively insulate against outdoor noises.

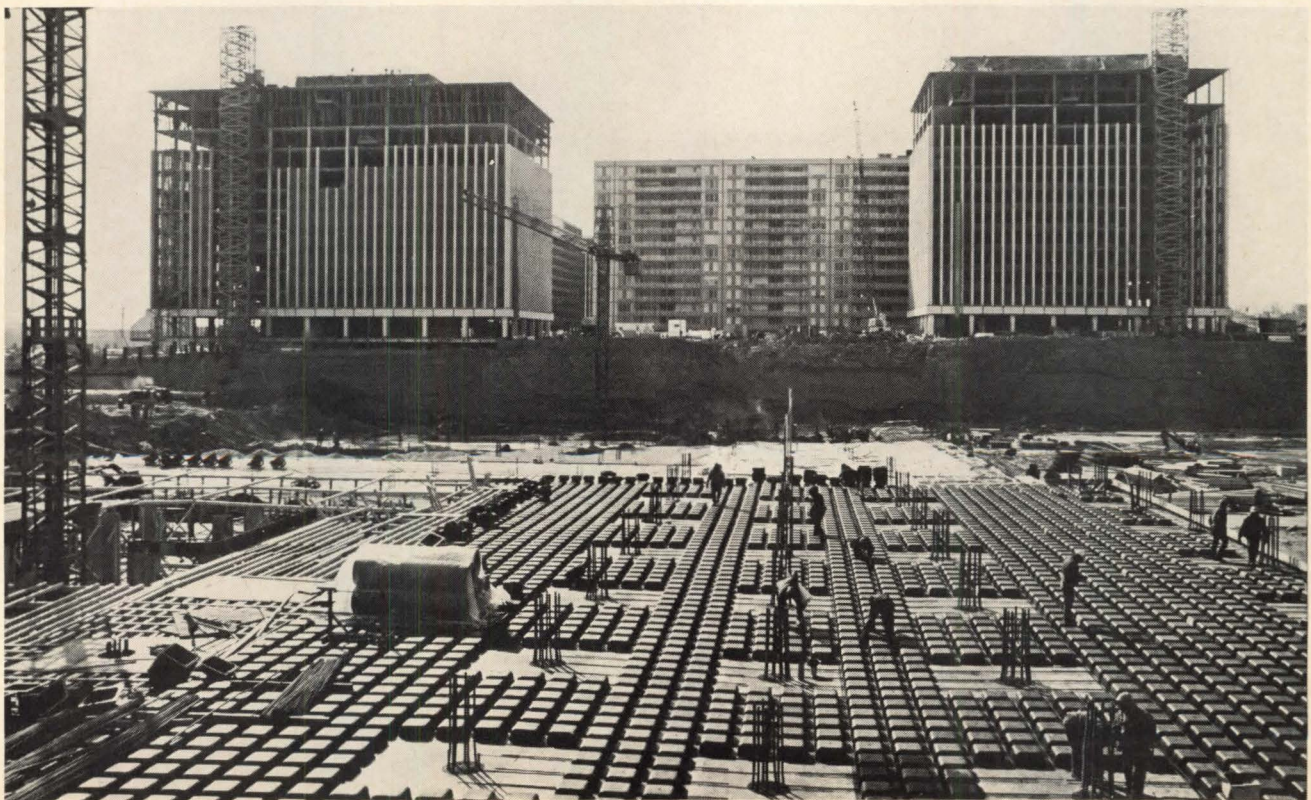
Ceco's specialists can help you plan and build your project from frame stability to outer "personality." Their help can save you money. Fine buildings deserve the advantages offered by Ceco's Experience in construction services and products. The Ceco Corporation, general offices: 5601 West 26th Street, Chicago, Ill. 60650.







Ceco Steelform Service for 790,000 sq ft of monolithic concrete joist construction  
 12,700 tons of Ceco-fabricated Reinforcing Steel  
 480,000 sq ft of Cecocolor Anodized Aluminum Windows and Curtainwalls



Foreground—Ceco Steeldomes in position before placement of reinforcing steel and pouring of concrete

For more data, circle 127 on inquiry card



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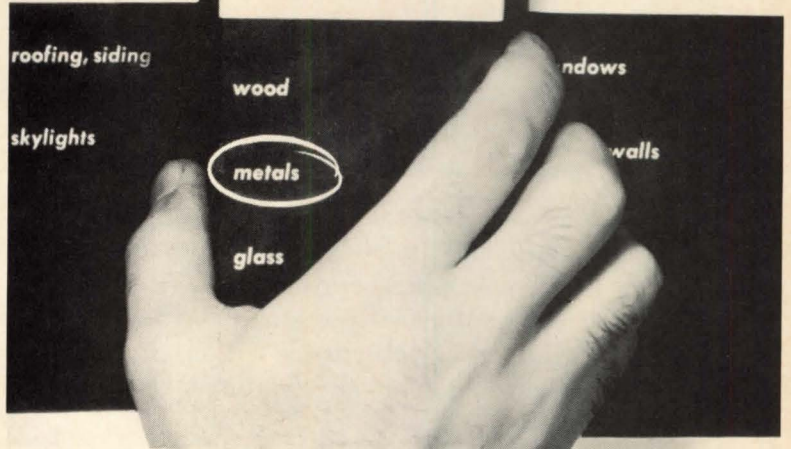


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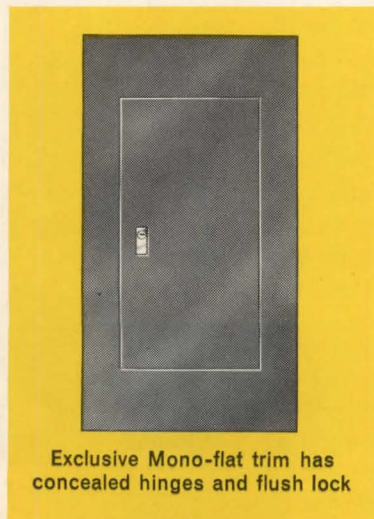
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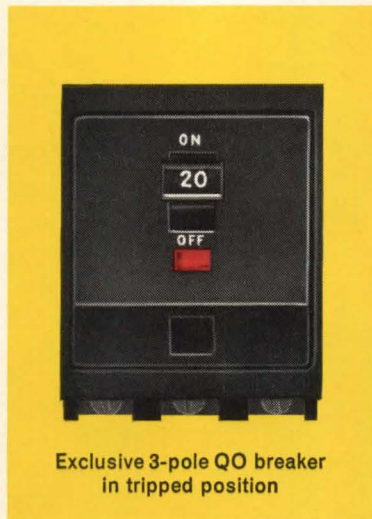


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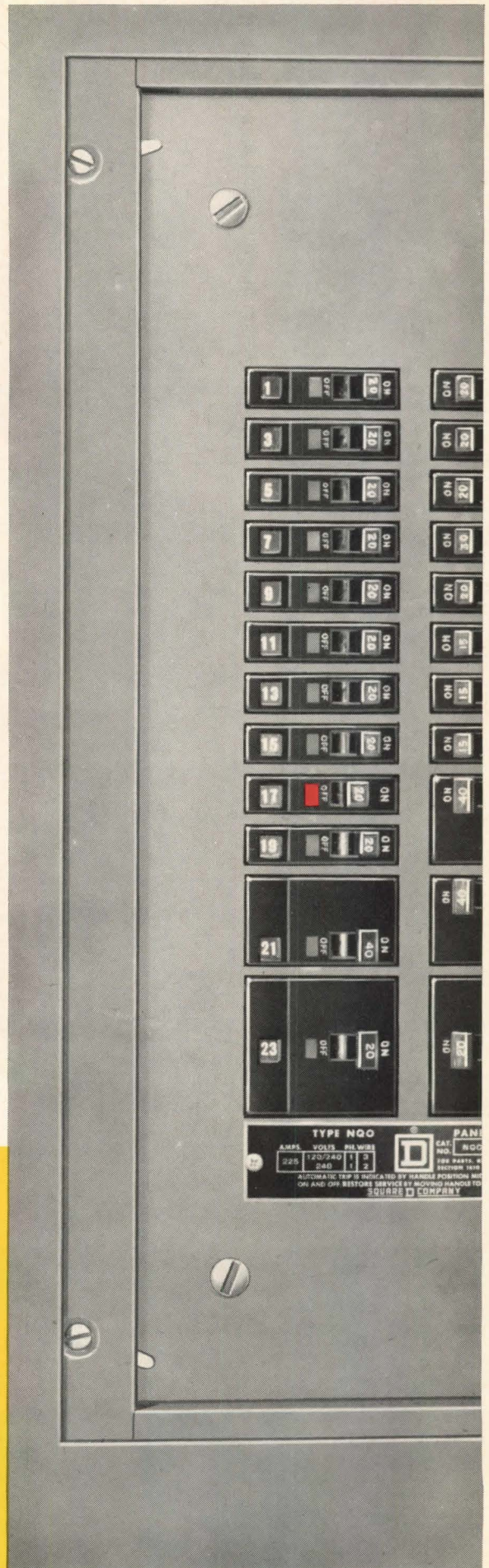
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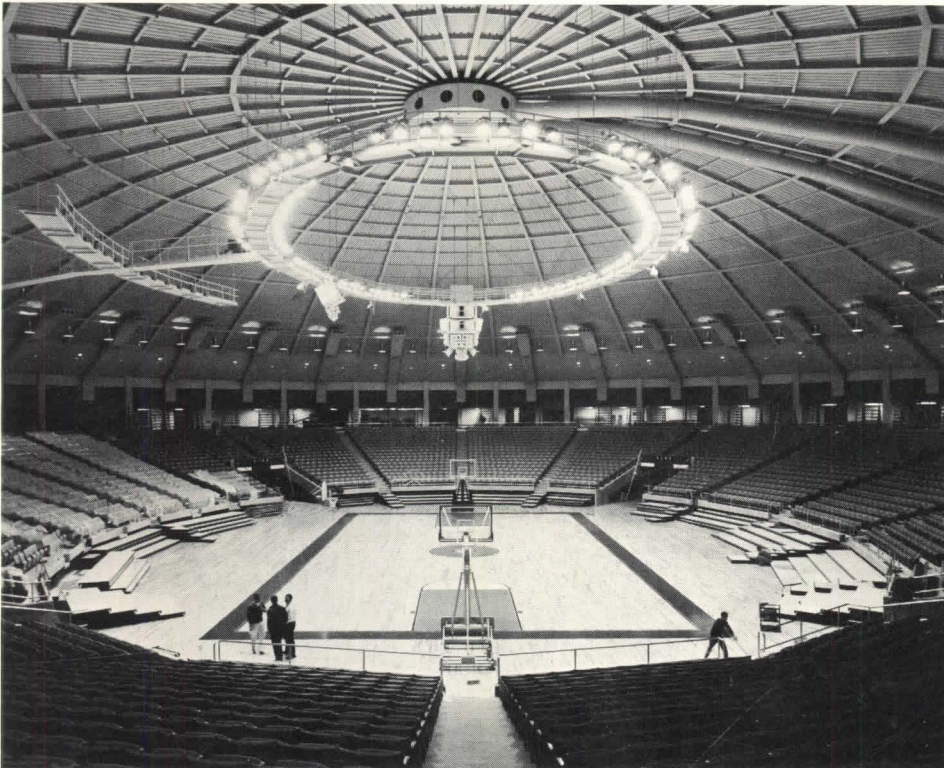
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