ARCHITECTURAL RECORD

7 JULY 1963

BUILDING TYPES STUDY: RELIGIOUS BUILDINGS

SAARINEN'S DULLES AIRPORT TERMINAL BUILDING

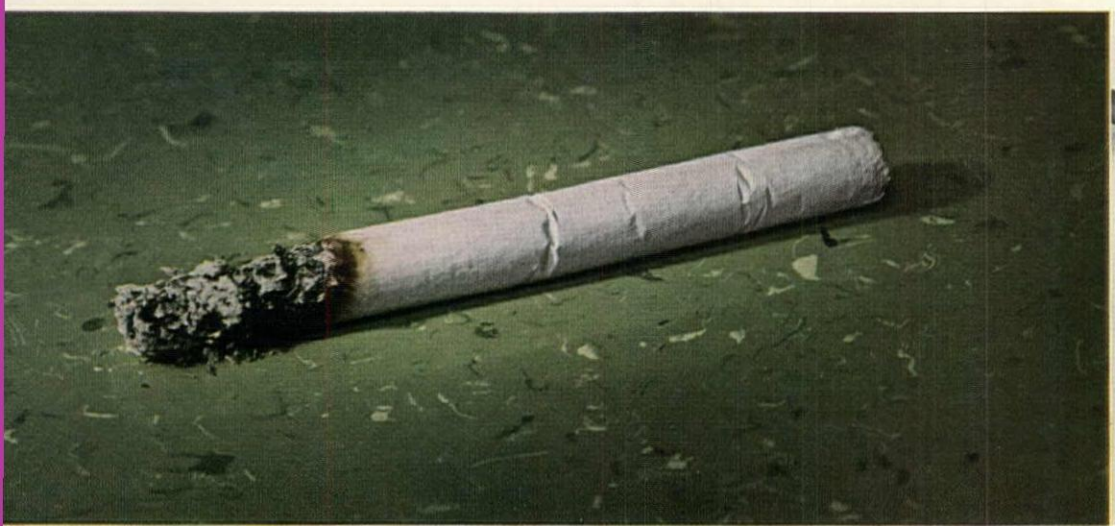
GOUCHER COLLEGE STUDENT CENTER BY BELLUSCHI

FULL CONTENTS ON PAGES 4 & 5

PROPERTIES OF HYPALON
ADVANTAGES OF VISTELLE

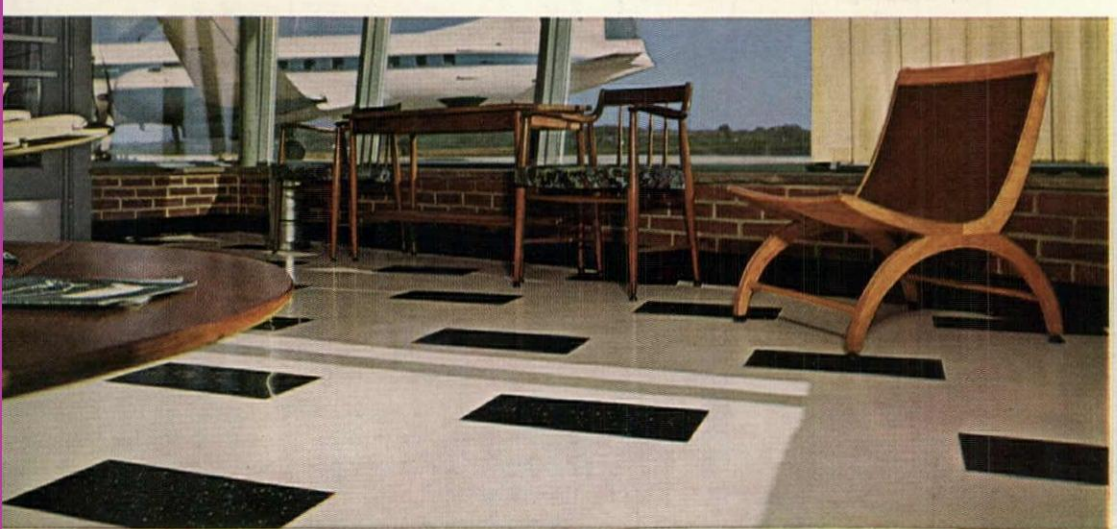
Hypalon: So tough and resilient, it's used for shoe soles and heels.

Vistelle: Long wear under heavy traffic. Outstanding resilience for comfort, quiet, recovery from indentation.



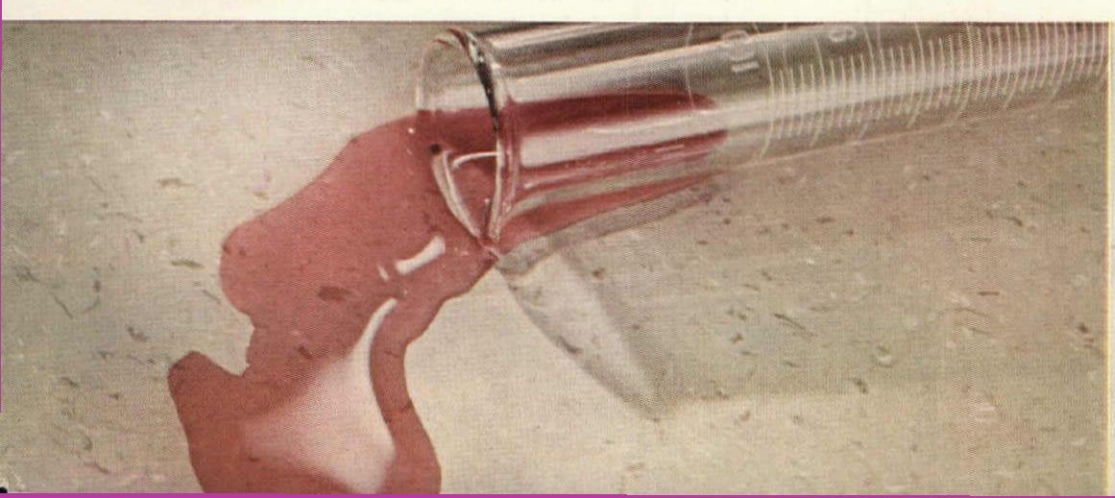
Hypalon: So resistant to heat, it's used for spark plug boots.

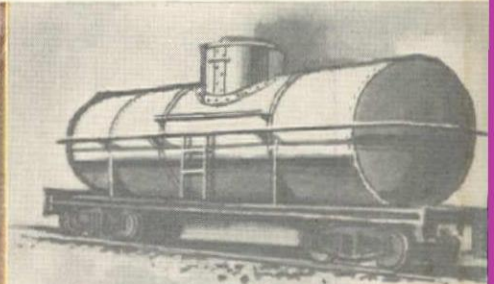
Vistelle: A lighted cigarette will not rupture its surface.



Hypalon: So colorfast it's used for white-walls . . . resists yellowing from sun and weather.

Vistelle: Extraordinary fade resistance. Richer, clearer colors.





Hypalon: So resistant to solvents, chemicals, acids, it's used to line tank cars, pipes, valves.

Vistelle: Superior resistance to staining compared to vinyl and rubber tiles. See text opposite.

NEW FROM ARMSTRONG:

VISTELLE CORLON TILE, made with Du Pont Hypalon.

Read how this new floor provides an unequalled combination of physical properties and functional advantages.

These illustrations show how Armstrong has utilized the remarkable physical properties of Du Pont Hypalon to create an equally remarkable flooring product called Armstrong Vistelle Corlon Tile. Vistelle is the result of ten years of Armstrong research and field testing, a completely new kind of floor. It offers the best combination of physical properties and functional advantages ever incorporated in one flooring material.

RESISTANCE TO INDENTATION MARKS:

Most flooring materials resist indentation by virtue of their **hardness.** Vistelle's exceptional resistance to permanent indentation is a function of its extreme **resilience.** It has outstanding ability to recover from pressure. It springs back from the impact of stiletto heels, from the weight of desks and chairs, keeping the floor virtually free of permanent indentation marks, without sacrificing underfoot comfort and quiet.

COMFORT AND QUIET:

Because of its amazing resilience, Vistelle gives luxuriously underfoot. It's as comfortable as rubber tile, almost as quiet as cork tile. And unlike other resilient floors, the extraordinary resilience of Vistelle does not decrease with age.

RESISTANCE TO CIGARETTE BURNS:

Lab tests and actual installations have shown that cigarettes left burning on Vistelle tiles won't rupture or permanently scar Vistelle's surface and leave only a surface stain which can normally be removed with standard maintenance procedures.

COLOR CLARITY AND FADE RESISTANCE:

Compared to other resilient floors, the whites in Vistelle are whiter, the blacks blacker, the colors richer, the designs sharper. Test installations of Vistelle Corlon Tile have been exposed to sunlight for several years with remarkable color constancy.

RESISTANCE TO STAINING:

Tests have been made with more than 100 chemicals and a like number of common staining agents, such as lipstick, grape juice, crayon, and ink. Compared to homogeneous vinyl, rubber, and unfilled vinyl tiles, Vistelle's over-all rating in resistance to staining was dominantly superior. Vistelle is also greaseproof.

DIMENSIONAL STABILITY:

Vistelle Corlon Tile has exceptional resistance to shrinkage or expansion, exceeding the requirements of Federal Specification (homogeneous vinyl tile) Interim L-F 00450 — (COM-NBS). Seams stay tight. Tiles won't cup. (Dimensional stability will be guaranteed in writing by Armstrong.)

ABRASION RESISTANCE:

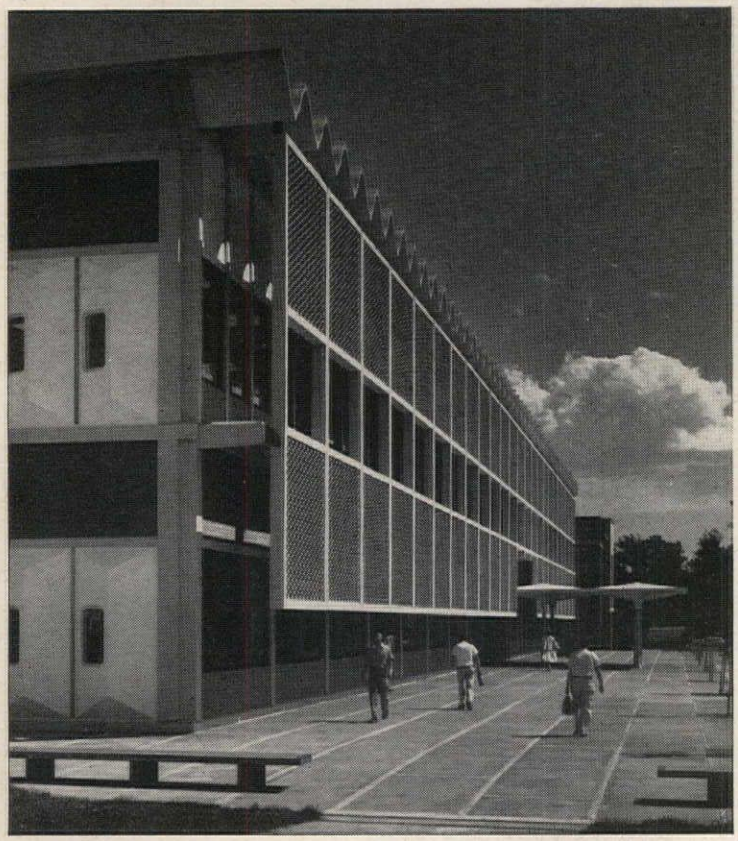
Vistelle provides excellent abrasion resistance for long wear under heavy traffic. A test installation of Vistelle on the entrance ramp of the Disneyland House of Tomorrow was abraded for 2 years by sand and gravel tracked from paths leading to the house. Even after 4 million people had used this ramp, only 20% of the tile's thickness had been worn away.

TECHNICAL DATA:

USES: Vistelle can be installed above, on, or below grade, over any kind of subfloor. Because of its versatility and good looks, Vistelle is ideal for use in hospitals, business interiors, institutional buildings, fine residential interiors. MAINTENANCE: Its tough, smooth surface makes Vistelle easy and economical to maintain. GAUGE: ⅛". SIZES: 9" x 9", 12" x 12". COLORS: 10 colorings in 5 color-coordinated pairs, which can be used in combination or separately. COST: $1.50 to $2.00 per sq. ft., depending on the size of the installation and job conditions.

For complete information on Vistelle, including performance tests, specifications, and samples, contact the Architect-Builder Consultant at your nearest Armstrong District Office. Or write direct to Armstrong, 307 Rock Street, Lancaster, Pennsylvania.

Above and below: Library, Central Washington College of Education, Ellensburg, Wash. **Architects:** Bassetti & Morris. **Contractor:** Newland Construction Co. Rotary Oildraulic Passenger Elevator sold and installed by Sound Elevator Co.



Tutt Library, Colorado College, Colorado Springs. **Architects:** Skidmore, Owings & Merrill. **Contractor:** Lembke Construction Company of Colorado, Inc. Rotary Oildraulic Passenger Elevator sold and installed by Dover Elevator Co.

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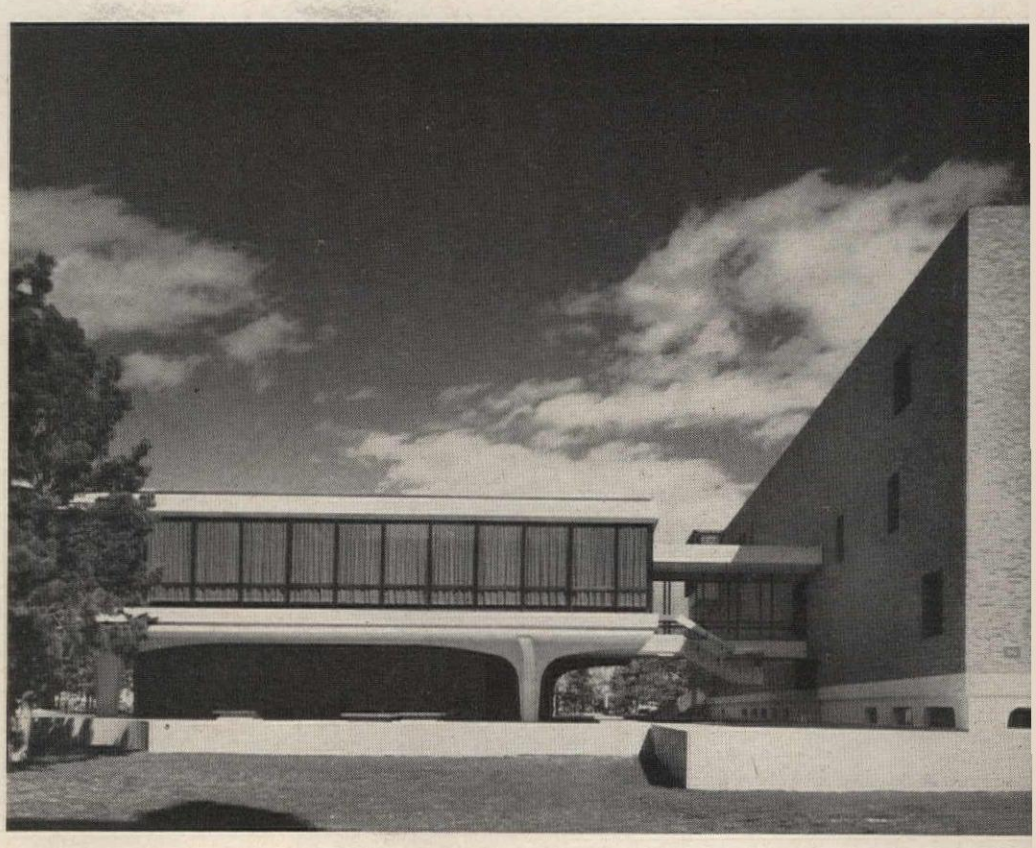

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Dulles International Airport, Chantilly, Virginia. Architects, Eero Saarinen and Associates; photograph by Joseph W. Molitor

Advertising Index: 248

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July 1963

Building Types Study 322: Religious Buildings

Coming in the Record

SPECIAL STUDY ON CAMPUS PLANNING AND CAMPUS ARCHITECTURE

Next month's Building Types Study on College Buildings will lead off with features on two major design concepts for two new expansion *campuses with totally different planning problems—the 25,000-acre* country *campus for Southern Illinois University at Edwardsville, Ill., and the 106-acre* urban *campus for the University of Illinois in Chicago. The study will also include important new examples of individual college buildings. Recognizing the current and coming opportunities for architects and engineers—as indicated by F. W. Dodge activity reports—of the field of campus architecture, this will be the largest Building Types Study of the year.*

New Headquarters For Architectural Record

Effective July 8, Architectural Record *moves its editorial offices (and its executive, circulation and advertising headquarters) to the McGraw-Hill Building, 330 West 42nd Street, New York 36, New York.*

Architectural Record is managed by the Publications Division of McGraw-Hill Publishing Company, Inc. Officers of the Publications Division: Shelton Fisher, president; vice presidents: Robert F. Marshall, operations; John R. Callaham, editorial; Ervin E. DeGraff, circulation; Donald C. McGraw, Jr., advertising sales; Angelo R. Venezian, marketing.

Every effort will be made to return material submitted for possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage.

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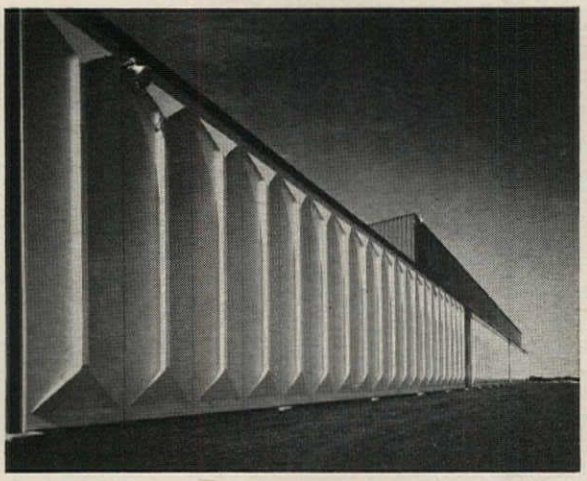

During construction of a new Collins Radio manufacturing plant in Richardson, Texas, the builders put up 162 square feet of exterior and interior walls with every swing of the crane. How? By using pre-cast, contoured white concrete curtain wall panels. Each panel was 6 feet wide by 27 feet high and was made of Trinity White and white marble aggregate.

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Bold and Innovative and Egocentric

Last month in this space I let fly some sharp but heartfelt remarks about public relations aspects of the Miami A.I.A. convention. Clearly the intra-profession observations about one another's artistic achievements are not exactly what public relations counsel would select as the best material for circulation to the general public. Introspective self-evaluation may be good for the soul, but it is usually conducted in private.

But enough of that. I am moved to comment on one question that came from the floor during the convention, a question about the role of the architectural magazines in the "quest for quality in architecture." The question directed at Karel Yasko, new chief architect for the General Services Administration, was "Are the editors of the architectural magazines capable of naming the best architects?"

If this is not an accurate recollection of the exact words, it is pretty close, for I remember that a single word in answer occurred to me. It was the word, "yes."

It was clear, however, that editors were in the line of fire but not the only target. The questioner was asking, seriously I suppose, if Yasko were going to select architects for Federal projects on the basis of work published in architectural magazines.

Now I suppose that we editors might still feel a needle in this phrasing, and that we could easily agree to answer: "He might well do so."

But I should still like to try one more, more brutal phrasing of the question: "Are the bold and innovative and egocentric architects of our time, whose work is published in the architectural magazines, the proper ones to do Federal work which is paid for by taxpayers?"

Well, this taxpayer would like to remark that I'd be less burned up about my taxes if I could be a bit more proud of the visible return. Not much of the vast government spending develops any visible, comprehensible form. Buildings represent the governmental image, and I could stand something better than the mediocre, inept, unimaginative, cringing committee-designed, barren barracks-like banalities that usually portray our government as a sort of ubiquitous, voter-conscious clod. In other eras government buildings had the best and boldest of architect, and there was money for colonnades and capitals and finials and, yes, sculpture.

Speaking as an editor, one who selects for publication this bold and innovative and egocentric work, I must observe that nobody asks that *all* government buildings have outstanding architectural expression. And I am not suggesting that any such building represent merely some egocentric designer's whim. Mr. Y will not have to be warned that architects do occasionally get carried away with creative zeal.

And, as the convention questioner was observing, in his tactful manner, not every bold and innovative and egocentric sally by an aspiring artist-architect will deserve perpetuation in the taxpayer's marble. Why, then, do we publish it in the magazines?

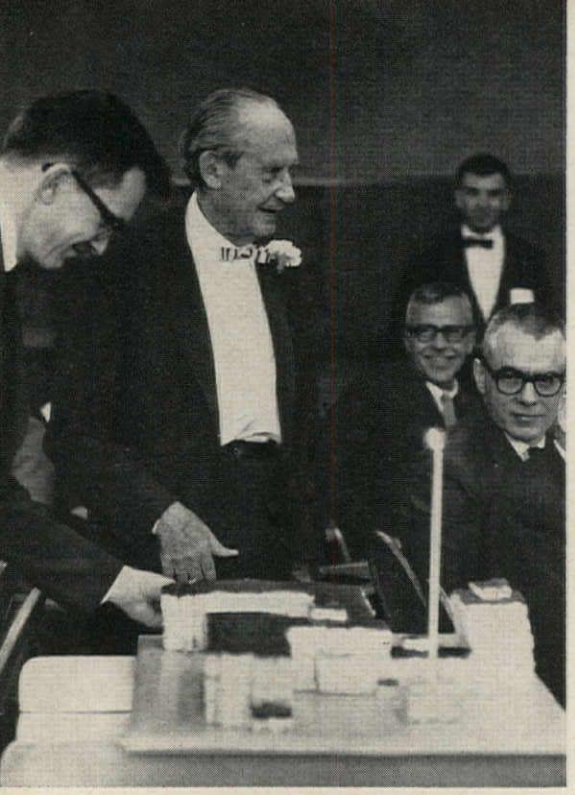
Well, do you have time for 100,000 words? No? So I'll just have to say because we consider it interesting, and important, to other architects. We try not to be subjective (not always, anyway). We reach for the bold and innovative because thus does architecture progress. We encourage the frequently egocentric architects because they are creative.

We believe that architecture progresses with its times, its possibilities, its responsibilities. It is the editor's job to support that forward movement, and to assist it. We do not suggest that this month's crop is greater than the greatest of Georgian or Renaissance buildings; we suggest that this month's issue is a good selection of projects and ideas (selected for a thousand different reasons) suitable for today's architects.

So for Mr. Yasko—if we could presume to get into the act—we hope he will be strongly influenced by the architectural magazines. He will not have to be reminded that his function is different from ours.

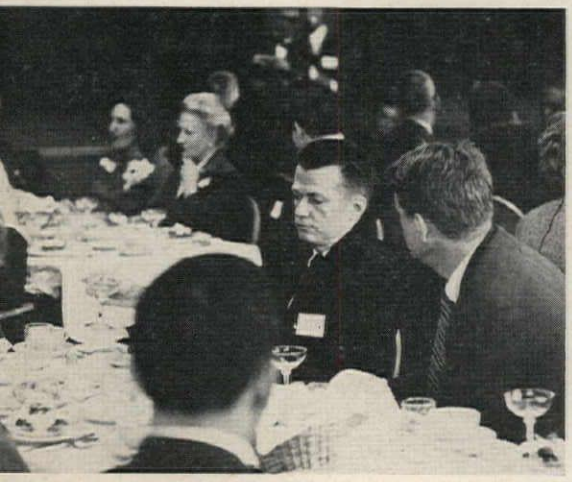
—Emerson Goble

GROPIUS' 80TH BIRTHDAY MARKED BY OLD FRIENDS AND STUDENTS



Functional birthday cake: Walter Gropius, at luncheon celebrating his 80th birthday, cuts cake constructed, roughly, on lines of the Bauhaus Building at Dessau

Above, left: Prof. Reginald Isaacs, toastmaster, officiates. *Above, right:* Professor Isaacs (at left), Chairman of Harvard's Department of City and Regional Planning, and Prof. Martin Meyerson, of Harvard's Department of Urban Studies. *Below:* architects Paul Rudolph and Ulrich Franzen, both former students of Dr. Gropius



Incredibly, Walter Gropius is 80 years old. On May 18, he was joined, in the Gropius-designed Harkness Commons at Harvard, by more than 70 colleagues and old students to celebrate this occasion. And, as is traditional on such occasions, Dr. Gropius expressed observations on the state of modern architecture. Being young, he was of course more interested in the present than either the near or remote past.

On the state of architectural practice: "In spite of all the lip service paid to it, there is still hardly a beginning at cooperation between groups of architects who, by choice or happenstance, are required to work side by side on larger projects. You know how important this has always seemed to me, but in all my recent experience . . . I have continually run into the same situation: a naive disregard for what happens beyond the borderline of one's own commission. . . . The desire to outdistance everybody else in dramatic appeal is still so irresistible that the necessary balance of the total design is destroyed."

On contemporary attitudes toward city planning: ". . . indicative of a prevailing urbanistic sentimentality, a blindness to new trends and to the changing order of scale and of magnitudes of building masses in cities. . . . The problem is not how to stem the tide of these new trends, but to find proper solutions for them."

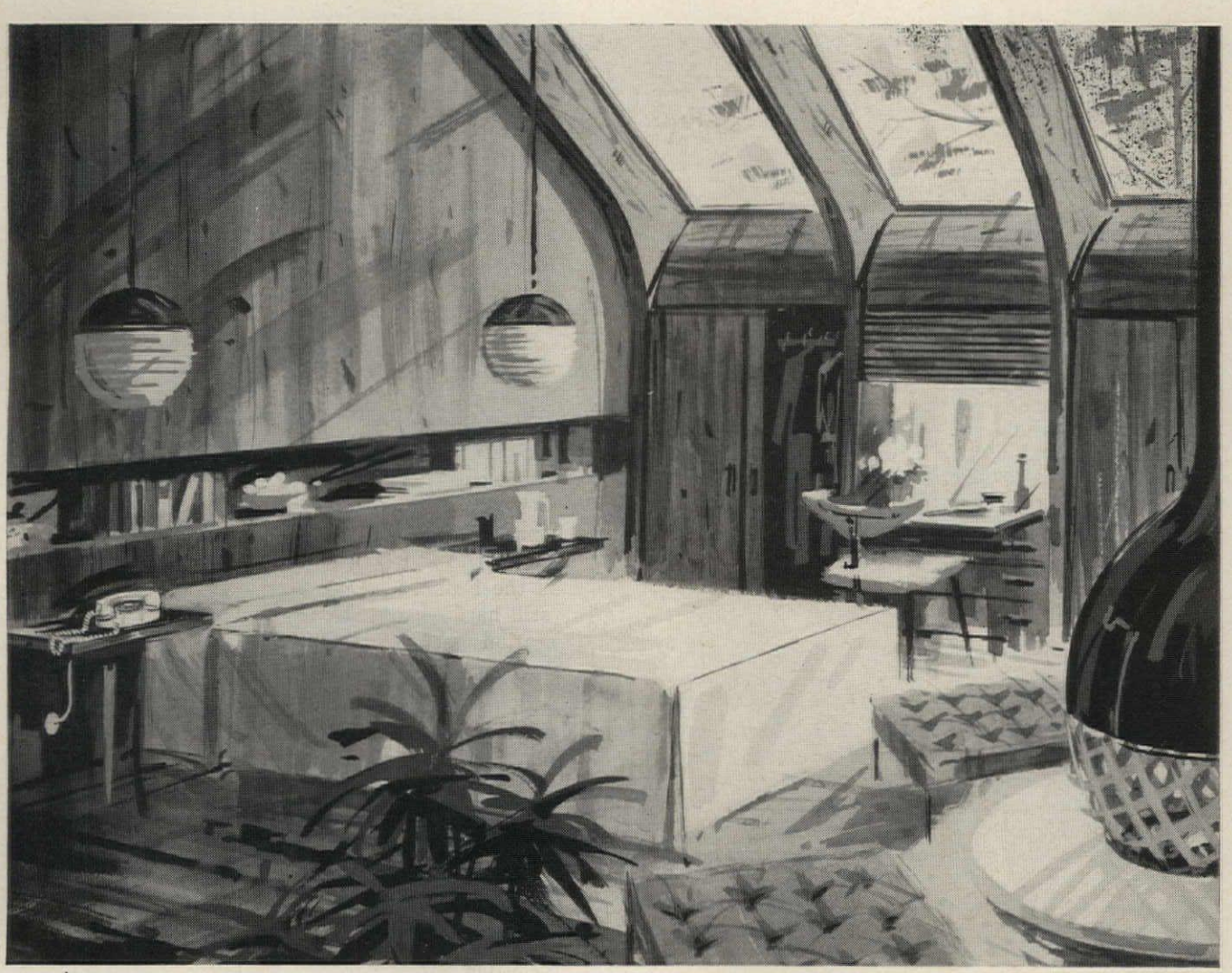
On modern man in the Western city, and the difficulties of living in "a land of abundance, free choice and limitless feasibility": "[We] are far from happy and confident because our emotional life is still conditioned by our early commitment to the economic and cultural standards of the past. We operate, so to speak, with a bad conscience, and often even with a certain revulsion against this cornucopia that has been emptied over our heads . . . We are not sure at this point of what is permissible and what is destructive for our society; and the architect and planner, who is supposed to create the physical structure for this vague situation, can only proceed from his personal conviction with no assurance that *his* will be the right kind of contribution for making a new pact with life which mankind so badly needs. This is the great risk and adventure we all have to face, and there is no ultimate comfort in reverting to answers found for an earlier age."

Reginald Isaacs, professor at the Graduate School of Design and a former student of Dr. Gropius, as toastmaster cited, among other accomplishments, 600 graduates from the Bauhaus under Dr. Gropius' direction, and several hundred from Harvard's architectural studies program. Dr. Gropius now practices with The Architects Collaborative.

Among the gifts presented to Dr. and Mrs. Gropius were a birthday cake built like the Bauhaus, a Harvard chair, a rocking chair, an album of letters and photographs, and a book prepared by Josef Albers.

After the luncheon, guests attended a preview of an exhibition "Walter Gropius: Architect, Creator, Educator." Sponsored by Harvard's Loeb Drama Center and the Busch-Reisinger Museum, the exhibition was assembled by H. M. Wingler, director of the Bauhaus Archive.

Among the guests: Mrs. Gropius; Mrs. Isaacs; Prof. Charles L. Kuhn, Curator, Busch-Reisinger Museum; Dean and Mrs. Jose Luis Sert; Acting Dean Martin Meyerson of the Graduate School of Design, and Mrs. Meyerson; Prof. and Mrs. Walter Bogner; Prof. Edward True; Mr. Philipp Schmidt-Schlegel, German consul; Prof. Lawrence B. Anderson; Nelson Aldrich; Leonard Currie; Henry Hill; Huson Hackson; Richard G. Stein; William B. Tabler; Charles Burchard; Alexander S. Cochran; Mr. and Mrs. Chester Nagel; John C. Harkness; Casper S. Neer; Hugh McK. Jones; Edward L. Barnes; Ernest Kump; Frances Quarton; Franziska Porges Hosken; Mr. and Mrs. Norman Fletcher; Louis E. Fry; Frank Weiss; Eduardo Catalano; King L. Wu; Arthur Q. Davis; Irving Maitin; Mr. and Mrs. I. Ming Pei; W. R. Allen; Mr. and Mrs. Charles Forberg; John C. Parkin; James R. Lamantia Jr.; Paul Rudolph; Robert A. Bastille; Ulrich Franzen; Ronald Gourley; Mr. and Mrs. Leo Kornblath; John E. Nickols; Henry Stone; Helge Westermann; Mr. and Mrs. Fred Bruck; Elsa H. Craig; Earl M. Harvey; Richard E. Baringer; Paul Mitarachi; E. J. Romienics; James Harris; Robert Myers; J. Von Henneberg; Mr. and Mrs. John Garber; Claude M. Pendley; Lien-Ching Chen; Tetsuo Takayanagi; Mrs. John Blakeley; and Mrs. Richard Talmadge.



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The Changing Times Tower

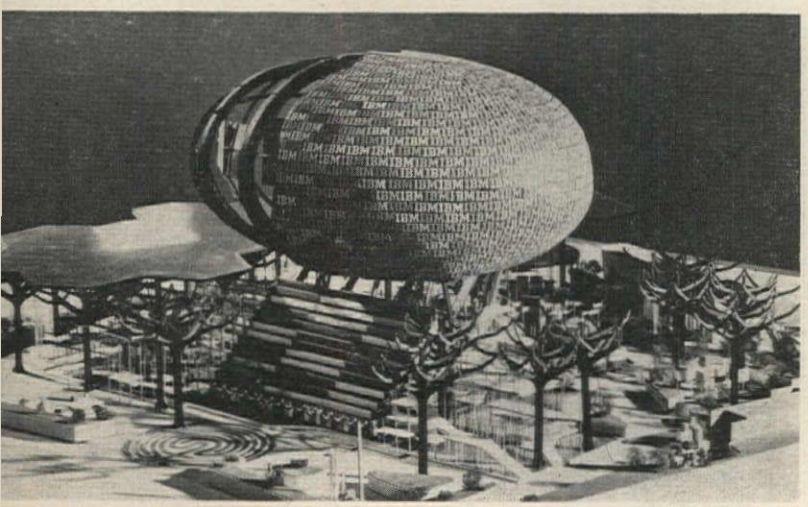
An old New York landmark familiar to both natives and tourists in Times Square is about to give way to the new. The Times Tower, designed in 1904 by Cryus L. W. Eidlitz and Andrew C. McKenzie, inspired by Giotto's campanile, will shuck its old white brick and terra cotta walls, and by late 1964 will become a display center for Allied Chemical Corporation. Removing everything but the steel frame, and adding steel bracing to compensate for the loss of masonry support, architects Voorhees Walker Smith Smith & Haines will give the building a new wall of glass and white facing, but will leave the basic shape of the building unaltered. News will still be flashed in lighted headlines at the third floor level. Allied Chemical hopes this renovation will have a "catalytic effect" on the contemplated improvement of the Times Square area

Independence Mall Development

Rohm & Haas have announced plans for a nine-story office building to be the first major construction in the Philadelphia Redevelopment Authority's Independence Mall West Project. Designed by architect Pietro Belluschi, in collaboration with George M. Ewing Company, architects and engineers, the exterior of the building will incorporate one of the owner's products—acrylic plastic—in sunshades and spandrel panels. The owners are acting as general contractors, with Turner Construction Company supervising construction

Redevelopment in Wisconsin

Sampson Plaza, designed by architects Harry Weese & Associates for the Madison, Wisconsin, Redevelopment Authority, will contain 150 apartment units. The paired buildings will share common entrance towers containing elevators, electrical distribution, trash disposal and storage space. Parking space will be located under the buildings, concealed by the buildings and 4-foot retaining walls

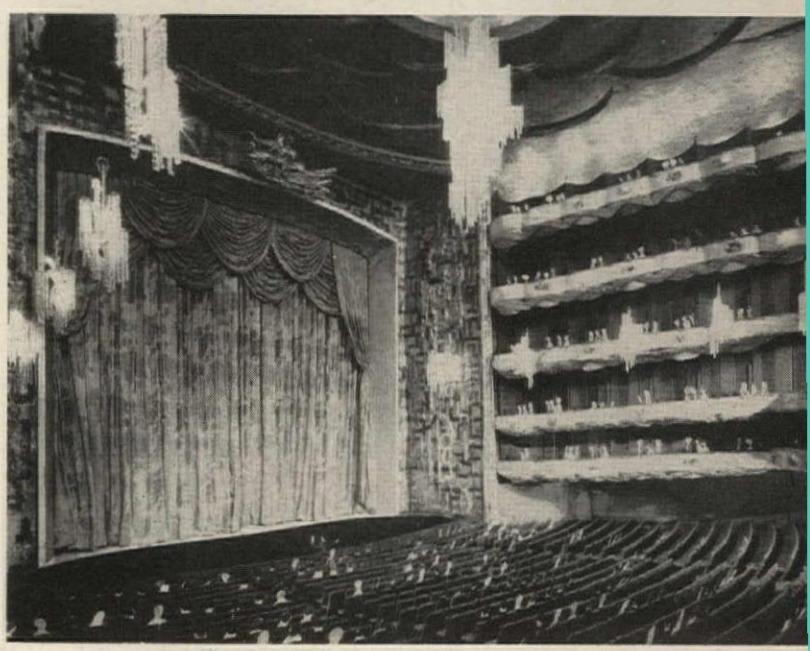


World's Fair Pavilion

I.B.M.'s pavilion at the 1964-65 New York World's Fair will be situated in "a grove of man-made steel trees." The trees and the pavilion have been designed by Charles Eames and by Eero Saarinen and Associates, architects. The pavilion will have six components: an "Information Machine," consisting of an ovoid theater and a "People Wall" (an audience of up to 400 will be seated at ground level and lifted into the theater); "Pentagon Theaters," containing explanatory exhibits of data processing systems; "Computer Court," with a working computer; "Probability Court," with an exhibit demonstrating probability theory; "Scholar's Walk," illustrating the history of computer development; and an administration building. Gilbane Building Co., contractors

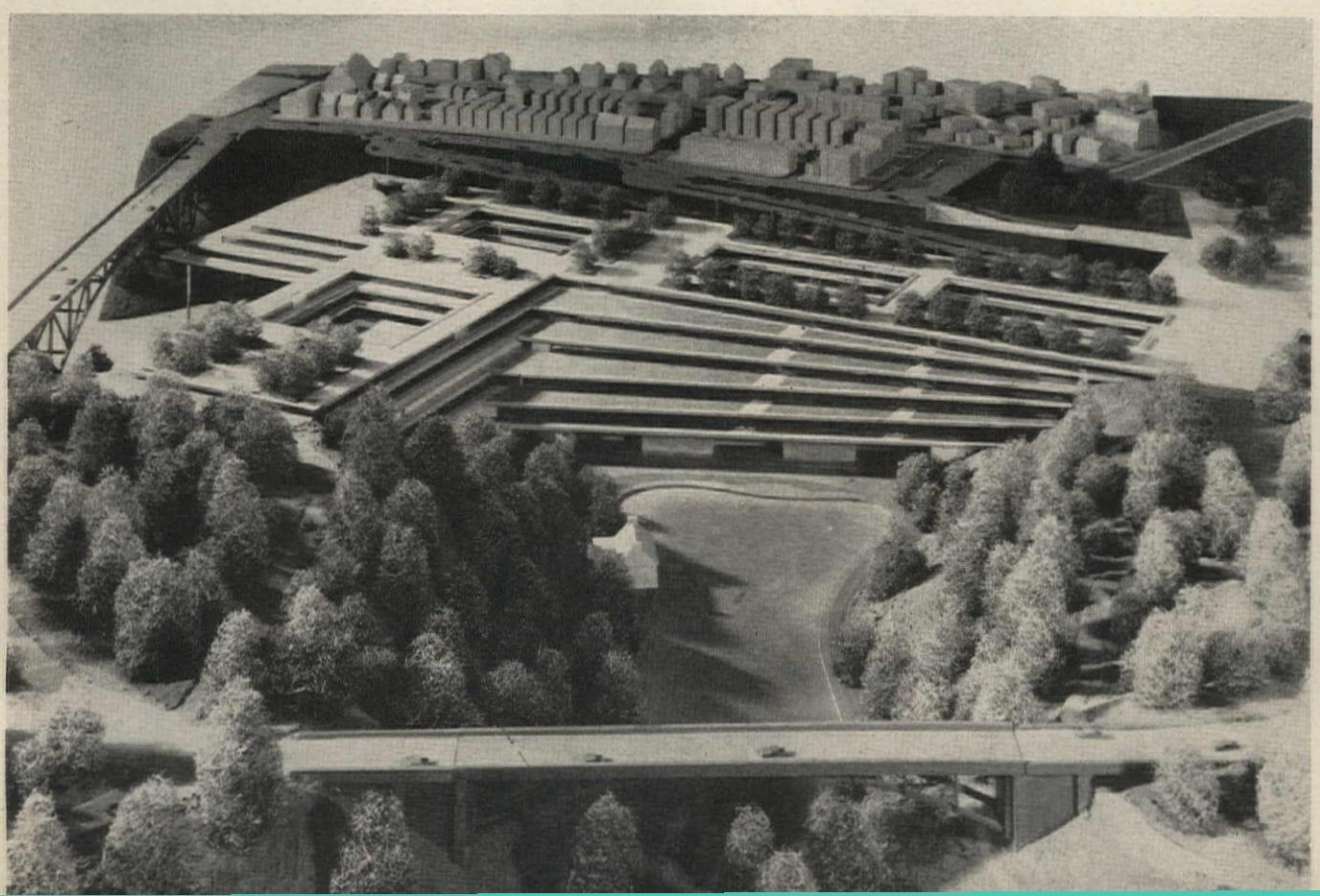
Interior for the Met

A slightly revised exterior design and first designs for the interior of the Metropolitan Opera House have been announced by New York's Lincoln Center for the Performing Arts. That part of the house seen by the audience will be comfortingly reminiscent of the old theater: the new opera house will hold slightly more spectators in slightly altered seating, the proscenium arch will be similarly scaled, the décor, though different in detail, will engage the old components of red, gold, ivory and crystal. Work space, however, is far more generously provided than in the old house, with about twice the space backstage, in the flies and in the pit, and with space enough to store a whole season's sets. Wallace Harrison, of Harrison & Abramovitz, is the architect. The contractors are George A. Fuller Company



Research Center in Pittsburgh

Below: Panther Hollow Research Center is designed to be a nearly self-sufficient community for work, living and culture. The site, a deep ravine long considered impossible for building, is adjacent to the University of Pittsburgh, Carnegie Institute of Technology and Schenley Park. The first phase of building, to be completed by 1966, will provide laboratories, reactor, computer center and data bank, as well as three theaters and schools for Pittsburgh Playhouse, additional space for Carnegie Museum, restaurants, shops, ice rink, heliport and parking for 8,000 cars. The second phase, scheduled for 1970 completion, will add housing. Max Abramovitz, of Harrison & Abramovitz, is the architect



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Square D electrical distribution and control equipment is on duty throughout this huge structure

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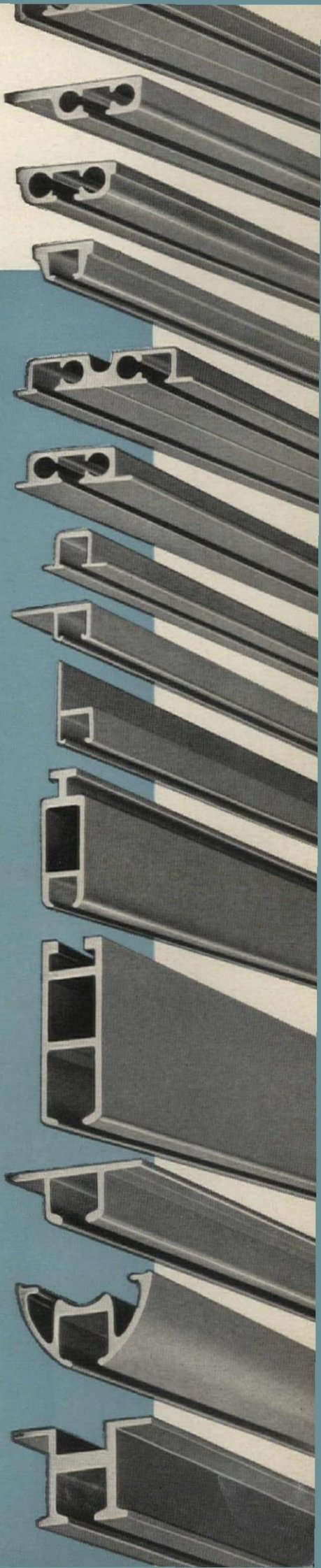

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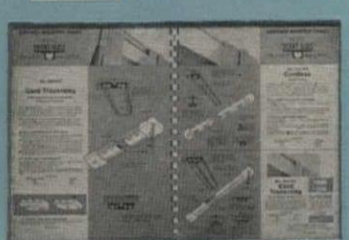

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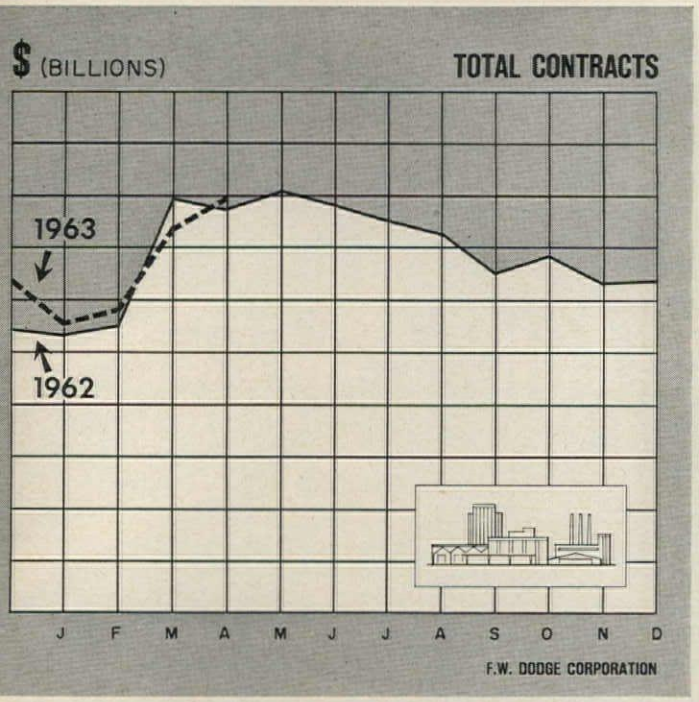
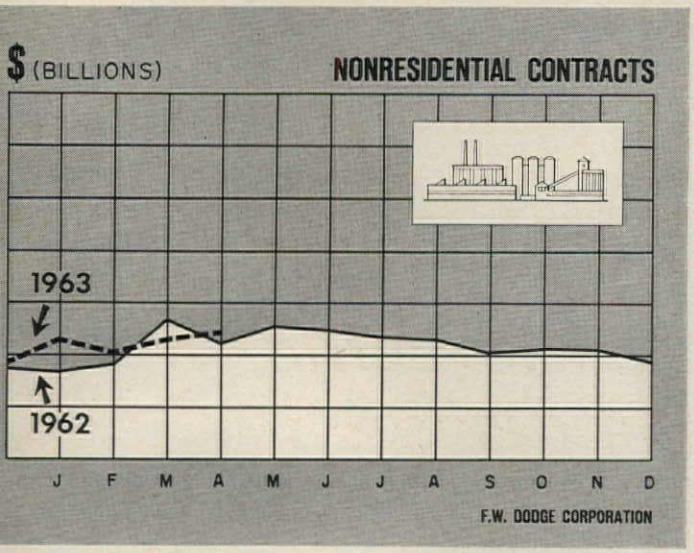
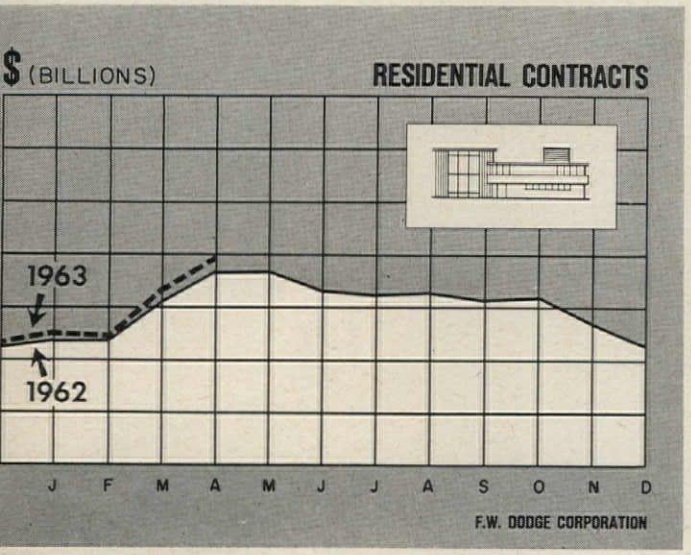


Total contracts include residential, nonresidential and non-building contracts





RELIGIOUS BUILDINGS: STABILITY AFTER THE BOOM

From 1945 to 1959, construction of religious buildings boomed, showing one of the fastest growth rates among all building types. Beginning with 1960, however, the number of square feet in religious building contracts has declined each year, and the trend has continued through the first four months of this year.

As with many building types, the beginnings of the postwar religious building surge goes back several decades. After active construction of religious buildings that kept pace with the population growth of the 1920's, the depression of the '30's and World War II practically brought religious construction to a standstill. For example, the total square feet of construction contracts for religious buildings in the entire period from 1931 through 1944 was only moderately higher than any one recent year's total! But, while church building was in a slump, population continued to grow (even if slowly during the depression), and the proportion of the population who were church members increased from about 48 per cent in 1931 to nearly 55 per cent in 1944.

When the war ended, the 14-year lag in church building coupled with sharply rising church membership caused the only possible result: an all-out building boom. By 1950, the annual physical volume of religious building had expanded to four times what it was in the first post war year. Church construction eased in 1951 and 1952 during the Korean conflict, then continued pushing upwards to a record 55 million square feet in 1959.

Why has church building declined slightly each year since its 1959 high water mark? There are two reasons that probably explain this downward trend. First, the postwar church building boom undoubtedly took up the slack that was caused by the low levels of construction during the depression and war years. Since 1959, the high level of church building contracts, even though no longer growing, has taken care of population increases. Second, and perhaps more interesting, is the trend of church membership. Each year, for almost 100 years, more and more people out of the total population have become church members. For instance, in 1870 available records show that only 18 per cent of the U.S. population belonged to religious groups. By 1900 this figure had doubled; and in 1950, 57 per cent of the population were church members. During the decade of the '50s, membership as a percentage of total population rose to 63 per cent in 1958, where it has remained ever since. One of the biggest forces that has helped push demand for church construction up has apparently stabilized.

What about the future? Religious building construction should remain strong, even if not of boom proportions. With over $800 million of contracts in 1961 and 1962, expectations of close to $800 million in 1963, church construction certainly isn't in a slump. Population will be growing more rapidly in the future; and unless there is a marked decrease in the proportion of total population which belongs to religious groups, the increased numbers of people will provide the demand for continuing high levels of church construction.

Henry C. F. Arnold, Economist
F. W. Dodge Corporation
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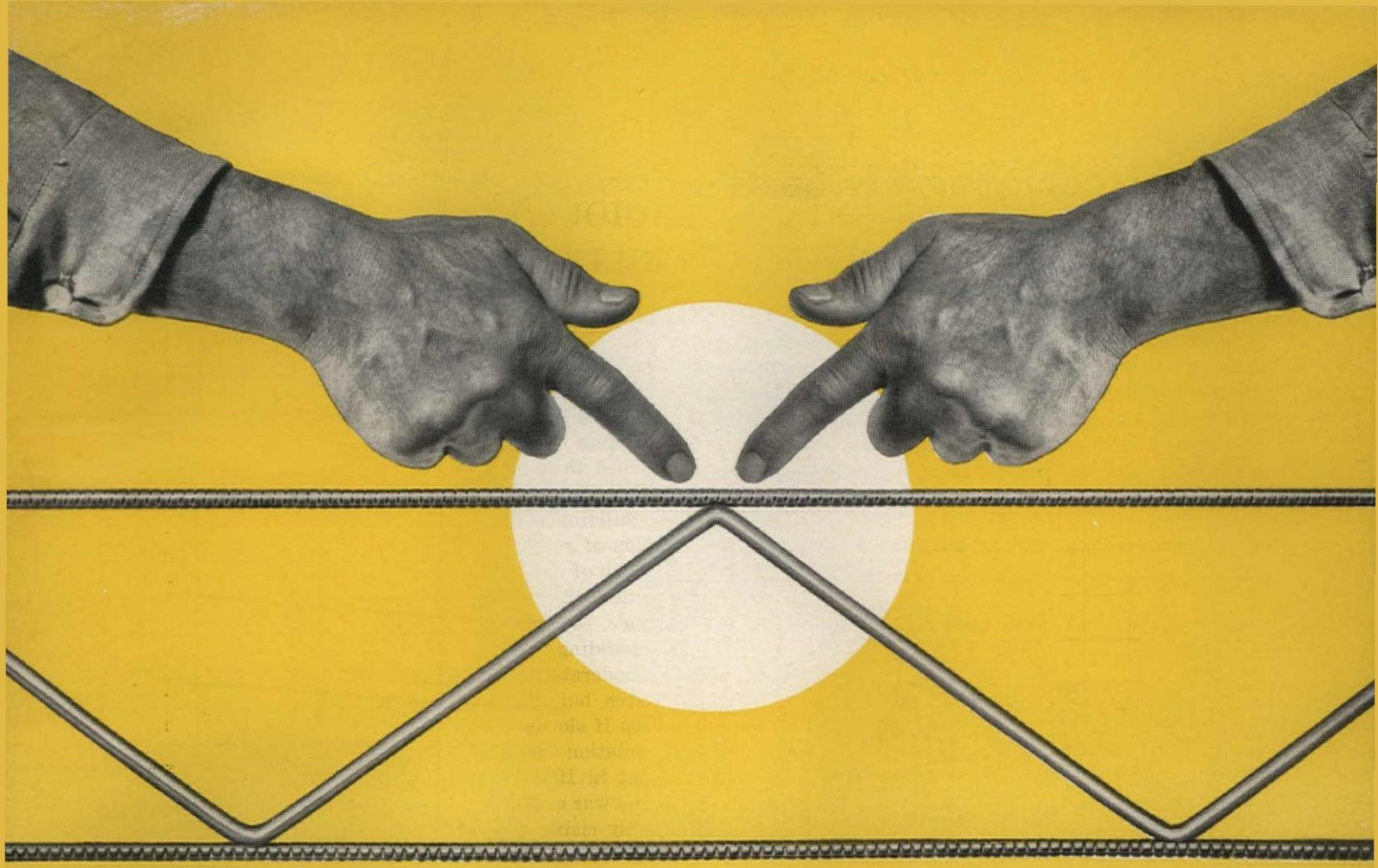

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Building Construction Costs

By Myron L. Matthews
Manager-Editor, Dow Building Cost Calculator, an F. W. Dodge service

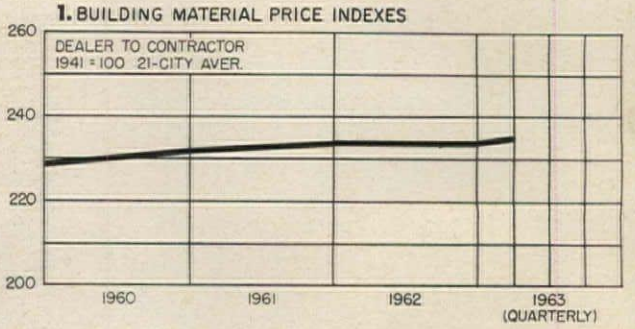
The information presented here permits quick approximations of building construction costs in 21 leading cities and their suburban areas (within a 25-mile radius). The tables and charts can be used independently, or in combination as a system of complementary cost indicators. Information is included on past and present costs, and future cost can be projected by analysis of cost trends.

A. CURRENT BUILDING COST INDEXES—JUNE 1963

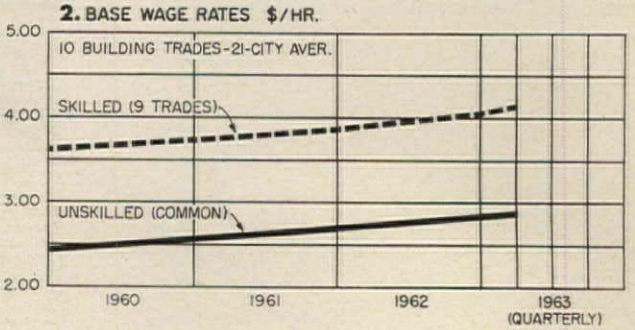
1941 Average for each city=100.0

Metropolitan Area	Cost Differential	Current Dow Index Residential	Current Dow Index Nonresidential	Per Cent Change Year ago Res. and Nonres.
U.S. AVERAGE— 21 Cities	8.5	257.4	274.2	+1.60
Atlanta	7.1	289.1	306.6	+1.81
Baltimore	8.0	261.0	277.6	+0.25
Birmingham	7.4	237.4	255.3	+0.76
Boston	8.4	230.8	244.3	+0.54
Chicago	8.8	286.0	300.8	+2.24
Cincinnati	8.8	248.5	264.1	+1.12
Cleveland	9.3	260.3	276.7	+1.83
Dallas	7.8	246.4	254.4	+2.94
Denver	8.3	262.0	278.5	−0.11
Detroit	8.9	258.0	270.8	+1.09
Kansas City	8.3	232.5	246.1	+1.54
Los Angeles	8.4	261.3	285.9	+1.89
Miami	8.4	256.2	269.0	+2.47
Minneapolis	8.9	258.8	275.1	+1.45
New Orleans	7.9	235.9	250.0	+0.73
New York	10.0	267.4	287.1	+2.70
Philadelphia	8.7	256.0	268.8	+0.07
Pittsburgh	9.1	243.2	258.6	+1.83
St. Louis	8.9	250.4	265.4	+2.90
San Francisco	8.5	327.3	358.2	+2.91
Seattle	8.5	236.6	264.3	+2.54

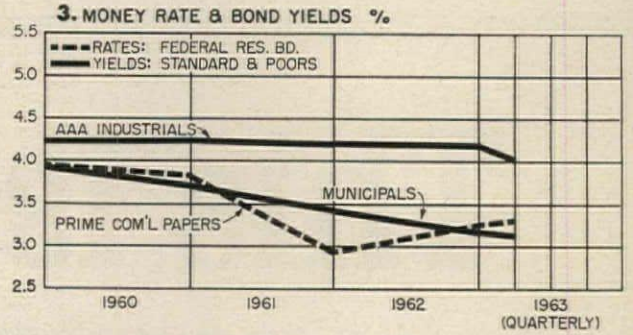
1. BUILDING MATERIAL PRICE INDEXES



2. BASE WAGE RATES $/HR.



3. MONEY RATE & BOND YIELDS %



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

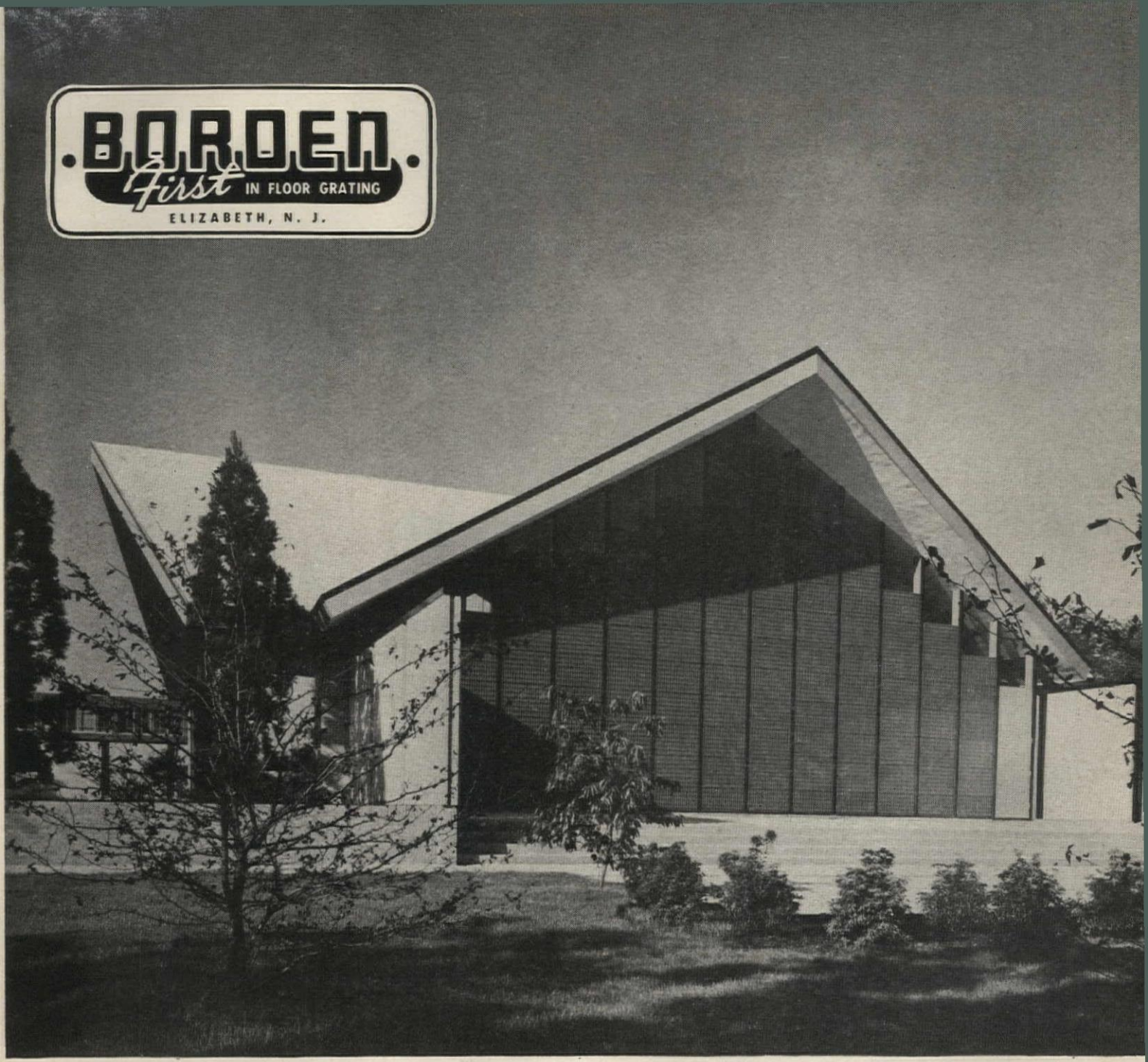
1941 average for each city=100.0

Metropolitan Area	1947	1952	1957	1958	1959	1960	1961	1962 (Quarterly) 1st	2nd	3rd	4th	1963 (Quarterly) 1st	2nd	3rd	4th
U.S. AVERAGE 21 Cities	185.9	213.5	244.1	248.9	255.0	259.2	264.6	265.1	265.9	267.4	268.7	269.4			
Atlanta	190.0	223.5	269.6	277.7	283.3	289.0	294.7	296.5	297.6	298.2	300.6	302.0			
Baltimore	181.0	213.3	249.4	251.9	264.5	272.6	269.9	270.5	272.6	272.4	271.9	272.3			
Birmingham	175.0	208.1	228.6	233.2	233.2	240.2	249.9	249.9	249.9	249.9	250.6	251.3			
Boston	187.0	199.0	224.0	230.5	230.5	232.8	237.5	238.5	239.9	240.4	240.4	240.4			
Chicago	182.0	231.2	267.8	273.2	278.6	284.2	289.9	289.9	289.9	292.6	295.8	296.4			
Cincinnati	178.0	207.7	245.1	250.0	250.0	255.0	257.6	257.6	257.6	260.0	260.0	260.0			
Cleveland	173.0	220.7	258.0	257.9	260.5	263.1	265.7	265.7	268.4	268.4	271.7	272.3			
Dallas	202.0	221.9	228.4	230.5	237.5	239.9	244.7	244.7	244.7	247.7	250.8	251.5			
Denver	187.0	211.8	245.6	252.8	257.9	257.9	270.9	273.1	276.3	275.3	274.8	275.0			
Detroit	158.0	197.8	237.4	239.8	249.4	259.5	264.7	264.7	264.7	267.1	267.1	267.1			
Kansas City	172.0	213.3	230.5	235.0	239.6	237.1	237.1	238.5	239.5	240.8	241.8	242.3			
Los Angeles	180.0	210.3	248.4	253.4	263.5	263.6	274.3	274.3	274.3	278.0	278.6	279.1			
Miami	193.0	199.4	234.6	239.3	249.0	256.5	259.1	259.1	259.1	260.8	262.4	262.4			
Minneapolis	176.0	213.5	235.6	249.9	254.9	260.0	267.9	267.9	267.9	269.5	270.8	271.4			
New Orleans	180.0	207.1	232.8	235.1	237.5	242.3	244.7	244.7	244.7	245.5	245.5	246.5			
New York	181.0	207.4	240.4	247.6	260.2	265.4	270.8	273.5	273.5	276.7	280.4	280.9			
Philadelphia	209.0	222.3	255.0	257.6	262.8	262.8	265.4	265.4	265.4	265.0	265.0	265.6			
Pittsburgh	191.0	204.0	234.1	236.4	241.1	243.5	250.9	250.9	250.9	252.1	253.5	255.0			
St. Louis	191.0	213.1	237.4	239.7	246.9	251.9	256.9	254.0	254.3	256.2	257.3	260.1			
San Francisco	243.0	266.4	302.5	308.6	321.1	327.5	337.4	339.1	340.8	344.5	348.7	350.1			
Seattle	175.0	191.8	221.4	225.8	232.7	237.4	247.0	249.0	251.9	253.7	255.3	256.5			

HOW TO USE TABLES AND CHARTS: Building costs may be directly compared to costs in the 1941 base year in tables A and B: an index of 256.3 for a given city for a certain period means that costs in that city for that period are 2.563 times 1941 costs, an increase of 156.3% over 1941 costs.

TABLE A. 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 first city are 25% higher than costs in second. Also, costs in second city are 80% of those in first (8.0 ÷ 10.0 = 80%) or 20% lower in the second city

TABLE B. 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 index for a city for one period (200.0) divided by index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than those of the other. Also, second period costs are 75% of those of the other date (150.0 ÷ 200.0 = 75%) or 25% lower in the second period. CHART 1. Building materials indexes reflect prices paid by builders for quantity purchases delivered at construction sites. CHART 2. The $1.20 per hour gap between skilled and unskilled labor has remained fairly constant. CHART 3. Barometric business indicators that reflect variations in the state of the money market



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The new Architectural Decor Panels by Borden are an extremely flexible medium, allowing the architect a rare freedom of expression in designing facades to blend with the nature of the building, its setting, and the preferences of his client. The dramatic effects achieved with this new material are being discovered daily; additionally, these panels are unexcelled for sturdiness, economy, ease of handling and installation, and ventilation.

Not limited to facades, the Borden Architectural Decor Panels are used as interior partitions, grilles, window guards, stair rails, doors, entryways, sunshades, and are especially adaptable in the refacing of existing buildings.

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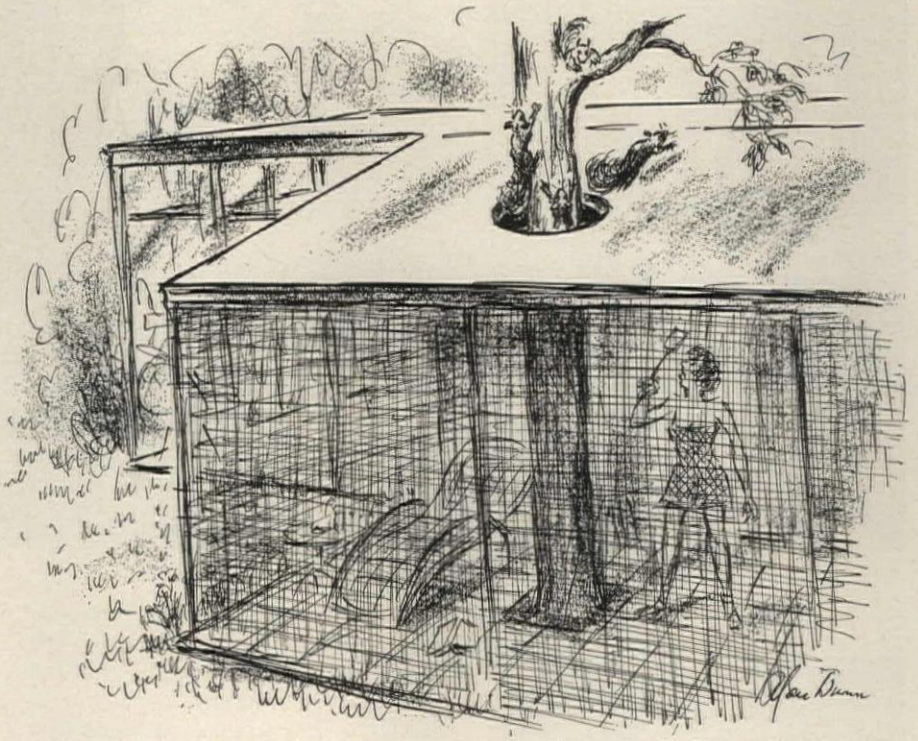

—Drawn for the RECORD *by Alan Dunn*

C.S.I. WELCOMES NEW SPECIFICATIONS FORMAT AT SEVENTH ANNUAL MEETING IN DETROIT

High spot of the Construction Specifications Institute's seventh annual meeting held at Detroit's Cobo Hall May 20-22 was official presentation of "The C.S.I. Format for Building Specifications," which is expected to have far-reaching implications in the preparation of specifications and in the filing of technical data and literature.

The C.S.I. format, now firmly set, can be listed in merely 20 lines of type. What it does essentially is to provide an outline for a logical, consistent order for specifications writing applicable in any part of the country. The format lists four parts: (1) bidding requirements; (2) contract forms; (3) general conditions; and (4) specifications. Most important of these is "specifications" consisting of 16 divisions which were selected to offer maximum flexibility, country-wide, for the grouping of trade sections. The format is thus conceived as a practical means of providing national uniformity without disrupting current practices in specification writing. It does not conflict with normal bidding procedures or local trade jurisdictions. Also it does not hem in the specification writer with the inflexibilities of "canned" specifications.

C.S.I. believes that with this format not only will the preparation of specifications be made easier, but contractors and product suppliers will be able to do estimating and bidding more accurately, and the specification writer will have an easier-to-use system for the filing of technical data and literature.

C.S.I. members were encouraged to hear at their annual meeting that the A.I.A. board of directors had passed a resolution a few weeks earlier in Miami recommending that the C.S.I. format be used in further studies of the A.I.A. Specifications Committee as a basis for a specifications check list and other documents.

The new format had its origin in work by the Specification Methods Committee presented two years ago at the New York meeting as "A Proposed Flexible Framework for Building Specifications." This was revised in November 1962, and a third and final draft was completed in March by the Specification Methods Task Force Committee comprised of Bernard B. Rothschild, chairman, Atlanta; Francis L. Frybergh, New York; Elliot H. Gage, Chicago; Edgar D. Tyler, Cincinnati; and Rolf Retz, Sacramento.

Theme of the program was, "Basic Ingredients of Specifications," which included, in addition to presentation of the new format, discussions on the development and application of technical standards.

Newly elected officers of C.S.I. are: Jack R. Lewis, San Diego, Calif., president; Henry Baume, Denver, vice president; Robert Burkhardt, Chicago, vice president; Terrill Harper, Dallas, Texas, vice president; Edwin A. Weed, New York, secretary-treasurer; Ronald Starkwaether, Madison, Wis., new board member; Maxwell Saul, Denver, Colo., new board member; and Charles Dorman, Washington, D. C., new board member.

—Robert E. Fischer

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Nine of the 101 buildings in various stages of construction. Entire project covers 80 acres.

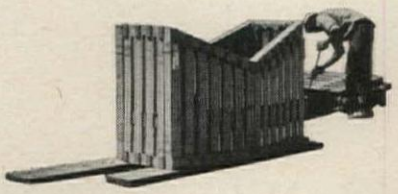
This is the concrete bed on which roof units are cast. Roof units as well as all the other precast structural units are 3,000 p.s.i. lightweight concrete.

• Atlanta's Field Road low-rent housing project will contain 3,245 rooms in 101 buildings with dwelling units for 650 families. It is being constructed almost entirely of precast concrete made with Lehigh cement.

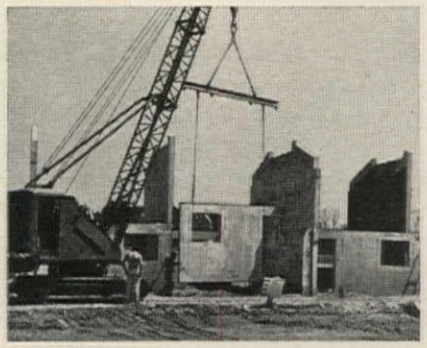
Precast concrete was chosen for its speed and economy in construction, for durability, and for low maintenance costs. The extra fire resistance of concrete provides safety for occupants while keeping insurance costs at a minimum.

This immense project is further evidence of the advantages and adaptability of concrete for structures of any shape or size. Lehigh Portland Cement Company, Allentown, Pennsylvania.

LEHIGH CEMENTS



The roof vent screens are cast in four sections on the ground and are assembled at the casting site. There is a roof vent screen for each family unit.



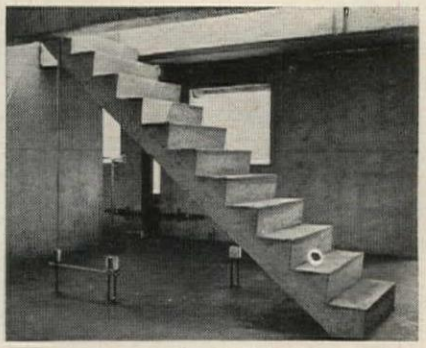
Crane places a first floor side wall between two-story party walls. Units are moved from casting areas to building sites on flat bed trucks.

Owner: Housing Authority of the City of Atlanta, Ga.

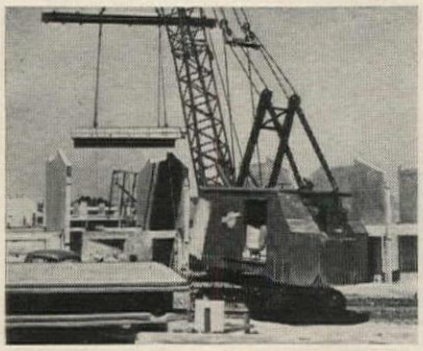
Architects: Bodin & Lamberson and Stevens & Wilkinson, Atlanta, Ga.

Structural Engineers: Chastain & Tindel, Atlanta, Ga.

Contractors: Thompson, Street & Diversified Co., Atlanta, Ga.



Precast stairs connect the first and second floor of each dwelling unit. Stair forms are positioned on a graded embankment and ready mix trucks dump concrete rom the top.

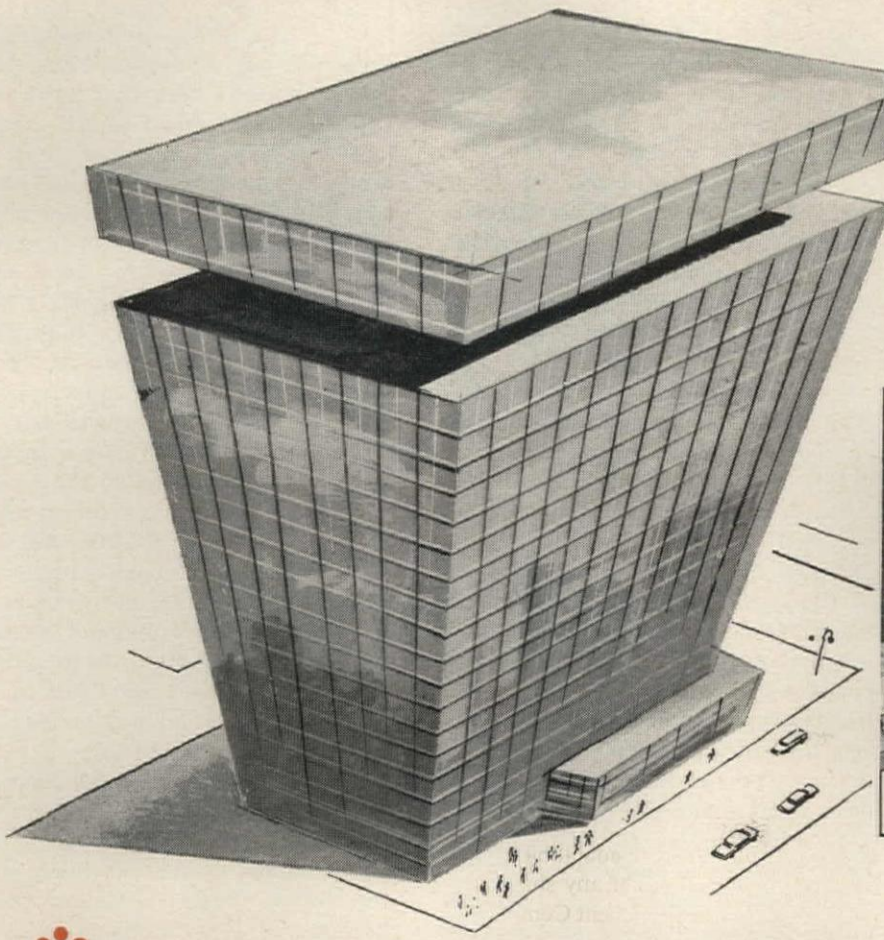


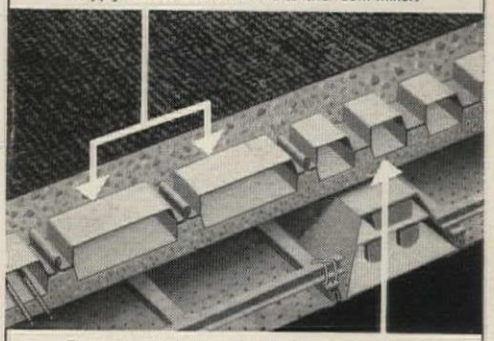
A second floor slab being lowered into place. Supporting beams are cast as an integral part of the slab. Connections are made with weld plates cast in the units.

Roof units provide an overhang and built-in gutter. Roof and side wall units are 4″ thick. Party walls are 8″ thick and second floor slabs are 5″ thick.

Buildings vary in size providing from four to sixteen dwelling units each. Exterior walls have masonry veneer. Note roof vent screens atop each unit.

savings*





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A.C.S.A. ENDORSES A.I.A. EDUCATION REPORT CALLING FOR MAJOR RE-EXAMINATION OF CURRICULA

Prospects for changing curricula in architectural schools to relate them ever more closely to the changing and expanding role of the architect were considerably enhanced by the action of the 49th annual meeting of the Association of Collegiate Schools of Architecture endorsing the recent report of the Three-Man Commission on Education of the American Institute of Architects.

A.C.S.A. met May 3-5 at the Balmoral Hotel in Miami Beach, and its most important business was consideration of a four-part report by its own special committee on the Advancement of Architectural Education, the final section of which recommended A.C.S.A. approval of the A.I.A. report.

Henry L. Kamphoefner, dean of the School of Design of North Carolina State College, was elected president of A.C.S.A. to succeed Dean Olindo Grossi of the School of Architecture of Pratt Institute. Other new officers elected were: vice president —George Danforth, director of the Department of Architecture of Illinois Institute of Technology; secretary—Nolan E. Barick, head of the Department of Architecture and Allied Arts at Texas Technological College; and treasurer—Henry Jandell of the School of Architecture at Princeton University.

Elected as directors of A.C.S.A. were Dean Grossi; Walter Sanders of the University of Michigan; William Caudill, chairman of the Department of Architecture of Rice University; and Marcus Whiffen of Arizona State University.

The Great Debate

In consideration of the report of the A.C.S.A. Special Committee on the Advancement of Architectural Education, the liveliest discussion developed not in connection with approval of the A.I.A. education report, with its far-reaching implications, but on another section which recommended revision of programs of A.I.A. member schools "as conditions permit to require, ultimately, that students entering the professional programs have a minimum of the equivalent of a two-year course of study in the basic liberal arts and sciences."

The opposition to immediate approval of this proposal which developed in the discussion appeared to arise not out of disagreement with the committee's view that more general education would benefit architects but out of the fear that approval of the proposal would imply an additional year in the curriculum of architectural schools which now have five-year programs—more than half A.C.S.A. member schools.

In spite of assurances that there was no intent to force compliance but rather to state an objective, the proposal was not approved but referred back to committee for further study and a canvass of all the schools to get their individual thinking on it.

Other sections of the A.C.S.A. committee report, easily approved, called for upgrading and greater integration of the professional training programs provided by school and office and increased participation by the schools in administering the state board examinations.

Walter Sanders was chairman of the special committee which produced the report. Members were Roger Bailey, Thomas Howarth, Walter Netsch, Buford Pickens, Ralph Rapson and John Williams.

N.C.A.R.B. APPROVES REGIONAL DISTRICT CONCEPT AND AUTHORIZES BYLAW CHANGES TO SUPPORT IT

An important new opportunity for interchange of information and consultation on common problems was opened for state architectural registration boards with the adoption at the 42d annual convention of the National Council of Architectural Registration Boards of a resolution approving the idea of regional districts of state registration boards and authorizing initiation of changes in the N.C.A.R.B. constitution and bylaws needed to support the establishment of such districts.

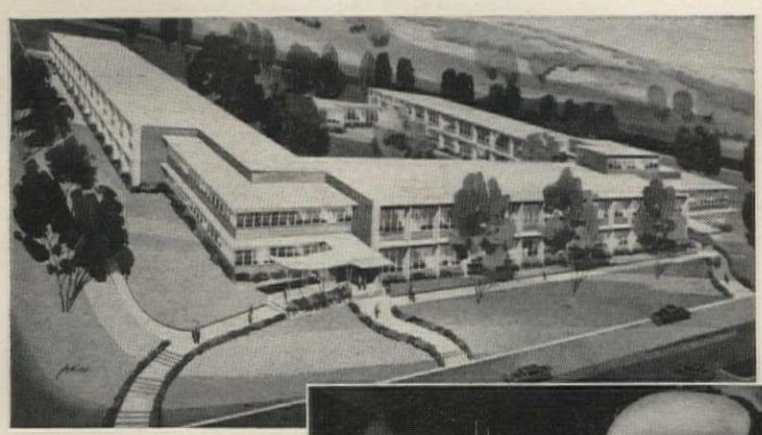
The N.C.A.R.B. action was the highlight of the Council's convention May 10-11 at the Americana Hotel in Miami Beach. The resolution endorsed the recommendations of an N.C.A.R.B. Committee on Study of Regional Structures and particularly noted that such regional districts "provide the structure for the adoption of common examinations, and the opportunity for better liaison between state registration boards."

Earlier, the convention had heard a report from G. Stacey Bennett, chairman pro tem of the Western Conference of State Architectural Registration Boards, organized on Jan. 18, 1963, at a meeting in Seattle and comprising the registration boards of Alaska, Arizona, California, Oregon, Washington, Hawaii, Nevada, Idaho, Montana and Utah.

Through the efforts of the Western Conference, Mr. Bennett reported, common registration examinations were to be held for the first time last month in California, Nevada, Oregon, Washington, Alaska, Hawaii and Utah. Montana and Idaho, because of schedule complications, were to abstain until 1964. Participating state boards were said to have been much encouraged by the workings of the conference so far.

In the elections, Paul Drake of Summit, N.J., succeeded Chandler Cohagen of Billings, Mont., as president of N.C.A.R.B., and Ralph Mott of Fort Smith, Ark., became first vice president. Other new officers are: second vice president—C. J. Paderewski of San Diego; secretary—Earl Mathes of New Orleans; and treasurer—John F. Ramsay, Salisbury, N.C.

New directors are George F. Schatz, Cincinnati; Howard T. Blanchard, Garden City, Kan.; and G. Stacy Bennett, Olympia, Wash.



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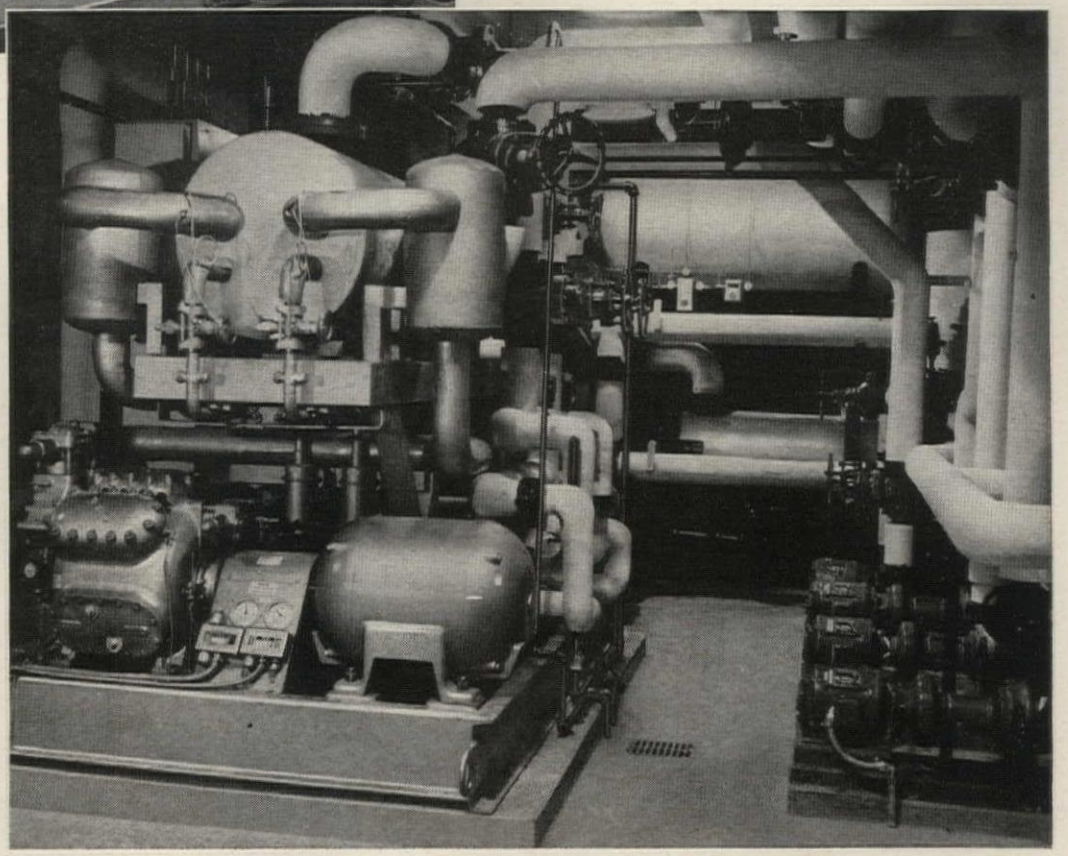

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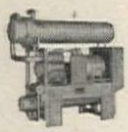
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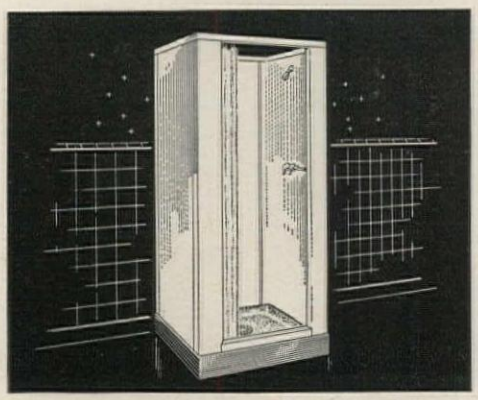
SHOWER CABINETS



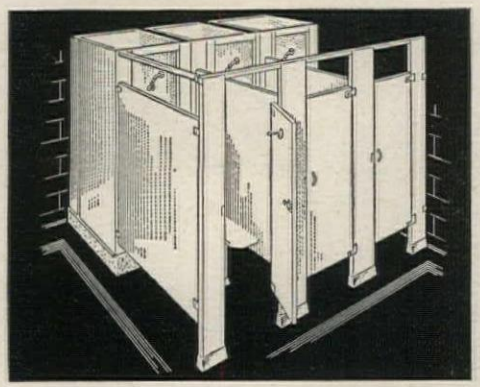
PRODUCT CADET SHOWER STALL

A versatile cabinet that fills a wide range of requirements. Bonderized-galvanized wall panels are prefabricated with precision to provide easy installation and leakproof service. Square, corner and recessed models available—come in white or choice of colors. **Cadet** is one of many Fiat models—see Sweet's Architectural File 22b/Fi for details on all models.

APPLICATION HOME/SCHOOL/CLUB

Cadet is the key to economy in planning for showers: Saves cost of carpentry (no lumber needed); saves cost of sub-pan (uses Pre-Cast Terrazzo floor); saves on call-backs (over 2,000,000 Fiat showers prove value and performance in new homes, remodeling and institutions). Contractors claim they save ⅔ the cost of built-on-the-job showers.

DRESSING STALLS



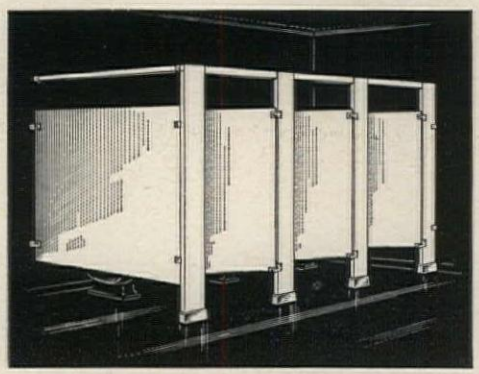
PRODUCT DRESSING ENCLOSURE

Designed with rugged, flush type panels, Fiat Dressing Enclosures combine with and augment the service of any shower stall. Bonderized-galvanized steel is finished with a long-lasting baked-on enamel. These quality enclosures may be specified for use with Fiat or other make shower cabinets, either with doors or with curtain rod and curtain. Hard wood seat optional.

APPLICATION ADDITION TO SHOWER

The usefulness of shower cabinets in institutions, factories, and clubs is greatly expanded when installed in combination with dressing enclosures to provide convenience and privacy in a wide variety of single and battery arrangements. Both should be by the same manufacturer to assure design and color harmony, and both should be placed in the same section of the specifications.

TOILET ENCLOSURES



PRODUCT TOILET ENCLOSURE

Duro headrail-braced model shown is the most simple and hence the least expensive toilet enclosure to install. It was deliberately designed to meet popular concepts of clean, modern design and yet was engineered to economize on details that do not detract from its appearance, nor lessen its performance or long-life.

TYPES AND APPLICATION

The Duro model is ideal for replacement, remodeling projects as well as new construction. No special reinforcement of floor, wall or ceiling required. Ceiling-hung and floor-braced models are also available with the "years-ahead" features that have earned a reputation for durability, low maintenance and easy installation.

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Arched bus stop shelter demonstrates panel flexibility.

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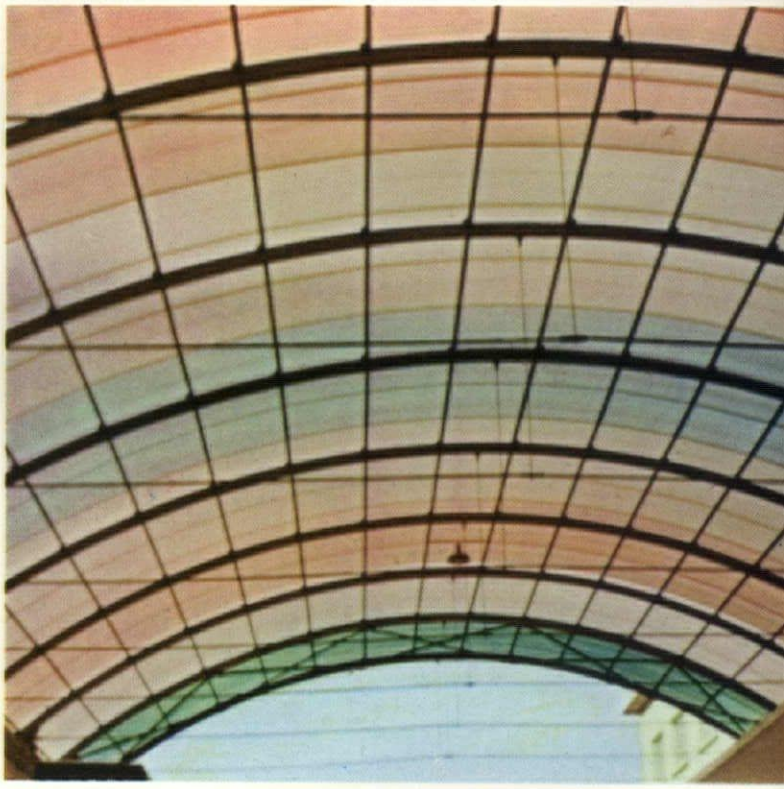
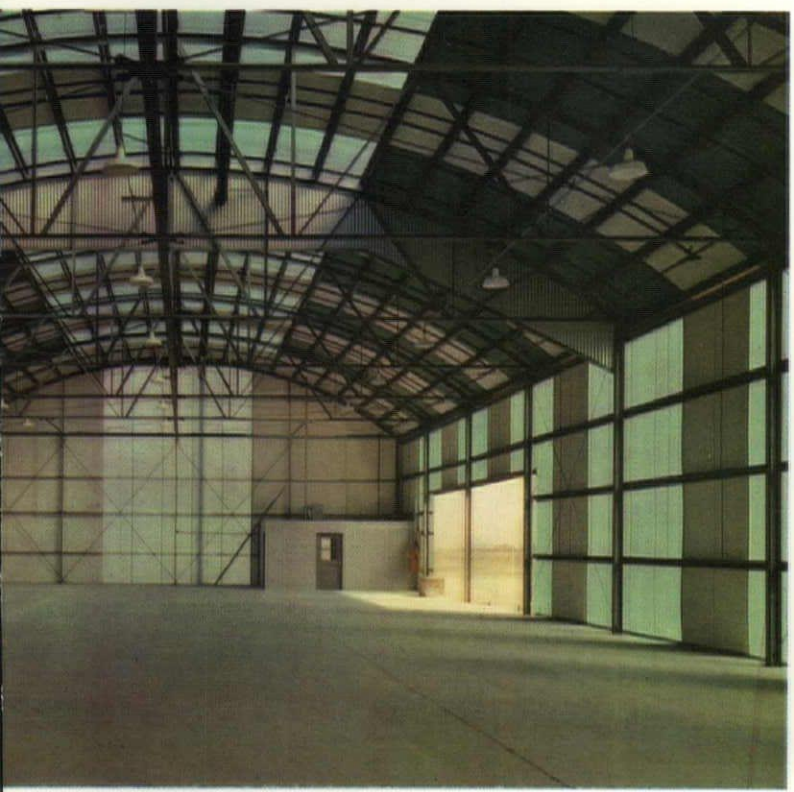
Panels resist fumes in Baton Rouge chemical plant.



Longer length panels can be arched for unusual shapes.



Vinyl panels provide free light in plant storage areas.

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increased flexibility of colorful Barrett vinyl building panels provided these results. These panels are currently available from building products and plastics distributors in 22 states, including the Pacific coast for the first time. They have been approved by approximately 130 key cities in 38 states. The cities include many operating under major regional building codes such as BOCA, Uniform Code, National Building Code and Southern Building Code.

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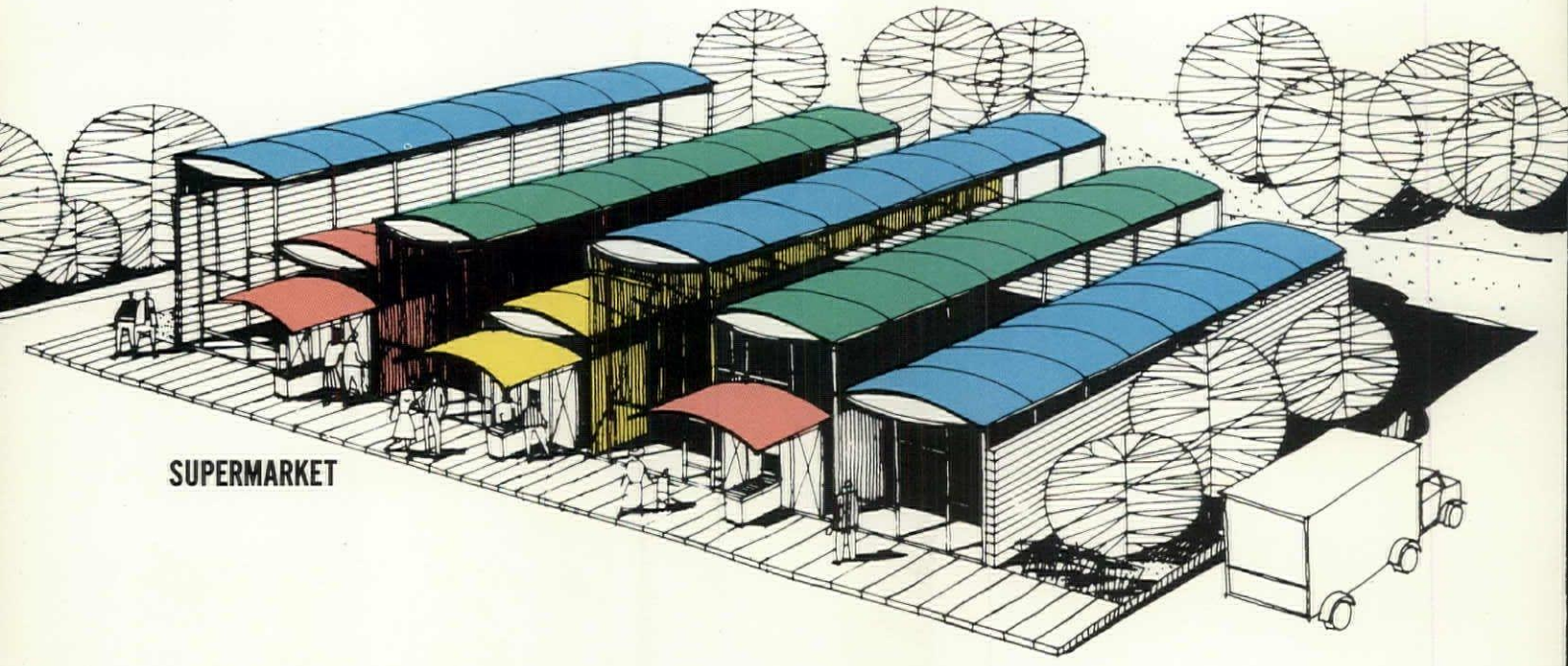

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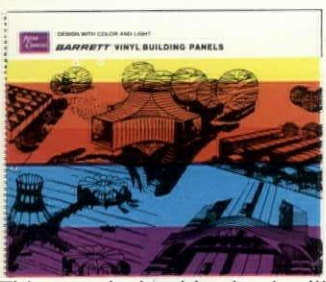

New Barrett vinyl building panels now make practical highly imaginative concepts which would have seemed fantastic only a few years ago. What direction some of these applications may take is indicated in a new design-idea book for architects created for Barrett by architect William B. Gleckman. This new design-idea book will show you imaginative and advanced structures...complete detailed information and performance data that take full advantage of Barrett vinyl building panels. And now with the Underwriters' Laboratories flame-spread rating of 25, these buildings can meet code specifications.

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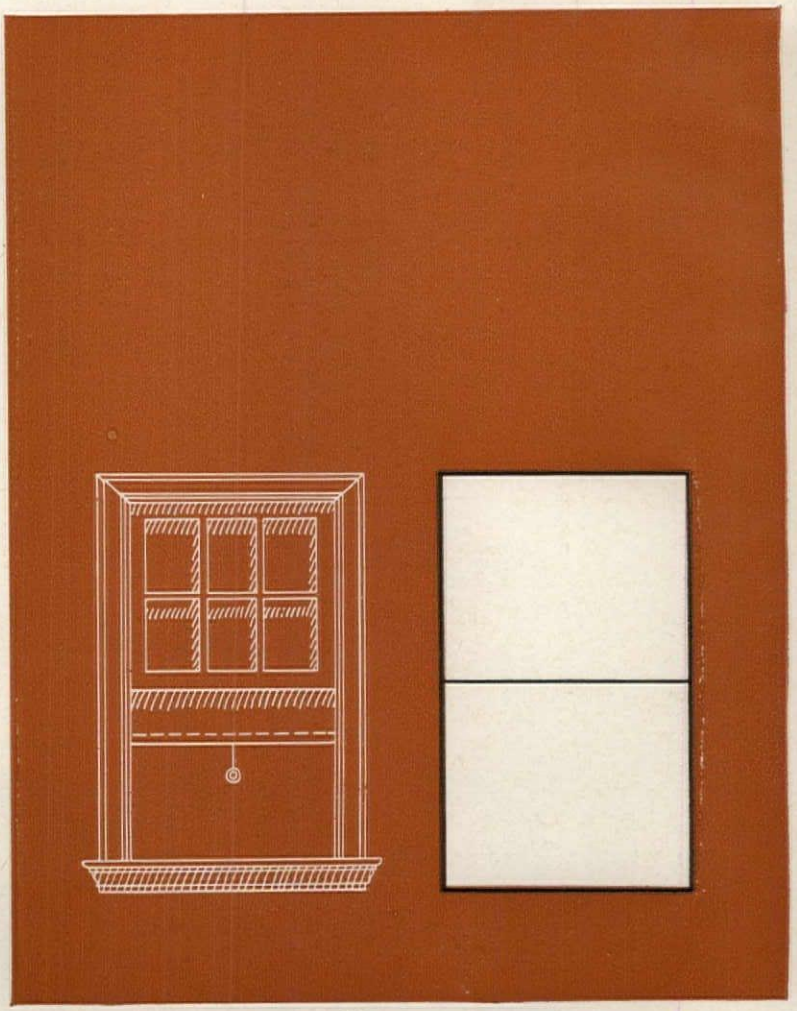
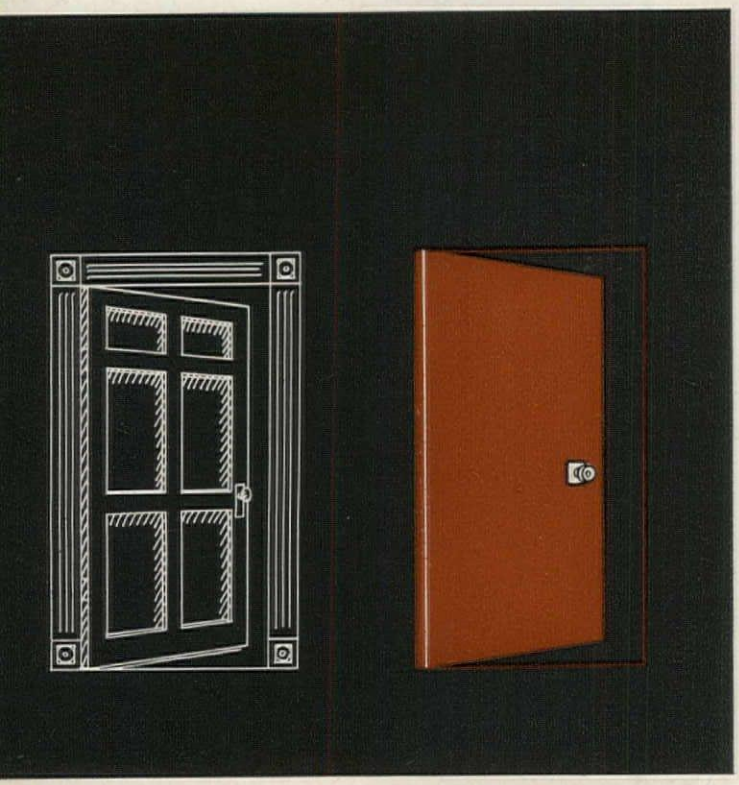
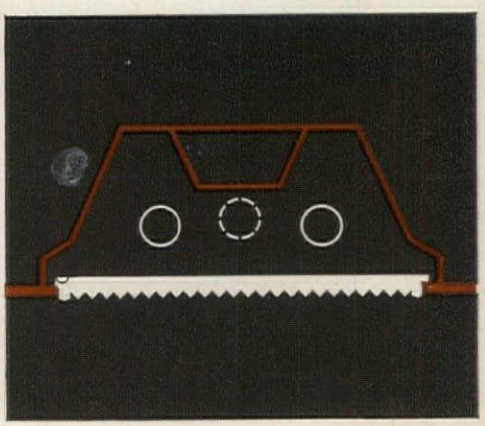
Progress in Design...



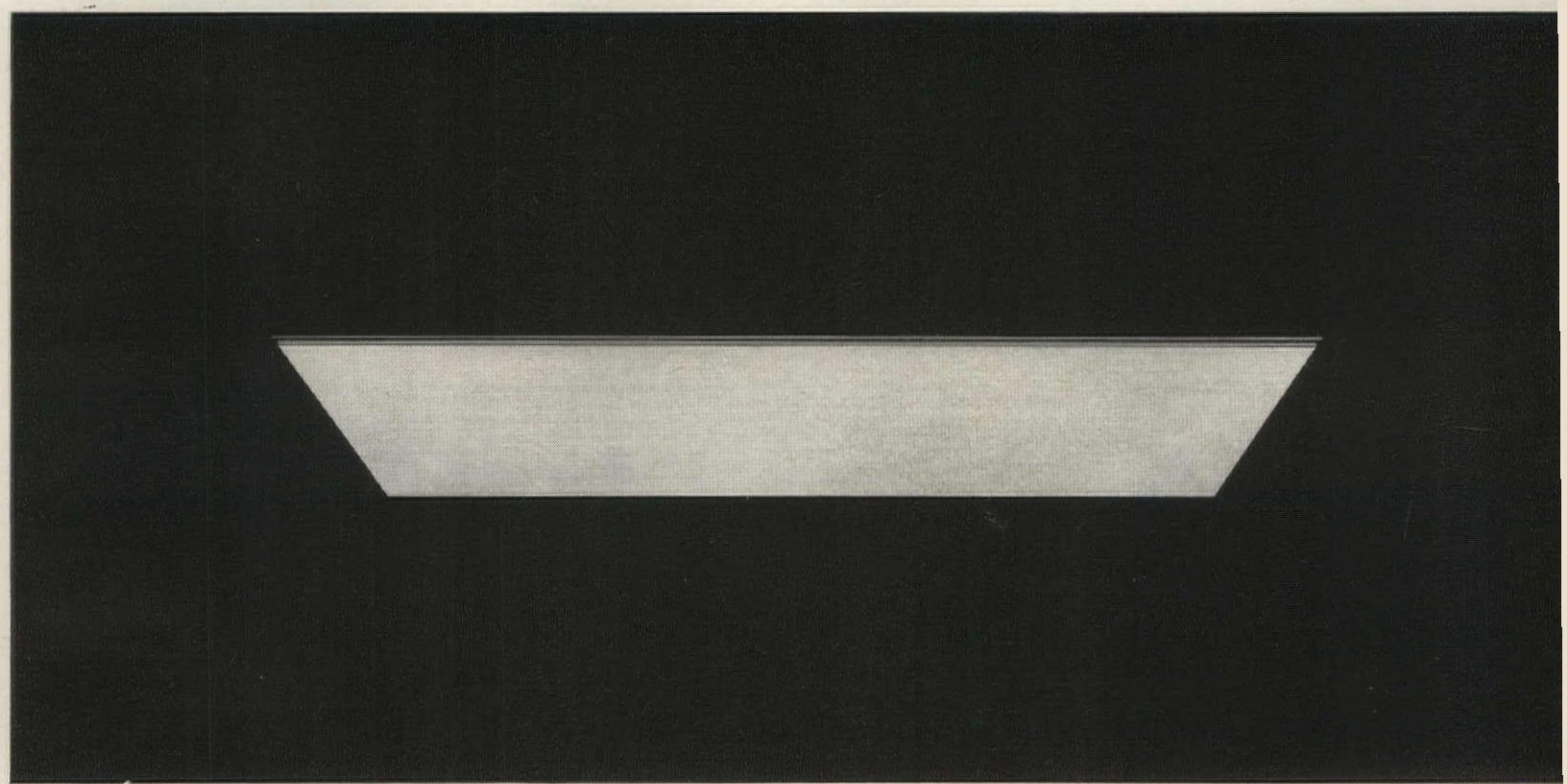
Frames came off windows...



Frames came off doors...



Where new ideas come to light— Holophane Trade Mark



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—from "SOM"

SOM

SOM: *The Architecture of Skidmore, Owings & Merrill, 1950-1962. Introduction by Henry-Russell Hitchcock, text by Ernest Danz. Frederick A. Praeger, 64 University Place, New York 3. 220 pp., illus. $18.75.*

In this introduction to this handsome review of SOM work for the 12 years just past, Henry-Russell Hitchcock points out that the larger significance of SOM'S architecture and approach to planning rests "not in the creation of individual structures of intense personal expression . . . conceived in isolation from an urban context and serving rather specialized cultural functions, but in the rebuilding of our cities, and in the undeveloped areas of the world, the creation of new ones. Although . . . fitted into the inherited scene . . . with the slight amelioration of the immediate neighborhood by . . . open plazas . . . and crisper outlines . . . they have provided many of the most important and useful architectural ingredients of the later 20th-century city we hope . . . will come into existence."

But SOM buildings are valuable contributions in themselves as well; for this remarkable firm has created a whole new language of architectural expression that is vigorous, imaginative, sophisticated and refined. This has been done by a group of dedicated partners and associates who subscribe to two disciplines: the discipline of modern architecture and the discipline of American organizational methods. The Museum of Modern Art pointed out that fact in the catalog of their SOM exhibition in 1950, and it remains true.

This book is a stunning production; photographs, architectural drawings and details, and graphic design are all notable for their high quality. Architects and students will find it invaluable, and it seems destined to become a must for the most modest of architectural collections.

—James S. Hornbeck

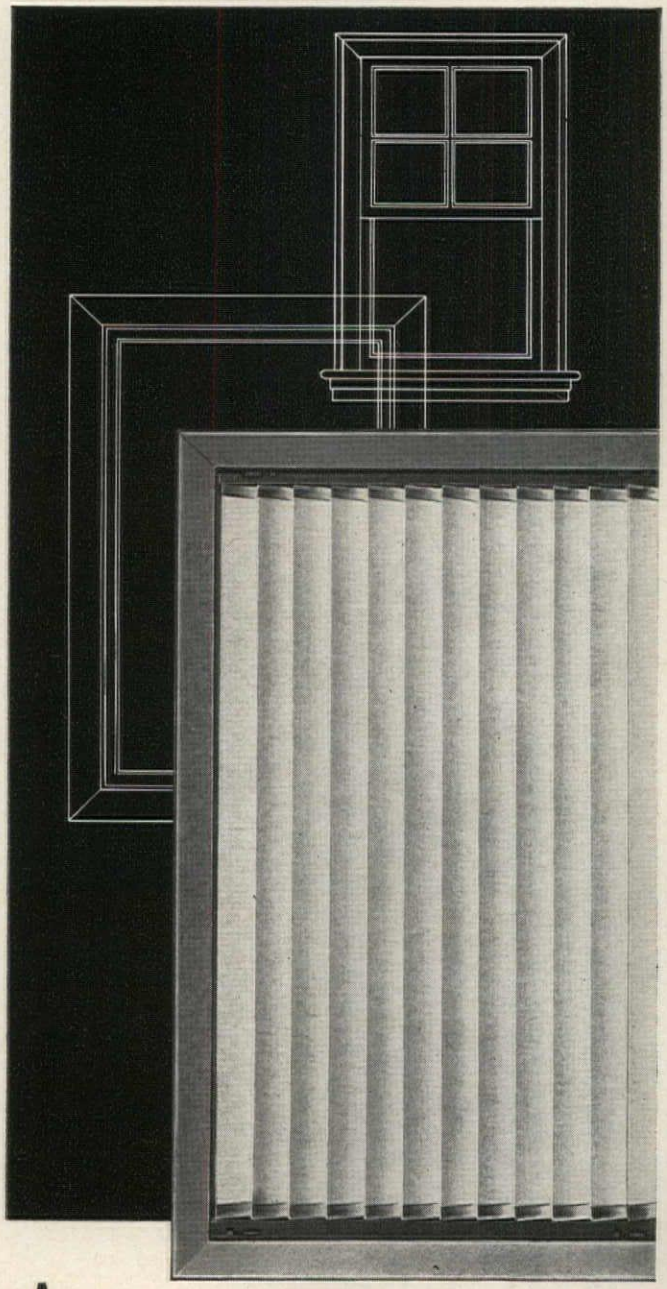
Mumford

THE HIGHWAY AND THE CITY. *By Lewis Mumford. Harcourt, Brace & World, Inc., 750 Third Ave., New York 17. 246 pp., $1.65, paperbound.*

Mr. Mumford's ability to synthesize the architectural and the social in his approach is unparalleled in current criticism, and this ability is perhaps even more apparent when, as here, it is applied to concrete questions than when applied to broad theoretical questions. This collection of articles, written while Mr. Mumford was engaged in producing "The City in History," was selected to show the interrelation of thoughts developed there and observations of contemporary architectural and planning phenomena. Apart from a few essays dealing almost exclusively with narrowly architectural matters—one on UNESCO House, another on the Guggenheim Museum, still another on postwar European war memorials—all are concerned directly with city planning or are brought within the wider scope of planning and social needs—from the Unité d'Habitation, through the renewal of historic Philadelphia, to the likely (deplorable) effects of the Narrows Bridge on the environs of New York City. But, however illuminating these essays may be as a reflection of the author's ideas in "The City in History" (it should be made clear that this collection was not intended to be a companion volume), it should be enjoyed, albeit sometimes with a wince, for itself.

All of the essays have been published before in, among others, The

continued on page 49



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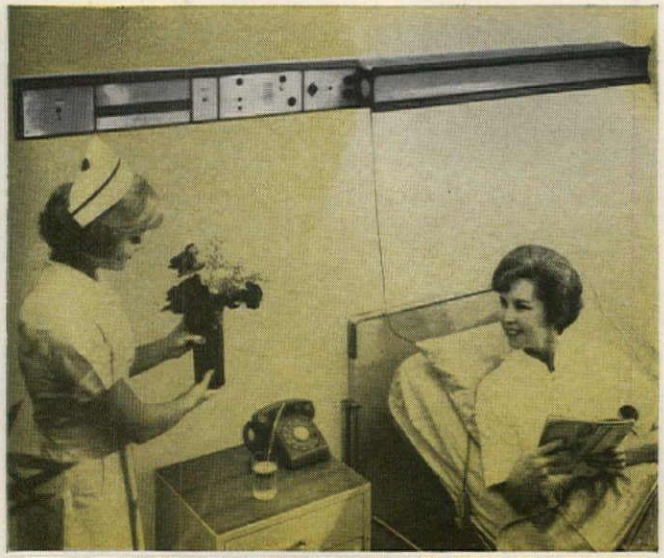

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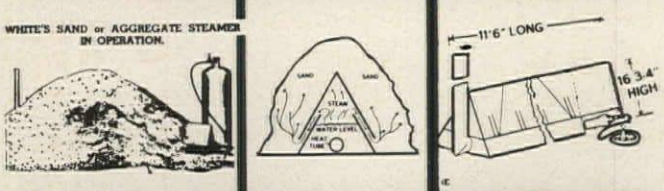

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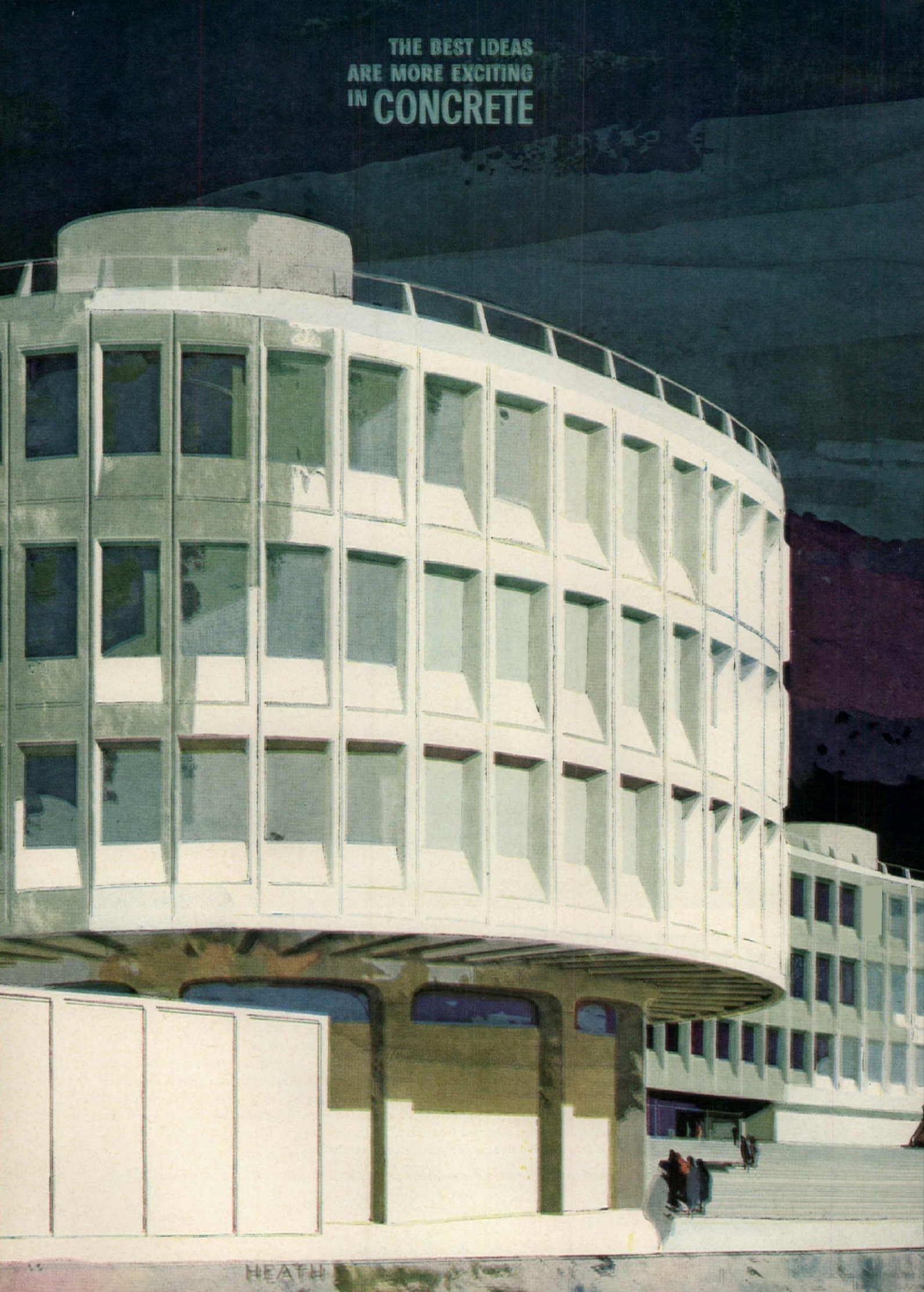
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City of Philadelphia Police Administration Building, Philadelphia, Pennsylvania. Geddes, Brecher, Qualls, Cunningham, Architects. D. Bloom and A. E. Komendant, structural consultants.

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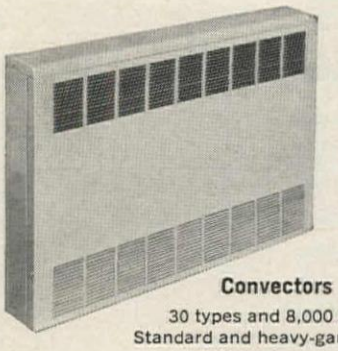

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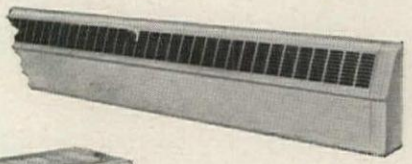

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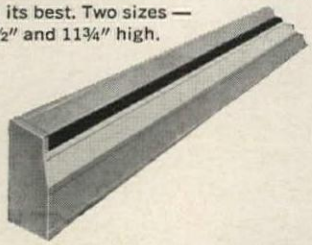

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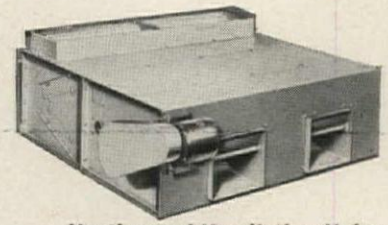

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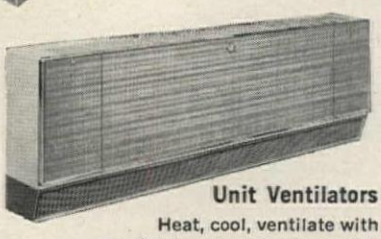

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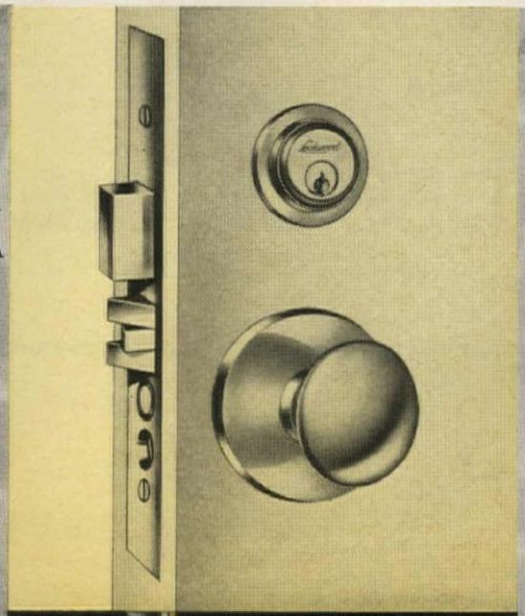
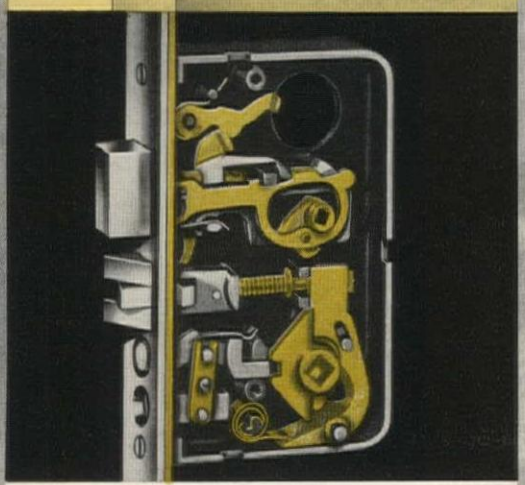


.....and here's what makes it tick



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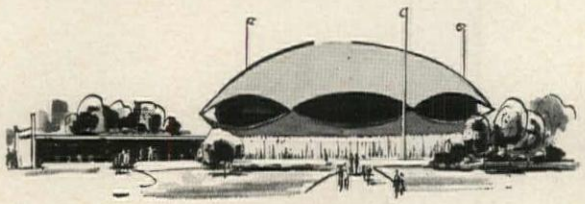
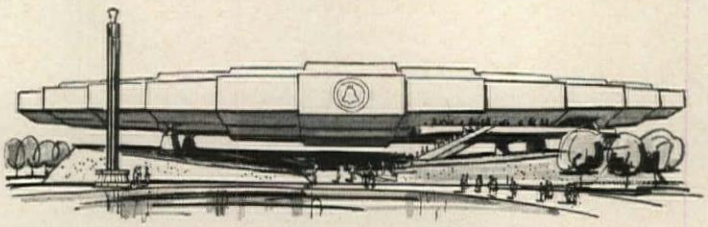
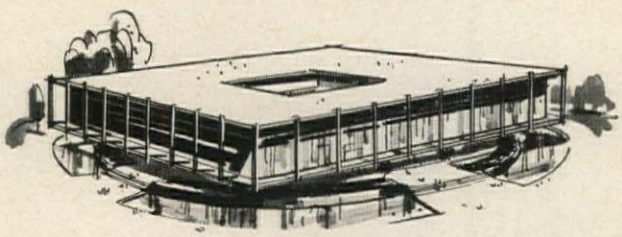
WORLD'S FAIR REPORT FROM BETHLEHEM STEEL NO. 2



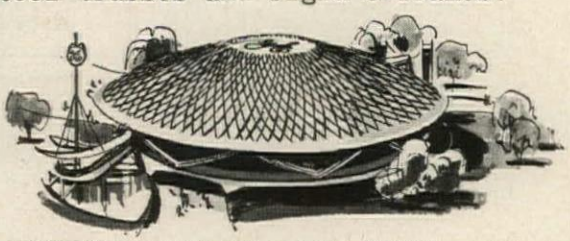
THE FAMILIAR RED UMBRELLA, The Travelers Insurance Companies' symbol of protection, provides the architectural theme . . . and imaginative steel design provides the structural solution. Eight main, and sixteen secondary, welded-plate ribs form an open cup, 132 ft in diameter, which is post-tensioned with a "belt" of four cables of galvanized steel strand. The ribs are then tied together at the apex by steel bridge strand radiating from a central tension ring. This design required only about one-fourth the weight of steel estimated for a more conventional solution.



A STEEL-FRAMED "FLYING WING" houses the Bell System exhibit. It is 400 ft long, 200 ft wide at its longitudinal midpoint, cantilevering from just four pylons. World's Fair visitors will be swept aloft by moving stairs, then will circumnavigate the vast exhibit area aboard an articulated chair ride. The "wing" is framed in steel trusses and rigid U-frames.



THE "HOVERING" HOLLOW SQUARE of the United States Pavilion encloses two floors of 70-ft-wide corridors surrounding a 174-ft-square open court . . . 150,000 square ft of exhibit space poised some 20 ft above a paved plaza on just four piers! Keys to the structure are eight steel trusses, each 57 ft high and 310 ft long. Four inner trusses, which rest on and are cantilevered some 75 ft beyond the piers, extend out to support the other four, which extend along the exterior curtain walls of the pavilion.



A LAMELLA DOME OF STEEL PIPE, anchored to a circumferential ring girder and tying into a compression ring at the apex, crowns the General Electric Company Pavilion at the New York World's Fair. The ring girder, in turn, is supported by sloping steel pipe columns. Clearly visible from outside is a slowly rotating carousel enclosing theaters where visitors will view the company's exhibit. At night, the entire structure will be a scene of color and light and motion.

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Required Reading

continued from page 40

New Yorker and ARCHITECTURAL RECORD, though not before in book form.

The Orient

MANY GOLDEN AGES. *Ruins, Temples and Monuments of the Orient. By Frank MacShane. Charles E. Tuttle Company , Rutland, Vt. 264 pp., illus. $10.* A SHORT HISTORY OF JAPANESE ARCHITECTURE. *By A. L. Aadler. Charles E. Tuttle Company, Rutland, Vt. 140 pp., plus 122 plates. $7.50.*

Mr. MacShane, whose Orient stretches from Luxor to Angkor, writes in his introduction that his aim was to give neither an archeological treatise nor a poetic appreciation of ruins in the moonlight, but rather "an accurate and readable description" of some of the great Oriental buildings. In this he has succeeded; although this is not properly a guidebook, it does serve as an introductory guide, with architectural descriptions amplified by historical explanations in brief. Though architects might prefer rather more technical detail in the text, they will surely be pleased by the excellent photographs, many of them in color.

Mr. Sadler's history of Japanese architecture is indeed short—comprising brief chapters on the major periods and on some of the distinctive features of Japanese building—and crammed with facts. Though the drawings are numerous, their separation from the body of the text and the lack of reference from text to drawing seriously impair their usefulness.

Index

THE ARCHITECTURAL INDEX FOR 1962. *The Architectural Index, 517 Bridgeway, Sausalito, Calif. 60 pp. $5.*

For the 12th year, The Architectural Index has published its invaluable compilation of buildings, architects and articles published during the year by Arts & Architecture, Architectural Forum, ARCHITECTURAL RECORD, House & Home, Interiors, Progressive Architecture, and the Journal of the American Institute of Architects. Although the editors have made some minor, and helpful, typographical changes and have added a summary of subject headings, the style remains consistent with that of earlier editions.

Drawings

PEN AND INK, INC. *By Edward Bateman Morris. 5517 Grosvenor Lane, Bethesda, 14, Md. 193 pp., illus.*

Most readers will be familiar with Mr. Morris's skilled pen and ink drawings, issued in years past under the auspices of the Tile Industry. Those who, for some reason or other, have not kept the former issues, will be glad to hear that the drawings have been collected, and are accompanied by Mr. Morris's very personal observations of New Orleans, Philadelphia, Washington and other parts of the country.

continued on page 72

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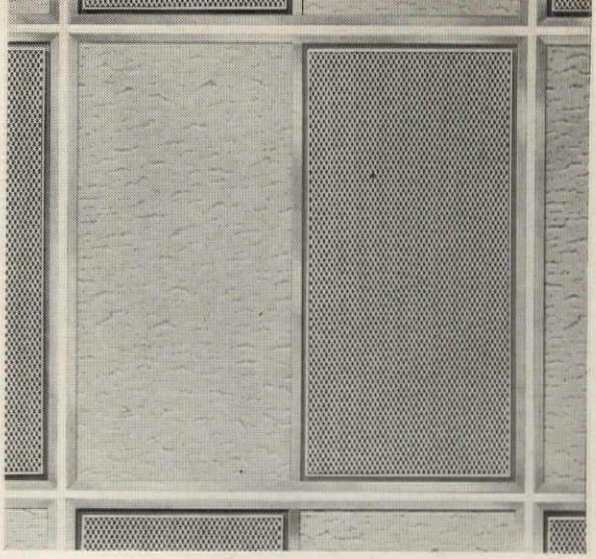

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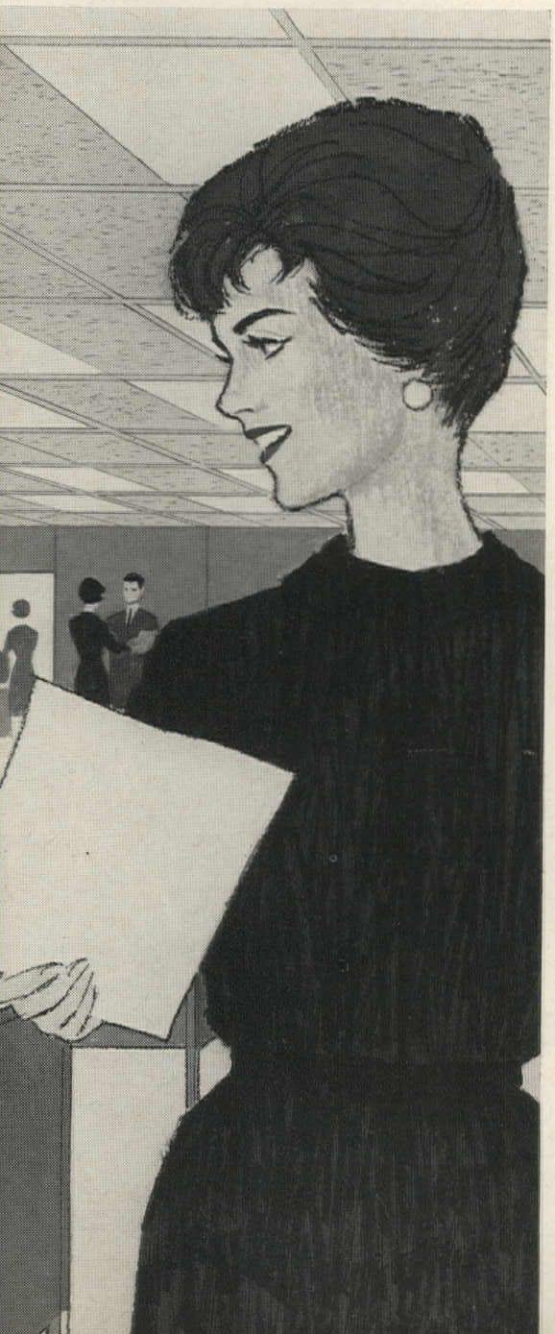

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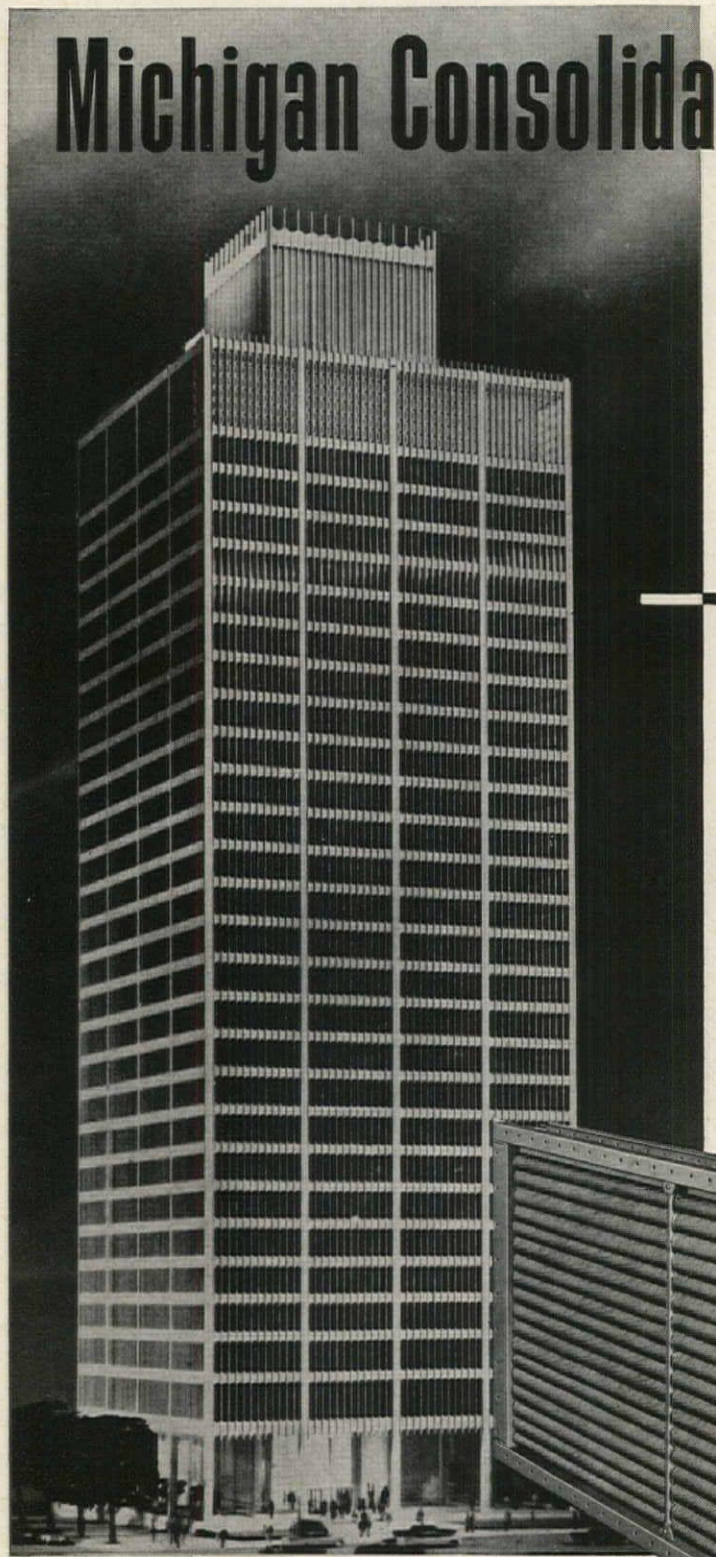

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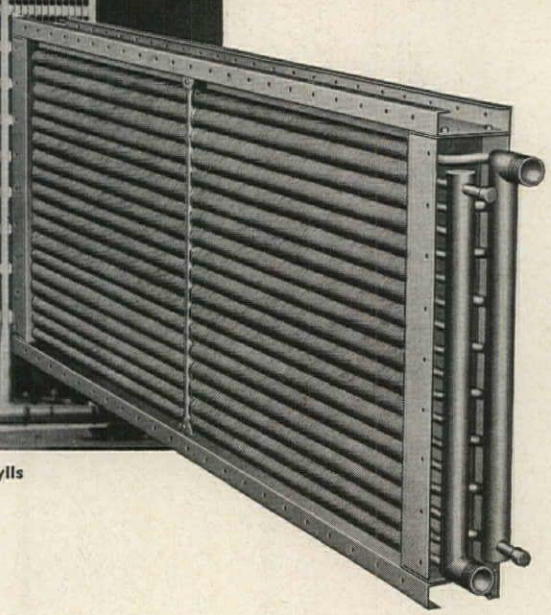

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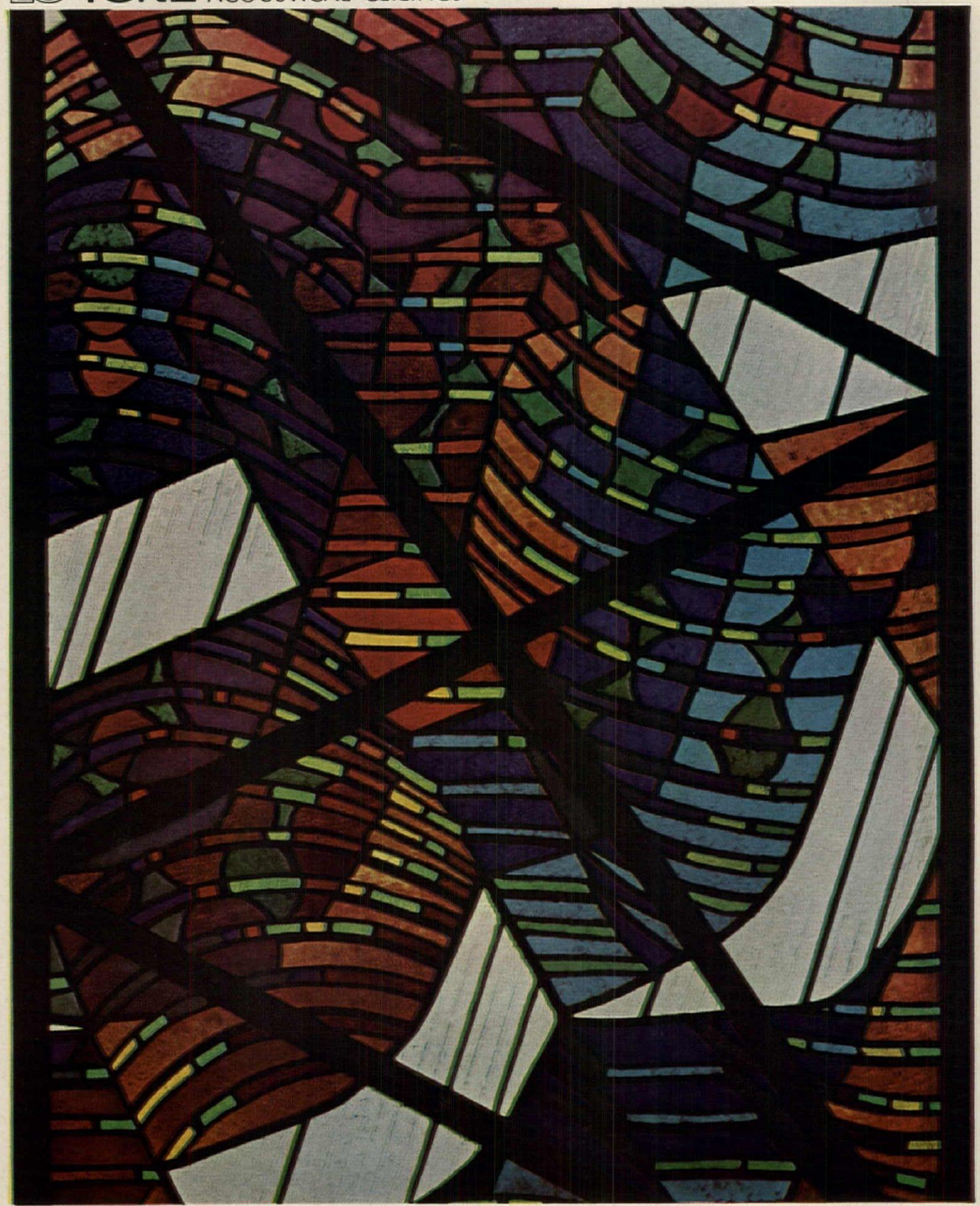

Section of stained glass window entitled "The Orchard" from executive offices of Svenska Handelsbanken—Stockholm, Sweden.

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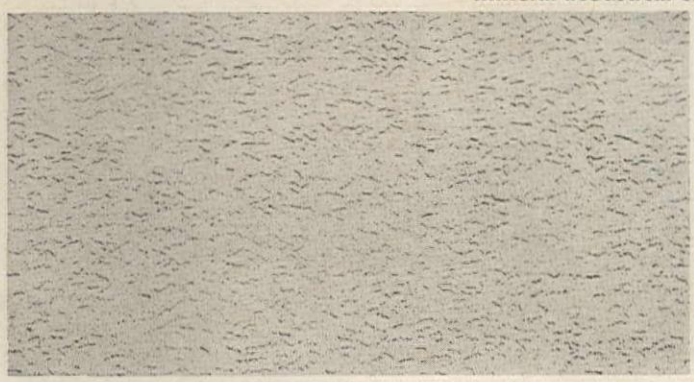
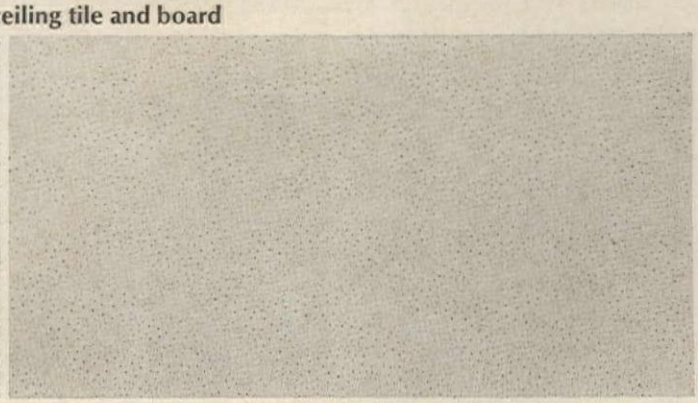


Fissura AF board (Also available in tile)



Constellation AF board (Also available in tile)

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We suggest you consider Alcoa® Duranodic* 300 finishes for monumental buildings. For outside surfaces that can't or won't be maintained. For strong color accents—in panels, solar screens, windows, mullions, trim and framing. For places where people step, grab or push—entrances, store fronts and kick plates, railings and push bars. If you're not concerned about wear and upkeep, then don't use Duranodic 300 finishes.

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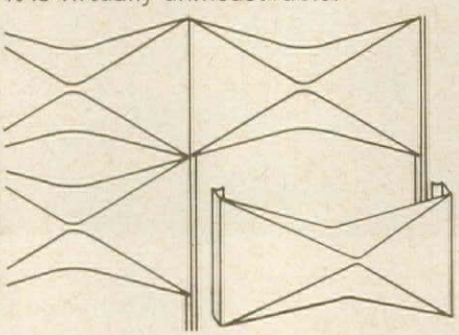
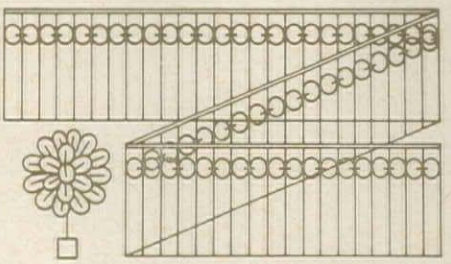


Alcoa Sol-Dec® screen patterns, including this new design, can be ordered in Duranodic 300 finishes.

DON'T SCUFF OFF. Aluminum hard coatings are so called because they are considerably thicker and more resistant to abrasion and wear than common anodic coatings. The thickness, weight and density of the coatings account for the longevity of Duranodic finishes in abrasive applications such as handrailing.

THREE NEW ALLOYS. Alcoa has developed three new alloys, Anoclad® Types 11, 12 and 13, for Duranodic 300 finishes. Specify them when you want thick-skinned durability. For good finishing characteristics, they are far superior to the standard and specialty alloys thus far developed. They provide better color control—bronzes that are deeper and richer looking than before and a black that's darker and more stable than any other black known.



THE FLOP EFFECT. We would be remiss if we didn't call your attention to what the finishing people call the "flop effect." Place two pieces of metal from the same anodizing bath side by side, deviate one ever so slightly from the same plane, and you'll notice a subtle difference in intensity or hue. You can see why we don't encourage the butting of Duranodic-finished panels against each other.

There is room for disagreement about our attitude, however. Some say the minute variation in color isn't detrimental to good design. There are those who consider the result pleasing to the eye because it breaks up an unrelieved surface. Feel free to indulge your own taste.

A WORD ABOUT SUPPLIERS. The Duranodic 300 process is licensed by Alcoa under written contracts with processors who pay royalties for use of the invention.

Tell us your name and we'll tell you the names of your nearest suppliers. Call your nearby Alcoa sales office or write Aluminum Company of America, 1785-G Alcoa Building, Pittsburgh 19, Pennsylvania.

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ALCOA

top right Brooks Brothers, Pittsburgh, Pa. Architect: Kanner & Mayer, Los Angeles, Calif. General Contractor: O. H. Martin Co., Pgh. Fabricator and Erector: Golomb Paint & Glass Co., Pgh. Duranodic Applicator: Baker Metal Finishing Co., Monterey Park, Calif.

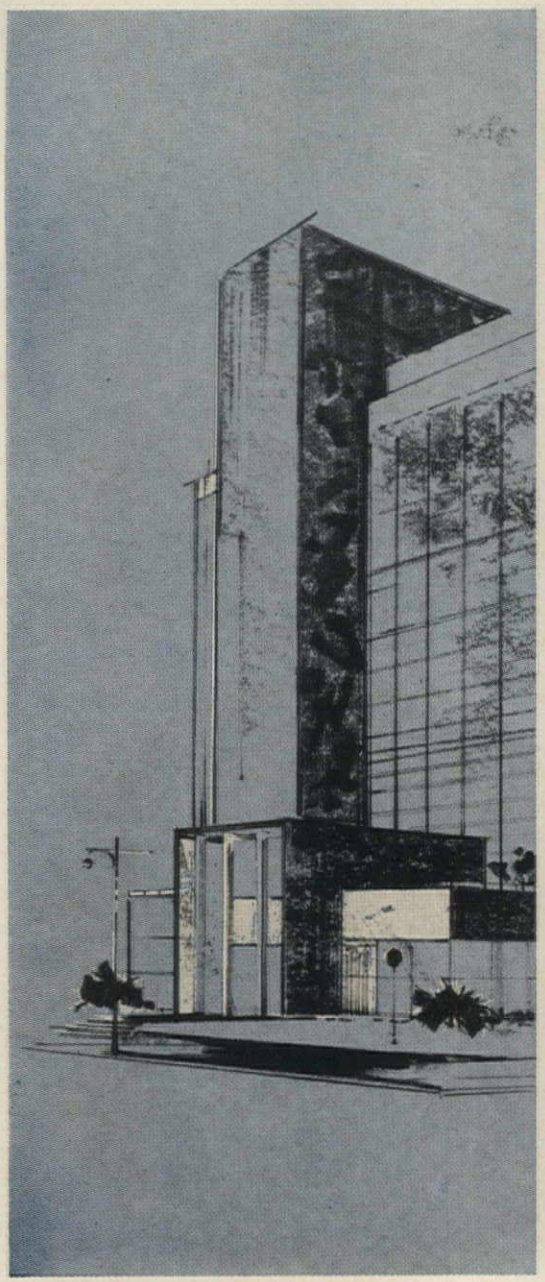
middle left 757 Third Ave., New York City. Owner: Durst Builders, N.Y.C. Architect: Emery Roth & Sons, N.Y.C. Fabricator and Erector: Cupples Products Co., St. Louis, Mo. Duranodic Applicator: Cupples Products Co., St. Louis.

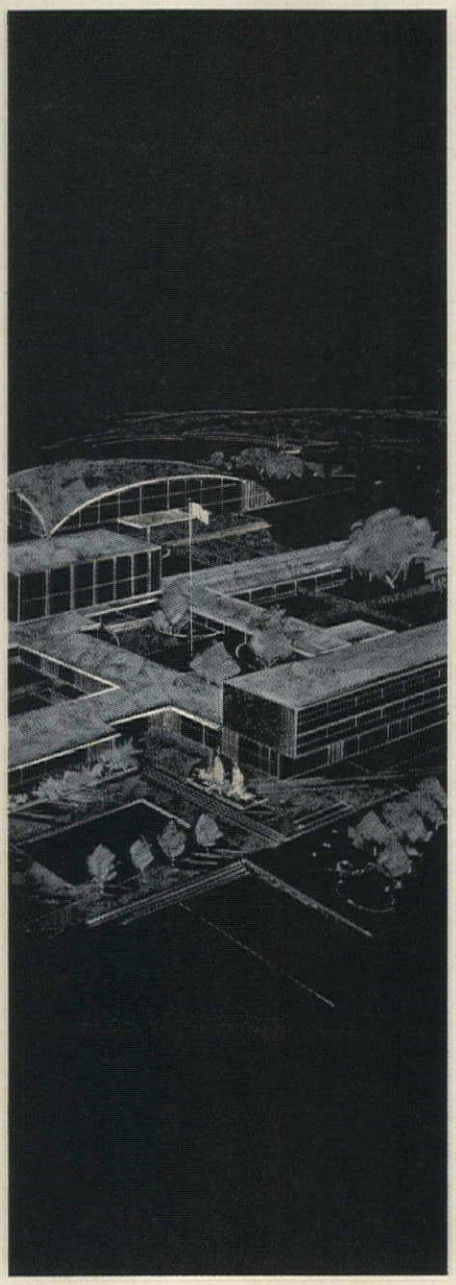
middle right The Pittsburgh Press Building, Pittsburgh, Pa. Owner: The Pittsburgh Press Co., Pgh. Engineers & Designers: Hunting, Larsen & Dunnells, Inc., Pgh. General Contractor: Martin & Nettrour Co., Pgh. Fabricator and Erector: Columbia Architectural Metals Co., Pgh. Duranodic Applicator: Stolle Corp., Sidney, Ohio

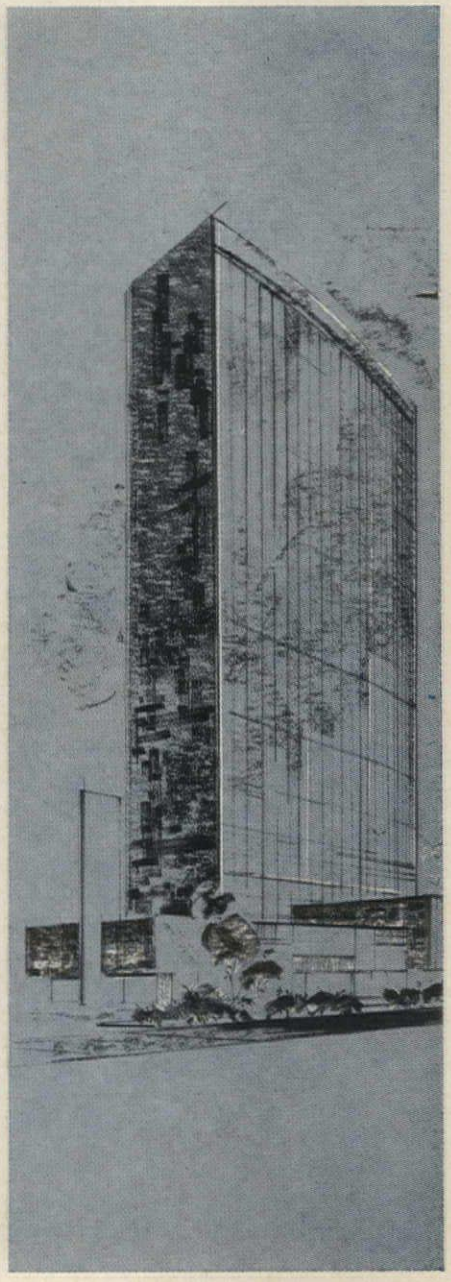
bottom left Grand Rapids Post Office, Grand Rapids, Mich. Owner: Thomas D. McCloskey, Philadelphia, Pa. Architect: J. & G. Daverman, Grand Rapids, Mich. General Contractor: Owen, Ames & Kimball, Grand Rapids. Fabricator and Erector: Marmet Corporation, Wausau, Wis. Duranodic Applicator: Stolle Corp., Sidney, Ohio

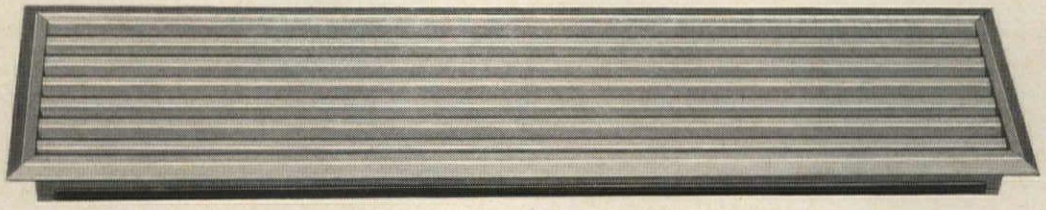
bottom right The Continental, Queens, N.Y. General Contractor and Owner: Cord Meyer Development Co., N.Y.C. Architect: Morris Rothstein & Son, Brooklyn, N.Y. Fabricator and Erector: Samson Window Corp., N.Y.C. Duranodic Applicator: Electro-Color Corp., N.Y.C.

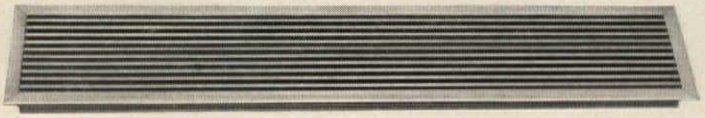
For more data, circle 37 on Inquiry Card











TUTTLE & BAILEY

Division of Allied Thermal Corporation
New Britain, Connecticut
Tuttle & Bailey Pacific, Inc., City of Industry, Calif.

Required Reading

continued from page 49

Churches

THIS BEFORE ARCHITECTURE. *By Edward S. Frey. Foundation Books, 122 Old York Rd., Jenkintown, Pa. 127 pp., illus. $3.50.*

Churchmen, at least those numbered among the liturgical reformers, must surely be among architecture's most remarkable clients; their readiness to assume the fault for the ailments of contemporary religious architecture is, if not absolutely unique, highly unusual. Dr. Frey, executive director of the Commission on Church Architecture of the Lutheran Church of America and a liturgical reformer in good standing, lays the blame at the feet of pastors and church building committees who fail to provide their architects with adequate programs.

Because this book is a collection of speeches made by Dr. Frey over a period of years to groups variously including clergymen, architects and laymen, its tone is uneven and marred slightly by repetition. But the essence of its message is plain: "Think! before you build." This exhortation means that, if the modern church is to reflect the modern community of worship, congregations will have to ask, and answer, some pretty hard questions about the nature of their faith and their expectations of its communal celebration. While Dr. Frey and his fellow reformers have not yet prevailed entirely over traditionalists in the Protestant church, the militancy of their arguments has had its effect. The corollary of this continuing quest among churchmen is a need for architectural quickness of response to new liturgical demands.

Stores

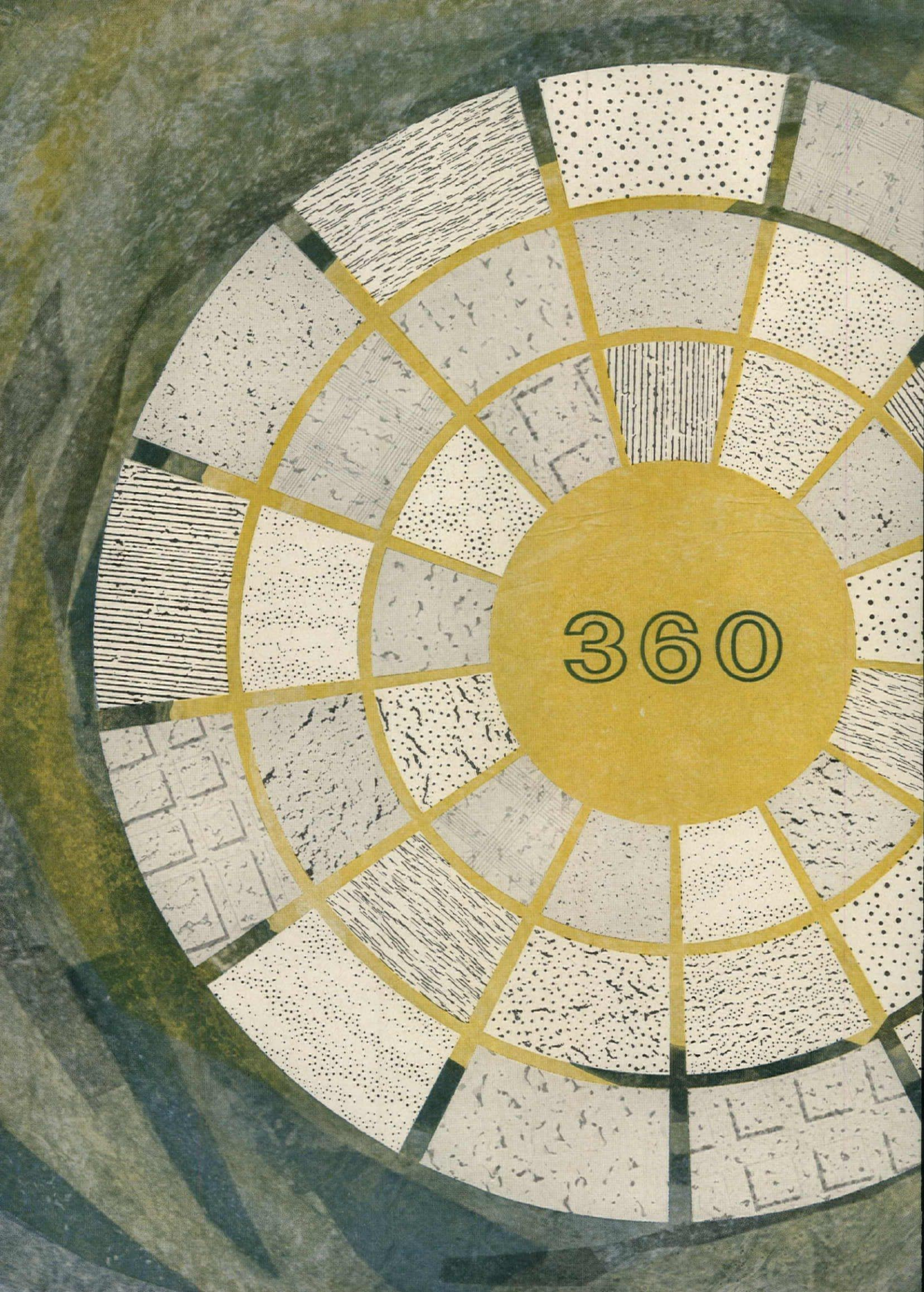
STORES AND SHOPPING CENTERS. *An Architectural Record Book, edited by James S. Hornbeck. McGraw-Hill Book Company, 330 W. 42nd St., New York 36. 181 pp., illus. $10.75.*

Compiled from material published in ARCHITECTURAL RECORD over the past few years, this study comprises the significant developments made in the design of retailing facilities during that period.

The first section, on stores, is preceded by articles by architects William T. Snaith and Morris Ketchum Jr., and covers, by examination of individual stores, design problems ranging from the small specialty shop's need to "seize the eye" to the complex logistics of the large department store.

The second section, on shopping centers, covers, generally and specifically, the small suburban and the large regional shopping center and the enclosed mall, and considers the possibilities for the urban shopping center. Consideration is given also to those esthetic embellishments which are the *sine qua non* of all self-respecting and ambitious shopping centers: landscaping, sculpture, fountains, graphic design. Articles by Edward Larrabee Barnes, Richard M. Bennett, Victor Gruen and Louis G. Redstone accompany this section.


Modern Door Control by
LCN
Closers concealed in head frame
General Offices, United Insurance Company of America, Chicago, Illinois
Shaw, Metz & Associates, Architects
LCN CLOSERS, PRINCETON, ILLINOIS
Construction Details on Opposite Page


360

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Manual Mark II Overhead Door for applications with limited ceiling space. Hinged panel construction. Powerful torsion spring with safe ratchet adjustment counterbalances door for easy operation.

NEW Jamison Mark II Vertical Opening Doors

low cost—easy installation

new lightweight construction—only 2" thick

- efficient insulation—foamed-in-place polyurethane bonds #26 gauge galvanized steel cladding into single structural unit.
- Jamison "down and in" closure wedges door against frame for perfect seal.
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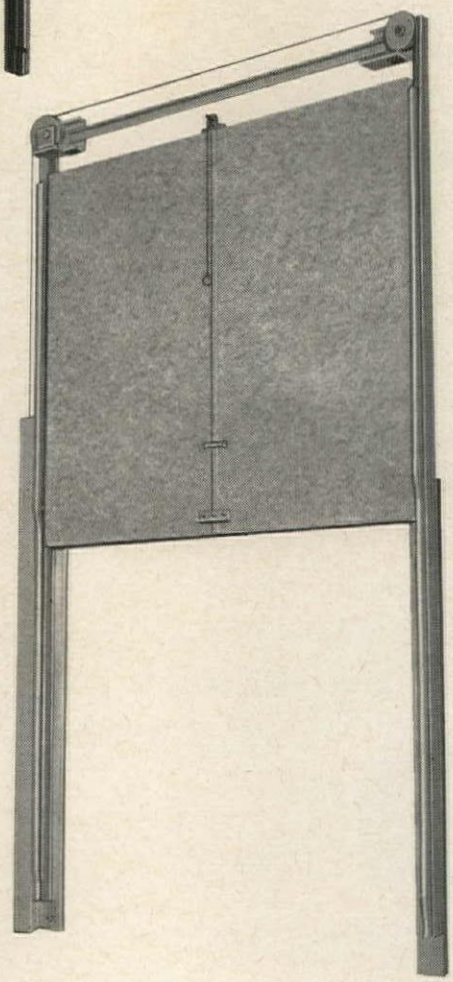
- vertical opening permits additional doorways, closer positioning.
- both doors available with power operation.

For bulletin with outline dimension and sizes, write to Jamison Cold Storage Door Co., Hagerstown, Md.



Vertical Sliding Manual Mark II Door for installations with high ceilings. Fully counter-weighted for easy opening.

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BLUE GLAZE ON
DESIGNER PATTERN

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SPANISH PATTERN

GREEN GLAZE ON
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Rowsey Memorial Chapel, Muskogee, Oklahoma—Archts.: Bennett & Crittenden, Dallas, Texas—Tile by Ludowici: Early American Gray Range

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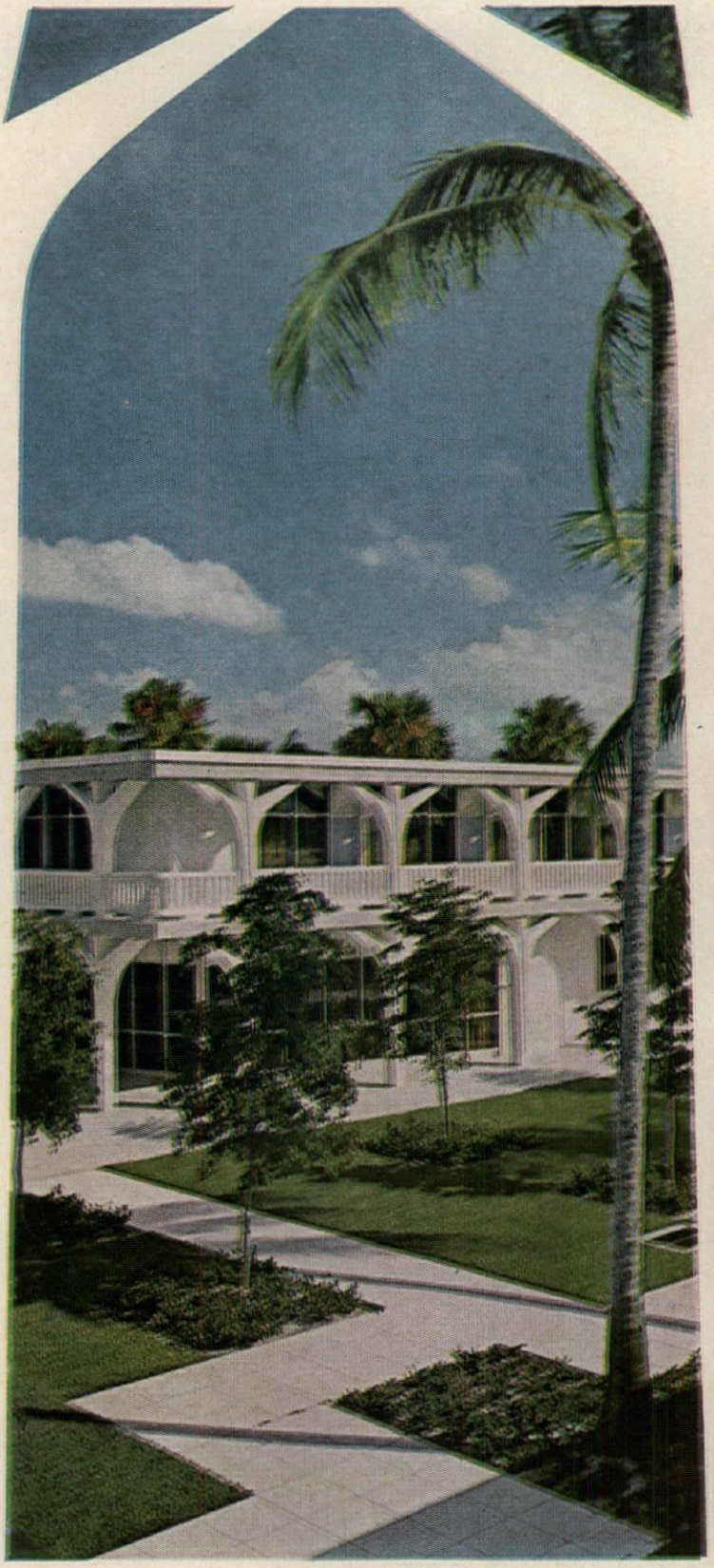
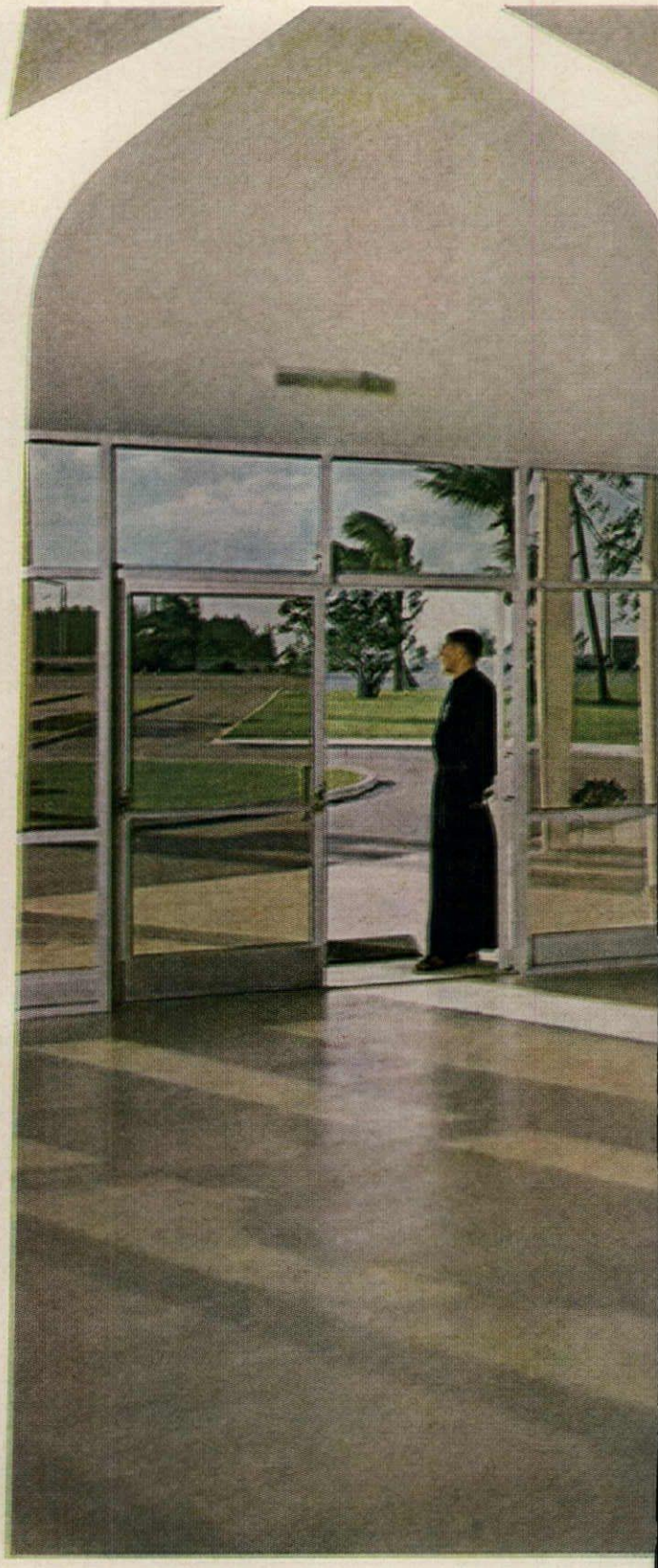
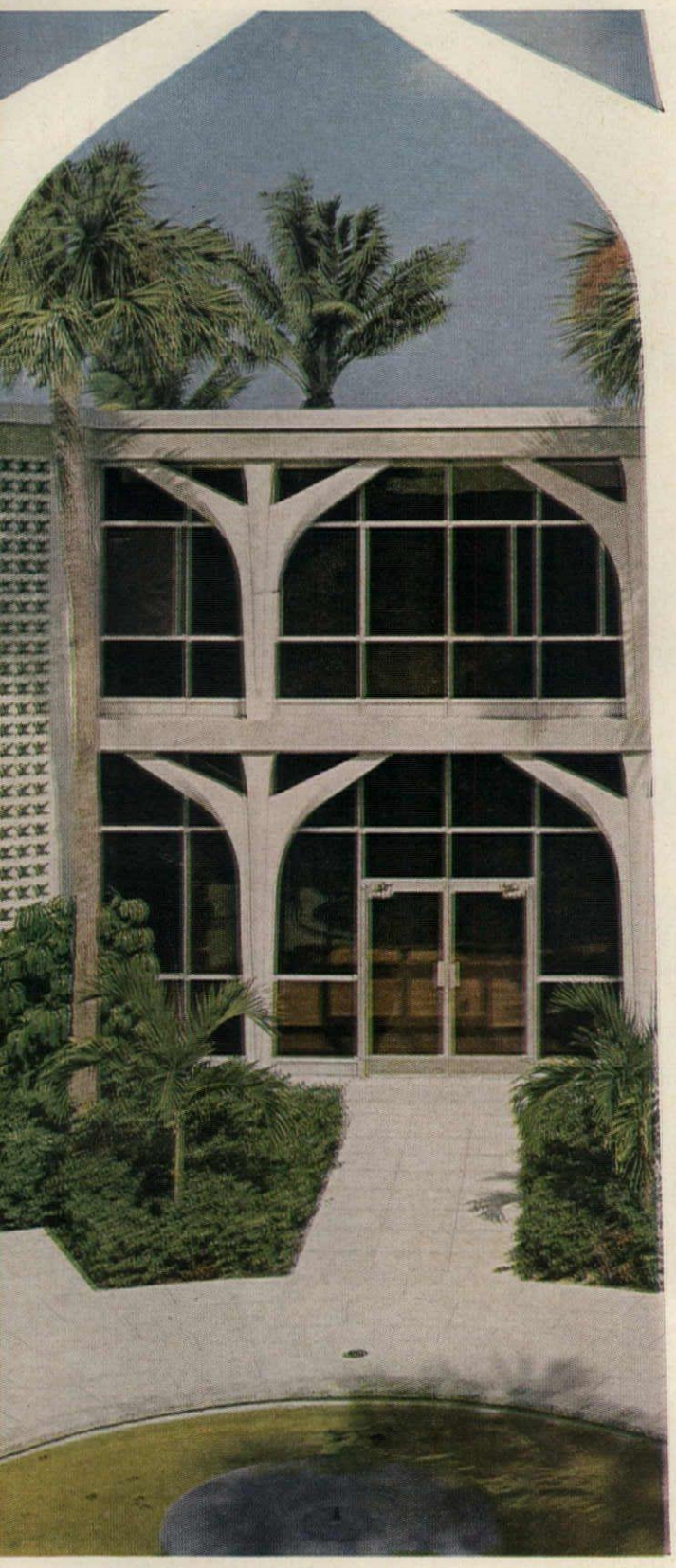


Cruciform Support Columns serve as a design motif throughout the building, and frame vistas viewed from colonnaded galleries. Top panels of ground floor window walls are of opaque white Supratest.



Glare Reduction is dramatically illustrated by strip of natural light shining through open door. Gray-tinted Supratest allows light transmission of only 28%, reduces solar heat by approximately 30%.

AMERICAN SAINT GOBAIN CORPORATION



Cloistered Courtyard of priests' residence features decorative screens of precast concrete blocks which shield windows of residence wash rooms. Window wall and doors are of Supratest. Window frames are aluminum.

Serenity Safety Sun-Control ...with glass by ASG

Gleaming white, clad in subtly tinted glass, the new monastery and retreat house of Our Lady of Florida in North Palm Beach, is a twentieth-century American statement of the centuries-old traditions of monastic life.

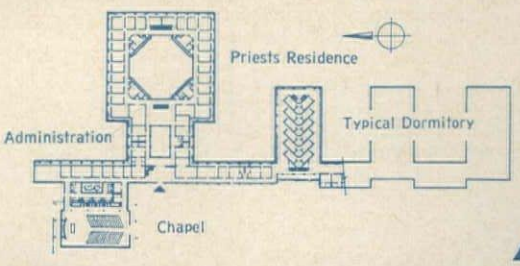
Designed by Brother Cajetan Baumann, F.A.I.A., a Franciscan friar, the two-story structure of reinforced concrete and glass is light and airy, in keeping with its tropical setting. Yet it possesses a dignity and sense of cloistered seclusion.

To create this feeling of serene detachment, to protect against wind damage, and to reduce heat and glare of the sun, ASG's Supratest® laminated glass was specified for all window walls and sliding doors. Supratest is a laminate of two lights of sheet glass bonded together by a plastic interlayer. In this case, the plastic was tinted to give the glass a uniform gray cast.

The gray Supratest is highly reflective and practically opaque when viewed from a distance, increasing the monastery's air of privacy and self-containment. The tint also makes the glass heat absorbing and glare reducing, bringing easy-to-live-with natural light to the interior, and relieving the burden on the building's air conditioning system. The plastic-bonded construction of Supratest makes it shatterproof, assuring interior safety even during the hurricane season.

Supratest is just one of the broad and versatile family of flat glasses available from ASG—the only U.S. manufacturer of all major types of flat glass. Whatever your need—plate, sheet or patterned glass—whatever the application—home, school, office, apartments—there's a quality ASG glass to do the job.

For more information, see your local glass distributor or ASG representative, or write: Dept. D-7, American Saint Gobain Corporation, Box 929, Kingsport, Tennessee.



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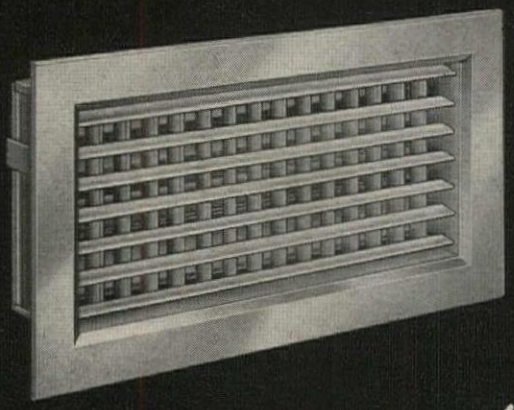
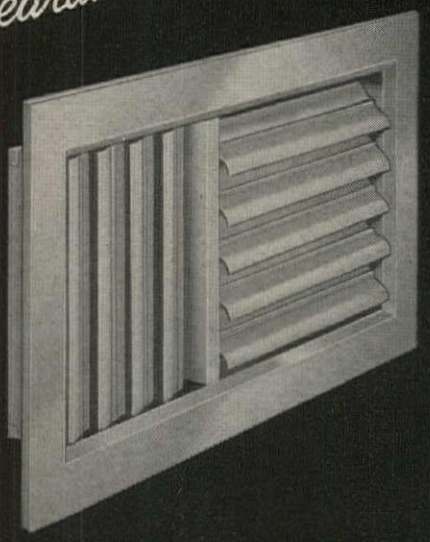
CURVED BLADE CEILING AIR OUTLETS



with Better Performance...Appearance...Construction



The new design and construction of AGITAIR grilles and registers offer the specifier and installer unusual performance features that assure better handling of air for supply, return or exhaust applications.

AGITAIR "ED" Series supply grilles handle larger quantities of primary air at higher than conventional velocities... lower pressure drops... minimum noise levels... rapid mixing of primary and room air... shorter blow... longer continuance of horizontal discharge... minimum arching ... higher degree of temperature equalization... better control of air volume... noiseless, draftless air distribution.

These AGITAIR grilles and registers combine excellent architectural styling with sturdy construction. Fins and frames are manufactured of heavy gauge aluminum extrusions. Mitered corners are staked for rigidity and seamless appearance. Finish is caustic etched aluminum.

These versatile AGITAIR air outlets give you widespread (on-the-job) adjustability to meet all usual or unusual job conditions.

Three basic models in a wide range of sizes permit unlimited air deflections for blows in one — two — three or four directions.

The unique curved blades, and their well conceived positioning provide unmatched functional features to assure proper handling of air. Each blade can be individually adjusted or completely reversed for horizontal, intermediate, straight out or downward blows.

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BETTER PRODUCTS FOR... AIR DISTRIBUTION • AIR CLEANING • AIR EXHAUST

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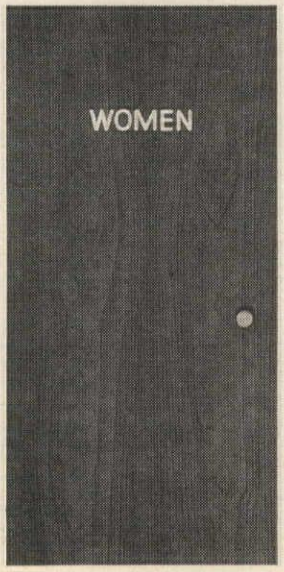
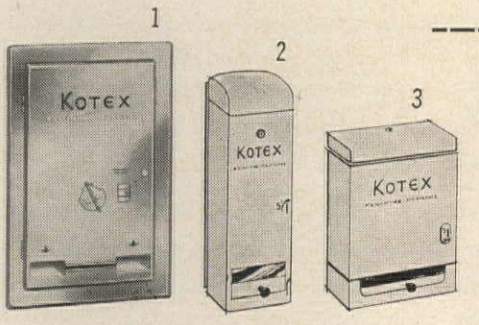


What do most women prefer in buildings?

It's a fact. Most women prefer modern, spacious washrooms equipped with vending machines for Kotex feminine napkins. It's a fact—because most women prefer Kotex to all other brands! When you make provision for vending machines for Kotex, you add a greatly appreciated thoughtfulness—and help to eliminate unnecessary embarrassment and absenteeism.

Only Kotex offers three separate vending machine designs. Each is easily installed and is available in your choice of white enamel, bright or satin chrome finish. (The Kotex recessed model is also available in stainless steel.) All three Kotex vending machines are made of sturdy 18 and 20 gauge steel, with trouble-free, long-wearing, cold-rolled steel mechanisms. (Five-cent, ten-cent or free vending mechanisms are available for all models.) (1) **Model R-63** (Recessed)—Dispenser can also be surface mounted. Holds 63 individually packaged Kotex napkins. (2) **Model MW-15** (Surface mounted)—Dispenser holds 15 individually packaged Kotex napkins. (3) **Model R-25** (Surface mounted)—Dispenser holds 22 envelope-wrapped Kotex napkins.

More women choose Kotex feminine napkins than all others combined



Kotex is a trademark of Kimberly-Clark Corporation, Neenah, Wisconsin

Kimberly-Clark Corporation, Department Number AR-73, Neenah, Wisconsin

Gentlemen: Please send complete information on vending machine service for Kotex feminine napkins.

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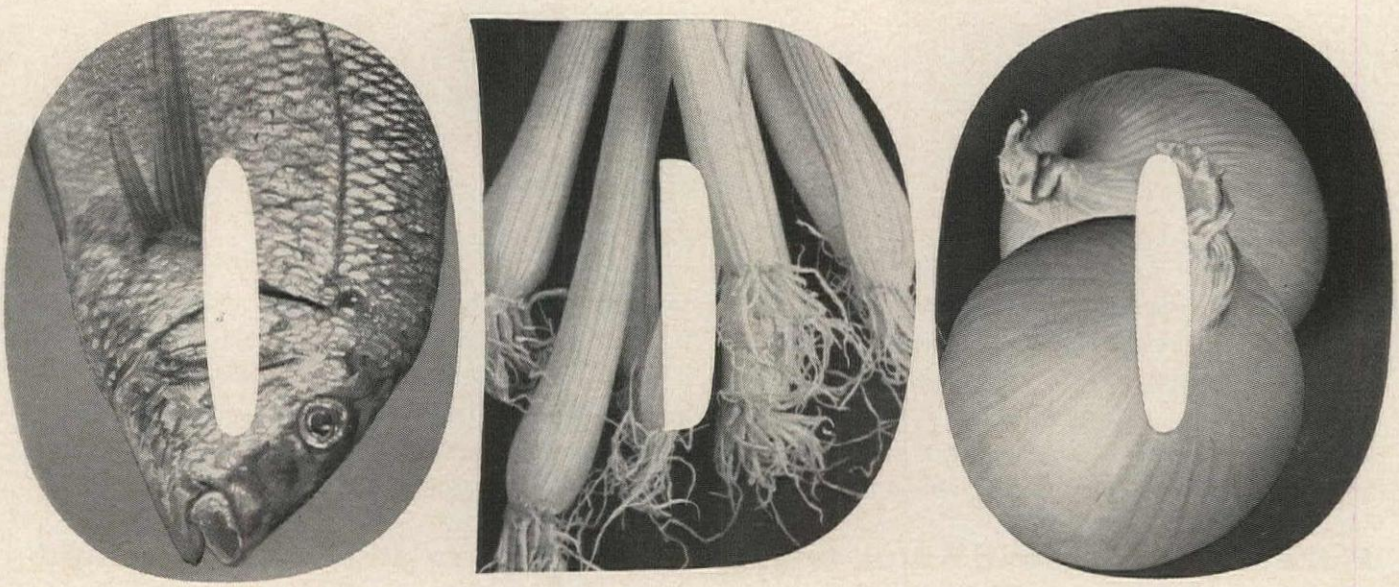
ANOTHER AIR CONDITIONING ADVANCE FROM YORK...

NEW! YORKAIRE Completely



Controlling temperature and humidity has always been the primary function of an air conditioning system. Now, York introduces a new and revolutionary way to eliminate odors; to destroy—not to mask—the actual odor-causing elements. This achievement is the most dramatic advance in environment control the industry has seen for over twenty years!

A solid deodorant, present in the Yorkaire Purifier Filter, reacts chemically to destroy the odors. In this new filter, there are chambers filled with small pellets impregnated with potassium permanganate; these pellets absorb odorous contaminants from the air . . . then destroy the odor-causing molecules before they can circulate through the conditioned air. Tobacco, kitchen and other common odors are effectively destroyed—not masked.

Now available in most York Air Conditioning Systems! Yorkaire Purifier Filters are optional components of air conditioning systems for office buildings, hotels, stores, apartments, shops, restaurants and plants. And they are offered now only with York equipment.

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Please send me free six-page, full-color booklet on Yorkaire Purifier Filters. I understand there is no obligation.

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Beautifully appointed office equipped with Fenestra steel doors and frames in one of many Baldwin Brothers, Inc. buildings.

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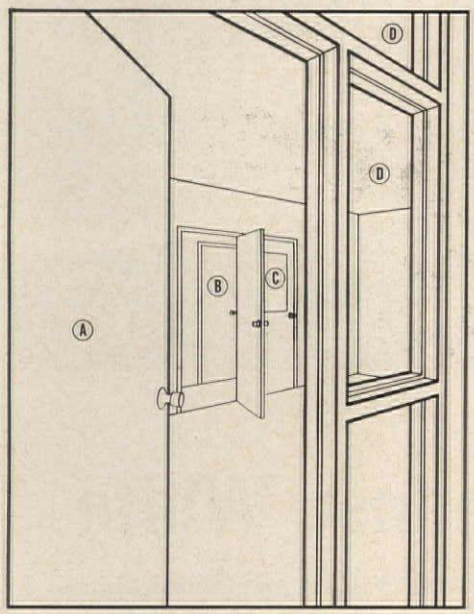

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Looking for something different in steel door and frame design . . . in transoms, vision lights, side lights or louvers? No need to search any further.

Want it *without* custom material costs or exasperating delivery delays?

Call in your Fenestra Distributor.

He is equipped to modify standard full flush steel doors speedily, economically and LOCALLY to meet your specifications and mirror your creativity.

He works only with the best. For example, the Fenestra CERTIFIED Door, tested under ASTM procedure E 152-58, offers schools, apartments, public housing, nursing homes and homes for the aged fire resistance for an hour and a half — yet sells at standard steel door prices.

You'll find your Fenestra Distributor in the Yellow Pages or write Fenestra Incorporated, Door Division, 4040 West 20th St., Erie, Pennsylvania.

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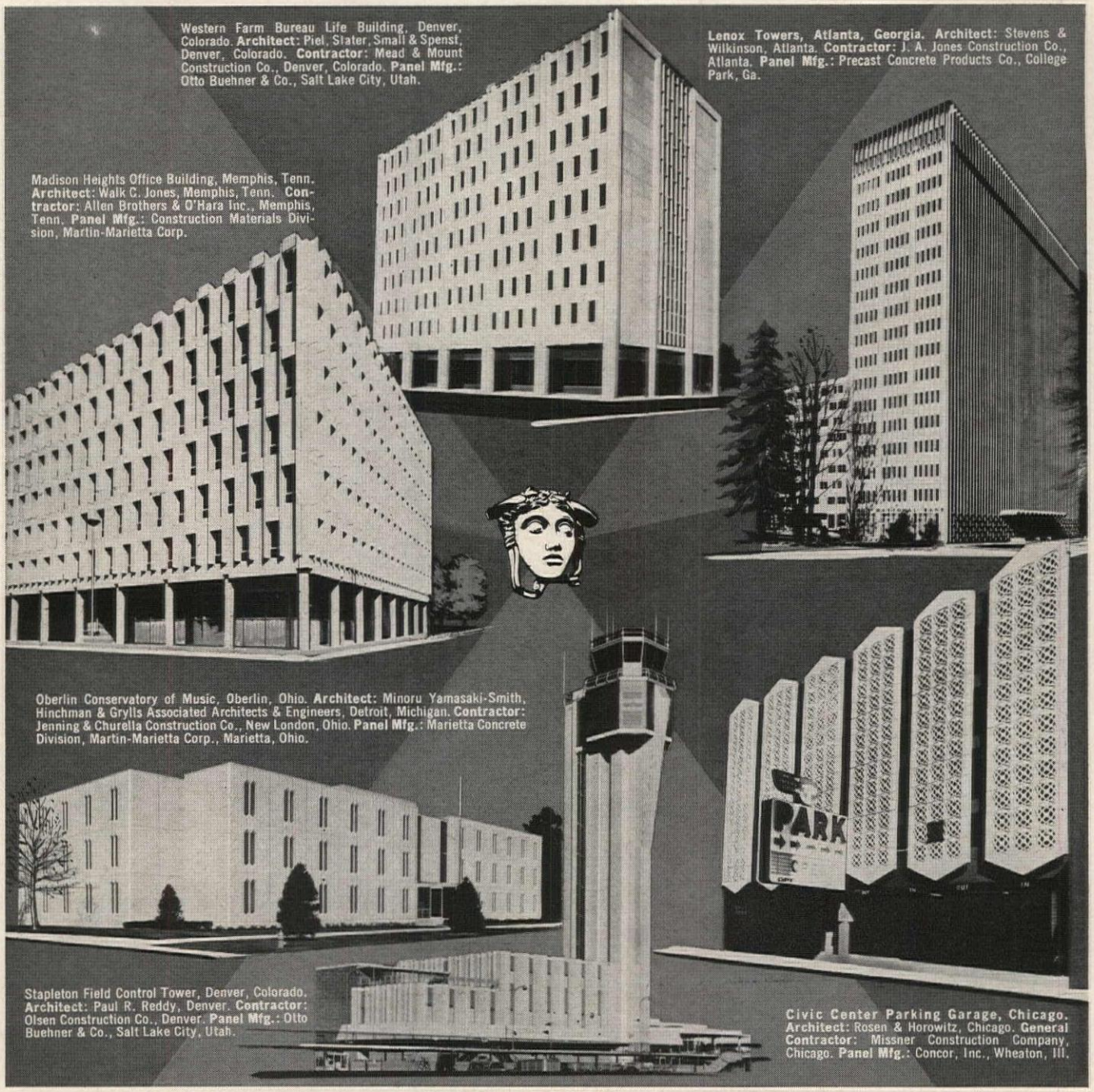

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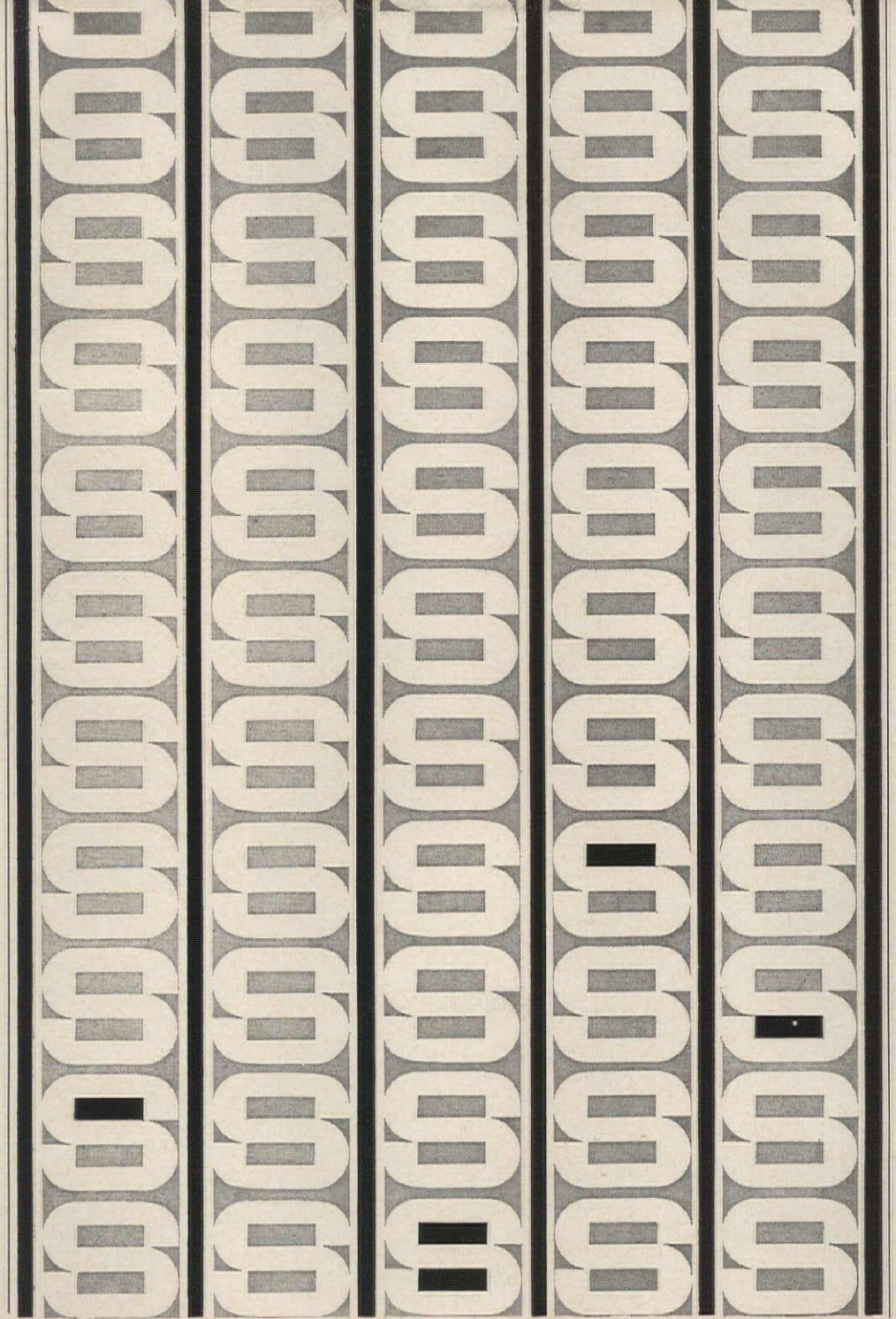

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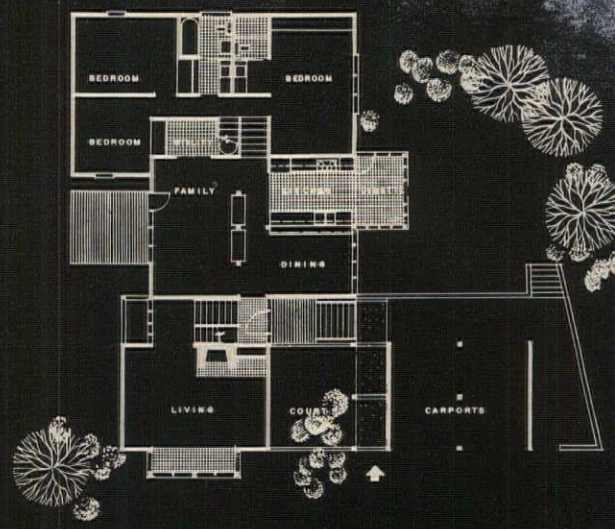

Residence: Bellevue, Washington / Architect: Gene Zema, A.I.A.

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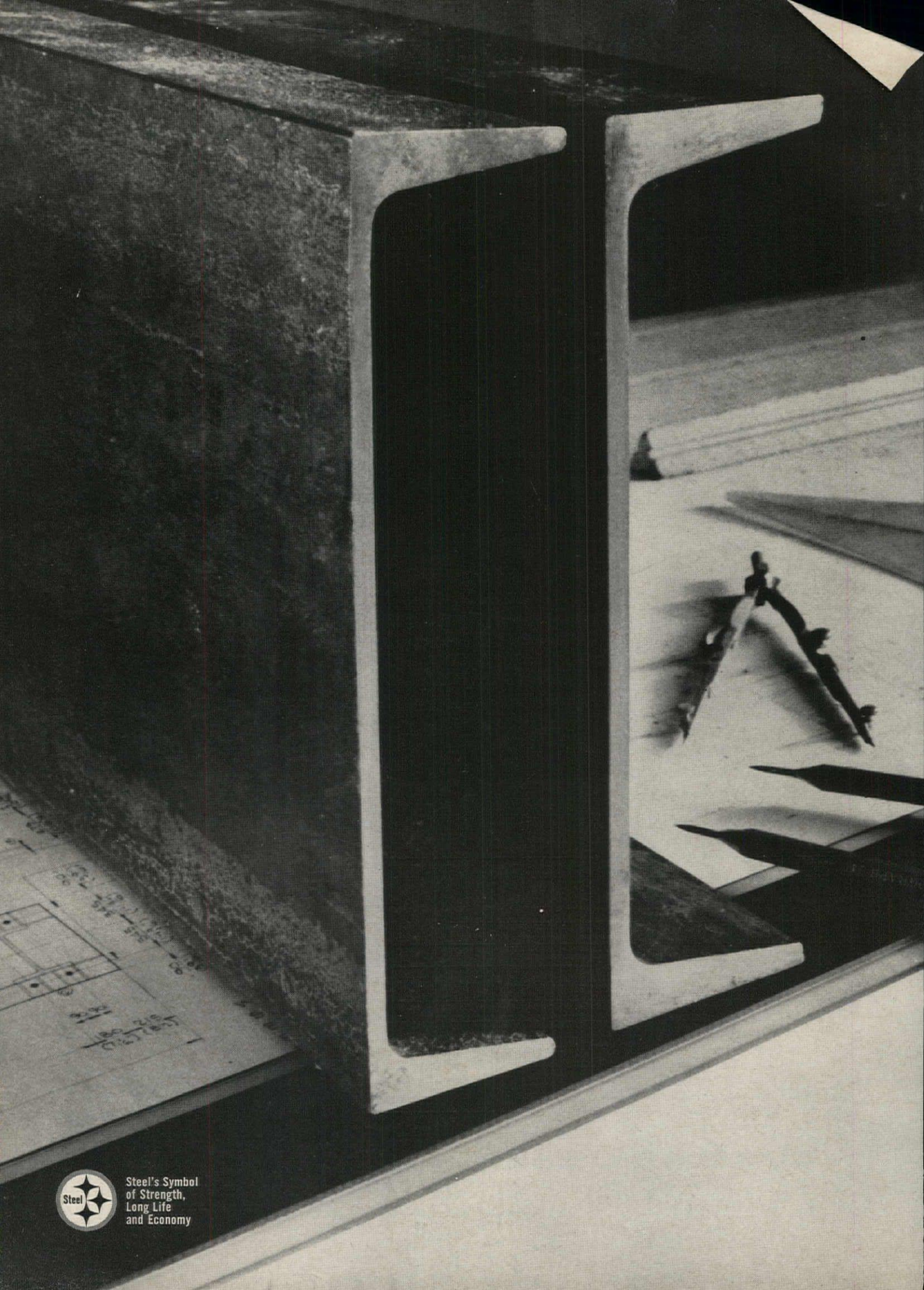
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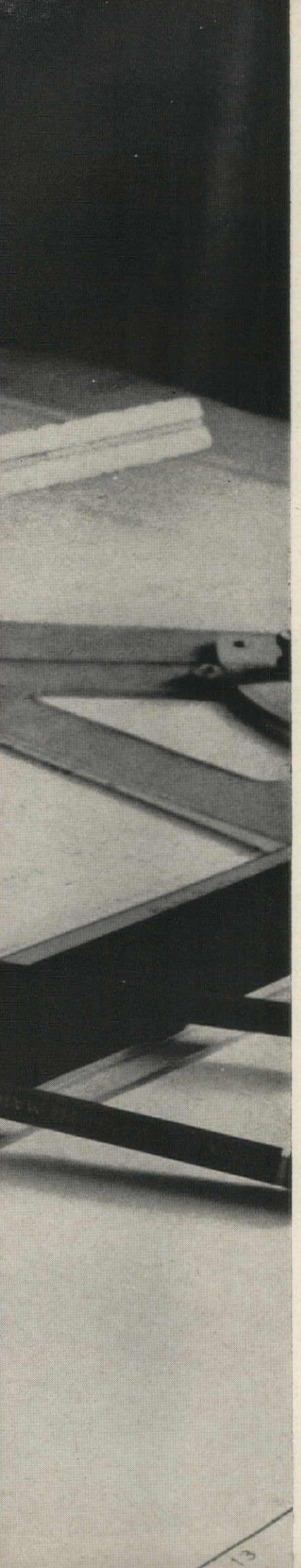
Steel's Symbol
of Strength,
Long Life
and Economy



NEW J&L 8-INCH CHANNEL CUTS WEIGHT 26%...COST ...EASES FABRICATION

Jones & Laughlin announces a completely new 8-inch standard channel weighing 8.5 pounds per foot—three pounds less than the conventional standard channel. And it's ready for market, now, in both carbon and high-strength steels.

This new section, because of its 26% less weight, is easier to fabricate and install. Handling and shipping costs drop sharply, too. And, of course, lightweight frames afford new flexibility in selecting other materials for your jobs.

So, to those concerned with the design and construction of apartment houses, schools, hospitals, garages and all commercial and industrial structures—your inquiries are invited! As are those of trailer and truck body builders, makers of construction and materials handling equipment, and building component producers—everyone interested in strong, lightweight frame construction.

The J&L 8-inch lightweight channel is the newest addition to a broad line of lightweight steel structurals ranging from 6-inch Junior Beams and Channels on up to 14-inch light beams. Full information is in the hands of your J&L representative. To get it into *your* hands, contact him today!

STANDARD CHANNEL

Nominal Size	Wt. Per Foot	Area	Depth	FLANGE		Web Thickness	AXIS X-X			AXIS Y-Y			
				Width	Avg. Thickness		I	S	r	I	S	r	X
in.	lb.	$in.^2$	in.	in.	in.	in.	$in.^4$	$in.^3$	in.	$in.^4$	$in.^3$	in.	in.
8x1⅞	8.5	2.49	8.00	1.875	.321	.180	23.6	5.9	3.08	.65	.45	.51	.45

STANDARD CHANNEL

Depth of Section	Wt. Per Foot	FLANGE		WEB		DISTANCE					Grip	Max. Flange Rivet	Usual Gage g
		Width	Mean Thickness	Thickness	Half Thickness	a	T	k	gl	c			
in.	lb.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
8	8.5	1⅞	5/16	3/16	⅛	1¾	6½	¾	2¼	¼	5/16	⅝	1⅛

Jones & Laughlin Steel Corporation
3 Gateway Center, Pittsburgh 30, Pennsylvania

STEEL

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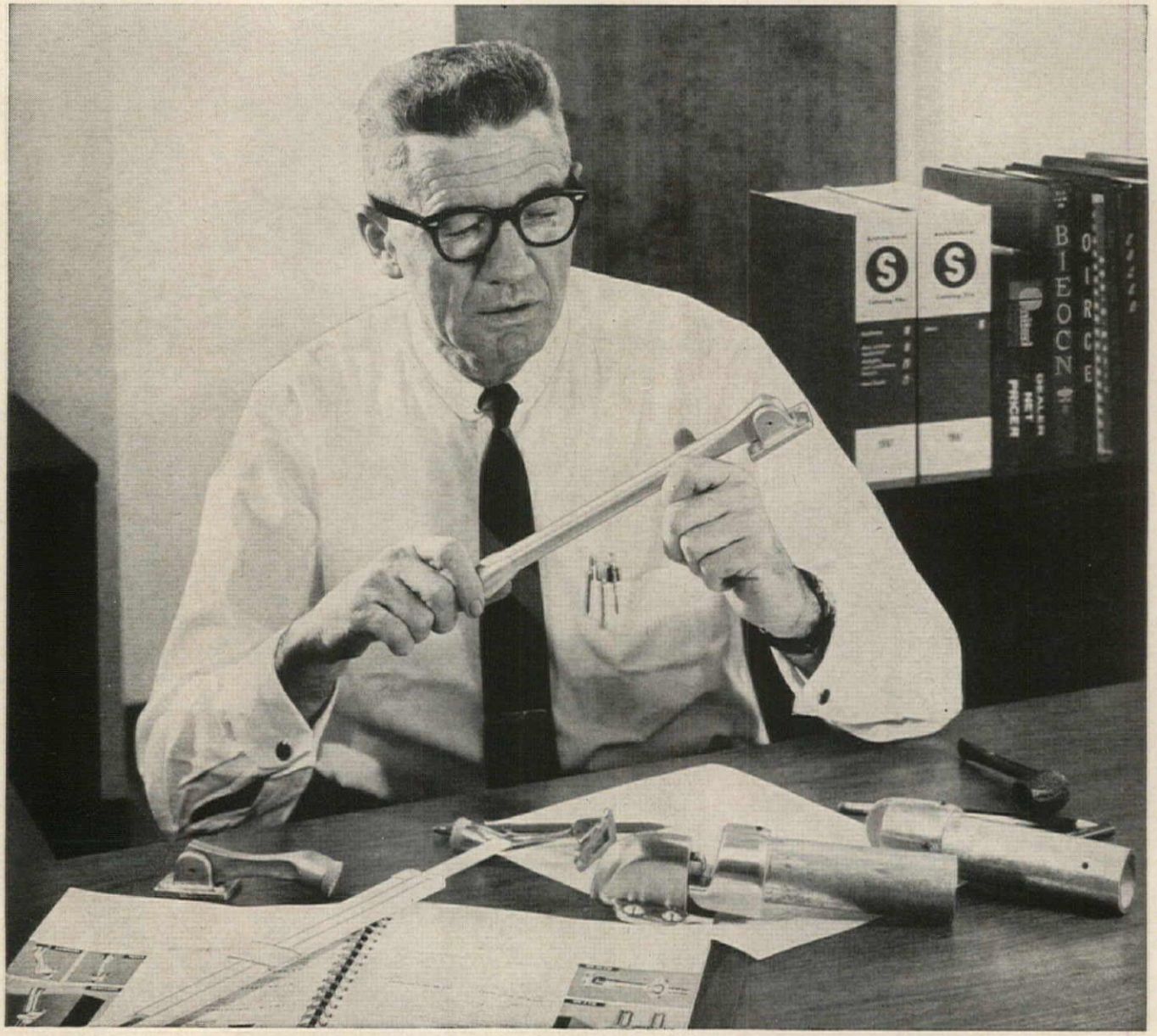

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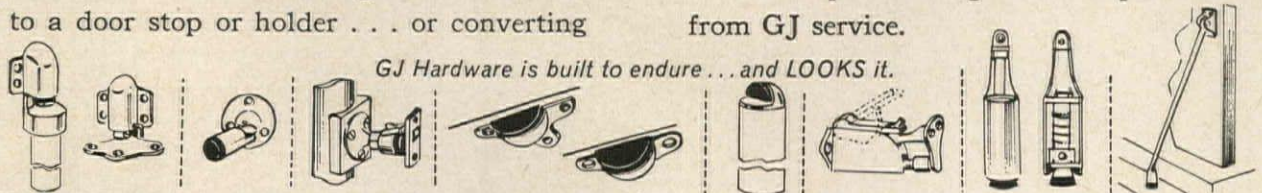

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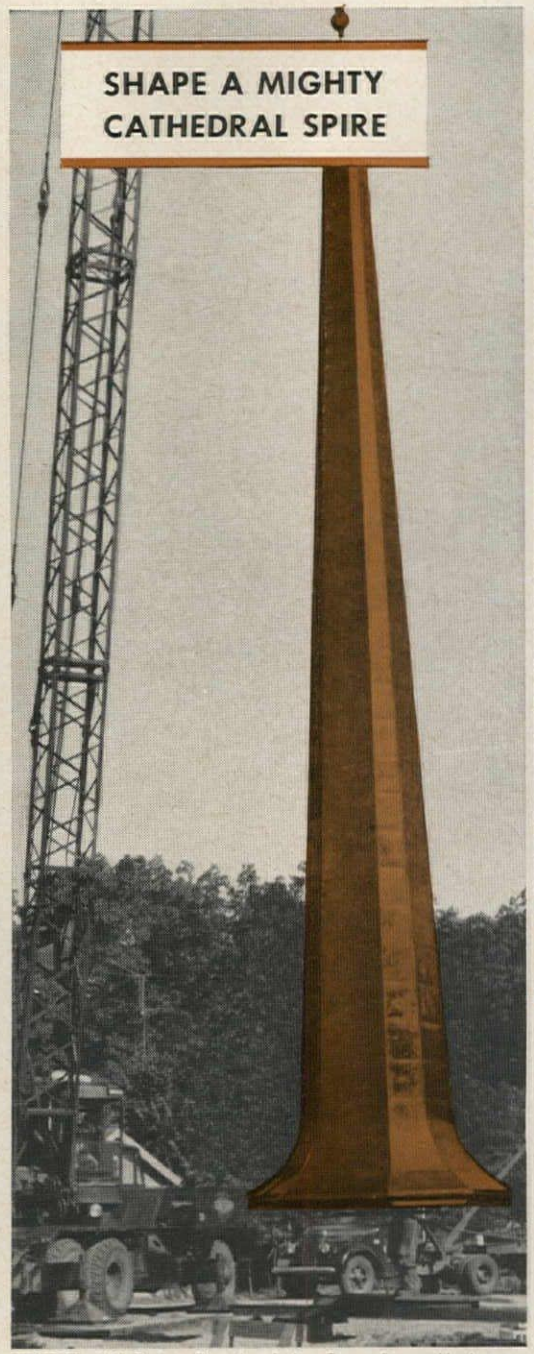
an inside story about the birth of an idea by Bradley Washfountain

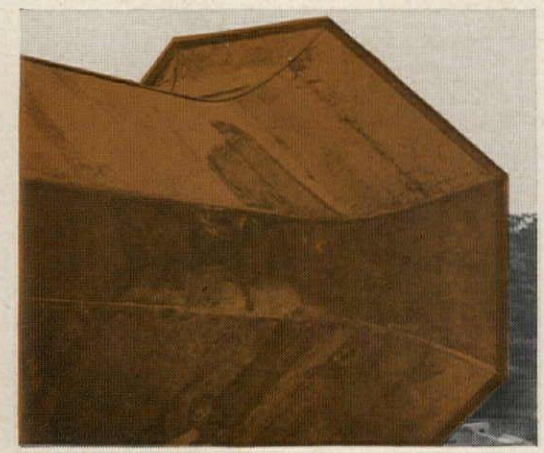
cheaper by the half dozen

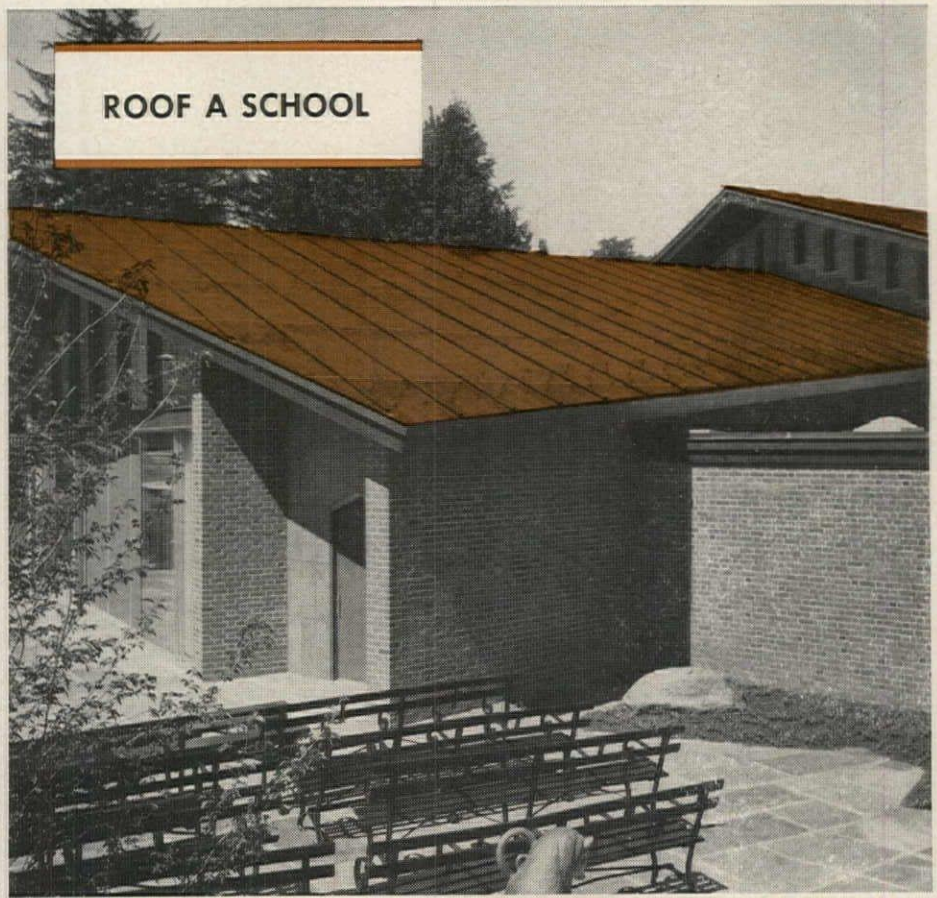
A revolution is underway in modern shower-room planning, and Bradley Column Showers are at the forefront. Why? Because Bradley Columns started the entire swing to *group* showers, proving they could serve up to six people at one time with only *one* set of plumbing connections — saving valuable space and cutting installation costs as much as 80%! Bradley Columns caught on fast because they also provided more design freedom; increased traffic flow; saved water and maintenance costs. (They were so successful that they prompted the development of four other Bradley Group Showers: Multi-Stalls, Wall-Savers, Modesty Modules and Panelons.) In short, Bradley Columns added up because their expenses *didn't*. And, today, they're saving money, space and time in modern buildings across the country — because architects know that showering is cheaper by the *half*-dozen. *Ask your Bradley representative for assistance on specific applications. And write for latest literature. Bradley Washfountain Co., 2377 West Michigan Street, Milwaukee 1, Wisconsin.*

Bradley



COPPER SPIRE for Church of the Open Door, Muskegon, Mich. It was fabricated from 5,000 lbs. of 16 oz. Cold Rolled Revere Copper by LIVINGSTON SHEET METAL CO., Muskegon. Spire is 81 feet high and 19 feet in diameter at the base. Revere Distributor: CENTRAL STEEL AND WIRE COMPANY, Chicago, Ill.





BATTEN SEAM ROOF on Miss Porter's School, Farmington, Connecticut, was fabricated from 30,000 lbs. of Revere Sheet Copper. Architect: MOORE & SALSBURY, West Hartford, Conn. General Contractor: FELIX BUZZI & SON, INC., Torrington, Conn. Sheet Metal Contractor: EARNEST PETERSON, INC., Hartford, Conn.

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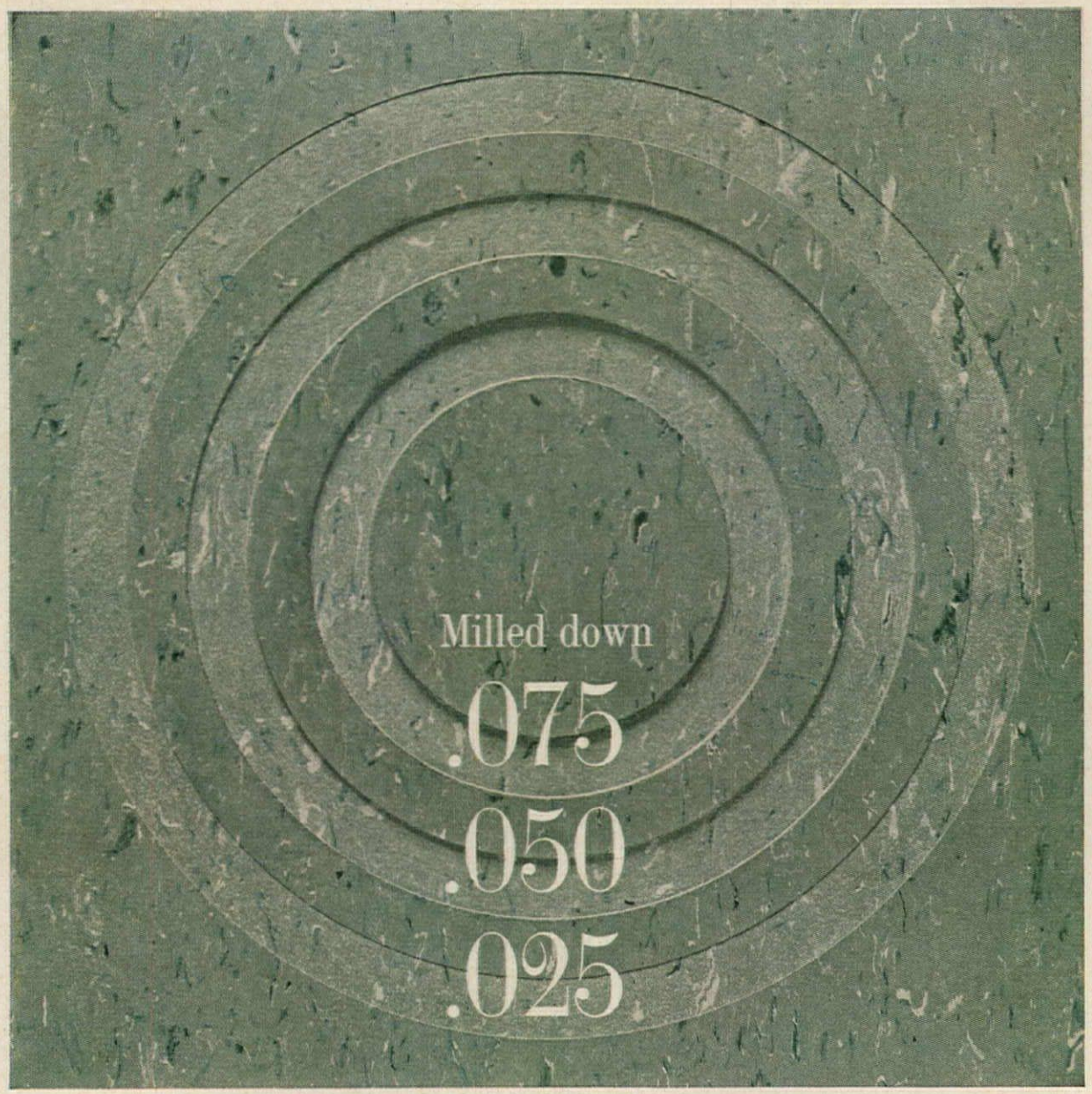

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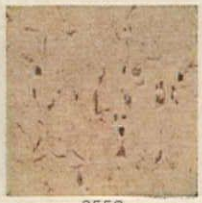
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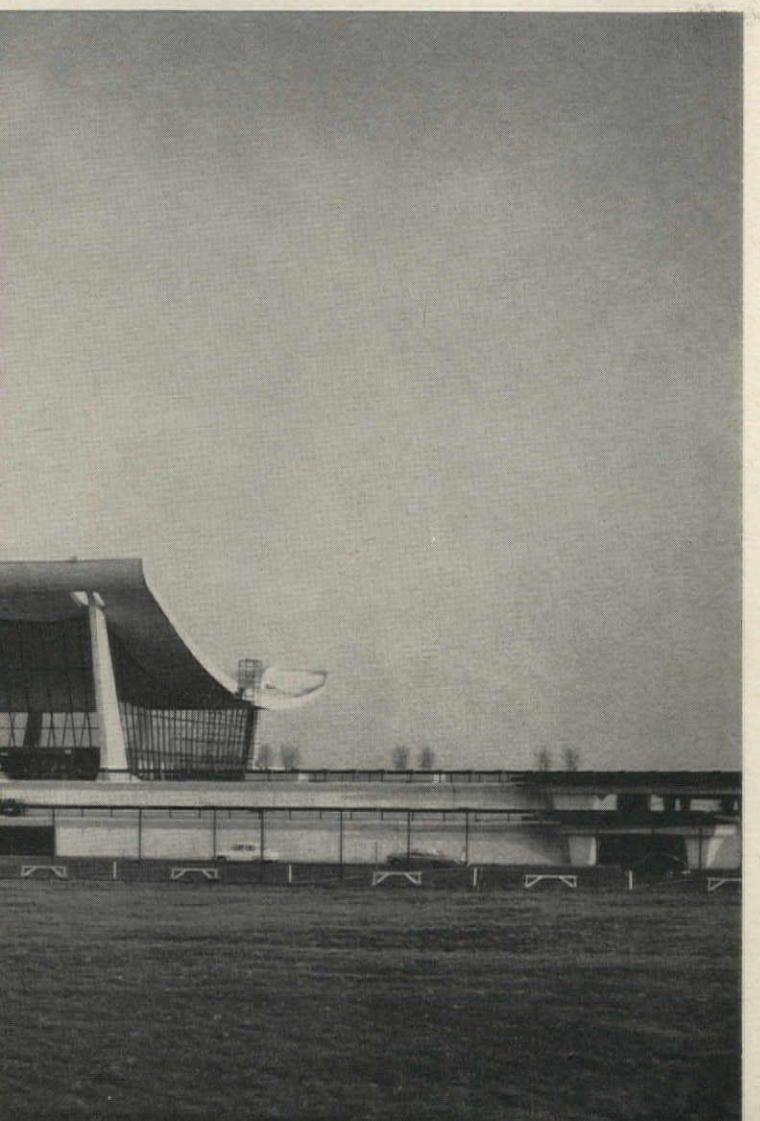
Joseph W. Molitor photos

DULLES INTERNATIONAL AIRPORT

Eero Saarinen's compact jet terminal building features a suspended roof, colonnaded facades, and a fleet of detachable lounges that deliver passengers directly to the jets



EERO SAARINEN'S STATEMENT ON THE DESIGN

After his last visit to Washington before his death, Eero Saarinen remarked: "I think this terminal building is the best thing I have done. Maybe it will even explain what I believe about architecture."

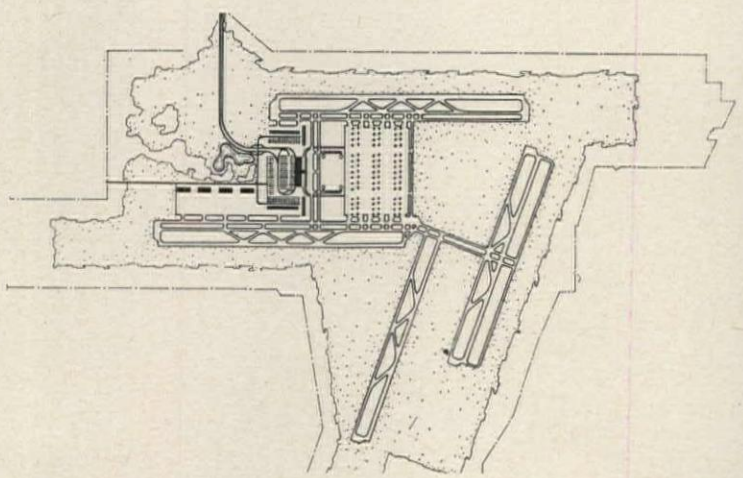
The Dulles Terminal Building is indeed a remarkable combination of ingenious planning and expressive architecture. It is notable for its compact plan and short walking distances; a contribution to airport amenity made possible by the concept of the mobile lounge. And it is notable for its graceful hanging roof, its colonnaded facades and its dynamic look. The terminal somehow manages to express the architect's urge to "place a strong form between earth and sky that seems both to rise from the plain and hover over it." But let Eero Saarinen explain:

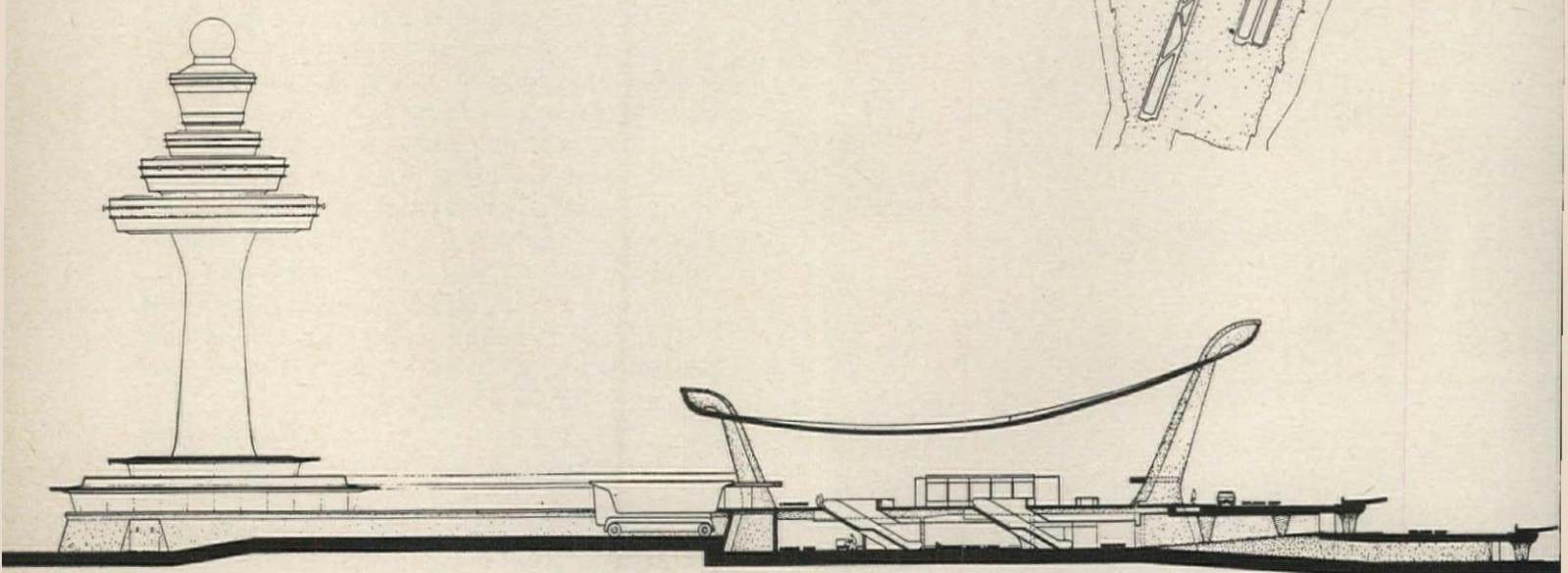
"Dulles is unique because it is the first airport really to be planned from the start for the jet airplane. No one asked us to grapple with such a problem beyond the question of pure architecture. But I believe the architect has to assume that kind of responsibility. Therefore, with the engineers and consultants, we decided to make a fundamental analysis of the whole problem of a large terminal for jets. It was a hard-boiled problem and we wanted to solve it in a hard-boiled way.

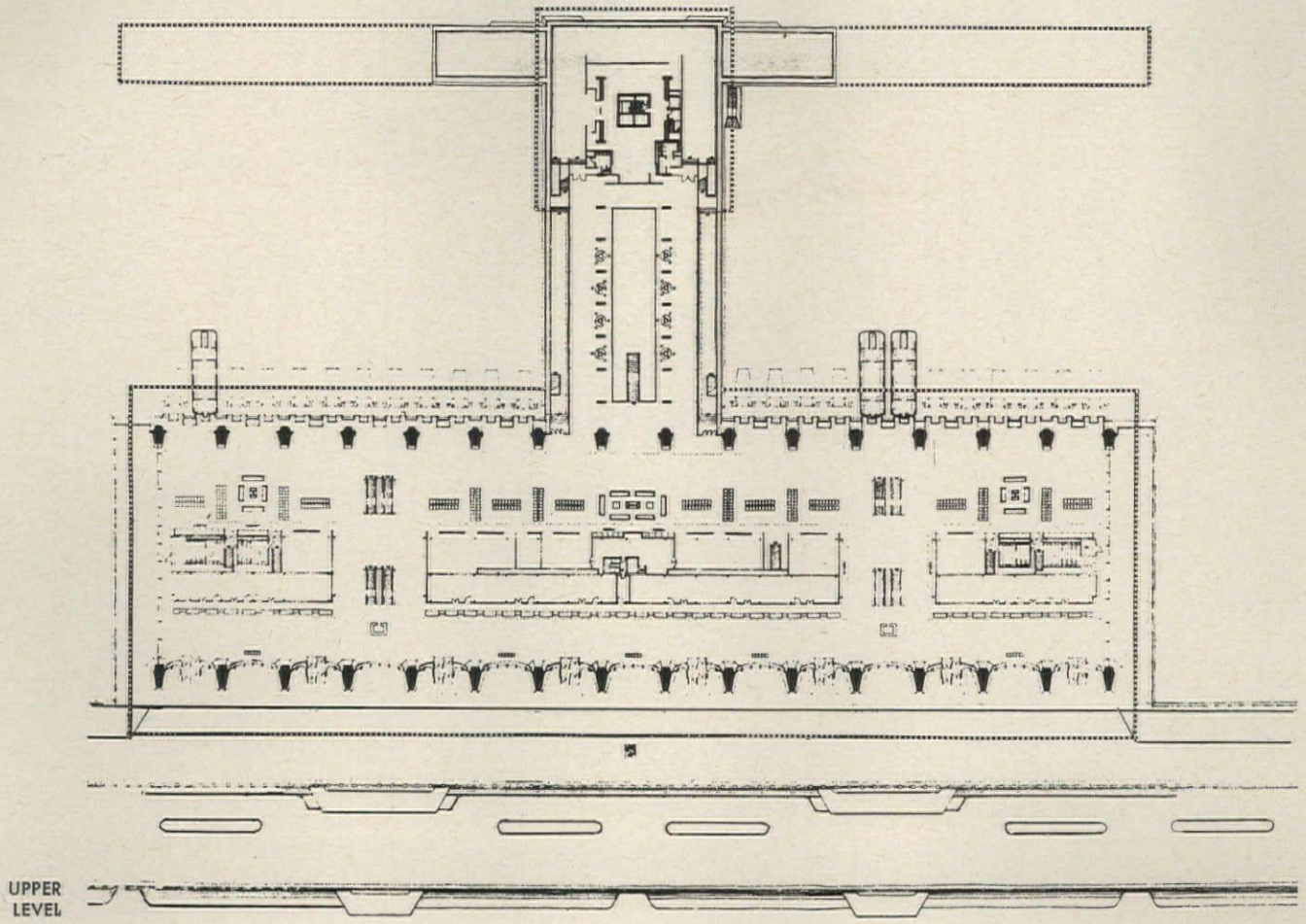
"We sent out teams with counters and stop watches to see what people really do at airports, how far they walk, their interchange problems. We analyzed special problems of jets; examined schedules, peak loads, effects of weather. We studied baggage handling, economics, operations, and so on. We reduced this vast data to a series of about 40 charts.

"We found three critical problems. One, the time and inconvenience of getting passengers to and from planes; the already tremendous distances passengers walk through terminals and their extend-

The upper level main concourse is reached by a motor ramp for departing passengers and visitors; contains ticket and check-in counters, waiting areas, concessions, and mobile lounge gates for both arrivals and departures. The lower level, devoted to baggage handling, customs, airport management, concessions, is served by a motor ramp for arriving passengers



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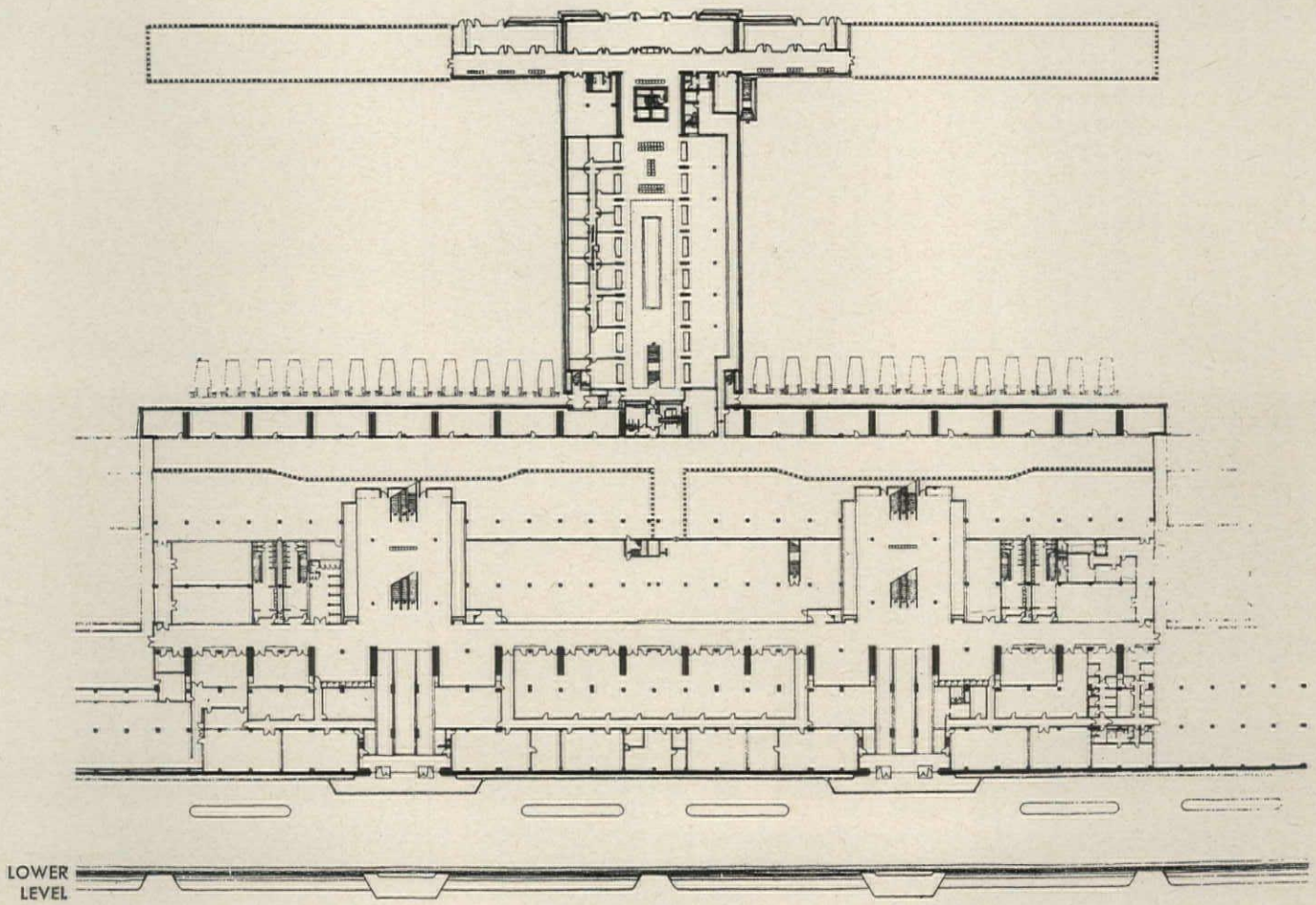
LEVEL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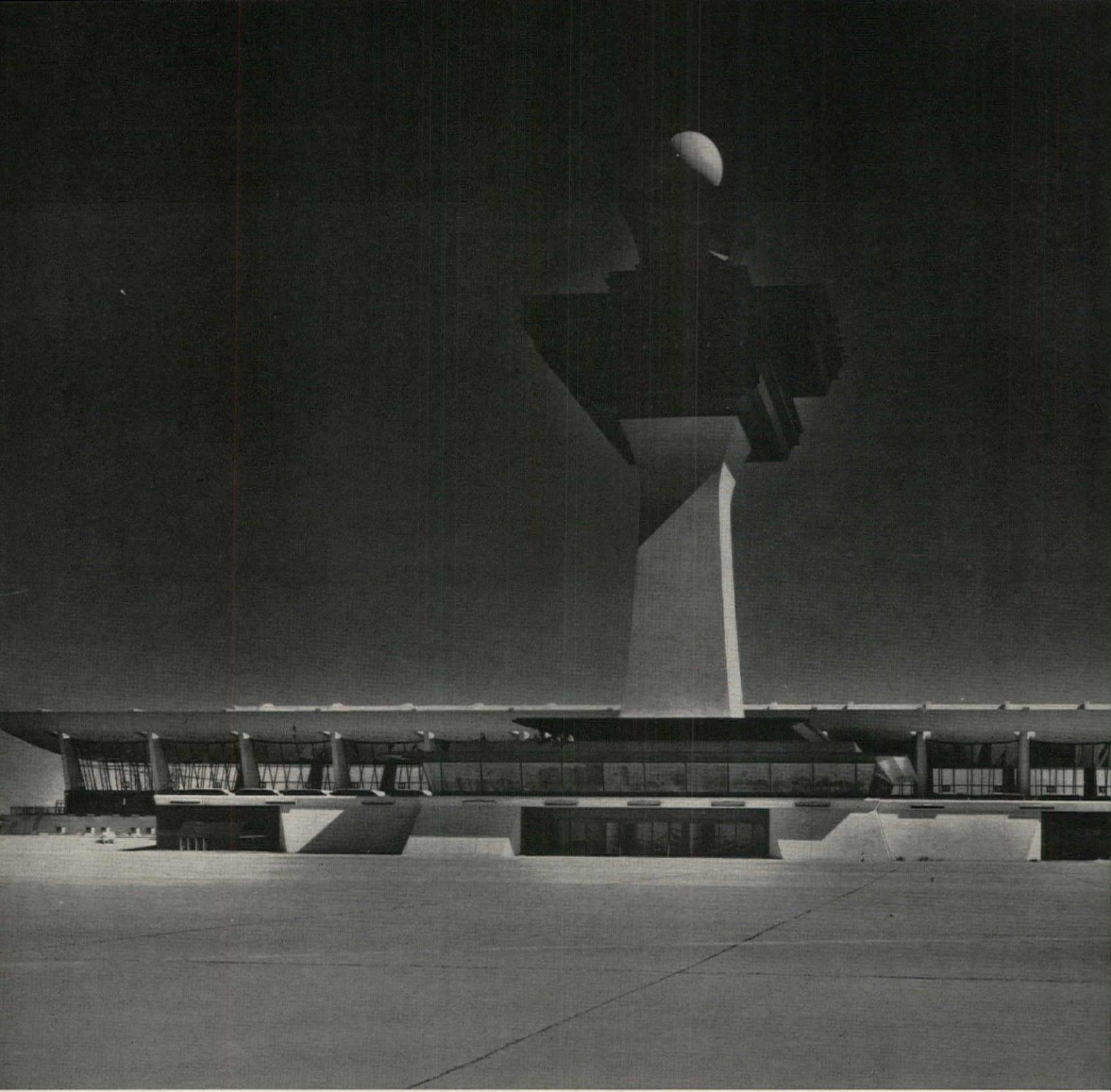


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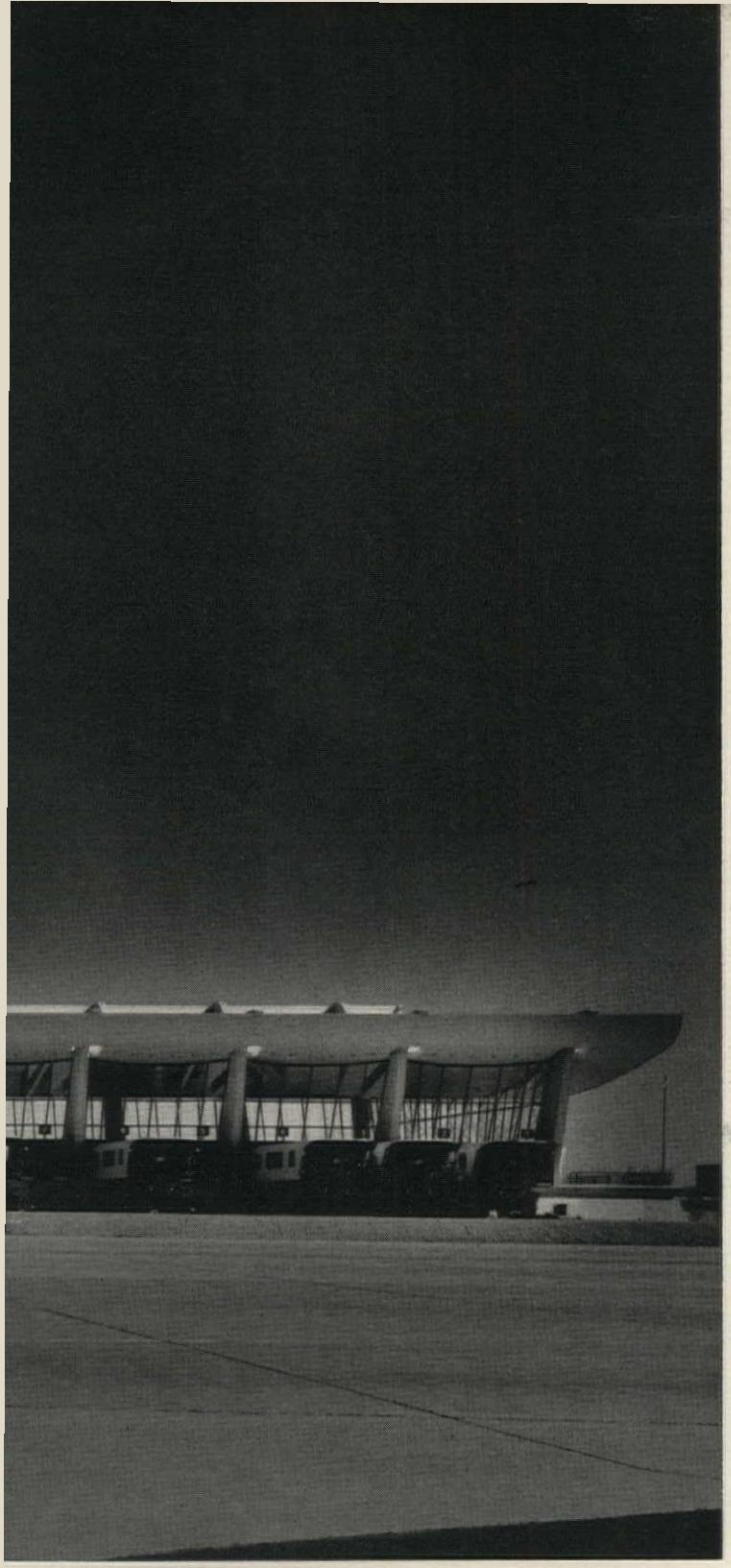


SAARINEN:

ing 'fingers' would become as nothing compared to the distances necessary in jet terminals. Another problem was the heavy cost of taxiing jets. A third consideration was the need for maximum flexibility in aircraft operations and servicing.

"We became convinced that some new method of passenger handling had to be found. The soundest system seemed to be one which brought the passenger to the plane rather than vice versa. Gradually, we arrived at the concept of the mobile lounge; a departure lounge on stilts and wheels—a part of the terminal that detaches itself from the building and travels to the plane.

"Further investigation convinced us the mobile lounge was a logical solution. We were aware that, like any prototype, it would be expensive and might develop 'bugs'. But we believed it sound. We think we have made a real contribution. The mobile lounge can have large application. It can be used in new terminals, and has obvious advantages for the economic, efficient expansion of existing airports.

"The airport is unique in several other ways. It is unique in being the national and international gateway to the nation's capitol. It is unique in its Federal Government ownership. It is unique in being a part of the complex of buildings that create the image of our nation's capitol. We felt the terminal should express all of this in its architectural design. Federal architecture is traditionally static, but we felt a jet airport should be nonstatic, expressing the movement and excitement of modern travel by air.

"There was also the problem of the site —a beautiful flat plain. In a way, architecture is really placing something between earth and sky. We came to the conclusion that a strong form that seemed both to rise from the plain and to hover over it would look best. The horizontal element, or roof, would be the highest element. It should be tilted forward so the building would be seen. The terminal should also have a monumental scale in this landscape and in the vastness of this huge airfield. The mobile lounge concept allowed us to make the terminal a single compact building. We started with abstract, ideal shapes for the site and went through many forms. Gradually, we arrived at the idea of a curved roof, high in

SAARINEN:

the front, lower in the middle, rising again at the back.

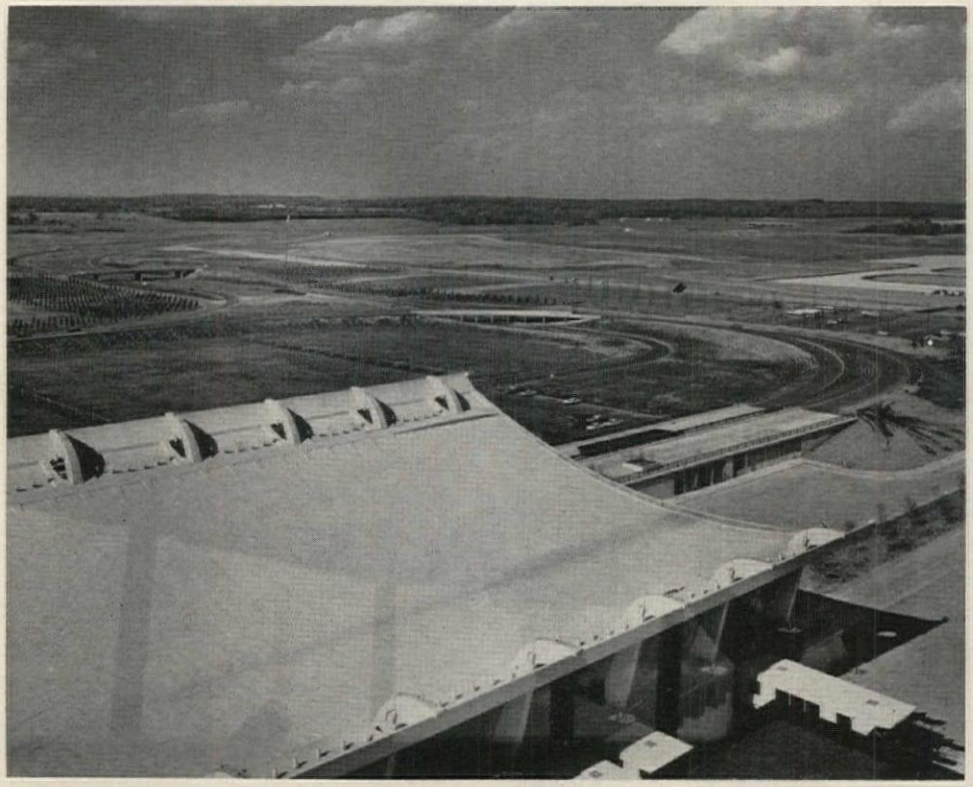
"The roof is supported by a row of columns 40 feet apart on each side of the concourse, 65 feet high on the approach side, 40 feet high on the field side. It resembles a huge, continuous hammock suspended between concrete trees. It is made of light suspension bridge cables between which concrete roof deck panels fit. The concrete piers slope outward to counteract the pull of the cables. We exaggerated this outward slope, as well as the compressive flange at the rear of the columns, in order to give the colonnade a dynamic and soaring look—in addition to its dignity.

"But how should this strong, hovering form be placed on the site? How should it look as one approached and arrived? The closer you come to some buildings, the less you see. Functionally, we had worked out approach ramps on three levels. Esthetically, these ramps could become a base. From a distance, the building would seem to rise from this base and assert itself as a hovering form between earth and sky. Approaching closer and arriving, one will see the large colonnade. The control tower (whose form was arrived at after much study) was placed at the back of the terminal, to be seen in changing relationships to the terminal.

"We saw other problems here as part of the architect's responsibility. We felt the interiors should convey the same dignified and attractive character we tried to give the architecture itself. Instead of the honky-tonk, Klondike-like chaos of the commercial space in most airports, we wanted inside and outside to be all one thing.

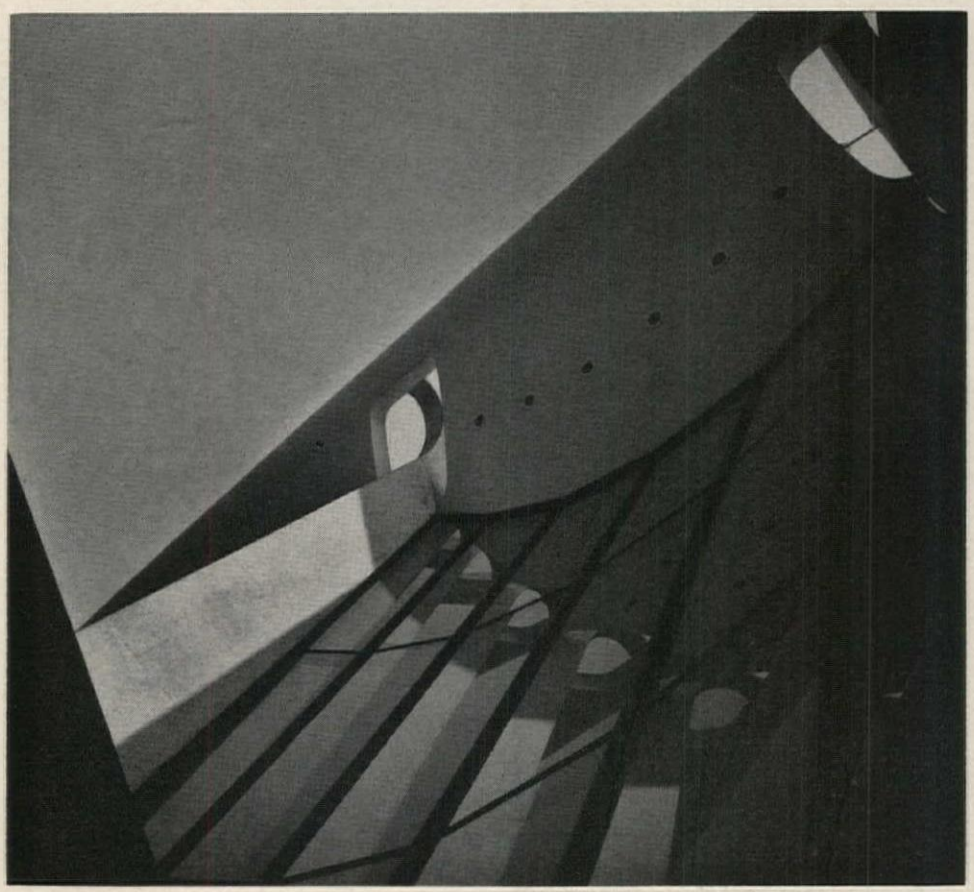
"The problem of long-term landscaping was worked out with Dan Kiley. There was the crucial problem of disciplined, long-term and imaginative zoning. The problem of some kind of continuing control in the terminal and its surroundings was of special importance. We made proposals for these things which I hope will be carried out.

"I don't think the terminal should be evaluated as just a work of art. I think we faced this job as an architect's problem in total relation to the present world. We tried to give a completely logical, imaginative, and responsible answer to that problem. I hope we have done a good job."



The airport occupies (to our best knowledge) more land than any other in the world. Its 10,000 acres are more than two times Idlewild's area. With the exception of the operating portion, all of the trees on the plot were left standing as a sound barrier, and an additional "buffer band" of seedling trees was planted on the periphery of the site.

A new, 14.7-mile expressway connects Dulles with main roads out of Washington; the 27-mile trip from downtown Washington takes about 35 minutes



Dulles International Airport Terminal Building
Chantilly, Virginia

ARCHITECTS:
Eero Saarinen and Associates

STRUCTURAL ENGINEERS:
Ammann and Whitney

MECHANICAL ENGINEERS:
Burns and McDonnell Engineering Company

AIRPORT CONSULTANT:
Charles Landrum

LANDSCAPE ARCHITECT:
Dan Kiley

CONTRACTORS:
Humphreys and Harding, Architectural and mechanical;
Corbetta Construction Company; Foundations and structure

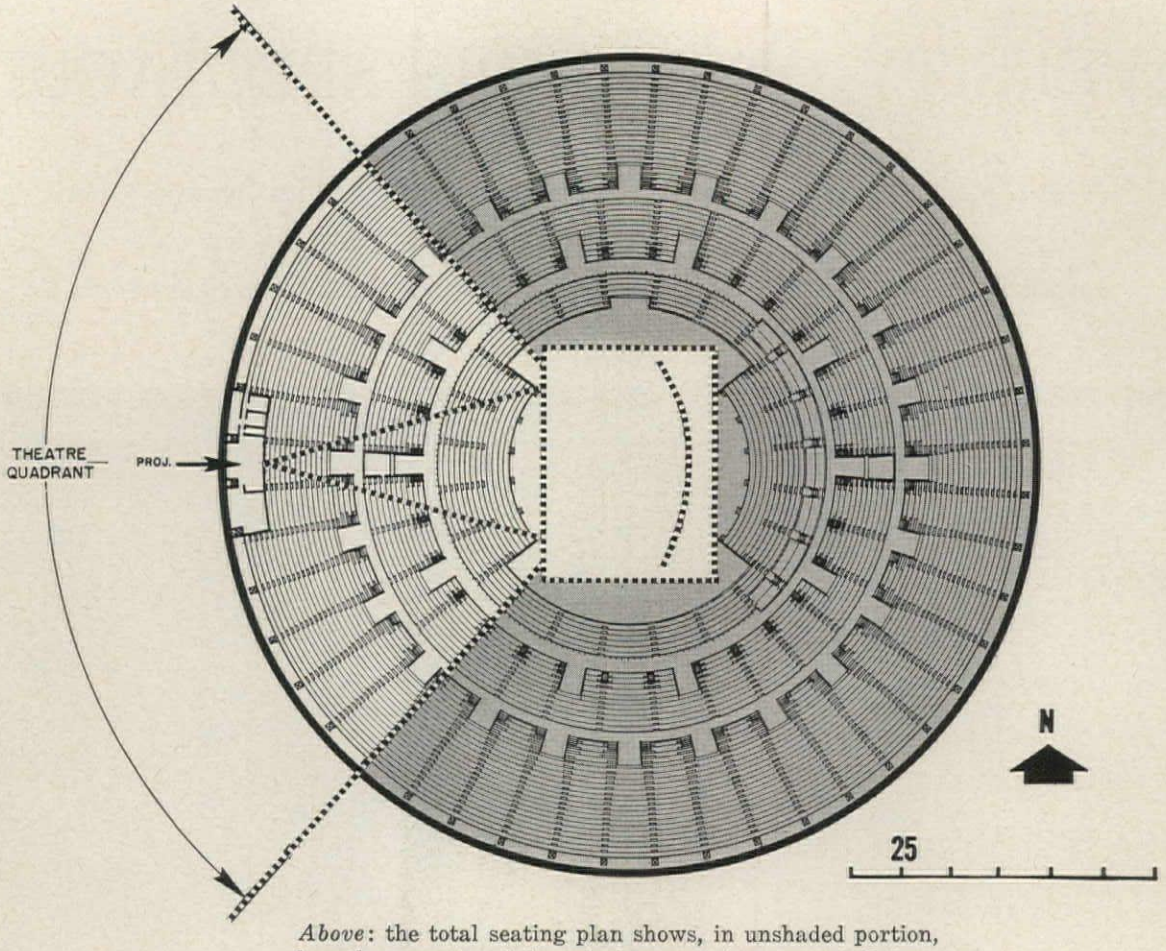
MOBILE LOUNGES:
The Chrysler Corporation, Prime contractor;
The Budd Company, bodies

UNIVERSITY OF ILLINOIS SPECTACULAR

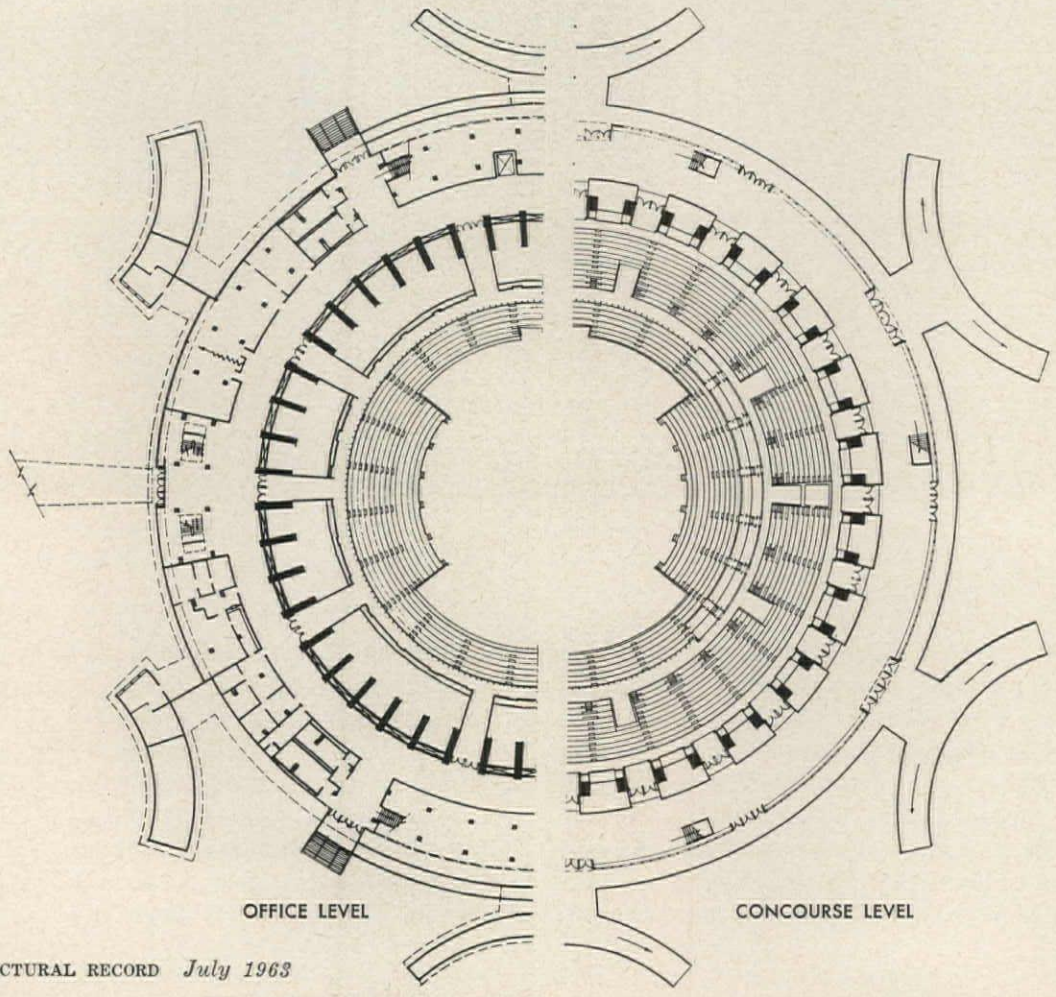
Design by architects Harrison & Abramovitz for new Illini Assembly Hall features the world's largest thin-shell concrete dome enclosing a 16,000-seat center for athletic, musical and theatrical events

© *Ezra Stoller Associates photos*

The new Assembly Hall at the University of Illinois is of more than ordinary interest for its size (15,823 seats); its structure (a 400-foot diameter concrete dome—largest in the world); its lighting (several interlocking systems designed to illuminate any kind of spectacle); its acoustics (which simulate an outdoor condition); but most significantly for its architectural concept. The hall was conceived as a giant bowl sunk halfway into the earth for easy access to the seating at the mid-point of its slope, as well as direct entrance into the glazed peripheral exposition ring and lobby-concourse. Resting on 48 radial buttresses, the bowl's outer rim is a post-tensioned compression ring which carries the thrust from the thin shell, segmented, folded plate dome. The significance of the $8.35 million building lies in the fact that its structure becomes architecture and its architecture becomes structure; it is impressive not for its embel-



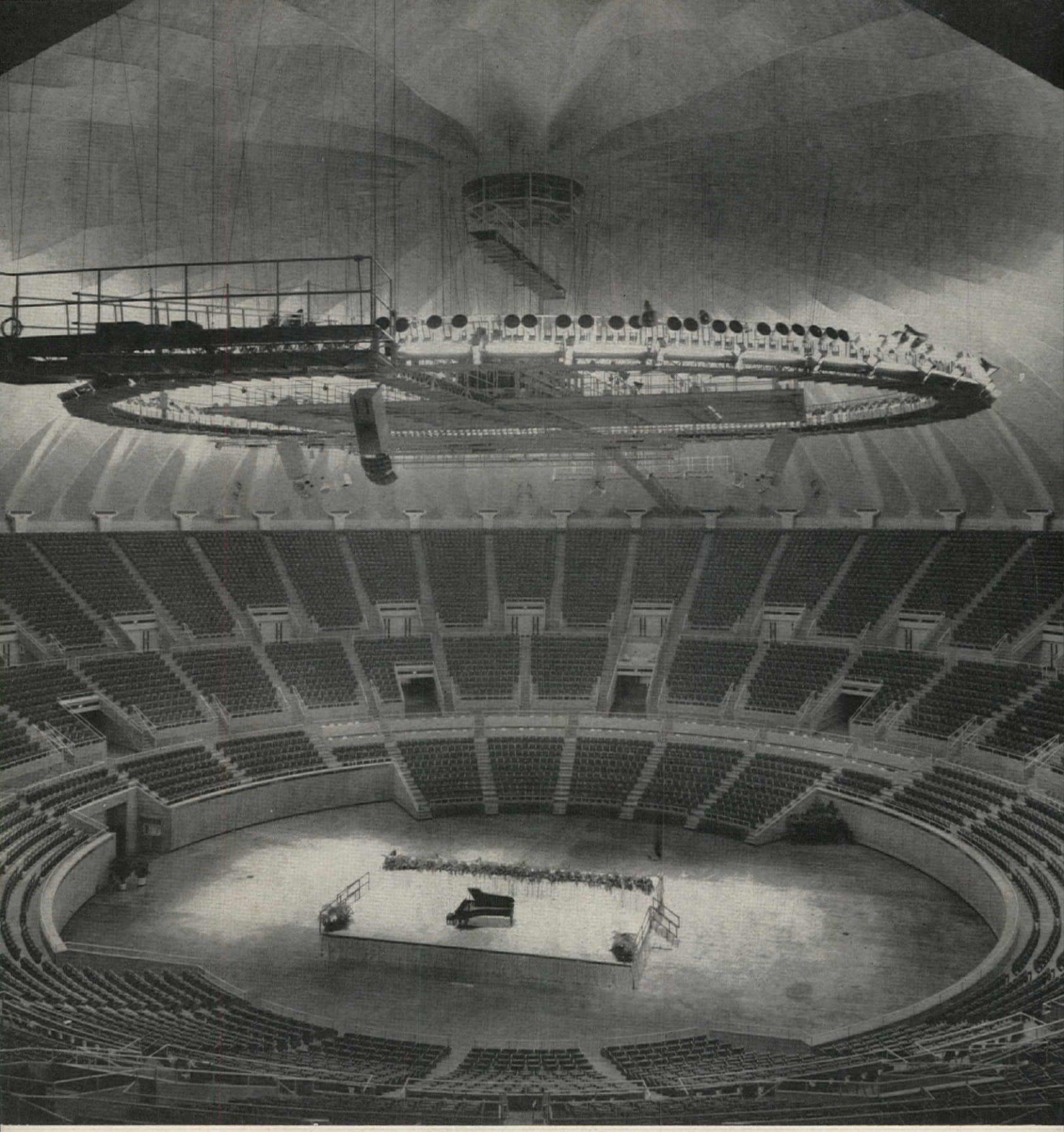
Above: the total seating plan shows, in unshaded portion, how the concert and theatrical segment is arranged. *Below*: the plan shows at left, the lower seating and office level; at right, the main entrance and peripheral concourse level



lishments but for their absence. Its effectiveness springs from refined form, appropriate scale, and the visible technology of mounting spectacles.

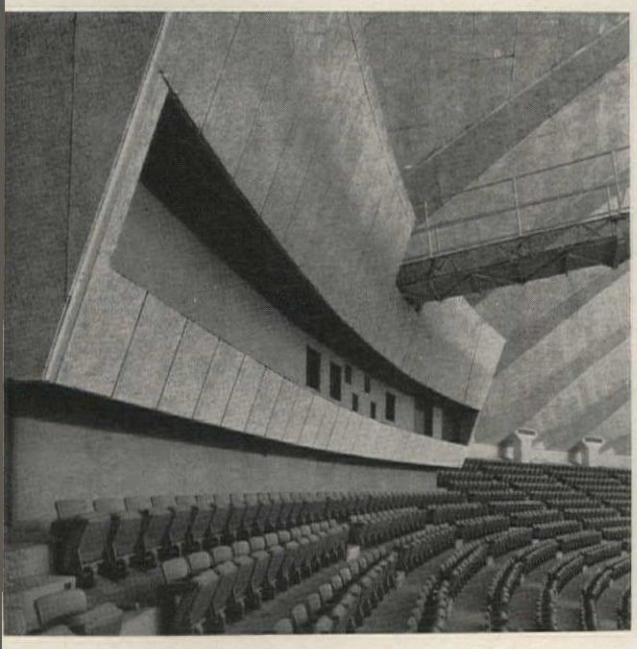
Architect Max Abramovitz explains: "I always had a dream of developing a building that would look as though you couldn't take a single thing away from it without its falling down; in which every element functions, and you can feel its vitality. If someone says, 'I don't understand why you did that,' then there is something wrong. If you feel you can understand it, then there is a statement of beauty. I want people not just to use the Assembly Hall; I want them to feel it.

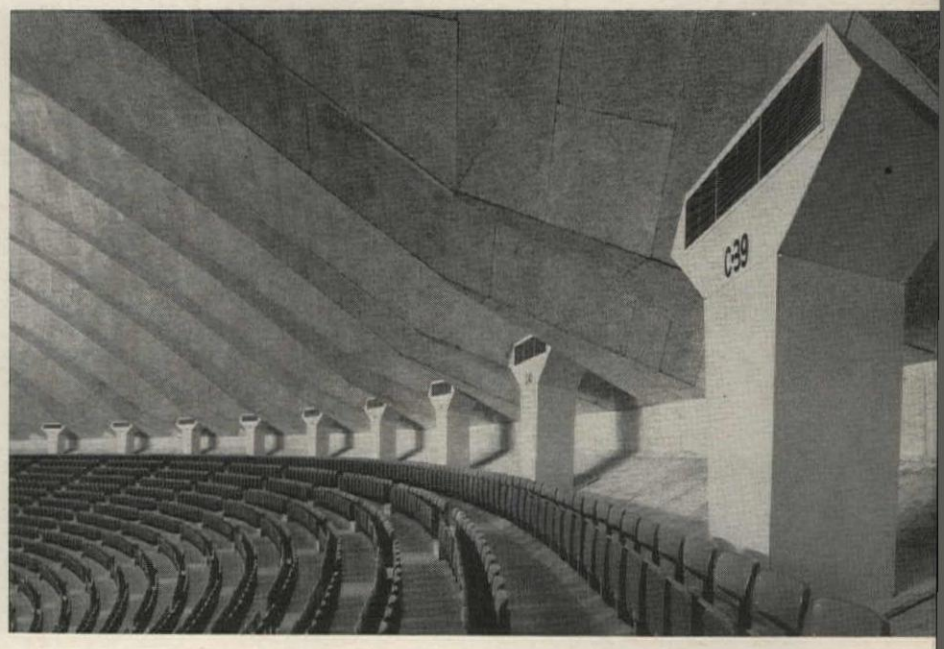
"There are many precedents for the building: the big, round shape has appeared many times; there is the openness of the Roman amphitheater; the top is like saucers tied together; the compression ring has been used in water tanks; the undulations add



strength to the dome; Nervi has developed beautiful spaces by using many pieces of precast concrete locked together. The Assembly Hall is a big, raw kind of thing all poured in place; the idea of concrete is different in this country. Here, manpower is expensive and materials cheap; the opposite is true in Europe, and their structures are light, strong and fine. They are not rich, but have come up with a new kind or richness."

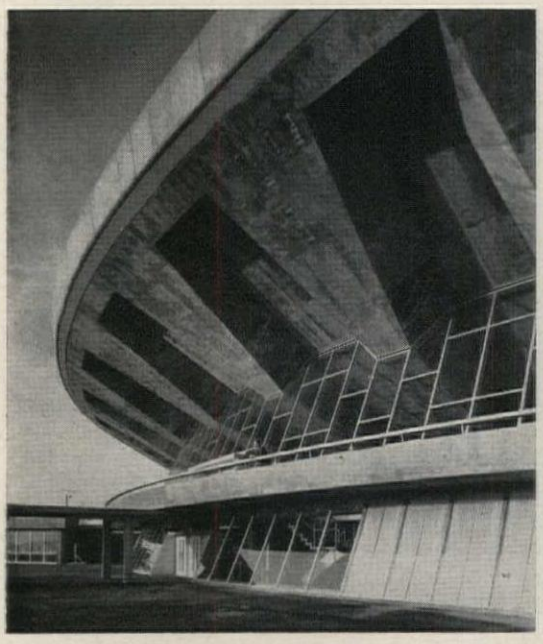
The hall will be put to many uses. It will become a center for athletic, musical and large-scale theatrical events; it can serve as convention hall, exhibition gallery or state fair headquarters; it will accommodate an ice show or a three-ring circus. Its usefulness will increase in ratio to the ingenuity of its management. The theater quadrant (see plan) will seat 4,150 and centers on a portable stage 48 by 96 by 3½ feet high, served by a permanent stage lighting

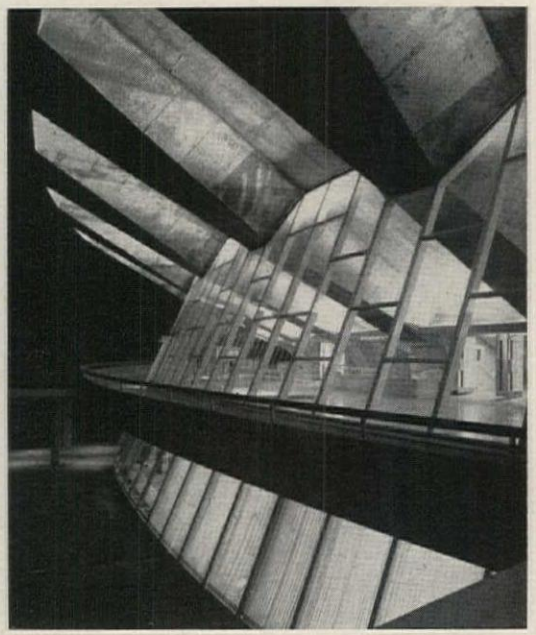


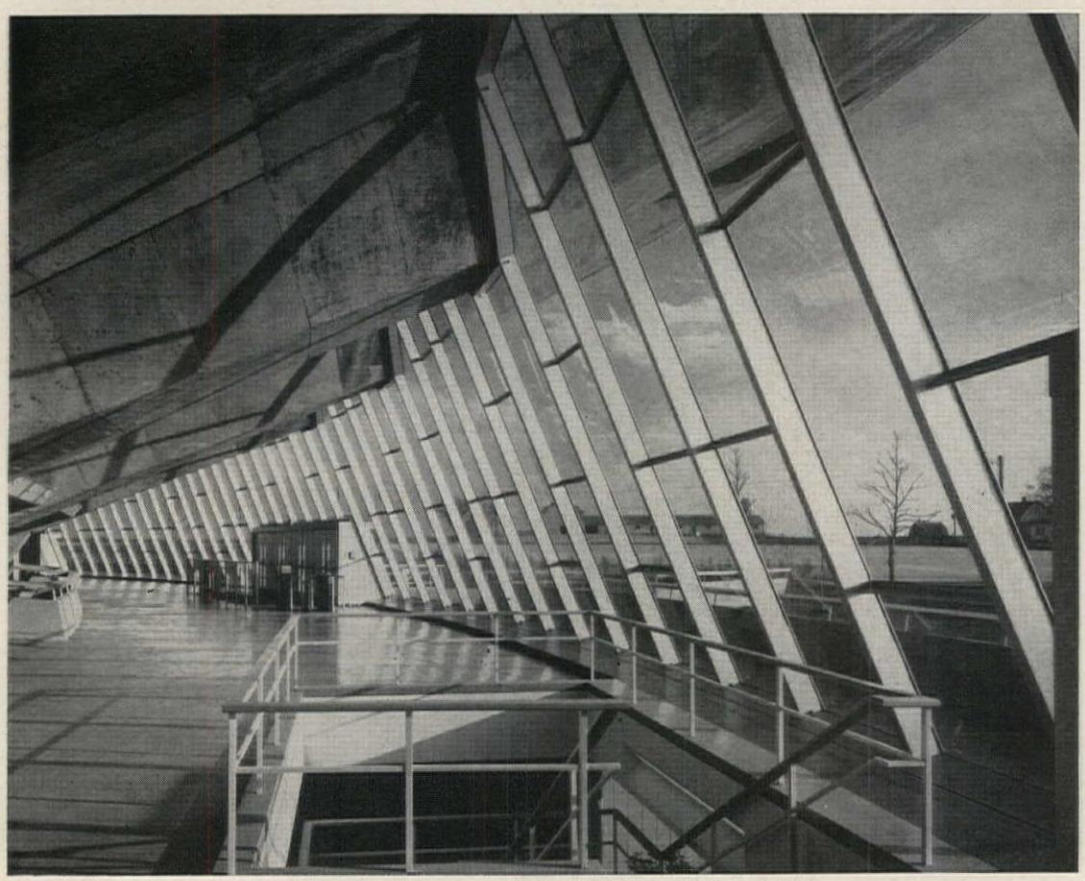


system and a gridiron with battens to fly 32 rows of masking draperies, travelers, borders, cyclorama, etc. The 50- by 94-foot gridiron—hung 85 feet above the floor—also includes lighting for other events. The suspended lighting ring—150 feet in diameter—serves to wash the dome with light for general "house" illumination, is rigged for various special kinds of lighting, is used also for TV camera stations. A movable console controls theatrical lighting.

The entire dome is lined with two inches of acoustical material—which was placed in the formwork—for sound absorption. The bottoms of the self-erecting seats are perforated and backed with acoustical material. The space thus assumes all of the acoustical qualities of the outdoors. A demountable reflecting shell will be used for symphony concerts; sound reinforcement is available for those particular theatrical and athletic events which require it.







Above are exterior and interior views of the peripheral concourse-exhibition area, which is reached by a flight of stairs from ground level. This glazed area provides 40,000 square feet of space, and extends for one-quarter of a mile around the building. The canted windows are set in extruded vinyl compression gaskets, designed to take care of expected movement in several directions

Assembly Hall, University of Illinois, Urbana, Illinois

ARCHITECTS: *Harrison & Abramovitz*

UNIVERSITY ARCHITECT: *Ernest L. Stouffer*

STRUCTURAL ENGINEERS: *Ammann & Whitney*

MECHANICAL AND ELECTRICAL ENGINEERS: *Syska & Hennessy*

SITE LANDSCAPING CONSULTANTS: *Clarke & Rapuano*

ACOUSTICAL CONSULTANTS: *Bolt, Beranek & Newman, Inc.*

SEATING CONSULTANT: *Ben Schlanger*

LIGHTING CONSULTANT: *Lighting by Feder*

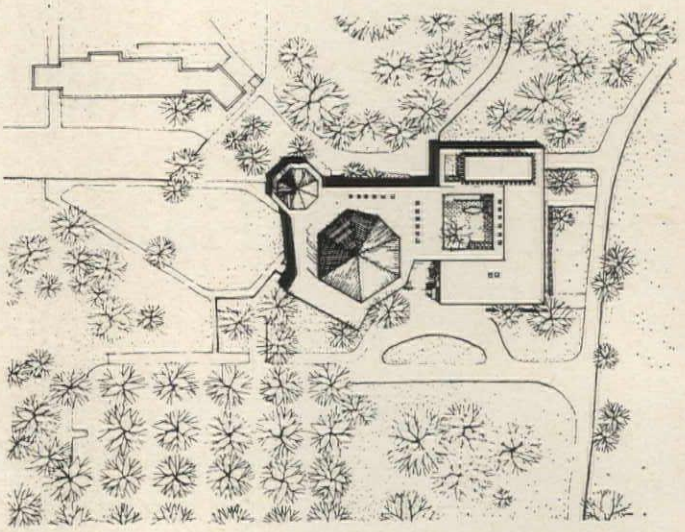
GENERAL CONTRACTOR: *Felmley-Dickerson Company*

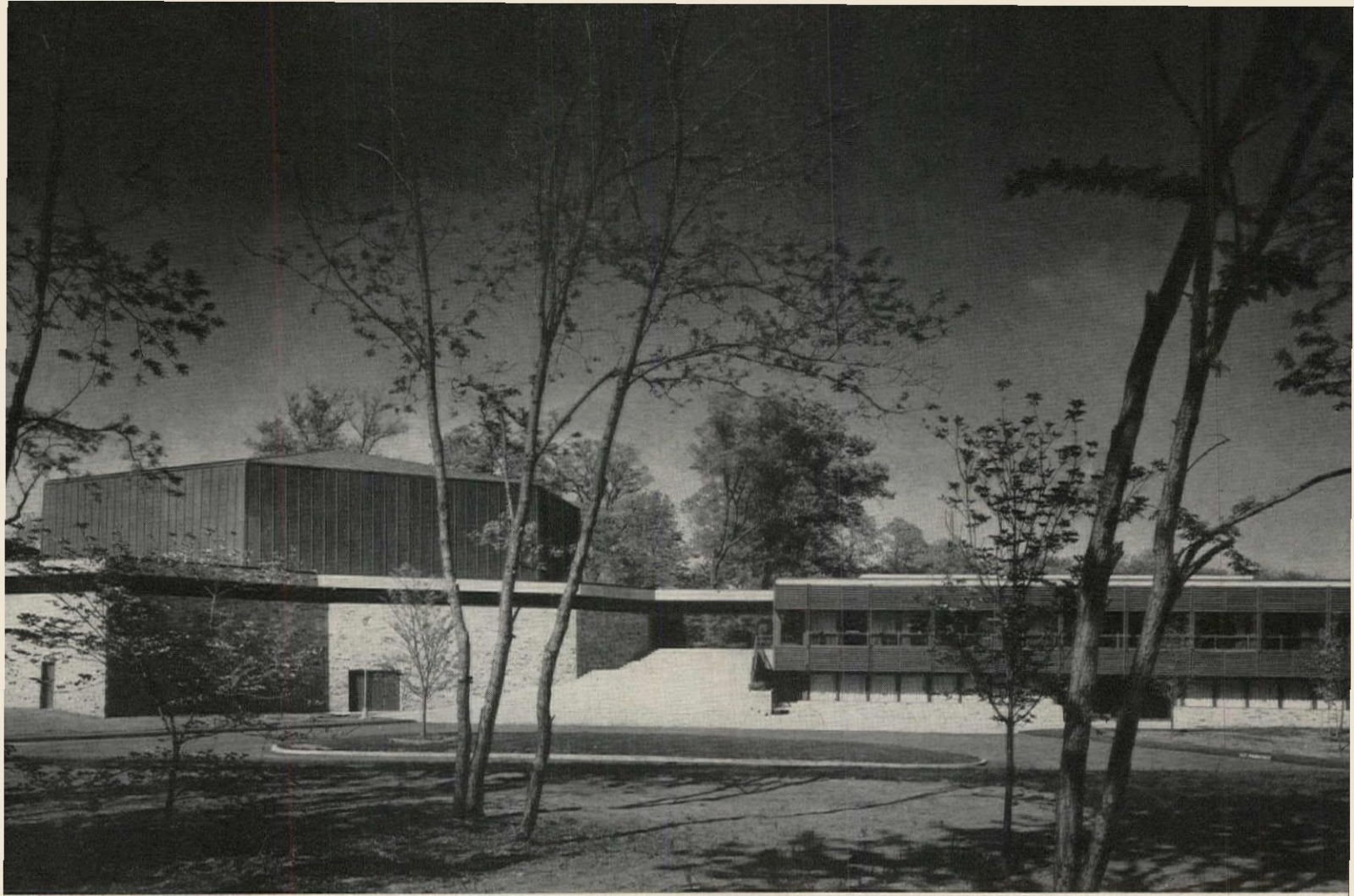
Pietro Belluschi's design for Goucher College Center was conceived within firm guidelines drawn a generation ago. In their preliminary report, prepared in 1958 on the then 20-year-old master plan for Goucher College, landscape architects Sasaki, Walker & Associates re-examined the original competition winning campus plan designed in 1938 by Moore and Hutchins, to evaluate the progress and changes made in its execution up to that point and to formulate guiding policies for the future growth of the college. The original master plan had been conceived in response to the major directives of the competition program: that "emphasis should be on the informal rather than the institutional or monumental . . . while achieving beauty in the structure and arrangement and preserving the natural loveliness of the landscape."

A college center had been part of the original Moore and Hutchins campus scheme and the 1958 revision preserved it in basic concept as well as in its position on the site. Sasaki and Walker stated approvingly: "The entrance approach to the campus area in all of the early studies of the Moore and Hutchins plan was from the southerly direction, up from the lowlands. The arrival point was at the college center. The location . . . is a strategic one. It is related to the entrance approach road in such a manner that symbolically and functionally it becomes the fulcrum of the existing campus as well as of the campus in its ultimate expansion stage." Their report then cautioned: "While the location of the site for the proposed college center is the correct one, the actual design and grouping of the buildings, which will compose the complex, must be carefully done. The existence of several very handsome trees, including Goucher Oak, plus the difference in elevation of some 20 to 30 feet between the site and the academic grouping call for extreme skill in the final solution. Moreover, since the college center is to be the *symbolic focal point as well as the gateway to the upper campus* (italics ours), it will be incumbent upon the designer to give a great deal of consideration to the physical layout and the design expression of the center." Note the stairs in the photograph and the plan opposite leading to the covered passage which opens to the northeast upon the green lawns of the academic area built along the spine of the hill.

The original campus plan called for a basic architectural character and use of materials particularly congenial to Belluschi and his colleagues who were to finally design the college center. In their written analysis of the problem, Moore and Hutchins suggested local rubble stone for the exterior walls of the campus buildings, with cornices and simple trim of wood or cut stone. Their suggested designs avoided extravagant materials, excessive heights or spans, or more than minimum grading since the buildings were designed to fit the contours.

ASSOCIATED ARCHITECTS: *Pietro Belluschi and Rogers, Taliaferro, Kostritsky, Lamb; Charles E. Lamb, project architect; Thomas F. Graves, associate*
STRUCTURAL ENGINEERS: *Van Rensselaer P. Saxe*
MECHANICAL ENGINEERS: *Henry Adams, Inc.*
LANDSCAPE ARCHITECTS: *Sasaki, Walker and Associates*
STAGE CONSULTANT: *George Izenour*
ACOUSTICAL CONSULTANTS: *Bolt, Beranek & Newman, Inc.*
GENERAL CONTRACTOR: *William T. Lyons Company*
MECHANICAL CONTRACTOR: *Custom Mechanical, Inc.*
ELECTRICAL CONTRACTOR: *Crown Electric Company*





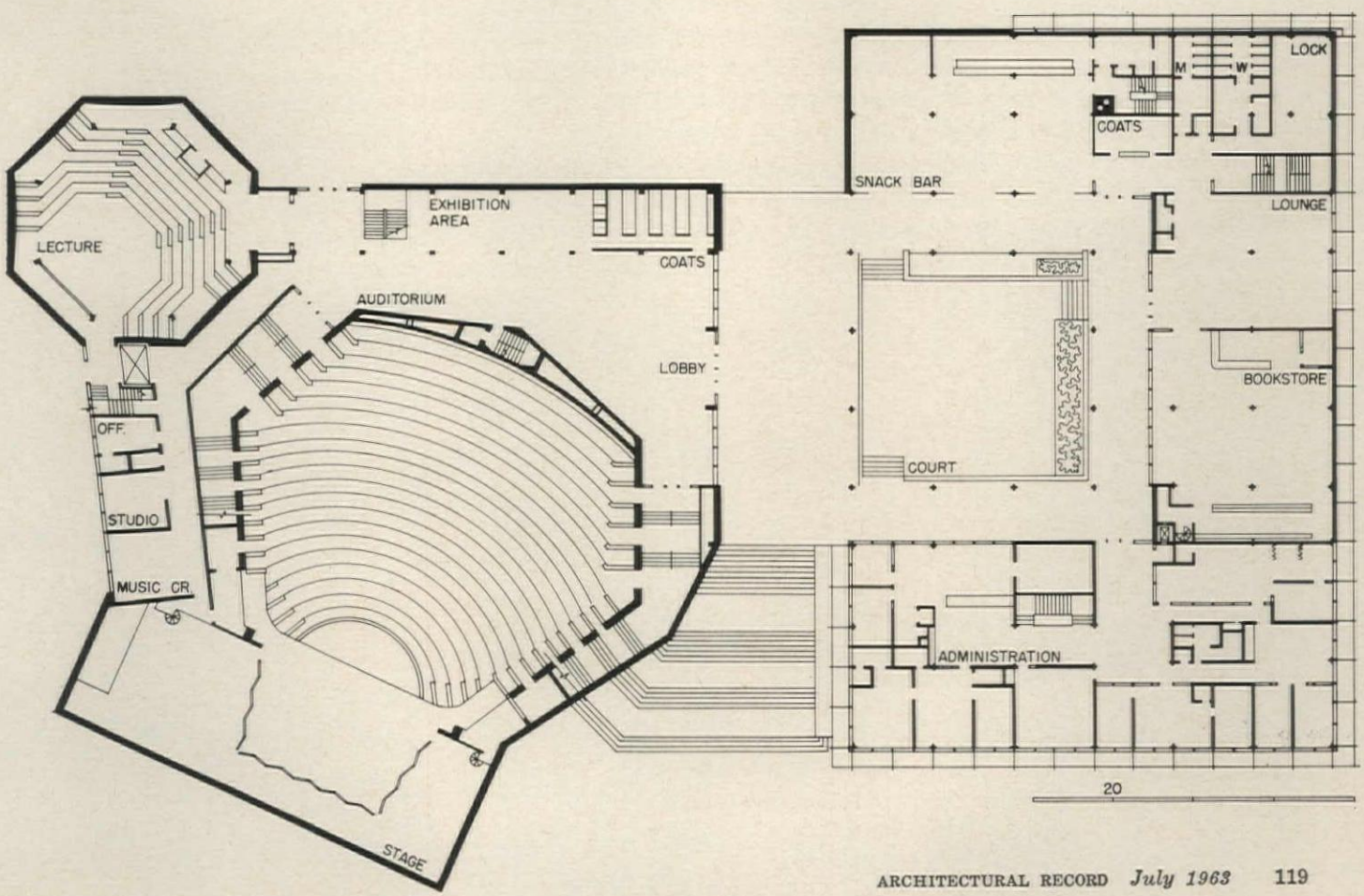
Center as it appears from campus entrance drive

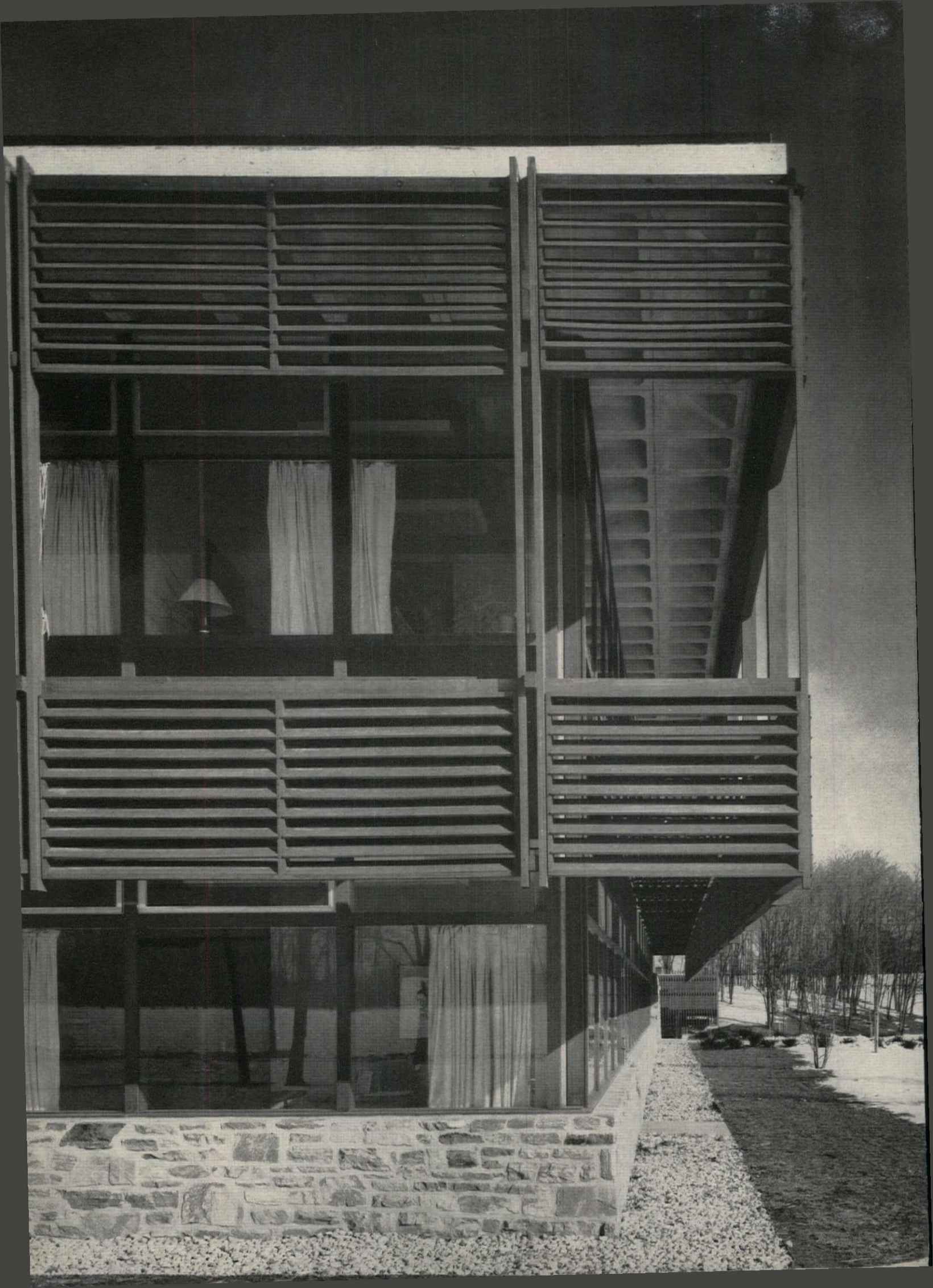
Joseph W. Molitor photos

Broad Stairs, Stone Walls and Courtyard Form Handsome Gateway to Rural Campus

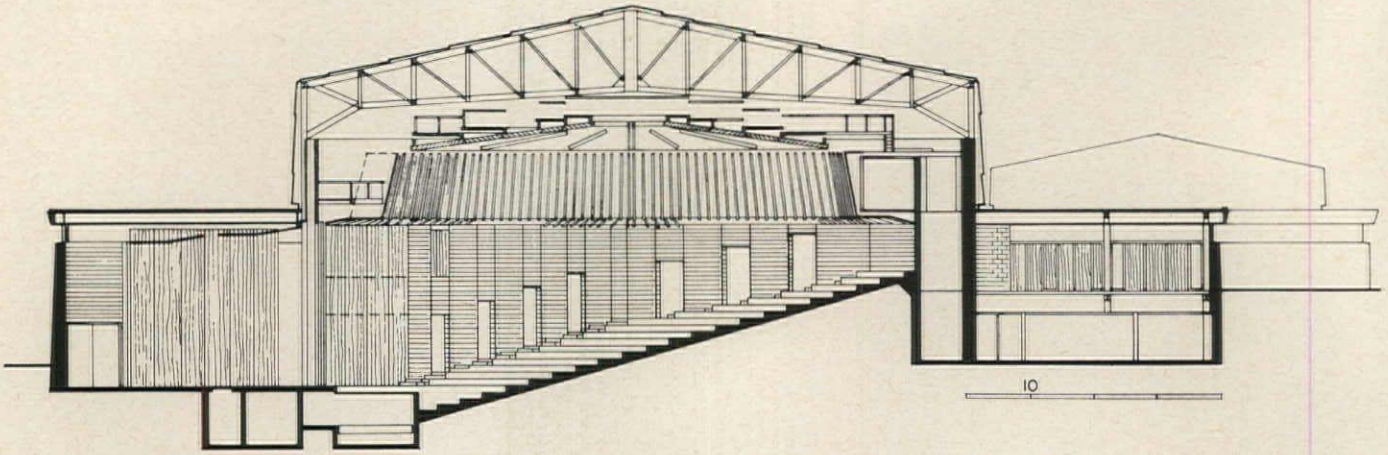
Goucher College Center, designed by Pietro Belluschi, ingeniously accommodates a sloping site providing a successful transition between levels for a campus with an uphill approach

Stairway to upper campus. Courtyard to right at top of the stairs





Left: structure is reinforced concrete used in combination with local stone. Redwood sunscreens are used on the northeast, southeast and southwest faces. *Right:* courtyard looking toward snack bar. Open passage is link from staircase to upper campus beyond

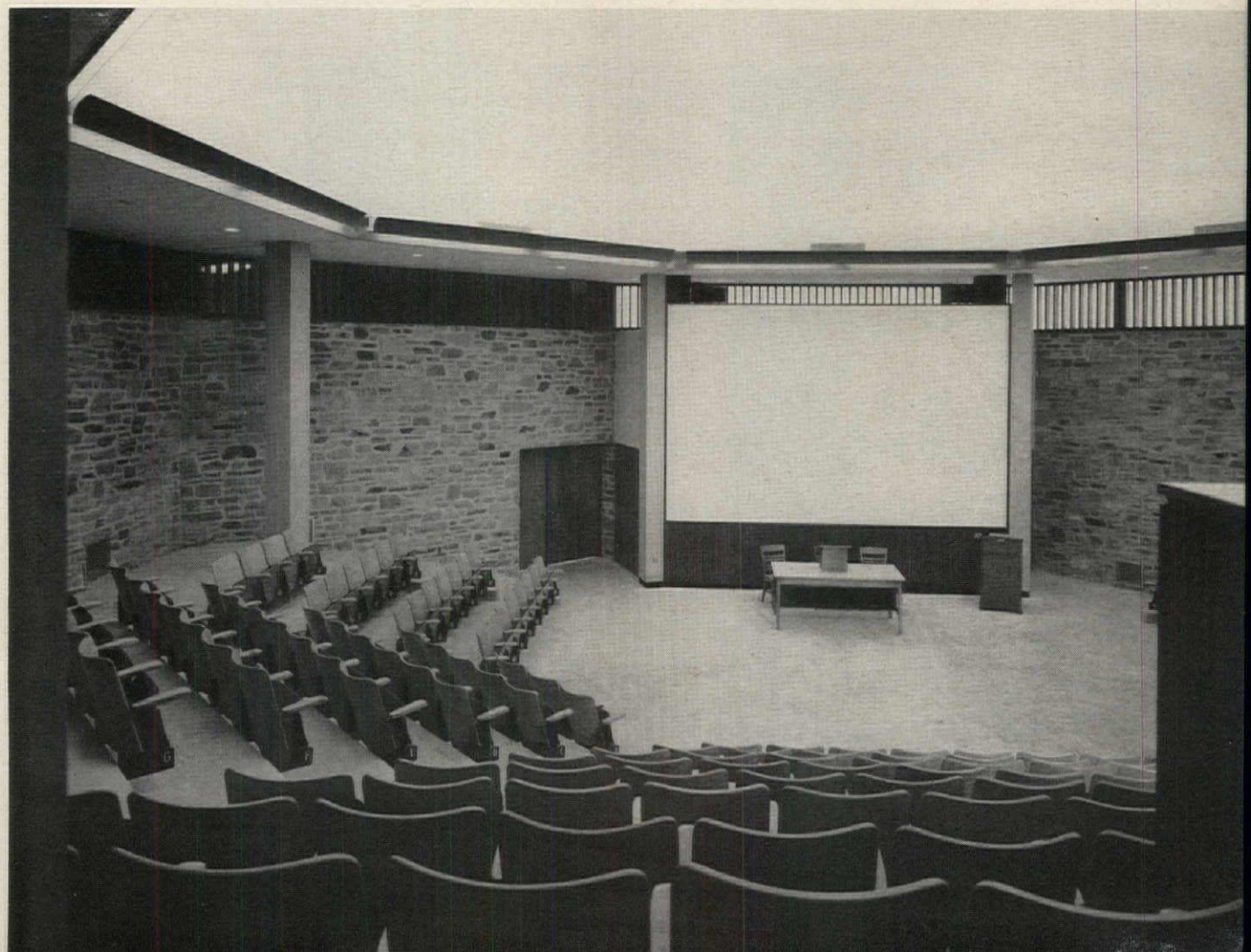


Section through auditorium

View from upper campus. Octagonal lecture hall in foreground. Roofs of both auditorium and lecture hall are covered with copper. Flat roof encloses auditorium lobby and exhibition area

Auditorium interior

Lecture hall interior



Auditorium lobby exhibition area

Snack bar

A CONTROL SYSTEM FOR ARCHITECTS' OFFICE COSTS

By Gustave R. Keane

The increasing complexities of the modern architect's practice, in which he deals with an ever larger number of special consultants and has large financial obligations to them, make it more important than ever before that he realize a fair profit to cover inevitable contingencies and assure his continuing practice. As recent court cases only too well attest, he is also exposed to considerable financial risks involving the owner, contractors, his bonding company and the general public.

It is a well-known fact that architects, even more than other professional men, find it distasteful to think about profit, let alone talk about it. This is probably a result of our hopefully desired historical image of the architect as an artist-public servant whose total goal in life is to beautify the world and improve humanity's lot.

However onerous or distasteful financial preoccupations may be to the architect as an artist, he must nevertheless operate profitably if he expects to practice his art at all without recourse to independent funds. Further, he must realize sufficient profit from his more successful operations to accumulate contingency funds against the seemingly inevitable occurrence of less successful operations. To do that, he must know where he stands financially at all times on every project.

Two prime conditions must be met in order to operate profitably: (1) the total fee obviously must be sufficient to cover all expenses and leave some profit; and (2) the total expenses either must be known before the fee is established or, as more frequently happens, they must be held within calculated allowances for the various operations comprising their total. It is this last proviso that requires careful attention during all phases of the project.

The solution outlined here lies in a simple cost reporting system which keeps the principal and the project manager *continually* informed on the financial status of each of their assigned projects. This continual awareness of the dollar balance serves not only as an internal guide to scheduling and other operations but is helpful in arriving at decisions on furnishing additional services beyond the scope of the contract (overtime for sudden crash programs, decorating, furnishings, rental plans, major design changes after approval of plans, etc.). It allows project managers and administrators of the firm to spot potential trouble while there is still time to do something about it.

GUSTAVE R. KEANE is associate and production administrator in the firm of Eggers and Higgins, Architects, New York, N.Y.

Project Cost Analysis

Project costs fall into three main categories:

1. Precommitted expenses (engineering and other consultants, model, travel, blueprints, etc.)
2. Variable costs (direct salaries paid on the specific project)
3. Fixed costs or overhead (rent, heat, power, depreciation, administrative personnel, clerical personnel, promotion and nonproductive client accommodation, principal's time not chargeable to a specific project, vacation and sick pay, insurance premiums, etc.). These can and should be expressed as a percentage of direct salaries.

This breakdown points up the fact that the important and, in fact, *only* key to effective cost control on a project during its progress lies in the control of direct salary costs based on frequent checks. Since salaries make up by far the major portion of an architect's controllable costs, it is this area in which attention will produce maximum results.

Units of budget measurement should be dollars rather than working hours (as some architects have unsuccessfully tried). A working hour budget would have to take different hourly rates into account. Since we are interested in checking deficiencies or excesses of dollars rather than working hours, it is much simpler to establish the budget in dollars and leave rate conversions to the accounting department where they belong.

The system illustrated here consists essentially of two separate sheets. The first, entitled "Fee Breakdown," is confidential and is prepared by the production administrator. It is issued to the partner in charge, to the business administrator and to the comptroller at the start of a project. If the basis of the fee changes considerably (as sometimes occurs after the award of the construction contract), it is revised and re-issued.

Sheet 1 starts out by computing the total fee as a percent of total construction costs and deducting from it allocations for profit and all committed expenses (Items 1 through 6 in the illustration). The balance (Item 8) represents allowable salaries and overhead. After extracting overhead (Item 9) as a percent of direct labor costs based on the firm's ex-

Date: 4-1-62

CONFIDENTIAL

Project No: 1216
Project Name: XYZ HIGH SCHOOL

(This sheet is to be retained by the principal for the duration of the project)

Principal: RMJ
Date Contract Signed: 3-1-62

FEE BREAKDOWN

1.	Total estimated construction costs	$ 2,100,000	
1a.	Total amount of construction contracts	$	
2.	Total fee; 6 % of (1)		$ 126,000
3.	Profit and contingency; 20 % of fee		$ 25,200
4.	Total left for disbursement		$ 100,800
5.	Consultants:		
	Structural engineers ½ % of (1)	$ 10,500	
	Mechanical & Electrical engineers 1½ % of (1)	$ 31,500	
	Landscaping	$ 4,500	
	Acoustical	$ 500	
	Estimating	$ 2,400	
		$ 49,400	
6.	Miscellaneous expenses		
	Rendering	$ BY STAFF	
	Model	$ —	
	Travel & Entertaining	$ 900	
	Specs., typing and printing	$ 1,000	
	Blueprinting & Miscellaneous	$ 500	
		$ 2,400	
7.	Total of (5) + (6)		$ 51,800
8.	Allowable combined labor & overhead costs; (4) less (7)		$ 49,000
9.	Overhead, 75 % of labor costs		$ 21,000
10.	Total allowable salary budget		$ 28,000

Salary Budget Breakdown

1.	Prelim. Dwg. Phase: 15 % of Total	$ 4,200
2.	Working Dwg. Phase: 60 % of Total	$ 16,800
3.	Construction Phase: 25 % of Total	$ 7,000
	Total 100%	$ 28,000

MONTHLY SALARY BUDGET STATEMENT

	I Total Budgeted Salaries	II Total Salaries Spent to Date	III % of Budget Spent	IV % of work Completed; Per Production		Remarks
Date: Pay Period ending 12-31-62						
1. Prelim. Dwg. Phase	$ 4,200	$ 3,800.50	91%	100%	12-31-62	
2. Wkg. Dwg. Phase	16,800	17,955.00	107	100		
Total of (1) + (2)	21,000	21,753.50	104	100		
3. Construction Phase	7,000	2,401.20	35	41		
Total of (1) + (2) + (3)	28,000					
Date: Pay Period ending						
1. Prelim. Dwg. Phase						
2. Wkg. Dwg. Phase						
Total of (1) + (2)						

SHEET 1 (*left*), Confidential Fee Breakdown. Two points of clarification: (1) the notation, rendering "by staff," means simply that its cost in this instance is direct labor rather than a commissioned expense; (2) seeming illogic at Items 9 and 10, where a fraction of an unknown difference appears to be required, means simply that Item 9 is computed as 3/7 of Item 8 for the illustrative example.

SHEET 2 (*lower left*), Monthly Salary Budget Statement has space for six similar pay period entries so that project progress can be followed. It carries a notation of project number, name, principal in charge and project manager. Sheet 2 might be accompanied by the note:

This budget statement shows:

1. That the project was under the budget by 9 per cent at the end of the preliminary phase
2. That it over-ran the budget by 7 per cent at the end of the working drawing phase
3. That when first two phases are combined, it still was 4 per cent over the budget at end of the working drawing phase
4. That it is running below the budget in the current phase
5. The exact financial status at this moment can be determined as follows:

ALLOWABLE BUDGET:

41 per cent of $7,000 — $ 2,870 (current phase 3)
21,000 (completed phases)
Total allowable to date $23,870

SALARIES ACTUALLY SPENT:

$21,755.50 spent to date on phases 1 & 2
2,401.20 spent to date on phase 3
$24,156.70 spent to date

PERCENTAGE SPENT:

$$\frac{24,156.70}{23,870.00} = 101.2 \text{ per cent}$$

6. The precise dollar amount of encroachment into the target profit is:

Total salaries spent to date:	$24,156.70
Total salary budget to date:	23,870.00
Deficiency	276.70
Add 75 per cent overhead	207.52
Total deficiency	$484.22

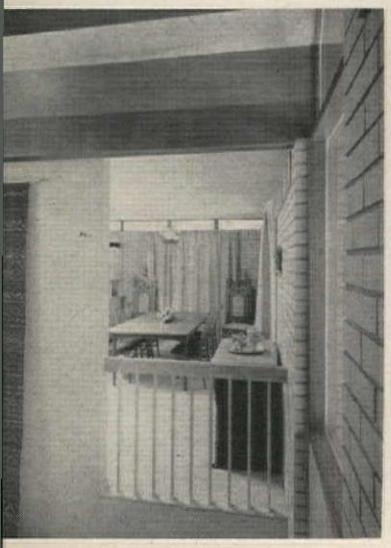
perience, we are left with net allowable salaries (Item 10). These are further broken down into the three phases of the project: preliminary drawings, working drawings and construction. Note that percentages shown in the example illustrated (as profit, consultants fees, and salary percentage breakdown) are chosen as representative of averages in the profession and do not necessarily reflect Eggers and Higgins practice.

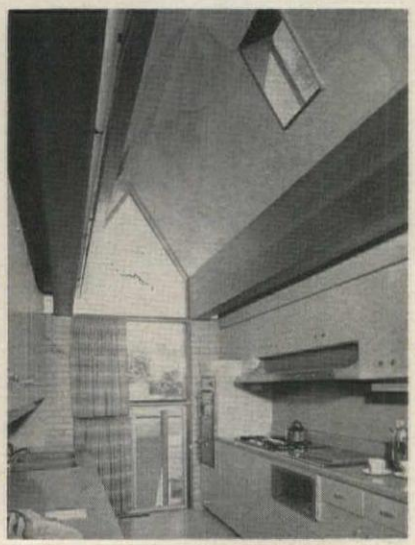
The second sheet is issued monthly by the bookkeeping department. One copy each is issued to the partner in charge, the project manager, the production administrator and the business administrator. Distribution is, of course, adaptable to the particular organization of any firm, and duplicates can be issued to selected firm members for initialing and return to bookkeeping. (Organization of the office of Eggers and Higgins is outlined in ARCHITECTURAL RECORD, April 1960.) Sheet 2 shows the budgeted salaries for the various phases of the work, the salaries actually spent, and a comparison of percentages of budget spent and work completed. Understanding of the system and implications of the sample illustrated are made clear by the caption.

C.N. Dean Paris photos

A GABLED HOUSE FOR A SMALL CITY LOT

James Stageberg provides a one and a half story, raised basement scheme that is compatible with the scale and designs of an existing neighborhood

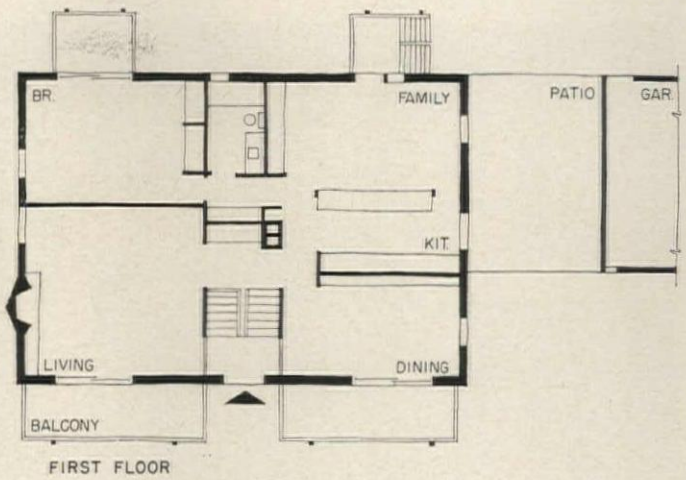




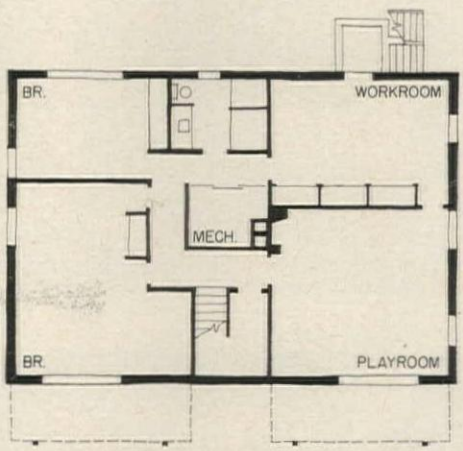
Residence for Mr. and Mrs. Peter Warhol
Minneapolis, Minnesota
ARCHITECT: *James Edgar Stageberg*
STRUCTURAL ENGINEERS: *Meyer & Borgman*
CONTRACTOR: *Joe Peterson Construction Co.*

Some interesting and mildly deceptive effects with scale were created in this design to make it more compatible with the generally low-lying houses in the neighborhood. The site is a rather small city corner lot, and the program called for suitable spaces for outdoor living and two distinct divisions of the plan: a basically one-level house for the parents, and a separate bedroom and playroom suite for a college-age child still living at home. With the little land area available, a two-level scheme became a necessity. The question of low scale was solved by setting the house into the ground, so that the lower level is a sort of half-basement, and the entry is set at mid-level between the two floors. The house is thus 1½ stories high, which scales out with the neighborhood. The waist-high windows of the lower level are operable sash, matched by similar units forming the bottom half of the windows of the top floor.

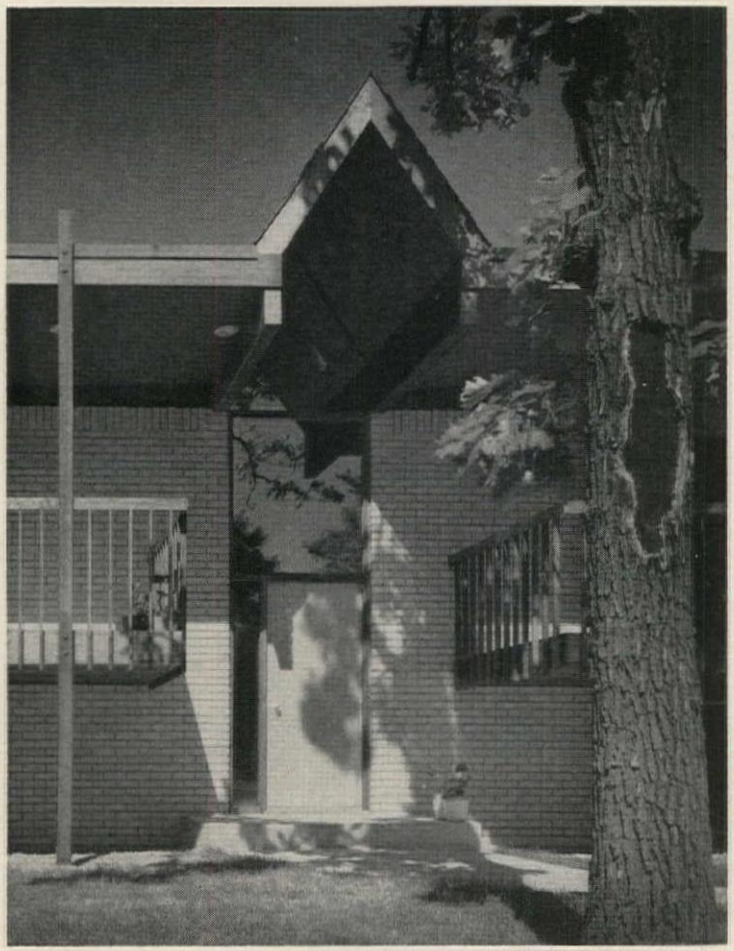
To further relate the house to the pitched roofed designs of the area, two little gables criss-cross over the middle of the house. Besides being glazed at the ends, the gables have 12 skylights and indirect lighting, adding considerable brightness to the entry, living room, kitchen and master bedroom. The gables are surfaced with birch plywood on the insides. Around the periphery of the house, glass panels are set between the roof beams and the tops of the exterior walls to add daylight and a sense of lightness to the structure—an effect further heightened by treating brickwork as "panels."

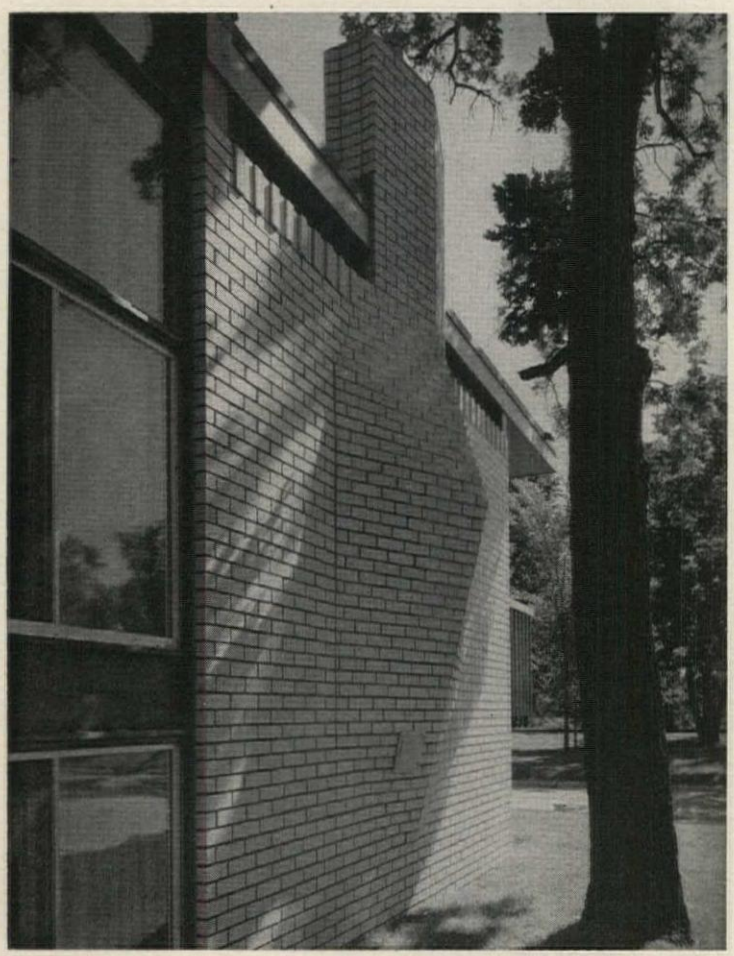


FIRST FLOOR



GROUND FLOOR 5





The detailing of the Warhol house was very carefully done, and worth noting. This is especially true of the brickwork. As was noted previously, the brick walls are treated as panels, separated by vertical fenestration strips. They are cavity-wall construction, exposed inside and out, and topped by a dentil-like vertical course of bricks. As can be seen in the photo (*lower left*), the fireplace and chimney were designed in a somewhat unorthodox fashion.

The interiors are finished in plywood and plaster, with floors surfaced by carpet in the living areas, vinyl in the kitchen, ceramic tile in the baths and vinyl asbestos in the playroom

Eloquent Simplicity in Architecture

By Pietro Belluschi
Dean of the school of Architecture and Planning
Massachusetts Institute of Technology

As I grow older I tend to feel less secure in my powers and more than ever awed by the complexities of architecture as an art of our time.

As I look, listen and read about the subject, I am rather discouraged by the shallowness of all slogans, by the polished pretenses of historians, but more by the elusiveness of the creative act. Were I to be completely honest, I would simply say to you that I do not know how good design is produced and that the creative act is an agony which cannot be shared.

But, like all architects, I am easily flattered—particularly by the recognition of my preference for those simple qualities which are the basis of all enduring architecture. As you may know, I was asked to make a case for "Simplicity in Church Design." The theme assumes that true, eloquent simplicity will enhance the central drama of worship. But simplicity which avoids dullness is a very difficult quality to achieve, and I find it now even more difficult to define. I am sure though that the simplicity we speak about is not that of the fool but rather that of the saint: the result of deep understanding and purification, or, if you will, of an act which has gone through the fires of passion and reason.

To impart this serene quality, it seems to me an architect should first acquire a certain degree of humility—not in the usual disagreeable meaning of the word, but in its original one of "being of the earth," of partaking of the eternal balance of Nature. He may also be asked that his work be an exercise in intelligent understatement, yet capable of giving an intimation of the mysteries and complexities of the inner life of the spirit.

In other and simpler words, an architect must be able to forget the superficialities which are such a part of all modern architecture, and be willing to open his heart as well as his mind to the faith which animates the religious world.

In my experience, it has become clear that the architect should go slow in imposing his own special taste, no matter how lofty, and should be willing to interpret the special moods of the client. His interpretation can then match the greatness of his vision, if his motives are pure and reflect the intensity of the collective faith of the religious community. In this context, a Unitarian minister for whom I am now designing a church in Syracuse, New York, recently spoke these words: "Our new house of worship needs to enclose us and it needs to free us; it needs to speak specifically to us and it needs to carry us beyond all words and details; it must have our ideas, the smell of our ground, and have grown out of the religion in our

Dean Belluschi gave this address at the 1963 National Conference on Church Architecture held in Seattle, Washington, in March of this year. It has been reprinted by permission from Your Church, *Jenkintown, Pennsylvania, 1963. Photographs of church interiors were selected by Belluschi to illustrate*

soul. Let our doctrines and our forms fit the soul, growing out of it, growing with it. A free people build because they have a need to glorify all their best and most precious insights, they build for remembering, for enhancing, for serving and for dreaming. A free people need to refashion their traditions in fresh new shapes and forms that they may speak vitally again."

In other words, it is the congregation's church, not the architect's church. Yet this fact should be kept in its proper perspective, because it does not mean that an architect must abdicate his duties and prerogatives, but that he must gain special insights. In any case, if he is honest, he will soon find that there are no perfect answers, only questions by earnest men; and it may well be that an earnest quest is the most important element in church design.

Having said this much, I should find myself in difficulty if I try to describe the ways and means by which eloquent simplicity can be sought. I wonder at times whether all an architect has learned in the span of his career is not more a handicap than a help in designing a church, and whether he is really capable of attaining humility or of shedding the tricks of his trade—particularly those which have helped him give the easy answers to other human problems in other fields. Yet the nonprofessional man who wished to create a place of worship and tried his hand at being humble would have no easy time either, even if his purposes were clear—the Vence Chapel by Matisse being a case in point.

In addition to a valid philosophy of restraint and integrity, a dedicated builder must have an equally dedicated client, able to appreciate and willing to accept the poetic values inherent but not always obvious in simple designs.

The general loss of the natural instincts which is typical of our society, and, as someone remarked, the knack of our technology of arranging the world so that we do not have to experience it, have rendered people less sensitive to subtle values, or rather more vulnerable to the appeal of inadequate ones. So the architect must find within himself the eloquence to explain and to convince, and such a task does not always come easy in a creative temperament which fears compromise and is impatient with the limitations of lay committees and with the general difficulty of defining art. So the burden that the creative person must bear is compounded by his own limitations, which he may or may not recognize, and by the limitations of the society in which he must operate.

The design of a house of worship, however, comes closer to being pure art, defined as an expression of the human spirit, than almost any other field of architecture, with the possible exception of monuments. In a church practical considerations are important but not paramount; what is paramount is the quality and drama of the space it contains. It is as a visual art, therefore, that church architecture more than other types mirrors a civilization and its religious climate.

Art and religion have been from time immemorial two aspects of the eternal quest to unveil or to interpret the mystery of our existence. The human condition, its fragmentation and agony, the very sense of crisis in our anxious age, are reflected in the works of our artists no less than in the words and acts of our clergy.

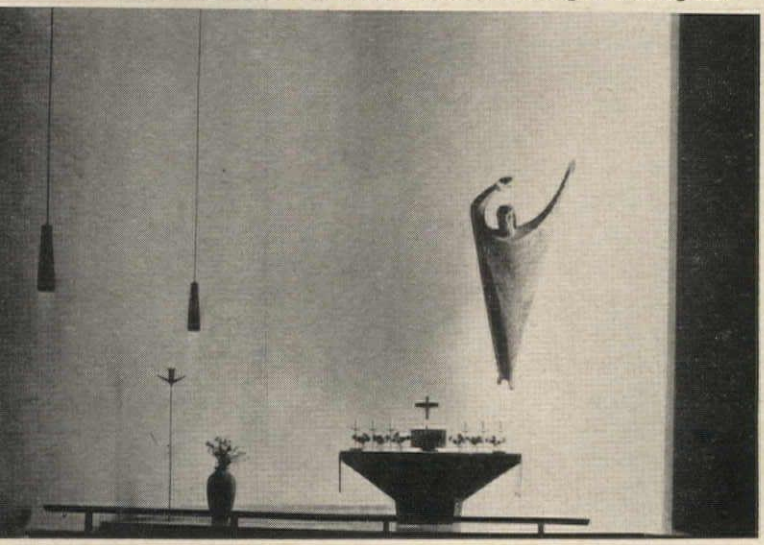
The arts in all forms have been the most eloquent means of expressing our beliefs as well as our humanity. Architecture in its long and intimate dialogue with religion has given us a whole series of unforgettable forms. All the historical styles we have known from Assyrian, Egyptian, Greek, Romanesque, Gothic, and so on, developed in great measure from a concern with how best to honor God.

Architecture can be said in fact to be mostly a catalog of symbols, born of religious beliefs, stretching in uninterrupted continuity from the very beginning of human history to fairly recent times. This continuity and the weight of the past have made it difficult for less committed generations to find expressions adequate for their purposes, yet possessing comparable intensity and nobility.

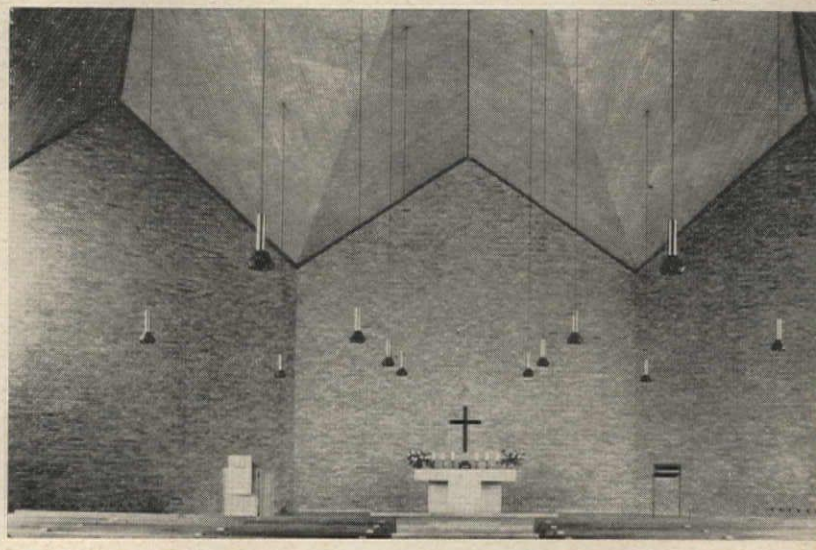
Our own modern movement began as a protest: the men responsible for its development meant to free architecture from forms which seemed to have spent themselves and become hollow. Tradition had become a collection of shells upon the beach of time, from which a noncreative society in a hurry could draw or borrow with impunity. The word beauty itself was compromised by external images of ideas long dead: the obelisk, the Egyptian religious symbol, transmuted into the Washington Monument, finally prostituted into the Minneapolis Foshay Tower; the Greek temple and its perverted image on Wall Street. It took great courage to redefine beauty as an intrinsic quality and not an embalmed image of things past; it took courage to rediscover that tradition, the word so often brandished by building committees, never meant to stand unchanged.

Tradition, in fact, was found to be change, evolu-

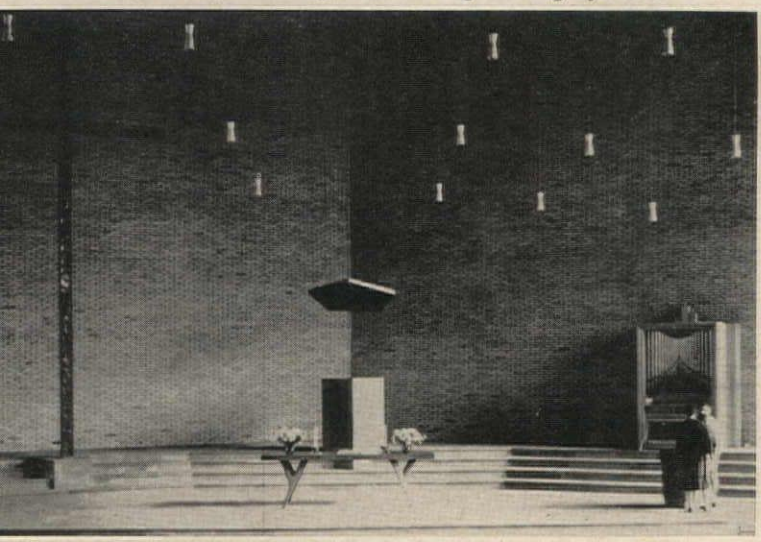
Hans Shadel, St. Joseph, Hasloch am Main, Germany
The drama of sculpture in a proper context of light and space



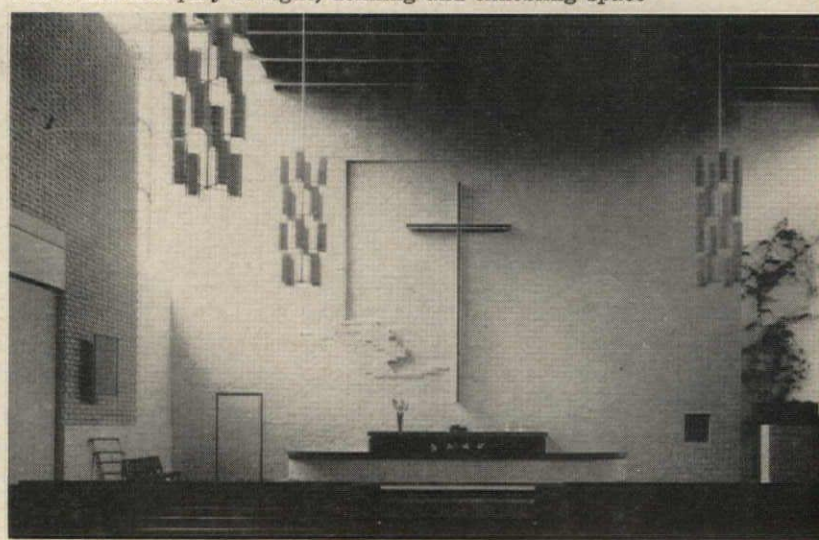
Dieter Oesterlen, Christ Church, Bochum, Germany
Shows the meaning of scale and texture in the modulating of space



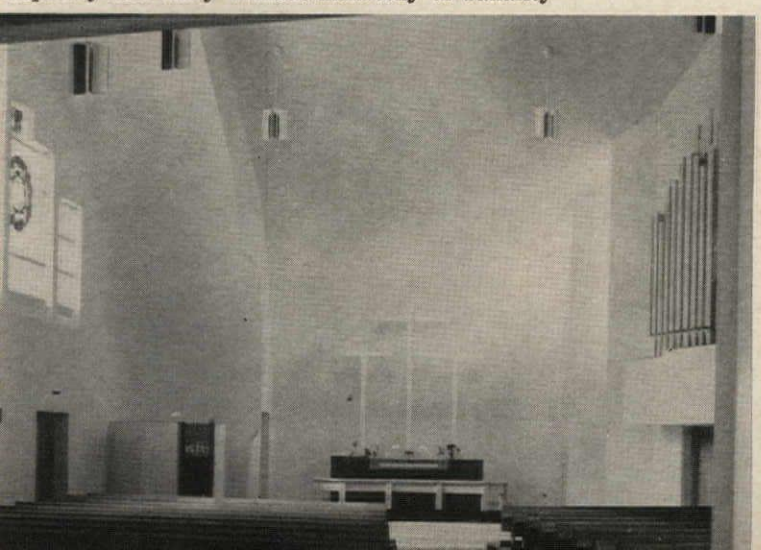
Hentrich & Petschnigg, St. Peters, Unterrath, Germany
Simple drama of objects in space becoming moving symbols



K. Strom & O. Tuomisto, Alppila Church, Helsinki, Finland
The wonderful play of light, defining and ennobling space



Alvar Aalto, Waoksenniska Church, Imatra, Finland
Simplicity and unity without monotony or banality



Hermann Baur, Bruder Klaus Church, Birsfelden, Switzerland
Light used almost like music to create a feeling of elation

tion, search. Human affairs have never been stagnant, and architecture in all great societies has had to come to terms with change. It was found that to stand still and copy, or to be awed by past symbols, was to weaken our own spiritual resources and to condemn our creative gifts to impotence—that the present, infinitely challenging, demands the utmost effort from each of us—and that opportunities for thought and action exist all around us.

It would be foolish for me to try to simplify the infinitely complicated human situation. There have been infinite visions of divine power and infinite ways of defining art—all seeking to reveal part of the mystery of life, a reason for their eternal appeal and for their continued renewal. We know that it is in the nature of man ever to probe beyond the boundaries of knowledge. He must forever find new expressions to witness his own deep concern, to forge new words or new meanings for old words, until he finds his own unique revelation of the inner harmony of the universe. However, with his right to fashion his own symbols goes the duty to develop a strong inner discipline.

It is all too easy to delude oneself into thinking of architecture as an exercise in cleverness. There is a real danger that any minor architect may claim the right to innovate without depth or reason. It is essential that our efforts be honest, that innovation be a reflection of inner longings, the result of having found what is central and lasting. Unfortunately, the ways leading to abuse have multiplied with the means placed at our disposal by technology. It is essential for an architect to discriminate and to choose until his work sings with purpose and unity. In the mass of forms and details and techniques at his disposal, he must train himself to eliminate, to refine, to integrate—a discipline which requires long and watchful efforts.

No less than religion at its best, architecture at its best is witness and custodian of the spirit of modern man. Unfortunately, architecture in our culture is so beset by practical demands that only rarely does it succeed in establishing poetic values. Poetry seeks the essence of meaning, so religious architecture must seek the essence of space from which nothing must be allowed to detract. That is why space in a church acquires supreme importance. Tillich calls it "Holy Emptiness." The architect must strive to achieve this quality of holiness. The designer need not become deeply involved in theology, yet he must understand the motives of the religious man; from such understanding he will discover the way to elicit the right emotions in response to his work.

This, unfortunately, is more easily stated than achieved. It takes great wisdom to say for sure what is permanent and what is transitory, to determine at what stage an architect acquires the right to innovate. Even a great creative mind can be troubled by doubts; yet the great mind will find the courage to stand by his work, if he deeply believes in certain principles which are a part of the common human experience. The Protestant Revolution, for instance, tended to make the church a place for men, not for mysterious rites; but this significant fact was not widely reflected in its architecture until fairly recently. Obviously, the forms of Medieval Christendom were no longer suitable, but it took dedicated men to bring the fact home. At the same time, social forces and advanced techniques were opening new fronts for lay architecture. Function and economy became bywords in a society dedicated to efficiency.

The functional idea, when invoked in church design, was found to be sterile unless it served to emphasize the central moving drama of space. This fact, in the hands of a sensitive designer, opened up infinite possibilities. Simplicity became a foil for poetic inspiration, a deliberate act of restraint, where the excellence of the details glorified the meaning of emptiness. The Medieval enrichment provided by painting, sculpture, and stained glass had already been removed from the temples, because the reformers did not believe man needed carved images in his quest for God; although even Calvin acknowledged that art could fulfill a man's deep-seated need. The modern man is finding that art does not have to describe or intercede; it may exist and flourish in a context of emptiness and silence.

Just as the idea of function has been put to creative use, so the idea of financial economy has forced the designer to seek an equivalent economy of means to define the real substance of space, gaining thereby in insight while avoiding the pomp and vulgarity which is all too often the result of ostentation.

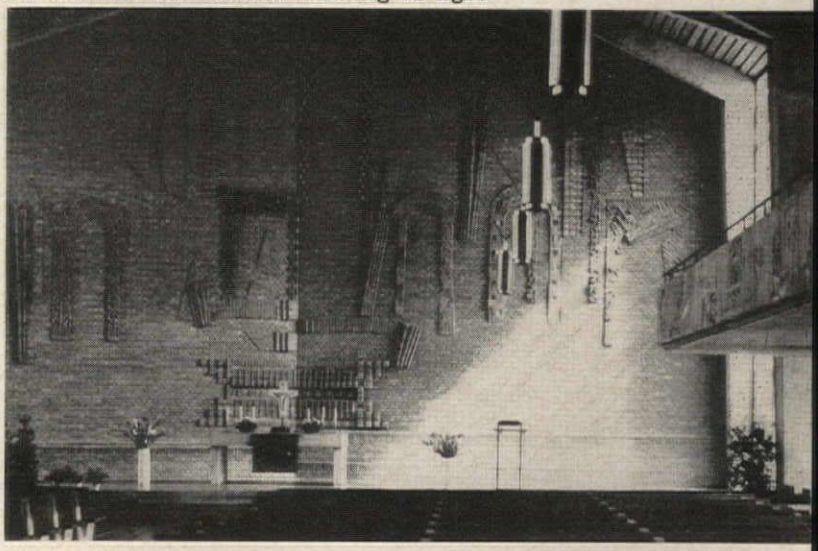
Several years ago at a conference in Minneapolis, I heard Prof. Joseph Sittler say that the "Community called 'Church'" can know itself to be a community most profoundly when the usual signs and motivations of community are either violently destroyed or authoritatively forbidden. When during the war all the visible phenomena that could sustain, support, and encourage community among Christians were either destroyed or forbidden by law so that there could be no meetings, precisely in that sit-

uation this community has asserted its reality and often performed its common task more profoundly and movingly than at any other time. One thinks of the Church of Norway during the occupation, or, as Dr. Tillich reported, of the deeply felt experience of services being conducted in bombed-out tenements in Berlin, or, if you will, the ecstasy felt by the early Christians meeting in community of worship in secret catacombs which were nothing but underground holes. So perhaps the question arises on how a church should strive to express its purpose. A community, but with special aims, it seeks to glorify the spirit or at least to announce its belief in the supremacy of the spirit. Therefore, if it is simple, it must possess the simplicity of poetry. It should intimate and suggest; it should be a segment of space which reminds the worshipper of the infinity from which it was wrested. It shelters the community but it gives a hint of other more satisfying purposes. So its architecture must be a subtle playing of spaces, a preparation for a succession of experiences—through enclosures and manipulation of overhead natural light and through suspense into other spaces and other experiences as movement succeeds movement as in a symphony, with reflective moments of transition, finally reaching a climax of height and light.

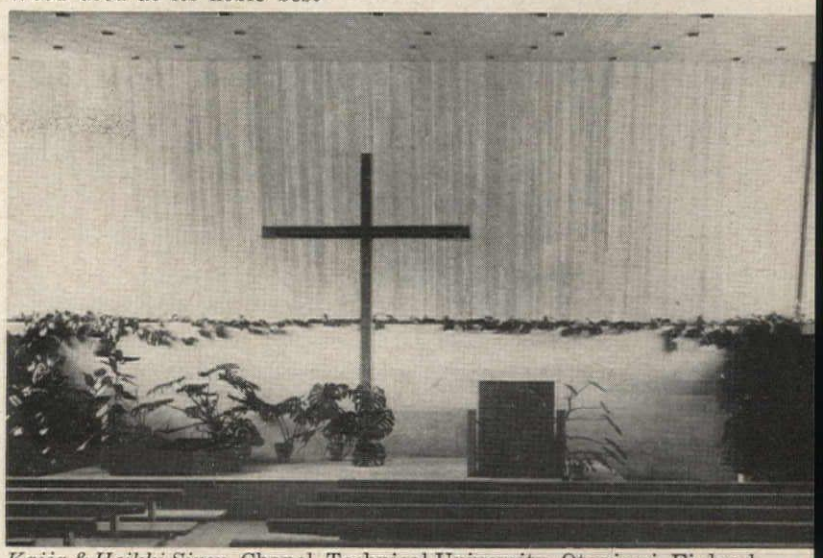
Color and light and proportions and the quality of the various materials placed in harmonious relationship—and above all scale, the subtlest and the most elusive of all means to bring space in proper rapport and emphasis to the worshipper—are the tools of the professional man. He can obtain strength and eloquence by using them clearly, if not too obviously. Final effectiveness will proceed from the logic of the plan, the clarity of the structure, the directness of means, and from the ease in which the layman finds his way.

In such manner we may see at work the three great principles that permeate good architecture and in fact all works of art: integrity, proportion and clarity. It is through them that beauty will shine, not through arbitrary and egotistical ways of catching the eye. This is the inner discipline of which I have been hinting. The work it generates may thus stand as a noble symbol of contemporary man's beliefs. It will reveal to his future descendants the depth of his concern, even the extent of his inadequacies; but it will avoid the frivolities of the tastemakers, who continually demand new fashions, soon to be bored by them, as they think of form-giving as a clever game of skill.

Dieter Oesterlen, St. Martin's, Hannover, Germany
Exhibits the full esthetic meaning of light

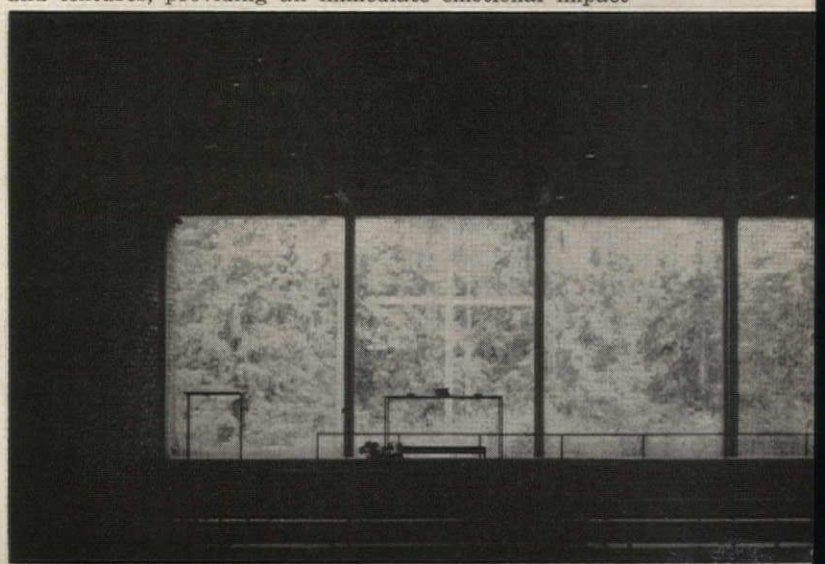


Lanners & Whalen, Chapel and Crematorium, Baden, Switzerland
Wood used at its noble best



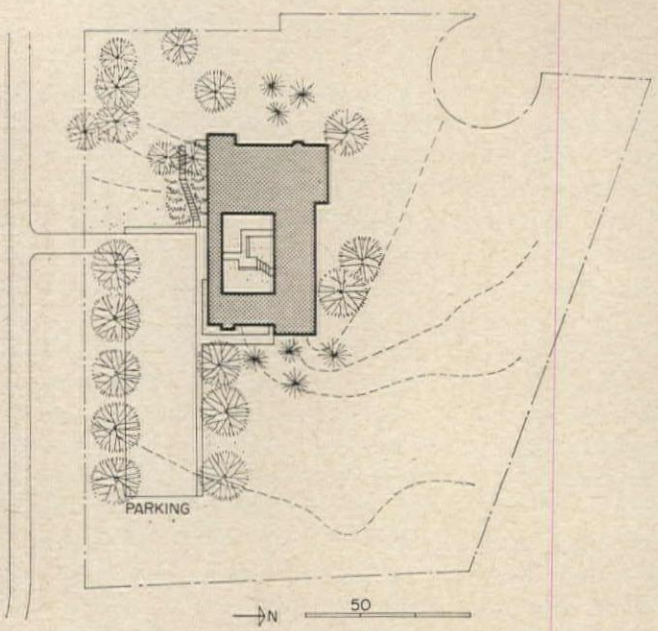
Kaija & Heikki Siren, Chapel, Technical University, Otaniemi, Finland

Wood and brick and trees, eloquent combination of simple materials and textures, providing an immediate emotional impact



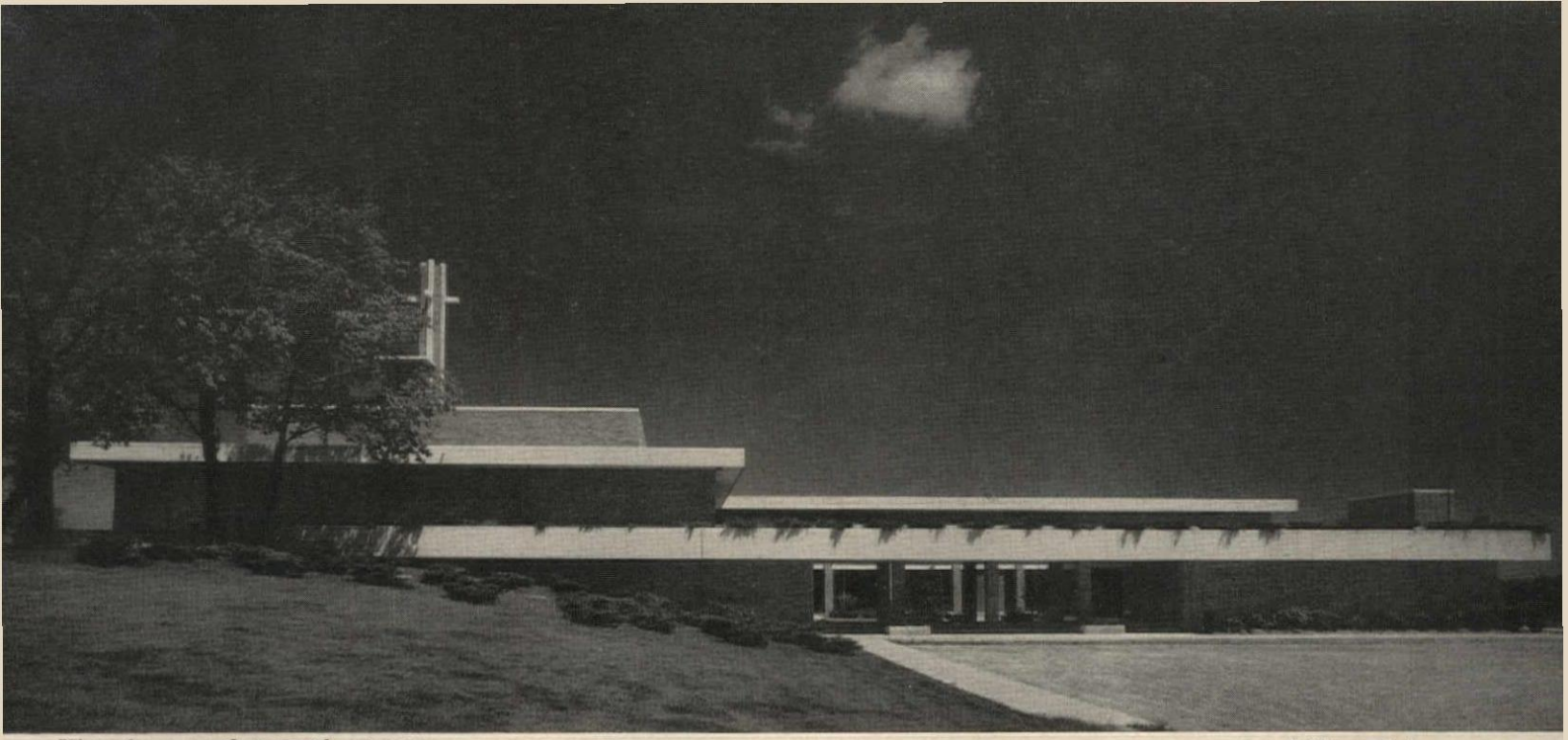
A Court Scheme Gives Church an Inward Focus

Christ Episcopal Church, Adrian, Michigan
ARCHITECT: *Alden B. Dow, Inc.*
MECHANICAL ENGINEER: *Kenneth E. Phelps*
GENERAL CONTRACTOR: *Lenawee Construction Company*



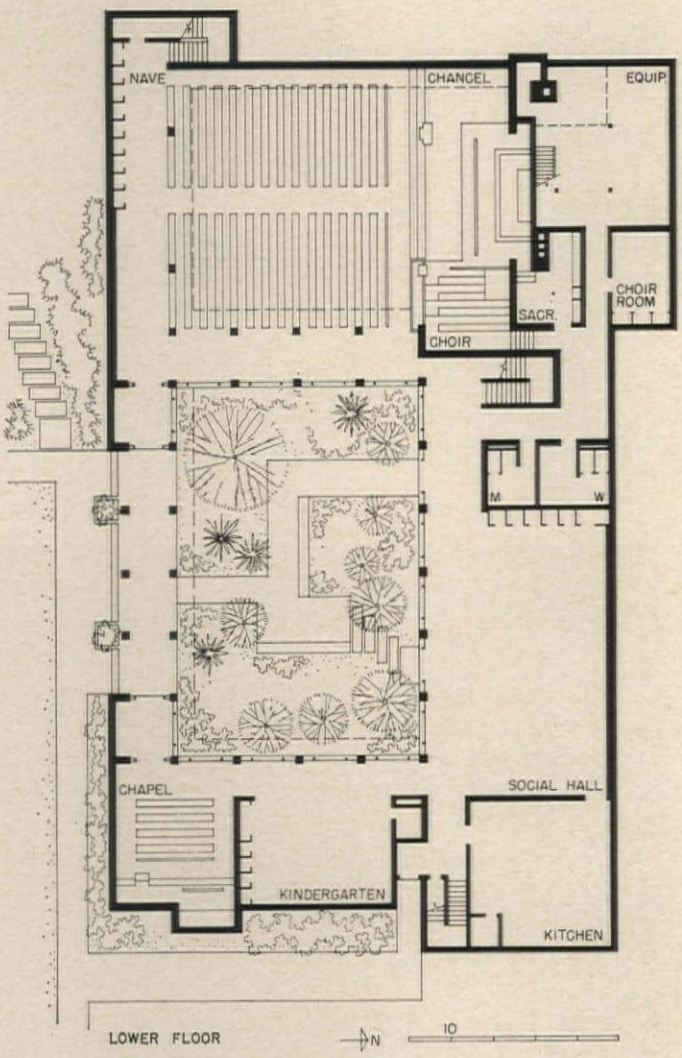
In general massing and detail the architect's debt to Frank Lloyd Wright is clear. Study of the plans on the opposite page reveal spaces enclosed by exterior walls which are for the most part continuous, their planes practically uninterrupted by windows or doors. The view is inward, toward a courtyard; the architectural character suggests privacy, retreat, seclusion. Dow has stated: "Because the site is rather open in character and on the side of a hill dominated by a tall hospital, we sought to provide preparation for mind and soul by nestling a courtyard, or "close," into the hill and opening the main spaces into it for restful views, with materials used simply and straightforwardly to enhance this quietude."

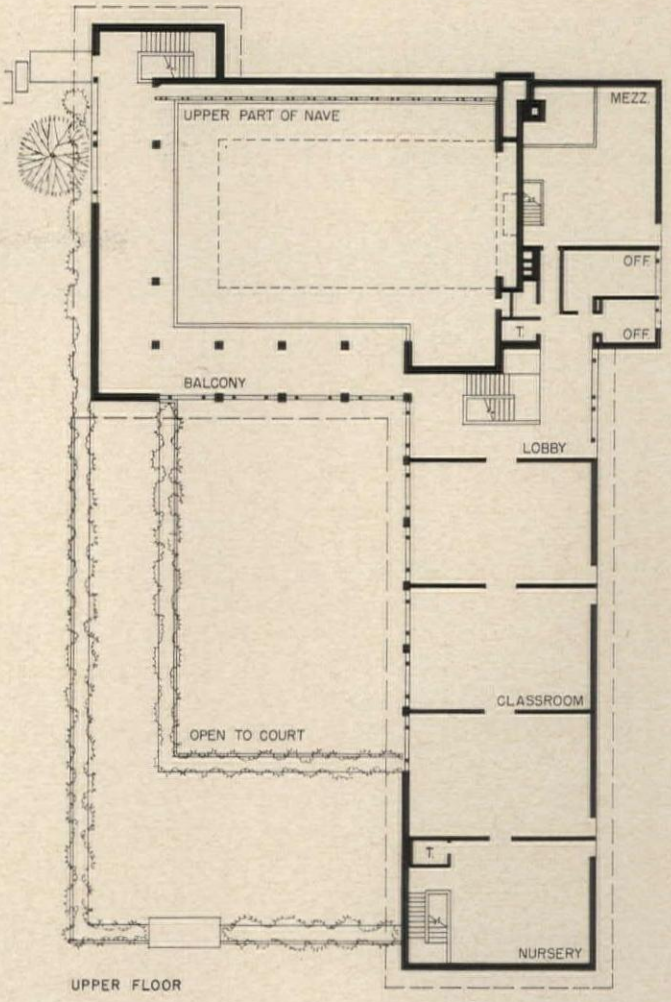
The chancel is to the north and the site slopes downward from west to east. Western light enters the nave at the balcony level on grade at the top of the slope. A flight of exterior steps gives direct access to the balcony from the parking area. A two-story social hall and classroom wing balances the higher element containing the nave and chancel. Both are offset by the lower element sheltering the main entrance, a small chapel and a kindergarten.



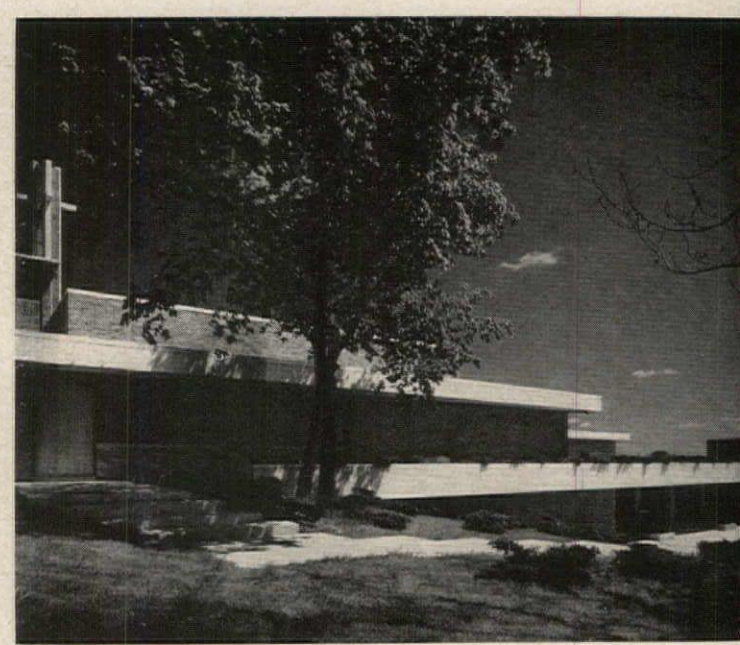
View from south toward entrance

Balthazar photos

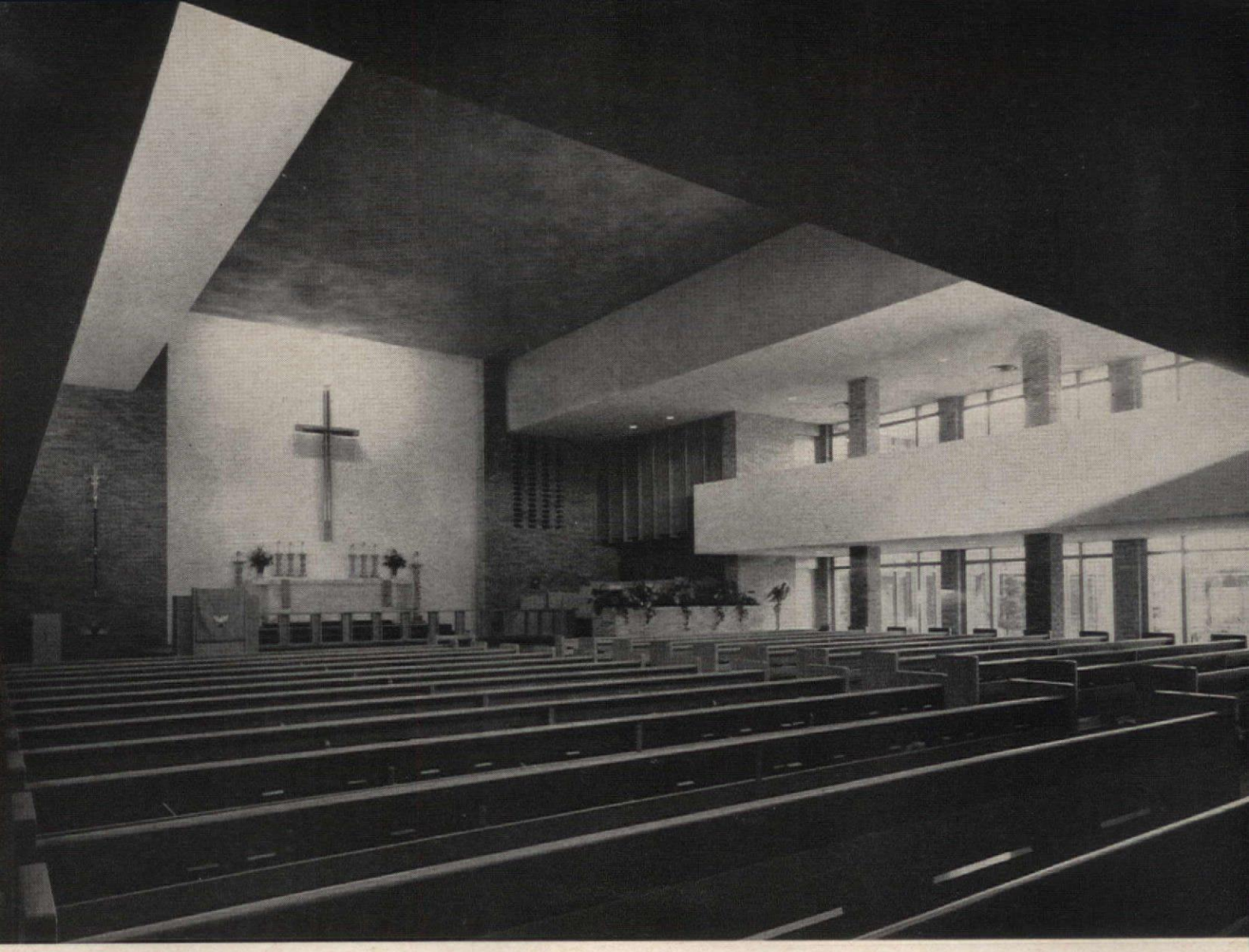




The nave seats 300 persons. The chancel is to the north. Wall to the west beneath balcony is below grade. To the east the nave overlooks court as can be seen in the photograph on the opposite page which also shows the choir and organ loft. The nave ceiling is sand finished gold painted plaster. All wood in nave and chancel is oak



Balcony entrance. Main entrance at far right.

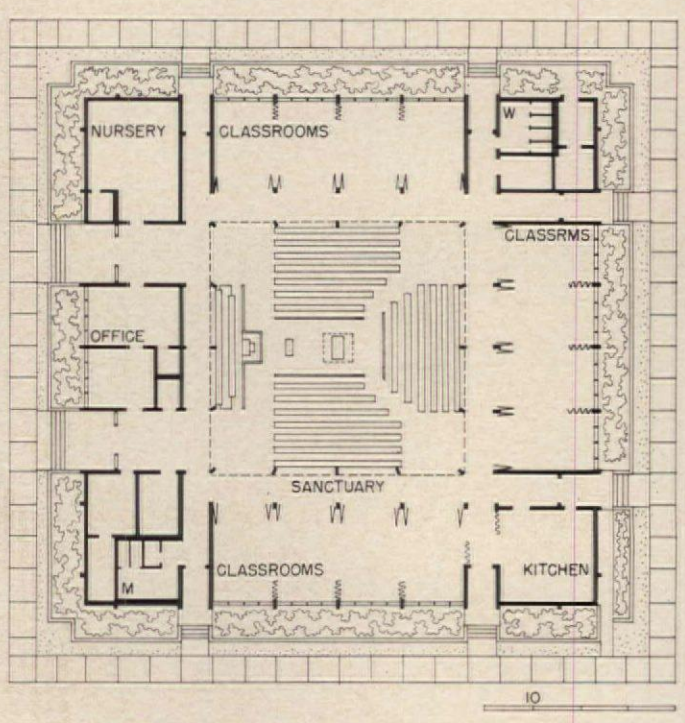


Courtyard

Alexandre Georges photos

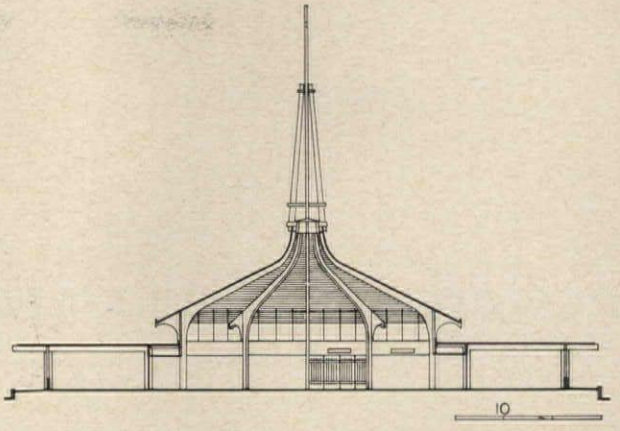
Elegance and Economy in a Simple Scheme

Key Biscayne Presbyterian Church
Key Biscayne, Miami, Florida
ARCHITECT: *Joseph N. Smith*
STRUCTURAL ENGINEERS: *Carr Smith Associates*
GENERAL CONTRACTOR: *G & N Construction Co.*



Key Biscayne is an island off the Florida coast connected to the city of Miami by means of a causeway. In recent years that portion of the land which has not been reserved as public park is being slowly developed into a residential community essentially modest in character. The new Presbyterian church is praiseworthy not simply because it was held within a necessarily limited budget, but because it could be considered as a prototype for further building in the area. The broad overhanging roof of laminated wood arches and wood decking is particularly appropriate to the climate, and the appearance of the building is enhanced by the use of concrete block made to order in a special shade of light ochre which contrasts effectively with the white reinforced concrete frame.

In plan, the nave is essentially a roofed court giving access from the ambulatory to surrounding classroom and office elements. Corridor space is saved and a compact plan results, which can be simply resolved into its high and low elements.



In the nave, the pulpit is treated as the dominant element to express the primary role of preaching in the Presbyterian liturgy. Pulpit, table and rail are of mahogany. The seating, re-upholstered in an off-white leather, was bought second hand from a movie house. Acoustical tile is suspended below the ambulatory ceiling, and linen over fiber glass is used for acoustical purposes directly below the band of windows. Acoustics are excellent

Brickwork and Carpentry on a Low Budget

"It's a simple masonry structure, and the rest is carpentry . . . brick piers, wood beams and joists." In describing the church further Rado said, "Bennington, Vermont is a real colonial town, and the parishioners were not thinking of a modern church." This one is traditional in its structure and in its materials, except for the use of white prefinished asbestos cement board with dark stained wood battens on the sanctuary exteriors and interior.

Rado sought to make a strong informal design, avoiding any suggestion of the pompous, which was to create an effect at the same time mysterious and full of emotional impact. The design required a vertical element to signal the presence of the church, to give the sanctuary a dominant and lofty character and to create interior vertical space overhead. The tower which finally took shape has a ridge rising 50 feet above the entrance terrace and can easily be seen from the street and the surrounding neighborhood.

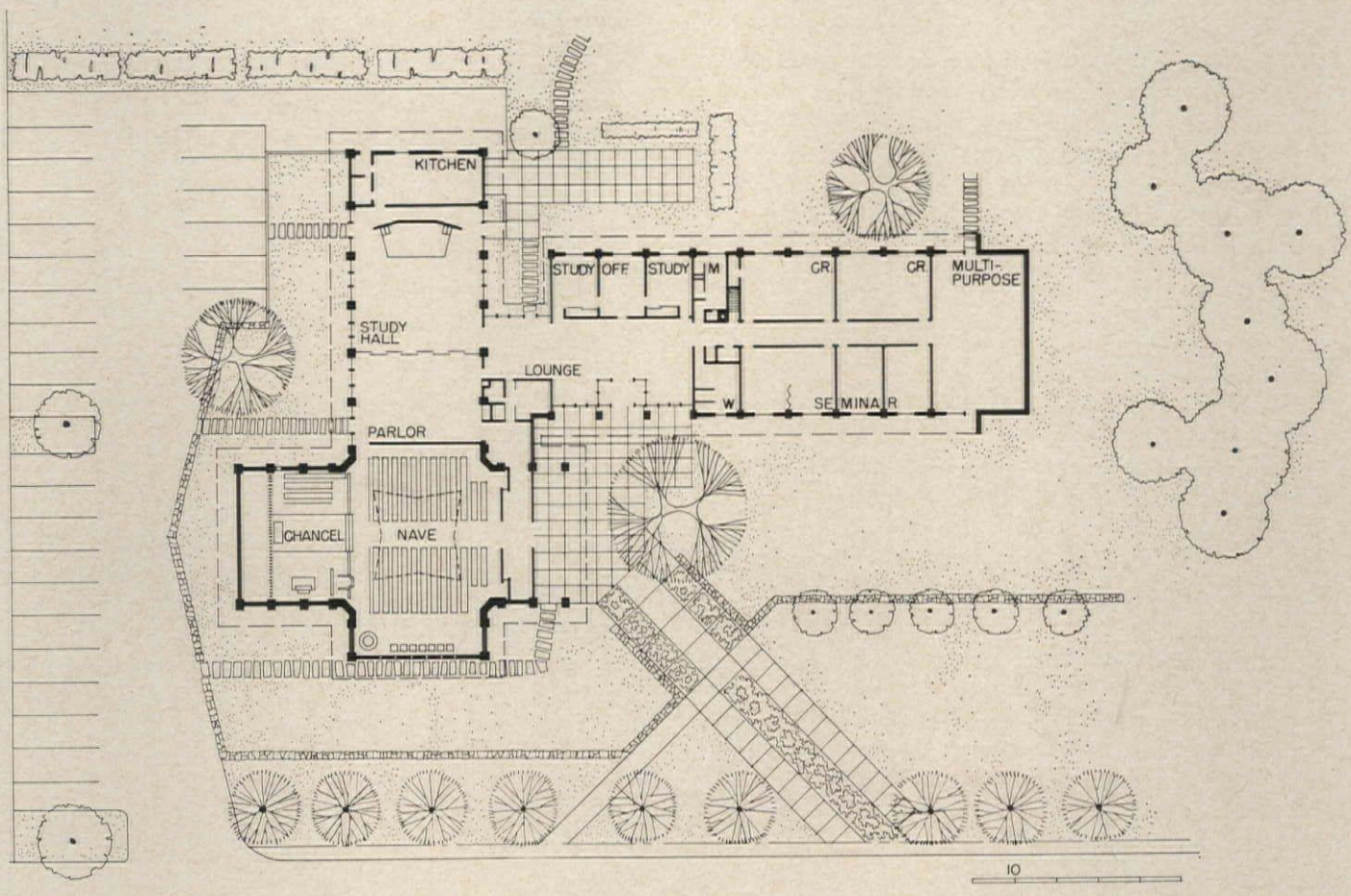
One entrance lobby serves classrooms, public facilities, fellowship hall and administration offices. While the sanctuary is readily accessible from the lobby—permitting the staging of weddings and other processions—it has its own narthex, entered from the terrace. The parlor is also equally accessible to the lobby and adjoins both sanctuary and narthex.

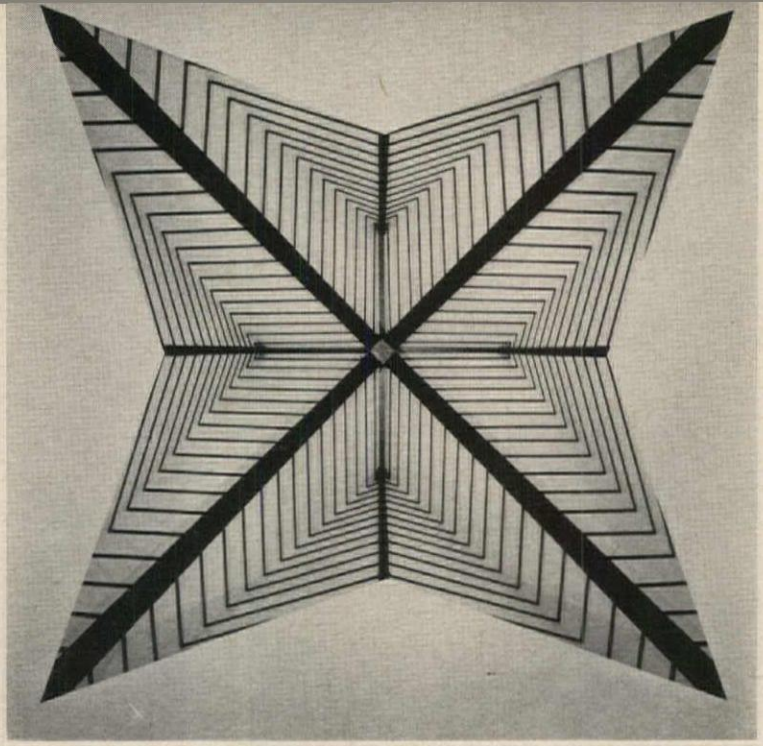
An interesting feature is the ability to include the parlor space with that of the fellowship hall by means of sound-proof sliding doors—permitting larger groups to be accommodated when occasion demands. A removable stage and an efficient kitchen are located at one end of the fellowship hall, and the kitchen may also serve groups on the outdoor terrace when weather permits.

The total cost of the church and school, including landscaping, chancel furnishing and pews, but not school furniture, was approximately $150,000.

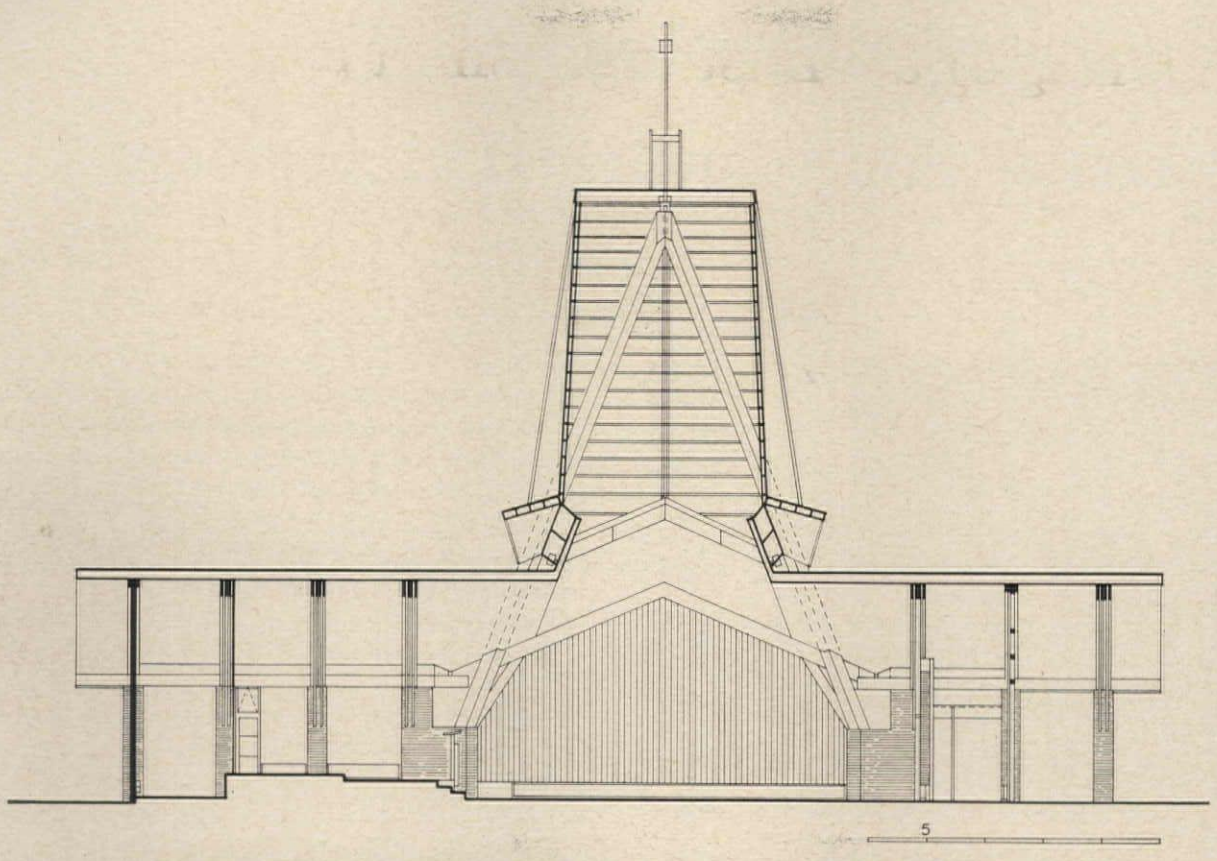
The Second Congregational Church, Bennington, Vermont
ARCHITECTS: *Antonin Raymond & L. L. Rado, Louis Kerner, project manager*
STRUCTURAL ENGINEER: *Paul Weidlinger*
MECHANICAL ENGINEER: *Henry J. Campbell Jr.*
LANDSCAPE ARCHITECT: *E. Ellwood Allen*
GENERAL CONTRACTOR: *Gerald E. Morrissey, Inc.*

Joseph W. Molitor photos





Tower is designed to admit natural light through tinted glass around the lower ridge, so placed as to be invisible. Asbestos cement panels were used for the interior lining of the tower as well as the sanctuary walls as they are dust proof and require no painting. Roof soffits are also of asbestos cement board. Copper is used on the steeple and asbestos shingles on the roof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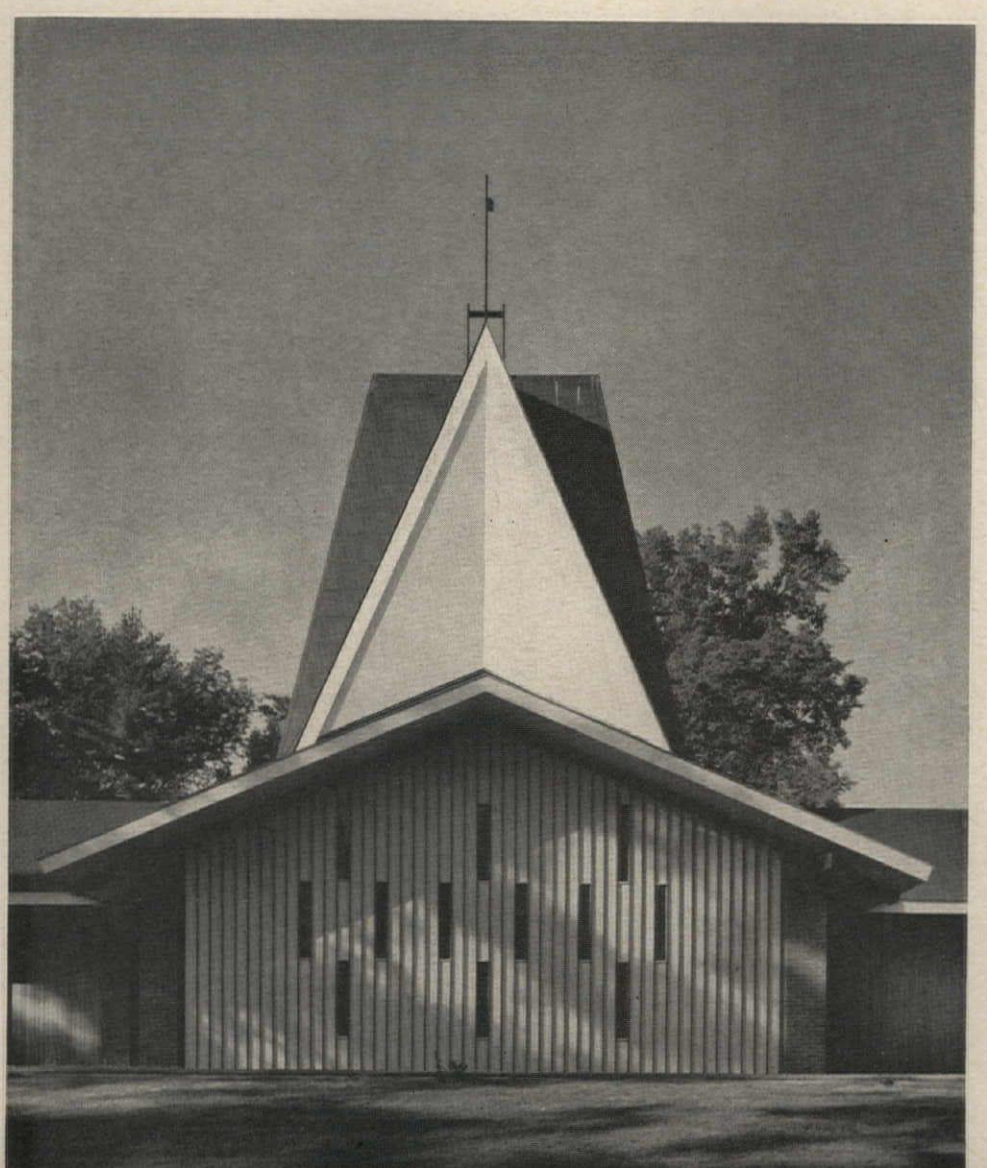


Synagogue Distinguished by Expandable Sanctuary for High Holidays

Hedrich-Blessing photos

School wing connected to synagogue by a lounge bridge

Gyo Obata describes the concept of the development of the design of Temple Israel as follows: "The problem was to design a synagogue which could be expanded from a normal seating capacity of 1,000 people to 2,200 people on high holidays.

"I visited a number of synagogues with the Rabbi and the chairman of the building committee where the idea of the expandable sanctuary was tried and discovered that in all cases the main sanctuary and altar were at one end of a long rectangular space, and the other end of the rectangle housed the auditorium. Therefore, when the removable wall in the center was open and the chairs in the auditorium were changed to face the main sanctuary and ark at the other end, the worshippers on high holidays, who were seated in the auditorium side, were at a great disadvantage. In the words of the Rabbi, "they were out in left field." Hence, I wanted to design the sanctuary and the auditorium so the two spaces when brought together would enable everyone to be close to the altar and the ark. The solution was accomplished by putting two hexagons together with a diagonal wall running between the hexagons. For most regular services this wall will be closed and the ark and altar will be turned to face the sanctuary in this hexagon. For the high holidays, this wall suspended from tracks in the ceiling moves against the side walls, and the movable chairs in the auditorium side are turned to face the ark and the altar, which also revolves so that everyone in the two hexagon spaces face directly toward the altar.

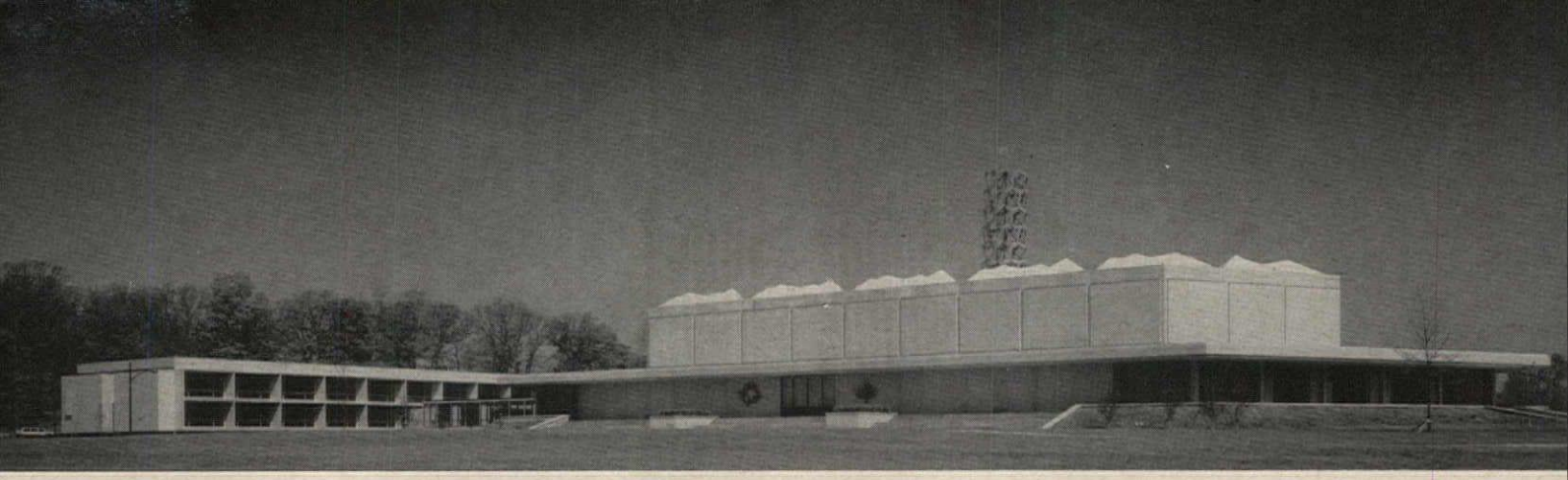
"In many of the synagogues I visited, I found there was a great deal of difference between the main auditorium and the sanctuary. Therefore, I wanted to get continuity of material and space when the two rooms flowed into one another. This was accomplished by continuity of the structure in the ceiling for both rooms. The structure is a series of diagrid beams forming a series of hexagons and triangles. The hexagons are filled with precast Star of David concrete units and the triangles are filled with skylights in some cases and precast pyramids in others. The walls in both of the rooms, as well as the moving wall, are a series of vertical boards in natural finish beech. It was very important that the movable wall be completely soundproof so that a worship service can take place on one side and theater or lecture performances can take place on the auditorium side. Dr. Jerome Cox, acoustical consultant of

Religious Facilities for Congregation Temple Israel
Creve Coeur, Missouri
ARCHITECTS: *Hellmuth, Obata & Kassabaum, Inc.*
Gyo Obata, designer; Rolf Muenter, project manager
STRUCTURAL ENGINEER: *Albert Alper*
MECHANICAL & ELECTRICAL ENGINEER: *Harold P. Brehm*
UTILITY ENGINEERS: *Horner & Shifrin*
LANDSCAPE ARCHITECTS: *Sasaki, Walker & Associates, Inc.*
ACOUSTICAL CONSULTANT: *Jerome R. Cox Jr.*
FOOD SERVICE CONSULTANTS: *Flambert & Flambert*

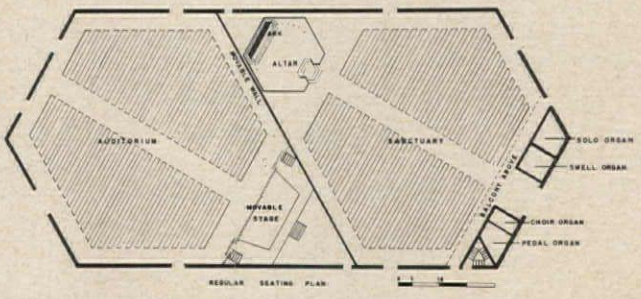
the Central Institute of St. Louis, devised a metallic acoustical wall which accomplishes this. Surrounding this main double hexagon room in the center are all the areas required for congregational activities, such as a board room, chair rooms, library and the Rabbi's office. There is also a complete serving kitchen so that banquets may be served in the auditorium space. There are two main lobbies, one serving the auditorium and the other serving the main sanctuary.

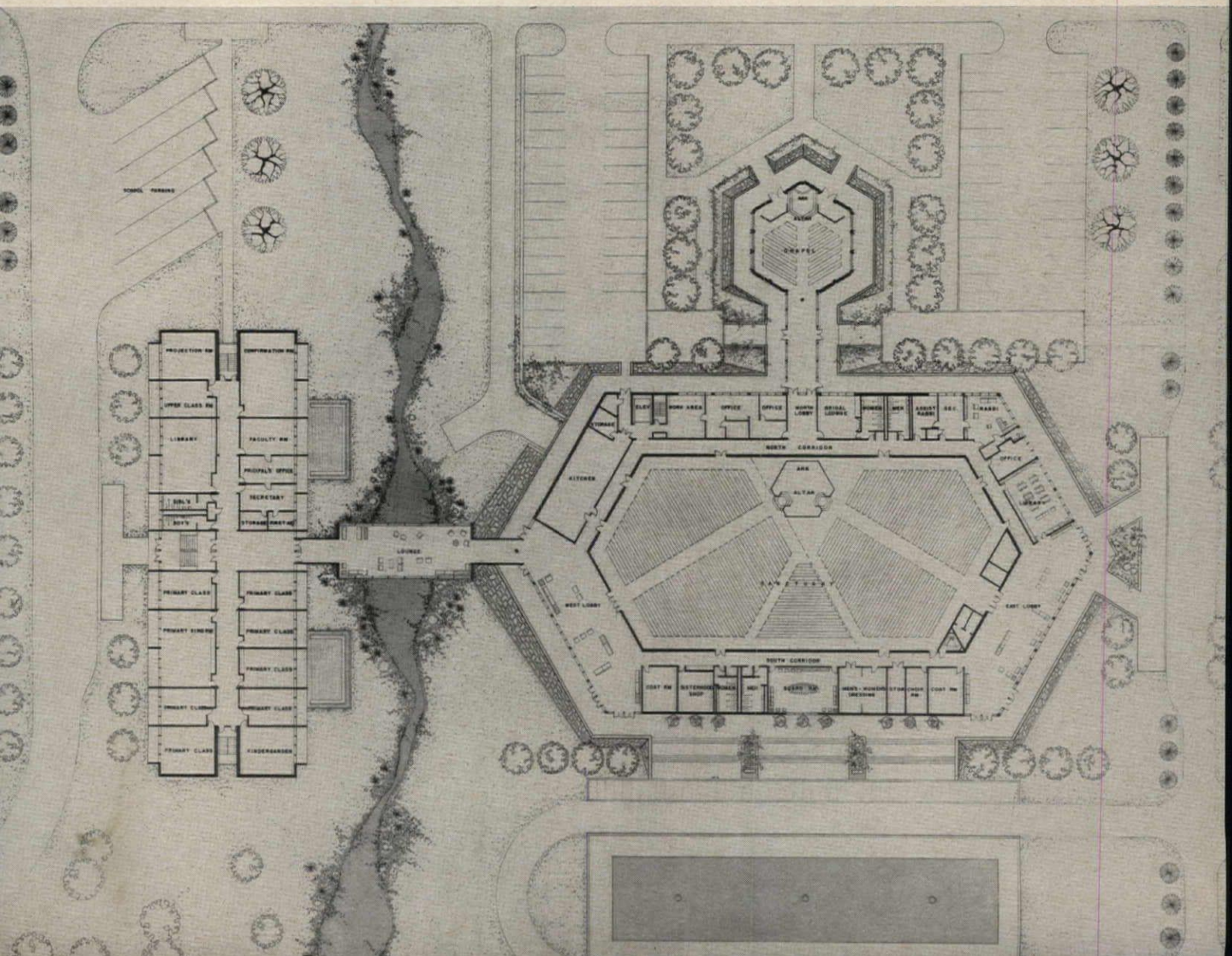
"The main synagogue building connects by a lounge-bridge over a stream to a three-level school building, where there are classrooms for 500 Sunday school children. The school building was placed on the other side of the stream in a beautiful wooded area, and there is a separate entrance road so parents can drop off their children directly at the school. The drop-off area for the main synagogue is in front of the building as well as at the side. The chapel to the rear will be added in the future.

"The congregation fortunately purchased enough land to provide parking for 600 cars. Since the main sanctuary and auditorium is a very simple room with vertical wood walls and structured ceiling, it became very important that the main altar area have a very strong background for the ark. Originally, the idea was to create a mural wall with the ark incorporated in the wall. However, a large model of the room was made and studied by Rodney Winfield, a young St. Louis artist, and it became quite evident that the mural had to become a three dimensional sculpture. The artist, working very closely with Rabbi Isserman, tried to incorporate in his sculpture all the various symbols of the Hebrew religion. The pews in the sanctuary were designed by the architect of walnut with bright blue upholstery, the only color in the sanctuary. The tower over the main ark and the altar and the two sculptural pieces in front of the temple are the work of Robert Cronbach."

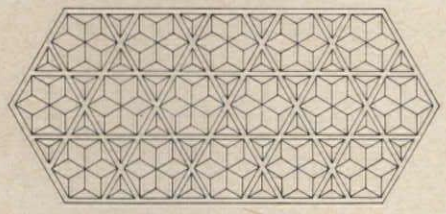


Synagogue and school as seen from entrance approach



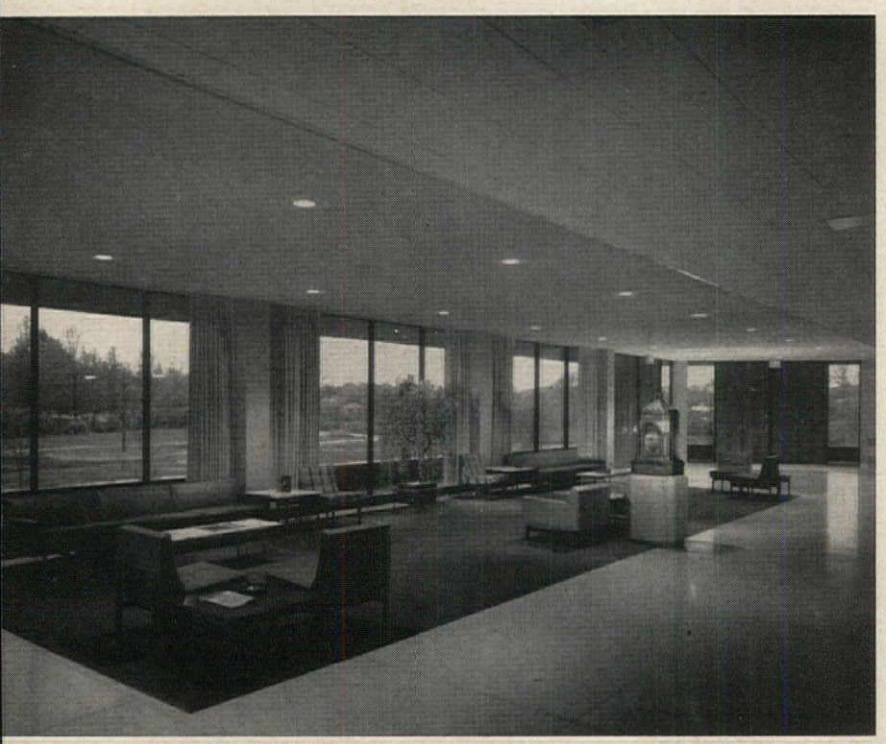


Tower is the work of sculptor Robert Cronbach. It is positioned over the beam in the sanctuary. Precast Star of David units and skylights make curious roofscape



Above and below: The roof structure is a series of diagonal beams forming a series of hexagons and triangles

Sculpture surrounding ark is by Rodney Winfield. Skylight is below tower on roof



Interior of bridge-lounge

Rabbi's study

Architectural Engineering

More on School Components

In the February issue an article, "Component Systems for Schools," told about the School Construction Systems Development project, being sponsored by the Educational Facilities Laboratories, Inc., which is engaged in the development of a series of standard components for secondary schools and junior college buildings. The program appears to be moving ahead with considerable dispatch, inasmuch as performance requirements have been written for four major component systems: (1) structure, (2) heating, ventilating and cooling, (3) lighting and (4) interior partitions. And bids were scheduled to be invited after May 31 on the components for approximately two million square feet of schools, valued at 30 million dollars, to be built in 15 school districts in the Sacramento, Bay and Los Angeles areas. As an indication of the flexibility requirements for the components, it is to be noted that interior partitions are to be capable of rearrangement on a 4-in. module; the mechanical system and lighting must automatically service new spaces created by partitioning rearrangement; the structural system must provide long spans to avoid interference due to columns.

A National Academy of Engineering

The Engineers Joint Council is hopeful that by this fall a National Academy of Engineering will have been formed which will be associated with the National Academy of Sciences to serve as an honor society for engineers and to open a new channel of technological advice to the Federal Government. Present plans are for the engineering academy to elect its own members, but to be linked to the science academy by having several scientists sit on its executive board.

Clean Room Bibliography

A 28-page bibliography on "clean rooms" (second annual edition) containing listings of reports, specifications, articles, books and speeches on the subject has just been published by Controlled Environment, Inc., designers and installers of clean room facilities. Copies are available from this company at 915 Great Plain Avenue, Needham 92, Mass., for 25 cents in coin.

Code for Air Distribution Equipment

A detailed code covering the testing of air distribution equipment has been promulgated by the Air Diffusion Council, a trade group made up of manufacturers of grills, registers, ceiling diffusers and high velocity system terminal control devices. The code covers: (1) uniform equipment for testing, (2) flow standards for both high and low velocity systems, (3) certification of member company laboratories, (4) test provisions to permit maximum comparability of test data, (5) review of individual data and certification concerning method and completeness. Information on the code can be obtained from the Air Diffusion Council, 330 North Michigan Avenue, Chicago 1, Illinois.

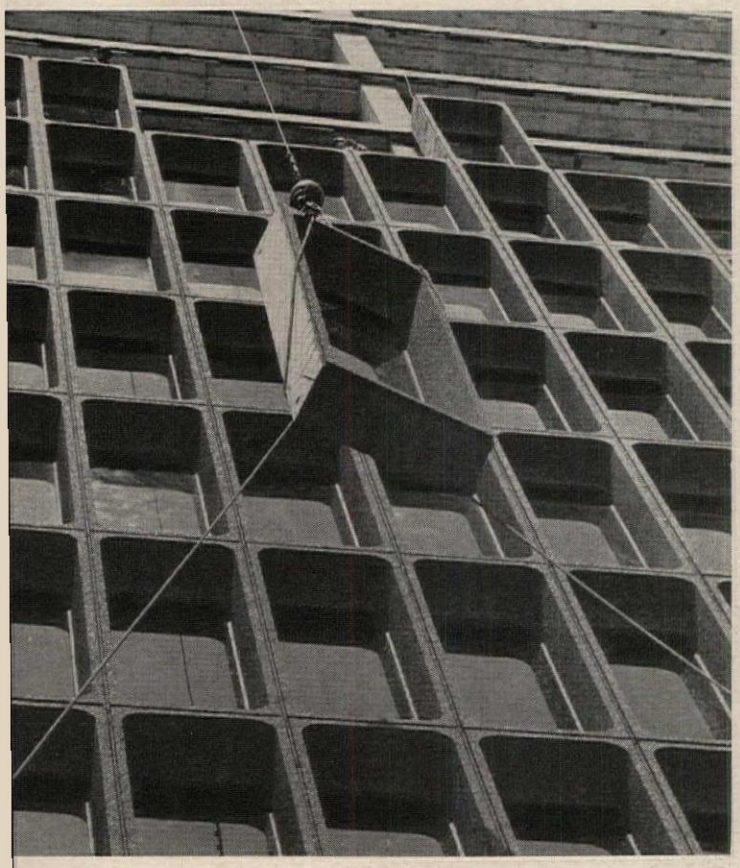
More on Polarized Light

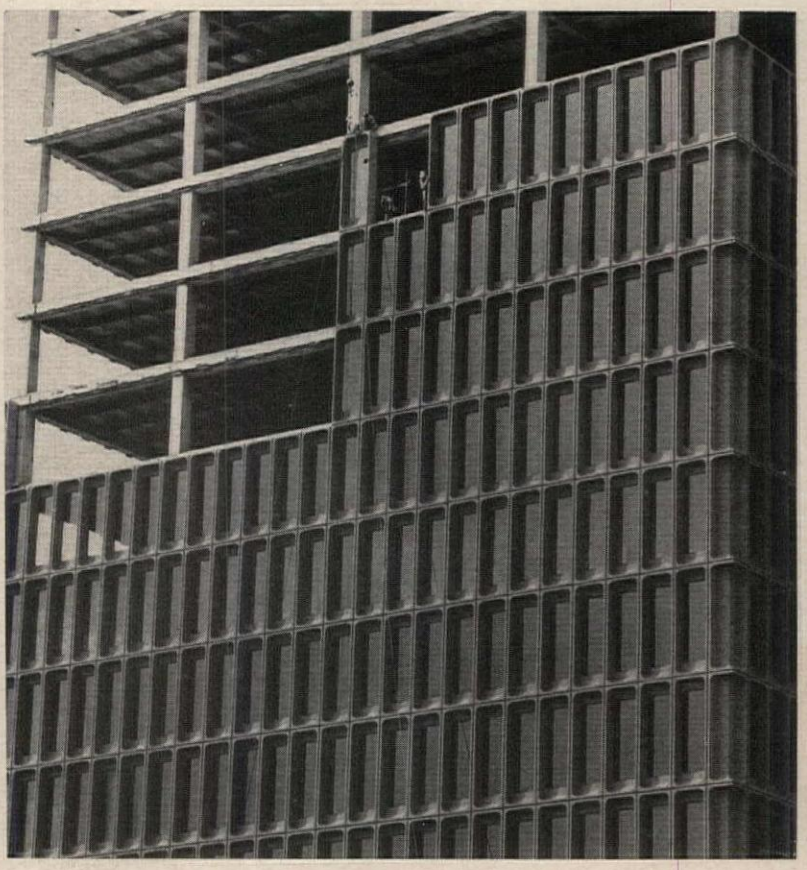
A uniform method for reporting the vertical polarization of fluorescent luminaires has been prepared by the Committee on Testing Procedures for Illumination Characteristics of the Illuminating Engineering Society and published in the May issue of Illuminating Engineering. According to this committee, "Statements have been made publicly and in print regarding degrees of polarization of various products. Many times the values have been maximum polarization at particular angles. Single figures without qualification give the impression of total polarization." The recommended method calls for reporting vertical polarization at angles of 5, 15, 25, etc., through 85 degrees in planes parallel, perpendicular and 45 degrees to the axis of lamps.

This Month's AE Section

PRECAST CONCRETE WALL FRAMES DELIVERED TO BUILDING PREGLAZED

Welton Becket and Associates designed a precast window frame for the Phillips Petroleum Building which cuts construction time by being glazed off-site at the precasting plant





The unusual fact about the 1,800 precast, exposed aggregate concrete frames for the 19-story Phillips Petroleum Building in Bartlesville, Oklahoma is that they are all preglazed. Since a properly designed precast concrete window frame is a rigid unit which will not rack or deflect while being lifted into place on a building, the frames were designed so that they could be glazed in the casting yard, and then brought to the job site. The builder was able to enclose one floor of the building every three days which indicates the amount of time saved through use of this technique.

The glazing technique was studied and analyzed in relation to the ease of glass installation, the number of procedures, building maintenance and the problems of expansion and contraction coefficients of dissimilar materials.

Structural neoprene seals were selected to meet these problems (see detail). The seals are molded with a slot at the inside edge in which the glass is inserted. They also have a slot on the side into which a neoprene strip or "zipper" is inserted, forcing a tight seal around the glass.

Each frame is glazed with a solar bronze, glare-reducing glass nearly the full size of the frame and set back 18 in. from its face.

During the development stages of the neoprene seals, they were secured to a ½-in.-thick metal fin cast into the concrete frame. However, tests showed that this technique was not the most satisfactory because the acid solution used to etch out the concrete and expose the aggregate would attack the metal unless it was first coated with an epoxy. To eliminate this operation, the panels for the new Phillips building were cast with a continuous groove around the inside of the frame. This allows for the specially designed neoprene gasket to be forced into the groove for a tight fit.

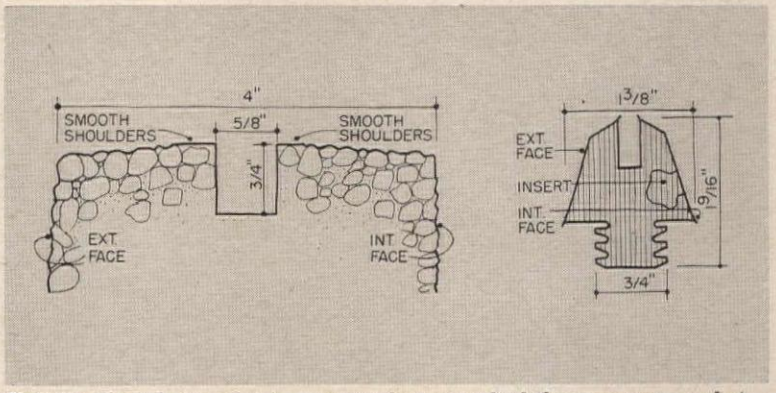
Tests have been conducted on a full size mock-up of similar panels of eight frames, four across and two high, which subjected the panels to wind velocities of more than 120 mph with a simulated rainfall of 4 in. per hour. The result showed no glass damage or leakage.

Each sculptured window frame used on the Phillips building is one building module or 4 ft 8 in. wide, 13 ft high, 21 in. deep, and weighs 4,000 lb. Oversized windows, the same width but 19½ ft high, are being

Neoprene gasket is wedged into the reglet of the precast frame

Sheet of bronze-color. Solar-reducing glass is next set in gasket slot

Neoprene zipper insert makes gasket form a tight seal around glass



Details of gasket reglet in precast frame and of the neoprene gasket

Frames are attached to structure by means of steel inserts

used on the second and 19th floors.

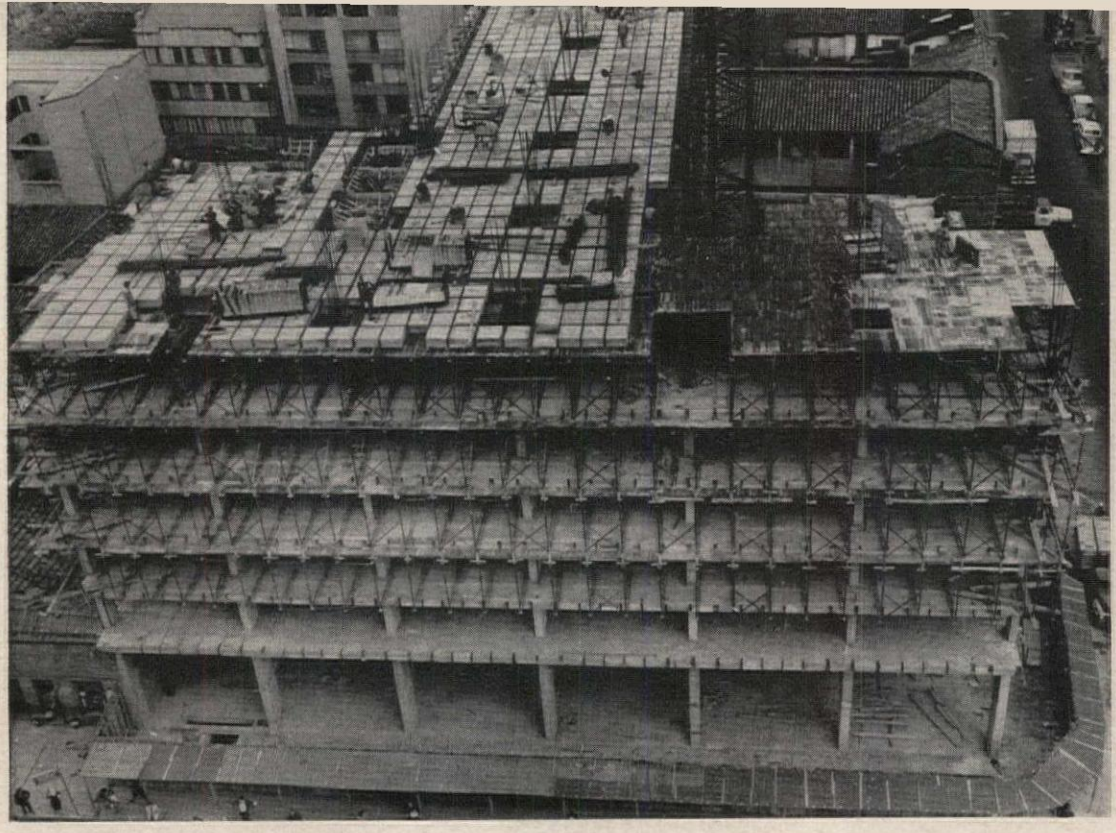
The total labor for fabricating a frame was approximately two days, spread over a two-week period. Single piece concrete forms, cast in a master concrete pattern, were used to insure exact duplication. This technique was necessary because of the frame's angles and compound curves.

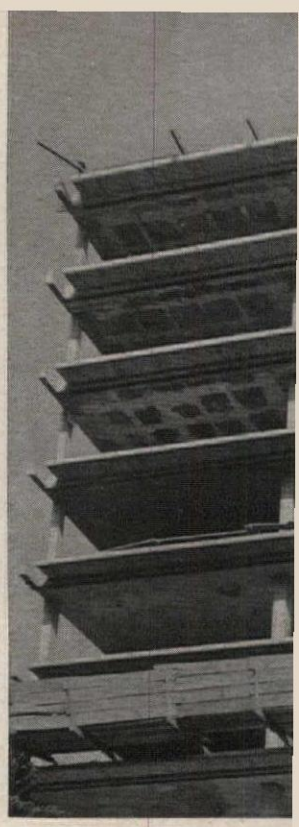
The interior sides of each frame were treated with silicone to provide a durable and stain-free surface.

After being trucked to the site, the frames were hoisted into position and immediately bolted and spot-welded to the structural frame.

A neoprene tube is set between the panels, recessed to a depth of ½ in. Polysulfide sealant is run on top, and the interior requires no treatment.

General contractor for the project is George A. Fuller Company.





CONCRETE SLABS MADE FROM PRECAST BOXES

System used in South America has been modified and fire-tested for application in the U. S.

By Kenneth C. Naslund and Alvaro Moreno

A cellular concrete floor system for multistory buildings which has been used successfully in South America for 15 years has met A.S.T.M. criteria for a 3-hr fire rating in tests recently conducted at Underwriters' Laboratories.

This lightweight floor system consists of a series of precast concrete cells (boxes) around which is poured a gridwork of reinforced concrete joists.

It combines desirable characteristics of several familiar types of concrete floor structures. It has the solid panel of the flat slab at columns; the flat ceiling of the flat plate; the reduced weight, concrete volume and reinforcement of the waffle slab without loss of the fire-resistive property of a solid slab.

The introduction of the system into the United States has been underway by Reticular Concrete Structures, Ltd. for two years with technical assistance being provided by The Engineers Collaborative of Chicago. This assistance included an economic analysis of the production, transportation and erection costs for the system.

The Engineers Collaborative determined very early in their studies that one of the most important code requirements to be satisfied was the fire rating. Therefore, after studying the various methods of providing resistance to the passage of heat and structural capacity under the adverse effects of high temperature, it was decided to employ a 3-in. topping placed integrally with the concrete ribs.

Each cell is composed of two half cells which is the basic unit produced in a precasting plant. The half cells are made of zero slump, 4,000 psi concrete that is subjected to vibration and pressure during the molding process by a specially designed machine. The top, bottom and sides of the cells are only 1 in. thick and are not reinforced.

One-half cell is inverted and placed on top of another forming the basic unit used in the construction of the system (*see photos*).

Standard half-cell dimensions are 20 by 20 in, 30 by 30 in, 30 by 34 in. and 34 by 34 in.

KENNETH C. NASLUND is partner, The Engineers Collaborative. ALVARO MORENO is vice president of Reticular Concrete Structures, Ltd.

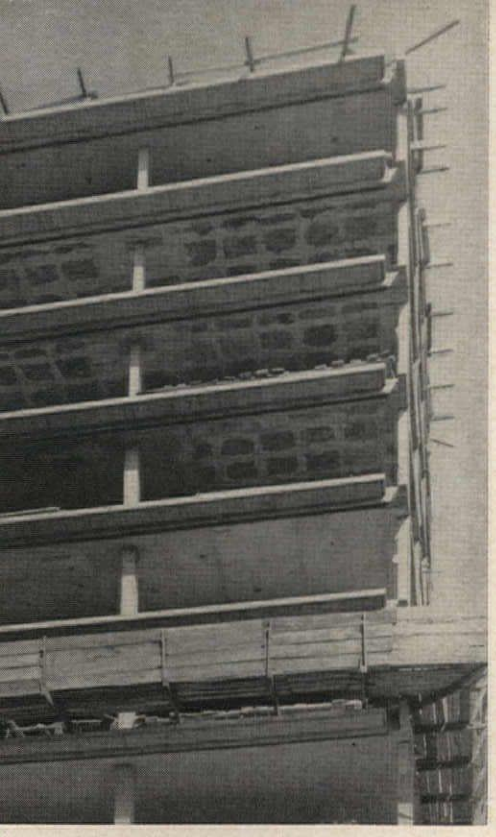
Development and Use

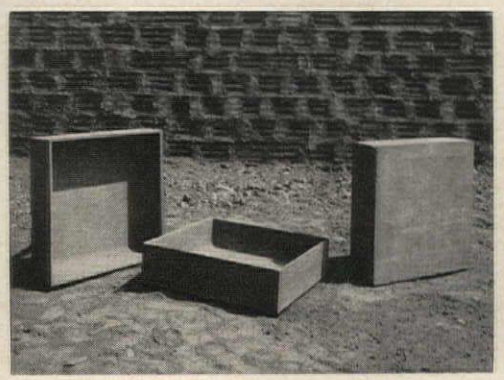
The system, as used in Latin America, was developed by Dr. Domenico Parma Marre and Dr. Jose Gomez Pinzon of Bogota, Colombia for the firm of "Cuellar, Serrano, Gomez y Cia.," Architects and Engineers of Bogota, in 1948. Since that time plants for the production of the precast cells have been established throughout the northern part of South America, Central America and Mexico. Over 40 million sq ft of multistory buildings have been constructed using this system.

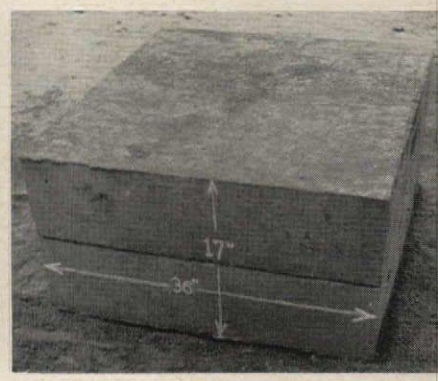
Fire Resistance

On April 16, 1963 a standard A.S.T.M. E-119 fire test was conducted on a full size panel of the system by Underwriters' Laboratories, Inc. at their Northbrook Fire Prevention Research Laboratory.

The panels tested measured 13 ft 8 in. by 17 ft 4 in. and contained 20 precast cells which created seven transverse and five longitudinal joists. The width of the poured joists were 4 in. and 5½ in. and the overall depth was 11 in. The cells were 8 in. in depth and the topping 3 in. (no reinforcement).





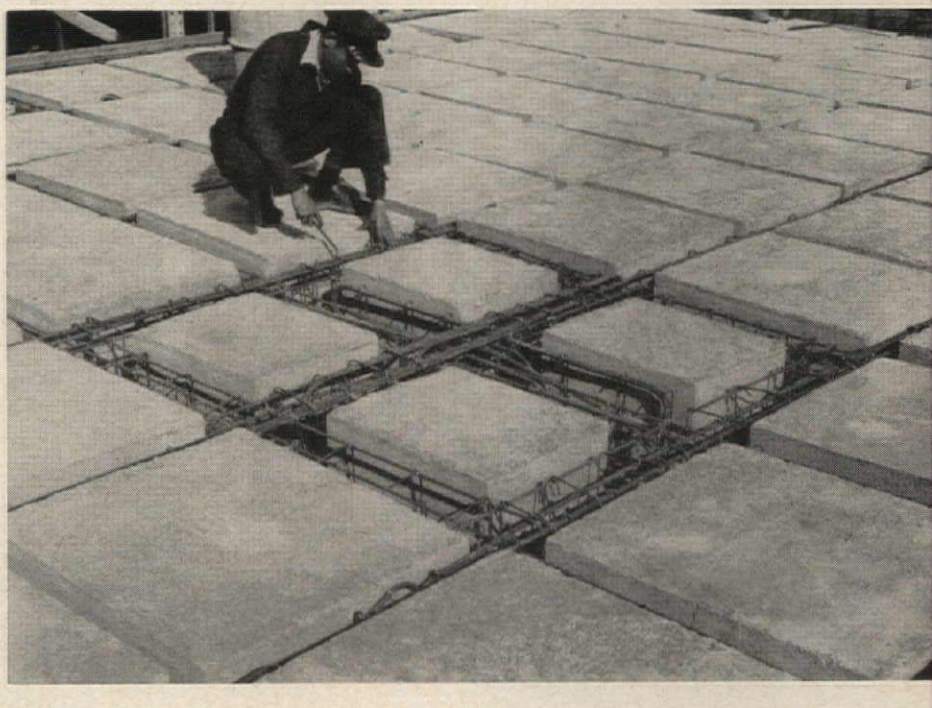


Cellular concrete floor system is comprised of precast boxes, provided in half-sections, and poured-in-place ribs—somewhat reminiscent of the tile-concrete floor system of several decades ago. The examples shown on this page are of buildings and construction in South America. (Dimensions indicated on boxes pertain to units used on that continent.) A range of sizes from 20 by 20 in. to 34 by 34 in. are planned for production in the United States some time this year

During the entire test the panel was subjected to a superimposed load of 100 lb per sq ft. This load produced stresses of 1,350 psi in the concrete, and 20,000 psi in the reinforcing steel.

The test panel successfully met all criteria for a 3-hr fire rating. A visual inspection showed no evidence of cracking or spalling of the bottom, or fire-exposed, surface of concrete.

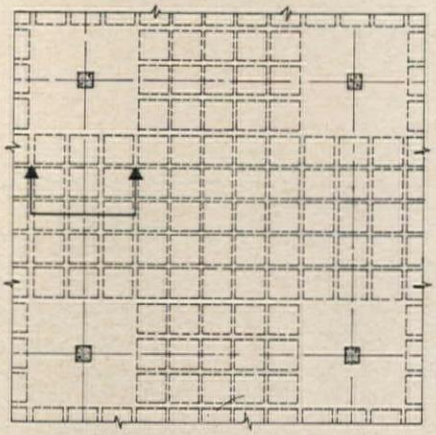
After cooling, the test specimen was given an additional test for structural adequacy (which is not a requirement of ASTM E-119) consisting of doubling the original design load to 200 lb per sq ft. The test specimen sustained this additional load without any cracking or spalling. This additional load created a deflection of only 0.13 in.

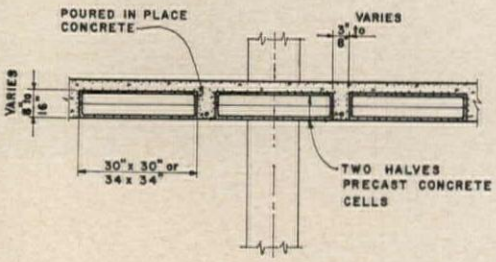


Design Procedure

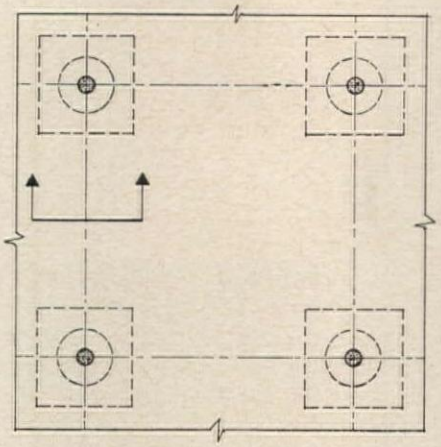
The design procedures originally developed for the system involved solving 100 panels of different span relationships, joists spacings and boundary conditions to obtain moments and shears at all critical sections. This data was used to prepare charts for the design of nearly all

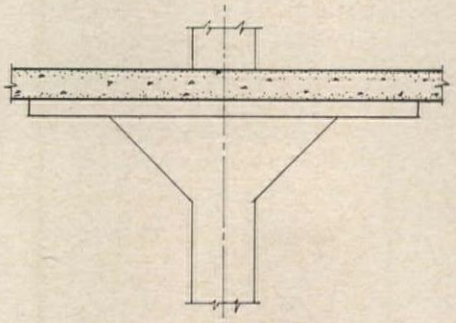
Reticular Cellular Construction



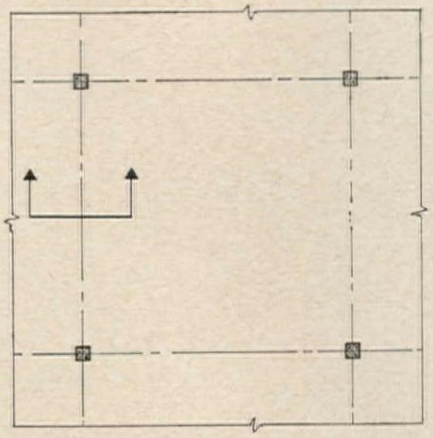


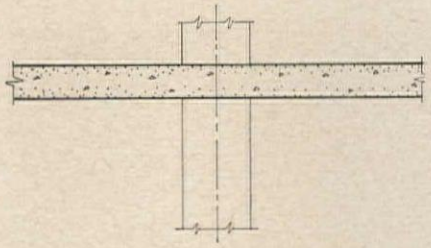
Flat Slab Construction



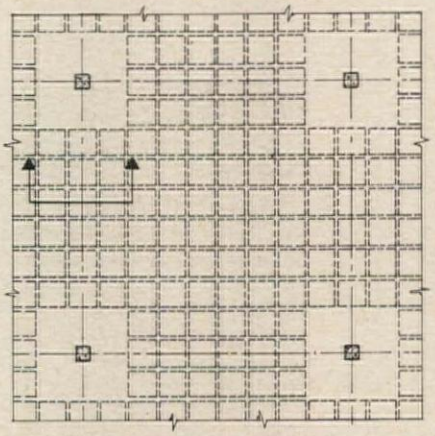


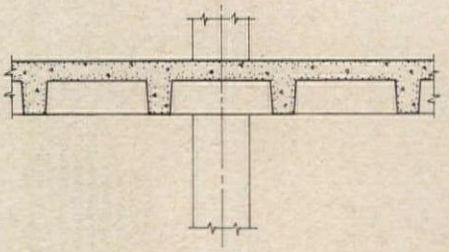
Flat Plate Construction

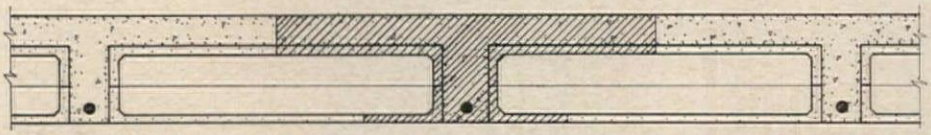




Waffle Slab Construction







Plans and sections compare the cellular concrete construction with the types of concrete floor slab systems now in use in the U. S. The cellular system combines many of the desirable structural characteristics of the other systems. The cross-section above indicates the composite section available for bending

conditions encountered in a framing plan. The range for use of these charts are: (1) ratio of panel width to length not more than 1:2; (2) ratio of joist separation to span from 1:4 to 1:10.

It has been determined, however, that the system can be designed conservatively by using the Building Code Requirements of the American Concrete Institute for Reinforced Concrete (A.C.I. 318-56 Proposed Revision) for the design of flat slabs or waffle slabs.

The design of the system is based on composite action between the precast cell and the poured-in-place concrete. Since the poured-in-place joists undergo normal shrinkage, the cells are subjected to biaxial compression. This, combined with the small amount of roughness produced during the fabrication process, provides the necessary bond for composite behavior.

The validity of the composite action has been verified by load deflection tests of the system.

Construction of the System

The framing required to form the slab may be either a flat deck or an open grid of shored timbers. The cells are placed in a grid pattern after which the reinforcing is placed.

Advantages

The advantages of this system are:

1. High load capacity
2. Long spans
3. Freedom of column location
4. Flat structural ceiling free of beams or drop panels
5. Light weight
6. Low deflection because of the reduced weight and greater stiffness
7. Fire resistance
8. Speed of erection
9. Possibility of post-tensioning
10. Reduction in reinforcing steel

Special precast cells to fit unusual conditions such as buildings curved in plan can be produced with relatively little extra cost. These might be triangular, trapezoidal, radial, segmental, etc.

The use of standard or special cells is not limited to flat slabs. They can be used in large hyperbolic paraboloid shells where buckling is critical for the usual 3 or 4 in. of shell thickness.

SUMMER COOLING FOR CHURCH SANCTUARIES

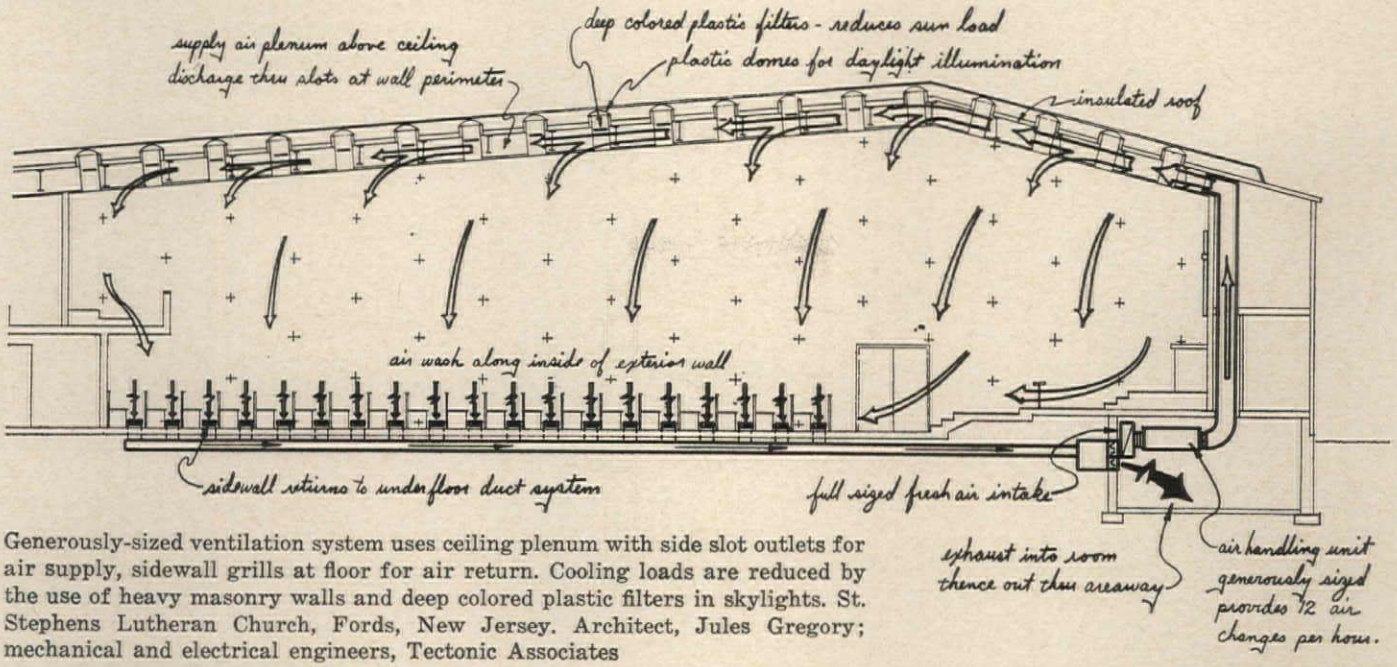
By R. A. Hanle, Partner, Tectonic Associates, Consulting Engineers

The decision whether or not to air condition a church sanctuary is a serious one in view of the great need for maximum space at minimum cost. Although many new churches are ultimately built without air conditioning, the question is almost always raised during planning stages by either the clergy or the architect. The case for or against air conditioning of church school rooms, auxiliary facilities and offices is more clear-cut and is made along conventional lines for those kinds of spaces. The sanctuary, however, poses special problems in size, cost and occupancy.

Sanctuary air conditioning, acknowledged as desirable, is frequently postponed "to be provided in the future" which, in too many cases, never seems to arrive. This treatment gives a far from optimum solution, since proper execution of the design would require that the architect plan the whole building as though it were going to be air conditioned initially.

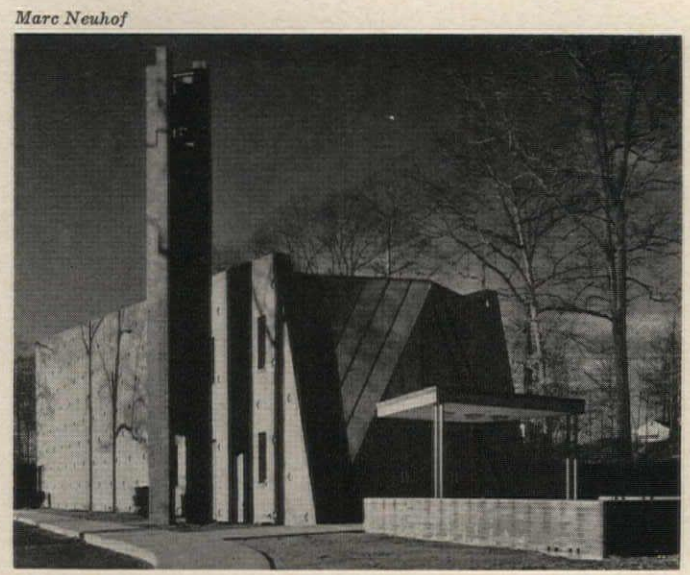
Even where air conditioning seems financially out of the question, it should be considered for several important reasons: (1) sanctuary use factors are higher than ever before and will almost certainly increase in the future; (2) people are beginning to expect, and many may soon insist upon air conditioning in all public places; (3) interference with services by noise and dirt which enter through open windows is less and less tolerable; (4) the environment for worship can be seriously hampered by open windows.

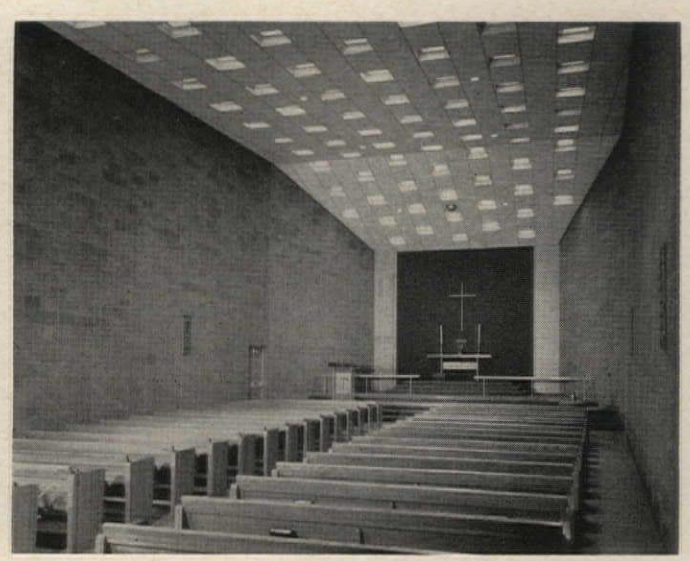
Operating windows are almost never an asset to a church interior. As a ventilation device they are limited in both temperature control and air distribution. Their operation during services is distracting. Dependence upon them limits the placement

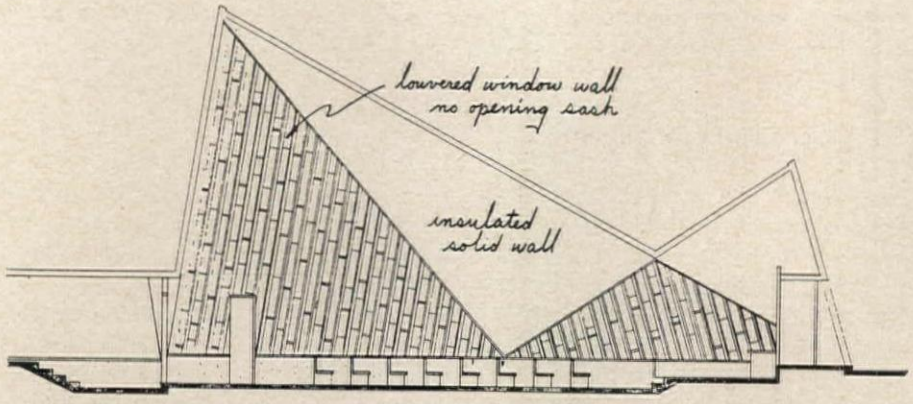


Generously-sized ventilation system uses ceiling plenum with side slot outlets for air supply, sidewall grills at floor for air return. Cooling loads are reduced by the use of heavy masonry walls and deep colored plastic filters in skylights. St. Stephens Lutheran Church, Fords, New Jersey. Architect, Jules Gregory; mechanical and electrical engineers, Tectonic Associates

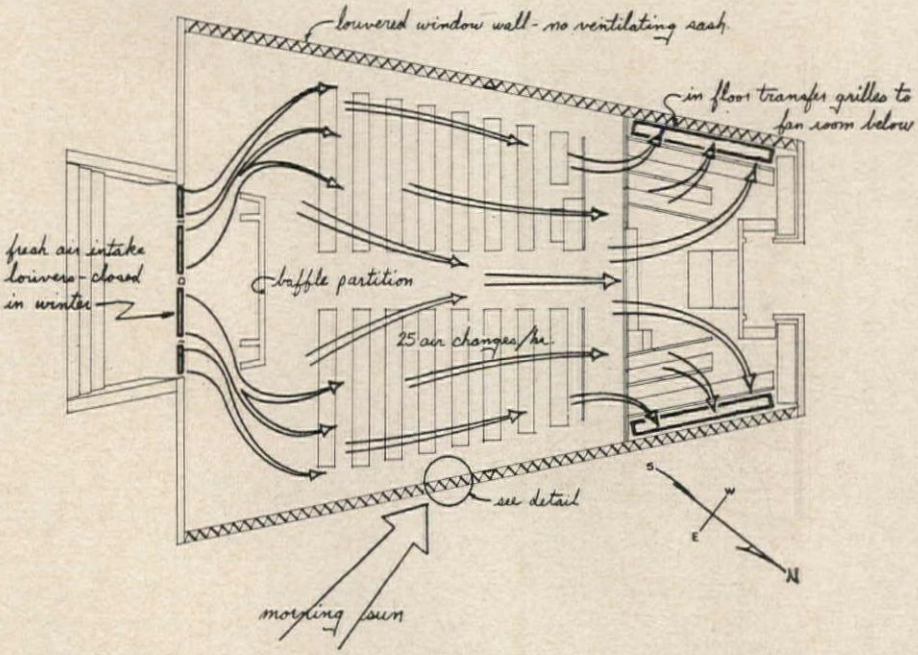
Marc Neuhof



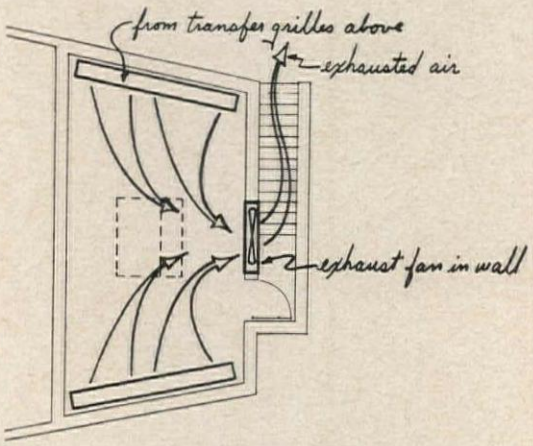




Designed originally with heavy-duty warm air system to permit controlled circulation of ventilation air in summer, this church was built with a commercial quality year-round air-conditioning system within the original budget. Sand Hills Presbyterian Church, South Brunswick, New Jersey. Architect, Jules Gregory; mechanical and electrical engineers, Tectonic Associates



Flow diagram of mechanical air circulating scheme as originally planned for Sands Hills Church



Fan room for original circulating scheme

of glass and proscribes an important architectural tool inherent in the dramatic and controlled use of natural light. Even where traditional fenestration is acceptable and natural lighting is controlled by stained glass, the open sash interferes significantly with the lighting desired.

Cooling by massive mechanical air movement on a principle similar to the attic fan might be considered as a low-cost alternative to air conditioning. With such a system, the practically negligible added first cost can be offset, even to the extent of reducing over-all building costs, by savings in fenestration costs.

Proper application of mechanical ventilation requires a controlled air velocity of some 50 fpm across each occupant. This stipulation plus the control of fan noise and elimination of drafts at candle locations are basic design criteria implying that control of air flow pattern is important.

Summer operation of fans associated with a standard warm air heating system will not do the cooling job for two reasons: (1) such systems move only about half enough air; (2) they are designed to avoid drafts on occupants whereas air cooling actually depends upon air movement at the occupant to be effective.

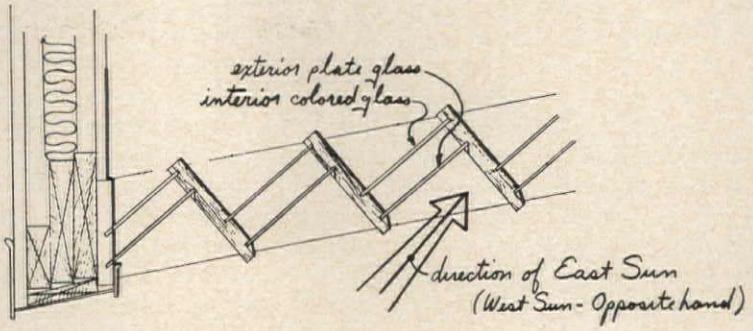
There are, however, situations where quite comfortable conditions can be maintained using only the winter air circulating system, provided the following favorable factors exist: (1) summer night temperatures are generally cool—in the 70's; (2) ducts and fans are amply sized for generous circulation; (3) the structure is designed to reduce external cooling loads by use of well-insulated walls, sun control at glass, massive construction to promote lag in morning warm-up, etc.

These favorable factors, especially the latter two, will substantially determine whether the added cost of mechanically refrigerated air conditioning will be major or minor. Other factors tending to reduce air conditioning costs are: (1) acceptable life expectancy of the equipment, which may permit use of residential or commercial grades rather than the more durable, but more expensive, institutional quality; and (2) the engineer's adroitness in taking advantage of the particular load and occupancy characteristics of churches to keep his cooling equipment sizes within reasonable bounds.

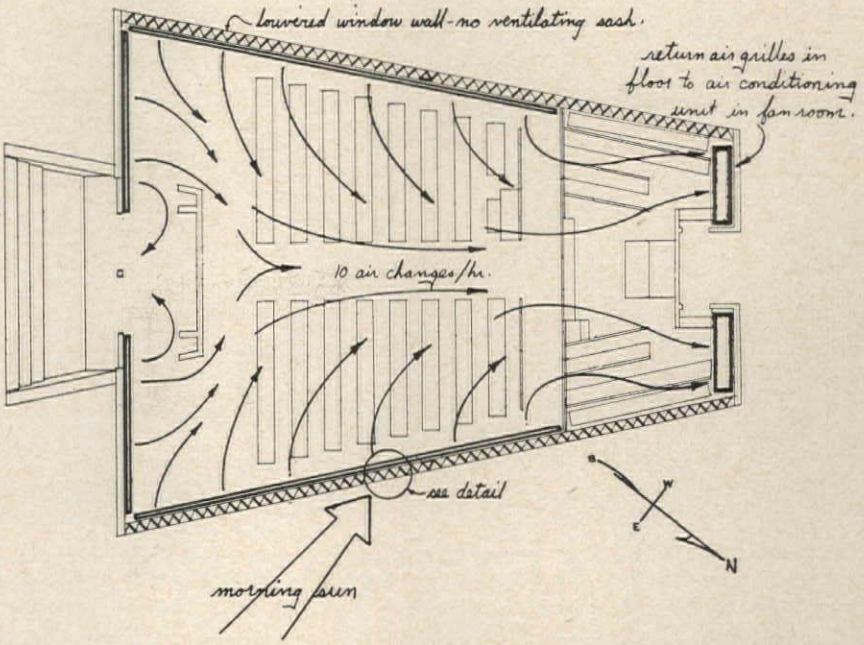
Some general suggestions applicable to church cooling load calculations are as follows:

1. High ceilings help the cooling problem, but the engineer should not include the full volume of the upper space in computing cooling load. Cool air stays in the lower strata, and full recirculation of upper air is not required.
2. A church having only one or two morning services should be considered as a "batch" cooling operation, taking advantage of building lag, pre-cooling, cold storage and an acceptable temperature rise toward the end of the occupied period. The straight application of standard factors to a steady-flow heat balance will generally require larger cooling equipment than is actually needed.
3. A cooling load calculated for morning occupancy will not be as large as one based on peak external load conditions.
4. Churches frequently have large pitched roof surfaces, an ideal situation for the use of roof sprinklers at the ridge line.
5. A system which provides for massive air movement lends itself to precooling with night air. Automatic clock control should be provided.
6. Equipment should be selected for low maintenance even though higher horsepower would increase energy consumption during the few hours of its use.
7. If auxiliary buildings are air conditioned, consider the possibility of diverting use of their refrigerating equipment to the sanctuary for Sunday services on an either/or basis.

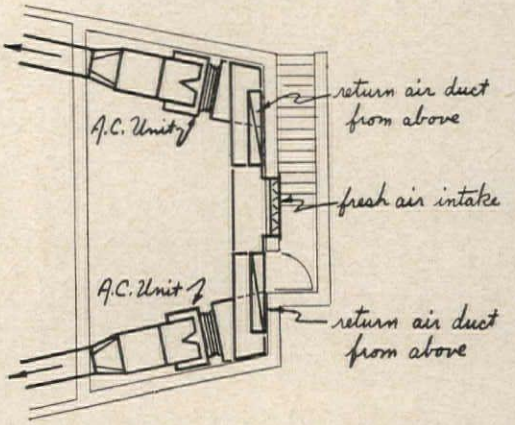
The Sands Hills Church illustrated here demonstrates some of the principles outlined. In this case, the added cost of commercial grade air conditioning equipment over the first proposed heavier duty system for warm air heating only was relatively small. In fact it added nothing, considering that the architect was able to plan for it in early stages of design and eliminated the use of any opening sash. Furthermore, he was able to design his window wall for sun control without other restrictions. Diagrams illustrate some of the basic differences between the mechanical air circulating system and the refrigerated air-conditioning system. A combination warm air heating and summer circulating air system is shown in the diagram of St. Stephens Lutheran Church.



Window wall detail



Flow diagram for air-conditioning system as installed at Sands Hills Church



Fan room for air-conditioning scheme

METAL SHIELDING USED AS WALL FORM

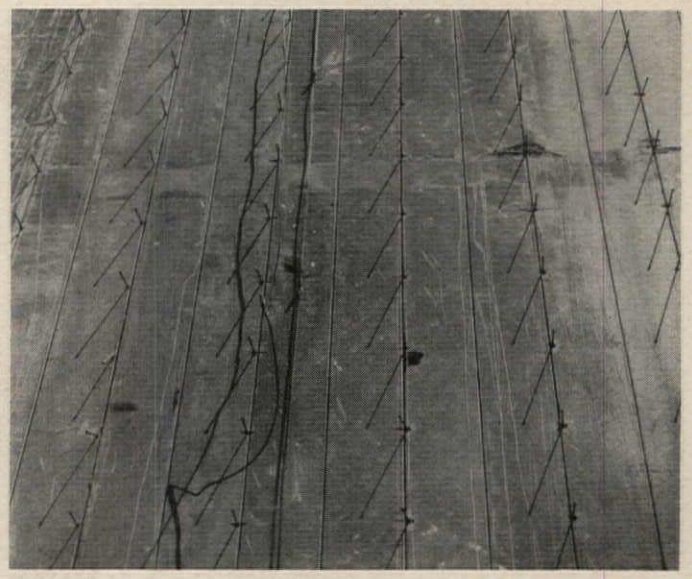
In the development of the Army's Nike Zeus anti-missile system, Bell Telephone Laboratories' engineers at the White Sands Missile Range were faced with the problem of completely sheathing in metal a concrete building designed to house sensitive electronic equipment. The metal shield was needed to protect the housed equipment from interference caused by high-energy radar beams.

Chief architect Emil J. Szendy of Burns and Roe, New York, engineering consultants on the Zeus project, thought of using a steel exterior form and simply leaving it in place after the concrete had set. He found that he could use vertical, 30-foot-long, flanged, 14-gage steel sheets, each 12 inches wide, erected in interlocked palisade formation as the outside form for the 30-foot-high concrete wall. A conventional wooden inside form was attached to the exterior steel form by steel tie rods bolted to the interlocked steel flanges at 2-foot vertical intervals the full height of the wall.

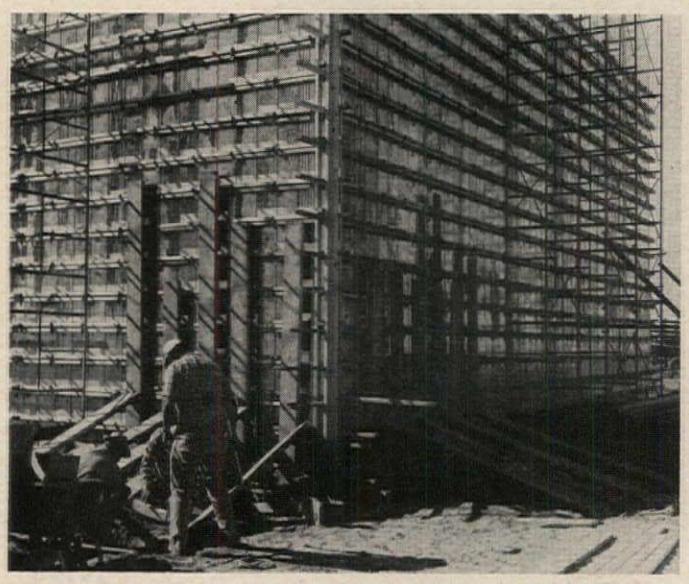
Temporary steel stud bolts were welded to the outside of the steel sheets adjacent to the ribs for tying on exterior stiffening walers. The concrete was poured from the inside. After the concrete had set it was a simple matter merely to remove the inside form, break off the snap ties and patch the concrete, leaving the metal outside form functioning as metal cladding.

The temporary steel stud bolts on the outside were knocked off and the scars welded at the same time the joints between vertical metal strips were sealed by welding. Metal cladding simply laid on top of the concrete slab roof was joined to the wall cladding also by welding continuously around the perimeter.

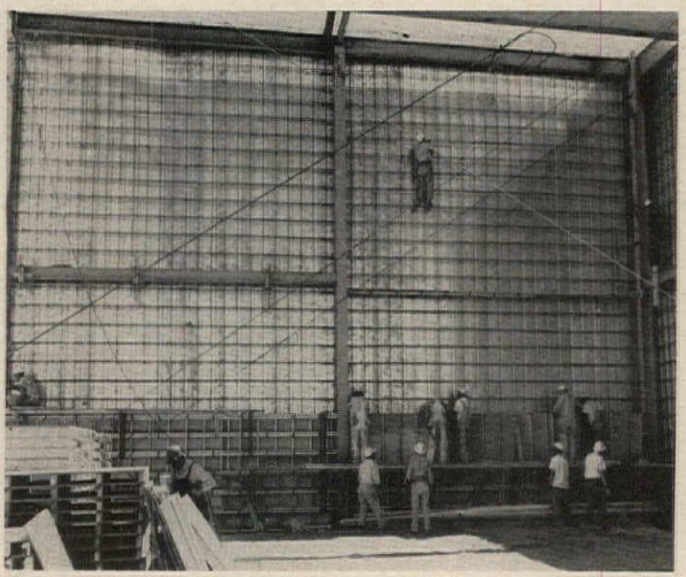
Removing stiffening walers from steel palisade used as form and left in place as sheathing for concrete wall. Section temporarily omitted is for access during construction



Detail of welded stud bolts to which walers were attached. As walers are removed, bolts are knocked off and scars are subsequently healed by welding

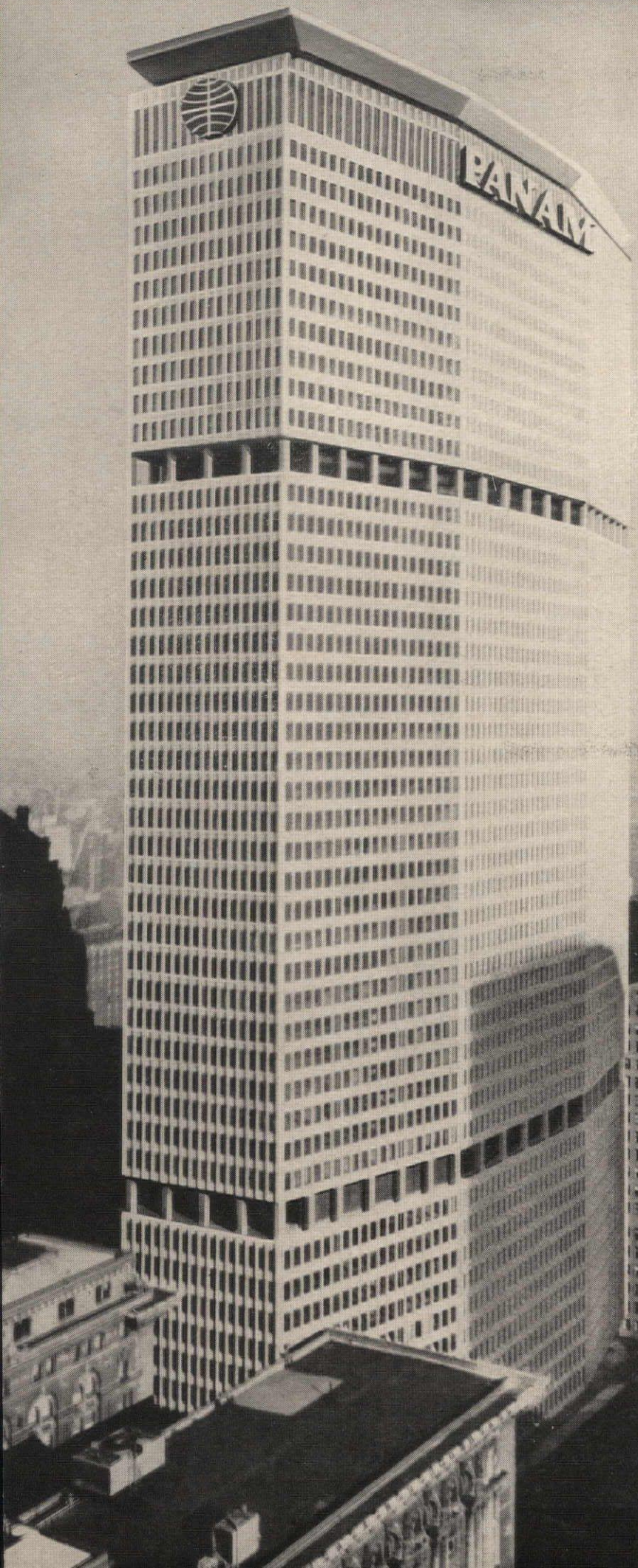


Shielding panels in place, supported by walers on outside and form ties on inside



Tying reinforcing steel and erecting interior wood forms in preparation for pouring concrete from inside building

THE F N SH NG TOUCH...
SCHLAGE LOCKS



This is the largest office building in the world . . . the Pan Am Building in New York.

Schlage Locks were selected to provide a lifetime of dependable, trouble free operation.

A special lock design was created to meet the specifications of Mr. Carl Morse, President of Diesel Construction Co., and is styled to match the unique design of the entire structure. Special finishes were utilized to complement the building's interior door installations.

Architects are Emery Roth & Sons; Contractor, Diesel Construction Co.; hardware was supplied by Beck-Guttman, Incorporated.

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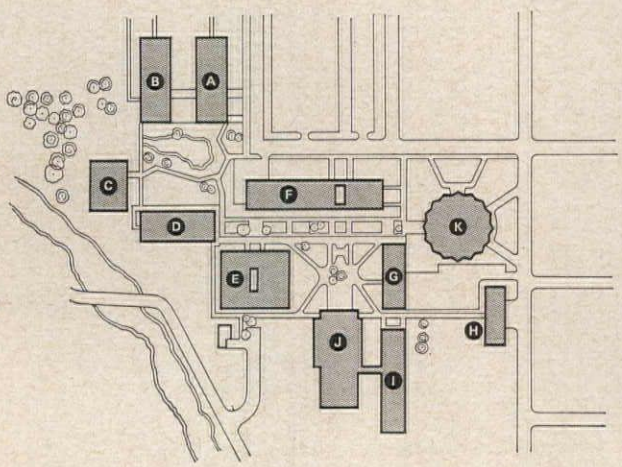
Why architects talk to total school air

San Angelo Central High School, San Angelo, Texas. Superintendent of Schools: G. B. Wadzeck. Architects and Engineers: Caudill, Rowlett, Scott. Associate Architect: Max D. Lovett.



A. Sophomore academic building
B. Junior academic building
C. Library
D. Senior academic building
E. All academic electives
F. Student center, administration
G. Music
H-I. Shops
J. Physical Education
K. Auditorium

How an 11-building, campus-type high school is heated and cooled with Trane central air conditioning

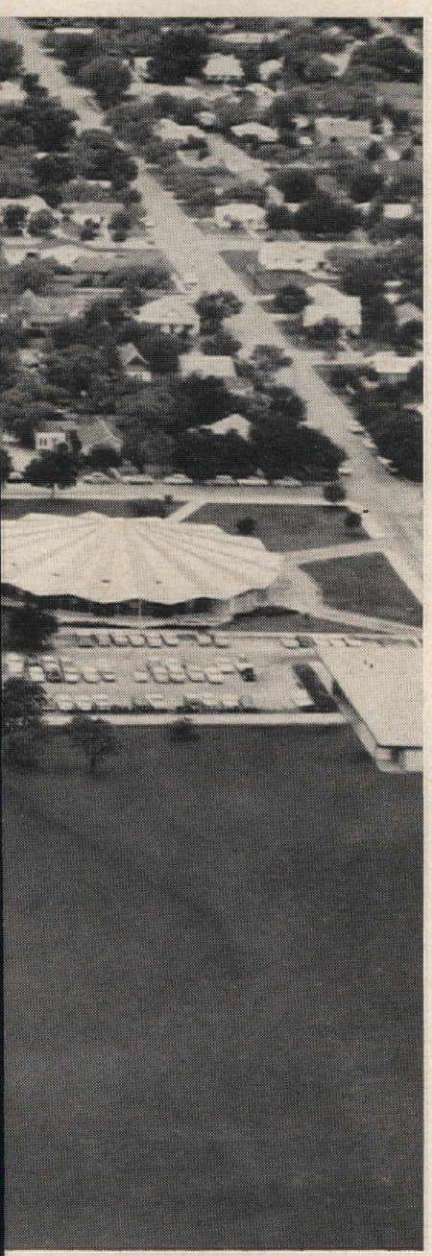
Completed in 1958, the San Angelo, Texas Central High School accommodates up to 2,000 students in an 11-building plant located on a rolling 30-acre site.

Because of its campus-type layout . . . with its varying design, exposure and student occupancy conditions . . . the San Angelo school represents a wide mix in air conditioning requirements.

Some areas require cooling at the same time others require heating.

To provide the right climate for learning throughout the school, two TRANE CenTraVacs®, with automatic capacity control, are used to chill the water for the system. Chilled or heated water, as required, is distributed through a network of piping running through underground tunnels around the campus. 33 TRANE Climate Changer air handling units distribute the conditioned air in as many zones throughout the school.

Trane for conditioning requirements



Providing total air conditioning for the schools you design requires specialists in the related fields of heating, cooling and ventilating. With Trane you can get all your answers from a single source. Here's why.

OUR BUSINESS IS PROVIDING CLIMATES TO ORDER

TRANE is one of the very few organizations of manufacturing engineers with depth of experience in all the related fields of total air conditioning . . . in heating, cooling and ventilating.

As specialists in this science of heat exchange, we manufacture equipment that's designed together to work together for maximum dependability and efficiency.

That's why TRANE equipment is selected for many complex air conditioning applications. For skyscrapers, jet planes and subway trains . . . homes, hotels and motels . . . ocean liners and railroad refrigerator cars . . . for schools and universities of many sizes, shapes and styles.

THERE ARE MANY WAYS TO AIR CONDITION, OR TO PROVIDE FOR FUTURE AIR CONDITIONING. ONE WAY IS BEST WITH YOUR PLANS!

Call your TRANE Sales Engineer early in the planning stages. He doesn't limit you to just one or two ways to air condition a school. For TRANE manufactures broad lines of many types of air conditioning equipment . . . to meet any requirement in any school. There's equipment that cools, heats and ventilates from the start. There's heating and ventilating equipment that lets you add cooling later . . . easily and economically . . . without classroom remodeling or additional piping.

Working with your TRANE Sales Engineer, you're free to pick-and-choose from these product lines and base your specifications entirely on *what's best with your plans!*

RESEARCH AND TESTING...KEY TO PRODUCT LEADERSHIP

Modern conditioning of air is a complex science . . . and TRANE has a multi-million-dollar laboratory devoted exclusively to the science of heat exchange.

Here constant research and testing result in new designs and new techniques to produce the kind of quality equipment you want in the schools you design.

LOCAL TRANE SERVICE FOR THE SCHOOLS YOU DESIGN

With TRANE there's the added assurance of on-the-spot service available from TRANE Offices in 113 major cities. Trained, experienced Service Engineers are on call to assure equipment performance for the life of the school.

FOR GREATER SCHOOL DESIGN FLEXIBILITY, plus the air conditioning that's best with your plans, contact your local TRANE Sales Office. Your TRANE Sales Engineer will be happy to give you specific information on the complete TRANE lines of school heating, cooling and ventilating equipment.

It's Trane for total school air conditioning requirements.

CENTRAVAC® (Centrifugal water chillers)—hermetic to 1350 tons; open to 2200 tons • ABSORPTION COLD GENERATORS—hermetic design, 100 to 1000 tons • RECIPROCATING COLD GENERATORS—sizes to 150 tons • CENTRAL STATION AIR HANDLING UNITS—from 1200 to 47,000 cfm, 2 to 100 tons • PACKAGED AIR CONDITIONERS—2 to 60 tons • UNIT VENTILATORS—for steam, hot water, chilled water or electric heating, 2 heights, 28 and 32 inches • INDUCTION UNITRANE—16 models • WALL-FIN CONVECTORS • UNIT HEATERS • TORRIVENTS • FORCE-FLO HEATERS

TRANE

FOR ANY AIR CONDITION

MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING, VENTILATING AND HEAT TRANSFER EQUIPMENT

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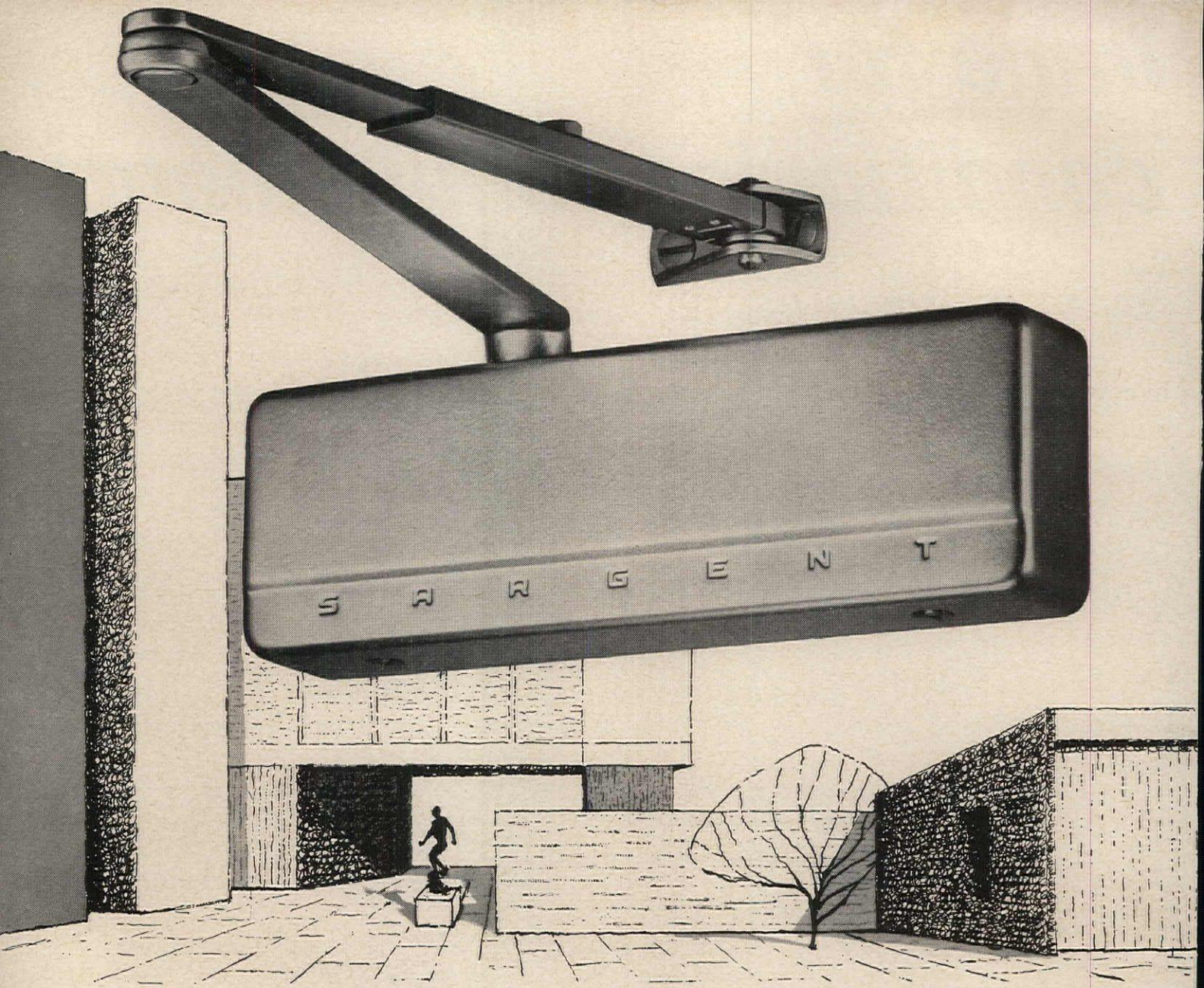
Clarksville Mfg. Plant, Clarksville, Tenn. • Salt Lake Mfg. Plant, Salt Lake, Utah
Trane Company of Canada, Limited, Toronto • 113 U.S. and 20 Canadian Offices.

For more data, circle 57 on Inquiry Card



Over tomorrow's threshold: today's door closers from Sargent

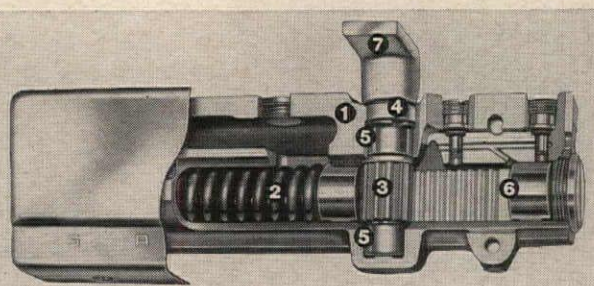
With the sleek geometric lines of the Sargent Powerglide, architects now have a fully matched, fully contemporary line of door closers — one for every conceivable type of closing application, for any door — interior or exterior, metal or wood. Now modern interiors retain their design simplicity . . . with Powerglide's simple grace belying its heavy-duty dependability.

Under Powerglide's trim rectangular case lies a horizontal hydraulic workhorse — the simplest, strongest, smoothest closing mechanism you can specify. Powerglide's action is controlled power — it eases the heaviest door to its jamb, silently, surely.

Where reliable door closer performance is important, specify Sargent — your single source of responsibility for quality closers, locksets, exit devices and other safety hardware. See your Sargent hardware supplier, or write Sargent & Company, New Haven 9, Connecticut.

SARGENT

The newest fashion in a complete line of architectural hardware



Part for part, the Powerglide closer does a bigger job better:

1 Cast iron case holds greater pressure, assures longer life **2** Heavier spring . . . longer chamber . . . less stress **3** One-piece spindle with induction hardened bearing surfaces **4** Spring-loaded lip type shaft seal — prevents leaking **5** Line bored bearing seats for perfect alignment **6** Precision ground pinion rack — double spring and plunger models for heavier door **7** Forged steel arms

For more data, circle 58 on Inquiry Card

SCHOOL FLOORS WARMED BY ELECTRIC HEATING

Electric cable heats concrete floor slabs in Chicago kindergartens. Slab surface is kept at 72 degrees by control device measuring slab temperature. Timer programs operating hours

By Robert E. Barnes

Use of concrete slab construction for schools has intensified an old problem—how to keep kindergarten children warm while they are lying, sitting or playing on the floor. Architects and engineers of the Chicago school system determined some time ago that the proper solution was to heat the slab. After design and trial of various systems they have come up with a slab heating system which is economical, virtually free of maintenance problems and completely automatic.

At first school board engineers tried heating the floors by circulating hot water or steam from the main heating plant through pipes located either in or beneath the slab. But this method was abandoned because of cost and temperature control considerations. The designers then decided to heat the slab electrically. An electric system could be separate from the main heating plant and could be independently controlled. In addition, heating cables are relatively easily installed.

School board engineers, concerned with operating cost, decided to devise means to insure that the heating elements would heat only the slab, not the room too. This, they reasoned, could be done by keeping the floor temperature slightly below that of the room air so that any heat transfer between them would be into, not out from, the slab.

To do this, it was obvious that a separate floor thermostat would be necessary and that its sensing element would have to be buried right in the slab itself. However, for purposes of adjustment and maintenance, the control instrument itself

Children can sit comfortably on the floor even at zero degree outside temperatures. Slab is electrically heated to a temperature of 3 F below that of the room air

Thermistor probe which senses slab temperature is connected by ordinary electric wires run through conduit beneath slab to remote temperature controllers

ROBERT E. BARNES, sales engineer, Fenwall, Incorporated

should be accessible. The Chicago School Board's Electrical and Mechanical Bureaus of the Department of Operation Services turned to industrial temperature control instruments capable of sensing temperatures at remote locations.

Initially a bulb-and-capillary type of control was selected. Although the least expensive of the available temperature controllers capable of remote operation, it presented installation and maintenance problems.

The problem was solved through use of an electronic temperature controller employing a thermistor sensing element. The thermistor probe is connected to the control instrument by ordinary electric wires which can be permanently installed in the roughed-in conduit before the final concrete pour. After the floor is poured, the thermistor probe is installed in a specially designed junction box and connected to the leads extending from the conduit.

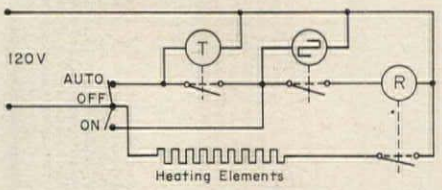
If required the thermistor probe can be easily removed and replaced by merely opening the floor box and disconnecting the lead wires. The controller itself is easily accessible in a wall box.

System Installation

To install the floor heating system, kindergarten floor slabs are made in two pours. First the base slab is poured to 2 in. below finishing level. Nylon-sheathed radiant heating cable is arranged on top of this subslab to provide 3 watts for each sq ft of floor area. To equalize the temperature throughout, the floor is divided into separate 500-sq-ft heating zones, each with its own heating and control circuit. This usually means two heating circuits per kindergarten.

Floor-type junction boxes of the type commonly used for microphone receptacles are also installed at this time. These boxes are modified to receive the thermistor probe. A 5-in. length aluminum rod is screwed into one side of the box and is provided with a 3/16-in. diameter, 3-in.-deep hole at the threaded end to receive the 3-in.-long stainless steel thermistor probe. The aluminum slug serves as a protective well for the probe and also provides greater surface area in contact with the concrete to improve the probe's ability to sense slab temperatures. The floor box is located so that its waterproof, hinged cover is flush with the asphalt tile floor. This also insures that the aluminum rod will be topped by at least 1-in. of concrete. One-half in. electrical conduit is layed from the

Wall-mounted box contains slab heating controls. Operation is programed by timer (T) which turns on power before start of school and off before dismissal. When slab temperature is below set point, control applies power to relay



box to the edge of the slab, lead wires are installed in the conduit, the top 2-in. layer of concrete is poured and floor tiles are layed.

The temperature controllers are mounted, usually two per kindergarten, in a wall box along with the room thermostat. These compact, transistorized control units measure only 6½ by 4 by 4 in. They are equipped with calibrated knobs to permit adjustment of the set point from 65 to 80 F. Sensitive to 0.1 F changes in temperature, they insure accurate control of slab temperature.

Automatic Operation

The floor heating system operates entirely automatically. Slab heat is programed by a timer which is tied in with the master clock system.

In this manner, slab heat can be turned on at a predetermined time before school begins in the morning to bring the floor up to temperature by the time the pupils arrive, and turned off again automatically when school is dismissed. Experience in Chicago indicates that heat should be applied about two hours before school starts and can be cut off about an hour before dismissal. The program provides for complete shut off during weekends, and an override switch is provided to bypass the timer permitting the floor to be heated during off-hour activities.

When called for by the timer or when the switch is in the manual position, the thermistor controller assumes complete control of the heating cycle. Changes in temperature of the slab are reflected as changes in electrical resistance of the thermistor bead located in the tip of the probe. When the signal from the thermistor indicates that the desired slab temperature has been reached, the contacts open in the controller removing power from the solenoid of a 30 amp power relay in the heater circuit. (See schematic.) When slab temperature drops below a set point, the controller's contacts close again energizing the power relay solenoid to close its contacts and reapply power to the heating elements.

Room temperature, of course, is controlled by a conventional wall thermostat. Room thermostats are normally set at 75 F, and the normal setting of the slab temperature controller is 72 F. Thus the slab temperature should always remain below that of room air so that the electric heat is not used in heating the room except to the extent that it reduces the heat loss from air to the slab.

Cost of operation of electric floor heat is small. With slabs poured directly on grade, power consumption is at a rate of 1½ kilowatts per heat zone per hour, providing a maximum total daily consumption of 24 kwh per kindergarten day.

For more information circle selected item numbers on Readers Service Inquiry Card, pages 183-184

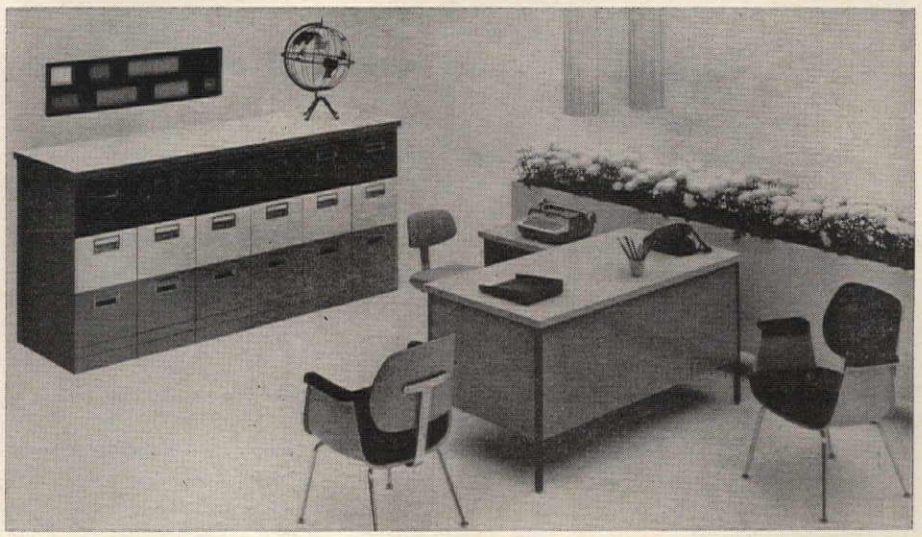
STANDARD FURNITURE FOR PLANNING CUSTOM OFFICES

Customized office interiors can be designed using standard furniture accessories from Steelcase Inc. Furniture styles for executive, secretarial, clerical and reception areas offer quality and beauty as well as convenience. Proper planning allows complete furniture flexibility—units can be interchanged between different offices while maintaining a uniform furnishing and color appearance from one office to another.

Furniture is available in 23 colors, including seven accent colors for desk accessories. Nylon fabric is offered in 14 colors; wool fabric in 11. Leather and vinyl upholstery are other choices. Filing cabinets, available in five colors, can be coordinated with the rest of the office.

Desks have such functional features as a suspension file drawer and a sliding reference shelf with a hinged cover of *Plexiglas*. Sound-deadening construction helps contribute to a quieter working environment. Desk tops have one-piece construction, with either plastic laminates or walnut available. Modular units allow formation of credenzas with a variety of forms. In addition to sofas and chairs for reception rooms, matching tables are available. *Steelcase Inc., Grand Rapids, Mich.*

CIRCLE 300 ON INQUIRY CARD



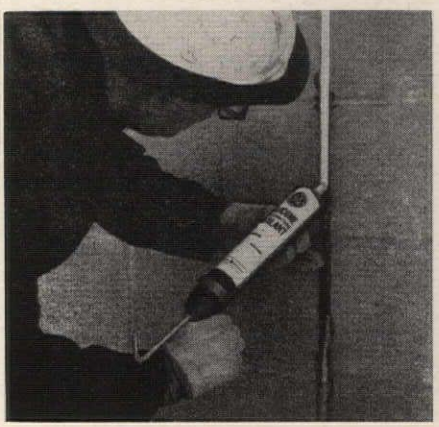
AIR-SETTING SILICONE SEALANT NEEDS NO MIXING

A one-part silicone rubber compound for all types of construction sealing is so durable that General Electric backs it with a five-year warranty. The warranty states the sealant will not become brittle or crack when exposed to weather, temperatures from −65 to 200 deg F, and expansion and contraction up to its ultimate elongation of 400 per cent.

The sealant is available in five standard colors, including translucent, and comes in standard cartridges and in bulk. Due to its soft texture the material may be applied at temperatures from 0 to 120 deg F. It is applied as a soft paste and sets in air to a durable rubber, bonding to most construction materials without a primer. Application time is short since there is no mixing, and the silicone compound is easy to clean up. It will not stain masonry, including light-colored materials such as marble, concrete and limestone. *General Electric Co., Silicone Products Dept., Waterford, N.Y.*

CIRCLE 301 ON INQUIRY CARD

more products on page 176



Office Literature

For more information circle selected item numbers on Reader Service Inquiry Card, pages 183-184

FIRE-PROTECTED WOOD

Non-Com fire-protected wood, which is also resistant to termites, decay and corrosion, is described in folder. *Koppers Co. Inc., Wood Preserving Div., 750 Koppers Bldg., Pittsburgh 19, Pa.**

CIRCLE 400 ON INQUIRY CARD

ADHESIVES, COATINGS

A 16-page catalog of adhesives, sealers and coatings includes new products such as a fast-drying contact cement and a white latex base vinyl and rubber tile cement. *The W. W. Henry Co., 5731 Bickett St., Huntington Park, Calif.*

CIRCLE 401 ON INQUIRY CARD

PANELS AND DOORS

(A.I.A. 19-E-1) Two 16-page booklets give detailed information needed to specify custom-made plywood panels and solid core doors. *Eggers Plywood Co., Two Rivers, Wis.*

CIRCLE 402 ON INQUIRY CARD

WOOD PARTICLE BOARD

(A.I.A. 19-F-1) Properties and advantages of *Timblend* wood particle board are given in a 16-page booklet that includes pictures of various uses. The eight different types are described, with sizes and specifications. *Weyerhaeuser Co., Box B, Tacoma 1, Wash.*

CIRCLE 403 ON INQUIRY CARD

LIGHTING FIXTURES

A loose-leaf notebook of data sheets on lighting fixtures has sections on indirect fluorescent, surface fluorescent, wall mounted fluorescent, large area incandescent, utility incandescent, outdoor lighting and prices. *Silvray Lighting, Inc., 100 W. Main St., Bound Brook, N.J.*

CIRCLE 404 ON INQUIRY CARD

CABINETS AND SHELVES

(A.I.A. 35-B) *Ebco* modular cabinets and book shelving of plywood and maple are described. *Ebenreiter Woodworking Co., Sheboygan, Wis.*

CIRCLE 405 ON INQUIRY CARD

DESIGNS WITH FLAT GLASS

(A.I.A. 26-A) Eight new buildings are illustrated in a 12-page booklet, "Creative Ideas in Glass." Inserted is a data sheet on *Supratest* laminated safety glass which is available in three colors. *American Saint Gobain, Box 929, Kingsport, Tenn.**

CIRCLE 406 ON INQUIRY CARD

SLIDING WINDOWS

Classic series windows with insulating glass have interior vinyl frost barrier and woven pile weather stripping. Folder gives types and sizes of the aluminum frame windows available. *Thermelite, 39 James St., Girard, Ohio*

CIRCLE 407 ON INQUIRY CARD

FLOORING MANUAL

Products and designs introduced during the past year are included in the 1963 flooring specification manual, a hard-bound book with 108 pages. *Congoleum-Nairn Inc., 666 Fifth Ave., New York 19, N.Y.*

CIRCLE 408 ON INQUIRY CARD

FABRIC VERTICAL LOUVERS

Custom-made vertical louvers made of vinyl-impregnated fabrics are described and illustrated in folder. *Elkirt Corp., 1500-02 Illinois St., Des Moines, Iowa**

CIRCLE 409 ON INQUIRY CARD

COLORFUL CONCRETE BLOCK

Acoustical structural concrete blocks with permanent glazed color finish are described in folder. *Eastern Glazed Products Co., Route 122, Shoemakersville, Pa.*

CIRCLE 410 ON INQUIRY CARD

SOUND CONTROL

"Principles of Architectural Sound Control" is an eight-page booklet, designed as a working handbook to help identify and solve various kinds of acoustical problems. *Amerada Glass Corp., 3301 S. Prairie Ave., Chicago 16, Ill.**

CIRCLE 411 ON INQUIRY CARD

HIGH-STRENGTH STEEL

(A.I.A. 13-A) Folder gives details on using *Cor-Ten* high-strength, low-alloy steel for architectural applications. Through weathering, this steel acquires an oxide coating which eliminates need for painting. *U.S. Steel Corp., 525 William Penn Place, Pittsburgh, Pa.*

CIRCLE 412 ON INQUIRY CARD

ADJACENT PARKING

Sample plans by architect William Lescaze show how *Speed-Park* automated parking system may be built adjacent to office buildings, motels, stores, etc. *Speed-Park, Inc., 140 East 57th St., New York 22, N.Y.*

CIRCLE 413 ON INQUIRY CARD

STRUCTURAL GASKETS

(A.I.A. 17-J) Complete specifications and details on physical properties for curtain wall "zipper type" gaskets are given in a 24-page illustrated booklet. *F. H. Maloney Co., Box 1777, Houston 1, Tex.*

CIRCLE 414 ON INQUIRY CARD

COLORFUL PAINTS

Six-page folder has case studies on the effective use of colors in painting chapels, libraries, hospitals, motels, high schools and airports. *Pratt & Lambert, Inc., 75 Tonawanda St., Buffalo 7, N.Y.*

CIRCLE 415 ON INQUIRY CARD

COMMUNICATIONS SYSTEMS

Separate brochures give information about internal communications systems for apartment buildings, industrial buildings, religious buildings and schools; intercom/program systems; private automatic telephone systems; communications systems for hospitals and nursing homes, and audio-visual nurses' call system. *DuKane Corp., Communications Systems Div., St. Charles, Ill.*

CIRCLE 416 ON INQUIRY CARD

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

more literature on page 222

Accent on VALUE

DIMMING DIMMING DIMMING DIMMING DIMMING

Fluorescent Comes of Age!

A compact, reliable system

Now, there is a fluorescent dimming system that is simple and compact . . . requires very little installation beyond normal mounting of lighting fixtures . . . and has demonstrated its reliability and highly satisfactory performance in installations from coast-to-coast.

It's General Electric's DS-5000 fluorescent dimming system, specifically designed and engineered for commercial and institutional applications: conference rooms, offices, auditoriums, restaurants, churches, schools . . . anywhere there is a need or desire to vary light intensity.

(We also make the DS-3000, a high-performance fluorescent dimming system for residential applications. If your interest lies in this area, be sure to check GEA-7351 on the return coupon.)

Controls up to 600 lamps

General Electric's DS-5000 system controls up to 600 F-40 rapid-start lamps over a wide dimming range—from full brightness down to 0.3% of maximum light intensity. Lamps operate at full 90-percent light output at maximum intensity setting.

Smooth performance

All lamps in the system start quickly at any intensity setting . . . dim and brighten smoothly in complete unison, without steps or flicker . . . and operate with stability even at lowest settings.

Responsibility for control components

All control components of the DS-5000 system are designed, manufactured and warranted by General Electric. They include (see photo): (A) a dimming ballast for each lamp; (B) a dimming auxiliary for every six dimming ballasts; (C) an intensity selector which controls up to 100 auxiliaries and 600 lamps.

(Incidentally, this is the first time a single manufacturer has assumed warranty responsibility for all control components in a commercial fluorescent dimming system.)

Easy installation

Simply install the fixtures, which include the dimming auxiliaries and ballasts. Mount the intensity selector in a standard, three-gang wall box, and connect to the dimming auxiliaries. It's that easy!

Multi-point control

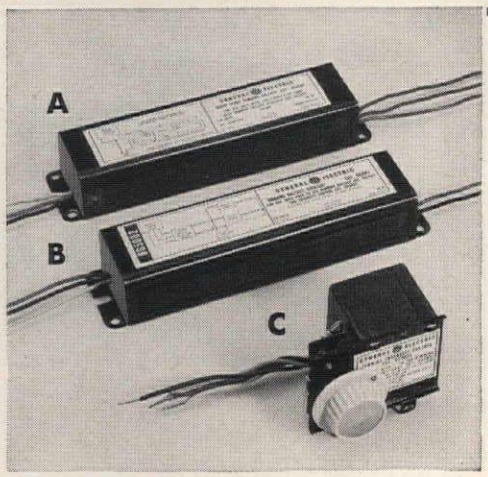
If desired, relays permit operation from more than one location. Additional relays allow lamp load to be split and sections to be controlled independently —especially desirable in rooms with folding partitions.

Availability

General Electric's DS-5000 fluorescent dimming system is included in the product lines of many leading fixture manufacturers. (Names upon request.)

For those who wish to convert existing lighting installations to dimming, components are available from General Electric Ballast Service Centers.

For further information and application assistance, contact your General Electric Components Sales Engineer. Or write today for our free dimming bulletins.



Section G403-06
Ballast Department
General Electric Company
1430 East Fairchild Street
Danville, Illinois

Please send me:

☐ GEA-7355, DS-5000 Fluorescent Dimming System for Commercial and Institutional Applications

☐ GEA-7351, DS-3000 Fluorescent Dimming System for Residential Applications

Name_____

Firm_____

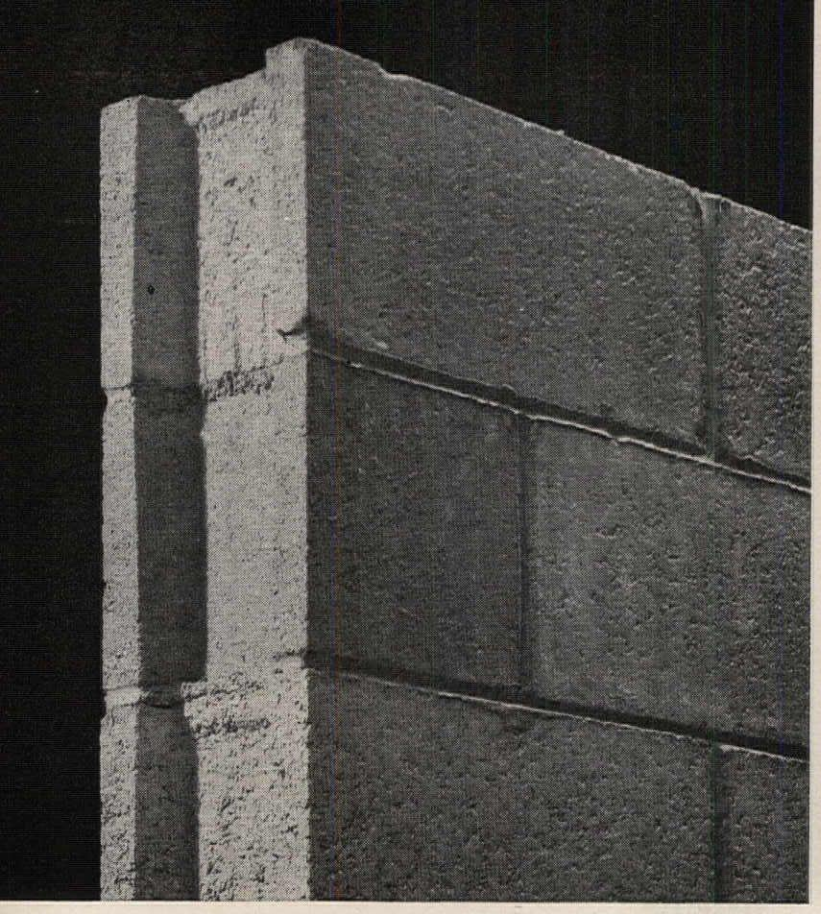
Address_____

City_____ Zone_____ State_____

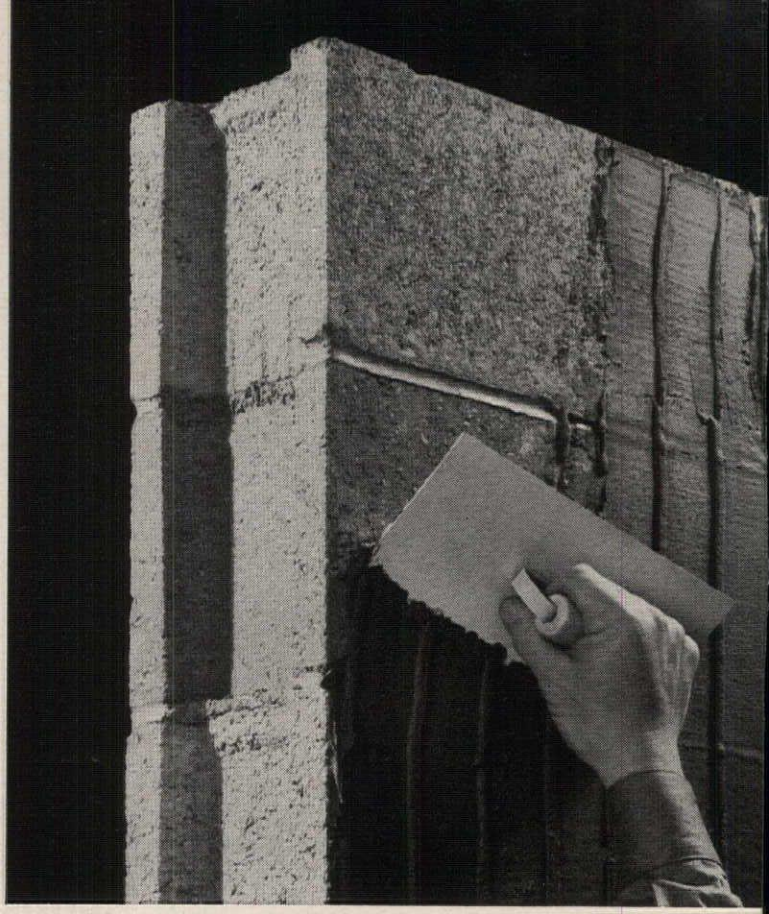
Progress Is Our Most Important Product

GENERAL ELECTRIC

For more data, circle 59 on Inquiry Card

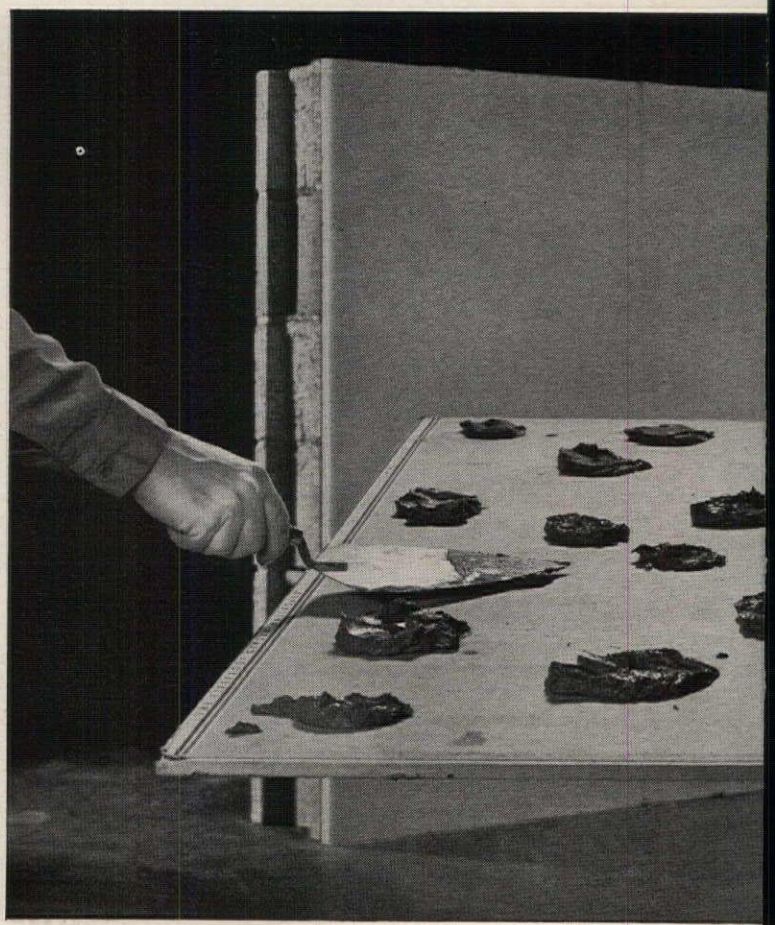


1. To insulate masonry walls *well:*



2. Start with Styrotac® bonding adhesive.

5. Take wallboard. (Forget the vapor barrier.)

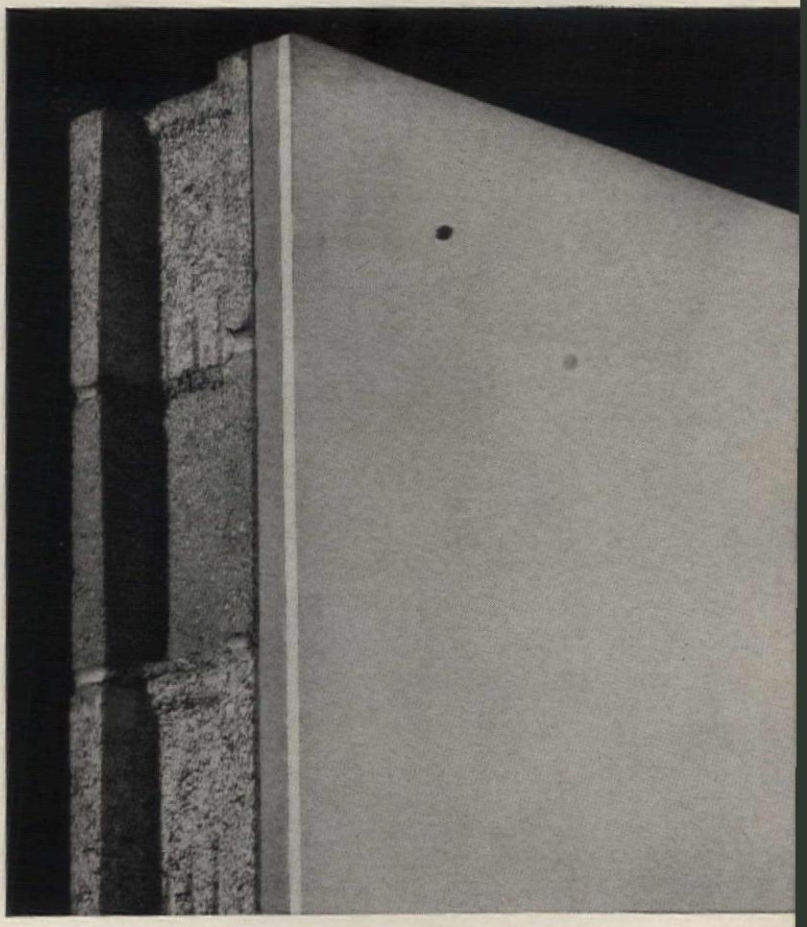


6. Styrotac goes on.

3. Specify Styrofoam® FR insulation board. It prevents moisture absorption and migration; keeps its low "k" factor (0.26!) *permanently*.

4. Styrofoam FR is pressed into place.

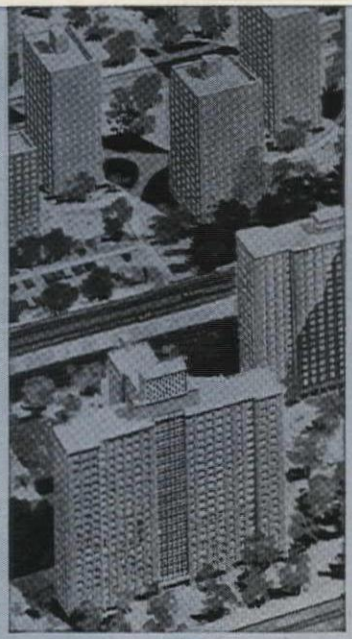
7. Wallboard goes up. Finished wall (8-in. cinder block, 1-in. Styrofoam FR) has U factor of 0.14.



8. Want more data? Consult our catalog in Sweet's Architectural File, or write: The Dow Chemical Company, Midland, Michigan.

DOW

For more data, circle 60 on Inquiry Card



■ Competitive bidding among six contractors for the Borgia Butler Housing Project proved the lower cost of monolithic reinforced concrete for this development type of construction. An estimated savings of $737,500 was realized over structural steel. ■ In most types of construction, a reasonable cost-savings can be obtained through the use of monolithic reinforced concrete. Before YOU build, be sure to compare costs—also the many timesaving and design advantages of this superior structural method. Write for the new booklet entitled "The Economic Advantages of Reinforced Concrete Building Construction."

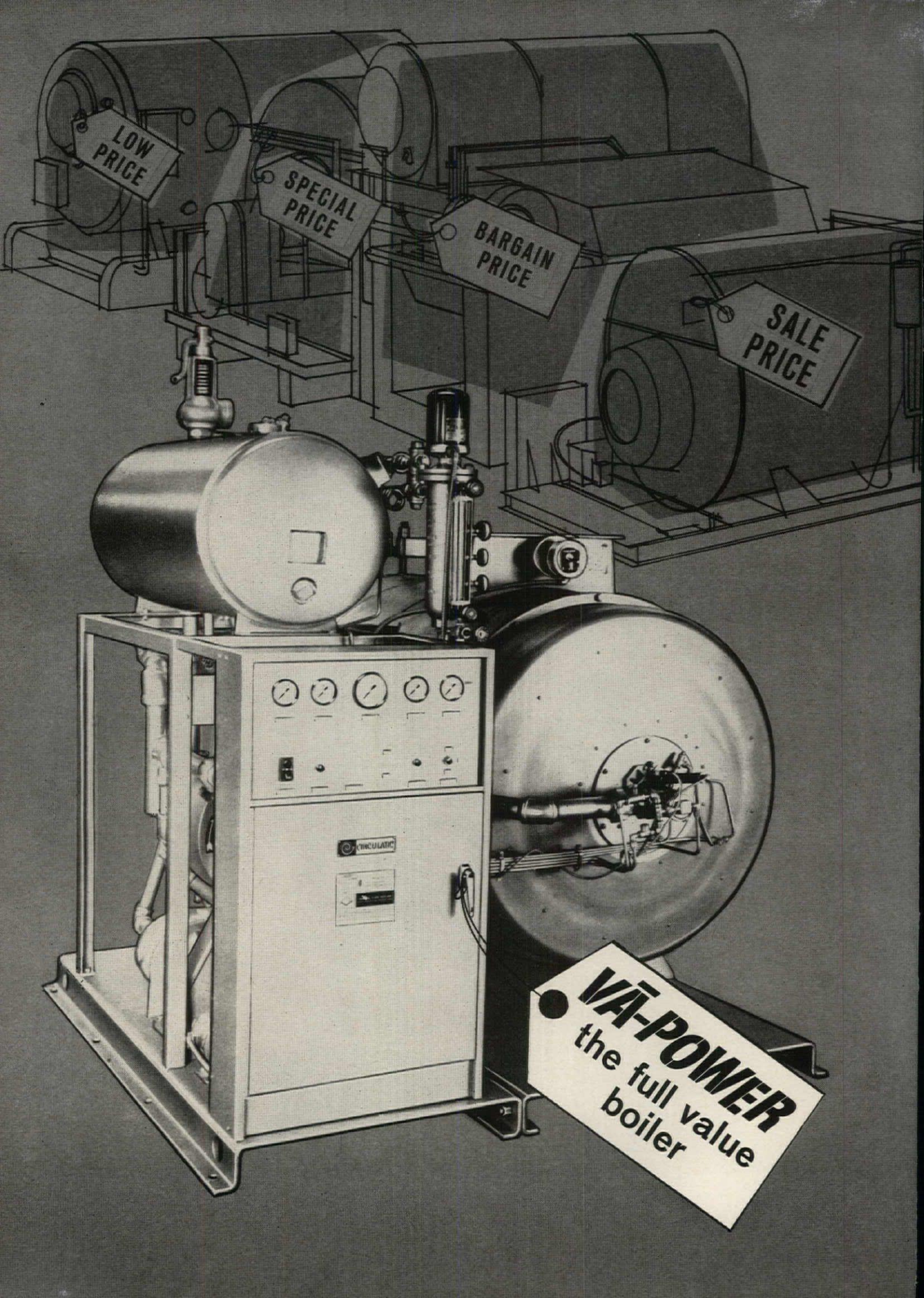
Borgia Butler Houses, Bronx, New York
Architect: Seymour R. Joseph, A.I.A., New York
Engineers: Weinberger, Frieman, Leichtman & Quinn, New York
Contractor: Terminal Construction Corp., Wood Ridge, New Jersey

monolithic reinforced concrete kept costs down

CONCRETE REINFORCING STEEL INSTITUTE

228 NORTH LA SALLE STREET • CHICAGO 1, ILLINOIS

10-62


LOW PRICE
SPECIAL PRICE
BARGAIN PRICE
SALE PRICE
VA-POWER
the full value boiler

before you buy boilers on initial cost . . .

LOOK OUT FOR HIDDEN COST FACTORS!

Hidden factors not shown on the price tag can often increase the cost of a boiler by as much as 25 to 35%!

Next time you are involved in specifying a boiler for a new installation, plant expansion, replacement, or for standby service . . . watch out for these hidden cost factors:

SPACE

You pay "rent" on every square foot of floor space in your building. VĀ-POWER SpecEngineered Boilers require as little as one-fifth the area of conventional boilers of the same rating—the rent you would have to pay year after year for this extra space is a *HIDDEN COST!*

INSTALLATION

Installation costs vary widely with the type of boiler and application. VĀ-POWER SpecEngineered Boilers are completely assembled "packages". Just hook up electricity, fuel, water, vent and steam line. No insulation. No special foundation. Only a simple vent stack. Compact size eliminates widening doors or breaking out walls—money required for preparation and installation is a *HIDDEN COST!*

FUEL

Fuel consumption at full output is only part of the story. VĀ-POWER SpecEngineered Boilers develop full operating pressure in two minutes from a cold start. Ends early start-ups, costly idling during lunch periods, line shutdown and slack periods. The 5 to 1 turndown ration (higher on multiple installations) adjusts supply to demand, saving up to 15% of annual fuel costs—the extra fuel consumed by conventional boilers is a *HIDDEN COST!*

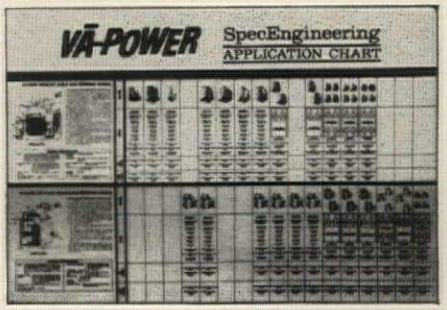
LIMITED LIFE

With conventional boilers the capital investment for replacement must be made every ten or fifteen years. VĀ-POWER SpecEngineered Boilers are a one-time investment. Every part (if required) can easily be replaced as routine maintenance. Your boiler stays young as long as you need it. Future capital investment for replacement is a *HIDDEN COST!*

next time—watch out for hidden costs—specify

VĀ-POWER SpecEngineered Boilers

Write today for your free copy of the new VĀ-POWER SpecEngineering Application Chart.



VAPOR®

INDUSTRIAL DIVISION
VAPOR CORPORATION

Dept. No. 41-G
6420 West Howard Street, Chicago 48, Illinois

Send free copy of VĀ-POWER SpecEngineering Application Chart containing complete information on the entire VĀ-POWER line of boilers.

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

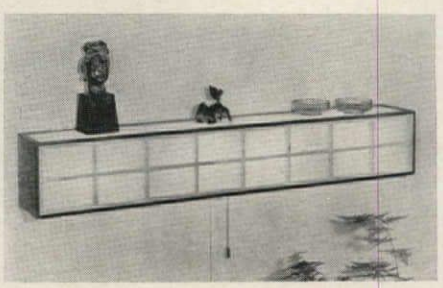
For more data, circle 62 on Inquiry Card

Product Reports

continued from page 167

DECORATIVE LIGHTING

Six new groups of wall, floor, table and desk lamps serve as columns of light, illuminated shelves, hidden light sources or decorative abstracts



with variable light levels made possible by dimmers. *Lightolier, 346 Claremont Ave., Jersey City 5, N. J.*

CIRCLE 302 ON INQUIRY CARD

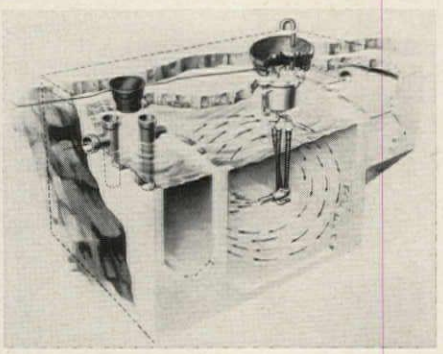
ALUMINUM REGLETS

Four types of reglets are made of rigid extruded aluminum with clear lacquer coating. They can be used on concrete, stucco, wood, brick or steel for installing counterflashing to wall and decks and for curtain wall and metal window applications. *Superior Concrete Accessories, Inc., 9301 King St., Franklin Park, Ill.*

CIRCLE 303 ON INQUIRY CARD

SEWAGE SYSTEM

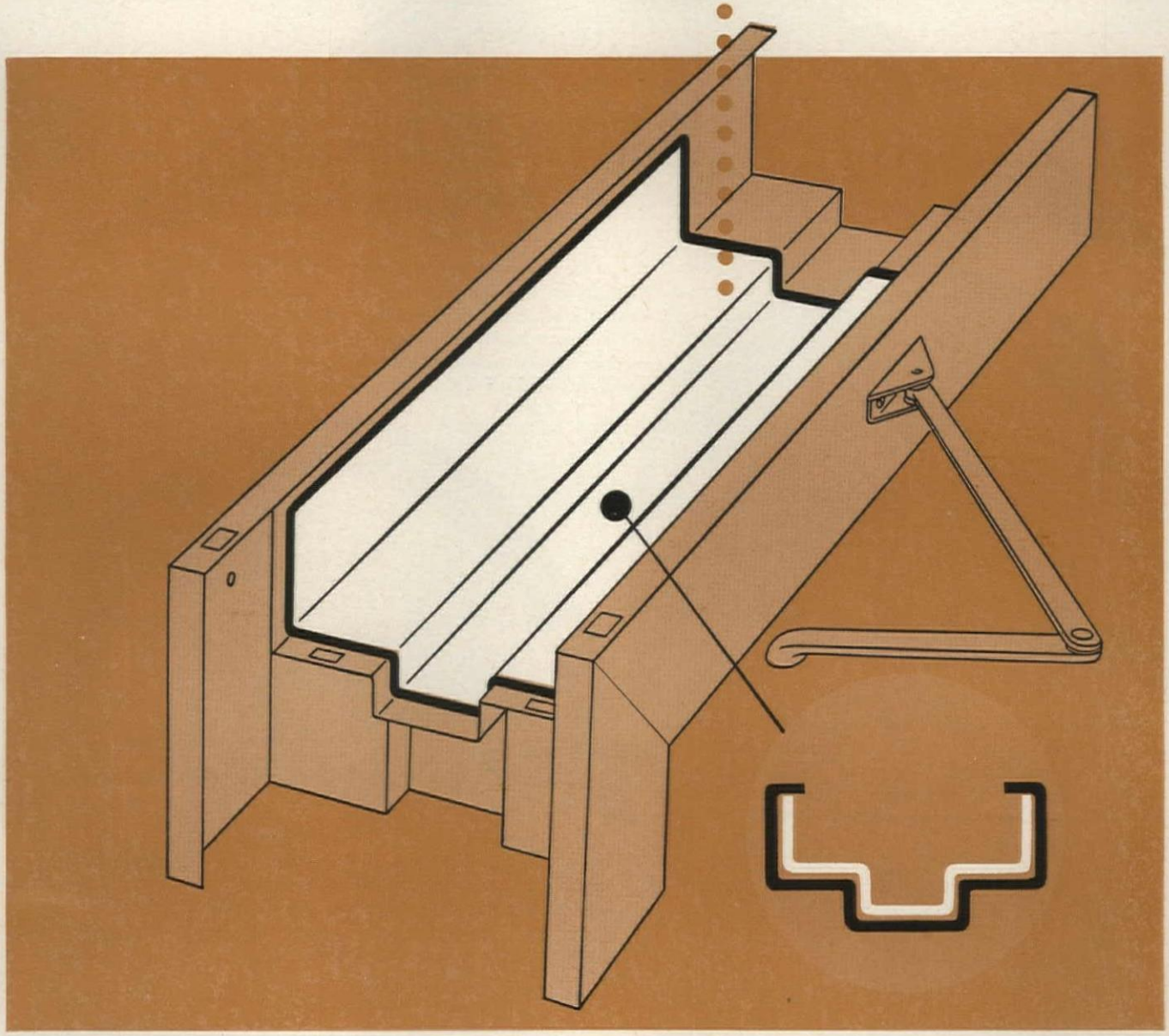
Crane-Flo packaged sewage systems, one for individual homes, the other for developments, laundries, etc, have plastic media trickling filters mounted on recirculation chambers, secondary clarifiers, chlorine contact chambers and primary settling and sludge-holding tanks. No moving parts are submerged. Factory-installed sewage service pumps are the only mechanical equipment. The systems can be added to an existing septic system. *Crane Co., Engineered Products Group, 3116 N. 17th St., Philadelphia 32, Pa.*



CIRCLE 304 ON INQUIRY CARD

more products on page 190

steelcraft metal door frame idea no. 5 in a series



CLOSER REINFORCING SLEEVE

In order to assure proper reinforcing of standard frames for closers . . . the Steelcraft distributor can reinforce frames with this sleeve for surface hardware requirements and give instant service.

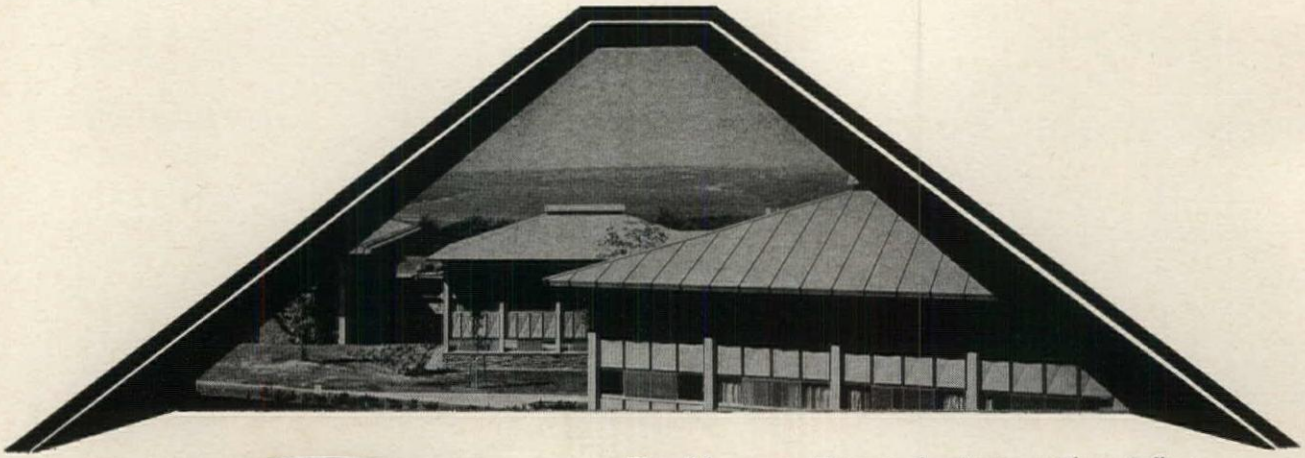
This is another of the many advantages gained from the use of Steelcraft metal doors and frames. Write for other ideas . . . and the name of your technically trained Steelcraft distributor.

STEEL Craft®

finest name in metal doors and frames

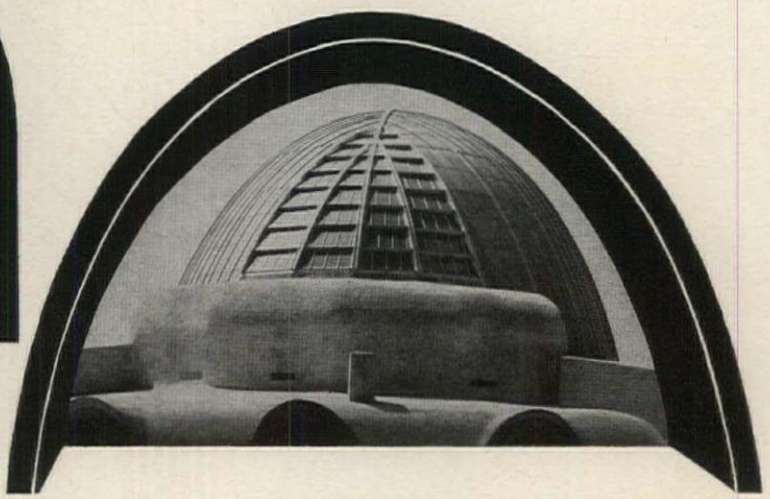
The Steelcraft Manufacturing Company, 9017 Blue Ash Road, Cincinnati 42, Ohio, U.S.A.

For more data, circle 64 on Inquiry Card



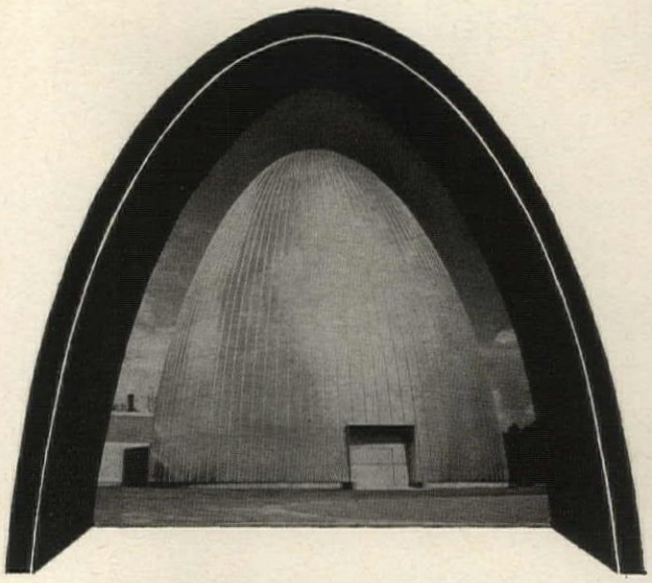
Top of the campus—Ten new dormitories at Ithaca College, Ithaca, New York, have Overly Batten "B" aluminum roofs with colorful Alumalure® finishes covering an area of 100,000 sq. ft. Successful weather resistance explains why Overly roofing has been selected twice for Ithaca's building programs. Architects: Tallman and Tallman, Ithaca, New York.

Jet-age cover—This ageless Overly parabolic roof covers an area of 26,000 sq. ft. at Idlewild Airport's International Arrivals Building. Crafted in enduring stainless steel, it will still be in service when tomorrow's planes are obsolete. Architects: Skidmore, Owings and Merrill, New York, N. Y.



Inside, outside, all the way through—Batten "B" Roofing System, skylights, arch beam covers, baptistry, cornices, passageways, and interior ceilings all by Overly—our responsibilities on this church assumed a wide scope over a span of three years from drawing board to completion. Architect: Aldo A. Minotti, Waltham, Mass.

COVER YOUR BUILDING PERMANENTLY -



Form and Function—Overly Batten "B" Roof System at Industrial Reactor Laboratories, Plainsboro, New Jersey. 87′ in diameter, 87′ high, protected with 14,500 sq. ft. of mill finish aluminum roofing. Architects: Skidmore, Owings and Merrill, New York, N. Y.

This is an Overly Batten Roof housing an atomic reactor. Others guard churches, auditoriums, schools and industrial facilities. Found everywhere, over 2,000,000 sq. ft. of Overly Roofing have been fabricated and installed on buildings from Alaska to the Caribbean. Overly Batten Roofs have been proven in use for over 30 years. We warrant them unconditionally for 15 years.

- BATTEN ROOFING FROM OVERLY

Everywhere, they have stood water-tight and secure against hurricanes, blazing suns, Arctic winds, hail and storm. Their patented mechanical joints expand and contract with all climatic changes—the secret of their long life. For all pitched or parabolic surfaces in all metals and all finishes, specify Overly. *See our catalog, Sweet's A.I.A. File No. 12-C; 12-L.*

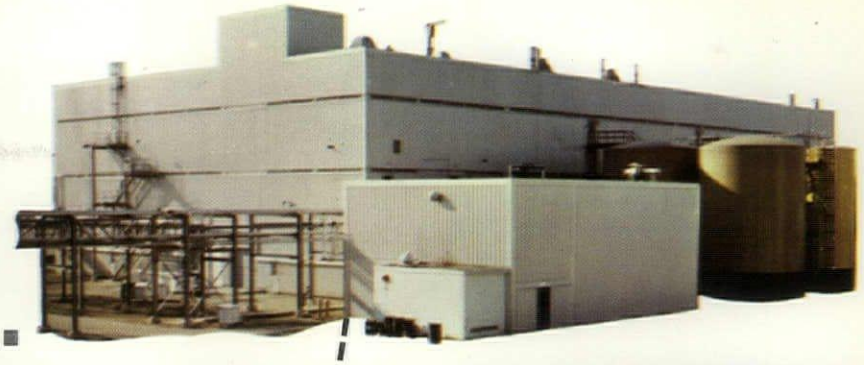
Overly

Greensburg, Pennsylvania

For more data, circle 65 on Inquiry Card

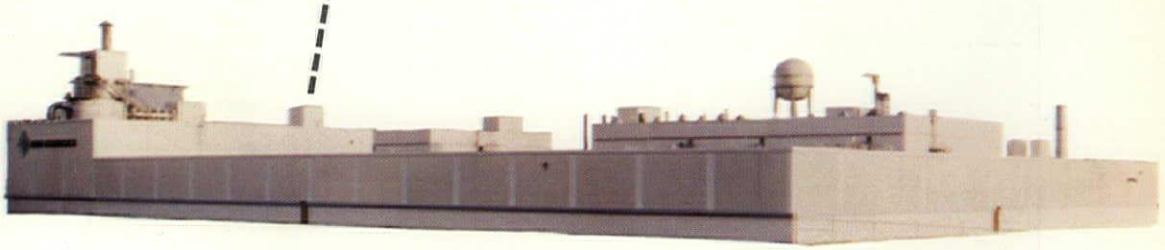
For more data, circle 69 on Inquiry Card ➔

INDUSTRIAL COMPLEX UNIFORMITY...



Archer Daniels Midland Company Plant, Mapleton, Illinois
Designed and Constructed by Girdler Corporation, Louisville, Kentucky

with SMITH metal walls



The family resemblance isn't accidental. The gleaming Smith insulated metal walls, in Shadowall contour, blend the separate structures of this sprawling industrial complex into a single corporate identity. So whether you're planning a single building or a multiple-unit project, it will pay you to investigate the economies of Smith metal walls.

The advantages of dealing with Smith go beyond simple product superiority. Why? Because our responsibility embraces every phase of building wall construction. Smith walls are designed and adapted to your building plans by our engineers. We make them in our factory. Our own trailers deliver them, at the time they're needed, to your building site. Experienced Smith crews erect your walls by a specialized technique developed in over a generation of manufacturing and erecting building walls.

And when you deal with us, you get the construction know-how and facilities of the largest erector of insulated metal walls in the nation.

Best of all . . . economical Smith metal walls are architecturally aesthetic and structurally efficient. So for your next building assignment, whether industrial, commercial or institutional, contact your local Smith representative. For complete information, see Sweet's File 3a/Sm, or write:

"Smitty builds walls for keeps"

ELWIN G. SMITH & CO., INC. Pittsburgh 2, Pa. / Detroit • Chicago
Cincinnati • Cleveland • New York • Toledo • Philadelphia

How to board a plane by just changing your seat

Airport terminals are usually a maze of gates, with miles of ramps and passageways. Passengers walk, walk, walk to get to and from the planes. Planes do a lot of expensive taxiing on the ground.

Not so at new Dulles Airport, in Chantilly, Virginia.

Passengers don't walk, they ride. Planes don't taxi, they wait near the runways. If you were taking a trip, you'd enter the terminal, check in, and step into an air-conditioned lounge a few feet away.

While you relax, the "lounge" moves out, carrying you to the plane waiting at a runway service area.

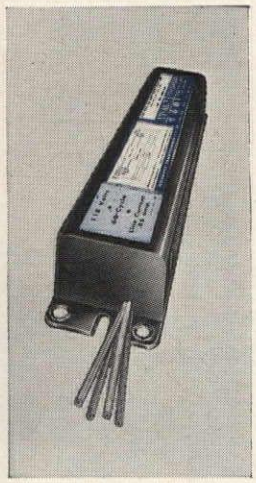
You change seats (see picture). The next move is up to the pilot. The Mobile Lounge was engineered by Chrysler Corporation for the Federal Aviation Agency.

PLYMOUTH • VALIANT • CHRYSLER • IMPERIAL • DODGE • DODGE DART • DODGE TRUCKS

CHRYSLER CORPORATION

← For more data, circle 70 on Inquiry Card

For more data, circle 71 on Inquiry Card



FLUORESCENT LAMP BALLAST

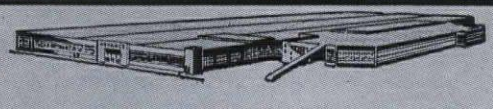
PROTECTION PRESERVATION

Only ADVAN-guard® . . . Advance Transformer Co's. thermally actuated automatic reclosing protective device, gives ballast protection with preservation. All other types of ballast protection destroy the ballast whenever the ballast operates at abnormal temperatures. Only ADVAN-guard® prevents premature ballast destruction.

ADVAN-guard® is sealed in the ballast housing and is preset to automatically "trip-out" whenever the Fluorescent Lamp Ballast operates at abnormal temperature. When heat decreases to normal operating temperature ADVAN-guard® resets automatically and the ballast resumes normal operation. If overheating continues . . . ADVAN-guard® protection continues . . . through this continuous protection the full life of ADVAN-guard® Fluorescent Lamp Ballasts is preserved . . . rated life of ADVAN-guard® Ballasts under normal operating conditions is 10 to 12 years.

Always demand ADVAN-guard® Fluorescent Lamp Ballast protection with preservation. End premature destruction and unnecessary ballast replacement labor costs.

"The Heart of the Lighting Industry."®

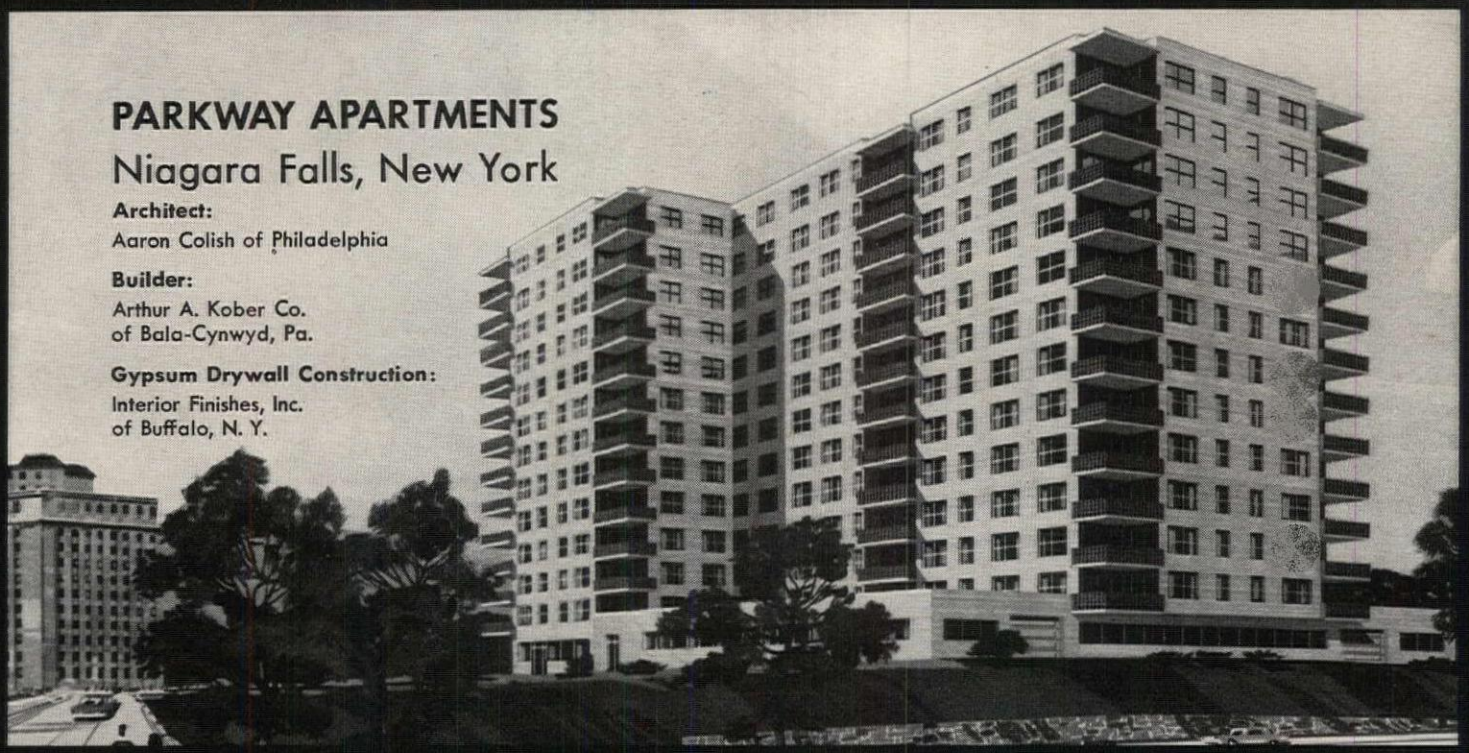


ADVANCE® TRANSFORMER CO.

WORLD'S LARGEST EXCLUSIVE MANUFACTURER OF FLUORESCENT LAMP BALLASTS

2950 NO. WESTERN AVE. CHICAGO 18, ILL. U.S.A.

For more data, circle 72 on Inquiry Card



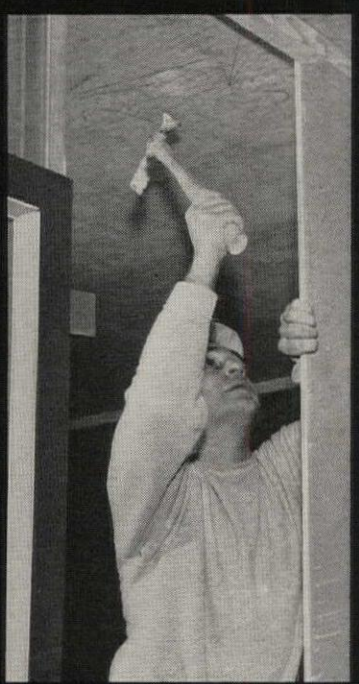
PARKWAY APARTMENTS
Niagara Falls, New York

Architect:
Aaron Colish of Philadelphia

Builder:
Arthur A. Kober Co.
of Bala-Cynwyd, Pa.

Gypsum Drywall Construction:
Interior Finishes, Inc.
of Buffalo, N. Y.

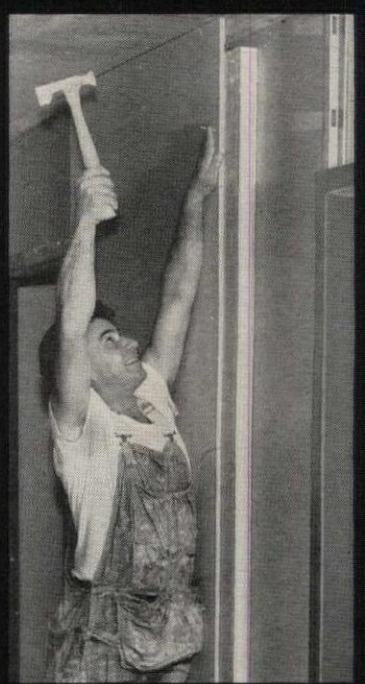
BETWEEN ROOMS—SEMI-SOLID PARTITIONS



1. Nail face layer to ceiling and floor runners

2. Apply adhesive-coated gypsum studs

3. Secure gypsum studs with nails or screws



4. Apply back face layer to runners and studs

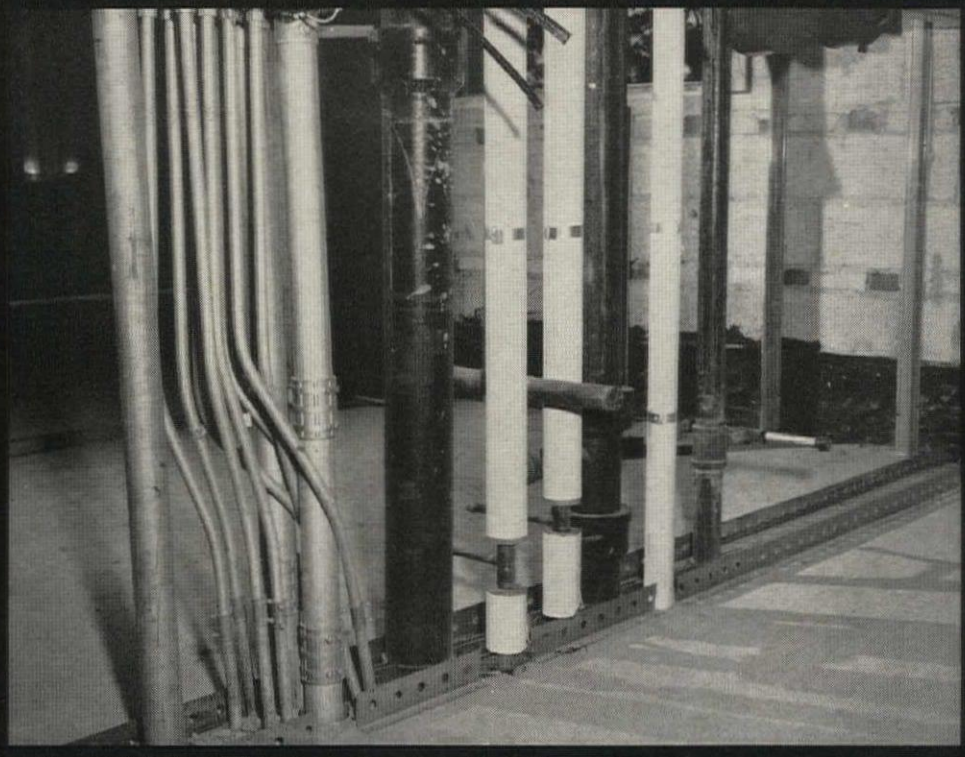
The Gold Bond difference:

Gypsum drywall methods that help sound-condition $3,500,000 Parkway Apts. ...two ways

Quiet conditioning will be a fast-renting feature at the Parkway . . . Niagara Falls' new 144-suite apartment building. Part of the "quiet" feature: two Gold Bond gypsum drywall partition systems. Actual construction is shown in these on-site photographs. For other ways with walls, see Sweet's File 12 C/NA.

BETWEEN APARTMENTS—DOUBLE-WALL, SOLID-LAMINATED PARTITIONS

A. Install metal floor and ceiling runners



B. Space is left for utilities to pass through double walls

C. Attach 1"-thick gypsum coreboard to each side

D. Apply adhesive to back of gypsum face layer

E. Screw face panels to gypsum coreboard on each side of double-wall partitions

BETWEEN ROOMS, privacy is achieved with low-cost, Gold Bond semi-solid drywall partitions. These non-bearing walls were constructed around metal door frames with two faces of gypsum wallboard laminated to gypsum studs. Either 2¼ or 2⅝" thick, these walls go up fast and save valuable floor space. They will withstand normal wall abuse for the lifetime of the building. And when ⅝" Fire-Shield wallboard is used, the walls earn a one-hour fire rating.

BETWEEN APARTMENTS, sound transfer is reduced with double-wall, solid-laminated partitions. This system delivers sound-transmission loss ratings up to 45 db. Permits simple enclosure of utilities, including plumbing, heating, and air-conditioning ducts. Call your Gold Bond® representative. Or write to Dept. AR-73, National Gypsum Company, Buffalo 25, New York.

Gold Bond
BUILDING PRODUCTS

Gold Bond materials and methods make the difference in modern building

For more data, circle 73 on Inquiry Card

Product Reports

continued from page 176

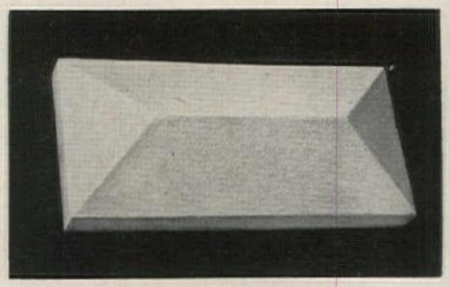
FIRE DOOR RELEASE

Fire Door Sentry is a device which can be installed on all sliding and hinged doors to provide release of all fire and/or smoke stop doors before the fire reaches the door. Any short circuit or malfunction in the control system automatically shuts the door. *Fire Door Sentry, 1184 Industrial Ave., Escondido, Calif.*

CIRCLE 305 ON INQUIRY CARD

ACOUSTICAL UNITS

Hansometric acoustical units are designed for use where "spot" absorption and diffusion of sound is needed. The units are made of molded glass fiber, having an elongated pyramid



shape, the size of a concrete block. *Elof Hansson, Inc., 711 Third Ave., New York 17, N.Y.*

CIRCLE 306 ON INQUIRY CARD

GLASS FIBER BAPTISTRY

Lightweight, permanent baptistries for complete immersion are offered in two groups. All steps and bottom are skid-resistant. There is a variety of optional accessories. *Wiedemann Industries, P. O. Box 672, Muscatine, Iowa*

CIRCLE 307 ON INQUIRY CARD

VENEERS OF RARE WOODS

Four rare woods—Brazilian rosewood, wormy chestnut, butternut and teak—have been added to the *Weldwood* line of prefinished paneling. *U.S. Plywood Corp., 55 W. 44th St., New York 36, N.Y.*

CIRCLE 308 ON INQUIRY CARD

MONOLITHIC FLOORING

Penntrowel 110 is a corrosion-resistant monolithic floor surfacing made of resinous mortar. Compression strength is 10,000 psi. *Pennsalt Chemical Corp., 3 Penn Center, Philadelphia 2, Pa.*

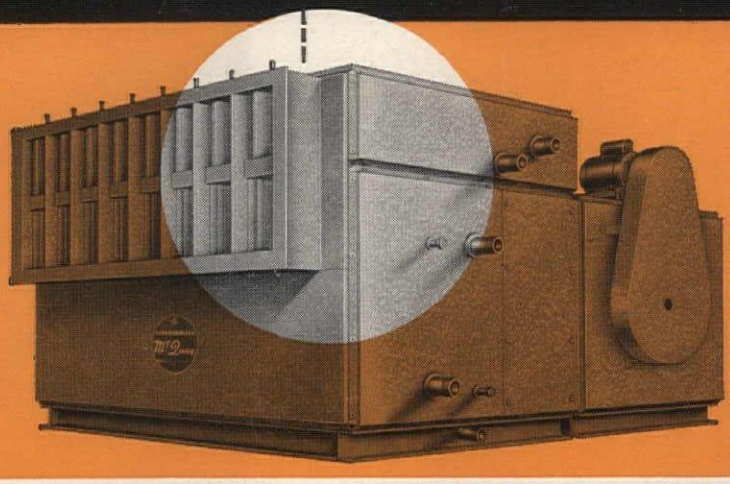
CIRCLE 309 ON INQUIRY CARD

more products on page 198

YOU GET TRUE MULTI-ZONE DESIGN with McQUAY

Seasonmaster®

AIR CONDITIONING UNITS



McQuay gives you true multi-zone design with its Seasonmaster central-station air conditioning units, accurately serving up to 14 separate areas. The zone damper section is engineered by McQuay for minimum maintenance and to virtually eliminate air leakage. The design features the following:

- Hot and cold dampers are permanently pinned to a common rod at a 90 degree angle to each other. This feature, coupled with a truly rugged framework, eliminates misalignment problems.
- Each damper rod rotates on nylon bearings to assure smooth, efficient operation.
- Each damper (both hot and cold deck) closes against double seal neoprene gasketing backed up by metal stops. Neoprene gasketing around the entire perimeter of each damper virtually eliminates air leakage problems.
- The zone damper section is insulated to prevent sweating. McQuay zone dampers are available for either horizontal or vertical air discharge arrangements. For double-duct applications, a discharge collar is furnished.

Your McQuay representative will be happy to show you how the Seasonmaster exactly meets your multi-zone air conditioning requirements. Or write directly to McQuay, Inc., 1605 Broadway N. E., Minneapolis 13, Minnesota.

McQuay INC.
MEANS QUALITY

MAKE THE SEASONS COME TO YOU

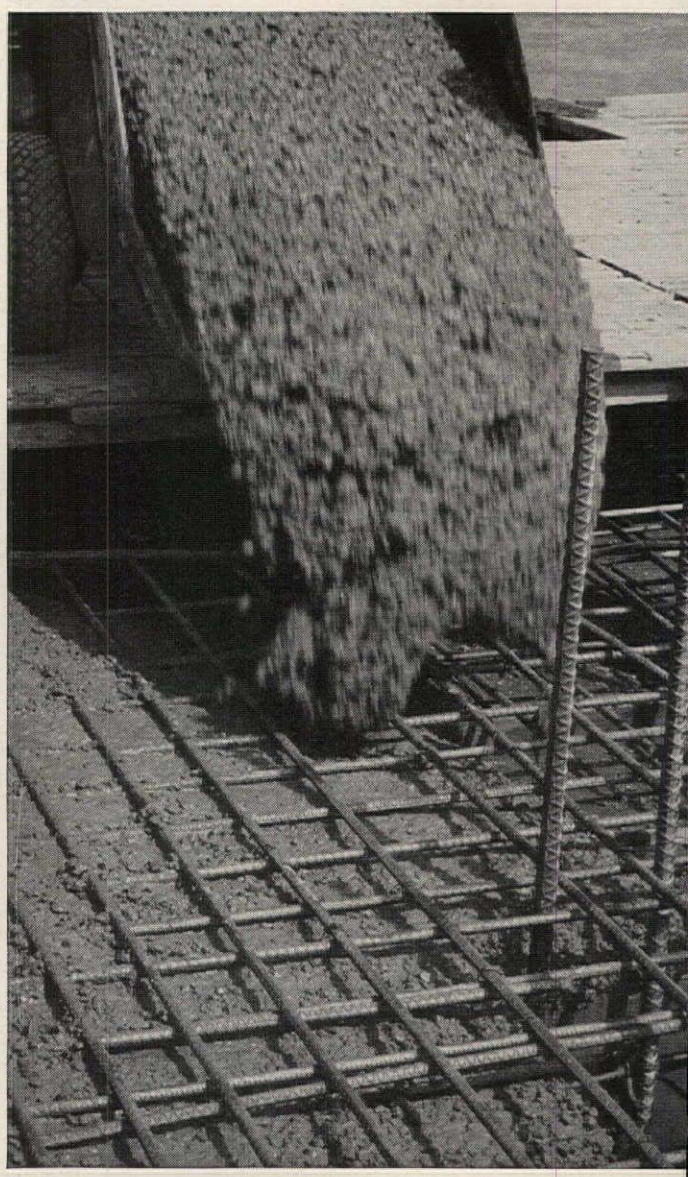
AIR CONDITIONING • HEATING • REFRIGERATION

MANUFACTURING PLANTS AT FARIBAULT, MINNESOTA • GRENADA, MISSISSIPPI • VISALIA, CALIFORNIA

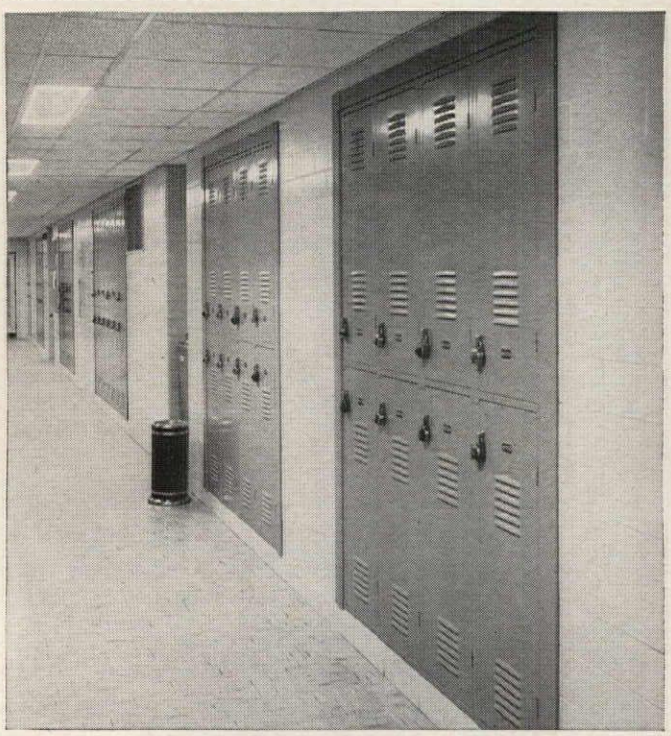
For more data, circle 75 on Inquiry Card

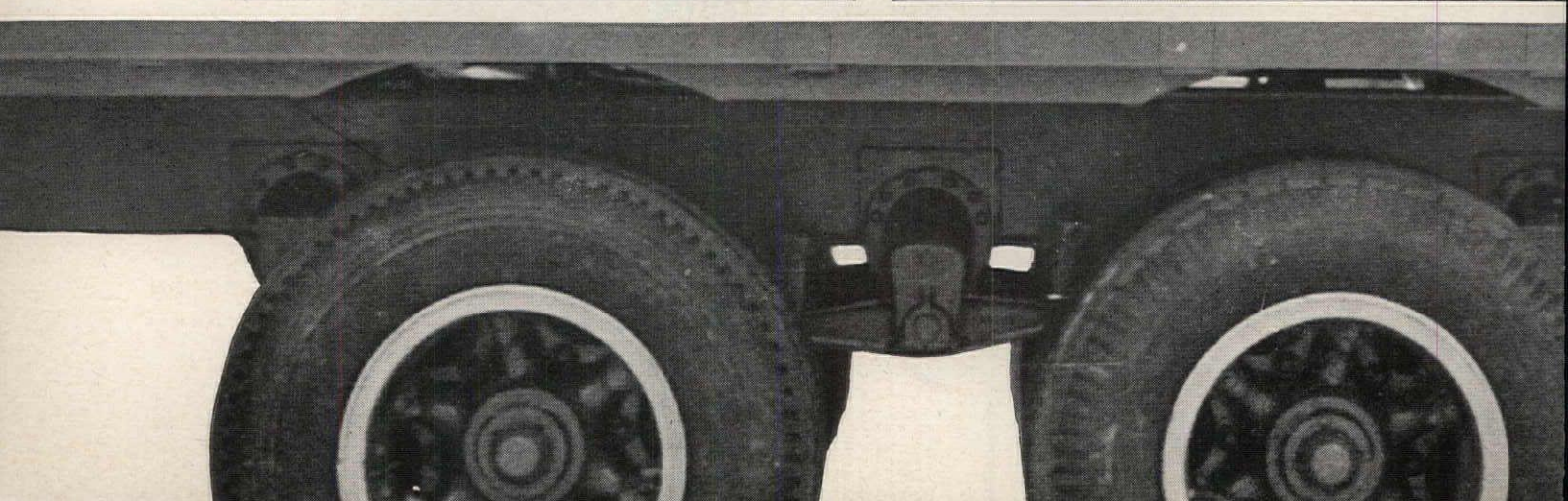
REPUBLIC'S NEW SINGLE-

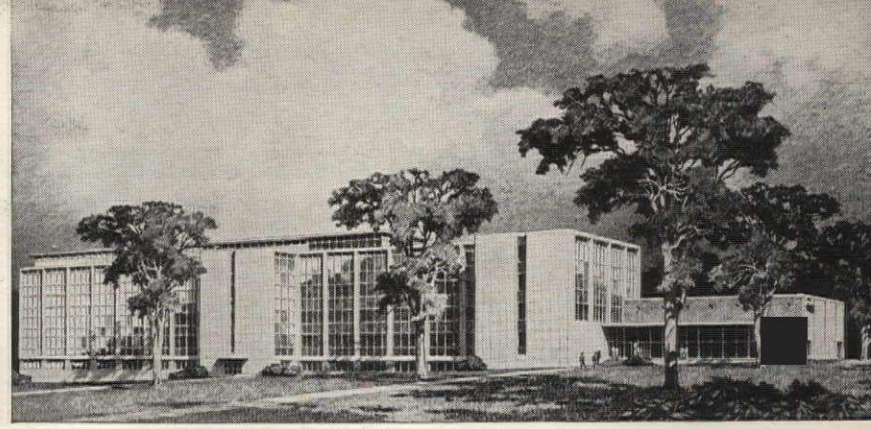
RE-BARS



RECESSED LOCKERS





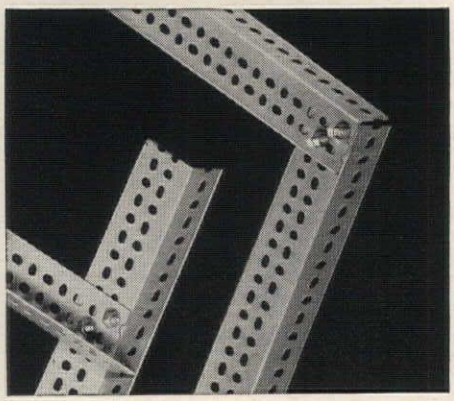


New John Schoff Millis Science Center on Western Reserve University campus, Cleveland, Ohio. *Architects:* Small, Smith, Reeb & Draz. *General Contractor:* The Albert M. Higley Company. *Mechanical Contractor:* Gorman-Lavelle Plumbing & Heating Company.

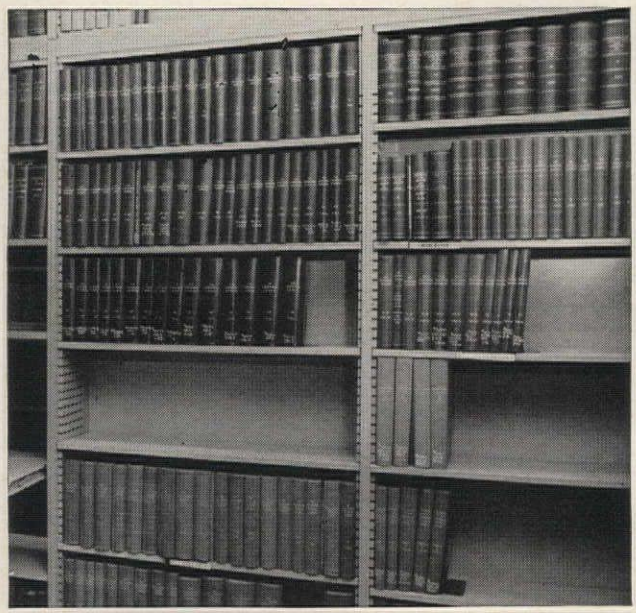
SOURCE SERVICE

saves time and costs at university science center

METAL LUMBER®



LIBRARY SHELVING



A single comment by one contractor on the building of this new science center tells the story: "Republic products were delivered on time."

On time means *on schedule*, too — and all the Republic products shown were delivered in coordination with construction schedules: *the kind of delivery that in today's cost climate can mean the difference between a fair profit and an unreasonable loss.*

When you can get so many of your building needs from a single source, why deal with more? Assure *yourself* a fair profit. Save at the planning stage — save in construction — save on completion time, with single-source single-responsibility supply of Republic building products, delivered on time!

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MANUFACTURING DIVISION
DEPT. AR-5964-A, YOUNGSTOWN 5, OHIO

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CORPORATION

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Youngstown 5, Ohio

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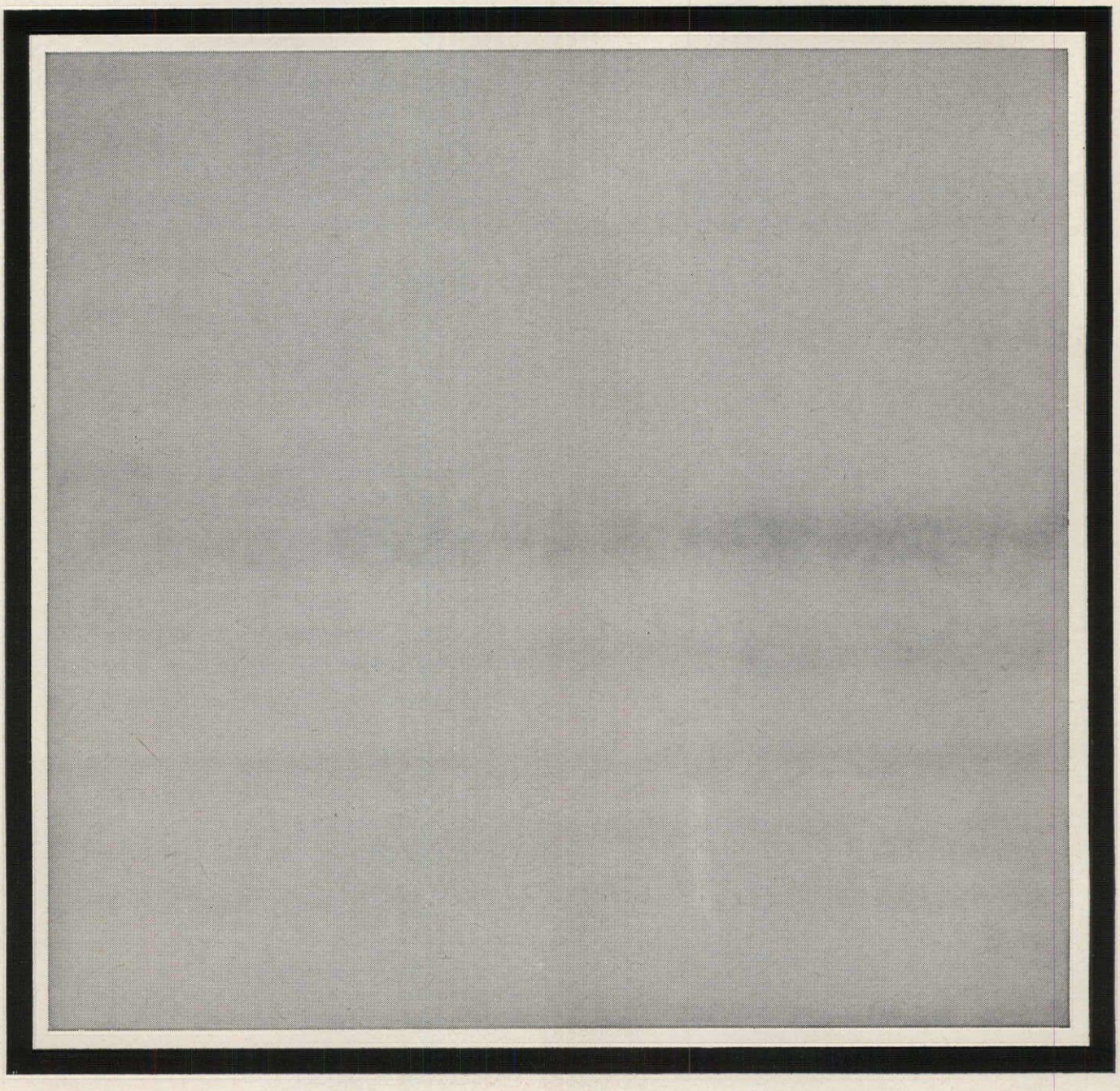

PERFECT ILLUSTRATION OF THE IDEAL HOSPITAL* LAUNDRY

See all the shiny, massive, expensive, power-devouring equipment? See all the personnel that must be paid, fed and negotiated with? See all the linens that must be bought, washed, ironed, folded — and replaced? See all the costly linen-storage space — space that's so badly needed for a new lab, extra rooms or whatall?

See?

Fact is, the ideal hospital laundry has none of these things, of course. All it has is a sensible, money-saving, trouble-free, smooth-running Linen Supply service... and all the fresh, clean linens it needs (everything from bedsheets to surgeons' masks)... when it needs them.

See?

More details? Call the Linen Supply Man nearest you. You'll find his name in the Yellow Pages under "Linen Supply" or "Towel Supply".

**Also... motel, hotel, restaurant or school.*

FREE DESIGN GUIDES!
They give case histories and suggestions for providing more efficient linen supply service in motels, hotels, schools, restaurants and hospitals, as well as for commercial firms, professional offices and various institutions. Write today.

LINEN SUPPLY ASSOCIATION OF AMERICA • 975 Arthur Godfrey Road, Miami Beach 40, Florida

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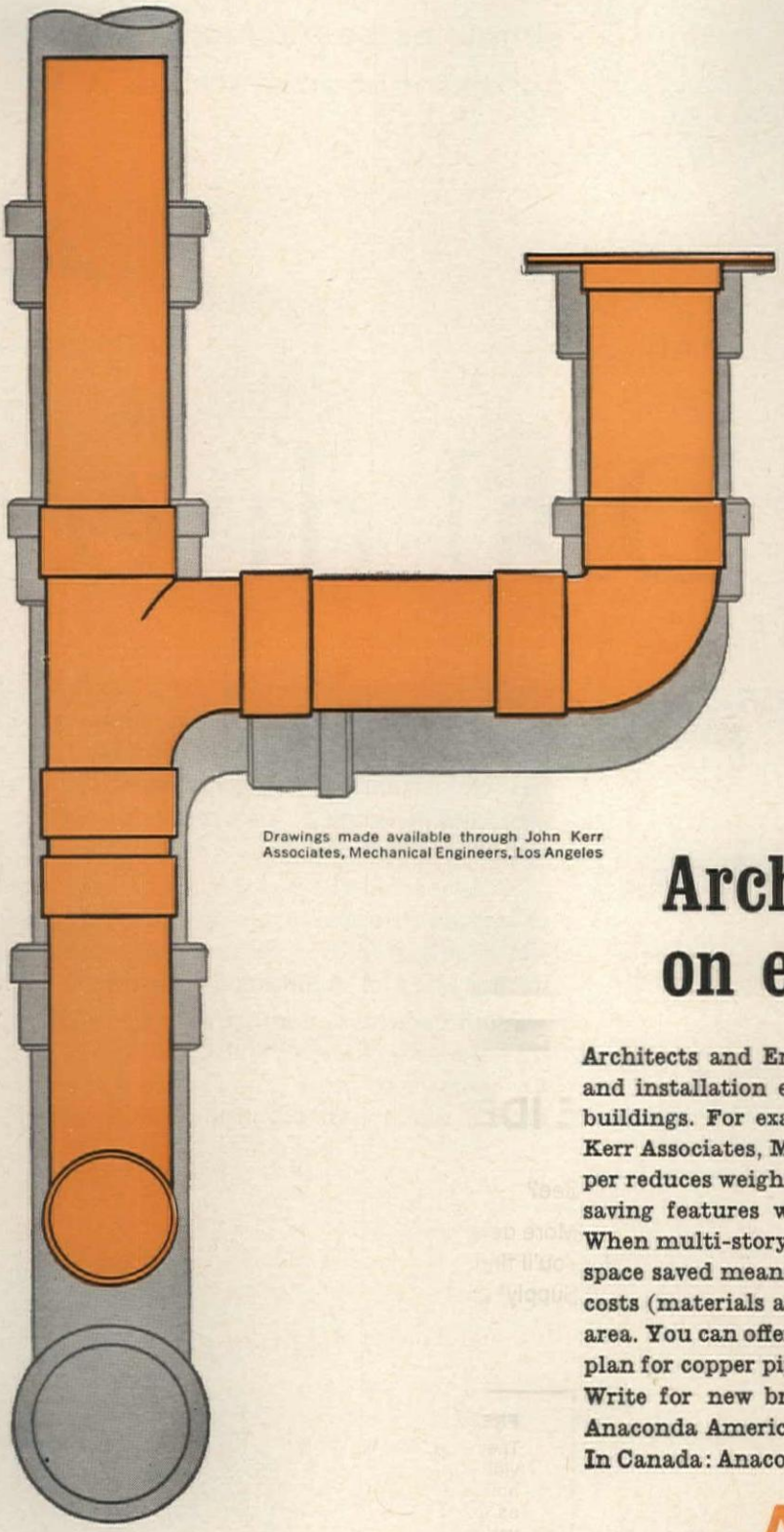
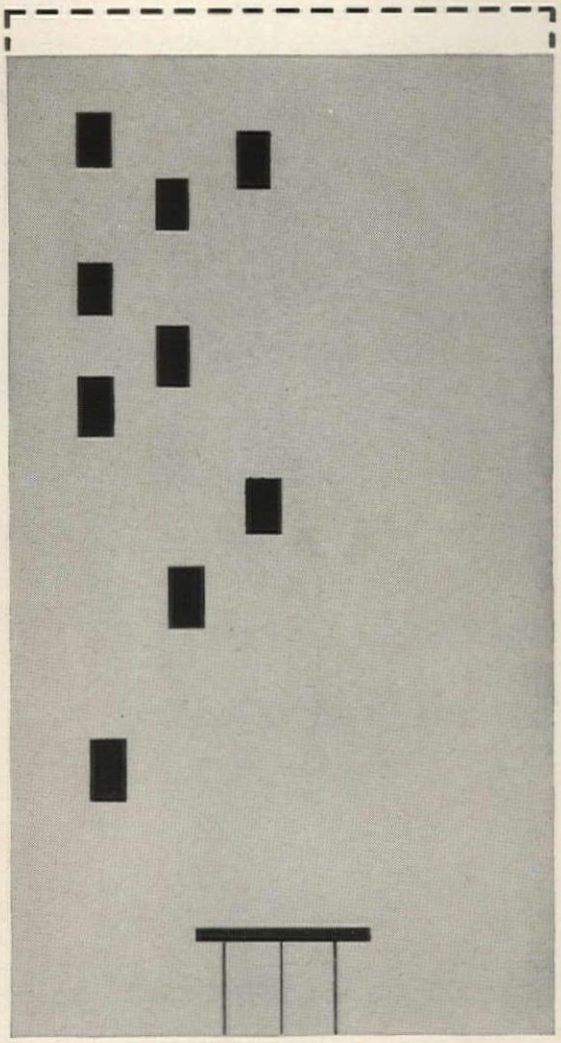


Drawings made available through John Kerr Associates, Mechanical Engineers, Los Angeles



Architects save more on every floor

Architects and Engineers are telling us about the space savings and installation economies of All-Copper plumbing in high-rise buildings. For example, D. F. Dickerson, Vice-President of John Kerr Associates, Mechanical Engineers, Los Angeles, writes, "Copper reduces weight of the piping system and provides many space-saving features when distributing water or collecting wastes." When multi-story buildings are designed for copper plumbing the space saved means substantial reductions in general construction costs (materials and installation) and more usable, rentable floor area. You can offer these floor-to-floor savings to your clients if you plan for copper piping in the blueprint stage. You're the key man. Write for new brochure, "It Pays to Specify Copper." Address: Anaconda American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

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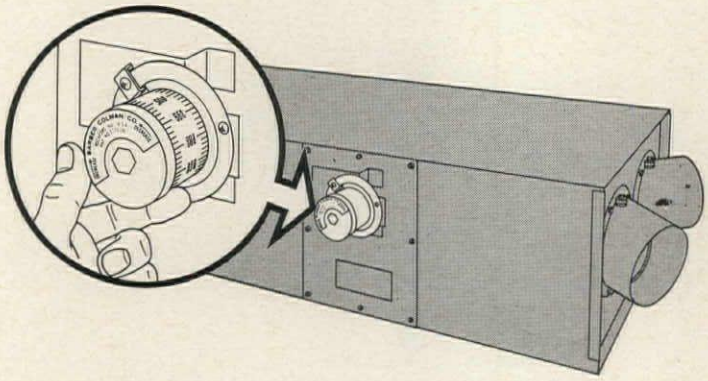


Self-operated, constant-volume regulator—with new dial-in cfm adjustment—speeds and simplifies balancing high-velocity air distribution systems.

NEWS from BARBER-COLMAN

Dial direct

Costly methods of adjusting cfm delivery can now be simplified or eliminated. Barber-Colman SCR regulator lets you dial the delivery volume you need . . . then maintains it within ±5%.

Dial-in cfm adjustment on the Model SCR constant-volume regulator is an important new Barber-Colman concept in high-velocity mixing box performance. A standard regulator is available with a simple, *visual* means of setting and adjusting delivery volume.

System balancing is easier. And, if requirements change, resetting is just as easy. Delivery volume can be adjusted over the entire cfm range of the mixing box and maintained to within ±5%.

Maintenance is all but eliminated. SCR regulators are self-contained and self-operated. No motor operator or other power source is required. A rugged diaphragm repositions automatically to

BARBER COLMAN

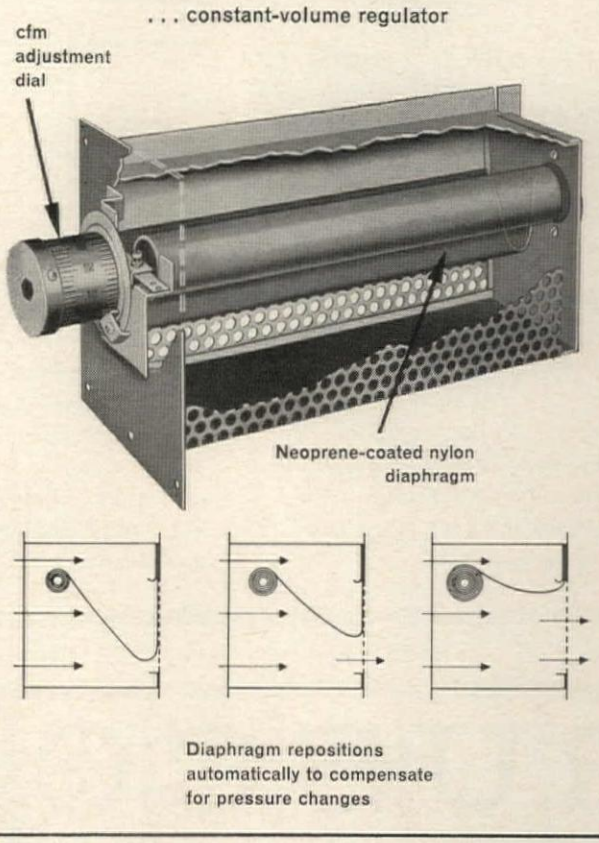
for cfm delivery!

compensate for pressure changes. (We have been trying to wear one out in our lab. Result: 23 million cycles — or 60 years of normal service — and still going strong.)

Design is more flexible. Compact regulators are self-contained; need less space. Can be used separately in high-velocity systems to provide self-balancing operation in low-velocity branch ducts. They also are an integral part of Barber-Colman's complete single- and double-duct control units.

For complete information on SCR regulators with new dial-in cfm adjustment—or our complete line of high-velocity, air distribution equipment — call the Barber-Colman field office nearest you.

NEW DIAL-IN CFM ADJUSTMENT



BARBER-COLMAN COMPANY
Rockford, Illinois
In Canada: BARBER-COLMAN OF CANADA, LTD.
Toronto, Ontario

. . . where originality works for you

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Product Reports

continued from page 190

AUDITORIUM CHAIR

A shell-and-pedestal *Sculptura Forum* chair for use in lecture halls, auditoriums and meeting rooms has drop-side tablet arm. Base can be adapted to inclined floors or risers for stationary installations or as portable units. *Clarin Mfg. Co., 4640 W. Harrison St., Chicago 44, Ill.*

CIRCLE 310 ON INQUIRY CARD

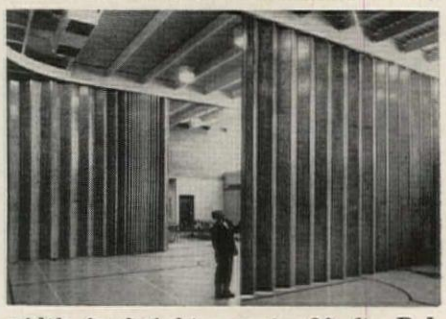
AIR-CONDITIONING VALVE

An automatic sequencing valve designed for three-pipe air-conditioning systems provides almost immediate response to room temperature changes. As room temperatures may demand, the valve passes either hot or cold water, but never mixes the two. Thus the system need not be changed over from winter to summer operation. *American-Standard Controls Div., 5900 Trumbull Ave., Detroit 8, Mich.*

CIRCLE 311 ON INQUIRY CARD

WOOD FOLDING PARTITIONS

Wood folding partitions, available with six veneers, are available in any



width in heights up to 20 ft. *Rolscreen Co., Pella, Iowa*

CIRCLE 312 ON INQUIRY CARD

APARTMENT PROTECTION

Intrudalarm warning system for apartment buildings with 24-hour-doorman service makes it possible for the doorman to stand watch via lighted numbers on a panel in the lobby. If an apartment is entered while the light is on, an alarm rings and the number of the opened apartment flashes. After the doorman investigates, the audible signal is turned off. The system can be activated for each apartment at tenants' requests. *Auth Electric Co., Inc., 3420 45th St., Long Island City 1, N.Y.*

CIRCLE 313 ON INQUIRY CARD

SOIL TESTING

An overhead compression soil testing unit is suspended from an overhead track so it can be moved quickly

into position above a number of soil chambers. *Meco-Matic, Inc., 10621 Briggs Rd., Cleveland 11, Ohio*

CIRCLE 314 ON INQUIRY CARD

TRANSPARENT VINYL PANELS

Transparent rigid vinyl panels, in flat and corrugated forms, are furnished in white and green with light transmission of 95 and 85 per cent respectively. *Kaykor Products Corp., Yardville, N.J.*

CIRCLE 315 ON INQUIRY CARD

more products on page 210

PARKING STRUCTURE AT WESTWOOD VILLAGE, CALIFORNIA • ARCHITECT: CHARLES M. BOLDON, AIA • ENGINEER: T. Y. LIN & ASSOCIATES INTERNATIONAL

LONG SPANS
in PRESTRESSED CONCRETE
—without premium cost!

Long spans in prestressed concrete increase the value of a building many times at surprisingly small increase in total building cost.

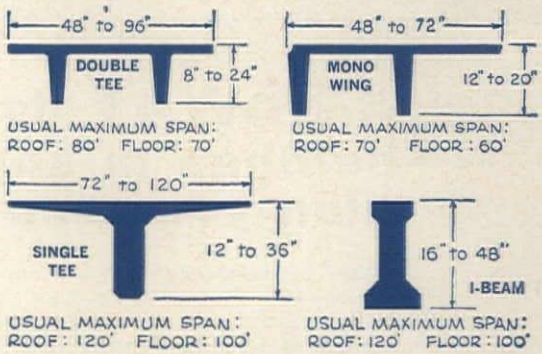
Planning for flexibility is one of the best investments that can be made in any type of building. Prestressing allows the design of well-proportioned building members of limited depth for long spans—eliminating columns and load bearing walls, providing more *usable* floor space.

The trend toward use of longer spans—to reduce operating costs and prevent obsolescence when occupancy plans change—has been a major factor in the growing popularity of prestressed concrete.

Prestressed concrete gives you the longer spans you need with only moderate increase in per square foot cost. For example, with a double tee 14 inches deep and 4 feet wide, the only real difference in per square foot cost between a 30-foot-span member and a 50-foot-span member is the cost of additional prestressing strand. The same is true for a single tee on a 60-foot-span versus 110-foot-span. The extra cost is partially offset by savings in column, footing and erection costs.

Although longer spans may slightly increase structural framing cost, it is usually found that the increase is only a small percentage of the total building cost.

Industrial plants and warehouses use long prestressed concrete spans to provide large column-free work areas for maximum operating efficiency. Long spans in office buildings permit flexibility for efficient interior arrangement. Schools with long span prestressed concrete construction are better suited to modern teaching concepts. Long spans allow multi-purpose rooms to be quickly doubled or tripled in size through use of folding or non-bearing wall dividers.



Prestressed concrete is used to obtain faster completion, lower total cost, for virtually every type of permanent quality structure. No fireproofing, finishing or painting is needed, maintenance is eliminated and insurance rates are reduced.

***WRITE FOR** description of publications available—and for information on PCI Professional Membership.*

PRESTRESSED CONCRETE INSTITUTE
205 W. WACKER DRIVE, CHICAGO 6, ILL.

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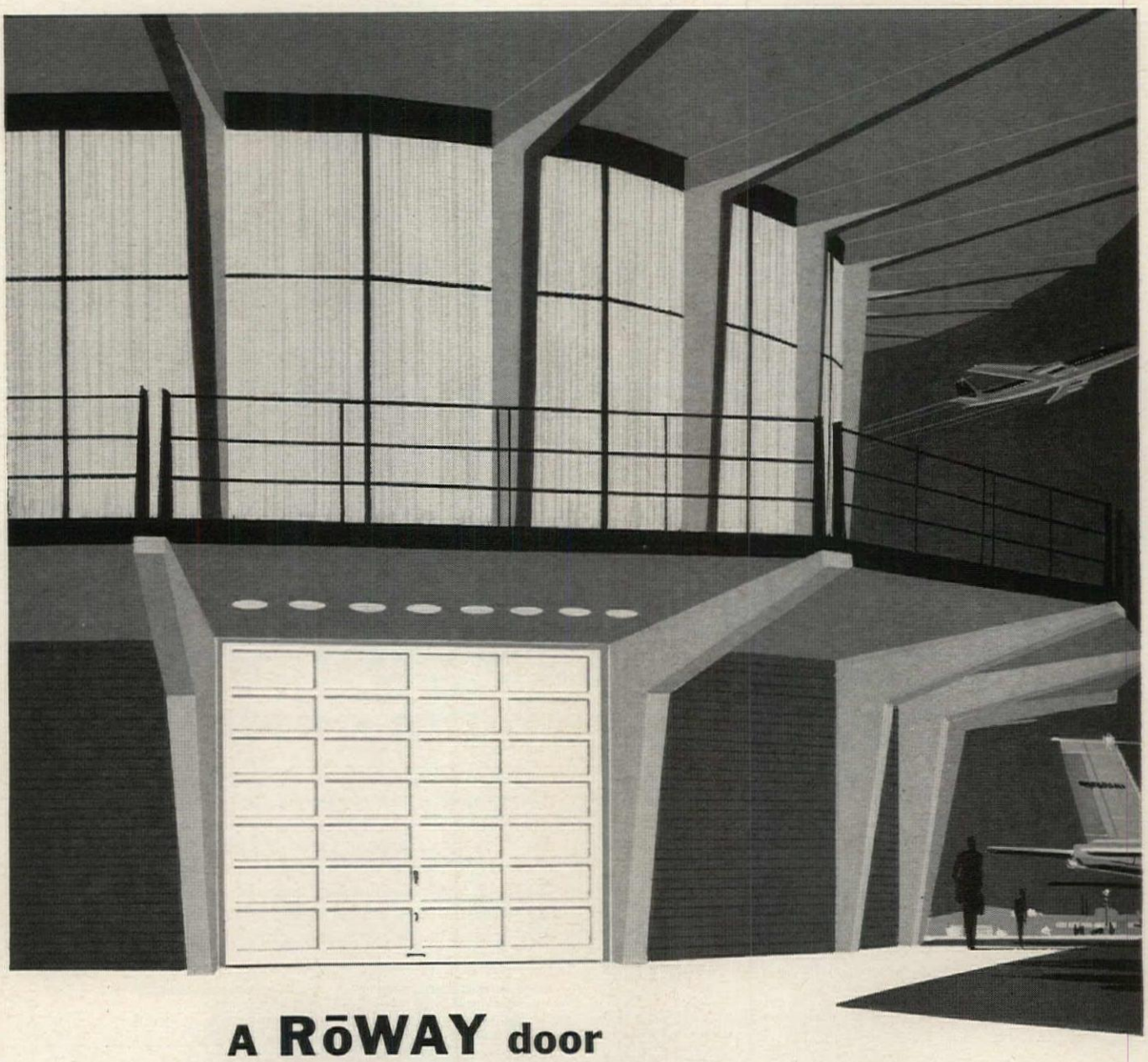

A RŌWAY door belongs in any plan you create

RŌWAY Overhead Doors belong to any plan you may have in mind . . . and for several reasons. Obviously, strength, ease of operation and economy are important RŌWAY features.

What about the **appearance** of an overhead door when considering the plan you have created?

Does it enhance the style of architecture being used? RŌWAY will.

Does it fit in with your design? RŌWAY will. There are no restrictions, no contrasts, no eyesores when you specify RŌWAY Overhead Doors.

there's a RōWay for every Doorway!

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Department AR763, Galesburg, Illinois

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SEE OUR CATALOG IN SWEET'S

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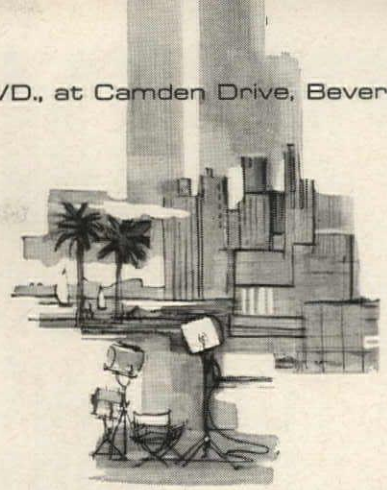
For more data, circle 84 on Inquiry Card ➔

UNITED CALIFORNIA BANK BUILDING, WILSHIRE BLVD., at Camden Drive, Beverly Hills, California



FIVE HAUGHTON ELEVATORS HELP FULFILL A CREED... "Building as it Should Be"

This exciting new building of glass and marble is the largest in Beverly Hills ...and the eleventh major office building to be built by the Kreedman organization. Its superb blending of functional beauty, comfort and convenience clearly expresses the Kreedman creed – "building as it should be." For example: Five Haughton elevators under fully-automated electronic control answer calls with uncanny speed and efficiency. ■ A new, advanced-design computer created by Haughton Elevonics* constantly monitors traffic demand, and responds instantly to match elevator service with the need. Include Haughton elevators in your plans for building or modernization. ■ Ask your Haughton sales office (listed in the Yellow Pages) for details, or write to us. Haughton Elevator Company, Division of Toledo Scale Corporation, Toledo 9, Ohio.

S. Jon Kreedman & Co., Beverly Hills, Calif., an investment building firm. Owner—Builder ■ Charles Luckman Associates, Architects, Los Angeles, Calif.

Haughton's advanced program in systems research and engineering with specific emphasis on the creative application of electronic devices and instrumentation for betterment of systems design and performance. Reg. in U. S. Patent Office.

MOISTOP

MOISTURE-VAPOR BARRIER CAN TAKE A BEATING WITHOUT DAMAGE!

This is the kind of rough treatment that a lot of vapor barriers, including 6 mil polyethylene, just can't take! Rips and punctures will allow moisture to get through. But super-strength MOISTOP won't let this happen! Moistop is a combination of tough, reinforced, waterproof Sisalkraft **plus** polyethylene . . . this combination is far tougher than polyethylene by itself.

Moistop has an MVT rating of 0.15 perms, and exceeds FHA minimum property standards. Available in 1,200 sq. ft. rolls, 72″, and 96″ wide, lays down fast over areas prepared for concrete slabs or basement floors and crawl spaces in homes. Specifications in Sweet's File 8h/AM. Send for additional information and samples.

AMERICAN SISALKRAFT COMPANY
73 Starkey Avenue, Attleboro, Massachusetts • Division of St. Regis Paper Company

MOISTOP a Lamination of Reinforced Paper & Polyethylene

For more data, circle 83 on Inquiry Card

For more data, circle 85 on Inquiry Card ➔

FLOORS WITH EXTRA STRENGTH FOR FUTURE LOADINGS

Inland Hi-Bond Steel Floor Deck

Future office changes involving heavy equipment will present no floor loading problems to the owners of Baltimore's new 30-story Blaustein Building at One North Charles Street. The architects designed a composite floor slab with ample extra capacity to provide for increased loadings. ■ In the Blaustein Building, composite floors constructed with Type B Hi-Bond Floor Deck over 7 ft. spans are capable of carrying total loads up to 239 psf. Non-composite decks with the same 1½" profile could carry only 134 psf. ■ This extra floor strength results from the composite action of the concrete and the Hi-Bond Deck. Lugs formed into the webs of the deck create a positive lateral and vertical bond between the two, causing them to act as a unit. ■ For more information about Inland Hi-Bond Steel Floor Deck and Celluflor®, see Sweet's Architectural File, Section 2j/In, or write for Catalog 270.

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Engineered Products Division

Inland Steel Products Company

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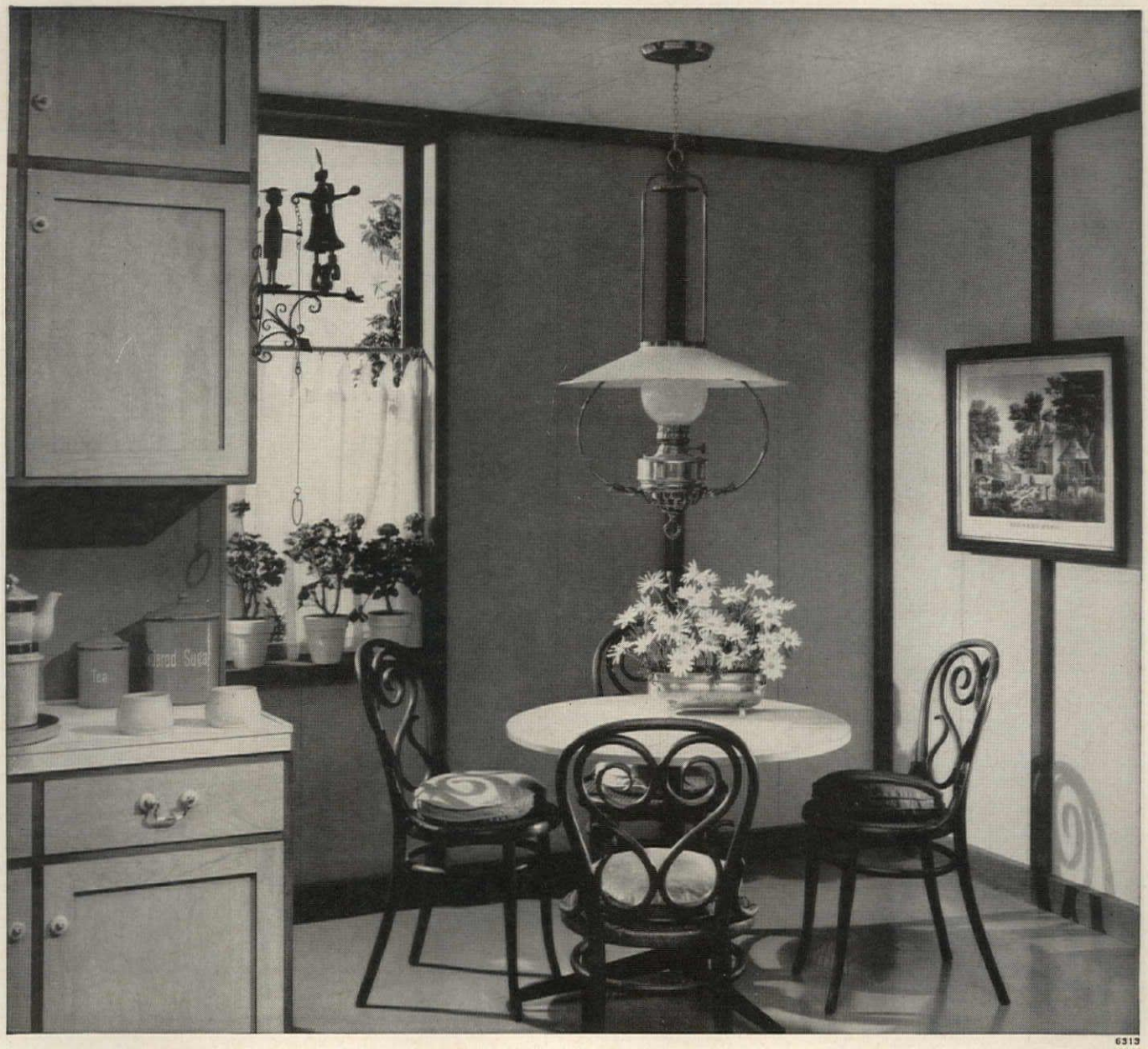
EP-30

Hi-Bond deck available in Canada through Rosco Metal Products Ltd., Toronto, Ontario



6313

Create home interiors that stay in style for years with beautiful wash-and-wear Marlite Paneling

With versatile Marlite paneling, you can create modern interiors in any room in the home that take years of wear with just minutes of care. Marlite's soilproof plastic finish is baked on at high temperatures most materials can't stand. Unlike many other wall coverings, Marlite shrugs off grease, stains, mars—even heat.

And the selection of Marlite colors and patterns is almost endless. You can choose from a complete array of beautiful colors, authentic Trendwood reproductions, distinctive marble and decorator patterns . . . all created exclusively for Marlite by American Color Trends to stay in style for years.

Get complete details from your building materials dealer, consult Sweet's File, or write Marlite Division of Masonite Corporation, Dept. 705, Dover, Ohio.

Marlite® plastic-finished paneling

ANOTHER QUALITY PRODUCT OF MASONITE® RESEARCH

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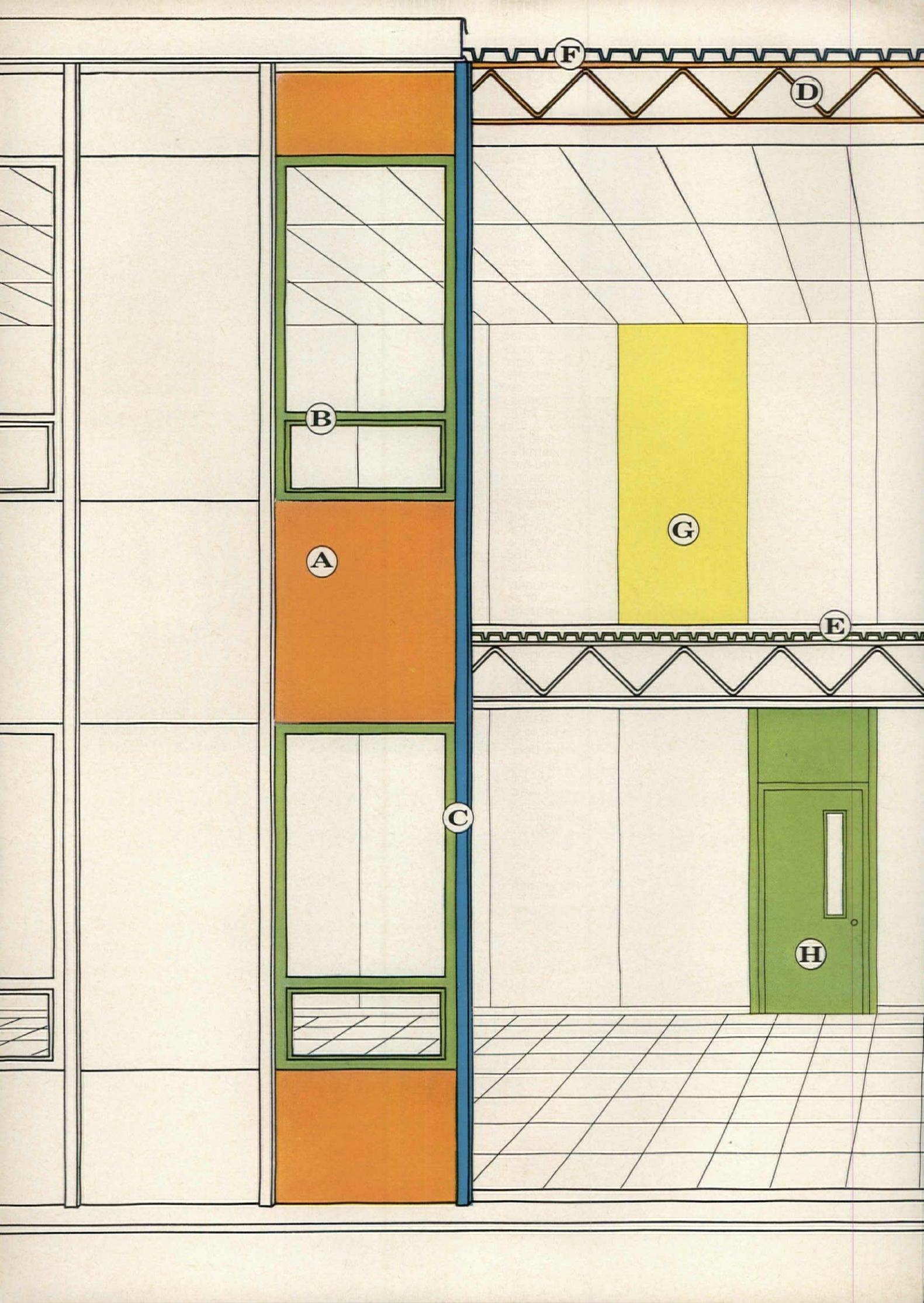
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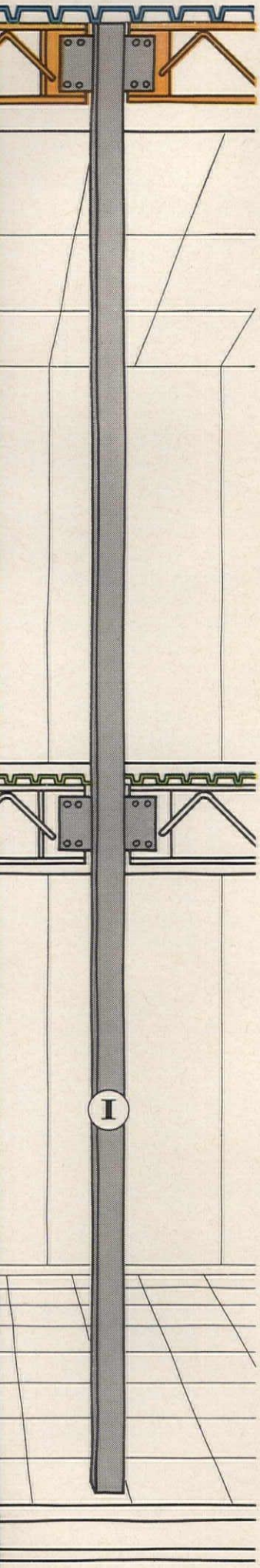


AmBridge Coordinated Building Components: beauty and the best

AmBridge Coordinated Building Components are precision-fabricated. The system is simple and fast to assemble—because every component fits perfectly. Biggest use so far for the AmBridge family of components is schools (where costs are often 13-18% less than average), but AmBridge Components have also been used successfully for power plant, bank, warehouse, laboratory, and office buildings. Architects find that AmBridge Components readily lend themselves to the most modern modular design practices.

USS AmBridge Curtainwall

(A) USS AmBridge Curtainwall systems are available with exterior faces in the 47 recommended PEI colors. Interior surfaces are fully finished with vinyl (at no extra cost to you) or baked enamel to match or harmonize with the partitions. The steel panels are normally designed to a 4-ft. module and run continuously outside the columns. Standard panels are available in 1-, 2-, and 3-story heights. Panel frame members are cold formed galvanized steel. Face sheets are mechanically attached to the structural frame. Heat transfer is controlled with thermal breaks which prevent a thru-metal condition. Because the glass fiber insulation is held away from the exterior face by stainless steel clips, the panel is free to breathe, thereby minimizing condensation. AmBridge walls are so thin compared to masonry construction that you gain about 5% usable floor space. Yet the walls provide a tested thermal "U" factor of .168 that assures comfortable temperatures at reasonable cost.

(B) Sash are high-quality 2" monumental projected or fixed-type, of stainless steel or aluminum. Vertical or horizontal sliding sash are optional.

(C) USS AmBridge Exterior Battens are extruded metal sections with provisions for mechanical attachment without drilling from interior. Battens are fitted with shop-applied neoprene gaskets that permit expansion or contraction while keeping joints weathertight. Custom-designed covers permit aesthetic variation in stainless steel, porcelain enamel finish, or special extruded shapes.

USS AmBridge Open Web Steel Joists

(D) USS AmBridge Open Web Steel Joists support floors and roof. Joist and framing details have been designed to adapt to any specific load requirements. Like all AmBridge Coordinated Structural Components, joists meet specifications of the SJI, AWS, AISC, and AISI latest adoptions.

(E) Leave-in-place light-gage steel floor forms provide support during cure for the poured concrete floor.

(F) Steel roof deck specifically engineered to the structural requirements permits all-weather installation, receives insulation for built-up roofing and supports roof loads.

USS AmBridge Partitions

(G) USS AmBridge Partitions, like our curtainwall interiors, are available in six pastel vinyl finishes that cost no more than our 28 baked enamel colors. Both finishes are applied under factory-controlled conditions. Mild detergents easily keep surfaces clean and new-looking. The panels incorporate a cold-rolled steel channel frame with face sheets attached to each side. Partitions are insulated with glass fiber, and although only 2¼" thick, they provide excellent acoustical values. Test results show an attenuation of 45 decibels or more from room to room. Partitions are easily movable (just unbolt) to permit alteration of room size with minimum disturbance and cost. Interior battens are flush with the partition and are removable for simplified wiring.

(H) USS AmBridge Steel doors with a corrosion-resistant polyurethane foam core are supplied as an integral part of exterior and interior panels. All doors are complete with pressed steel frames and hardware, baked enamel finish, and can be furnished with lights and/or louvers. Neoprene weatherstripping is furnished on all exterior doors to assure a storm-tight seal. Hardware of the finest quality approved by the architect—such as lock sets, closers, panic bars and kick plates in various finishes—can be installed under supervision of experienced AmBridge personnel.

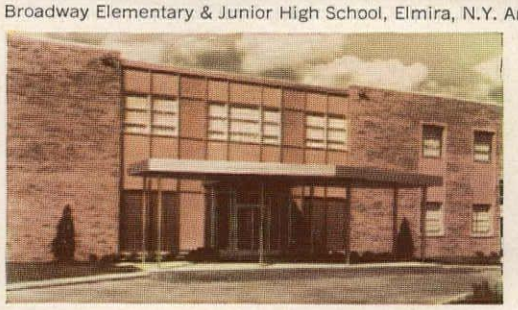
(I) Square or rectangular tubular columns are offered for maximum economy of section.

If you want, American Bridge will provide experienced erection crews. We'd like to give you more information. For our free full-color booklet, write to American Bridge Division, United States Steel, Room 1831R, 525 William Penn Place, Pittsburgh 30, Pa.

American Bridge Division of United States Steel

Beauty, too. Best of all, USS AmBridge Coordinated Building Components blend handsomely with traditional materials, letting you stamp your own signature on every AmBridge Building you design. Three good examples:

Broadway Elementary & Junior High School, Elmira, N.Y. Architect: Considine & Haskell, AIA, Elmira.



Mobay Chemical Company Office Building, Pittsburgh, Pa. Architect: J. Kenneth Myers, AIA, Pittsburgh.

Union Carbide Company Laboratory and Testing Building, Eastview, N.Y. Architect: Skidmore, Owings and Merrill, AIA, New York.

Product Reports

continued from page 198

PRODUCT BRIEFS

Luminaires with multi-layer polarized panels are available in a variety of sizes. *Edwin F. Guth Co., 2615 Washington Blvd., St. Louis 3, Mo.*

CIRCLE 316 ON INQUIRY CARD

Packaged hydronic heating system supplies heat for baseboard panels, service hot water and swimming pool and/or snow and ice removal units. *Ace Tank & Heater Co., 10847 S. Painter Ave., Santa Fe Springs, Calif.*

CIRCLE 317 ON INQUIRY CARD

Compact fire protection system for houses and small commercial buildings includes a "prowler switch." *Notifier Corp., 3700 N. 56th St., Lincoln 4, Neb.*

CIRCLE 318 ON INQUIRY CARD

Concealed panic device for narrow stile doors has a trigger-type button release locking mechanism with a minimum number of moving parts. *Detroit Hardware Mfg. Co., 560 Eleventh St., N.W., Grand Rapids 2, Mich.*

CIRCLE 319 ON INQUIRY CARD

Water booster system operates at a constant speed and maintains constant pressure regardless of variations in flow demand or suction pressure. *FMC Corp., 622 W. Diversey Pkwy., Chicago 14, Ill.*

CIRCLE 320 ON INQUIRY CARD

A specially-processed plastic laminate looks and feels like wood when rubbed with oil. *Westinghouse Electric Corp., Decorative Micarta Div., Hampton, S.C.*

CIRCLE 321 ON INQUIRY CARD

Locksets with internal working parts of nylon show high wear-resistance and reduce maintenance. *Lockwood Hardware Mfg. Co., Fitchburg, Mass.*

CIRCLE 322 ON INQUIRY CARD

Blast-resistant door has concave/convex design and special reinforcing to provide a secure barrier against severe airborne shock waves. *Overly Mfg. Co., 847 W. Otterman St., Greensburg, Pa.*

CIRCLE 323 ON INQUIRY CARD

Horizontal window shades for skylights have hidden metal channels and can be operated electrically or manually. *Joanna Western Mills Co., 22nd and Jefferson Sts., Chicago 16, Ill.*

CIRCLE 324 ON INQUIRY CARD

Electro-magnetic door holder release for fire doors is surface-mounted on door and wall and can be used with any door closer. *Rixson, Inc., Franklin Park, Ill.*

CIRCLE 325 ON INQUIRY CARD

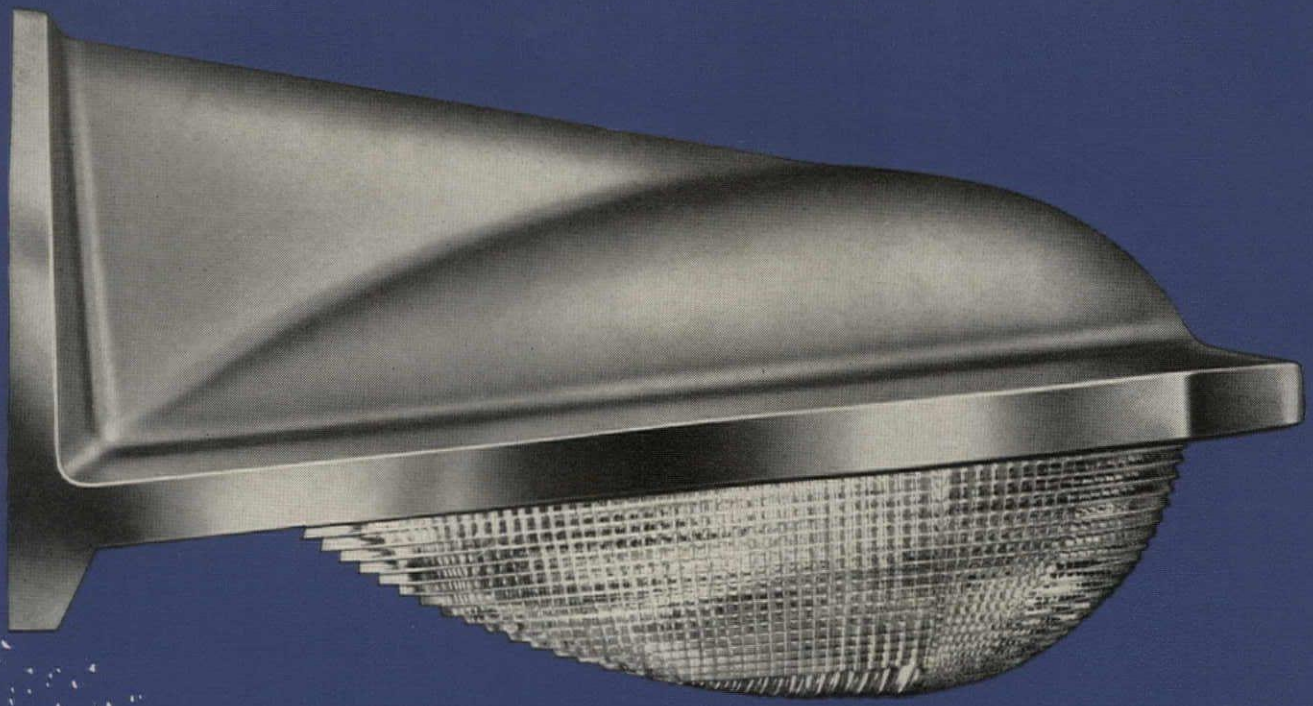
Laminated vinyl panels feature patterns into which leaves, butterflies, woods, gold mesh and metallic weave are embedded. *Decorative Laminates, Ltd., Merchandise Mart Plaza, Chicago 54, Ill.*

CIRCLE 326 ON INQUIRY CARD

Stamped metal grills, in many designs and signs, have flat surfaces which inhibit dust collection while making repainting easy. *Auer Register Co., 6600 Clement Ave., Cleveland 5, Ohio*

CIRCLE 327 ON INQUIRY CARD

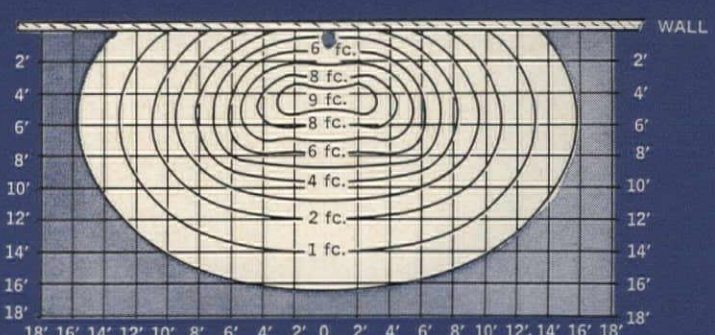
For more data, circle 92 on Inquiry Card ➔



GUTH *Thunderbird**

UNIQUE AMONG PRISMATIC BRACKETS

1. Dynamic Contemporary Design
2. Best In Light Utilization
3. Minimum High-Angle Glare Light
4. Cast Aluminum — Alzak Finish
5. Extends 11"; max. 5" height and width backplate
6. 2 Sizes: 75/100W and 150/200W
7. Companion Units (White Glass)
8. Write for Brochure.



ISOLUX CHART — 200W T-Bird Bracket at 8'0" mtg. Amazing uniformity and utilization. Spacing not to exceed 2.25 x Mtg. Ht.

*T.M. and Pats. Pending

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Guth LIGHTING since 1902

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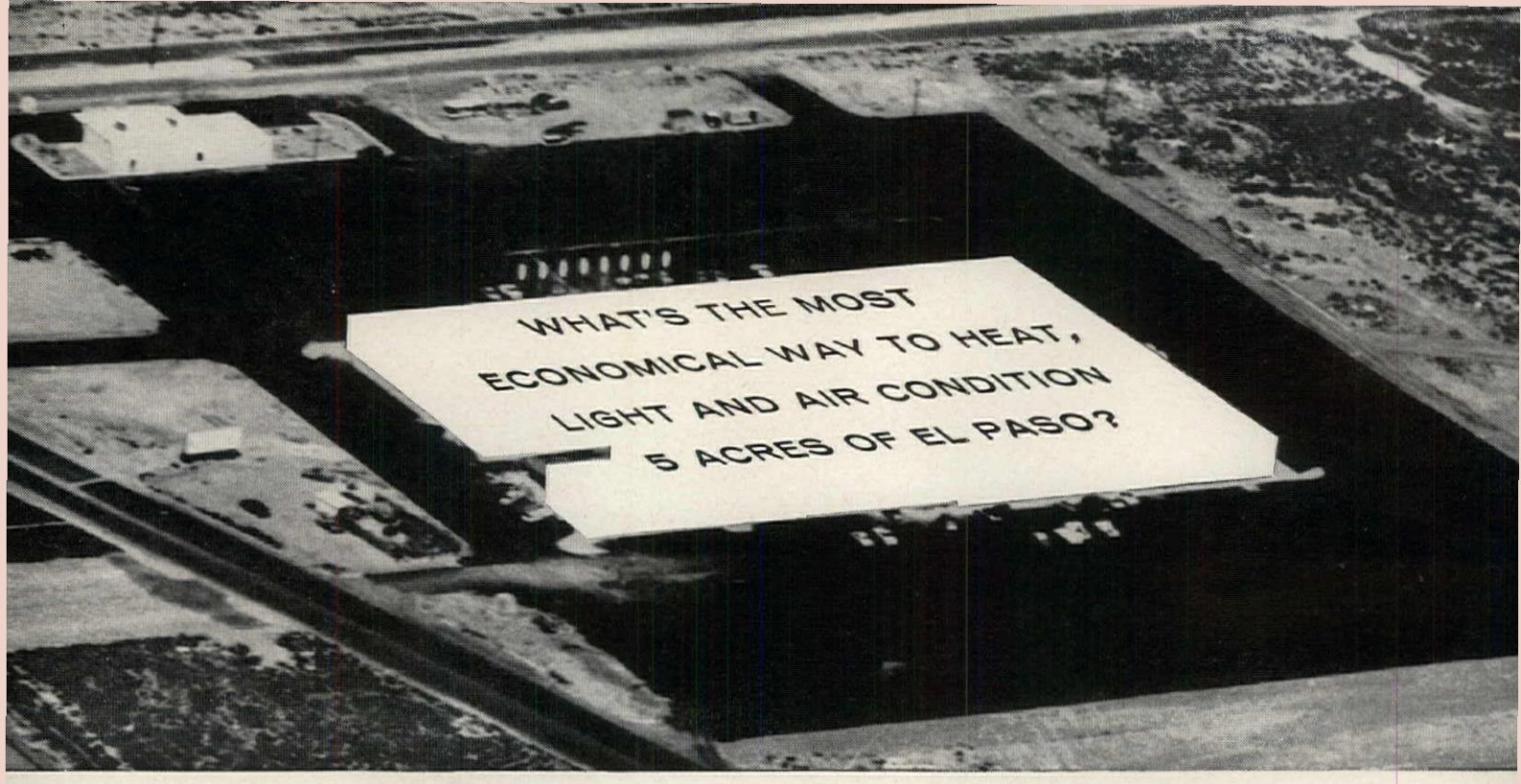


Use Caterpillar Natural Gas Electric Sets for total power. That's the solution at new Rushfair Shopping Center in El Paso, Texas. Three Cat G379 Engines, driving generators, will ensure year-round comfort—at low cost—for Rushfair tenants and shoppers.

The power demands of this shopping center will be great. Contrary to conventional centers with strips of street-front stores, Rushfair will be built entirely under one roof. This means that every square foot of the 5-acre center, including all shops and malls, must be comfortized. To take care of this demand, the Caterpillar Natural Gas Electric Sets will provide 900 kilowatts—enough power to light more than 600 homes.

Two of the units can carry the maximum load. The third unit will be used only to provide service during scheduled maintenance periods. However, since no local utility power will be used at all—not even for standby—the units must be absolutely dependable.

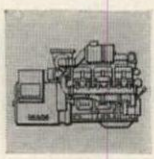
That is one good reason Caterpillar units were chosen. Since all Cat Natural Gas Engines are direct conversions from their diesel counterparts, they give all the advantages of diesel strength. In the less strenuous demands of gas operation, Cat Natural Gas Engines last longer... give thousands of hours of excellent performance before they need to be overhauled.

Besides being dependable, these Cat Natural Gas Engines offer very definite economic advantages. Initial costs are low. 10:1 compression ratios allow maximum fuel economy. Replacement parts are inexpensive.

Another cost-cutting factor: the gas-powered utility center will also produce steam for heating and hot water by utilizing rejected heat from the G379 Engines. Then, in the summer, the steam will be used in a 220-ton gas absorption refrigeration unit to help provide chilled water for low-cost air conditioning.

For full information on how Cat Natural Gas Electric Sets can provide dependable, low-cost power for buildings of every description, see your Caterpillar Dealer. Or write direct for brochure 40-20492.

CATERPILLAR
ENGINE POWER



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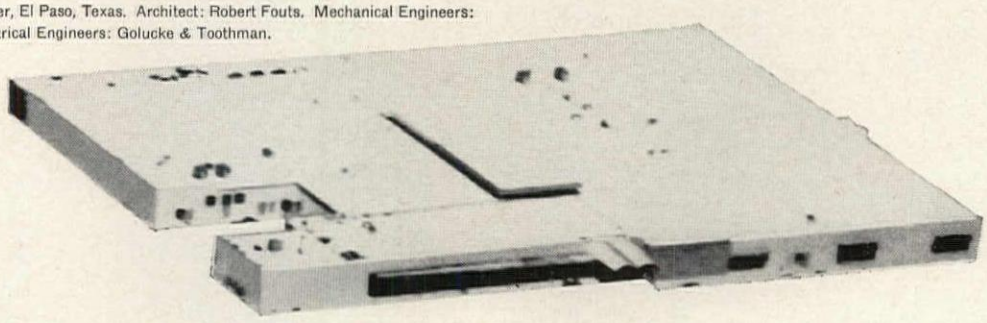
Rushfair Shopping Center, El Paso, Texas. Architect: Robert Fouts. Mechanical Engineers: Randall and True. Electrical Engineers: Golucke & Toothman.



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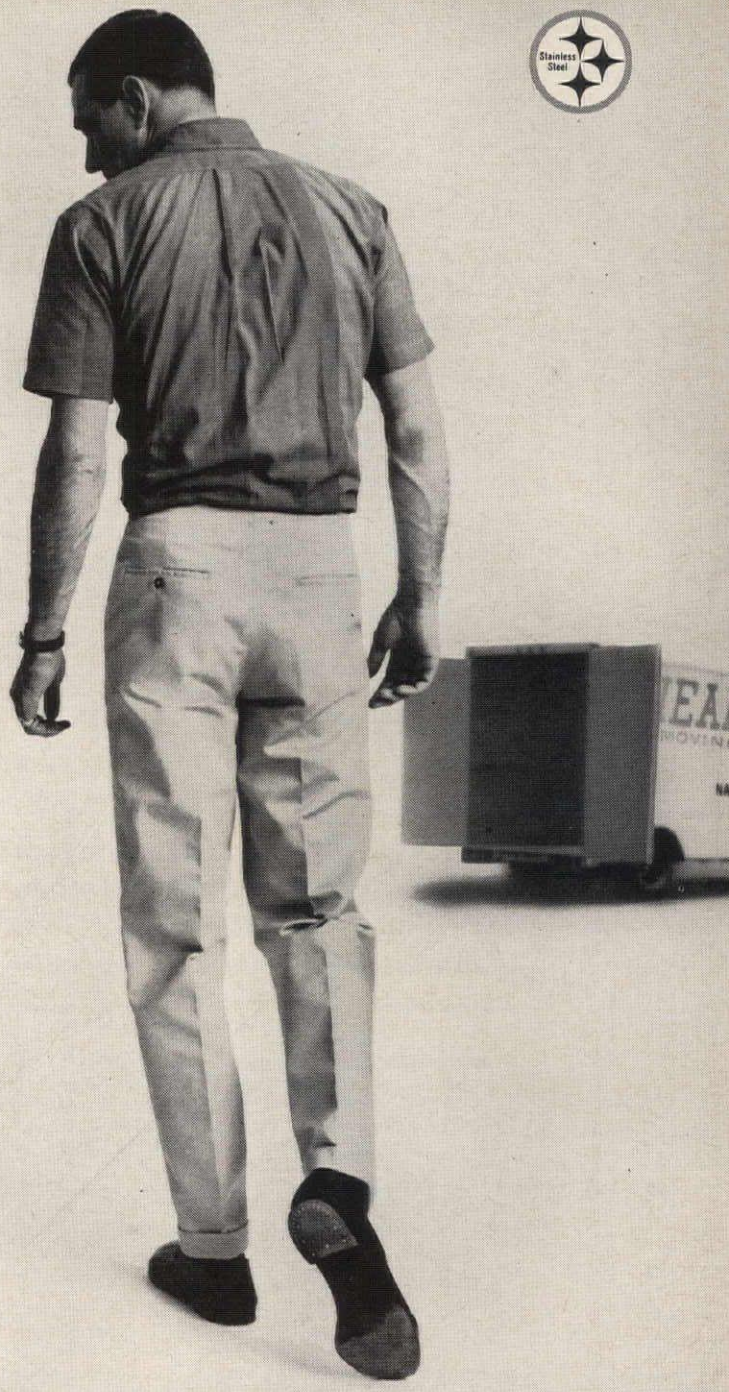
"We won't need that. Our new house has FREEDOM STAINLESS STEEL WINDOWS"



Be known as the expert who *eliminated* window maintenance from his structures!

You can do it with FREEDOM Stainless Steel Windows: most durable windows ever made. No need to paint, putty, or patch, *ever*.

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Choose from a complete range of styles—single-hung, double-hung, and horizontal sliders—to suit colonial, contemporary, or modern architecture, perfectly. Priced to be practical for every class of building FREEDOM Windows will attest to your good judgment for years to come.

Literature and detailed specifications are available. Write!

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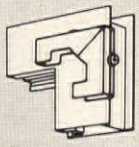
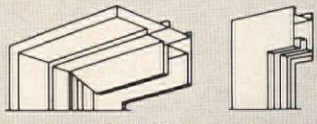
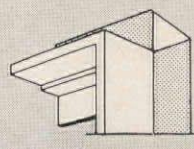


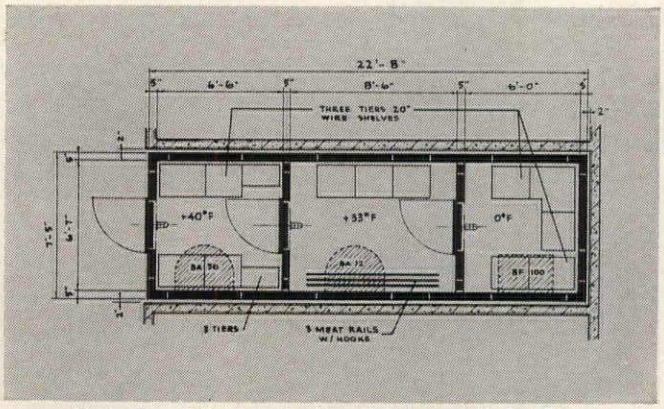
To make strong construction even stronger, FREEDOM Window Corners are ruggedly reinforced with zinc block inserts, sealed with mastic, and assembled with offset screw fastenings for extreme rigidity.



Other FREEDOM Window features that buyers like—tubular "trapped air" frame construction plus optional double glazing, to eliminate heat-cold transmission problems and interior condensation.



Machine-mitered corners assure a perfect, square fit, first try, and a unique, integral folding fin snaps in place for nailing—or can be removed for anchored or mullion installation.



Plan view of the combination Walk-In installed at **Somerset Community Hospital**, Somerset, Pa.

Specifications prepared by **Scarlett & Mitchell, Architects,** 673 Washington Road, Pittsburgh, Pa.

Bally pre-fab walk-ins

all-metal coolers and freezers

World's most advanced design. New materials and construction techniques offer architects an opportunity to provide tremendous refrigeration advantages to their clients.

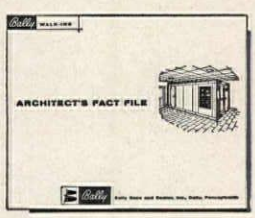
Urethane 4" thick (foamed-in-place) has insulating value equal to 8½" fibreglass. Standard models can be used as freezers with temperatures as low as minus 40° F. Urethane has 97% closed cells . . . cannot absorb moisture . . . ideal for outdoor use.

Speed-Lok Fastener designed and patented by Bally for exclusive use on Bally Walk-Ins. Makes assembly accurate and fast . . . easy to add sections any time to increase size . . . equally easy to disassemble for relocation.

New foamed door, so light in weight it ends forever the "hard pull" . . . the "big push". Door is equipped with new type hand lock (with inside safety release) and convenient foot treadle for easy opening. Also has special hinges that close door automatically. Magnetic gasket guarantees tight seal.

Self-contained refrigeration systems combine balanced capacity condensing units and refrigeration coils. Mounted and hermetically sealed with necessary controls on small wall panel. Simplifies installation. Four-hour factory test assures quiet, efficient, trouble-free operation.

Write for Free Architect's Fact File which includes 12-page brochure . . . Specification Guide . . . and sample of urethane wall construction.



See Sweet's File, Section 25a/Ba

Bally

Bally Case and Cooler, Inc.
Bally, Pennsylvania

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The CASE #3000 One Piece Closet is mounted off the floor. You can hardly hear its "Whispering Flush".

Like all Case one-piece closets it positively will not overflow.

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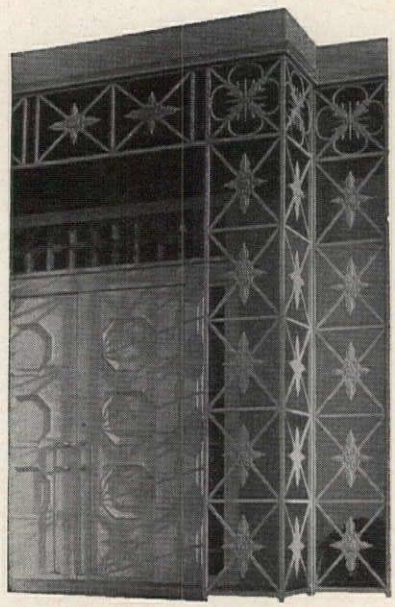
Smith, Kratz & Strong
Architects
B.P.O.E. Elks Lodge No. 682
Jacksonville, Ill.



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NO. 12 exposed aggregates

a.i.a. file: 4a

Prepared as a service to architects by Portland Cement Association

clip along dotted line

Exposed aggregate provides concrete surfaces of unusual beauty and variety. To emphasize the gleaming freshness, true colors and textures of the aggregate, architects, today, choose concrete made with white portland cement. It is also an excellent tinting base for mineral coloring pigments.

Reveal of precast concrete panels is largely determined by aggregate size. When panels are to be viewed relatively close, less reveal is needed. When panels are some distance from the main flow of pedestrian traffic, greater reveal is required for a rough textured look.

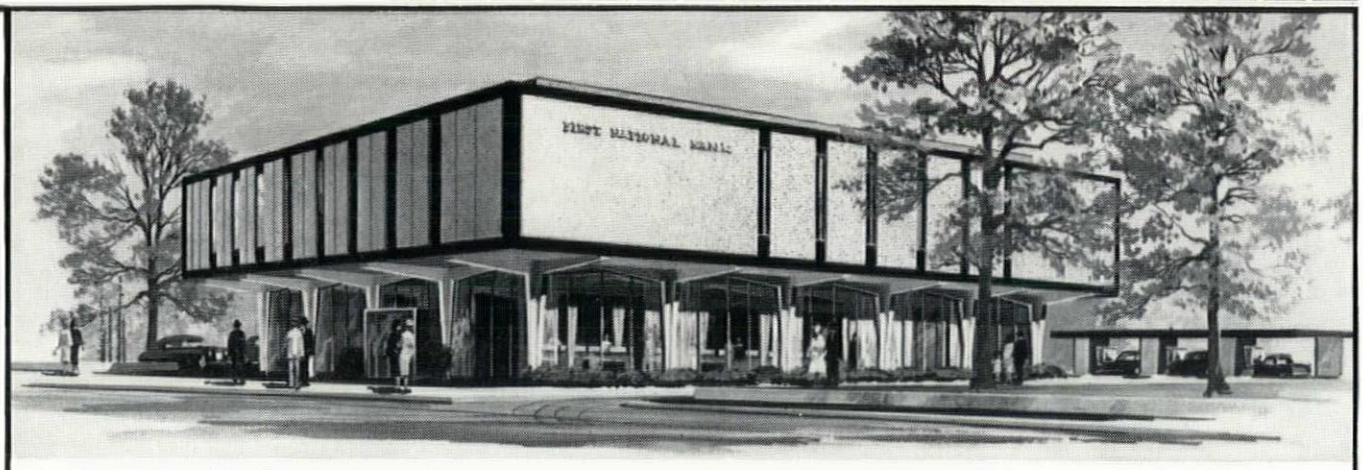
Polished panels of pastel colors tend to appear white when viewed from a distance due to the high reflectance of the surface.

Shown at right is a table which demonstrates the unlimited range of colors possible with commercial aggregates and white cement.

Write for additional free information (U.S. and Canada only.)

VISIBILITY SCALE

aggregate size	*distance at which texture is visible*
¼″—½″	20— 30 feet
½″—1″	30— 75 feet
1″—2″	75—125 feet
2″—3″	125—175 feet



First National Bank, San Angelo, Texas. Architects: Abel B. Pierce and George Pierce, A.I.A., Architect & Planning Consultants, Houston. Structural Engineer: Walter P. Moore, Houston. Contractor: Templeton & Cannon, San Angelo

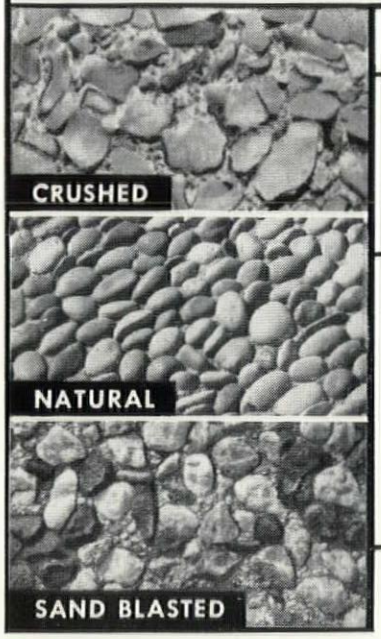


TABLE OF COMMON COMMERCIAL AGGREGATES

		SIZE	USES	SOURCE**	COLOR RANGE
GLASS*	ARTIFICIAL	¼″—1½″	stained glass, walls, panels	Mich., N.J., Texas	brilliant and almost unlimited ranges
CERAMIC	ARTIFICIAL	¼″—1½″	curtain wall panels, ornamental work	Ark., Ariz., Mich.	any color
SAND	MINERALS	fine to coarse	plain or sculptured panels	all areas	white-buff-yellow
PEBBLES	MINERALS	¼″—6″	tilt-up walls, panels, walkways	west & southeast	white-red-orange-buff-black
MARBLE	MINERALS	½″—2″	curtain wall panels	all areas	white-red-buff-yellow-black
GRANITE	MINERALS	¾″—2½″	tilt-up walls, panels, walkways	midwest & west	red-gray-buff-dark blue-black
QUARTZ	MINERALS	½″—2″	curtain wall panels	east, west, south & midwest	white-pink-gray-clear

*Reactivity: some glasses may react with alkalis in the cement to cause expansion. Consult glass manufacturer to determine if glass is reactive.

**List of manufacturers available.

PORTLAND CEMENT ASSOCIATION Dept. A7-8, 33 West Grand Ave., Chicago 10, Ill. *An organization to improve and extend the uses of concrete*

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Another new, exclusive pattern in General Electric Textolite... a gentle flotation design that hints of majestic marble. Four subtle pastels—Aqua, Melon, White, Champagne—selected for outstanding color coordinating versatility. Non-directional, too, for perfect design flow at seams. Get samples free from your G-E Textolite distributor, or write:

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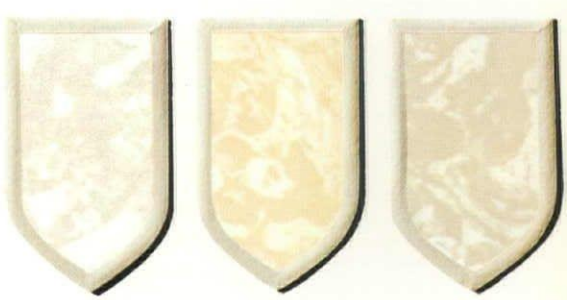


GENERAL ELECTRIC

Now—in minutes—estimate the cost of any building accurately

Try the Dow Building Cost Calculator FREE for 10 days

See for yourself how easy it can be to get the cost estimates you must have to tell a client how much space his budget will buy. Also invaluable for planning bond issues; temporary and permanent financing; determining amount of federal or state aid, fire insurance, appraised value; counselling client on most economical plant location; checking contractors' bids; reactivating postponed projects.

Two easy steps — the easiest, most reliable method you ever used:

First, select the building in the Dow Calculator most similar to the one you're planning (Figure 1). The Dow Calculator contains cost factors and descriptions for more than 750 buildings of all types . . . most with photos. Then, just jot down the base cost factor.

Second, turn to the Local Cost Multiplier section (Figure 2) and adjust the base cost to local labor and material prices. The Dow Calculator covers most metropolitan areas in the U.S. and Canada. Result: a current, locally accurate cost figure, ready to apply to your projected building.

Fig. 1

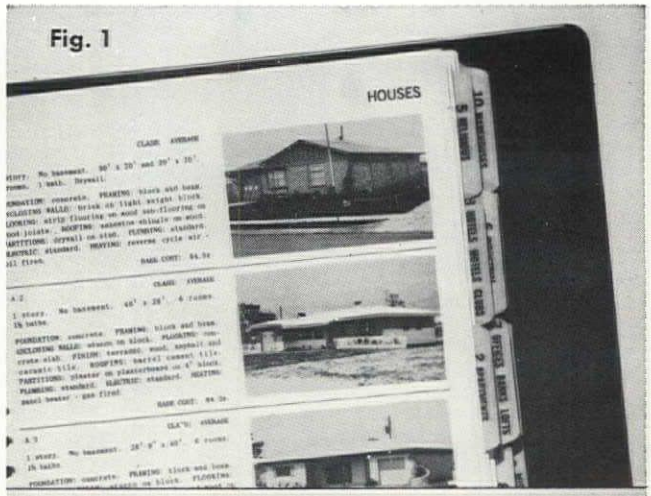
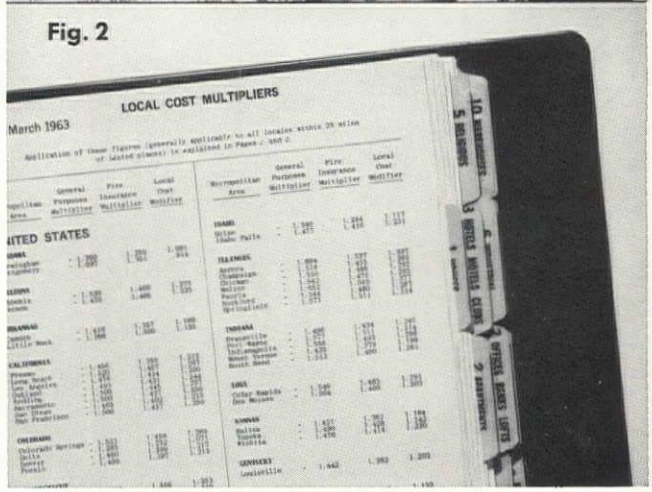


Fig. 2



The Dow Calculator is always up to date. Cost changes are constantly researched, and results are sent quarterly to Dow Calculator subscribers. Sharply erratic markets are covered by special bulletins issued as often as necessary.

The Dow Calculator covers major building types. There are sections covering houses, apartments, hotels, motels, clubs, hospitals, religious buildings, factories, offices, banks, lofts, stores, schools, warehouses, garages, service stations, theaters — and there's a "Miscellaneous" section, too.

The Dow Calculator is realistic. Dow figures are based on buildings actually built, not theoretical structures. Each section includes a representative number of buildings with varying shapes, sizes and specifications.

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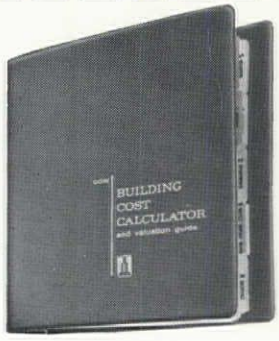
Send me the new Dow Building Cost Calculator. I understand that I may use it for ten days, return it and be under no obligation. If I keep it, I will accept your bill for $36* to cover the current Calculator and the quarterly revisions and/or supplements for an entire year.



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119 West 40th St., New York 18, N. Y.

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*Recommended maximum size for Coolite wire has been increased from 10 sq. ft. to 20 sq. ft.

Send for new WIDE Coolite Catalog. Free Sample, with or without special Glare Reducing finish, on request.

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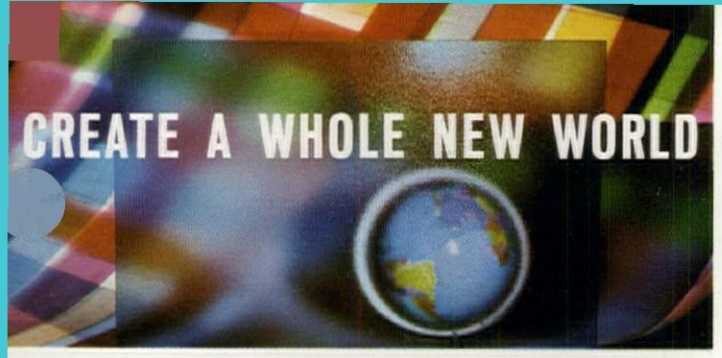

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COOLITE

HEAT ABSORBING GLASS

Coolite, Glare Reduced, installed in Pacific High School, San Leandro, California.
Architect: Schmidts, Hardman & Wong, Berkeley, Calif. Glazing by W. P. Fuller & Company

SPECIFICATIONS

NEW WIDE COOLITE

⅛″ LUXLITE COOLITE
plain, maximum width 48″; maximum length 132″

¼″ LUXLITE COOLITE
plain (not wired), maximum width 60″; maximum length 144″

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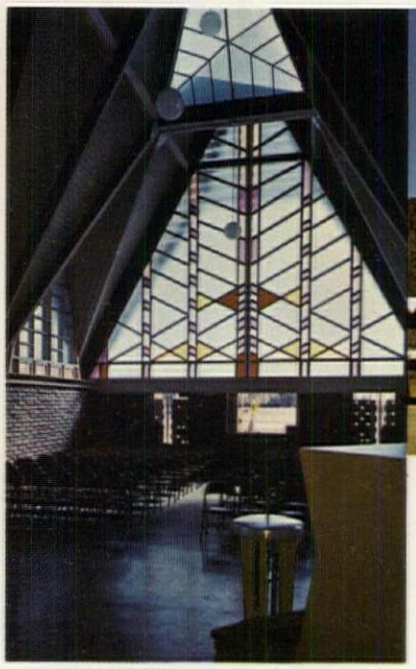
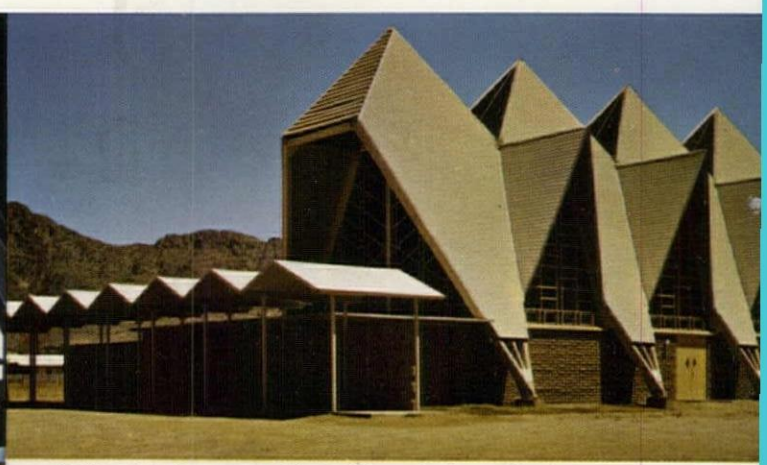
(diamond-shaped welded wire) maximum width 60″; maximum length 144″

NOTE:
Recommended maximum size for Luxlite Coolite Misco (wire) has been increased from 10 sq. ft. to 20 sq. ft. No maximum limit on ⅛″ or ¼″ Luxlite Coolite, plain.





Coolite wire glass graces Prince of Peace Lutheran Church, Phoenix, Ariz. Glazing Contractor: W. P. Fuller & Company.

Coolite wire glass spans western elevation in Belleville Township High School gymnasium, Belleville, Ill. Associated Architects: Charles E. King & Wesley W. Chorlton.

Coolite, heat absorbing glass, controls light and temperatures in Parkway Consolidated School, St. Louis, Mo. Architect: Schwarz & Van Hoefen. General Contractor: Swan Construction Company.

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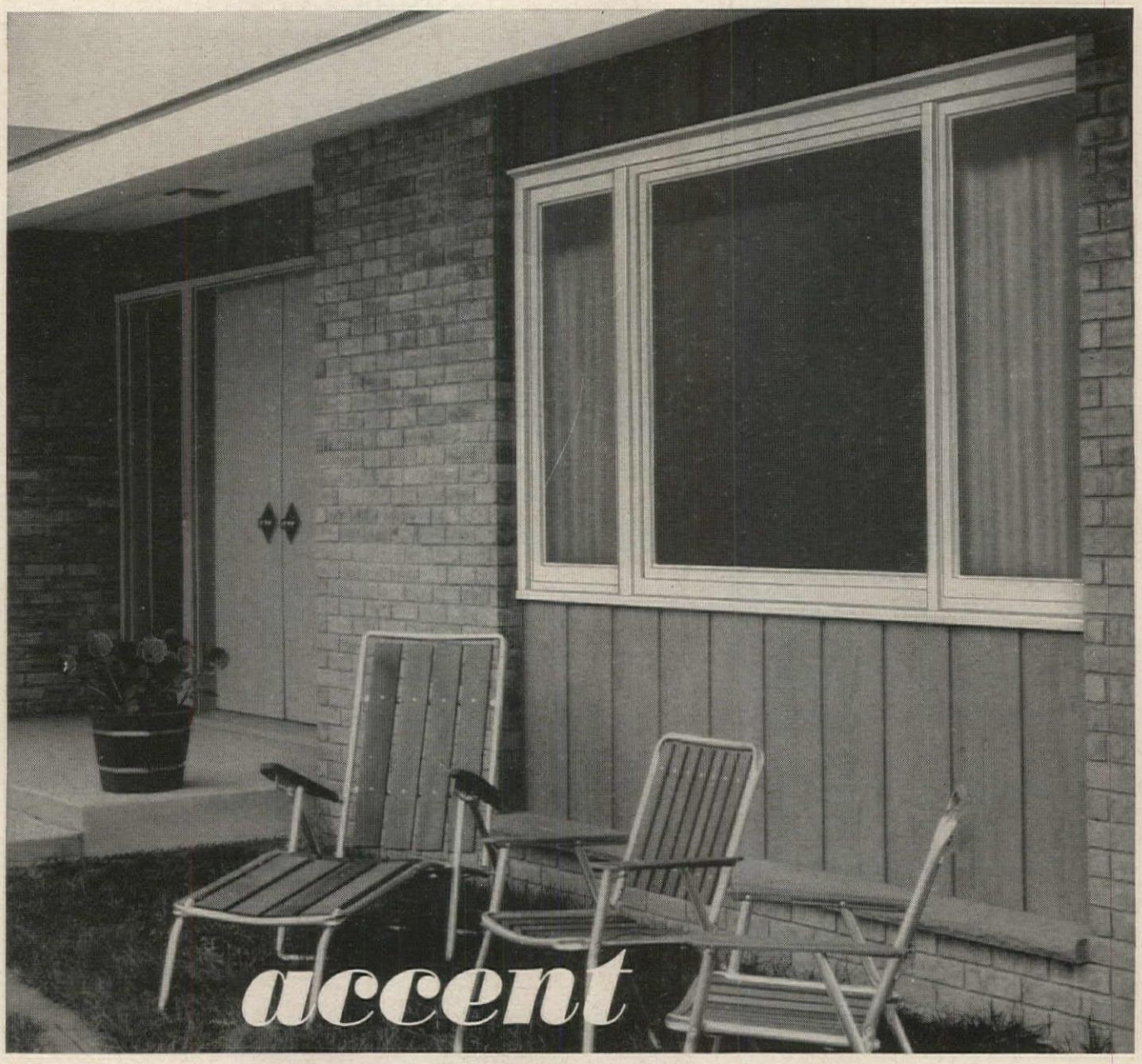

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RIMCO Wood Window Units

Rock Island Millwork Company, Manufacturing Division, Dept. 3ARI, Rock Island, Illinois

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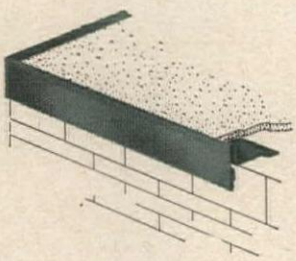
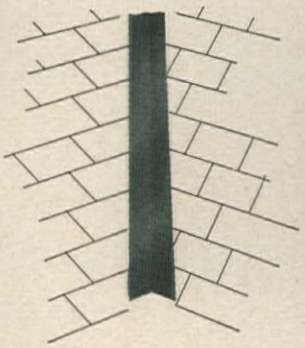
TERNE METAL: The Accessories

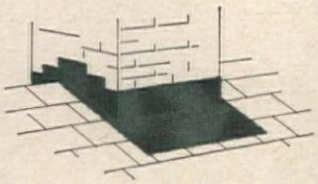
We believe most architects are now aware of terne's nearly unique design potential for visually significant roofs in the contemporary idiom. But terne is also among the best of accessory metals—probably the best when initial cost is balanced against durability. If considerably fewer architects are aware of it in this context, the fault is largely our own, for we frankly haven't found too many exciting things to say about gutters, flashings, valleys and gravel stops. Exciting or not, however, these commonplace items still play an important role in most buildings, and any failure can be very troublesome indeed. When next specifying them, therefore, why not give Follansbee Terne a trial? It should not only save your client money, but under normal exposure has a life-expectancy measured in generations rather than years.



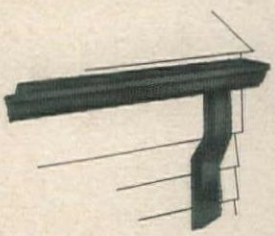
Combination Gravel Stop and Fascia



Valley



Chimney Flashing



Gutter and Downspout

FOLLANSBEE STEEL CORPORATION
Follansbee, West Virginia

Follansbee is the world's pioneer producer of seamless terne roofing.

Office Literature

continued from page 168

PER FLASHING

.A. 12-H) Weatherproofing for nry buildings using copper ing is described in 20-page book- as isometric drawings and appli- n pictures covering various in- tions. *Revere Copper and Brass 230 Park Ave., New York 17,* *

CIRCLE 417 ON INQUIRY CARD

COMPACT AIR CONDITIONERS

Lo-Line Seasonmaker fan-coil air-conditioning units are described in Bulletin 750-2. Included are a free standing console, a flush wall model and a basic unit for concealed installations. *McQuay, Inc., 1600 Broadway, N.E., Minneapolis 13, Minn.*

CIRCLE 418 ON INQUIRY CARD

CIRCULAR LIGHTS

(A.I.A. 31-F) Detailed drawings of a complete line of fluorescent round dome lights are presented in brochure. *Morris Kurtzon, Inc., 1420 S. Talman, Chicago 8, Ill.*

CIRCLE 419 ON INQUIRY CARD

PARTITION TRACKS

(A.I.A. 20-B-1) Data sheets give details on one-piece, slotted drop-in *Milcor* partition tracks which are said to simplify and speed installation. *Inland Steel Products Co., 4157 W. Burnham St., Milwaukee 1, Wis.**

CIRCLE 420 ON INQUIRY CARD

STRUCTURAL BOLTS

High strength structural steel bolts are discussed in 22-page booklet. Various shapes and installations of bolts are illustrated. *Republic Steel Corp., 1441 Republic Bldg., Cleveland 1, Ohio*

CIRCLE 421 ON INQUIRY CARD

CONSTRUCTION AIDS

(A.I.A. 7-C, 4-E-11) An eight-page brochure gives details on pvc plastic waterstops, masonry control joint units and expansion joint flashings, joint fillers and polysulfide sealing compounds. *Electrovert Inc., 240 Madison Ave., New York 16, N.Y.**

CIRCLE 422 ON INQUIRY CARD

EQUIPMENT HOUSING

Construction details and engineering data on modular housing for central air handling equipment. *United Sheet Metal Co., Inc., 883 N. Cassady Ave., Columbus 19, Ohio*

CIRCLE 423 ON INQUIRY CARD

VIBRATION CONTROL

(A.I.A. 39-D) More than 35 ways to measure and control vibration and noise from all types of machinery are given in eight-page booklet. *Korfund Dynamics Corp., Cantiague Rd., Westbury, L.I., N.Y.*

CIRCLE 424 ON INQUIRY CARD

HUMIDITY CONTROLS

Humidity sensors and control units for industrial application are subject of 12-page brochure. Included is information on using psychrometic charts. *Minneapolis-Honeywell, 2727 Fourth Ave. S., Minneapolis 8, Minn.**

CIRCLE 425 ON INQUIRY CARD

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

more literature on page 230

First from Amtico! Vinyl Asbestos color-keyed floor tile coordinates floors and decor!

NEW AMTICO CONTRACT COLORS

Here at last . . . flooring you can specify exactly and easily for overall color coordination. Amtico's new Contract Colors in popular Vinyl Asbestos tile include marbleized color-keyed neutrals and bright accent tones . . . plus solid chip patterns.

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Amtico Contract Colors meet Federal Specification L-T-00345. In 9″ x 9″ Vinyl Asbestos tiles, 1/8″ gauge (or 12″ x 12″, 1/8″ gauge, on special order). Smooth prewaxed surface for low-cost maintenance.

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Amtico FLOORINGS

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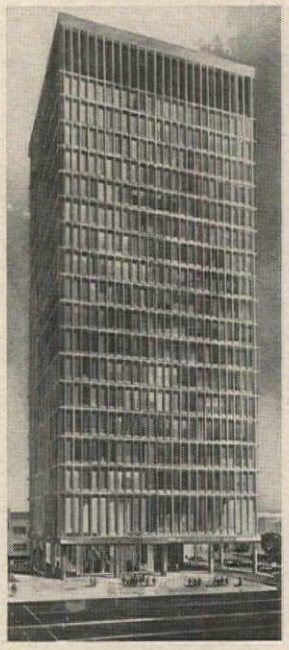
The Phillips Petroleum Building, Bartlesville, Okla., is another example of buildings across the country sealed with Maloney gaskets. Used in structures designed by some of the nation's foremost architects, Maloney gaskets have proved their strength as the mechanical fastener holding glass or panels, and their tightness as a seal.



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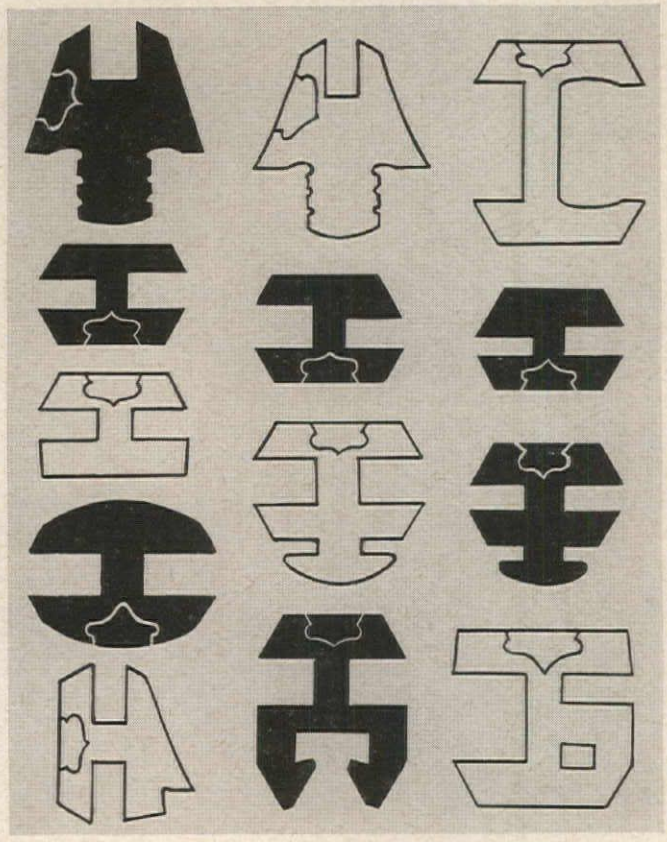

For more data, circle 106 on Inquiry Card

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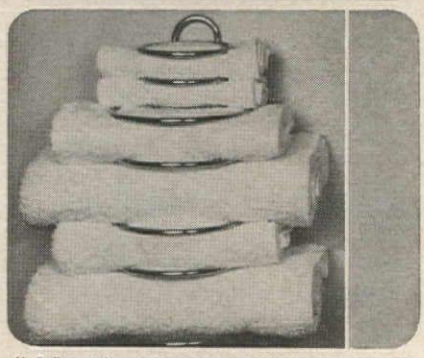

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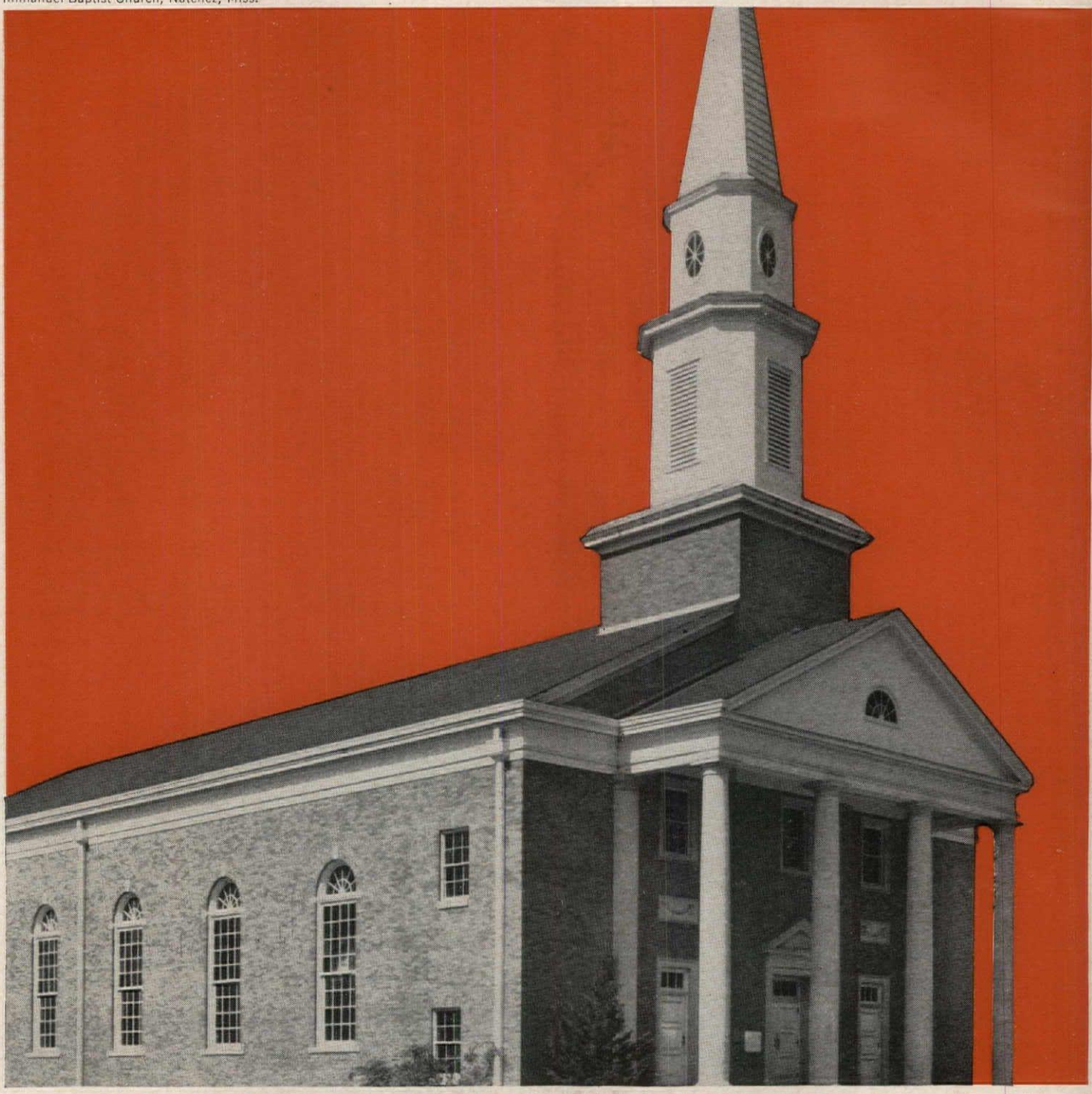
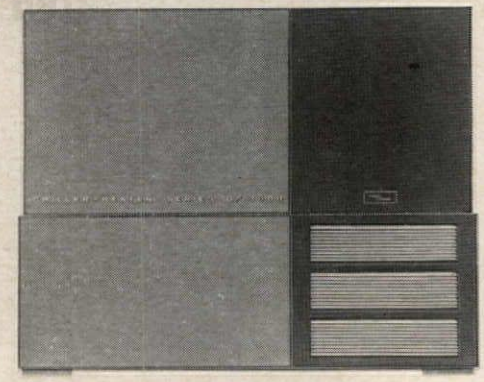
Immanuel Baptist Church, Natchez, Miss.

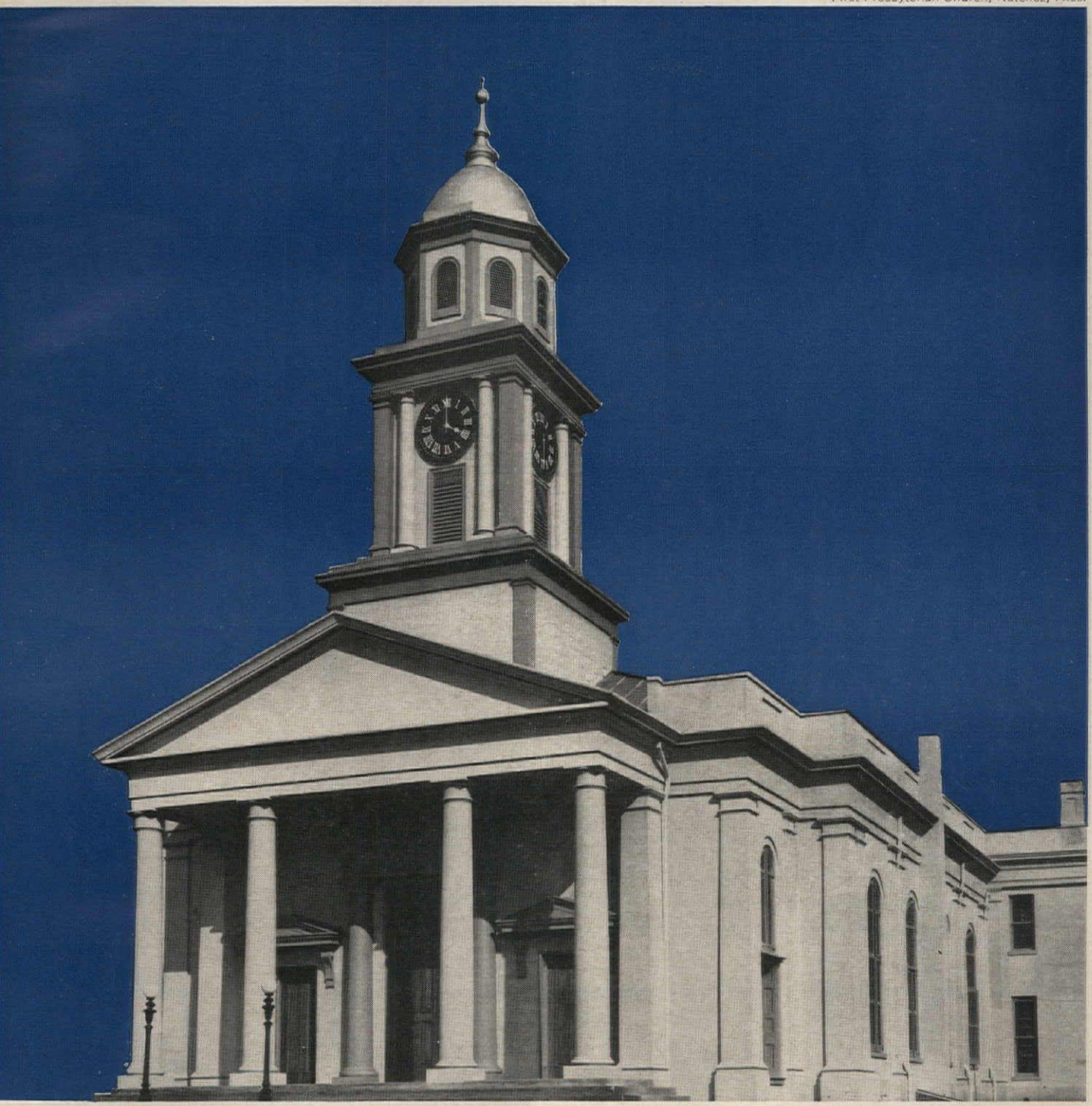


Church heated and cooled...

(by Gas)



First Presbyterian Church, Natchez, Miss.



Church cooled and heated!

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AMERICAN GAS ASSOCIATION, INC.

For heating & cooling Gas is good business

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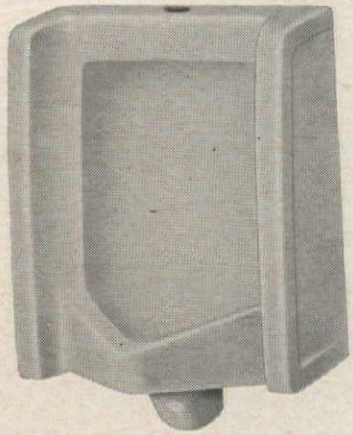
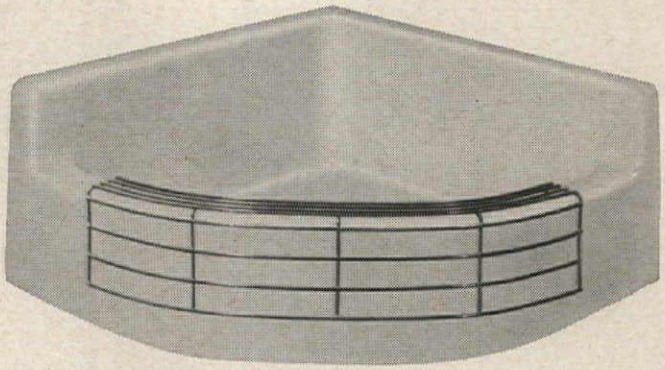


Sanitary maintenance is easier with the clean-lined vitreous china Washbrook urinal. Open trap—no strainer, no fouling areas. Washout action.



Dirt-catching under-sink areas are eliminated by the exclusive floor-mounted, corner-fitting Florwell service sink. Heavy cast iron; all exposed surfaces are acid-resistant enamel. Vinyl-covered rim guard is instantly removable for cleaning. Ideal for mop-truck use.

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PLUMBING AND HEATING DIVISION

Backflow is effectively prevented with new built-in vacuum breakers, available in 24 fittings for laboratory, service sink and laundry-tray use. Solid brass, including handles; heavy Chromard plating. Only one moving part. Service-sink model is shown.

The shallow well of the Akron service sink reduces lifting effort. The wide, flat rims afford ample area for brushes, etc. Molded channels facilitate drainage with bucket in sink. Heavy cast iron, with acid-resistant enamel surface. Available with stainless-steel rim guard.

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Why was the Man from Devoe in this women's dormitory?

Philip L. Fogarty, "Man from Devoe" serving architects in New Jersey.

No mystery: he was helping the painting contractor achieve the architect's concept—a concept in which the architect had selected the right interior and exterior color combinations to complement the building's design and to please its future occupants.

Actually, Devoe's architectural representatives are in and out of women's dormitories all the time—as well as men's dorms, commercial buildings, churches, factories, apartment houses. It's their job.

These men are dedicated to the services of architects and painting contractors. If the call is for an unusual shade, they're there with the Devoe Library of Colors® system, with its more than 1,000 colors. If the problem has to do with light reflectivity or weathering, they have the technical know-how and experience to provide the right answers. If the demand is for an industrial finish that will resist corrosion or erosion, they can deliver products that have proven effective for these difficult jobs.

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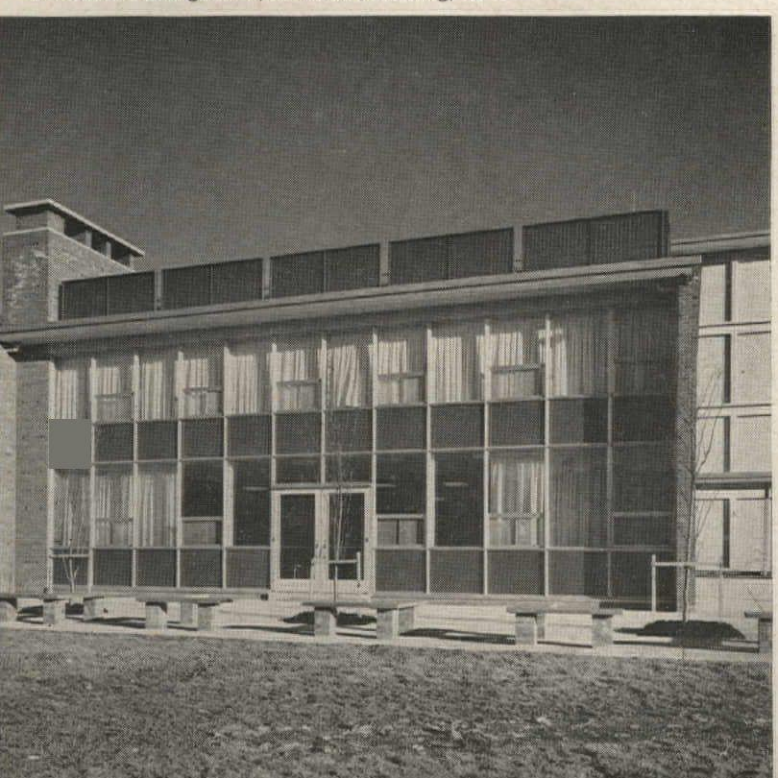
Douglass College Dormitories, Rutgers, The State University, New Brunswick, N. J.; Architect: Scrimenti, Swackhamer and Perantoni, Somerville, N. J.; Painting Contractor: George Campbell & Co., Flushing, N. Y.

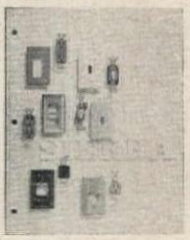


Office Literature

continued from page 222

NONWOVEN GLASS FABRIC
Properties and applications of nonwoven glass fibers in unidirectional fabric materials are given in folder. *Ferro Corp., Fiber Glass Rd., Nashville 11, Tenn.*
CIRCLE 426 ON INQUIRY CARD

CURTAIN WALL SYSTEM
Illustrated brochure describes porcelain enameled steel curtain wall system which has a two-year guarantee against leakage. *Erveen Corp., 4000 W. Ridge Rd., Erie 2, Pa.**
CIRCLE 427 ON INQUIRY CARD

WIRING DEVICES

A 164-page catalog on wiring devices and wall plates has illustrations and prices for more than 7,000 items. *Sierra Electric Corp., 15100 South Figueroa St., Gardena, Calif.*
CIRCLE 428 ON INQUIRY CARD

BOWLING LANE POWER
Use of electricity for lighting, climate control, etc. in bowling lane buildings is described in 16-page booklet. *Westinghouse Electric Corp., Box 868, Pittsburgh 30, Pa.**
CIRCLE 429 ON INQUIRY CARD

FASTENING DEVICES
Fastening devices and masonry drills are described and illustrated in a 20-page booklet. *Holub Industries, Inc., Sycamore, Ill.*
CIRCLE 430 ON INQUIRY CARD

RUST-PREVENTIVE PRIMER
Folder describes *Addex Actoprime 431*, a rust-preventive primer that reacts chemically with the surface it is priming. *Addex Mfg. Co., 30060 Lakeland Blvd., Wickliffe, Ohio*
CIRCLE 431 ON INQUIRY CARD

FLOODLIGHTS
Pictures of various floodlight installtions and seven types of floodlights are shown in folder. *Wide-Lite Corp., 4114 Gulf Freeway, Houston, Tex.*
CIRCLE 432 ON INQUIRY CARD

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

more literature on page 238

So little of the total building cost goes for weatherproofing sealant

Sealant material costs for wall joints and window units in a typical $1,000,000 building seldom reach $5,000. Initial savings in the cost of one sealant over another, therefore, are relatively insignificant regardless of any slight price difference per gallon.

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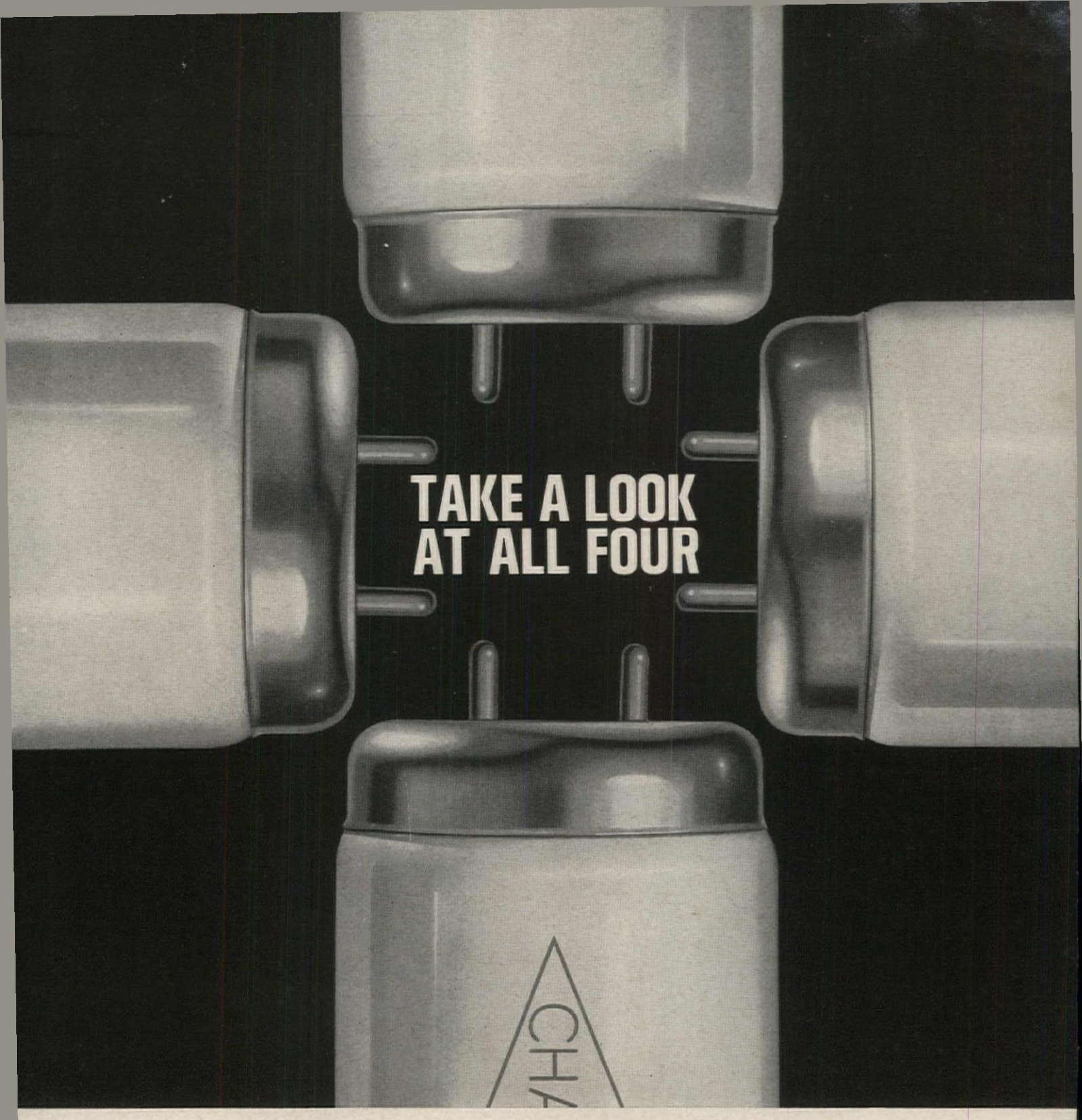
See our detailed catalog in Sweet's or write for a copy.



There are four leaders in the lamp industry. You know the other three. Our name is Champion. ■ Naturally, all four have much in common. What makes Champion different? Most importantly — we're lamp specialists. In two ways. For one thing, we make lamps *only* — thousands of different kinds. They have been our one product since 1900. ■ Then, our field is commercial and industrial lighting — exclusively. Always has been. That's why we know it so well — and why we can offer the kind of service we do. You won't ordinarily find Champion lamps in the supermarkets (unless you look in the fixtures). ■ Being specialists, we can concentrate on making superior lamps. All Champion lamps are made under one roof, to a rigid set of production standards. Every one of them is quality-controlled through more than 200 inspections. ■ Over the years we have developed our own special techniques and products. For example, a coating developed in our laboratory for the cathodes of our fluorescents that makes for long and efficient lamp life. Or our Very High Output lamps — the Champion VHO T12 line. They fit *all* standard high-intensity fixtures . . . no need for special positioning. They're trimmer and lighter than others, too. ■ Industrial or commercial lighting represents a big expenditure. When it's time to buy, take a close look at all four. We think you'll buy Champion. For full information, call your local Champion distributor or write Champion Lamp Works, Lynn, Massachusetts.

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OUR ONLY BUSINESS *FOR OVER HALF A CENTURY*

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98%

mechanized laundry produces over

66 lbs.

of work per operator per hour at St. Vincent Infirmary,

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This type of creative planning by American assures your clients the utmost in efficient, productive laundry facilities

The almost complete mechanization of this laundry operation has so streamlined the work flow that soiled linens are processed and back in the clean linen room in just 63 minutes!

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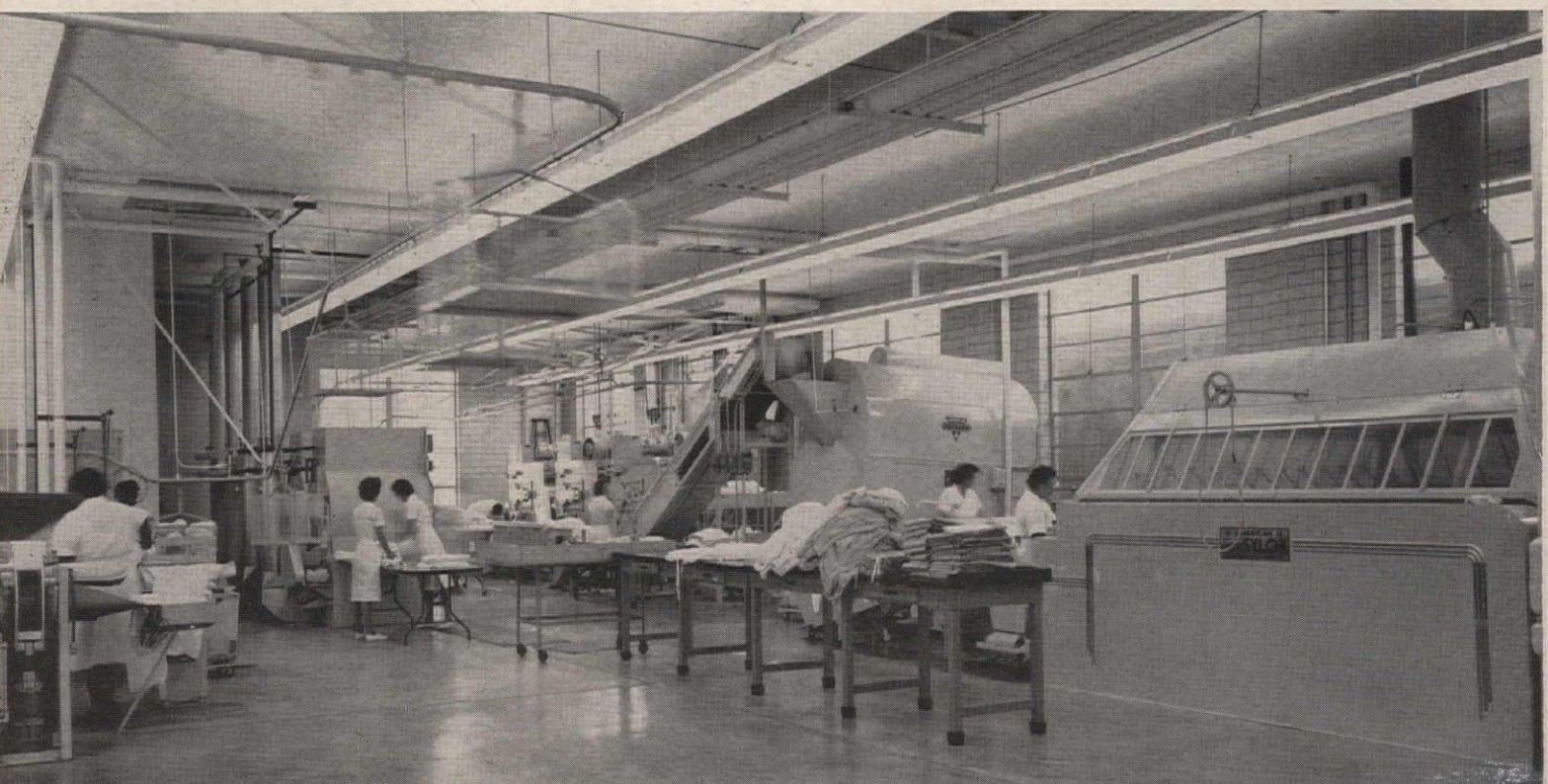

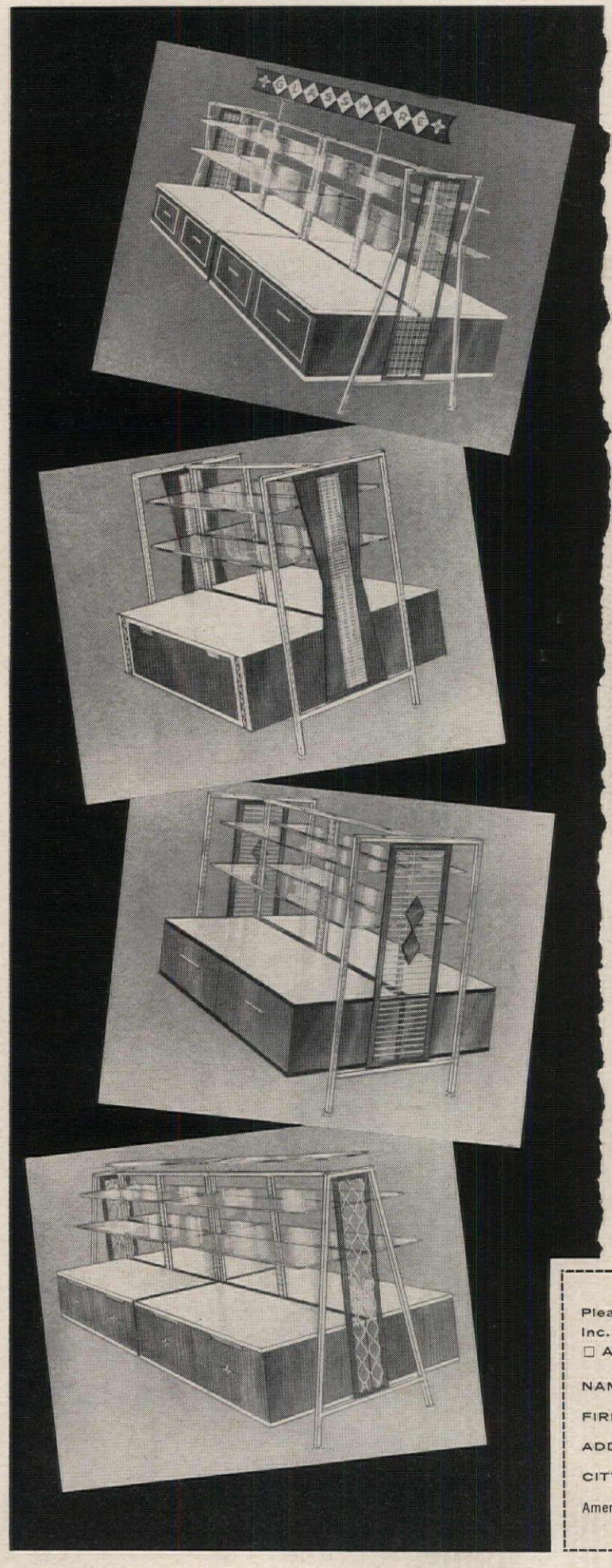

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TRIMLok STORE EQUIPMENT

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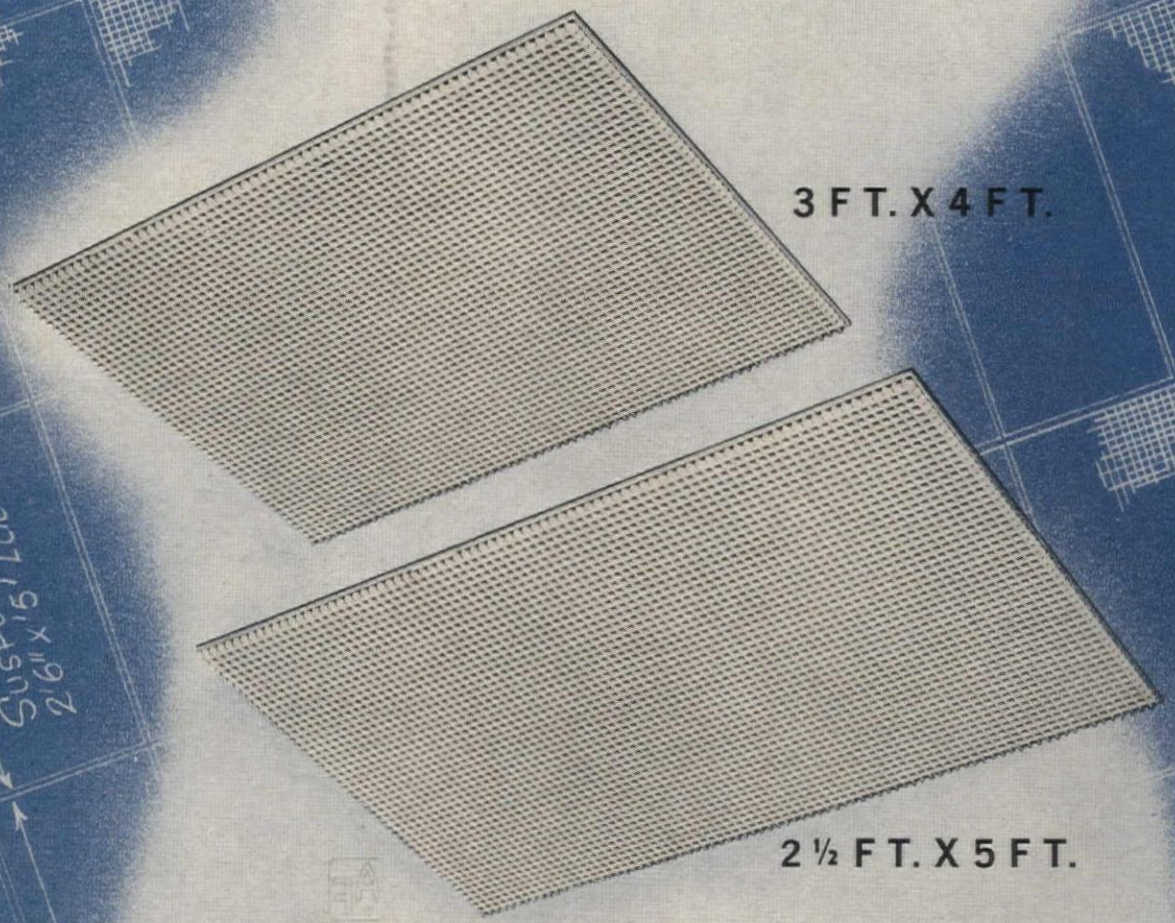
larger panels give cleaner neater uncluttered look—provide larger areas of uninterrupted light . . .



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125 models to choose from in the Vance line of 302 nickel bearing #20 gauge or #18 gauge stainless steel. Single, double and triple bowl, with or without ledge back and either self rim or with frame. Hand blended and polished satin Butler finish. Truly America's top quality line of stainless steel sinks. Vance also makes a complete line of stainless steel sink frames, a new single handle drip-proof faucet, a liquid soap dispenser, a stainless steel sink strainer, and cutting boards.

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A.I.A. FILE NO. 29-H-6

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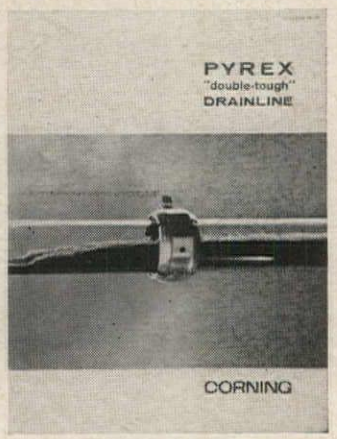
Write today for Bulletin PE-39 to Building Products Department, Corning Glass Works, 8507 Crystal Street, Corning, New York.



CORNING
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That's why safety and budget-conscious officials insist on Melflex step treads and flooring products. For new construction or replacement, they're unbeaten underfoot for safety, quiet, easy cleaning and long wear. Let us send you a useful catalog.

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BY

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Call your local Standard Conveyor representative . . . he's listed in the Yellow Pages of major cities under PNEUMATIC TUBES. Or, call our main office listed below for information.

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312-G Second St., North St. Paul 9, Minn., Telephone: SPring 7-1355

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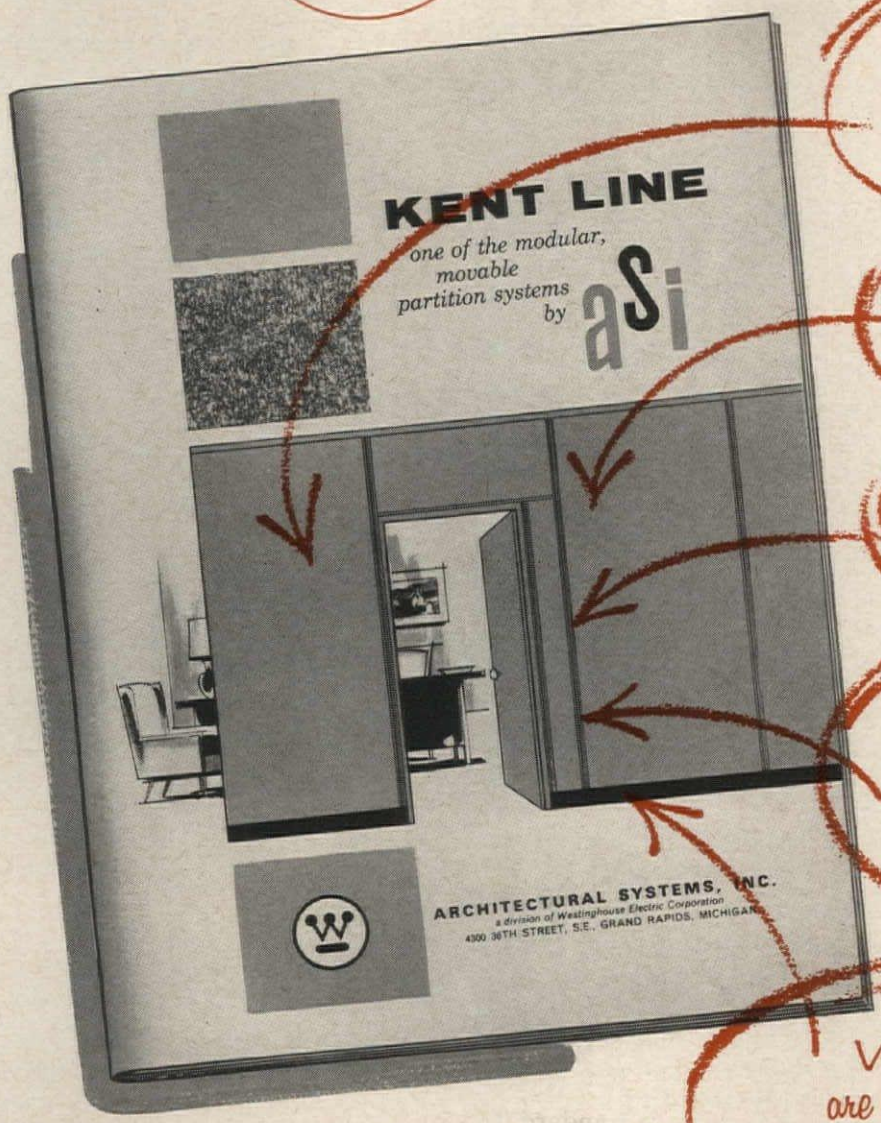
new, Kent Line partitions by ASI cut materials and installation costs



Standard 5/8" gypsum board panels painted on the job

...or pre-faced with vinyl fabrics

No taping of joints—no field lamination

Versatile mullion design creates continuous wall surfaces or accents panel divisions

Vinyl baseboards are impact, abrasion and chemical resistant

WRITE FOR THIS NEW CATALOG TODAY

Not every new product is news . . . but this one is. The new Kent Line catalog tells you why.

Kent Line installed costs are substantially below 70% of the movable partitions on the market today. Architectural System's use of standard gypsum board panels with no laminating is one of the reasons why this is possible. Economical joinery channels, roll-formed from 20-gauge electro-galvanized steel, are another. And quick, easy assembly on the job, plus simplified lay-in wiring, drops installations costs. At the same time, these ASI partitions have an excellent sound rating because of their double thickness of gypsum board with entrapped air space between. And all Kent Line materials are either incombustible or highly fire-resistant.

Write us at 4301 36th Street, S.E., Grand Rapids 8, Michigan for your copy of the Kent Line catalog. For even quicker action, call us at 949-1050, area code 616.

We never forget how much you rely on Westinghouse

ARCHITECTURAL SYSTEMS, INC.
a division of Westinghouse Electric Corporation
4300 36TH STREET, S.E., GRAND RAPIDS, MICHIGAN

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Office Literature

continued from page 230

STRUCTURAL SYSTEMS

Dimensions, properties and load tables for structural steel systems are given in 24-page booklet. Items included are joists, studs, channels, columns, beams, roof decks, rigid frames and metal curtain wall panels. *Stran-Steel Corp., Detroit 29, Mich.**

CIRCLE 433 ON INQUIRY CARD

OFFICE FURNITURE

Three folders illustrate executive and general steel office equipment and filing cabinets. *Bentson Mfg. Co., Box 1143, Aurora, Ill.*

CIRCLE 434 ON INQUIRY CARD

COLOR CHIPS

A "Color Library" of paint chips has a complete range of colors in a tear-out form. A separate booklet gives complete descriptive information for specifying. *Minnesota Paints Inc., 1101 Third St. S., Minneapolis 15, Minn.*

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TRAFFIC-BEARING ROOFS

Folder gives details on *Ply-Deck*, a roofing made of synthetic rubbers which can be used on any surface. *Ply-O-Glas Co. of America, 50 Cutter Mill Rd., Great Neck, N.Y.*

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MASONRY INSULATION

(A.I.A. 37-C-2) Folder gives technical data on silicone-treated perlite which provides a granular insulation for concrete block and masonry walls. *Perlite Institute, Inc., 45 W. 45th St., New York 36, N.Y.**

CIRCLE 437 ON INQUIRY CARD

ACOUSTICAL MATERIALS

(A.I.A. 39-B) Performance data on architectural acoustical materials are given in 84-page booklet. Included are sound absorption coefficients, sound attenuation factors, flame spread classifications and fire resistance time ratings. Price is 50 cents a copy. *Acoustical Materials Assoc., 335 East 45th St., New York 17, N.Y.*

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

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This unique Nesbitt radiation adds rhythm to reason in the application of perimeter heating to structures of contemporary design.
Modular enclosures and ingenious telescoping sleeves permit wall-to-wall fitting or periodic accent at desired intervals, without cutting.
The crisp, clean lines of the slab-type front, recessed sleeves, end-caps, corners, and bar-type grille are the work of Paul McCobb.
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Here are line, form, mass, and color—all tools of design to serve your imagination.
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Capacities, of course, for all your normal needs, and quality that is typical of Nesbitt.
But look . . . if you haven't yet seen Architectural Sill-line, why not let a Nesbitt man bring in a sample section for you to examine?

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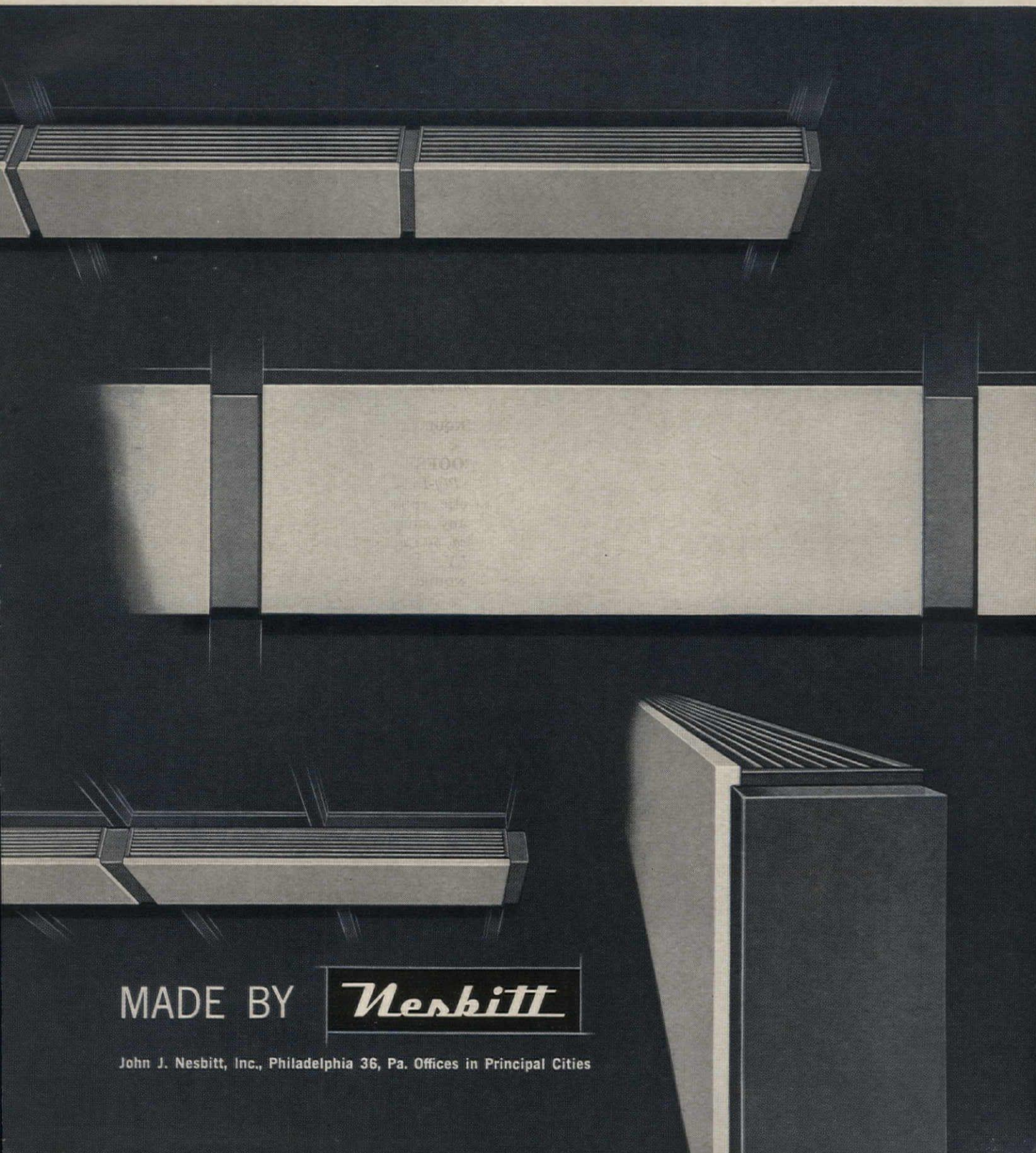

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The hand holding the hammer will someday make products for you.

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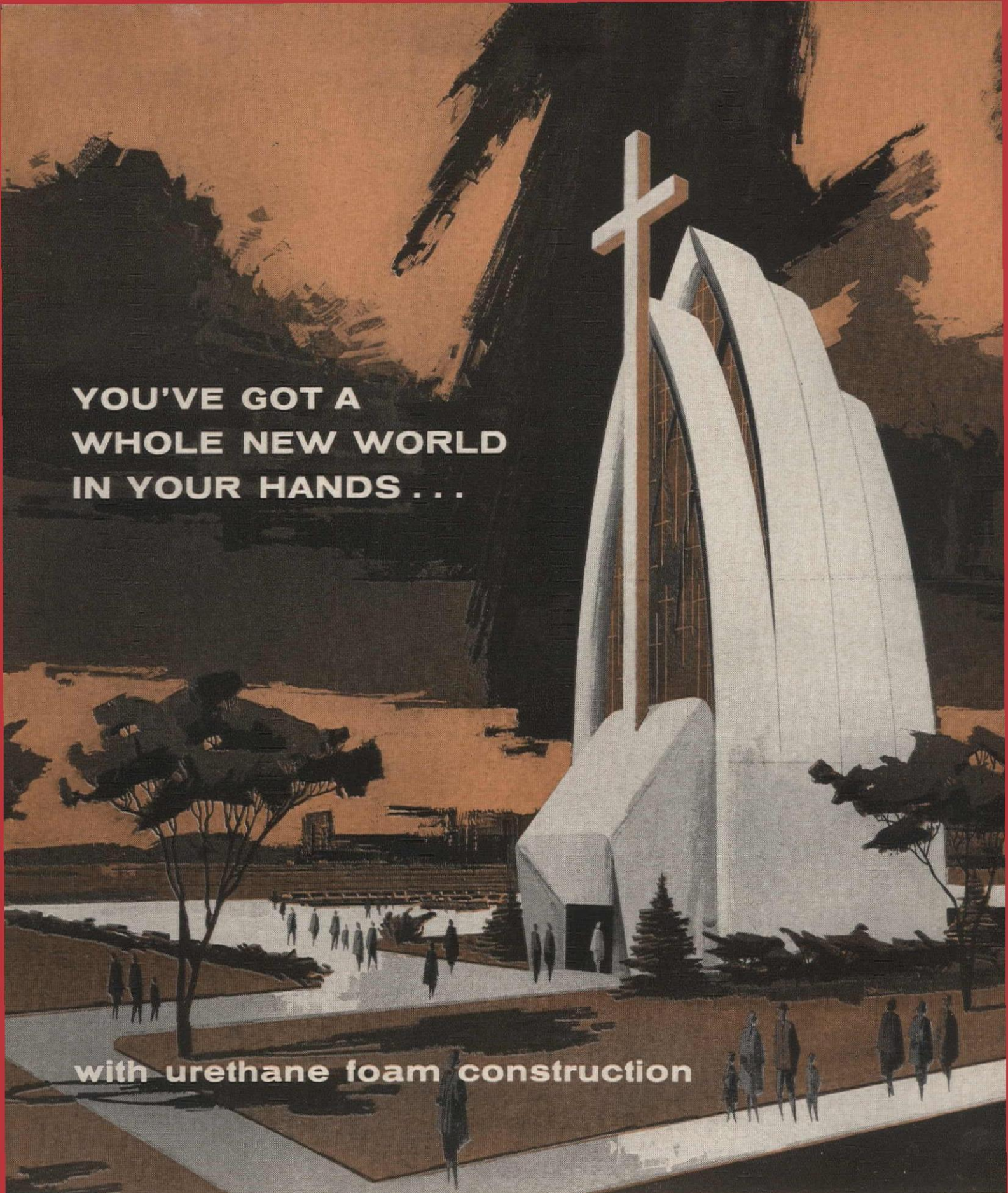

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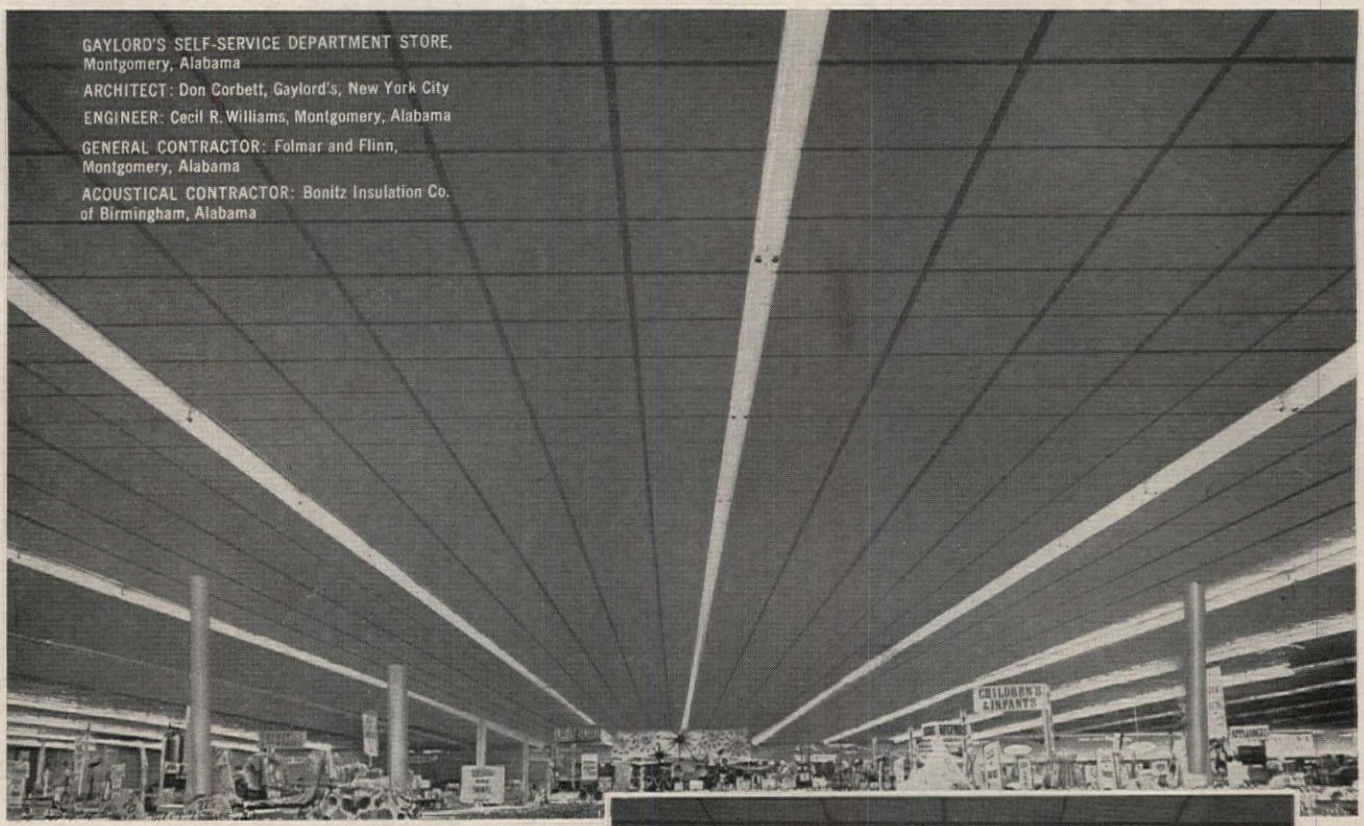

GAYLORD'S SELF-SERVICE DEPARTMENT STORE,
Montgomery, Alabama
ARCHITECT: Don Corbett, Gaylord's, New York City
ENGINEER: Cecil R. Williams, Montgomery, Alabama
GENERAL CONTRACTOR: Folmar and Flinn,
Montgomery, Alabama
ACOUSTICAL CONTRACTOR: Bonitz Insulation Co.
of Birmingham, Alabama

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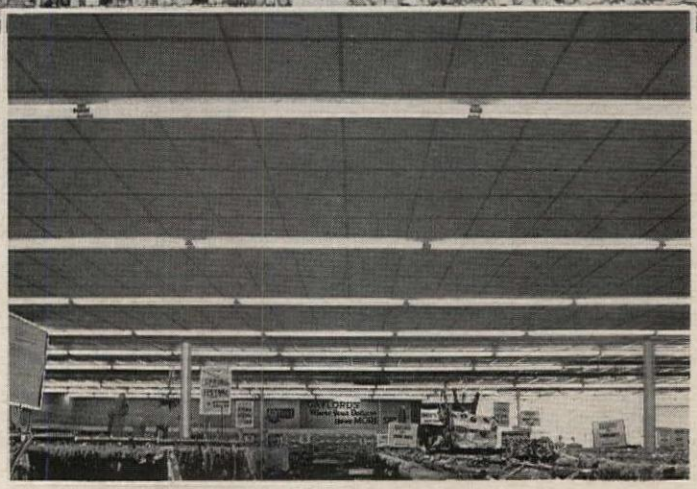
chosen for 60,000 sq. ft. area ceiling . . .



Gaylord's Department Store in Montgomery, Alabama posed two distinct problems in ceiling installation: (1) The vast 60,000 sq. ft. single area, (2) Separating departments by lighting where an overall design occurred.

W. J. Haertel & Co. engineers and Bonitz Insulation Co. of Birmingham, the Acoustical Contractor, in conjunction with the architect and building contractor, solved this problem by using Securitee Exposed Grid System.

Main runners were installed 4′ 0″ on center; 4′ 0″ cross tees, 2 ft. O.C. with an intermediate 2 ft. cross tee formed a 24″ x 24″ ceiling pattern for **direct application of the tile.** The result: (1) a finished ceiling that met the most critical inspection requirements, (2) labor savings beyond the estimated costs were realized, (3) separation of various departments by overhead light arrangement, allowing the store to have a clean open look.

*Securitee SYSTEMS

* T. M. REG. U. S. PAT. OFF.

For more information about this particular installation, and other **SECURITEE SYSTEMS,** write

W. J. HAERTEL & CO.
1932 15th Avenue, Melrose Park, Illinois
Phone FI 5-7995

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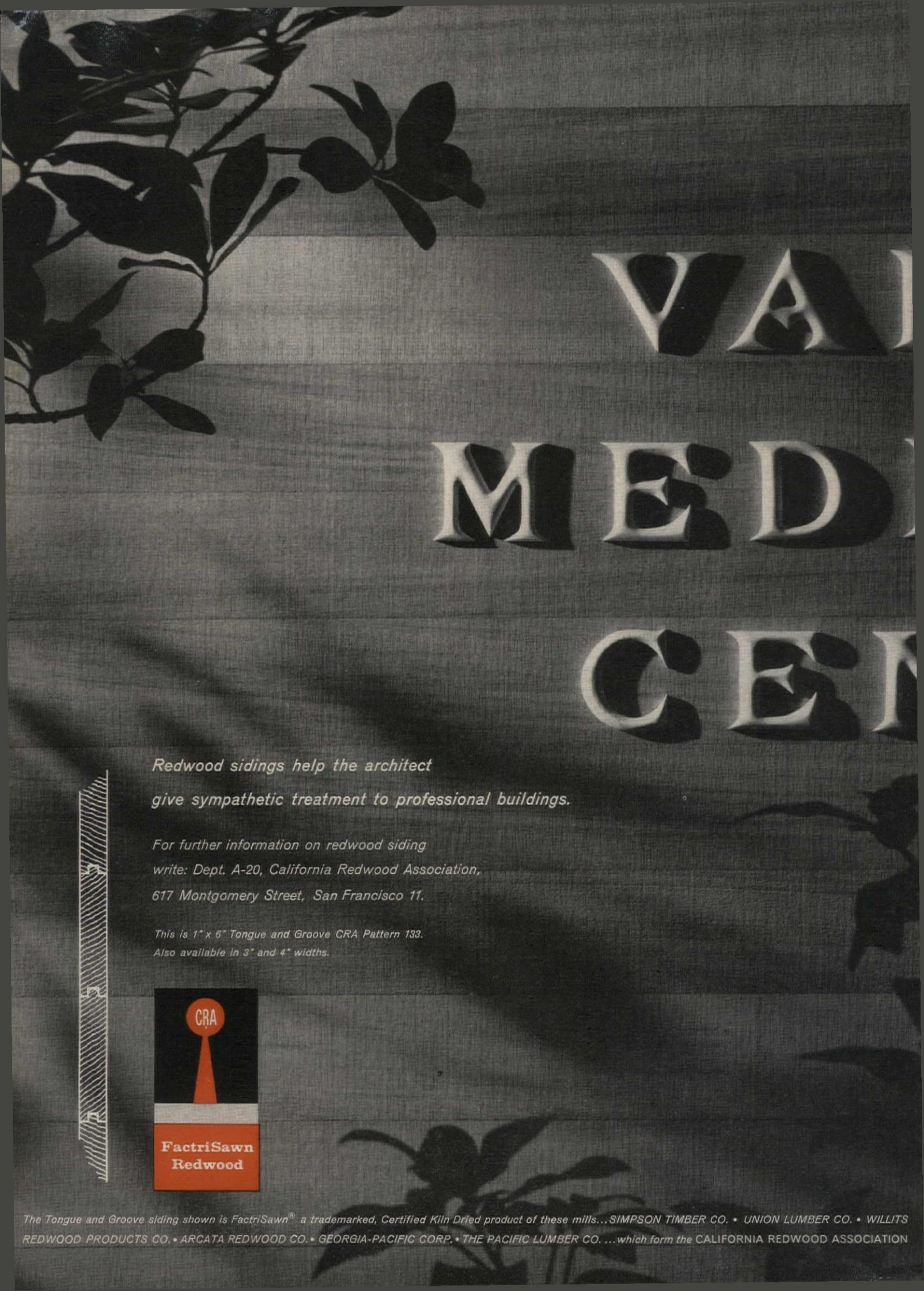

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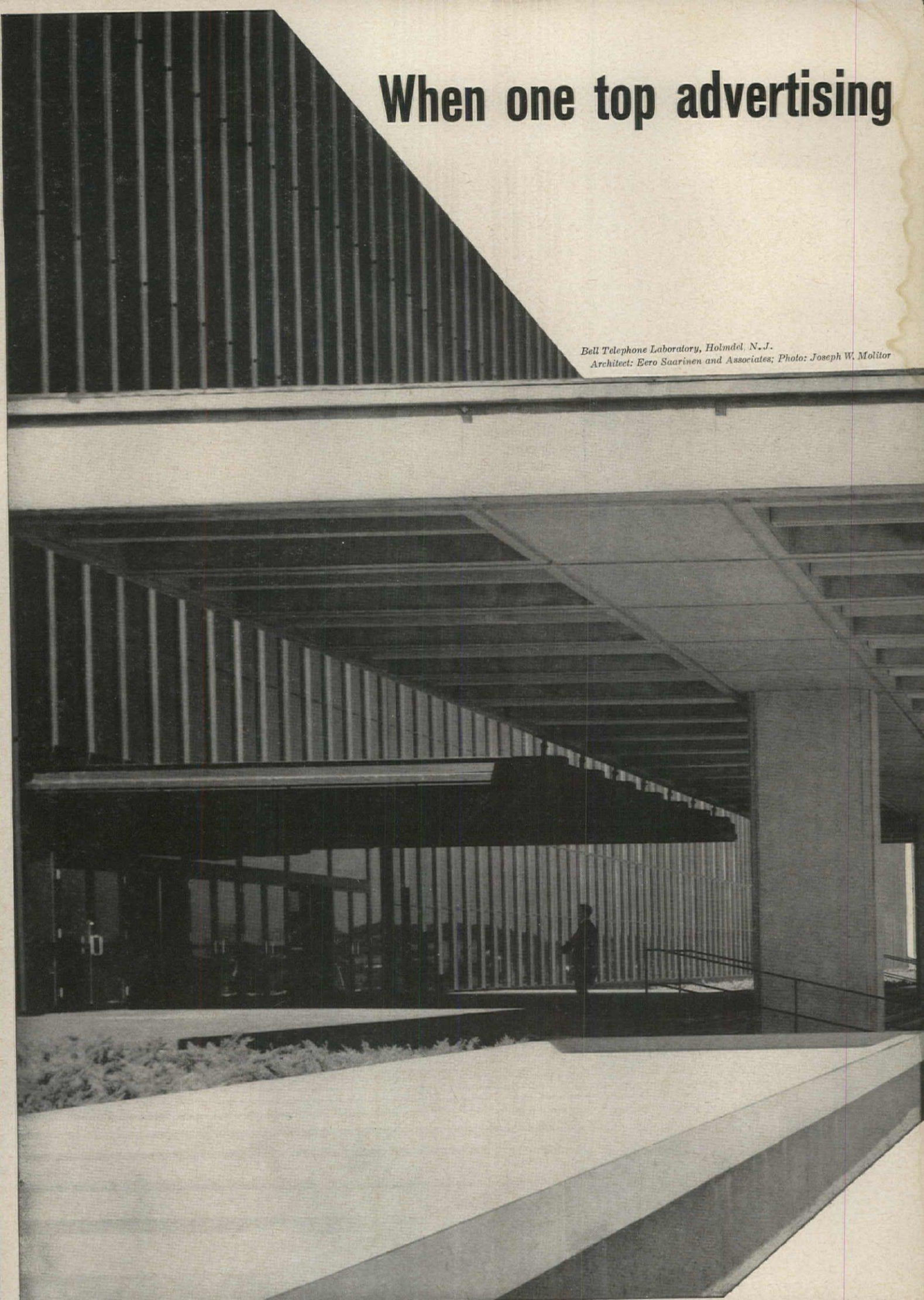

Bell Telephone Laboratory, Holmdel, N.J.
Architect: Eero Saarinen and Associates; Photo: Joseph W. Molitor

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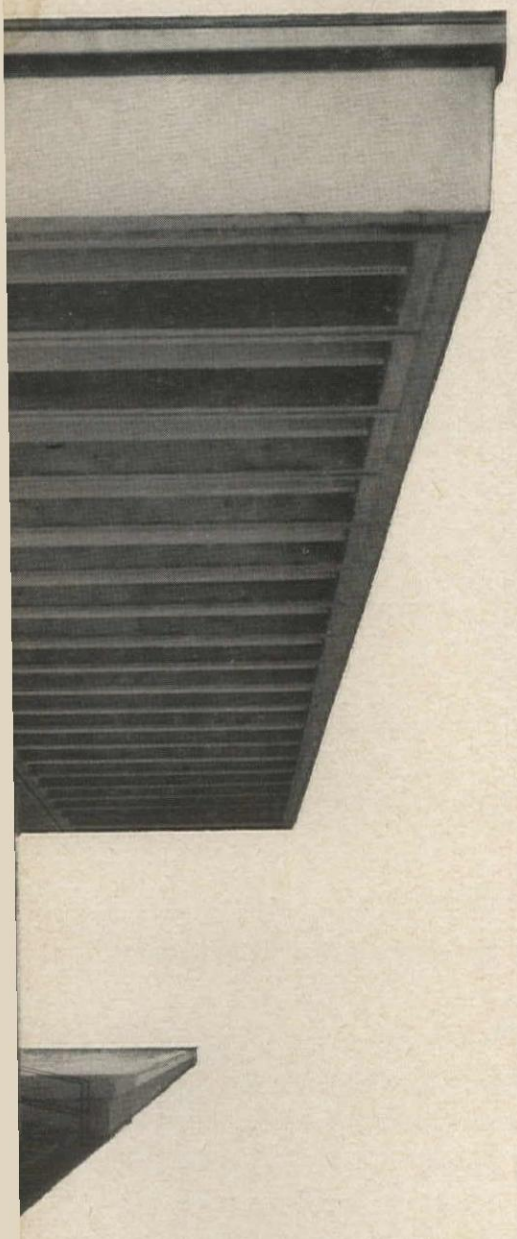

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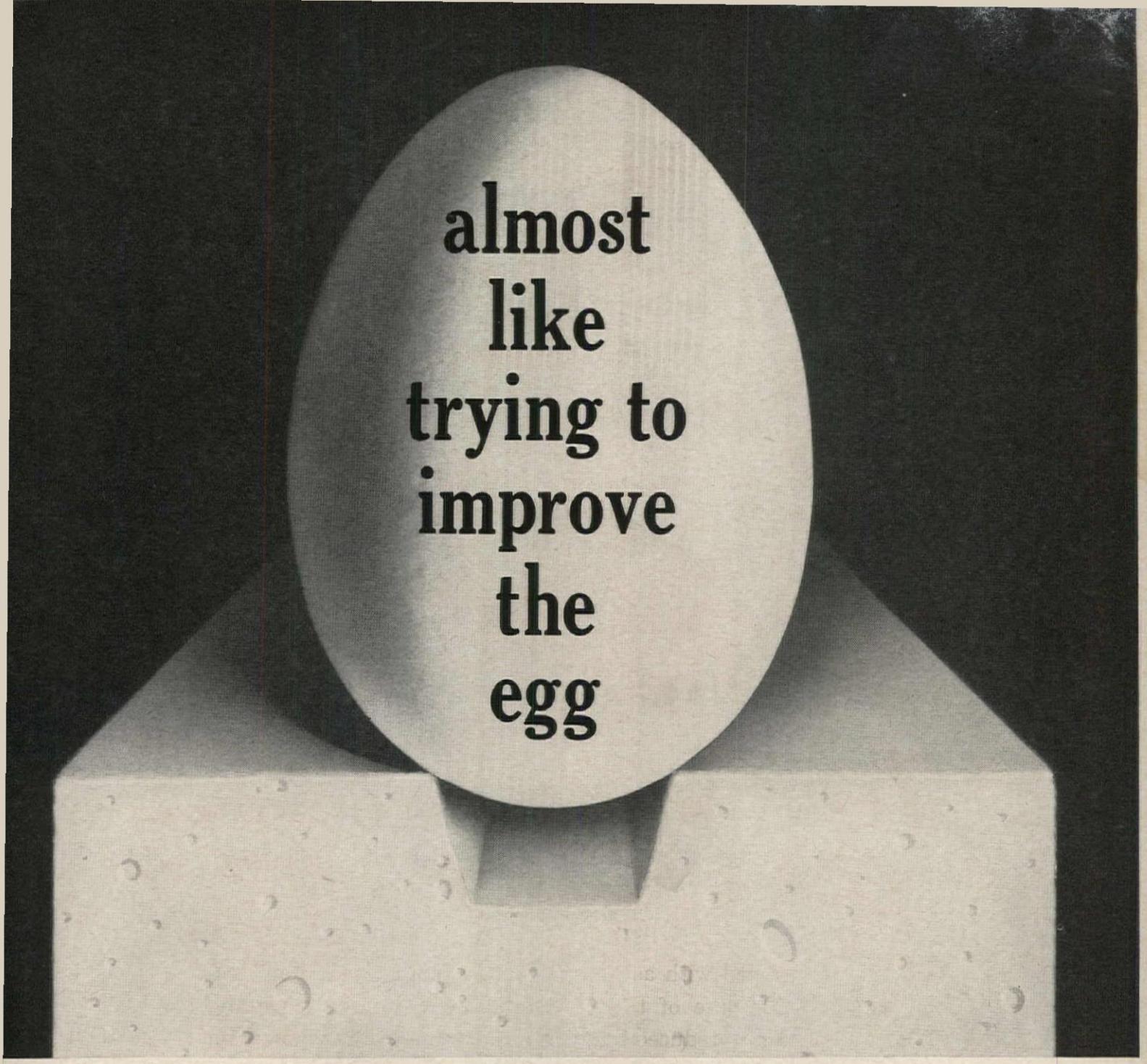

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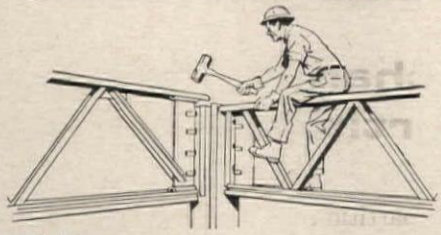

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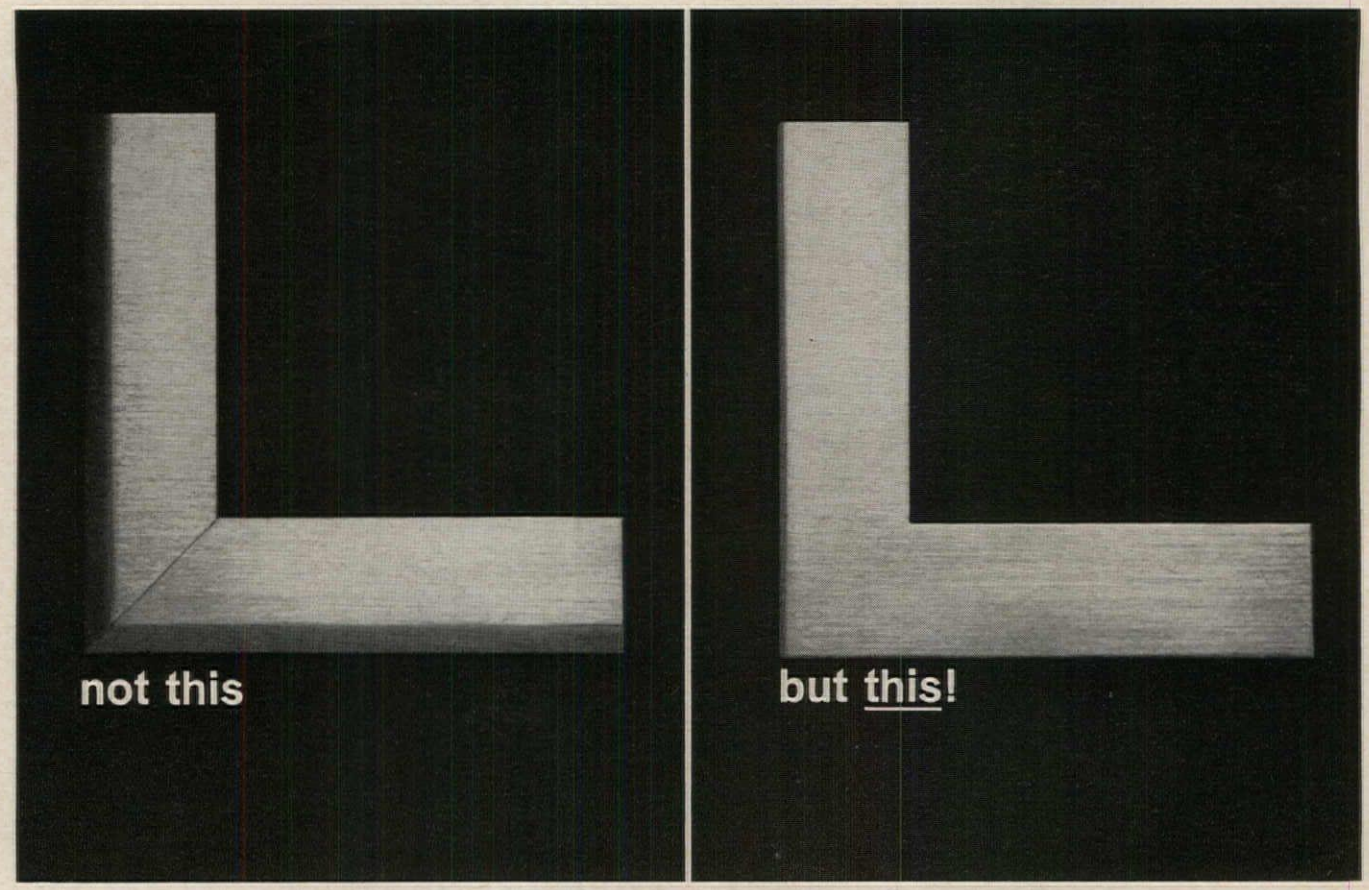
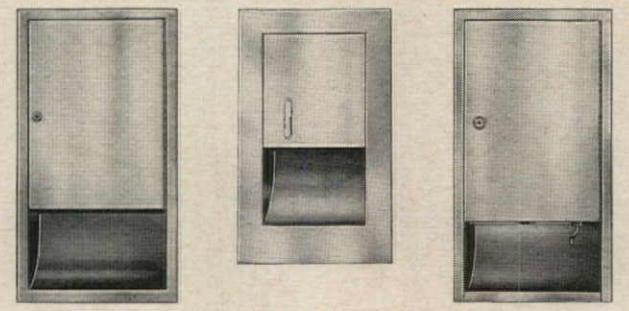


No mitered corners

on any of the new Recessed Washroom Accessories now available from West!



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