ARCHITECTURAL RECORD

9 *September 1960*

Building Types Study: Office Buildings

Drama Center for Harvard

Building Components: Aluminum Finishes

Full Contents on Page 5

Where other floors fail . . . Specify

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Summitville floor brick is the perfect heavy-duty ceramic material . . . produced exclusively for industrial and commercial installations. High grade raw material and advanced production methods assure highest resistance to impact, abrasion and shock . . . impervious to acids, oils, greases, chemicals and fire. Available in 5 floor surfaces to meet every requirement. Contact your local ceramic tile contractor, or write direct to . . .

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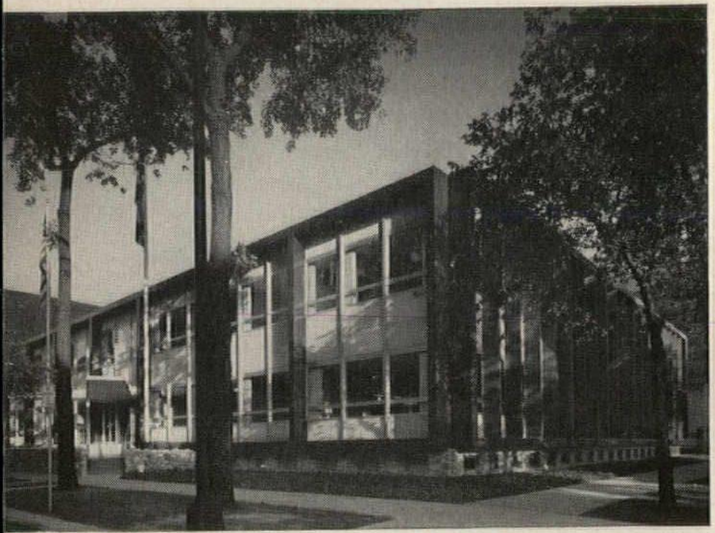
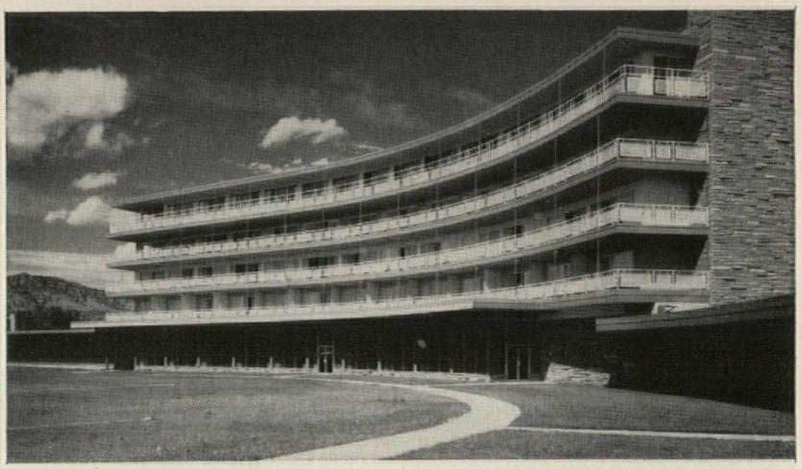


Most practical elevator



OFFICE: KIWANIS INTERNATIONAL BUILDING, Chicago. **Architect**—Mielke & Smith. **Contractor**—C. W. Haynes Co. Rotary Oildraulic passenger elevator sold and installed by **Gallaher & Speck,** Inc., Chicago.

MOTOR HOTEL: HARVEST HOUSE, Boulder, Colo. **Architects**—Ralph D. Peterson, AIA, Robert E. Zermuelen, AIA, and Paul E. Graves, AIA, Associates. **Contractor**—Gerald T. Hart Construction Co. Rotary Oildraulic elevators sold and installed by **Dover Elevator Co.,** Denver.

Rotary Oildraulic Elevator satisfies the esthetic and mechanical requirements of these modern low-rise structures

For buildings to six stories, the Rotary Oildraulic Elevator is the most practical choice because of the many design and operational advantages it offers.

There is no need for a machinery penthouse since the elevator is pushed up from below by an oil-hydraulic plunger. No elevator counterweights are required and, frequently, no special machine room, permitting better utilization of available space within the building.

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For complete information, or assistance on plans and specifications, contact your Rotary Oildraulic Elevator Distributor listed in the yellow pages of your phone book. See our catalog in Sweet's Files.

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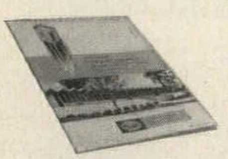

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choice for modern buildings

DORMITORY: EMMA HARTMAN NOYES HOUSE, VASSAR COLLEGE, Poughkeepsie, N. Y. **Architect**—Eero Saarinen & Associates. **Contractor**—Gilbane Building Co. Rotary Oildraulic passenger elevator sold and installed by **Burlington-Burwak Elevator Co.,** New York City.

ARCHITECTURAL RECORD

September 1960

THE RECORD REPORTS:

Building Components: A New Department

Aid for the busy professional who must absorb and utilize information about the ever more numerous and complex varieties of building materials and equipment available to him— a new department starting this month (see page 247) will provide a new reference source on application and specification.

Cover:

Loeb Drama Center, Hugh Stubbins, Architect; Joseph W. Molitor, Photographer

ARCHITECTURAL RECORD
September 1960
Vol. 128, No. 3

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(National Edition)

Coming in the Record

THE LEGACY OF WRIGHT

The buildings are familiar but the context is new: now they are a heritage, fixed and immutable, and the heritage can be evaluated as the living legend could not. What has Frank Lloyd Wright given to architecture? Next month, 55 years after the RECORD *gave Wright's work its first architectural publication, a 40-page presentation prepared in collaboration with Frederick Gutheim will examine the legacy.*

NEW OPPORTUNITIES IN APARTMENT DESIGN

With some solid achievements in the field of single-family housing to its credit, the Architectural Standards Division of the Federal Housing Administration has launched a major effort to win the best architectural attention to the area of multi-family housing. A distinguished advisory committee of private architects is working with the Division to develop new definitions of FHA requirements which will mean a significant advance in design opportunities. The Building Types Study on Apartment Buildings will lead off with the first major article on this effort and its implications for apartment design.

Members of Audit Bureau of Circulations and Associated Business Publications. ARCHITECTURAL RECORD is indexed in Art Index, Industrial Arts Index and Engineering Index.

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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The Day of Doing

Our most recent emissary to Japan (yes, John Burchard will soon be reporting on current trends in Japanese architecture) tells a story about the design of a certain very famous palace. The architect, as a condition to his accepting the commission, posed three provisos. The client was not to restrict him as to money; he was never to hurry him, and he was not to see anything until everything was finished.

As the story goes, the client agreed and the architect set about his work with his creative powers all nicely untrammeled. Yes, and the result was one of the most photographed of architectural executions.

There must have been clients like that among the great patrons of feudal times. The architect was given his head, and could extend himself freely to please his master. If he didn't please him, presumably, the master might have his head on a platter. But such were the risks of the times.

We had a recent opportunity to speculate on the relations of an architect and his patron client of more recent times, say at the turn of the century. We in this instance is my wife and I, spending a long week end with wealthy friends, seeing how the other one tenth of one per cent lives. Our hosts were ushered into this world about at the beginning of the century, and the silver spoon was solid gold. They were raised to be wealthy, in fact carefully trained as the good old idle rich. Father was founder of one of the dynasties of business, patriarch, benefactor. He was frequently a client of architects, and no doubt a magnanimous one. Father is long gone, and the picture of him as client is drawn only by inference.

On our week end, architecture was rarely discussed. It gradually dawned on us that these dear people never talked about anything but money and the people who had it. Names, famous names, were dropped just all day long. We began, in private, to do little parodies. "I had lunch that day with Mr. Rest." And then the inevitable parenthesis: "You know, he was one of the Beauty Rest people." "One of my oldest friends was Mr. Bones; his great grandfather, you know, was the Bones of Skull and Cross Bones. They made their money at sea, many, many years ago."

My wife tried to break into this stream of subconscious snobbery. She told them about a cocktail party; she dropped the names of at least two very famous architects. This conversational gambit went out into space and fell dead. They had never heard of these architects. Stanford White had done the living room in the big house, yes. And an architect was soon to be called, "the man who is to redo the kitchen." But nothing more about architects. We tried some other areas of doing, with the same result. Having was the thing, not achieving.

It must have been the mention of White that set me to speculating as to how an architect might fare. Not an architect of modern persuasion; but any architect of any time. I got a clue from their conversation about a doctor, a benighted individual who for some reason could not be drawn into civilized conversation. "It is so strange. I told him once, Mildred, about your latest cruise. I said, 'You know, Mildred is leaving tomorrow on a wonderful cruise.' And all he said was 'Indeed.' Really, I don't understand him at all." Clearly the good doctor was not to be possessed. Maybe he had other patients, if not other patrons.

The dear, dead days, fortunately beyond recall.

—EMERSON GOBLE

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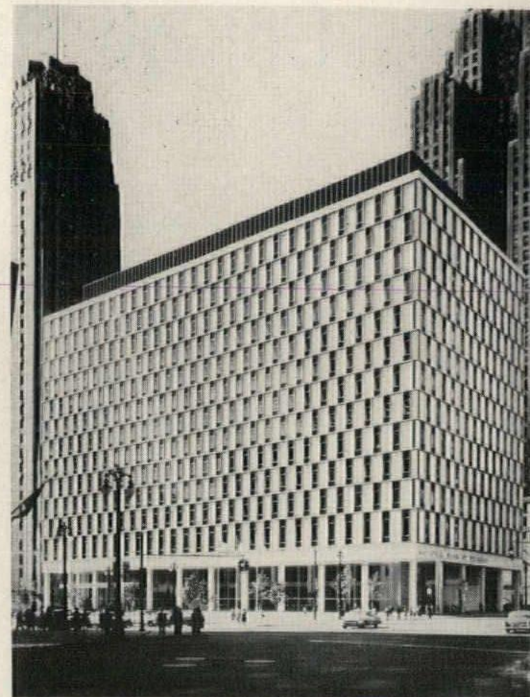
12 BUILDINGS CITED AS A.I.S.C. MAKES ITS FIRST "ARCHITECTURAL AWARDS OF EXCELLENCE"

The American Institute of Steel Construction has announced its first "Architectural Awards of Excellence" in recognition of "outstanding esthetic design in structural steel."

Since 1927 the A.I.S.C. has sponsored a Prize Bridge Competition for engineers. "Now," said M. G. Gaskin, chairman of the Committee on Awards, "we want to honor the country's architects who recognize the esthetic, practical, and economic uses of structural steel in buildings."

The awards will be presented to 13 architectural firms at local meetings of the American Institute of Architects. Photographs of the winning buildings are shown on these pages, with the exception of the unfinished Red Bud High School Coliseum, Red Bud, Ga., designed by Clarence H. Glass, Decatur, Ga. Twelve buildings were cited. Two architectural firms received awards for the Bloomington High School Gymnasium.

Photographs were submitted for nomination by A.I.S.C. engineers throughout the country and winners selected by an A.I.S.C. Committee on Awards which included: Mervyn G. Gaskin, Taylor & Goshen, Inc., Detroit; Clyde G. Conley, Mt. Vernon Bridge Co., Mt. Vernon, Ohio; C. P. Watson, Louisville Bridge & Iron Co., Louisville, Ky.; and T. R. Higgins, Director of Research and Engineering for A.I.S.C.



4 *Baltazar Korab*

1

1. Bloomington High School Gymnasium, Bloomington, Ill.; architects: Lundeen & Hilfinger with Schaeffer, Wilson & Evans, Bloomington. General contractor, Felmley-Dickerson Co.

2. Episcopal Church of Our Saviour, Baltimore, Md.; architects: Cochran, Stephenson and Wing, Baltimore. General contractor, Consolidated Engineering Co., Inc.

3. National Maritime Union Hiring Hall, Baltimore, Md.; architects: Ledner and Suputo, New Orleans, La. General Contractor, Goodman Construction Co., Inc.

4. National Bank of Detroit, Detroit, Mich.; architects: Albert Kahn Associated Architects and Engineers, Inc., Detroit. General contractor, Bryant and Detwiler Co.

5. Southland Center, Dallas; architect: Welton Becket and Associates, Los Angeles. General contractor, J. W. Bateson Co., Inc.

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M. E. Warren

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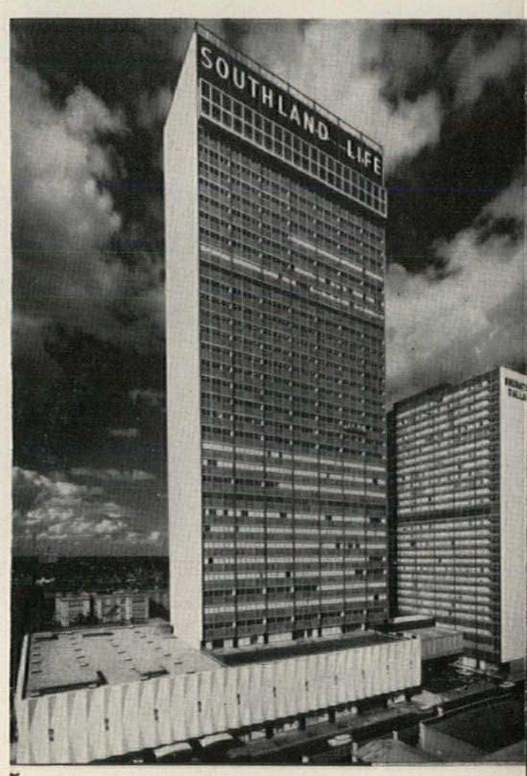
M. E. Warren



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6. Children's Hospital, Pittsburgh, Pa.; architects: Alfred D. Reid Associates, Pittsburgh. General contractor, Mellon-Stuart Co.

7. Harvest House Hotel, Boulder, Colo.; architects, Ralph D. Peterson & Associates, Denver. General contractor, Gerald T. Hart Construction Co.

8. St. Ann's Catholic Church, Midland, Tex.; architects: Martin and Lemmon, Andrews, Tex. General contractor, Rose Construction Co.

9. Wells Fargo Bank American Trust Company, San Francisco; architects: Skidmore, Owings and Merrill, New York. General contractors: Haas and Haynie.

10. Dudley High School Gymnasium, Greensboro, N. C.; architects: Loewenstein-Atkinson, Greensboro. General contractor, H. D. Barnes Inc.

11. Bartlett Mountain Cabin, Huntington Lake, Cal.; architect: B. David Thorne, Berkeley, Cal. General contractor, Robert Jolly.

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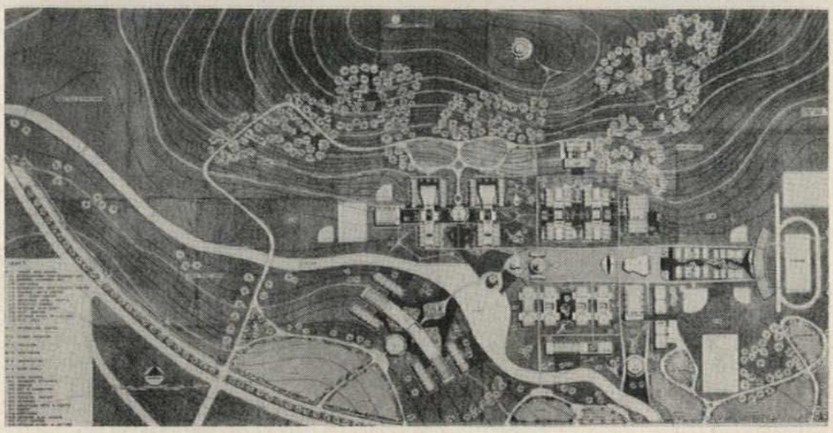
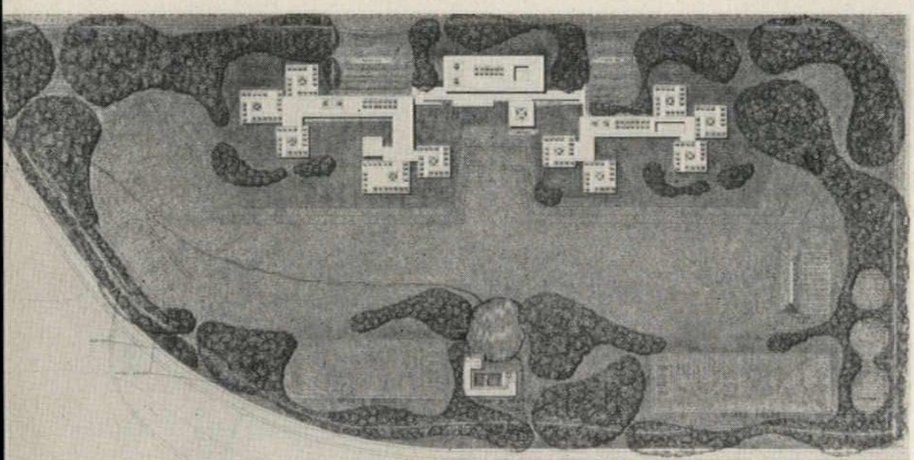
Winners in the Second Annual Architects Competition sponsored by the Mastic Tile Corporation of America have been announced. A continuation of last year's project, the design of a middle-income housing development, (Sept. 1959, pages 14-15) the 1960 program challenged architects to design for a 295-acre site "an educational and recreational 'plant' for the use of everyone in the community, with educational facilities for approximately 5500 students. Entries were to show master plan and details of jr. high school.

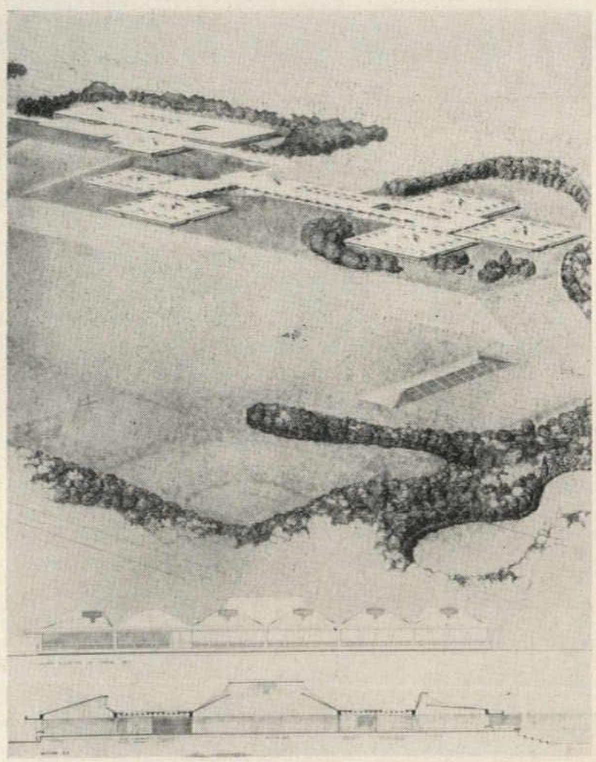


Grand prize ($10,000): Entry of Edward Colbert and Alfred J. Petrilli. Jury cited "total plan . . . relationship, scale of buildings . . . sense of educational community, including scientific aspects (atomic reactor) . . . air of reality . . . awareness of revolution occurring in American education"

EDUCATION AND RECREATION: THEME FOR SECOND ANNUAL MASTIC TILE COMPETITION



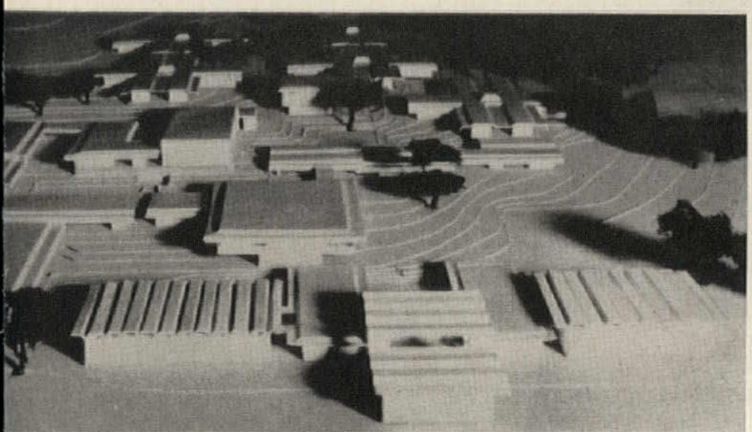
Second prize ($5000): Entry of Edwin F. Harris, Jr. "Accent is on building design . . . Most interesting besides intriguing roof is that buildings were conceived in terms of large space module . . . Interesting vistas, covered space make it a pleasant place to go to school"

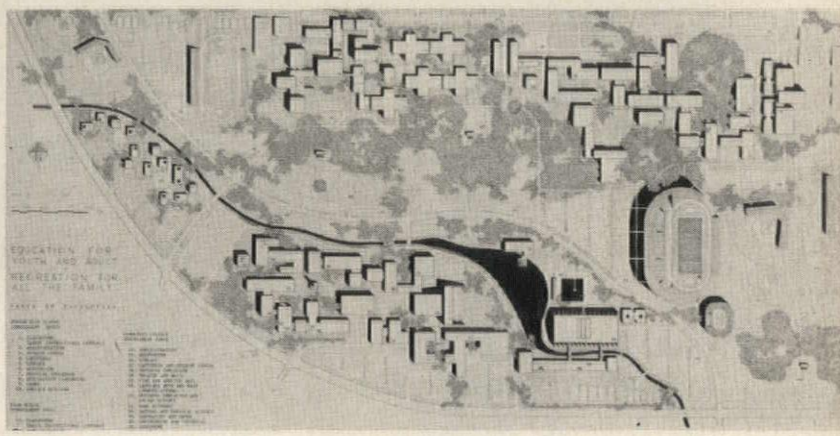


Professional adviser to the $25,000 competition was A. Gordon Lorimer, A.I.A. The jury panel was headed by Henry L. Kamphoefner, F.A.I.A., Dean of the School of Design at North Carolina State College. Other members were: Harry J. Carman, Dean Emeritus of Columbia College, New York; William W. Caudill, A.I.A.; John Lyon Reid, F.A.I.A.; and Eberle M. Smith, A.I.A.

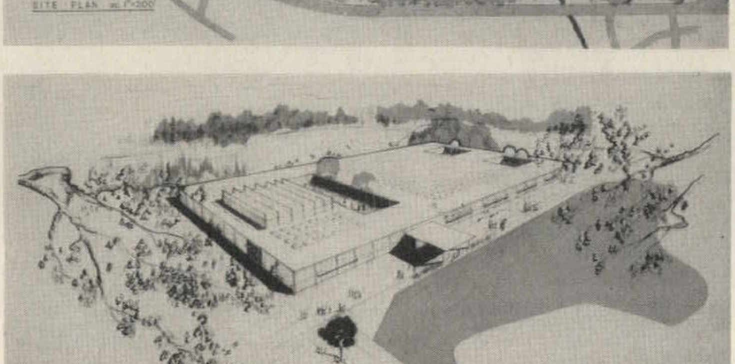
The competition was divided into two categories: professional and student. The jury considered 138 qualified entries: 100 professional and 38 from students. Shown on these pages are professional grand, second and third prize winners. In addition, the following professionals won $500 merit awards: John V. Sheoris, A.I.A., Israel Stein and Robert F. Lindsey; J. Byers Hays, Harry J. Roberts, Joseph A. Poch, H. David Howe of Hays & Ruth; Peter Tarapata, A.I.A. and Charles H. MacMahon Jr., A.I.A.; Richard Saul Wurman and Alan Levy; John V. McPherson, Jack H. Swing, Robert L. Amico, George Albers, of McPherson-Swing & Associates.

The winner of the first student prize of $2000 is also shown. Second and third prizes of $1000 and $500 and the four merit awards of $250 each went to the following: Richard M. Foose, Columbia University School of Architecture (second); Richard C. Marcantonio, Pratt Institute (third); and (merit)—Frederic E. Melby, University of Minnesota; Minoru Takeyama and Ozdemir Erginsav, Harvard Graduate School of Architecture; John M. Ellis, M.I.T.; and James S. Daley, Oklahoma State University.





Third prize ($2500): Marvin Hatami. "One of best decentralized plans . . . Overall coverage of site, distinguished . . . Simple in its forms . . . a well-integrated job"



First prize, Student Awards ($2000): John Scarlata, Pratt Institute. Jury cited "development along water's edge . . . double-decking of seminar rooms on perimeter of building"

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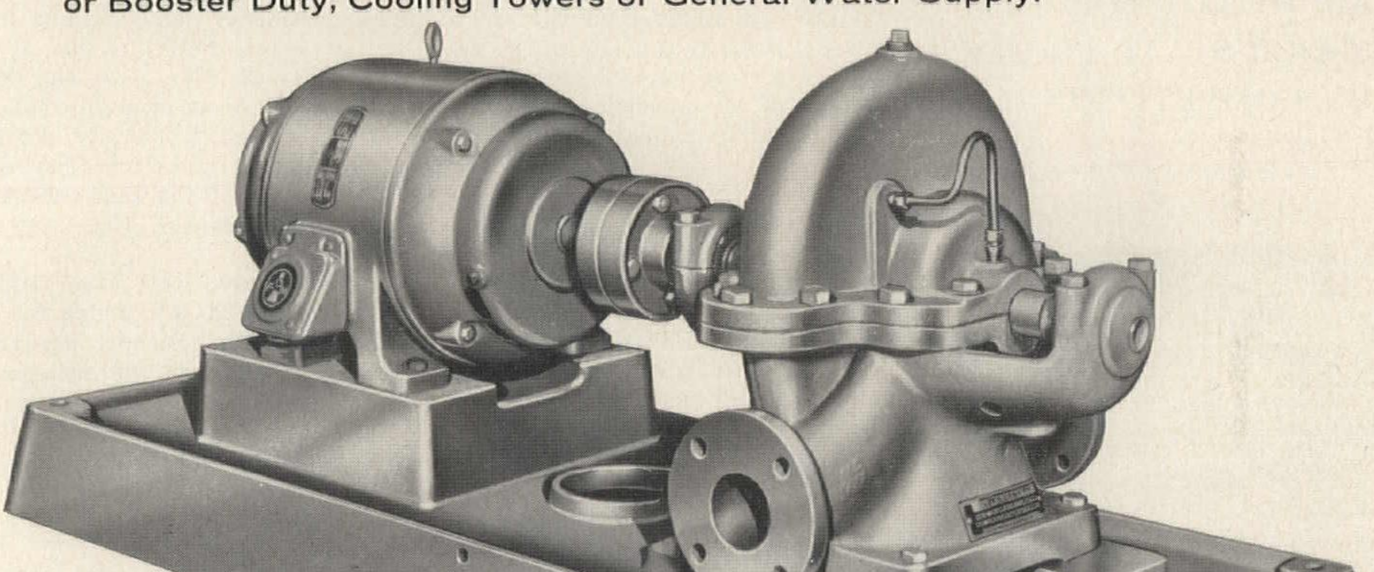

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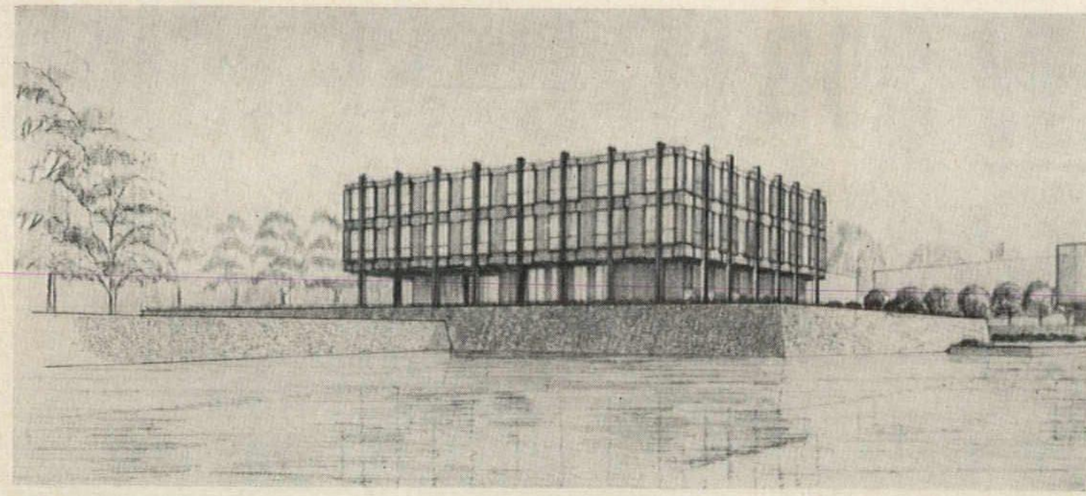
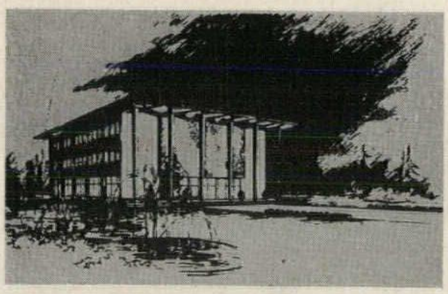


Winning Design. Architects: Frankel, Curtis and Coleman, Lexington. "Clearly superior in site solution, architectural character . . . appropriate to the program requirements for . . . sympathetic exploitation of natural beauties of land, water, trees. . . . "

KENTUCKY SELECTS ARCHITECT FOR MAJOR STATE PROJECT BY COMPETITION



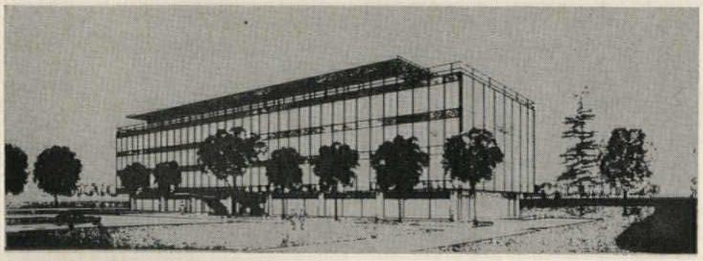
Chrisman, Wash and Miller, Lexington

In the first architectural competition in its history, the State of Kentucky invited four young Kentucky architectural firms to compete in the design of a state-financed project, the nucleus of an economic and industrial research complex situated on the grounds of Spindletop Farm near Lexington, Ky. Winning design is shown above; other entries at left below.

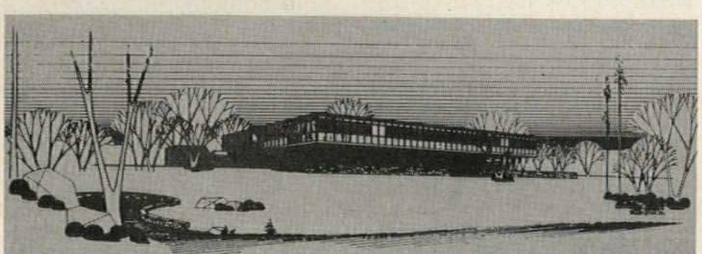
The project was the Administration Building, first in the prospective 10-year building plan for the Kentucky Spindletop Research Center, which will house a Research Institute for the University of Kentucky and an Industrial Park for private research facilities.

Jurors for the competition, which was approved by the American Institute of Architects, were: John Noble Richards, of Toledo, A.I.A. past president; Ralph Rapson, head of the School of Architecture at the University of Minnesota; and Samuel T. Hurst, dean of architecture at Auburn (Ala.) University. Professional Adviser was Prof. Charles P. Graves, head of the Department of Architecture at the University of Kentucky.

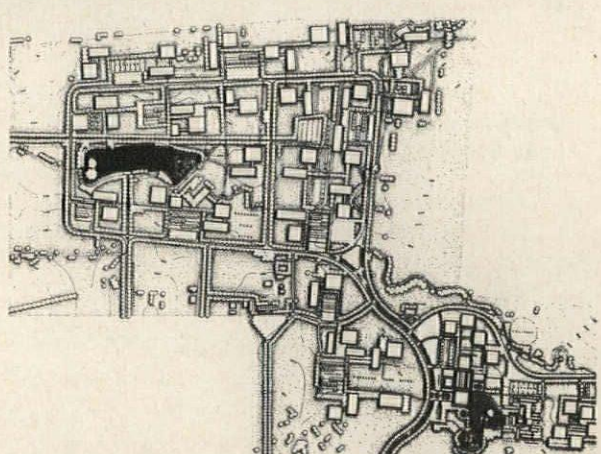
As to future State competitions, Kentucky officials will weigh the results of the Spindletop competition and, "depending on the advantages which may become apparent as the Administration building project moves into the construction phase," may consider the same method of selecting architecture for state-constructed buildings.



Jasper D. Ward, Louisville



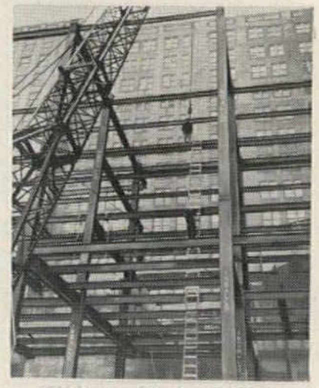
Gray and Coblin, Lexington



Master Plan, developed by Scruggs & Hammond, Landscape Architects, provides for such facilities as fire and police services, auditorium, restaurant, research meeting area, library, and heliport

The Federal Reserve Bank of Atlanta
Birmingham Branch office

The American National Bank & Trust Co.
New head office, Mobile, Alabama



Whitney National Bank
Extension, New Orleans

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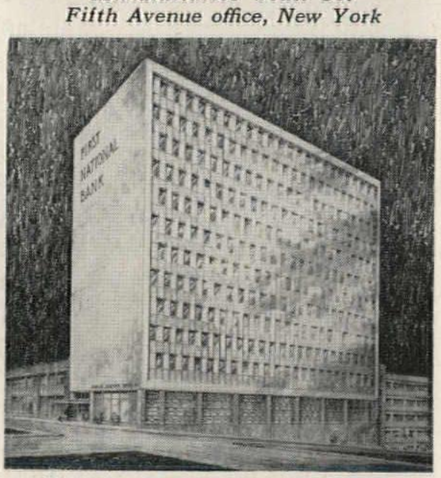
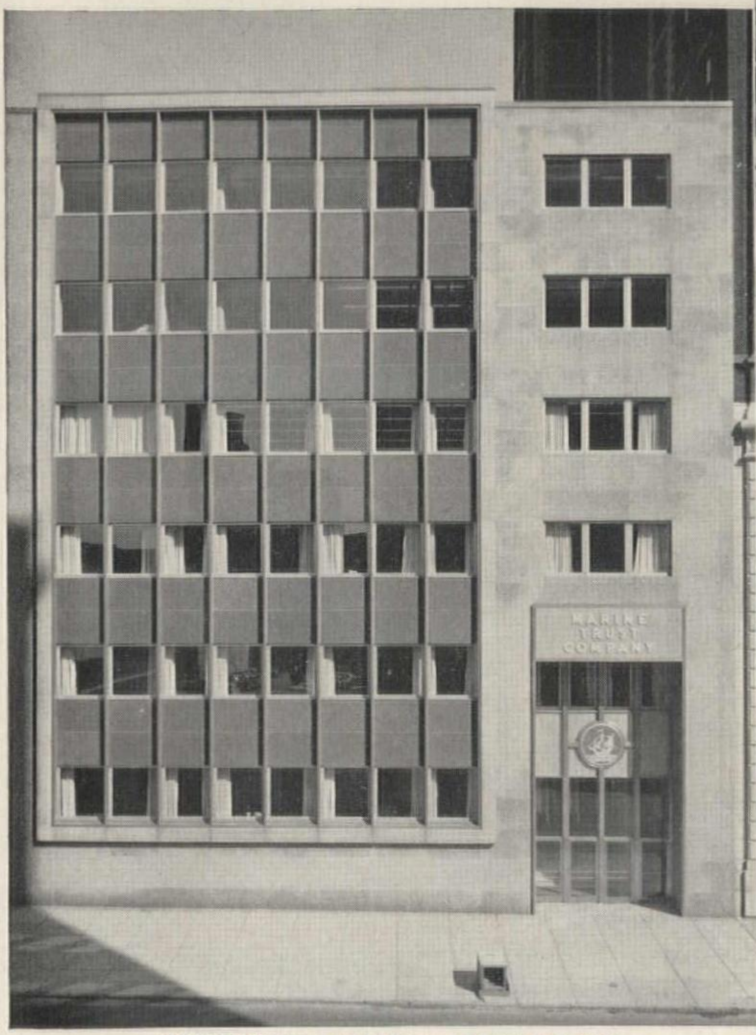


The First National Bank of Atlanta
Peachtree and North Ave., Atlanta

INGALLS

THE INGALLS IRON WORKS COMPANY
Executive Offices: Birmingham, Alabama



MARINE TRUST COMPANY
ADMINISTRATION BUILDING
Buffalo, New York

Architect:
James, Meadows & Howard
General Contractor:
The John W. Cowper Co., Inc.
Painting Contractor:
Alba Painting & Decorating Co.
P & L Products Used:
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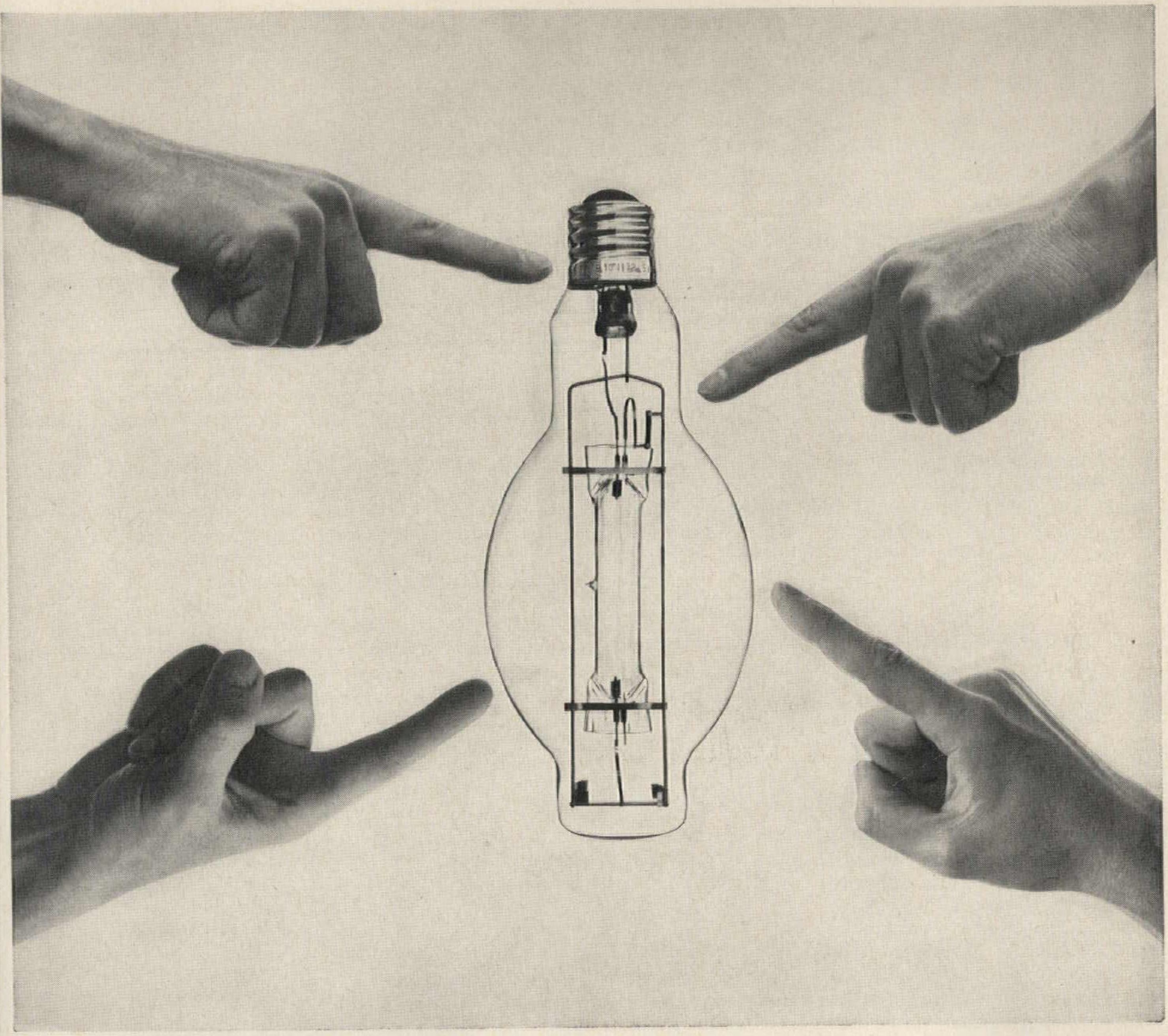

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The Editor
Architectural Record
May I differ a bit from my good friend, Ed Barnes, in what he had to say about home furnishings in "Record Houses of 1960." I think his view is a bit impractical on some points and typical of that segment of modern designers who have tried to strip domestic architecture of its warmth, feeling, comfort and appeal to the imagination. Their hard, slick, smooth, uncomfortable angles and planes contribute little or nothing to physical well being and nothing at all to the spirit. Man cannot live by drab practicality alone!

He says, "We are building bedrooms just big enough to sleep in and dining rooms just big enough to eat in and living rooms just big enough for a fireplace." The antidotes he prescribes for what he later calls "confined modern space" are immovable pedestals, instead of beds; single support tables "cantilevered up from the floor"; "more sunken seating wells around fireplaces"; and "modular coordination."

Is it entirely impractical, in these days, for the average home owner to dream of possessing a home with rooms of sufficient size to permit the use of comfortable furniture that can occasionally be moved about to create fresh arrangements? Can he no longer dream of using his bedroom as a private sitting room or his children using theirs as a playroom or study? And how about his wife? Making a bed on a pedestal is a bit more of a chore than doing the same job on a bed you can move about. Is he, also, to banish forever, the thought of family Thanksgiving and Christmas dinners, because the dining room comes only in one size and, presumably, the family does too?

If "floor space is at a premium," it is going to take something other than "modular coordination" to provide more of it. The suggestion that "our floor plane can actually dissolve into a series of steps and platforms" does not offer much practical help, when we consider the complexity of construction and additional cost inherent in the idea. Neither does it seem compatible with the general idea of a "harem interior," which the speaker favored. A bit further along he says, "If we are not able to sit on the floor, then the floor can rise up to meet us." Well, before it does, I think I shall depart for outer space.

I do not agree that this kind of thinking "leaves us with absolutely wonderful space." It's going to take a lot more than that to give the average American family something better than a 12-by-14 ft living room, 8-by-9 ft bedrooms and the Spartan austerity that some architects and builders provide.

Mr. Barnes says, "It is so easy to add, and so hard to subtract." Let us then *add* enough space to the house so it will no longer be true that "even if the buyer owns the furniture, frequently there is no room for it." Then tables and chairs can continue to have four legs (as they have had for quite some time) and we won't have to have the "fairly stiff chairs with squarish lines," and slab sofas, or "a stiff chair (that) is good for your back."

Must we sacrifice the warmth and comfort of our homes; the "clutter" that is sometimes nothing more than the product of children's play or adult home activity, in order to "recede into a quiet architectural background?" Is that what house and home have to become in the space age? If it is, it bears at least a passing resemblance to the place where all lines are hard, straight and clean, where chairs are built in and stiff, where tables have pedestals instead of legs, where the wall serves as a support for the bed, the closets have standard drawers, and lethal wires are all safely tucked away—our shiny new state prisons.

I agree that for the average client, "we must give him space and furnishings that work together, not close him in but rather give a sense of calm." It will take architects and furniture designers of imagination and creativity and ingenuity, if we are to do it.

Julian H. Salomon, A.S.L.A.
Landscape Architect
Suffern, N. Y.

ON ARCHITECTURE FOR A MAN AND HIS CAR

The Editor
Architectural Record
In reviewing the July issue which under its Building Types Study takes in motor hotels, I could not help but be struck by a most unusual American phenomenon as represented in some of the new motels which are anticipated in architect's drawings.

From earliest days man always needed, aside from wife and family, another creature to act as sort of alter ego. At first, it would seem that it was a man and his dog, later in civilization it was a man and his horse (especially if we are to believe our television screen). In the last century it has become a man and his car. It seems that man has become almost inseparable from his mechanical steed. This love of a man for a car has practically ruined most of the downtown areas of cities throughout our country. This phenomenon is about to create some of the most ridiculous architectural solutions imaginable. At long last in the San Francisco Hilton Hotel, a man will lovingly drive his car up ten stories so that he can have the mystifying pleasure of sleeping next to his car. In the Sky Host Motor Hotel the ultimate has been achieved in togetherness between a man and his car because in this scheme a man can leave his door open and with loving eyes see his car as he drowses off to sleep for the night and upon awakening, behold his beloved right next to his bed. This is such a touching spectacle—"A Man and His Car."

Morris Lapidus,
Architect
New York

Terrazzo

. . . all that a floor can ever be

Approximately 40,000 square feet interior and 20,000 square feet exterior terrazzo made with Trinity White portland cement is in the Royal Ponciana Shopping Center, Palm Beach, Florida. John L. Wolk & Associates, Palm Beach, Architects; terrazzo by E. R. Anderson & Co., West Palm Beach.

COSTS HAVE BEEN KEPT on terrazzo and 6 competitive floors. First cost plus seven years of maintenance for each were compared. Terrazzo was the least expensive of any type—less costly by one-third than 5 of the 6 types. And it had far more remaining value after seven years than any other type.

Ask for Trinity White's full-color reproductions showing 24 chip and matrix color combinations plus standard terrazzo specifications. Address: Trinity White, 111 West Monroe St., Chicago 3.

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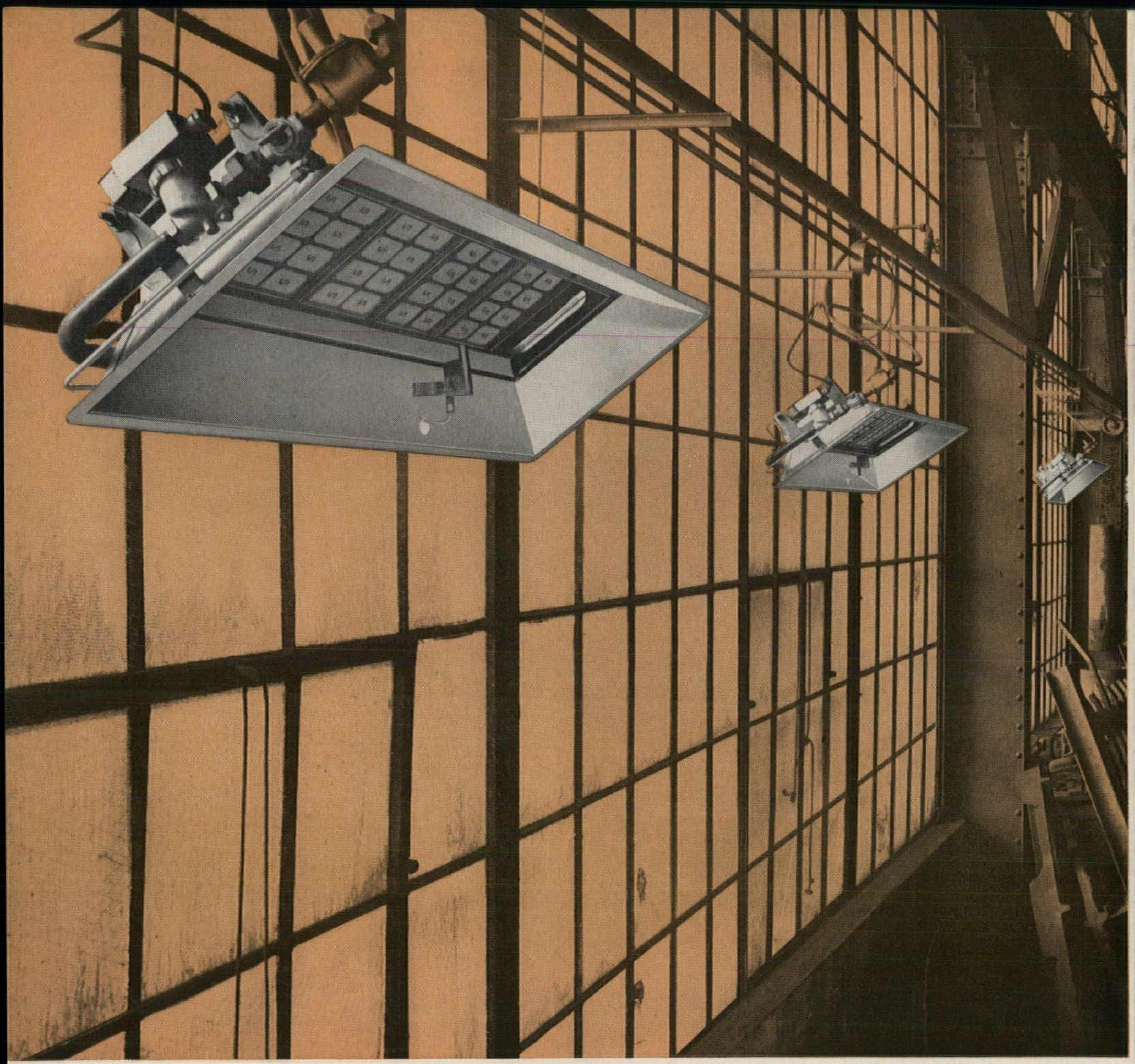
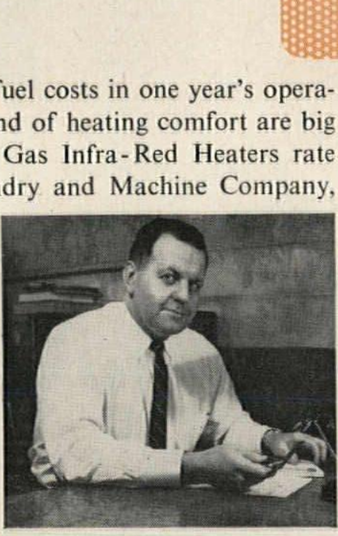


PERFECTION

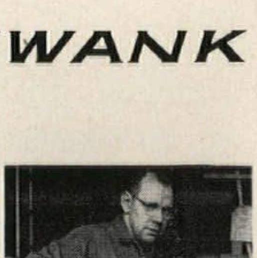
Infra-Red
GAS
Heaters

SCHWANK

Startling savings of $9892 in fuel costs in one year's operation plus a wonderful new kind of heating comfort are big reasons Perfection Schwank Gas Infra-Red Heaters rate high with Youngstown Foundry and Machine Company, Youngstown, Ohio. Listen to these comments:

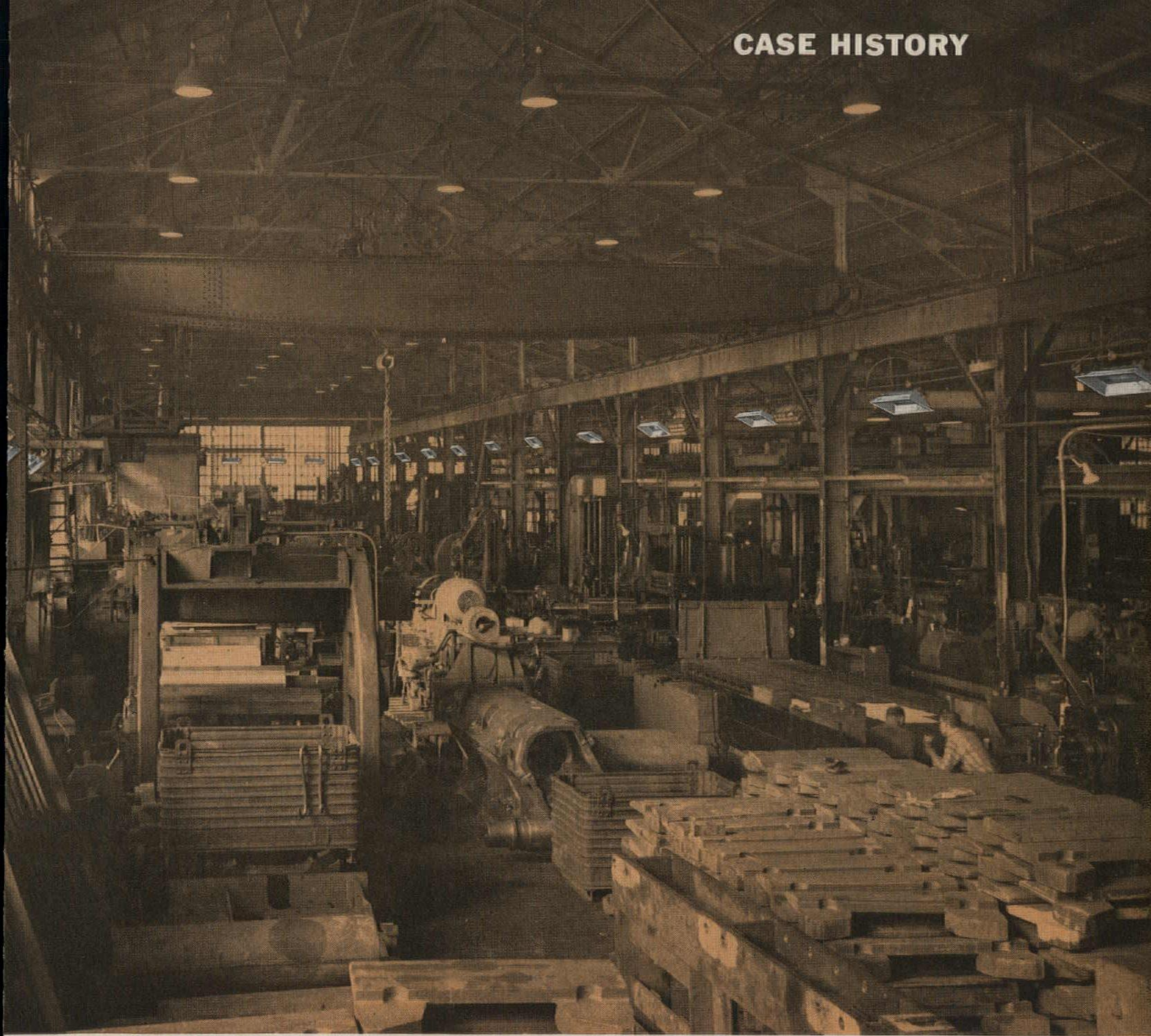


"Heating a 60 year old building like this is a tough job", states James Paumier, Plant Superintendent, "but this Perfection Schwank system gives us a constant and comfortable 65° temperature, drastically cut our fuel cost and requires practically no maintenance."



Wayne Thew, Foreman, exclaims, "I've been here for 20 years and Perfection Schwank Infra-Red is far superior to any other heating system we've tried. Castings and machinery are

CASE HISTORY



Part of the 41,160 square feet of floor space at Youngstown Foundry and Machine . . . all heated by Perfection Schwank Gas Infra-Red Heaters.

cut heating bill $9,892 . . . give Youngstown Foundry and Machine "Best Heat Ever!"

always the same temperature eliminating expansion and contraction problems and making tolerances much easier to meet."

States Joseph Sagy, Plane Operator: "Since we've had these Infra-Red heaters, there are no drafts, no hot and cold spots . . . in every way they're a big improvement over our previous heating system."

Acceptance like this makes it easy to understand why there are over 25,000 users of Perfection Schwank Gas Infra-Red Heaters.

Approved by A.G.A., Underwriters, C.G.A. and C.S.A.

Under Schwank U.S. Patents 2,775,294 and 2,870,830 and pending applications.

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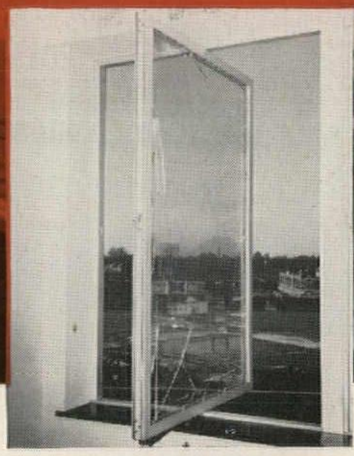
FAHRENHEIT...1200° PLUS



Weatherstrip still intact, this Baptist Memorial hospital window, typical of the *Adlake* reversibles exposed to flame, retained its glass in spite of temperatures which reached 1200° plus for more than thirty minutes. Unretouched photo reveals how glass cracked but did not shatter.

ADLAKE...A-PLUS!

Lashed by 25 m.p.h. winds, flames from the Memphis stadium towered like a gigantic blazing tongue above the roof of the Baptist Memorial hospital . . . licked hungrily at its face and the *Adlake* double-glazed reversible aluminum windows. For more than half an hour temperatures stood at Fahrenheit 1200° plus, the melting point of aluminum. Yet, no *Adlake* windows gave way. Frames retained their square . . . weather-strips their seal—thanks to *Adlake's* built-in *safety of quality.* "Without those windows, we would have had a bad situation," firefighters agreed. Officials credited Adlake double-glazed windows with having "saved the life of the hospital" not to mention human lives that may well have been spared. Write for 36-page catalog of non-residential aluminum windows and curtain walls.

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custom windows

—*Drawn for the* RECORD *by Alan Dunn*

"Well, so much for our lifelong battle against 'facade'—our next commissions are all for underground missile bases!"

Gropius Receives German Grand Architectural Prize

Dr. Walter Gropius was awarded the German Grand State Prize of Architecture, given by the Minister President of Rhineland Westphalen, Dr. Meyers in the Academy of Arts, Dusseldorf in July. The Award read: "The comprehensive community of the Fine and Applied Arts united by him in the Bauhaus has set an example of how to renew the integration of all design. . . . His architectural work, his thoughts, and his teachings have found acceptance throughout the world illuminating the German sphere through his personal participation and counsel."

Lawrence Appointed Dean at Tulane School of Architecture

John W. Lawrence has been appointed Dean of the School of Architecture and Professor of Architecture at Tulane University. He succeeds the late John Ekin Dinwiddie, who died last September.

A member of the faculty of the School of Architecture at Tulane since 1949, Mr. Lawrence has taught Design at all levels of the undergraduate curriculum. Concurrently he has been engaged in private architectural practice, a partner in the firm of Lawrence and Saunders.

Dean of Architecture at R.I.S.D. is DuMoulin

The new head of the department of architecture at the Rhode Island School of Design is Rockwell K. DuMoulin, associate professor of Architecture.

Mr. DeMoulin will also serve as Acting Chairman of the Division of Architecture for 1960-61 during the absence of Albert E. Simonson, who plans a research visit to Japan on a sabbatical leave.

Second World Conference on Earthquake Engineering

Japan, home of more than 1000 minor earthquakes a year, where myth has it that a playful underground catfish is the cause, was host in July for the Second World Conference on Earthquake Engineering. Participants in this world-wide effort toward mitigating earthquake disaster through an interchange of ideas and knowledge were scientists and engineers from 27 countries, including the USSR, Rumania, East Germany, and the Republic of China (Formosa).

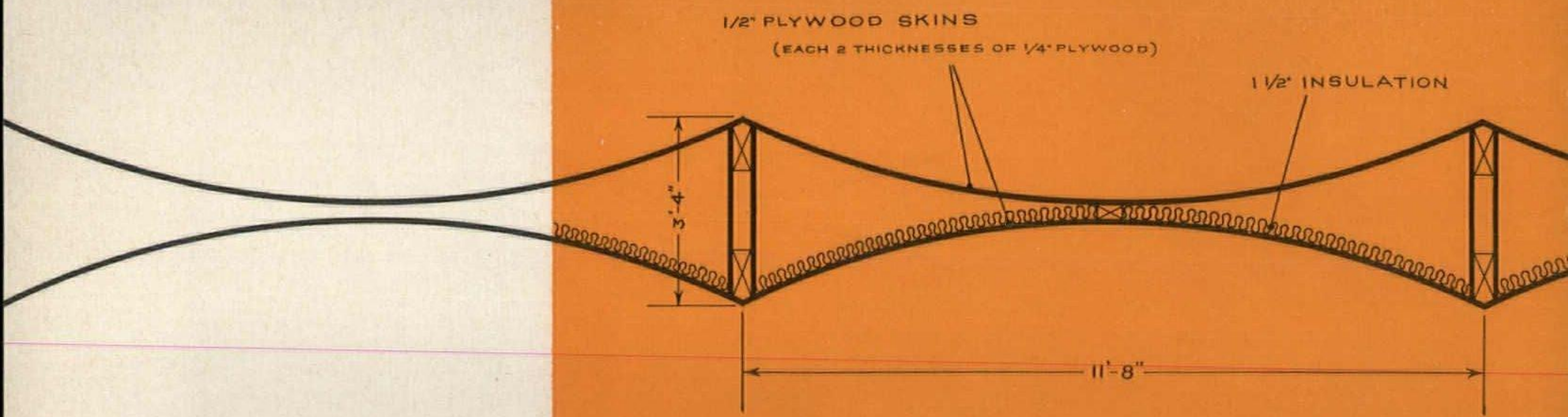
The United States delegation included Professor George W. Housner of the California Institute of Technology, president of the Earthquake Engineering Research Institute. The E.E.R.I. originated the First World Conference on Earthquake Engineering four years ago in Berkeley, Cal.

Sponsored by the Science Council of Japan, the Seismological Society of Japan, the Japan Society of Civil Engineers, and the Architectural Institute of Japan, the conference heard a total of 118 technical papers. These were grouped into five classifications: the relation of soil and foundation conditions to the earthquake problem; analysis of structural response and instruments; seismic and earthquake ground motion; earthquake resistant design, construction and regulations; and recent strong motion quakes and resultant damage.

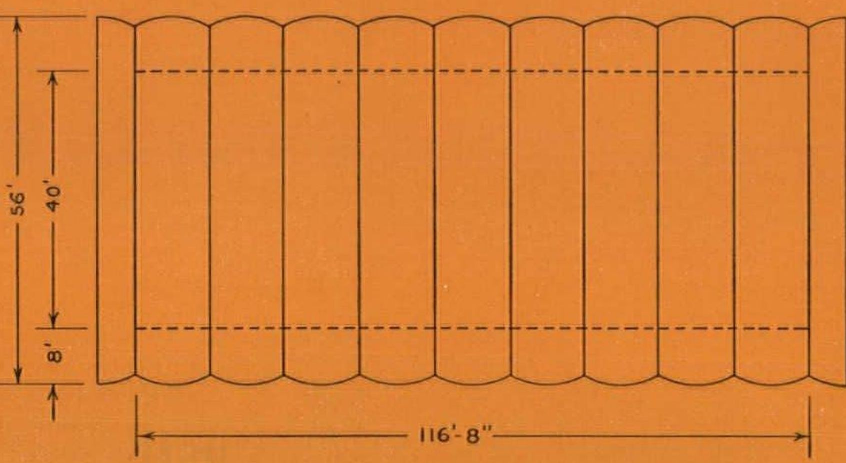
A statement by John Rinne of Standard Oil of California, chairman of the committee of cooperation with Japanese conference organizers, can be said to express a general conclusion of the conference. He said: "engineered design and construction can provide reasonably earthquake-resistant structures with most of the construction material used or available throughout the world."

Conference proceedings are being published in a three-volume set and can be purchased at $17.00 a set, including postage, from the Intelligence Section, Science Council of Japan, Ueno Park, Taito-ku, Tokyo.

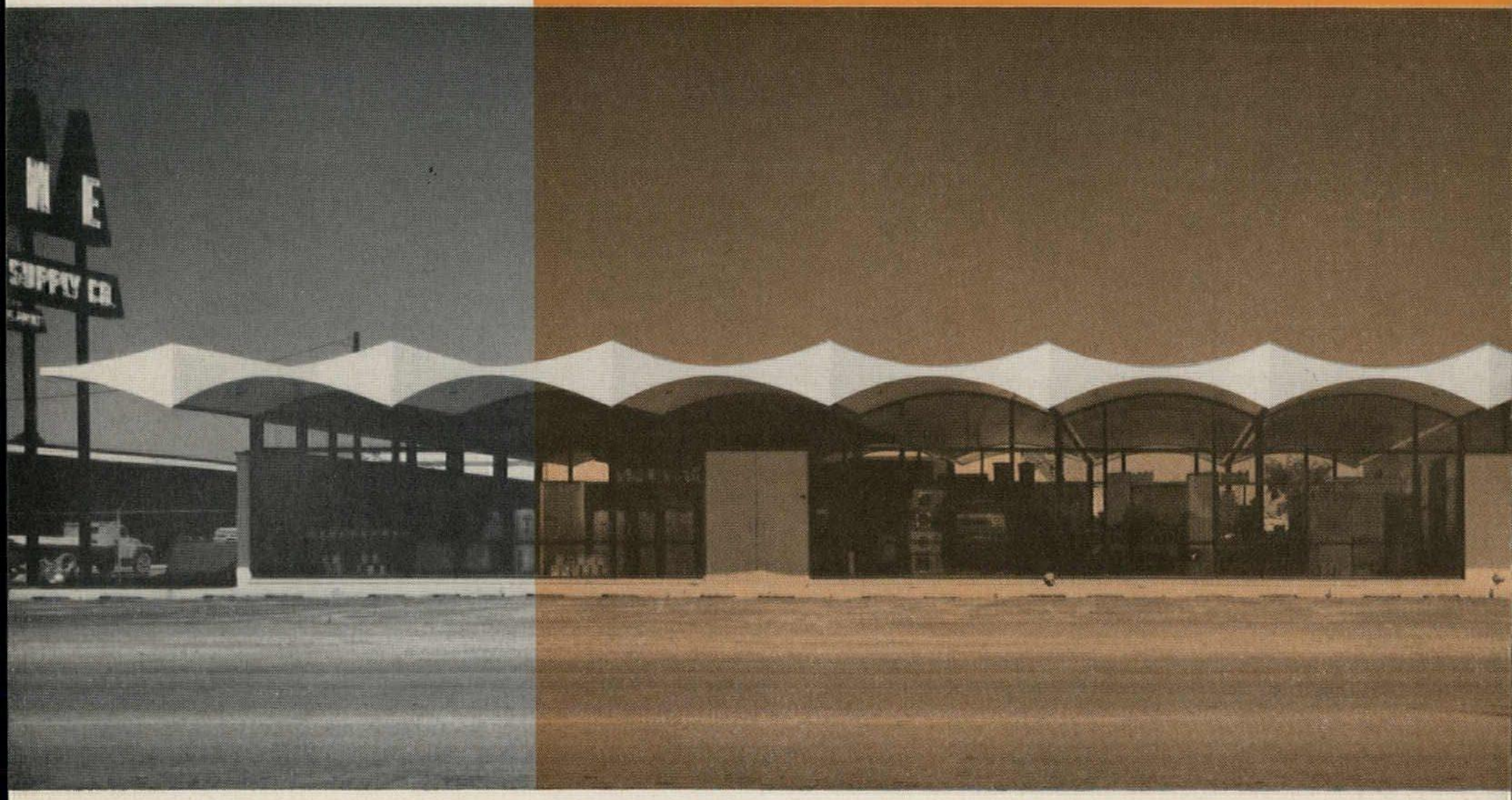
more news on page 62



1/2" PLYWOOD SKINS
(EACH 2 THICKNESSES OF 1/4" PLYWOOD)
1 1/2" INSULATION
3'-4"
11'-8"



56'
40'
8'
116'-8"



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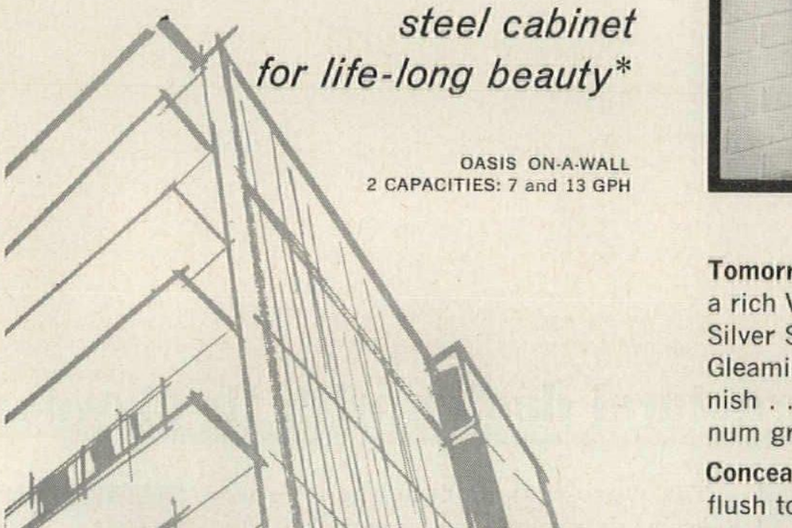
TOMORROW'S STYLING

FOR TODAY'S MODERN BUILDINGS

*compact wall mounted water cooler has mar-resistant vinyl clad steel cabinet for life-long beauty**

OASIS ON-A-WALL
2 CAPACITIES: 7 and 13 GPH



Tomorrow's styling today. Only Oasis On-A-Wall offers a rich Vinyl laminated 20 ga. steel cabinet in stunning Silver Spice color . . . mar resistant for lasting beauty. Gleaming stainless steel top can't chip, crack, or tarnish . . . cleans in a whisk. Recessed anodized aluminum grille-work accents the crisp modern look.

Conceals plumbing . . . makes clean-ups easy! Mounts flush to wall—at any level—to hide plumbing and save space. Off-the-floor design makes the janitor's job a breeze. Highest anti-splash back of any wall mounted cooler. Designed for easy installation.

Full 5-year warranty. Superb Oasis engineering has finest record of trouble-free performance in the industry. Warranty covers entire refrigeration system and all components.

***WRITE FOR FREE VINYL SAMPLE.** Actual Vinyl laminated steel sample in Silver Spice color available on request. Free specifications and details of entire water cooler line for architects and engineers. (See Sweet's AIA File No. 29-D-42)

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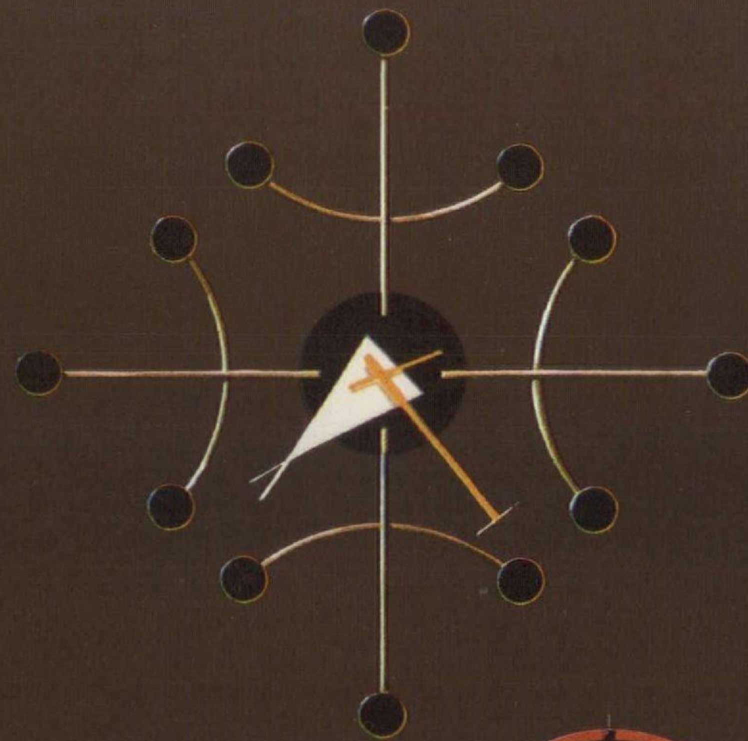
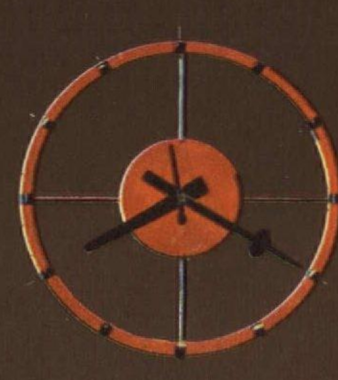
WATER COOLERS

The Ebco Manufacturing Co., Dept. 7-R, Columbus 13, Ohio
Manufacturers of the most complete line of water coolers. Distributed in Canada by G. H. Wood & Co., Ltd.





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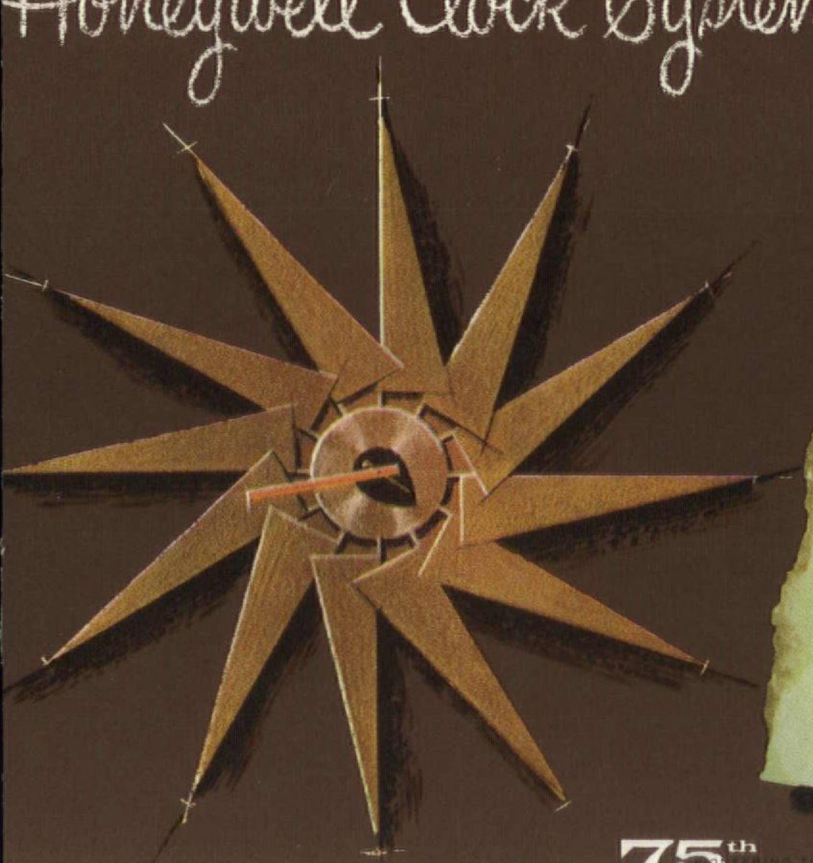

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SWEET'S FILE 4d/Mos

For the "largest office building west of Chicago"

Mo-Sai®

precast concrete curtain wall and precast facing

Mo-Sai curtain wall on tower was made with a coarse white aggregate, with maximum grading to 2", cast in grey Permanente cement matrix. Mo-Sai precast facing on street level is same aggregate in a white cement matrix.

MO-SAI INSTITUTE, INC.

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WAILES PRECAST CONCRETE CORP.
Los Angeles, California
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Omaha 7, Nebraska

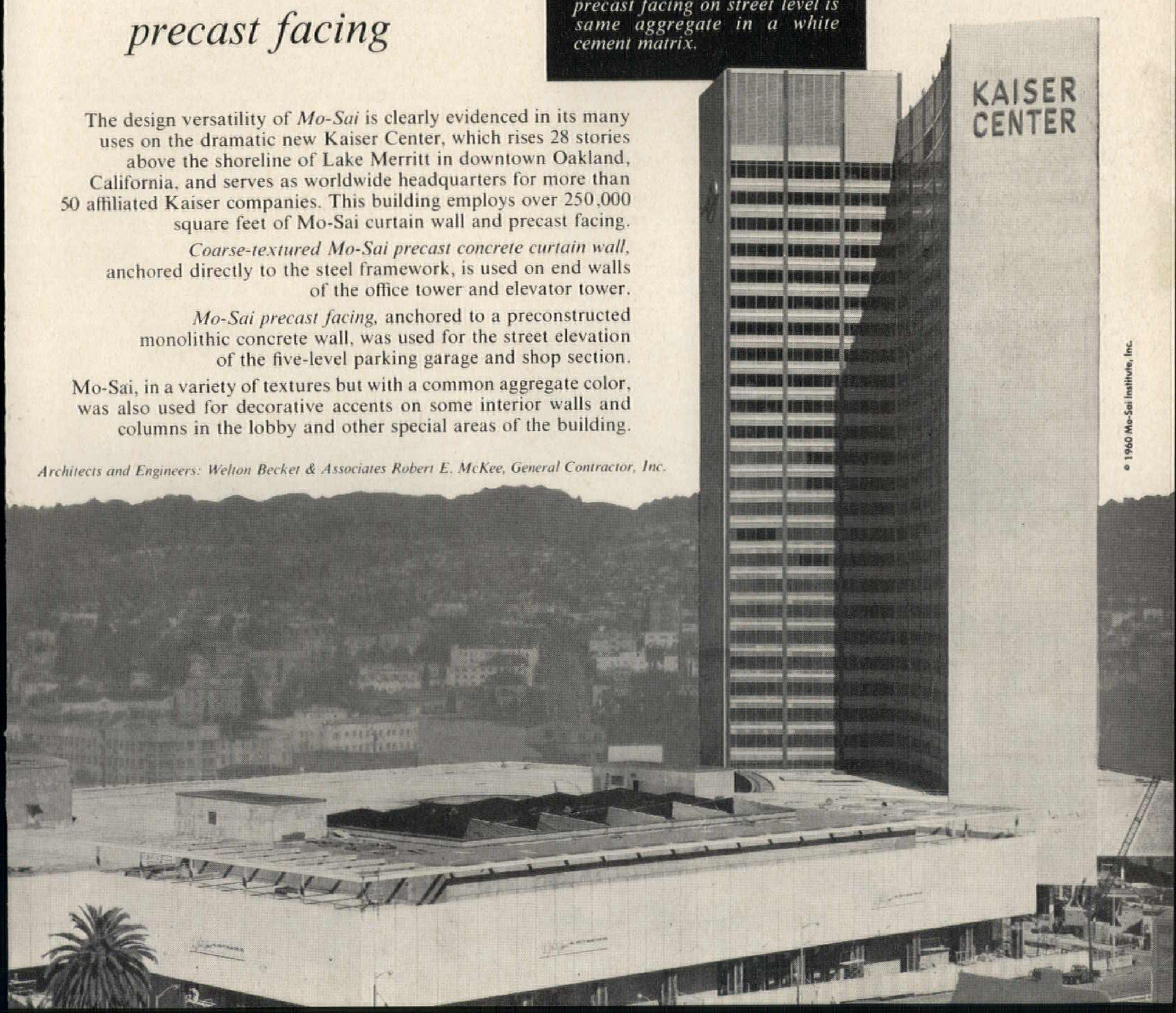
The design versatility of *Mo-Sai* is clearly evidenced in its many uses on the dramatic new Kaiser Center, which rises 28 stories above the shoreline of Lake Merritt in downtown Oakland, California, and serves as worldwide headquarters for more than 50 affiliated Kaiser companies. This building employs over 250,000 square feet of Mo-Sai curtain wall and precast facing.

Coarse-textured Mo-Sai precast concrete curtain wall, anchored directly to the steel framework, is used on end walls of the office tower and elevator tower.

Mo-Sai precast facing, anchored to a preconstructed monolithic concrete wall, was used for the street elevation of the five-level parking garage and shop section.

Mo-Sai, in a variety of textures but with a common aggregate color, was also used for decorative accents on some interior walls and columns in the lobby and other special areas of the building.

Architects and Engineers: Welton Becket & Associates Robert E. McKee, General Contractor, Inc.



continued from page 45

Gallion Leaves U.S.C. Burge New Acting Dean

Arthur B. Gallion, former Dean of the School of Architecture at the University of Southern California, has been appointed director of planning for the Honolulu office of Harland Bartholomew & Associates, city planning and civil engineering firm with headquarters in St. Louis, Mo.

A Fellow of the American Institute of Architects and member of the American Institute of Planners, Gallion served at U.S.C. as vice president of the Association of Collegiate Schools of Architecture.

Succeeding him at U.S.C. is Henry Charles Burge, A.I.A., as Acting Dean. Mr. Burge is a U.S.C. graduate and a member of the architectural faculty since 1945.

Opportunity for Architects, Artists to Study Abroad

Young American architects and artists have an opportunity to study abroad in 1961-62 under the Department of State's educational exchange program. Awards under the Fulbright Act, are given for study in Europe, Latin America, and the Asia-Pacific area. They cover tuition, maintenance, and travel for one academic year.

Requirements are U. S. citizenship, a Bachelor's degree or its professional equivalent (for an architect, an architectural degree), language ability to meet the demands of the proposed study project, and good health. Preference is given to applicants under 35 years of age.

Requests for applications must be postmarked before October 15, 1960, and sent to: Institute of International Education, Information and Counseling Division, 1 East 67 St., New York 21.

Claude B. Riemersma, 53; 23 Years on AR Staff

Claude B. Riemersma, national sales manager of ARCHITECTURAL RECORD and a member of its sales staff for 23 years, died unexpectedly of a heart attack July 12 at his home in Chicago. He was 53.

Mr. Riemersma, who had been advertising manager for Crane Company in Chicago before coming to the RECORD as a district manager in 1937, was promoted to regional sales manager in 1955 and became national sales manager last year.

University Research Center Headed by Kinne

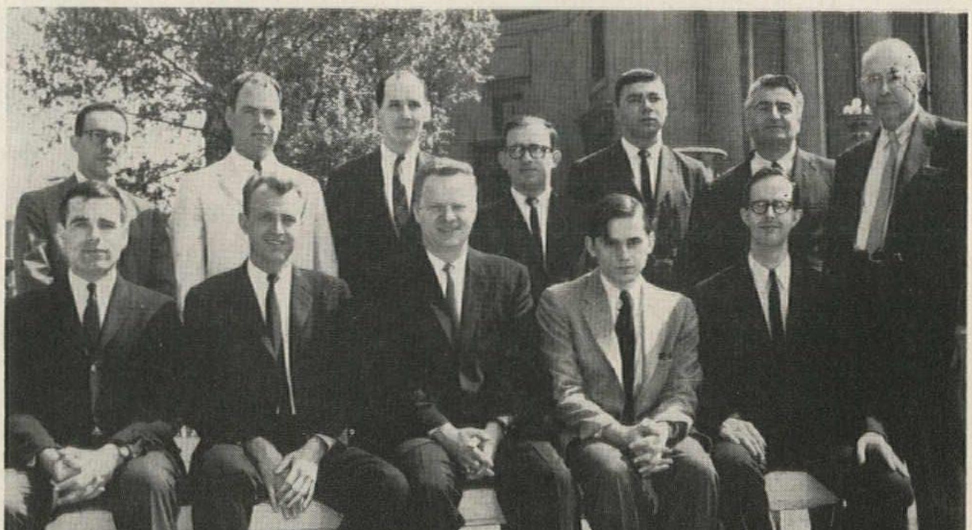
William S. Kinne Jr., former professor of architecture at Illinois University, industrial architectural adviser, has been named director of the University Facilities Research Center located on the campus of the University of Wisconsin. The Center was established to spur cooperation of Western Conference Universities and University of Chicago in programs for building facilities.

Cummings Named Consultant To Building Code Commission

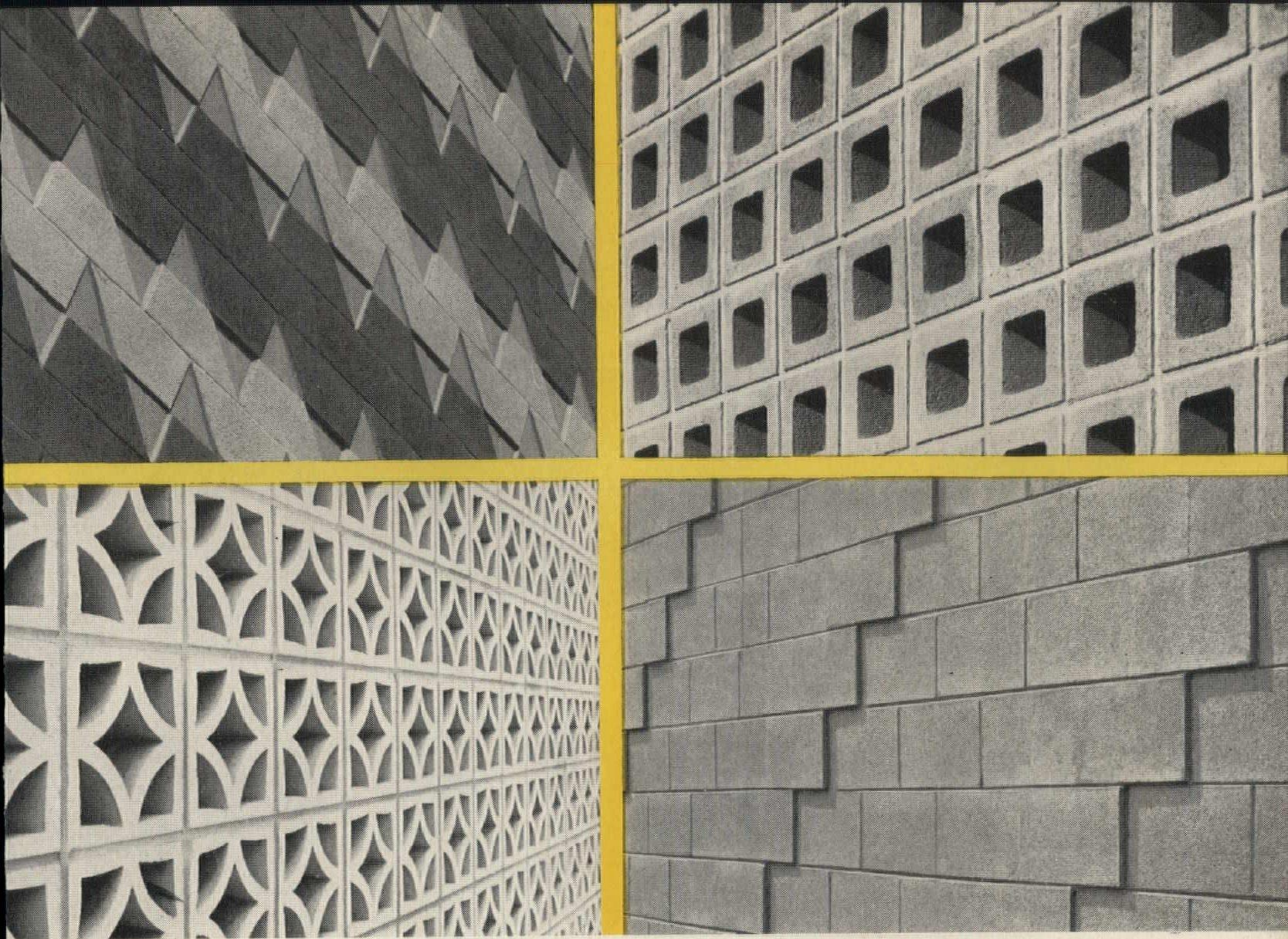
George Bain Cummings of Binghamton, N. Y., a past president of the American Institute of Architects and former vice chairman of the New York State Building Code Commission, has been named Division of Housing building code consultant. He will study, recommend methods to improve administration of services provided to cities by the Division's state Building Code Bureau.

John W. Lawrence (above), new architecture dean at Tulane, and students in the classroom

Barry Byrne, A.I.A., Evanston, Ill., gets Building Stone Institute award for distinguished use of stone from Gen. C. J. Hauck and Les D. Stennette at BSI meeting in Detroit



Ten top students out of 18 in the 1960 graduating class of Columbia University's School of Architecture received William Kinne Fellows Memorial Traveling Fellowships which finance six months abroad for graduate study and publishable research. They are: seated (left to right) Peter D. Eisenman, New York; Lewis Dale Booher, Iowa Park, Tex.; Henry H. J. Heissenbuttel, New York; Robert J. Badia, New York; and Frank B. Hollenbeck, Wilton, Conn. Standing (left to right) Armando Vargas, Puerto Rico; John H. Crowther, Mystic, Conn.; Nelson T. Nordquist, New York; Manuel D. Herz, New York; Ricardo M. Scofidio, Brooklyn; Alexander Kouzmanoff, associate professor of architecture and member of Fellowship Committee; and James G. Van Derpool, Acting Dean of the School of Architecture



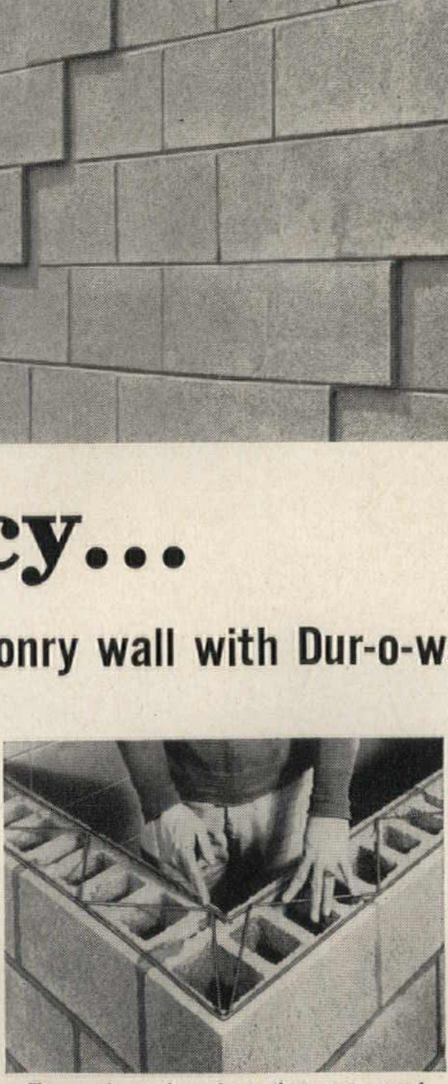
Plain or fancy...

you can strengthen just about any kind of masonry wall with Dur-o-wal

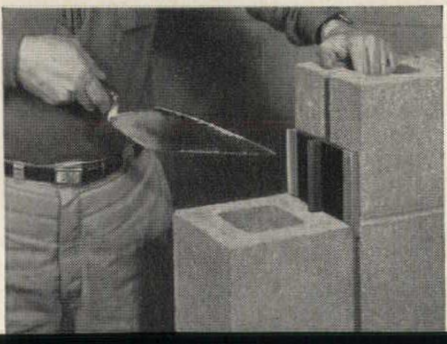
Hats off to today's architectural designers for a new world of beauty in concrete masonry. And orchids to the modern builders who are making that beauty last with Dur-o-wal. It's the rare block pattern, plain or fancy, that does not permit America's most practical, most widely used, most widely proved masonry wall reinforcement. Dur-o-wal is versatile.

Dur-o-wal's trussed, butt-welded construction—with deformed rods that lay straight and flat—has been *engineered* to do a job. Increases the flexural strength of a masonry wall at least 71 per cent, as much as 261 per cent, depending on the weight Dur-o-wal used, number of courses, and type of mortar. This makes for truly permanent masonry wall construction and looks.

For technical details, write to any of the Dur-o-wal locations below. See us in Sweet's.



Two engineered products that meet a need. Dur-o-wal reinforcement, shown above, and Rapid Control Joint, below. Weatherproof neoprene flanges on the latter flex with the joint, simplify the caulking problem.



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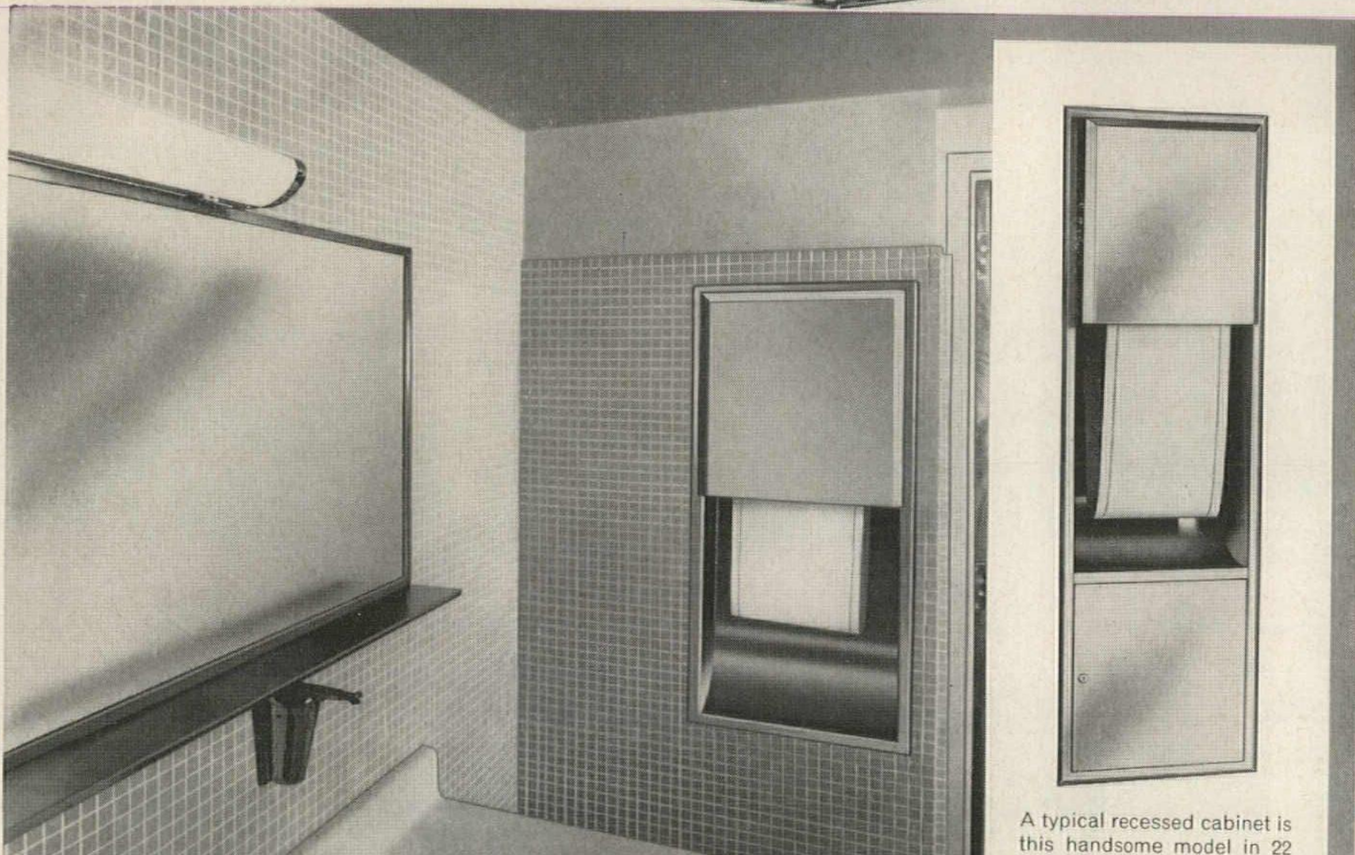
- Dur-O-waL Prod., Inc., 4500 E. Lombard St., **BALTIMORE, MD.**
- Dur-O-waL of Ill., 119 N. River St., **AURORA, ILL.**
- Dur-O-waL Prod. of Ala., Inc., Box 5446, **BIRMINGHAM, ALA.**
- Dur-O-waL of Colorado, 29th and Court St., **PUEBLO, COLO.**
- Dur-O-waL Inc., 165 Utah Street, **TOLEDO, OHIO**

Design for beauty and utility with an eye to economy, too...



A typical recessed cabinet is this handsome model in 22 gauge, satin-finished stainless steel. It has continuous piano hinges, tumbler locks and ample storage space.

Specify
Continuous Cloth Towel Cabinets

Cloth towel cabinets add smartness to this washroom in the newly-built Prudential Federal Savings Building, Salt Lake City. Architect: Cunneen Co., Philadelphia, Pa. Service is by American Linen Supply Co.

Check the benefits your clients get when your design includes cloth towel cabinets in all washrooms.

- ☐ An end to litter, storage and disposal problems.
- ☐ Reduced maintenance and janitorial costs.
- ☐ Fewer plumbing repairs.
- ☐ Elimination of fire hazard.

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 by Ernest Mickel

BACKGROUND PAPER FOR CONFERENCE ON AGING SEES TODAY'S DESIGN TRENDS AS PROBLEM

The new background paper on housing, prepared under direction of the committee on housing for the White House Conference on Aging in January, is crammed with statements which challenge architects.

The point is made, for example, that much of the housing presently being built and projected for construction will not serve adequately the needs of elderly persons. The split-level variety with narrow doorways and small bedrooms, with stairs at entrances, and with such meager space for circulation as to preclude continued occupancy by persons of advanced age, particularly the infirm, was noted as one of the problems in consideration of future shelter.

The White House Conference on Aging will be held in Washington January 9 through 12. Authorized by Congress, it will study 20 subject matter areas, of which one is housing. Like similar conferences on current problems, this is being preceded by local and state meetings and the background paper is being used by these pre-conference sessions to stimulate thinking on all aspects of shelter for older people.

Nelson Heads Housing Unit

Walter C. Nelson, Minneapolis, president of the Mortgage Bankers Association of America, is chairman of the conference's housing committee and Walter K. Vivrette, Minneapolis architect, is technical director for housing, with his headquarters in the Housing and Home Finance Agency.

The background document carries no recommendations but pointedly sets out existing conditions, achievements in and out of government, and the pressing need for a look at techniques for housing aging persons adequately.

There is this statement in the section on improving the quality of such housing: "While our efforts to increase the supply of housing for the elderly will serve to improve the quantity of housing generally, much of our discussion will center upon the standards of housing and its suitability to the particular needs of the elderly. It goes without saying that generally rising standards of living in the United States should apply across the board to all individuals regardless of age. Certainly as successive generations of the aged appear, they will demand standards of housing comparable to those to which they were accustomed in earlier years."

Basic Criteria Listed

Discussing emerging objectives in the field, the report states that the house or apartment, to fulfill its purpose for independent living in later years, faces these criteria:

1. It must be as good if not better than the individual's customary living quarters of earlier years.
2. It must be suitable to the conditions of failing health and illness frequently observed.
3. It must also have maximum adaptability to the less frequently observed conditions of illness, disability, and convalescence.
4. It must contribute to continuing rehabilitation of the individual.

"Much of the available housing does not fulfill such objectives," the paper comments. "Some of its shortcomings can be overcome by minor adjustments or remodeling, but more generally, barring some outside help, these shortcomings will continue on into the years because of the habits and reduced energy which are characteristic of old age."

What Do Old People Need?

In its section on physiological and socio-physiological needs, the document gets down to some more specific treatment of the architectural applications in the design of housing for the elderly.

On light— We do know that most people intuitively seek sunlight. They also recognize the value of proper artificial illumination, for as eyesight begins to fail, inadequate illumination may adversely affect not only efficiency but also mental and physical health. The light intensity for reading required by the older person is higher than that required by the student in school; the source and distribution of this light must properly relate brightness contrasts within his line of vision. Similarly, both in the home and in the institution, the older person needs control of the brightness contrast among the several spaces through which he moves— from room to hall, and from hall to room.

On sound— While excessive noise is disturbing, excessive quiet can be even more disturbing, particularly if the individual's sight is poor and he must depend on hearing for his cues. With loss of hearing, he may desire increased volume from his radio or TV; and unless he is living in isolation, such intensity of sound must not be allowed to annoy those about him.

On air—Some of the general reactions of the aging person as they pertain to the air about him have been observed: a desire for greater warmth and freedom from drafts; an inability to tolerate extremes of heat or cold; and a concern about air pollution and excessive humidity or dryness as they relate to comfort and range of toleration.

On hazard control— Resilient nonslippery floors, or at best floors with only the slightest coat of wax can be substituted for highly polished wood or terrazzo; scatter rugs and scattered furniture can be removed from circulation paths; unnecessary stairs and changes of level can be avoided in the design of housing; control of drafts and rain at entrances can be achieved without a four- to six-in.-high step at doors, and even without a "tripping" threshhold; bathroom accessories, towel bars, curtain rods, soap dishes and grab bars can be in-

continued on page 364

Washington Topics *by Ernest Mickel*

New Housing for Elderly Program Launched by HHFA

The Housing and Home Finance Agency late in July announced it was ready to receive applications for mortgage insurance under the housing for the elderly program. Daniel G. Minto, Burlingame, Cal. was named by Housing Administrator Norman P. Mason to administer this portion of the housing law which Congress enacted last year. A total of $20 million was appropriated.

Under the program, loans may be insured where they do not represent more than 98 per cent of the total development cost, and interest charges are expected to be approximately three and one half per cent.

To be eligible for insurance, the loans may be made only to private nonprofit corporate sponsors of rental housing for elderly families and persons. The housing and related facilities may be provide through new construction o through the acquisition and re habilitation or conversion of exist ing structures. Construction mus be undertaken in an economica manner and may not be of elaborat or extravagant design or materials HHFA said.

Because the primary purpose o the program is to test and repor promptly on the rent levels whicl can be achieved under varying con ditions, HHFA said that selectio will be made from otherwise eligibl applications in a way to assure a objective test of (1) projects buil in widely scattered location throughout the country; (2) proj ects located both in large cities an smaller cities and towns; and (3 projects designed for independen or self-contained occupancy, alon with those designed for congregat living.

HHFA also said that other sig nificant elements of design, plan ning, and location which give prom ise of providing useful informatio and experience on the most effectiv means of meeting the housing need of lower middle-income elderly per sons and families will be weighe in selecting from eligible applicant and projects.

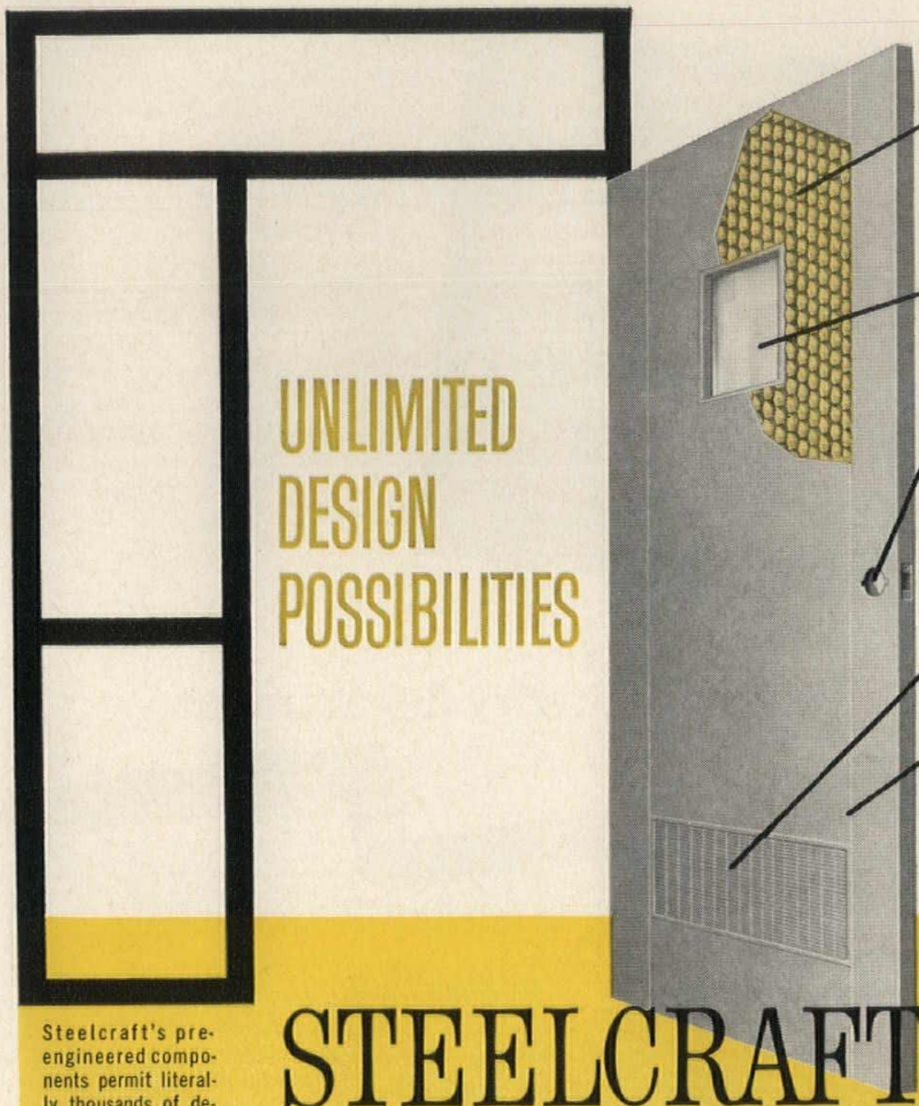
FAA Issues Revised Guide On Airport Construction

Publication of a revised edition o "Standard Specifications for Con struction of Airports" has been an nounced by the Federal Aviatio Agency. (Copies can be obtaine from the Superintendent of Docu ments, U. S. Government Printin Office, Washington 25, D. C. a $2.75 per copy.)

The specifications apply in the construction of civil airports and particularly projects sponsored under the Federal airport aid program, FAA said.

The new 599-page book updates the last edition published in 1949 and contains valuable information for guidance in the preparation of plans and specifications for airport construction. Covered in the publication is such work as clearing, grubbing, grading, drainage, paving, lighting, turfing and incidental construction.

continued on page 337



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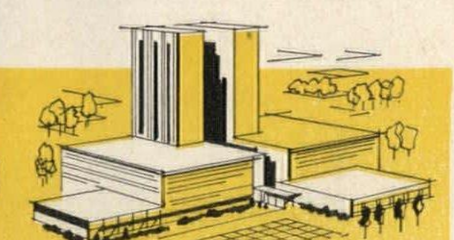

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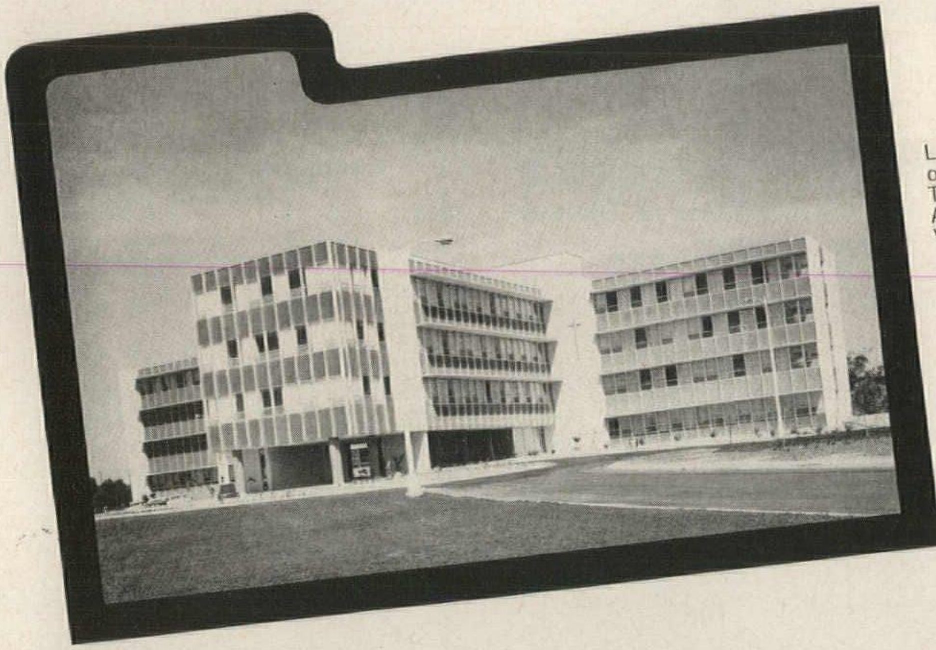

Little Company of Mary Hospital, Torrance, Calif. Architect: Verge & Clatworthy & Associates, Los Angeles, Calif.

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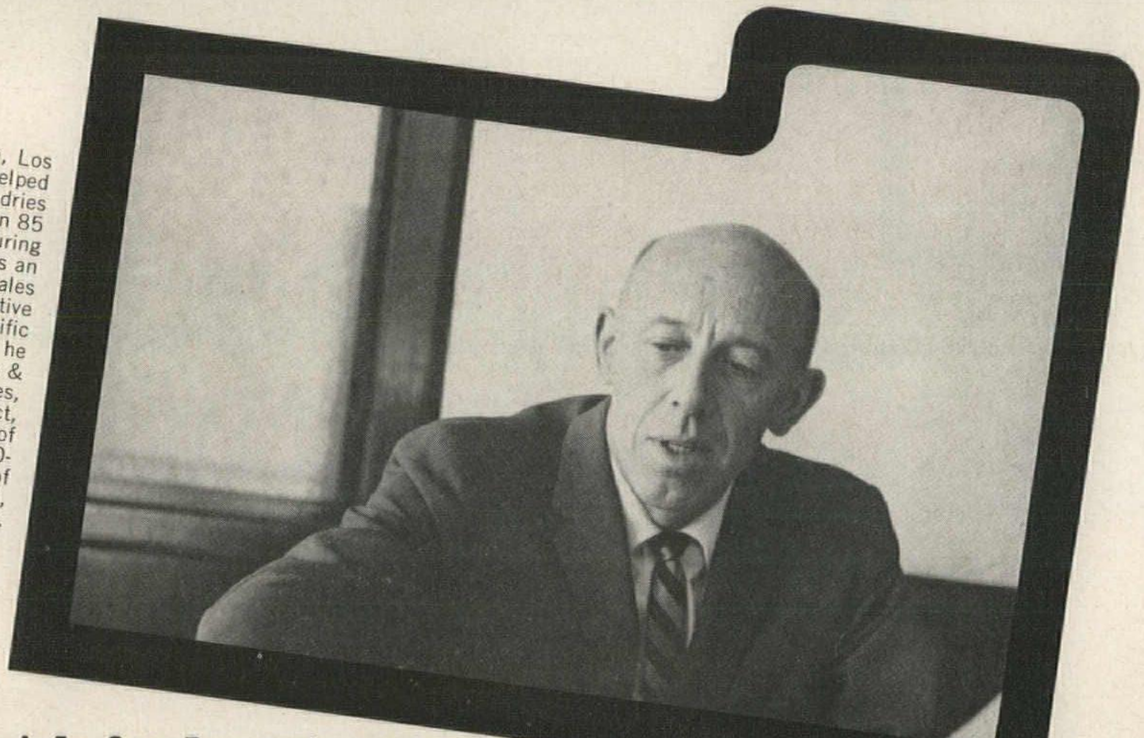
Ben J. Heath, Los Angeles, Calif., has helped architects plan laundries for more than 85 different projects during his 15 years as an Institutional Sales Representative for American's Pacific Division. Recently he assisted Verge & Clatworthy & Associates, Los Angeles architect, in the preparation of laundry plans for the 150-bed Little Company of Mary Hospital, Torrance, Calif.



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The Record Reports

New Cultural Ambassadors: Art in Embassies

Original works of art are being sent to United States Embassies abroad from more than 50 museums of this country under a new plan organized by the International Council of the Museum of Modern Art. This new "Art in Embassies" project was initiated to make art works available for our ambassadors' and foreign service officers' residences for the purpose of representing American creative achievements and of demonstrating this country's interest in the visual arts.

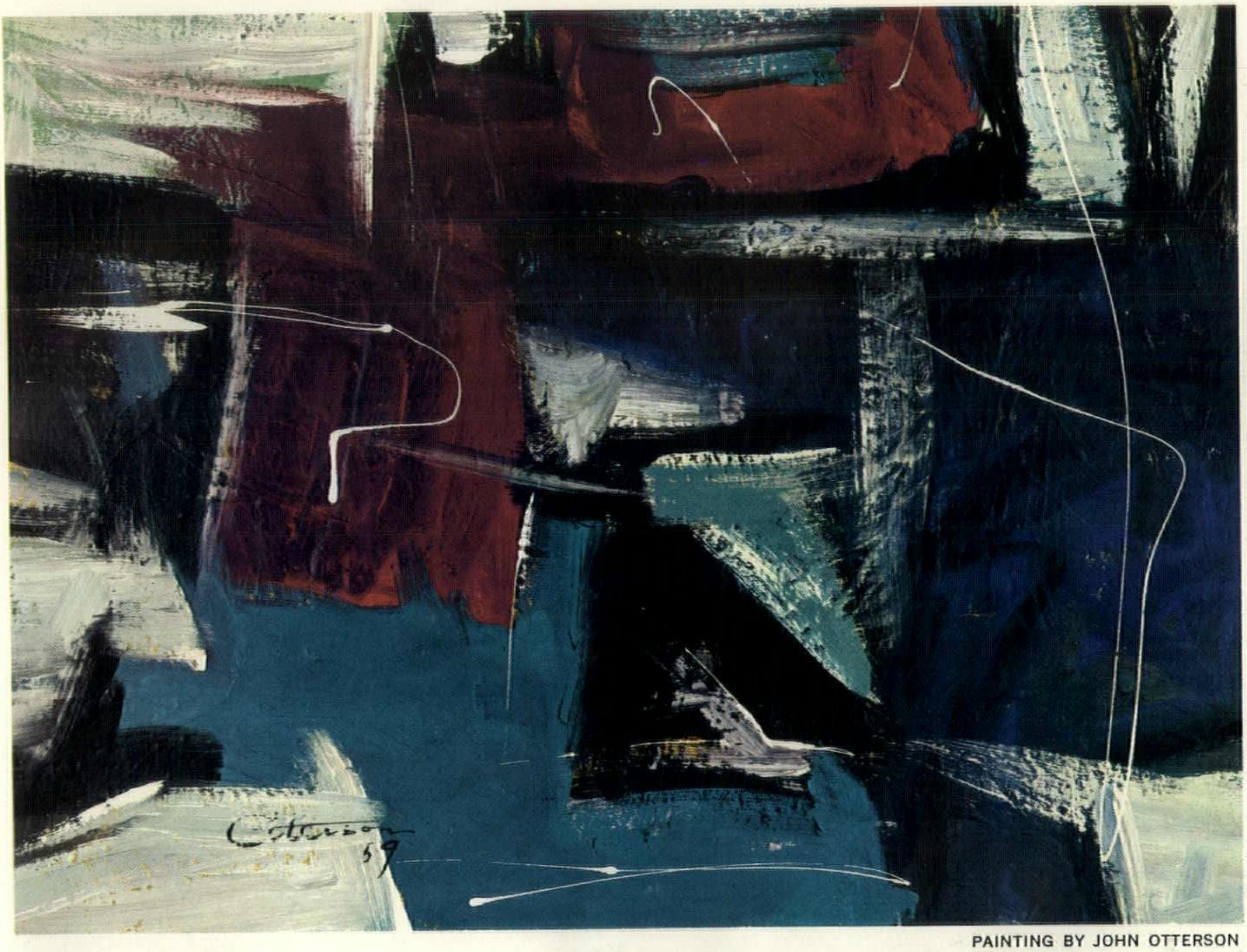
On a loan basis for at least one year, the first shipment of paintings arrived in May in Germany, where the paintings have been installed in the official residences in Bonn and Berlin of U. S. Ambassador and Mrs. Walter Dowling. U. S. Embassies in Brazil, Egypt, Iceland, Peru, Portugal and Spain have shown interest in obtaining paintings and sculpture under the plan.

The project is being carried out by the Department of Circulating Exhibitions of the Museum of Modern Art under the direction of Porter McCray. Among the museums and galleries which have agreed to lend works are: Carnegie Institute, Pittsburgh, Pa.; The Corcoran Gallery of Art, Washington, D. C.; William A. Farnsworth Library and Art Museum, Rockland, Maine; Philadelphia Museum of Art, Philadelphia, Pa.; The Whitney Museum of American Art, New York, N. Y.; The Columbus Gallery of Fine Arts, Columbus, Ohio; and The Downtown Gallery, New York, N. Y.

The original impetus for the cultural project was given by Mrs. L. Corrin Strong when she and her husband went to Norway on his appointment there in 1953. At her request a number of art works were lent by the Museum of Modern Art and other collectors. The success of this experiment led to the present plan.

The Museum of Modern Art's International Council is a privately supported educational group composed of approximately 110 men and women who are interested in furthering the international exchange of visual arts.

more news on page 126



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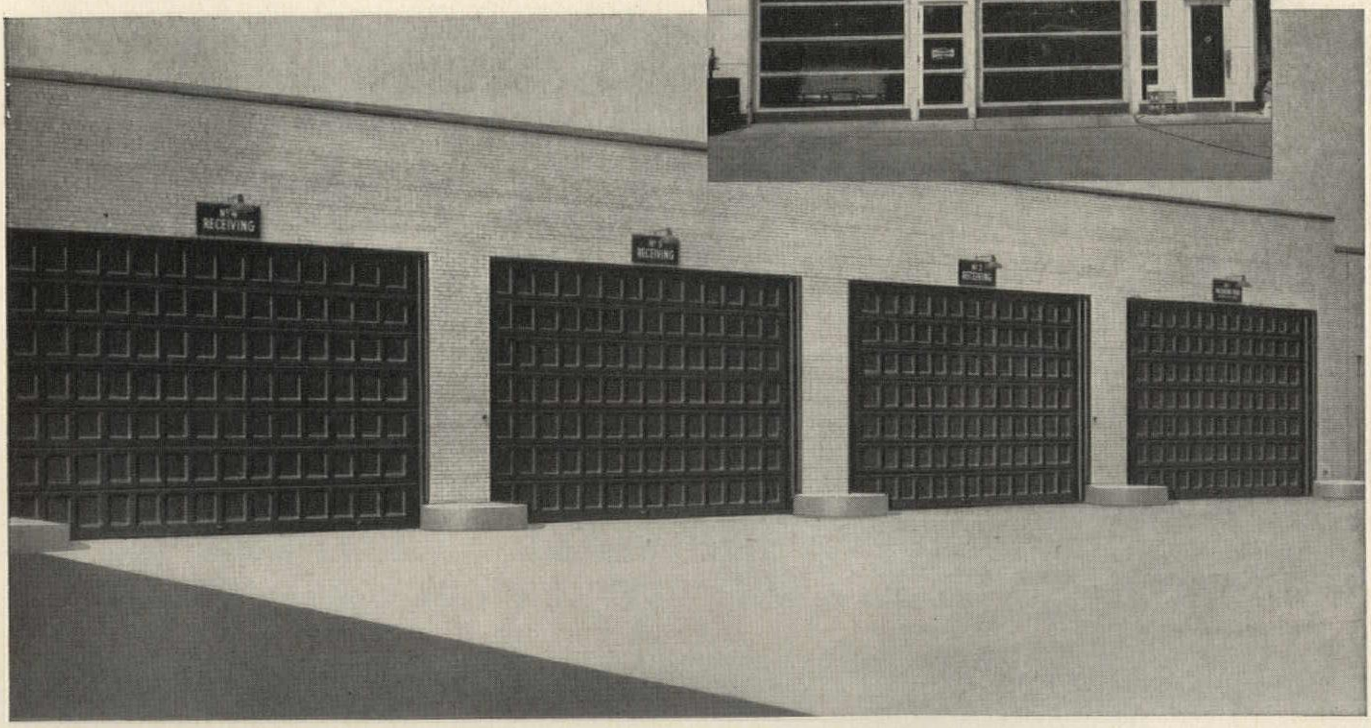

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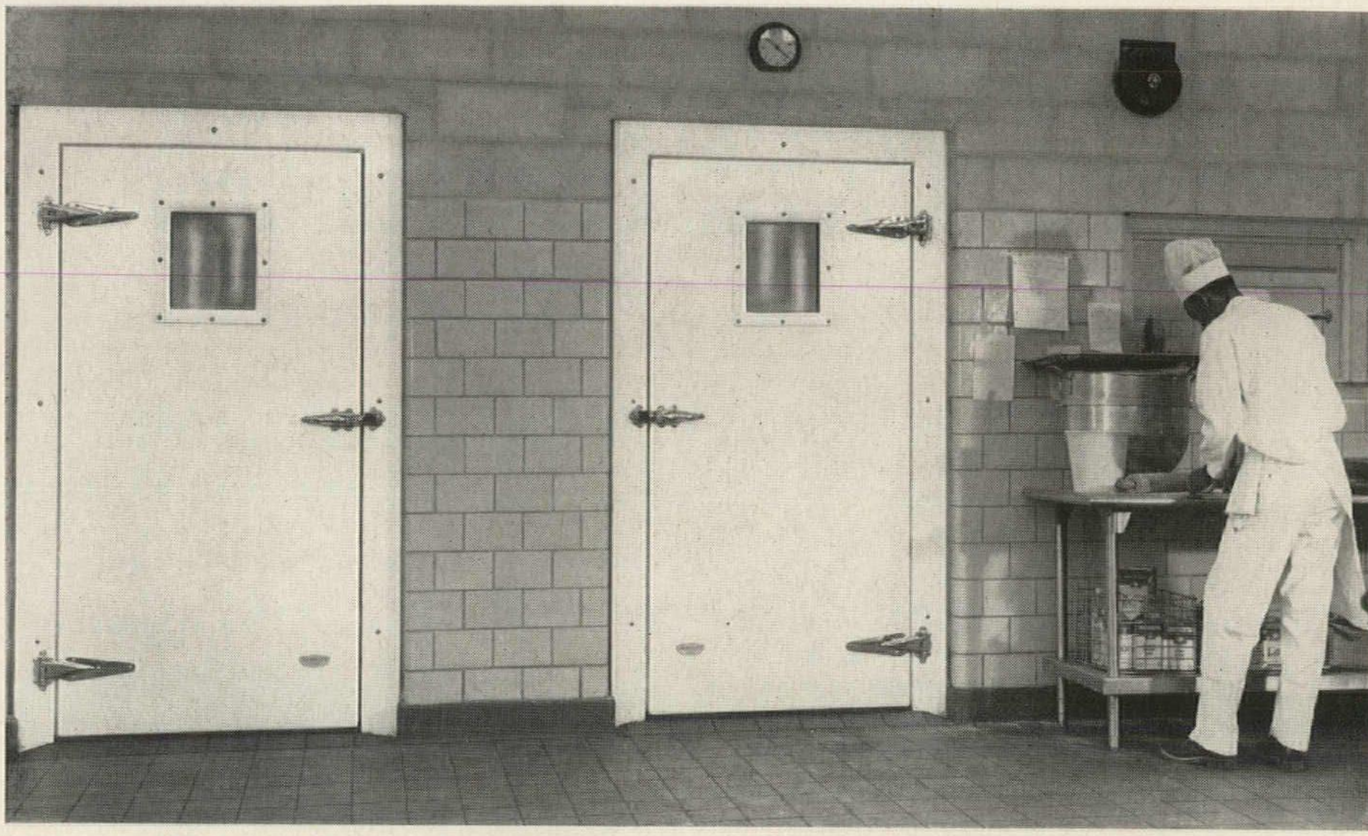

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Construction Cost Indexes

Presented by Clyde Shute, Director of Statistical Policy, Construction News Div., F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assoc., Inc.

Labor and Materials: U.S. average 1926-1929=100

	NEW YORK					ATLANTA				
	RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.		RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.	
PERIOD	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel
1930	127.0	126.7	124.1	128.0	123.6	82.1	80.9	84.5	86.1	83.6
1935	93.8	91.3	104.7	108.5	105.5	72.3	67.9	84.0	87.1	85.1
1939	123.5	122.4	130.7	133.4	130.1	86.3	83.1	95.1	97.4	94.7
1948	250.1	251.6	239.4	242.2	235.6	199.2	202.5	178.8	178.8	178.8
1949	243.7	240.8	242.8	246.6	240.0	189.3	189.9	180.6	180.8	177.5
1950	256.2	254.5	249.5	251.5	248.0	194.3	196.2	185.4	183.7	185.0
1951	273.2	271.3	263.7	274.9	271.8	212.8	214.6	204.2	202.8	205.0
1952	278.2	274.8	271.9	265.2	262.2	218.8	221.0	212.8	210.1	214.3
1953	281.3	277.2	281.0	286.0	282.0	223.0	224.6	221.3	221.8	223.0
1954	285.0	278.2	293.0	300.6	295.4	219.6	219.1	233.5	225.2	225.4
1955	293.1	286.0	300.0	308.3	302.4	225.3	225.1	229.0	231.5	231.8
1956	310.8	302.2	320.1	328.6	324.5	237.2	235.7	241.7	244.4	246.4
1957	318.5	308.3	333.1	345.2	339.8	241.2	239.0	248.7	252.1	254.7
1958	328.0	315.1	348.6	365.4	357.3	243.9	239.8	255.7	261.9	262.0
1959	342.7	329.0	367.7	386.8	374.1	252.2	247.7	266.1	272.7	273.1
Apr. 1960	348.8	335.1	374.0	391.1	379.7	258.1	252.8	273.1	279.9	279.6
May 1960	348.8	335.1	374.0	391.1	379.7	258.1	252.8	273.1	279.9	279.6
June 1960	353.8	338.9	380.4	399.7	382.8	258.1	252.3	272.1	279.6	277.6
	% increase over 1939					% increase over 1939				
June 1960	186.5	176.9	191.0	199.6	194.2	199.1	203.6	186.1	187.1	193.1

	ST. LOUIS					SAN FRANCISCO				
1930	108.9	108.3	112.4	115.3	111.3	90.8	86.8	100.6	104.9	100.4
1935	95.1	90.1	104.1	108.3	105.4	89.5	84.5	96.4	103.7	99.7
1939	110.2	107.0	118.7	119.8	119.0	105.6	99.3	117.4	121.9	116.5
1948	227.9	231.2	207.7	210.0	208.1	218.9	216.6	208.3	214.7	211.1
1949	221.4	220.7	212.8	215.7	213.6	213.0	207.1	214.0	219.8	216.1
1950	232.8	230.7	221.9	225.3	222.8	227.0	223.1	222.4	224.5	222.6
1951	252.0	248.3	238.5	240.9	239.0	245.2	240.4	239.6	243.1	243.1
1952	259.1	253.2	249.7	255.0	249.6	250.2	245.0	245.6	248.7	249.6
1953	263.4	256.4	259.0	267.0	259.2	255.2	257.2	256.6	261.0	259.7
1954	266.6	260.2	263.7	273.3	266.2	257.4	249.2	264.1	272.5	267.2
1955	273.3	266.5	272.2	281.3	276.5	268.0	259.0	275.0	284.4	279.6
1956	288.7	280.3	287.9	299.2	293.3	279.0	270.0	288.9	298.6	295.8
1957	292.0	283.4	295.2	307.1	302.9	286.3	274.4	302.9	315.2	310.7
1958	297.0	278.9	304.9	318.4	313.8	289.8	274.9	311.5	326.7	320.8
1959	305.4	296.4	315.0	329.8	323.9	299.2	284.4	322.7	338.1	330.1
Apr. 1960	310.5	300.2	320.3	335.1	330.1	304.9	289.4	331.2	346.6	338.7
May 1960	312.5	302.3	323.5	338.6	333.0	308.1	291.2	335.9	353.6	344.3
June 1960	311.8	301.4	322.8	337.9	330.1	309.1	293.4	337.8	354.0	345.1
	% increase over 1939					% increase over 1939				
June 1960	182.9	181.7	171.9	182.0	177.4	192.7	195.5	187.7	190.4	196.2

Cost comparisons, as percentage differences, for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110
index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926-29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.


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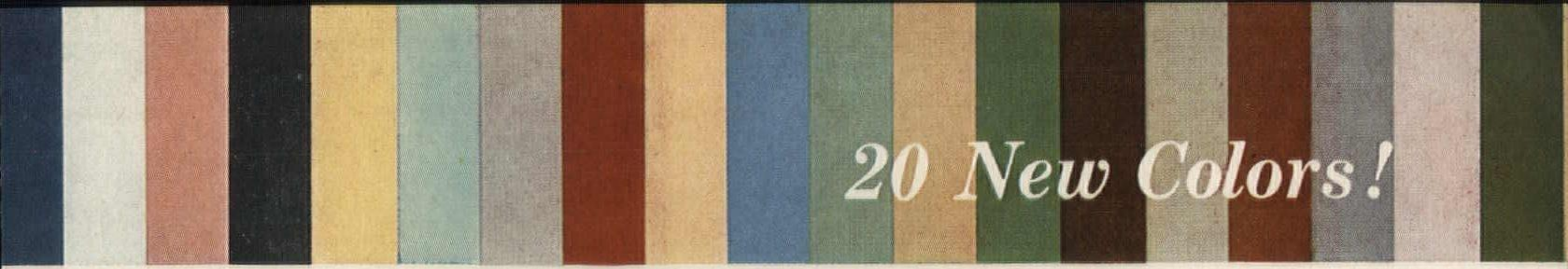

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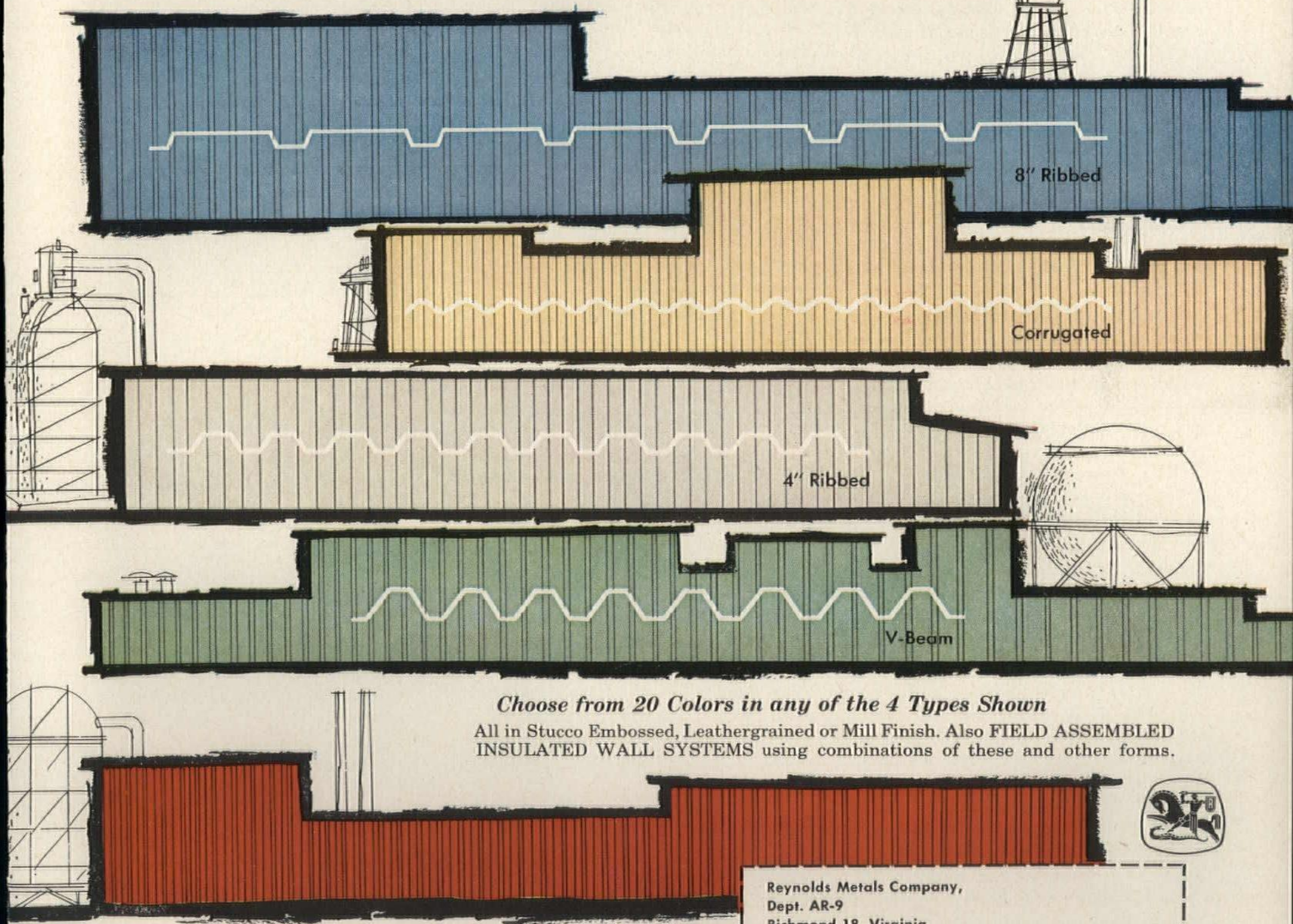

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Wayside Inns Up-to-Date

MOTELS, HOTELS, RESTAURANTS AND BARS. *F. W. Dodge Corporation, 119 W. 40th St., New York 18, 327 pp., illus. $9.75.*

This is the second edition of this book, considerably larger than the edition of seven years ago. Much of the material has been reprinted from ARCHITECTURAL RECORD studies on motel and hotel design, but some is altogether new, notably RECORD editor William Dudley Hunt's article on motels. This constitutes in effect a check list of the questions, if not always the answers, which must be faced in motel design: location and site selection, with reference both to existing services and to eventual drawing power; site planning, and parking facilities; programming, in terms of size and number of units, and planning, in terms of sleeping units and of ancillary facilities; construction, mechanical services and furnishings; and costs.

The book also contains articles on various aspects of planning hotels and restaurants, presentations of buildings in photographs and plans, and engineering articles on acoustics, air conditioning and ventilating.

Good Design in Dixie

THE SOUTH BUILDS: *New Architecture in the Old South. By Edward Waugh and Elizabeth Waugh. The University of North Carolina Press, Chapel Hill. 173 pp., illus. $12.50*

The major breakthrough in public recognition and acceptance of good contemporary architecture all over the South since World War II is well documented in this handsomely presented book. Such a book has certainly been needed to solidly demonstrate the quality and quantity of contemporary work in the region.

It is perhaps ironic that the timing of a collection of "Southern" architecture pretty well coincides with the disappearance of most vestiges of regionalism. The authors themselves find that "It is hard, if not impossible, to find any such influence except in the pseudo-neo-Georgian, neo-Charlestonian, neo-Orleansean eclectic buildings." These continue to be built in the South, as elsewhere.

The result is that the book, in the essays which introduce the six sections, takes a general tone which is not particularly Southern, except in the explicit historical allusions. It becomes a piece of the mainstream of architectural development—which is as it should be.

It is a little regrettable that the segment of the U. S. selected to cover in the book (below the Mason-Dixon Line, west to the Mississippi) somewhat arbitrarily lops off most of Louisiana, and all of Arkansas and Texas. They certainly belong in the picture, and such centers as Little Rock and Shreveport are producing some vigorous, top-drawer work.

Beginning with a brief and discursive history of Southern architecture, with a dip into comments on Wright and the Chicago School, and Mies and the Bauhaus, the book presents sections on houses, schools, community and institutional buildings, and commercial and industrial buildings. Each building is shown with the usual case study type presentation. The book concludes with a section called "Trends and Purposes" showing some of the more "radical" buildings, along with some pictures of the TVA.

The text seems mainly slanted to the profession, and to students, and does some gentle chiding and urging on to better things. The buildings shown include both the work of Southern architects and others who have built in the south. All in all, it does a good job of selection, reporting, and placing the South of today into perspective with the national scene. —*Herbert L. Smith Jr.*

The Baroque Interpreted

BAROQUE IN ITALY. *By James Lees-Milne. The Macmillan Co., 60 Fifth Ave., New York. 216 pp. illus. $7.*

It is rather unfortunate that this book should appear at the same time as Rudolph Wittkower's *Art and Architecture in Italy 1600-1750;* for, while it cannot claim the completeness and depth of scholarship of Professor Wittkower's study, it certainly deserves independent consideration.

Mr. Lees-Milne's approach is essentially subjective, both in his choice of material and in the manner in which he analyzes it. He considers the Baroque as an artistic concept rather than as an historical period, and finds it "an essentially religious manifestation, Catholic and primarily Roman."

There are, of course, dangers in a selective and speculative method. The reader may find himself wondering if, in fact, the plan of Borromini's St. Ivo does follow the contour of a bee with folded wings, or whether the Erectheum can be considered Baroque in any sense of the word whatever. He will nevertheless find this work an intelligent and readable introduction to the subject. The book is of normal size and weight, the illustrations are well-chosen and they and the notes are integrated with the text, which facts alone should commend this volume to the general reader.

The Modern Church in Evolution

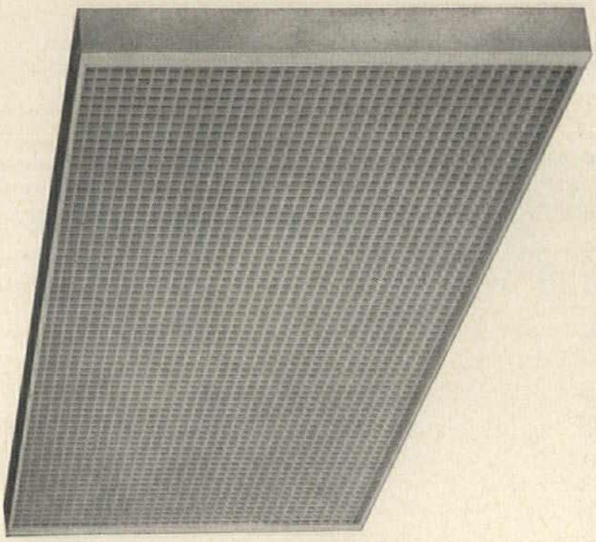
KIRCHENBAU. *By Reinhard Gieselmann and Werner Aebli. Verlag Girsberger, Kirchgasse 40, Zürich, Switzerland. 160 pp., illus. Approx. $7 (28.50 Swiss francs).*

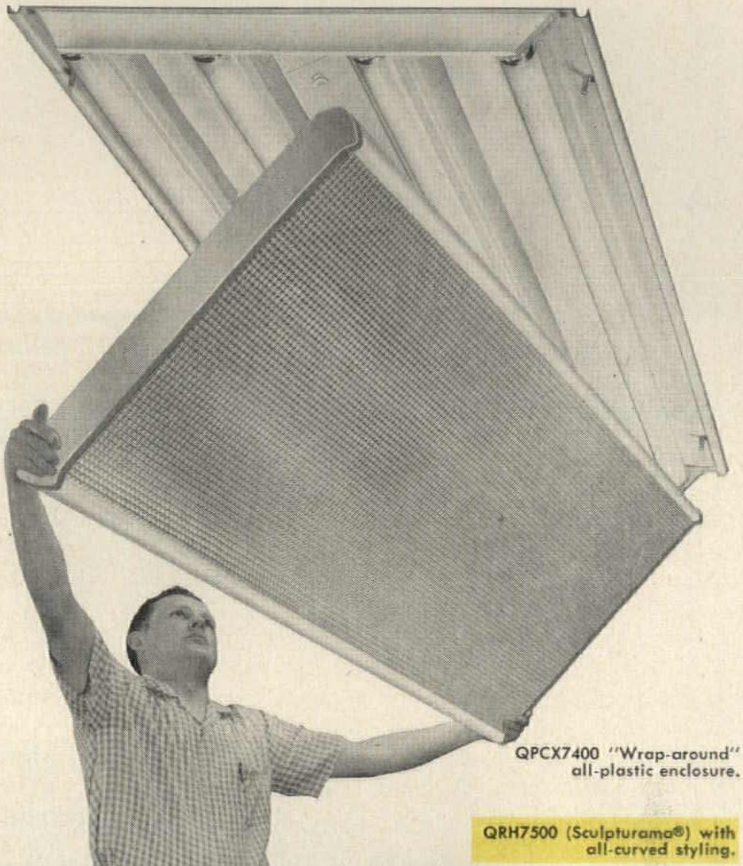
The reaction of the English-speaking reader of this small and exceptionally good-looking book is likely to be one of frustration. Although the English summary is interesting and suggestive, one of the things it suggests is that the non-reader of German is missing a great deal, for the summary clearly covers only the highlights of what must be a uniformly interesting and suggestive text. It is additionally frustrating, for the non-reader of German, to have to forego the authors' discussions of individual churches.

Frustrations aside, however, it is still possible, and useful, for any reader, with the aid of the English captions and admirably organized examples, to follow the line of the authors' thesis of modern church archi-

continued on page 95

QPLM6500 for thin-lined architectural appeal.





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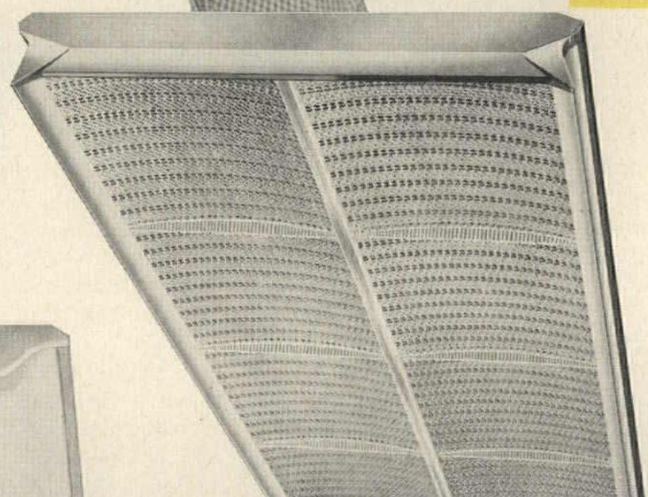

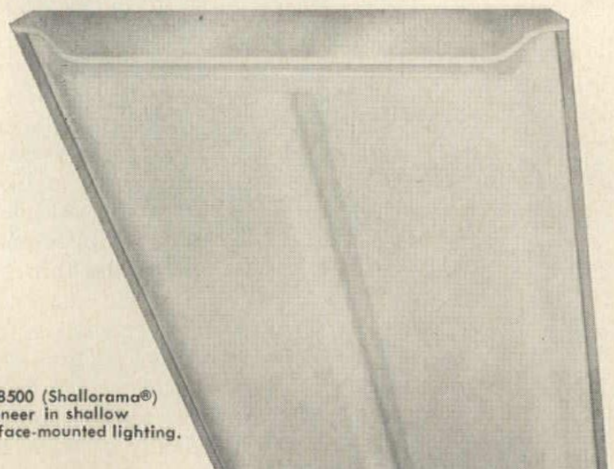

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The Template Group by Leopold: High styled furniture for every office

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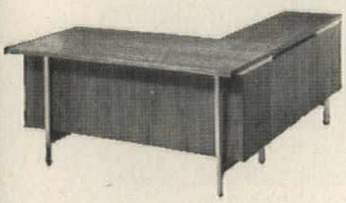
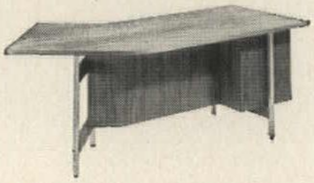
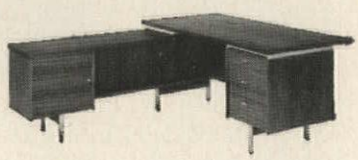


Executive L desk with 44" return, pedestals right or left side.



Conference desk with free form or rectangular overhanging top.

Bi-level L desk, 30" return, with or without paper rail.



Bi-level L desk, 44" return, with or without paper rail.

Designer: Charles Deaton

Roof under construction at Squaw Valley Winter Olympic Ice Arena. Associated Architects: Corlett and Spackman, A.I.A., and Kitchen and Hunt, A.I.A.; Structural Engineers: H. J. Brunnier, San Francisco, and John Sardis, San Francisco. General Contractor: Diversified Builders, Inc., Paramount, California.

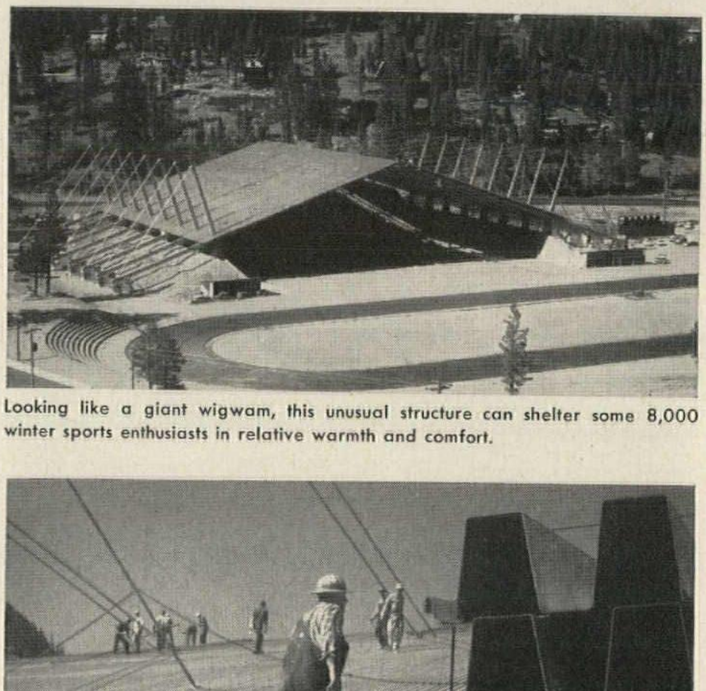
Unique use of steel roof decking

The thrills of the 1960 Winter Olympics have faded away, but the picturesque Arena will serve for many years to come. And one of the most unique features of this unique structure is the roof decking.

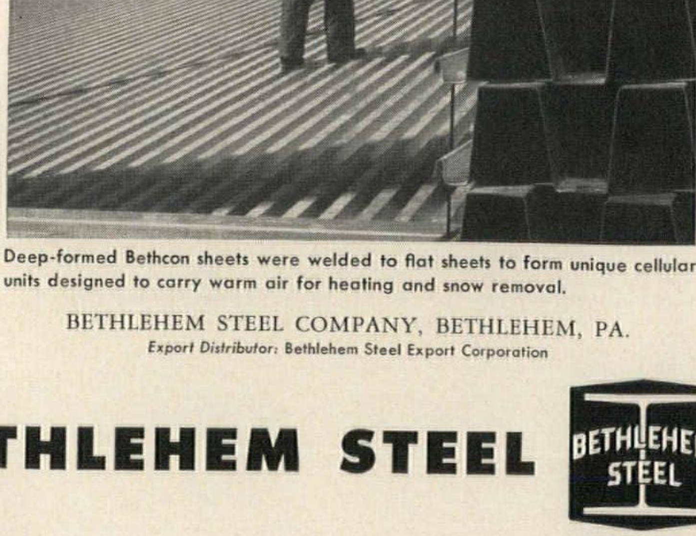
Designed to reduce snow loads, and at the same time provide a measure of warmth for spectators, the decking consists of cellular panels fabricated from strong, durable Bethcon galvanized steel sheets. Bethcon sheets were "corrugated" to a depth of 4½ in., then welded to flat sheets of Bethcon to create a row of warm air ducts. These cellular panels were then plug-welded to structural steel purlins.

Warm air, pumped from the skating-rink refrigeration plant, flows through a continuous duct along the eave line and thence into the roof-deck cells mentioned above. This heating method effectively melts the snow atop the roof, and at the same time raises the temperature within the building for the comfort of spectators.

It's another example of the way architects can capitalize on the strength, economy, and versatility of Bethcon galvanized sheets, and at the same time create pleasing architectural effects. Available in a wide variety of gages, in coils or sheets, Bethcon can take severe forming without damage to the zinc coating. Let our nearest sales office tell you more about Bethcon.



Looking like a giant wigwam, this unusual structure can shelter some 8,000 winter sports enthusiasts in relative warmth and comfort.



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Required Reading

continued from page 88

The Modern . . .

tecture: from the "first experiment" (neoclassicism), through the second experiment (eclecticism), the third experiment (emphasizing the "process of industrialization," and exemplified by Notre-Dame-du-Raincy), the fourth experiment (characterized by purity in form and in use of materials), to the fifth, and current, experiment (a break away from the rectangular plan and an aspiration toward "active forms of space," as in Aalto's church at Imatra, or Wright's at Madison). Changing esthetics is not the only factor considered; changing views of the Church's place in the community, and of its function, are also covered.

Buonarotti Biography

THE LIFE OF MICHELANGELO. *By Charles H. Morgan. Reynal & Co., 241 E. 49th St., New York 17. 254 pp. plus illus. $6.*

This biography is relatively brief and readable (though it must be a continuing source of sorrow to art historians that paintings are so much more fun to write about than to read about), and serves as a useful introduction to the art as well as the life of Michelangelo. To those whose readings in Renaissance art history have progressed very far, it will be of less service, and architects will find that the master's architecture gets short shrift.

Romanesque and Early Gothic

ROMANESQUE EUROPE. *By Harold Busch and Bernd Lohse. The Macmillan Co., 60 Fifth Ave., New York 11. 23 pp. plus 225 plates. $9.*

The latest in the publishers' series "Buildings of Europe," this book covers Romanesque architecture as far west as Ireland and far east as Dalmatia. The text is a straightforward and sufficiently detailed description of the chronological and regional developments of Romanesque building, including transitional and early Gothic, and makes no attempt to gild the lily—the lily in

continued on page 372

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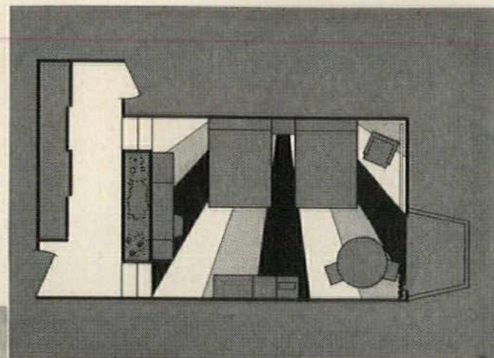

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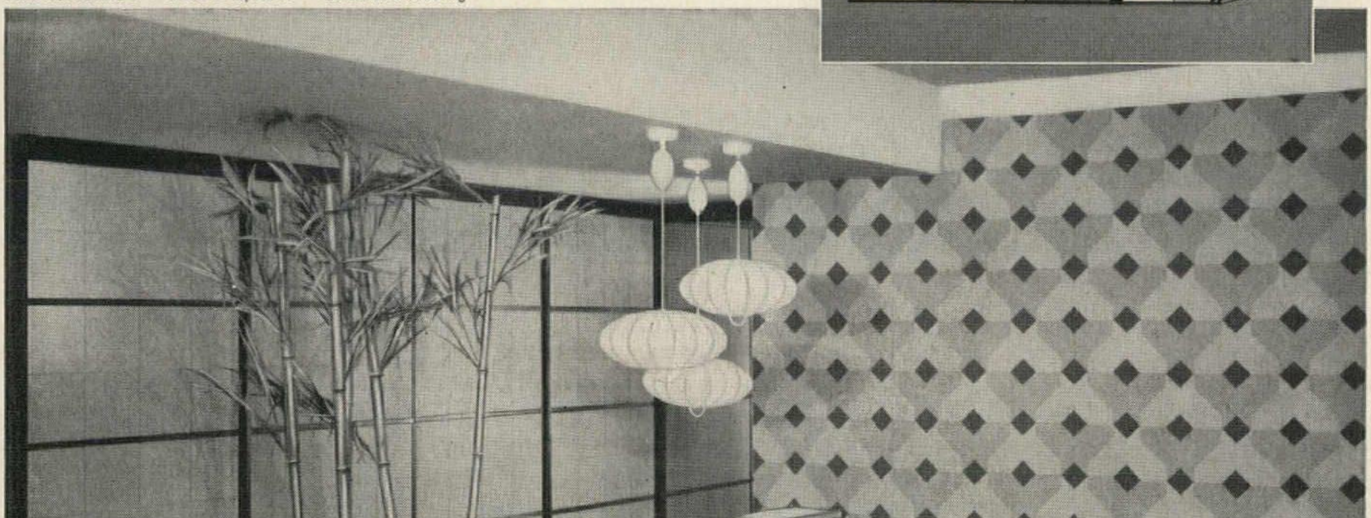

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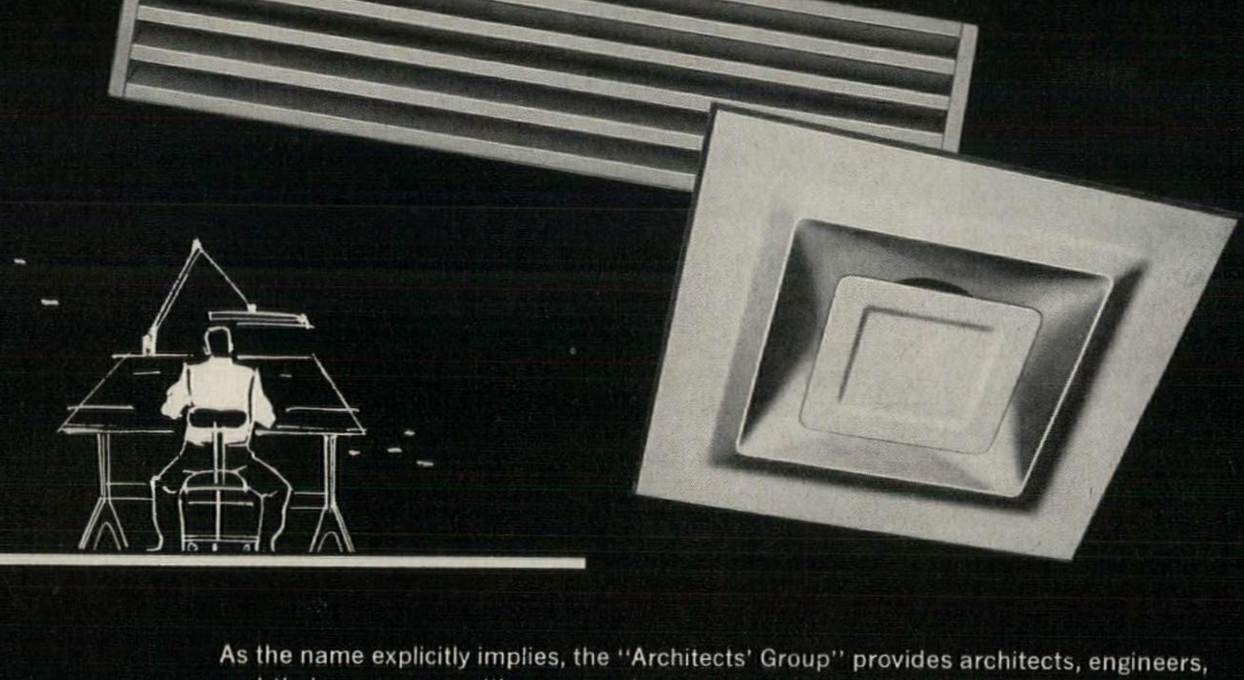

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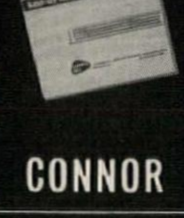

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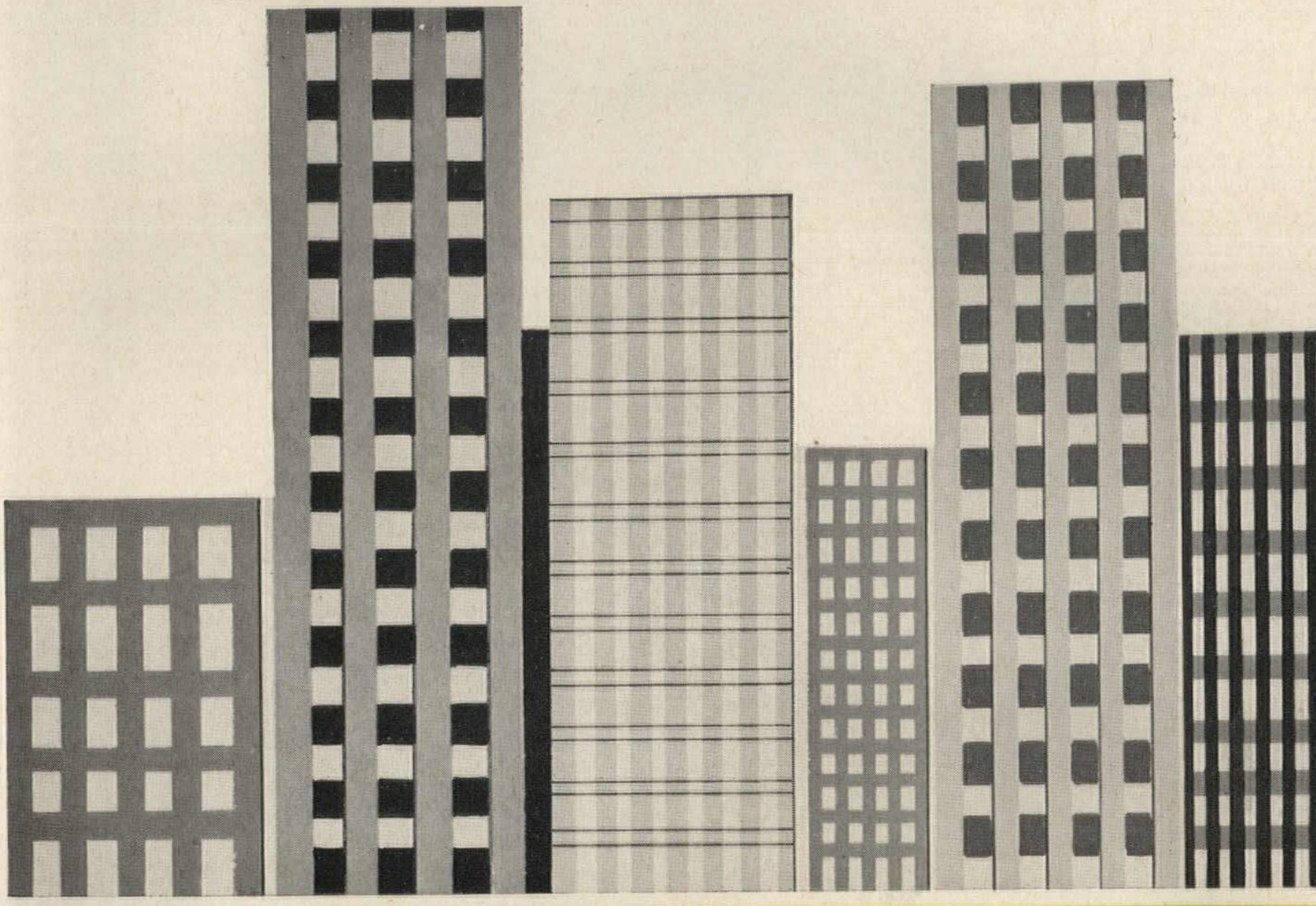

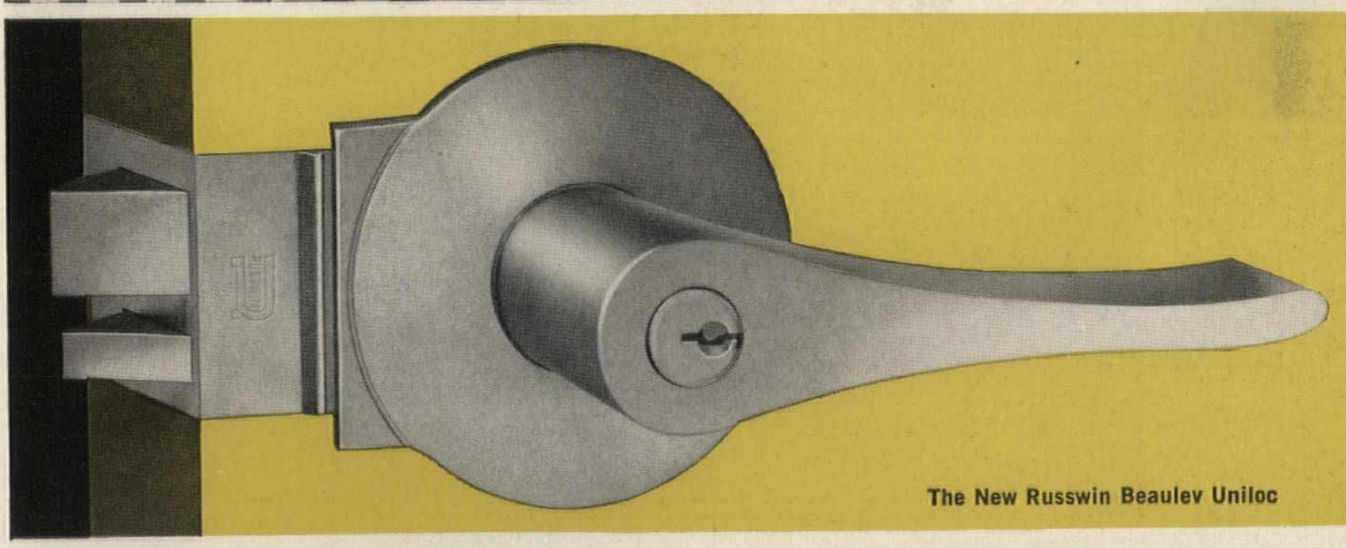

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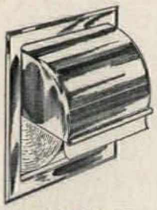

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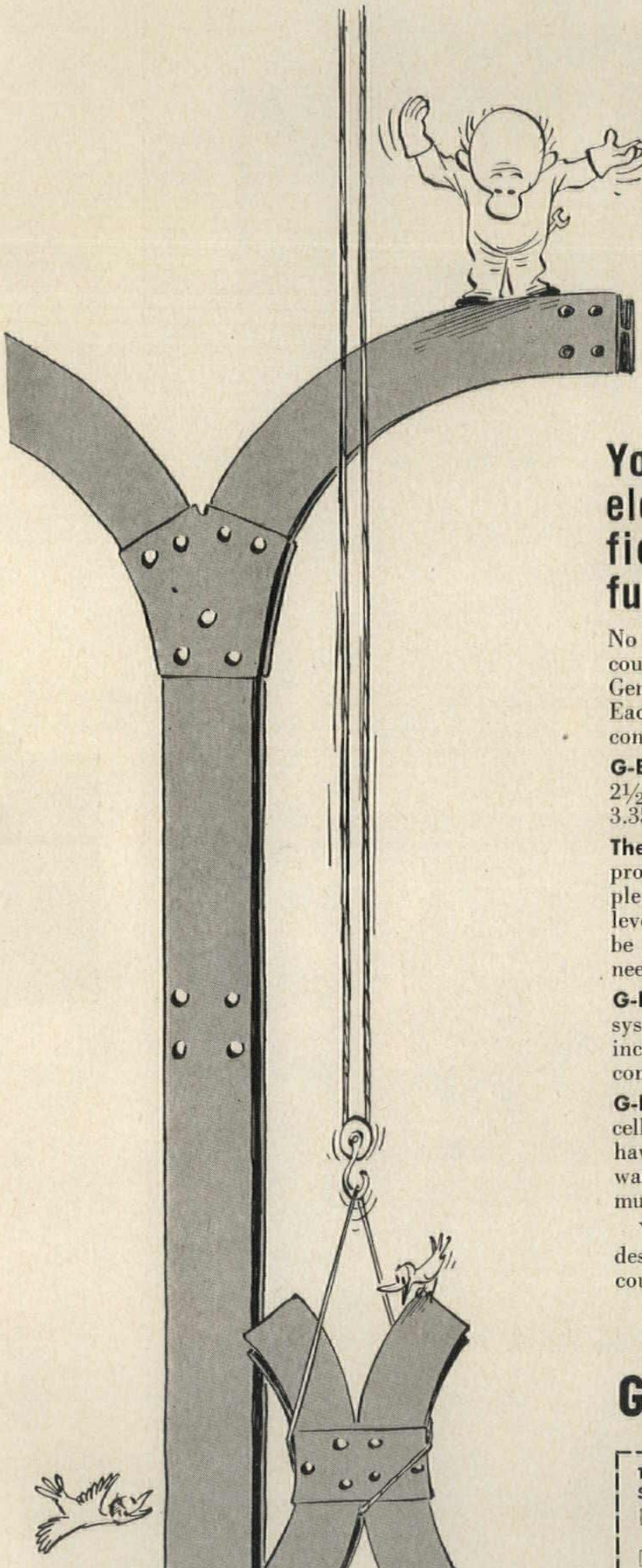

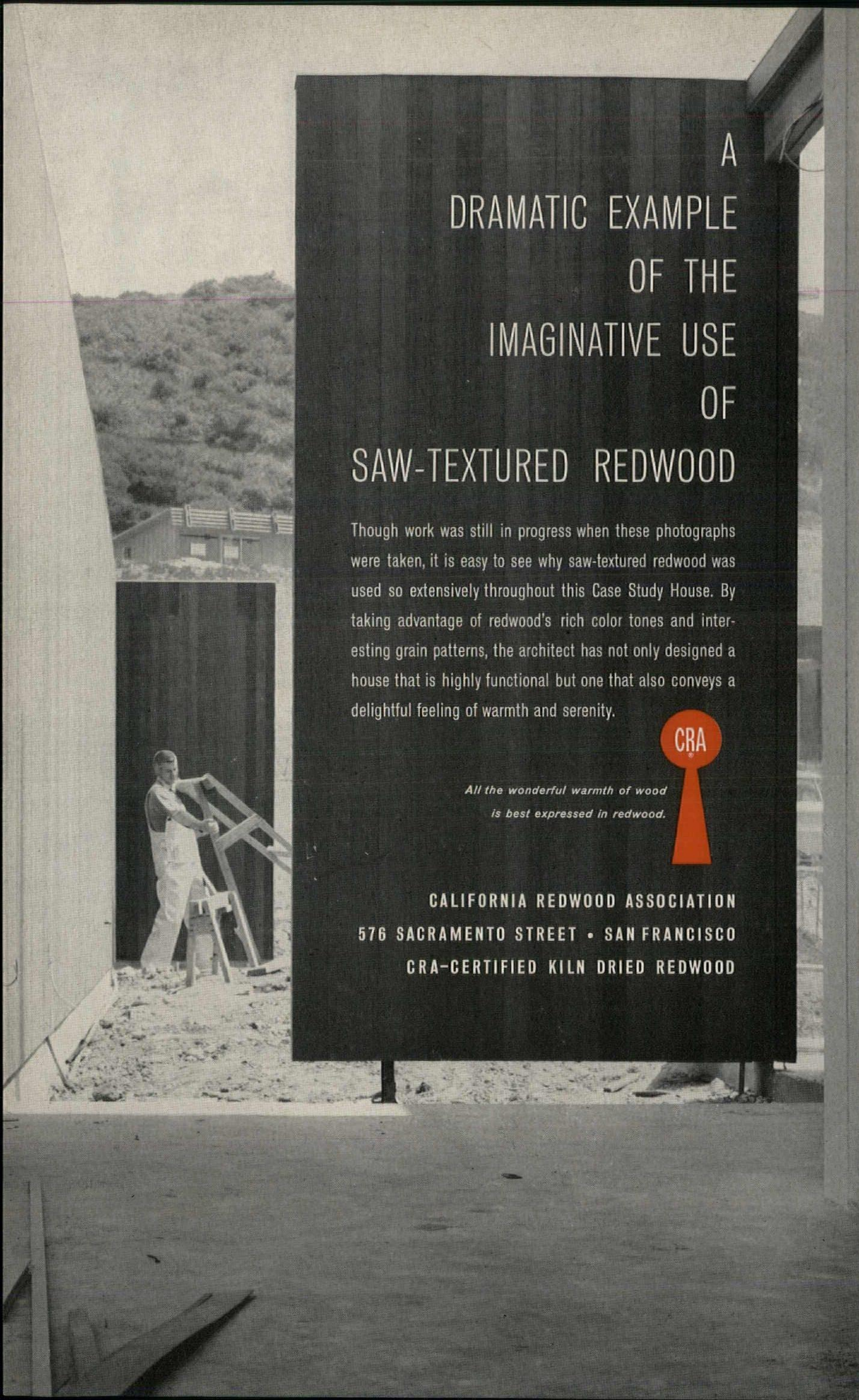
A
DRAMATIC EXAMPLE
OF THE
IMAGINATIVE USE
OF
SAW-TEXTURED REDWOOD
Though work was still in progress when these photographs were taken, it is easy to see why saw-textured redwood was used so extensively throughout this Case Study House. By taking advantage of redwood's rich color tones and interesting grain patterns, the architect has not only designed a house that is highly functional but one that also conveys a delightful feeling of warmth and serenity.
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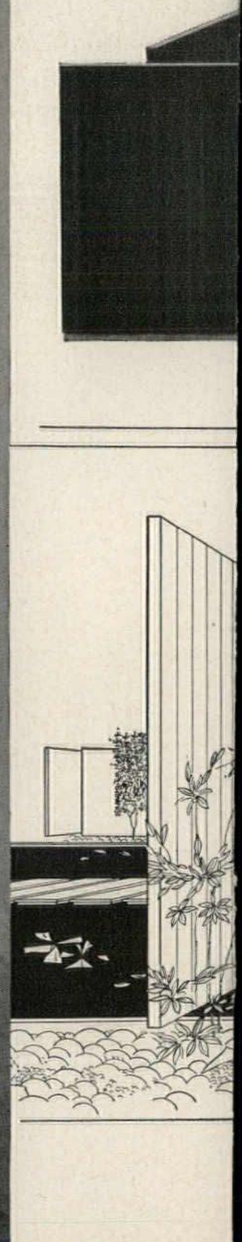
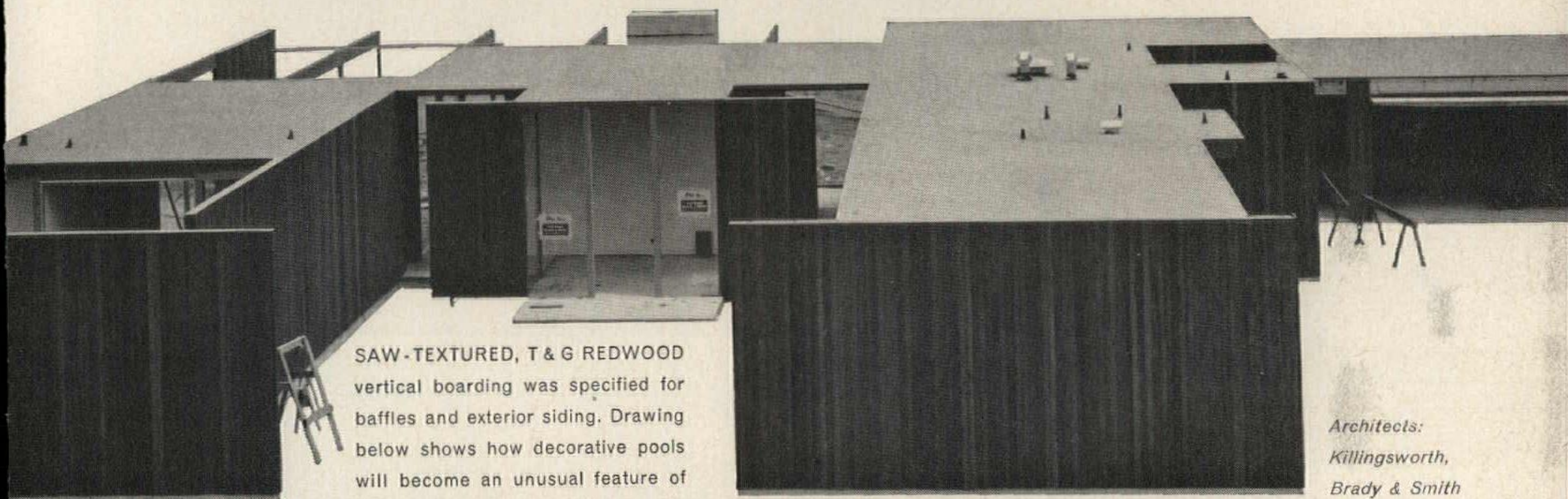


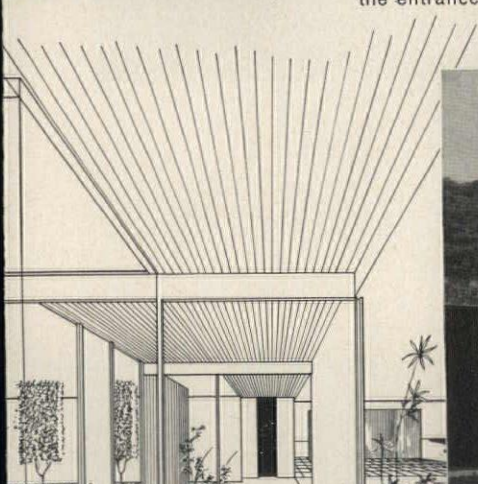
REDWOOD PANELING in the bathroom (note concrete form for sunken tub) extends into free-standing redwood wall in the adjacent sun-bathing patio.

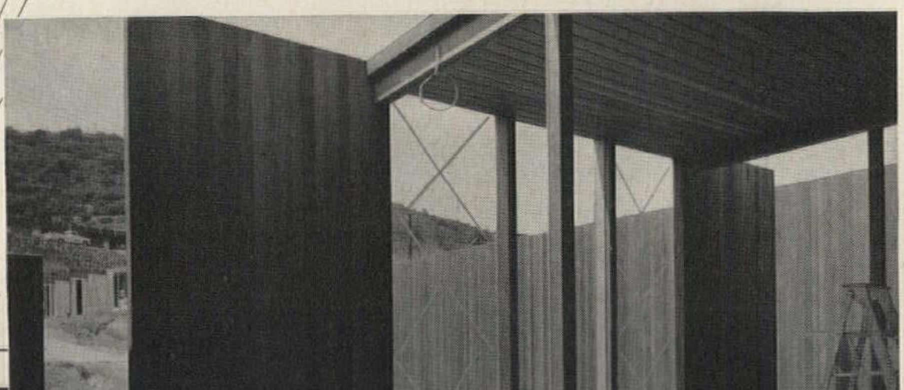
INTERIOR PANELING was left unfinished so that nothing would detract from the decorative grain patterns and subtle color tones of the saw-textured redwood. Exterior siding was treated with a clear water-repellent.



SAW-TEXTURED, T & G REDWOOD vertical boarding was specified for baffles and exterior siding. Drawing below shows how decorative pools will become an unusual feature of the entranceway.

Architects: Killingsworth, Brady & Smith





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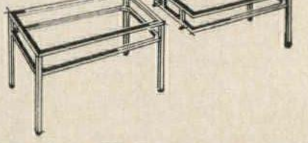

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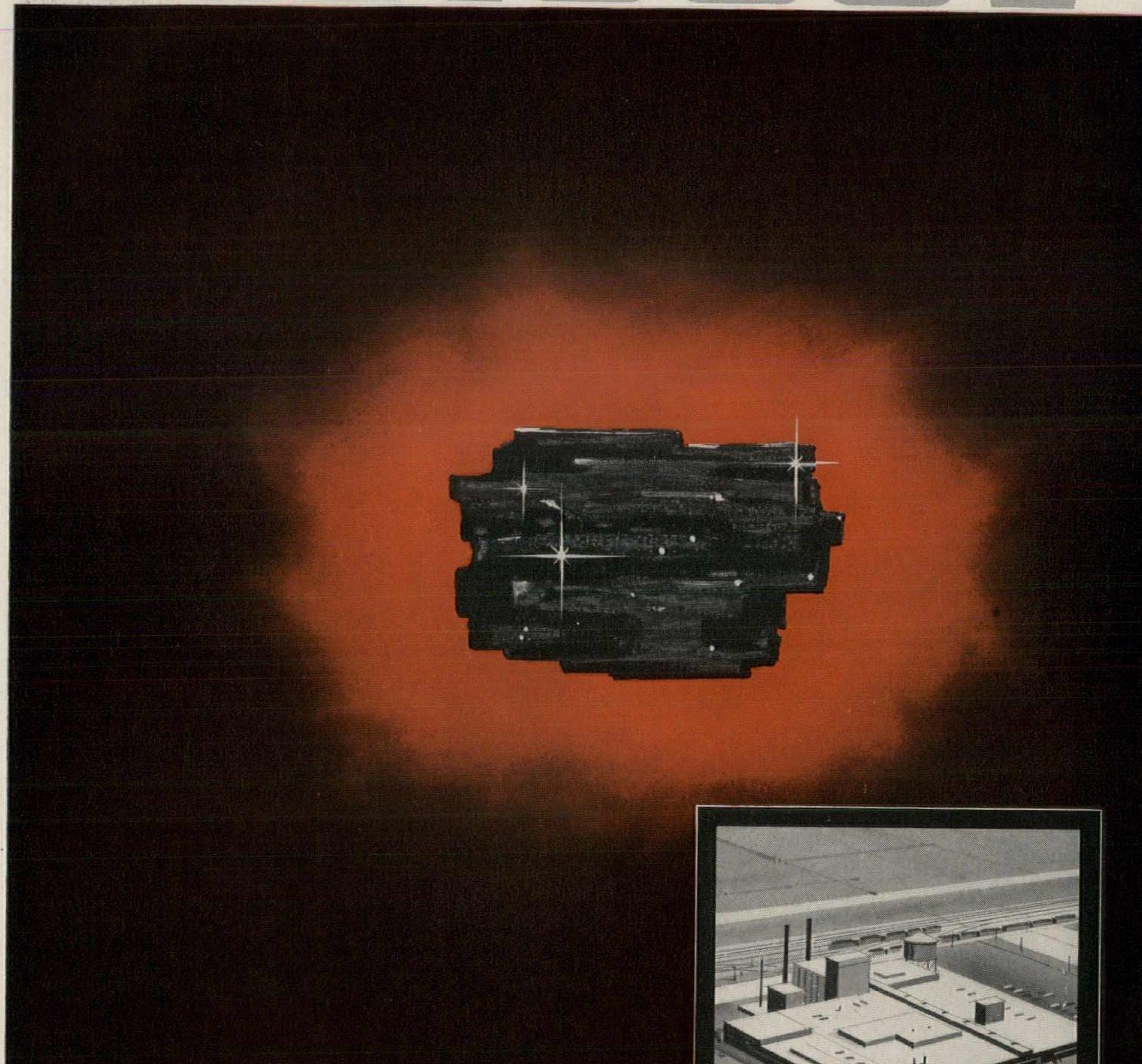

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AWARDS

Lewis Mumford Honored as Architectural Critic

The American Institute of Architects has made Lewis Mumford, architectural critic, an Honorary Associate Member of the New York Chapter of A.I.A. "for his articles on architectural criticism which have contributed importantly to a greater esthetic appreciation of architecture by the reading public."

Also honored was the late Bassett Jones, an engineer who developed lighting systems and elevators for skyscrapers. His was a special citation "in affectionate memory of his distinguished contribution to the technical development of architecture and his stimulating collaboration with its practitioners."

James Felt, chairman of the City Planning Commission, was given the New York Chapter of A.I.A. Award of Merit "in recognition of your integrity and dedication as a public servant with the most laudable ambition to create a new zoning ordinance for the City of New York."

1960 awards in the annual A.I.A. journalism competition were presented to representatives of *Time* Magazine, *The Nation*, and *Horizon* Magazine. First prize in the journalism competition went to Grady Clay, real estate editor of the Louisville Courier, for an article on architecture which ran in *Horizon*.

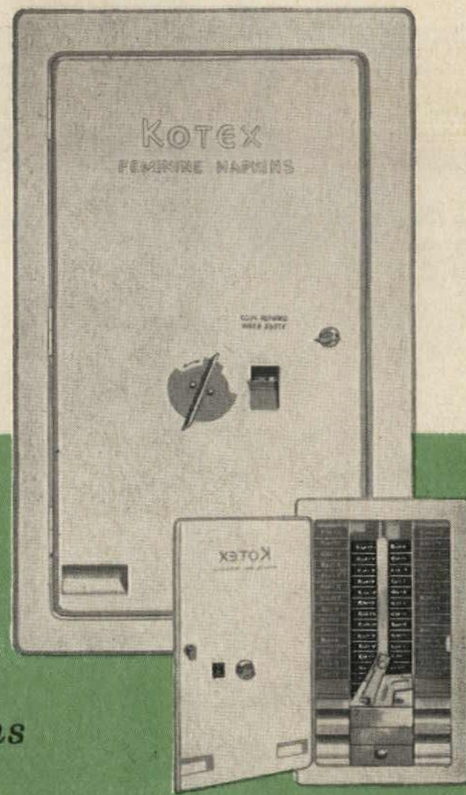
Stein Gets Howard Medal

Clarence Stein, F.A.I.A., New York, was awarded the Howard Medal for "distinguished contribution" to the advancement of city planning. The medal was awarded by the British Town and Country Planning Association.

Design Award to Eames

The 1960 Design Award from the Philadelphia Museum College of Art was presented to designer Charles Eames "for making a fine art of fur-

continued on page 130



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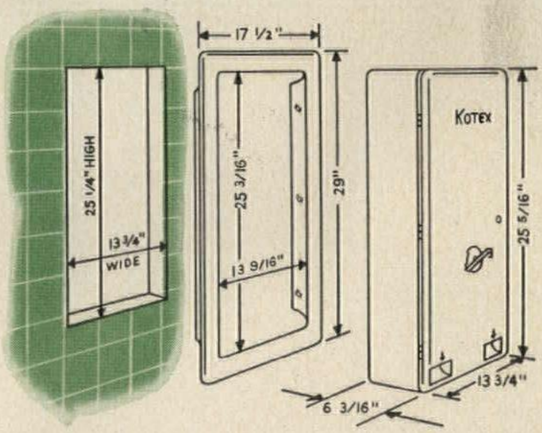
These streamlined, sturdy, pilfer-proof vendors add a much appreciated service to any public building. They are available with either a five-cent or ten-cent coin mechanism.

Available in durable white enamel, satin chrome, gleaming polished chrome and stainless steel. Matching frame for recessed installation. (Other vendors that can be surface mounted are also available.)



Cabinet size:
5" x 11" x 2$\frac{1}{16}$"

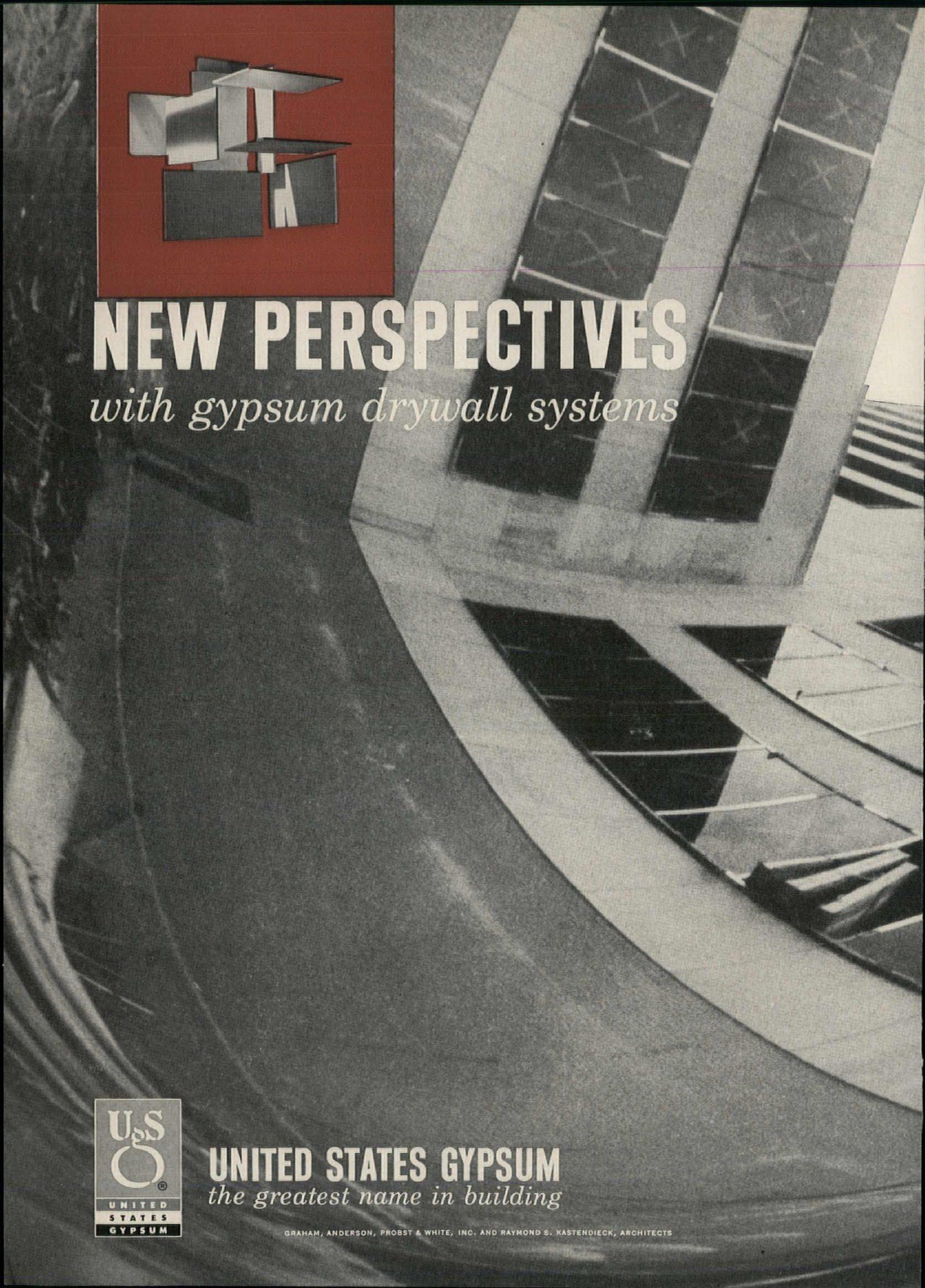
RECESSED DISPENSERS FOR KLEENEX TISSUES

Holds full box of Kleenex 200's. Dispenses one tissue at a time. Mirror-chrome finish. Holes in back and side make it easy to fasten to studding.

For further details on how these attractive new dispensers can fit into your plans, see Sweet's 1960 Architectural File Cat., Section 19a/Ki. or write to Kimberly-Clark Corp., Dept. AR-90, Neenah, Wisconsin.

KOTEX and KLEENEX are trademarks of KIMBERLY-CLARK CORPORATION

KIMBERLY-CLARK CORPORATION NEENAH, WISCONSIN


NEW PERSPECTIVES
with gypsum drywall systems
UNITED STATES GYPSUM
the greatest name in building
UNITED STATES GYPSUM
GRAHAM, ANDERSON, PROBST & WHITE, INC. AND RAYMOND S. KASTENDIECK, ARCHITECTS

The Record Reports

continued from page 126

niture and the film." Mr. Eames is known as the first designer "to exploit the possibilities of mass production methods for the manufacture of furniture" and as a writer, producer, and director of films which have received awards at the Edinburgh Film Festival and American Film Festival.

Harry C. Plummer Honored

Harry C. Plummer, Director of Engineering and Technology for the Structural Clay Products Institute and a leader in the formulation of improved building codes for masonry construction, was honored with the Award of Merit of the American Society of Testing Materials at the Society's annual meeting.

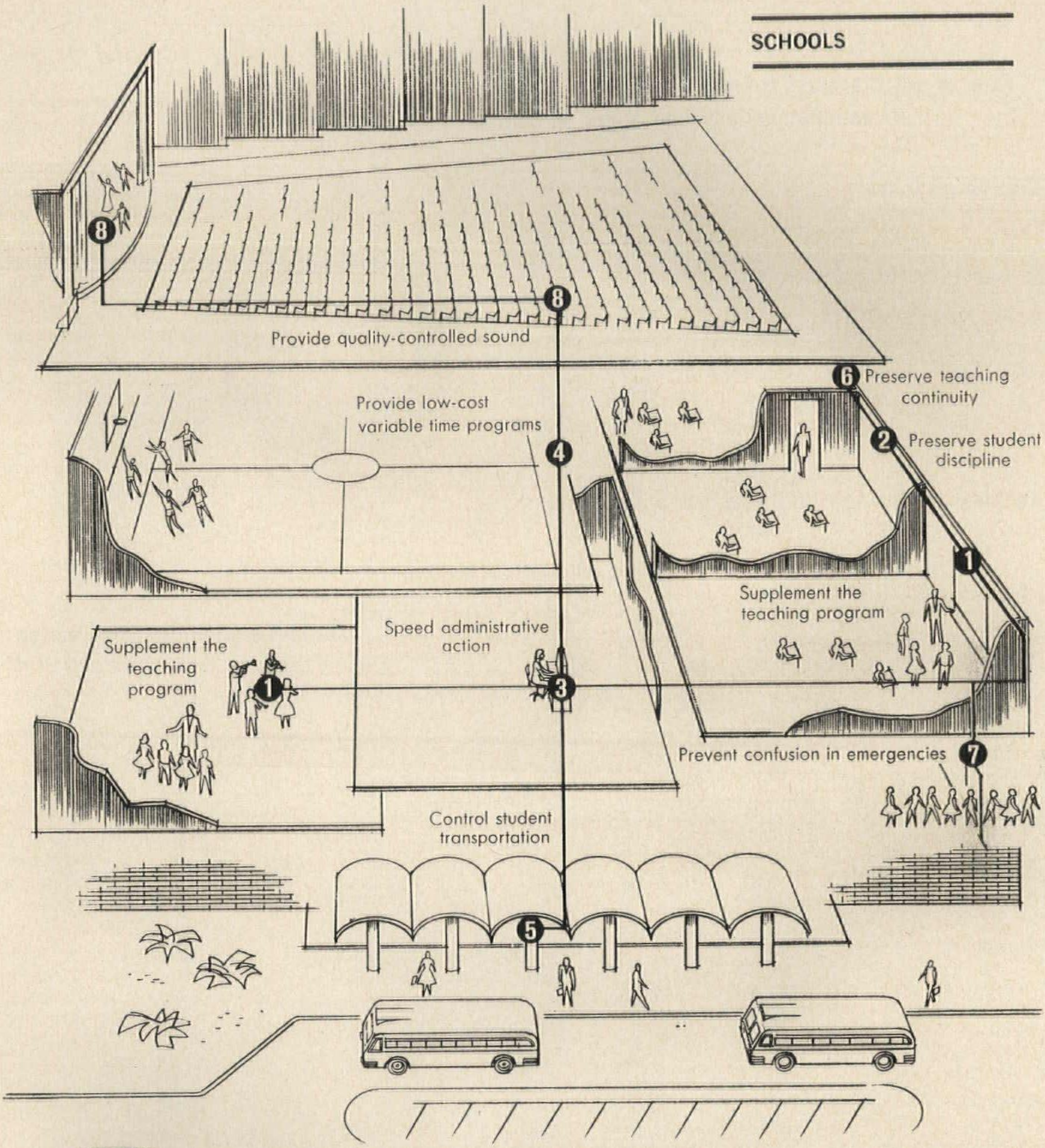
Hering Memorial Awards

The National Sculpture Society presented its first Henry Hering Memorial Medal Awards for outstanding collaboration between architect, sculptor and owner in the distinguished use of sculpture. The awards, given in three categories —Ecclesiastical, Monumental and Commercial—were made by Paul Manship, honorary president, at a meeting held at the Architectural League of New York.

Architect and sculptor recipients of the awards in the Ecclesiastical category were: for Loyola Seminary, House of Studies, Shrub Oak, New York (completed in 1955)— Voorhees, Walker Smith Smith & Haines, architects; and Donald De Lue, Gleb Derujinsky, Henry Kreis, Joseph Kiselewski, Oronzio Maldarelli, and Carl L. Schmitz, sculptors.

In the Monumental category, the following were honored for the Normandy American Memorial, St. Laurent-sur-Mer, France: Harbeson Hough Livingston & Larson, architects and Donald De Lue, sculptor.

In the Commercial Building category, awards for 100 Church Street, New York City (dedicated 1958) and 529 Fifth Avenue, New York City (opened 1959) were given to the firm of Emery Roth & Sons, architects; and Frank Eliscu, sculptor.



8 economical ways to use sound and communications . . .

to enrich school curricula and improve administration

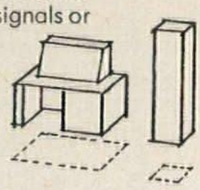
Few architectural means at your disposal can do more to broaden a school's educational program and improve its management than functional sound and communications. Several such services are described on the following pages. You will also find an unusual offer of technical assistance in pre-planning a system to fill any set of needs.

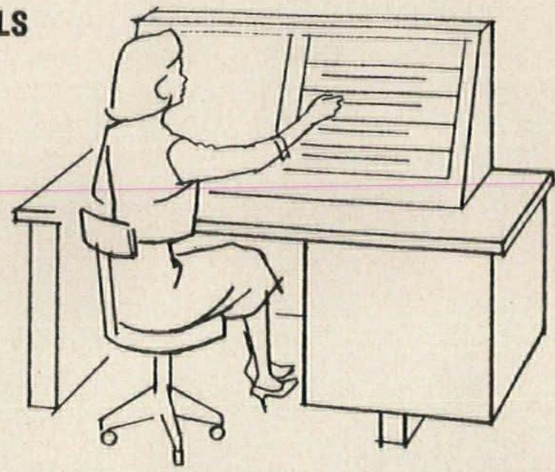
This kind of pre-planning provides you with expert guidance in layout and specification . . . helps you present to your client a variety of useful functions based on aptness of design rather than additional expense . . . assures easy maintenance, good appearance, and any degree of expandability . . . to fit any budget.

Executone

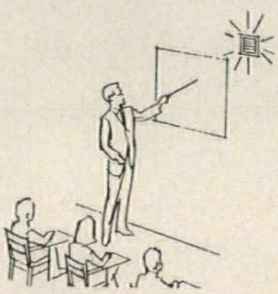
How to get the most out of communications and sound in SCHOOLS

The console shown here is the central control of an Executone sound-communication system for an average-sized K-8 or secondary school. Located in the General Office, it handles switching, programming, transmission and power amplification for all the services described below—and others that your client's special requirements may suggest. Its 5-channel capacity eliminates the need for more than a single conduit for signals or communication between any two points in the system. Identical functions are available in a vertical console, for use where office space is at a premium.





1. Supplement the teaching program with sound



Educators today attach great importance to audio-aids in the class room. They wish to exploit sources of special teaching materials...to place each class in closer relation to the school and the world around it . . . to develop each student's critical faculties. They value the availability of:

Radio broadcasts: speeches; music; coverage of special events; interviews; important dramatic presentations; sessions of Congress; etc.

Recordings: from an ever-increasing fund of educational material on tape and discs.

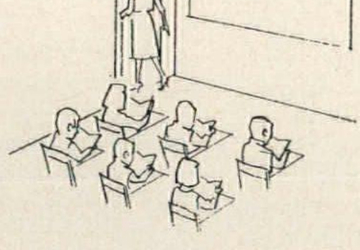
Transmissions from other parts of the school: student musical programs; sports events; etc.

Recording and play-back facilities: for classes in choral and instrumental music; language and speech courses; drama workshops; etc.

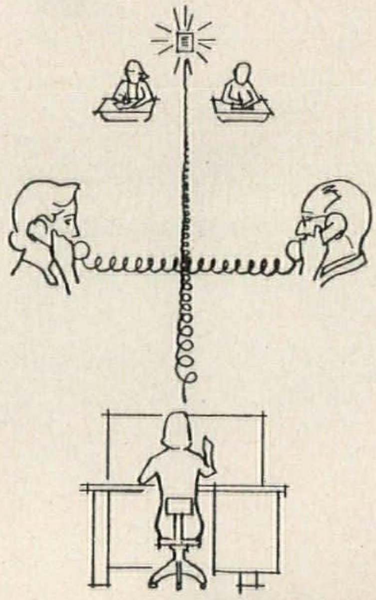
All these audio-aids can be supplied by a single Executone classroom reproducer . . . the same instrument that handles time signal, alarm and intercom functions. With a standard Executone system, any combination of rooms—chosen by selector-switches—can receive either of two simultaneous sound transmissions. Reproduction is of unusually high quality. Where recording and play-back are desired, rooms need only be supplied with microphone and tape-deck jacks. Amplification takes place at the main control console.

2. Preserve student discipline during unsupervised intervals

When teachers must leave their classes, the maintenance of discipline usually depends on the presence of a substitute. Faculty members may now be relieved of this non-productive extra duty. Unattended students can be monitored from the Office—through the Executone speaker—and notified by its open-line signal light that they are under remote supervision.

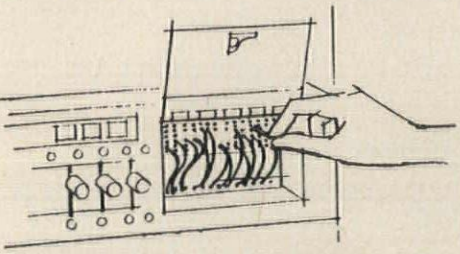


3. Speed administrative action: relieve over-burdened staff



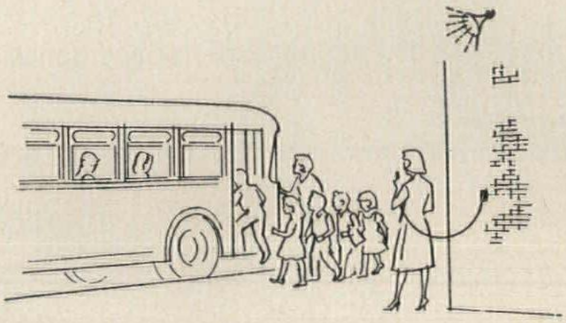
Freedom to teach—and to work more productively—is one of the best answers to the chronic shortage of teachers and administrative personnel. Time savings increase in direct proportion to the staff's communication capabilities. Today, these can economically include: A) 2-way electronic voice intercom . . . between the office and any classroom . . . with complete privacy safeguards. B) Private-line room-to-office and room-to-room intercom . . . with call origination from any point. The Executone system offers all the above, providing 2-way remote-reply intercom through each classroom speaker . . . optional private-line handset communication using an independent channel carried by the same wiring.

4. Save money & space in providing variable time programs



Classes with varying time requirements need no longer be subject to an inflexible set of signals. But conventional time-programming equipment—including independent crossconnect panels, relay racks, classroom buzzers and wiring systems—is bulky and expensive.

The Executone system includes a remarkably compact, easily accessible peg-board programmer—which allows each classroom to be placed on any one of six different time programs within seconds. This function is built directly into either standard console! The costly conventional system is eliminated.

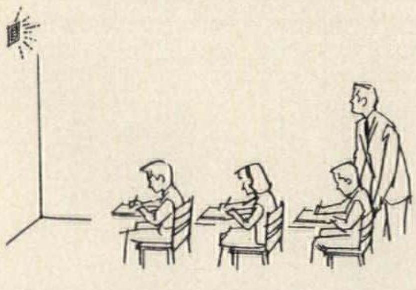


5. Control student transportation

Teachers find it especially difficult to keep order—and prevent delays—when restless students must await loadings of homeward-bound school buses. This condition is relieved when children are permitted to play freely—until summoned to the loading area in proper groups and directed to their buses.

This can be achieved through an inexpensive adjunct to the Executone system: a microphone jack at the loading area and speakers at loading and congregation areas. Both microphone and speaker wiring run in the same conduit. The amplifiers at the main console are utilized. Any available microphone can be plugged in at dismissal time.

6. Preserve the continuity of classroom activities

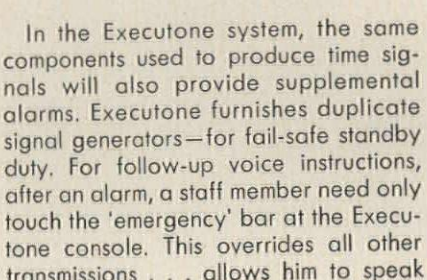


Communications in the modern school go a long way toward assuring uninterrupted class activities. But care must be taken that the facilities which make this possible are not themselves a disruptive influence. This is the case where calls make it necessary for teachers to drop what they are doing, to approach or handle equipment . . . or where a call interrupts a sound transmission.

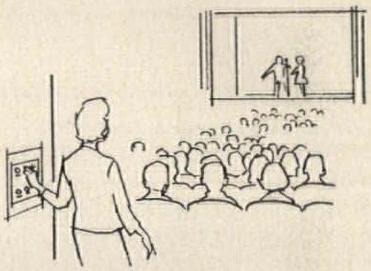
Executone removes both of these contingencies. Through-the-speaker calls, for brief conversations, can be answered by the teacher from any point in the room—without raising her voice. And use of the optional handset channel for longer conversation prevents interference with concurrent sound programs.

7. Prevent confusion and panic in emergencies

Leading administrators have long felt the need for greater control of student bodies in emergencies. They seek alarm signal facilities to augment standard fire alarm systems—for such special contingencies as air raids. To control student movements in critical situations, they wish to make it possible for any staff member to broadcast voice instructions—without having been trained in the use of sound equipment.



In the Executone system, the same components used to produce time signals will also provide supplemental alarms. Executone furnishes duplicate signal generators—for fail-safe standby duty. For follow-up voice instructions, after an alarm, a staff member need only touch the 'emergency' bar at the Executone console. This overrides all other transmissions . . . allows him to speak immediately to the entire student body.



8. Provide quality-controlled sound for audience activities

No audience facilities are so intensively used as those in the modern school. Auditoriums and gyms serve not only during the school day—but also for adult and community activities . . . for socials and special events. Sound reinforcement equipment must be designed to high standards. And controls must be efficient. Conventional microphone mixing units—because of A-C power, ventilation and space needs can seldom be situated where they do most good.

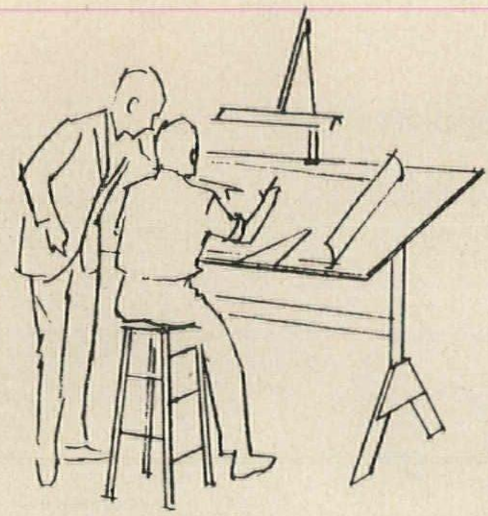
An Executone system provides not only sound reproduction of highest quality, but also new flexibility in the location of controls. Transistorized preamplifiers and mixers are compact enough for concealment anywhere . . . have no special installation requirements.

On the next page . . . an offer of unusual benefit to you and your client!

Executone

How to get the most out of communications and sound

Executone OFFERS YOU SIX STAGES OF SERVICE



STAGE ❶ DESIGN STANDARDS

Executone's service-tested design standards—mechanical, electronic and acoustical—are your assurance of trouble-free system performance. Design ingenuity—resulting in simplification, miniaturization and increased capability—keeps the cost of an Executone installation competitive . . . reduces maintenance costs.

STAGE ❷ CONSULTATION OR SURVEY

To help you plan an *optimum* system, your local Executone Systems Engineer will assist in a comprehensive study of your client's needs . . . recommend the equipment designed to meet them within his budget . . . suggest ways of implementing a system through modular purchases where funds are severely limited . . . provide you with full information on a professional level. You will find him thoroughly conversant with specialized practices in your client's field.

STAGE ❸ INSTALLATION AND SUPERVISION

Your Executone distributor will assume full responsibility for the final and satisfactory operation of the system—whether installed by a contractor or by a factory-trained Executone crew. An Executone Field Engineer will co-ordinate and supervise all phases of the installation, and check it out thoroughly on completion.

STAGE ❹ PERSONNEL INSTRUCTION

Executone representatives will train and—when necessary—re-train your client's personnel in the proper operation of the system. This planned program assures maximum benefits through full utilization and correct care of the equipment.

STAGE ❺ MAINTENANCE ON THE PREMISES

To assure uninterrupted performance from any Executone system, prompt and reliable maintenance service, and complete stocks of factory replacement parts are always available locally. Each distributor is staffed with skilled technicians trained on a continuous basis at Executone's Factory Technical School . . . to provide your client with expert service on his own premises . . . for the life of the building.

STAGE ❻ FULL YEAR FACTORY GUARANTEE

Every Executone system and component is guaranteed by the Executone factory for a full year.

THIS COUPON WILL BRING YOU UP-TO-THE-MINUTE INFORMATION OR ASSISTANCE...WITHOUT OBLIGATION

Executone, Inc., Dept.S-3
415 Lexington Avenue, New York 17, N. Y.

- ☐ I would like my local Executone Systems Engineer to call.
- ☐ I would like detailed literature on intercom and sound systems for the following building types:

☐ schools
☐ hospitals
☐ churches
☐ plants
☐ offices
☐ retail stores
☐ transportation terminals
☐ other

Name ______________________ Title ____________
Firm ______________________________________
Address ____________________________________
City ______________ Zone ________ State ________

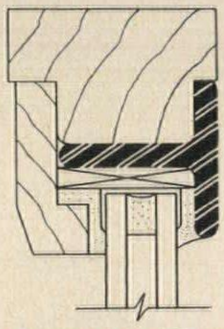
In Canada: 331 Bartlett Avenue, Toronto

Executone

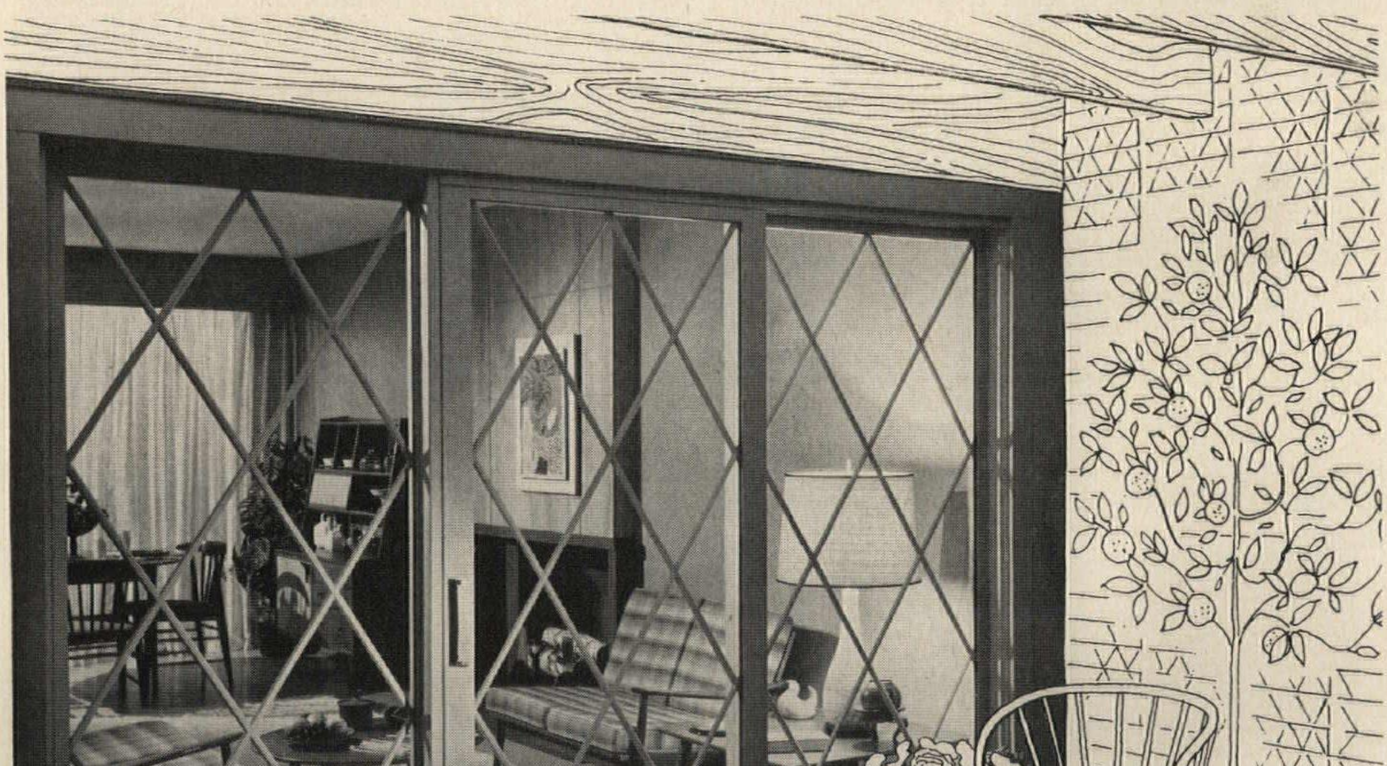
COMMUNICATION and SOUND SYSTEMS

now... Pella® wood sliding glass doors that can be painted or finished naturally

PELLA now offers sliding glass doors of WOOD that can be painted or finished to match *any* color scheme *inside and out*. The superior insulating qualities of WOOD plus a combination of stainless steel and wool pile weatherstripping make this sliding door weathertight — prevent condensation. And you can achieve warm, traditional effects with PELLA removable muntins in regular or diamond patterns. Types O, OX, XO, OXO and OXXO doors available in 33″ and 45″ glass widths x 76¾″ glass height. Call the PELLA distributor listed in your classified telephone directory for specifications and literature. ROLSCREEN COMPANY, PELLA, IOWA.



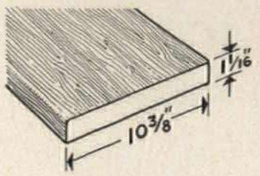
The welded steel T-section on all four sides of the 1¾″ Ponderosa Pine door panels gives the PELLA SLIDING GLASS DOOR its rugged strength and slim lines.



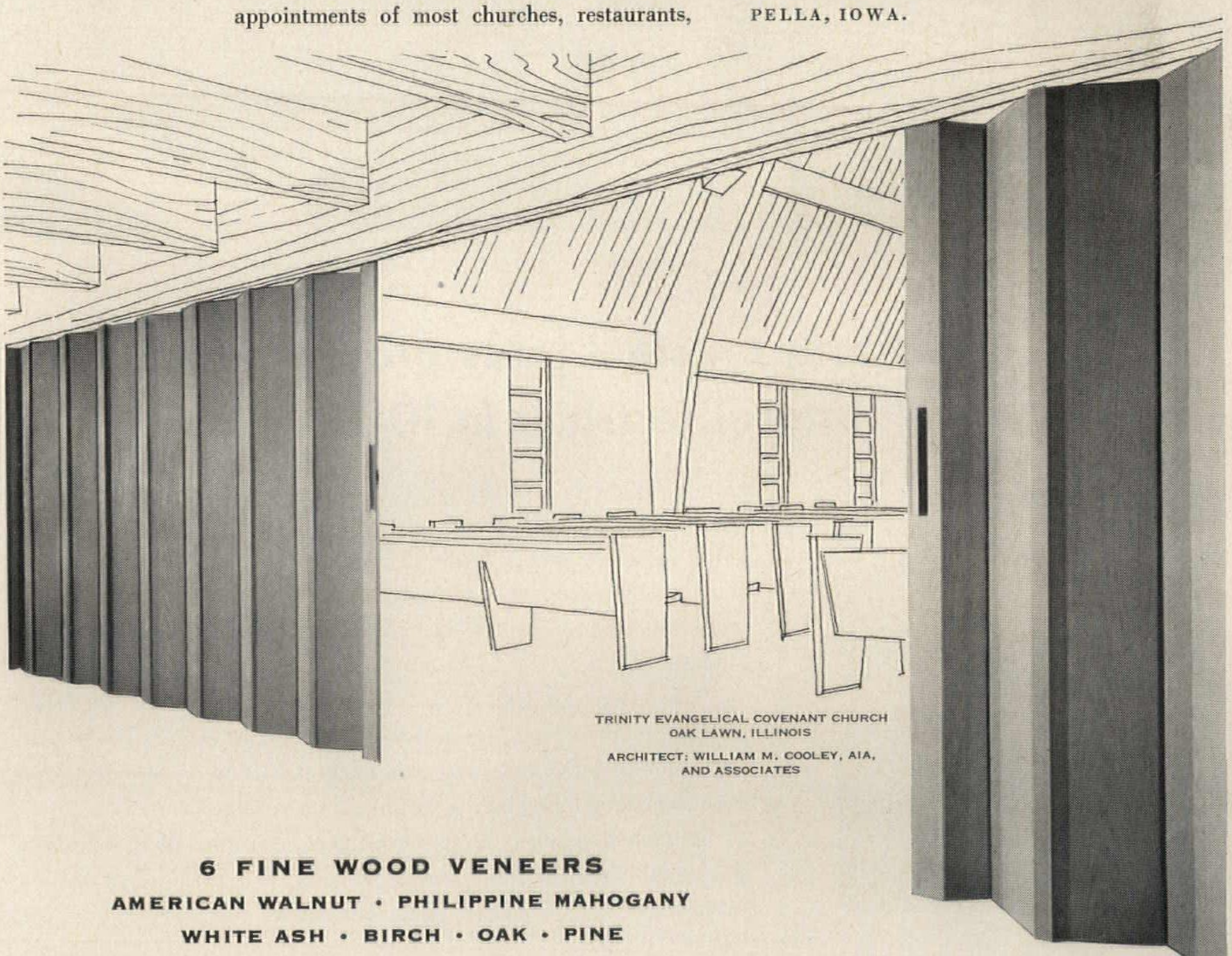
PELLA ALSO MAKES QUALITY WOOD WINDOWS, ROLSCREENS, WOOD FOLDING DOORS AND PARTITIONS

new Pella® folding partitions

...massive panels of WOOD to divide large areas of space



When plans call for a large space divider—one that's substantial yet decorative—try PELLA WOOD FOLDING PARTITIONS. This latest PELLA product offers new panel dimensions of 10-3/8" x 1-1/16". Available for any width opening and heights up to 20′ 1". Embodying good basic design and rich natural wood textures, these partitions integrate with interior appointments of most churches, restaurants, schools, clubs and offices. Specify factory-finished or for finishing on the job. Stable core construction assures non-warping panels. Patented "live-action" steel spring hinging system maintains panel alignment. Consult your classified telephone directory for nearest PELLA distributor in U.S. or Canada, or, send for literature. ROLSCREEN COMPANY, PELLA, IOWA.



TRINITY EVANGELICAL COVENANT CHURCH
OAK LAWN, ILLINOIS
ARCHITECT: WILLIAM M. COOLEY, AIA, AND ASSOCIATES

6 FINE WOOD VENEERS

AMERICAN WALNUT • PHILIPPINE MAHOGANY

WHITE ASH • BIRCH • OAK • PINE

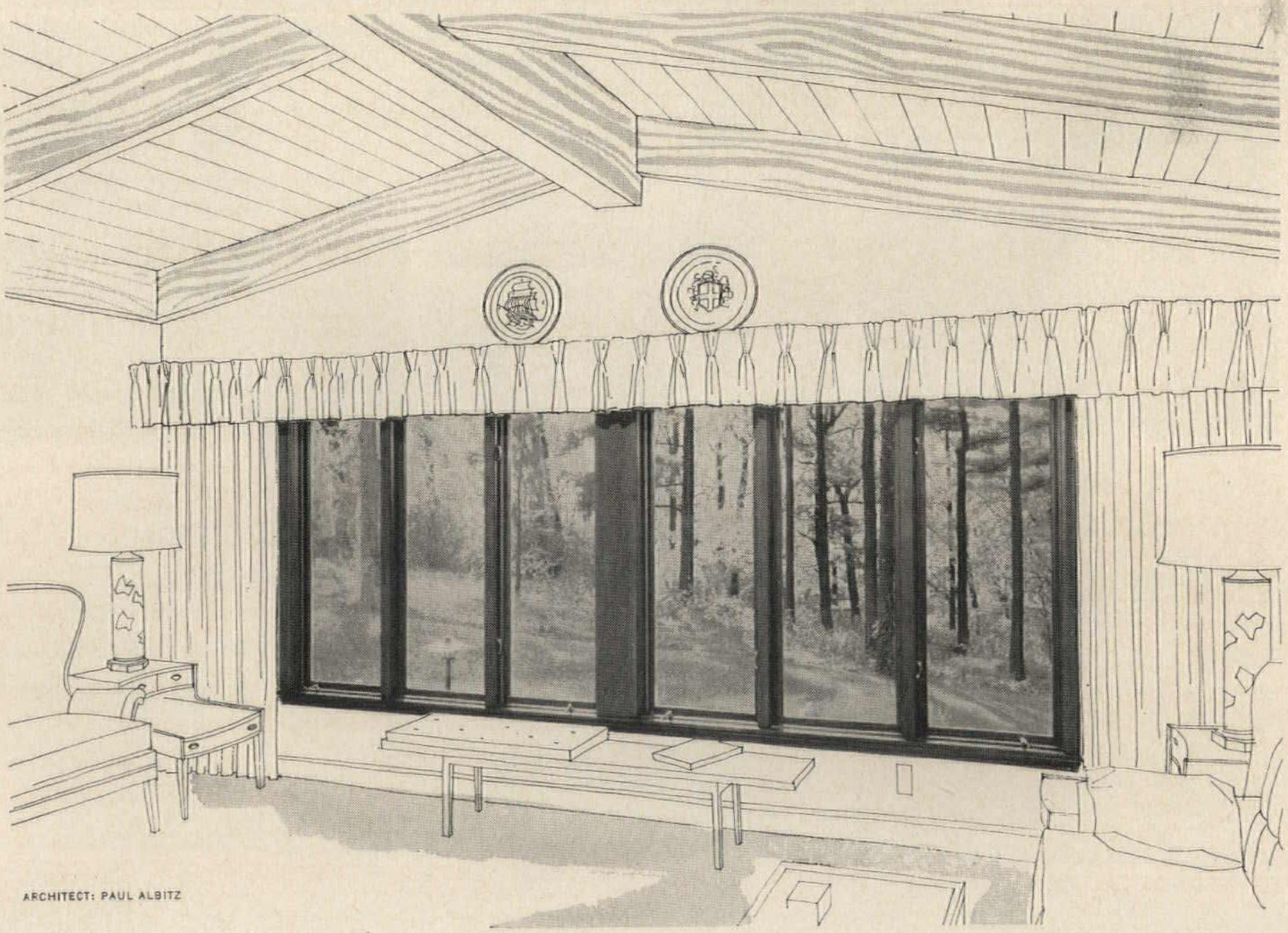
OTHER PELLA QUALITY PRODUCTS INCLUDE PELLA WOOD WINDOWS, ROLSCREENS, WOOD FOLDING DOORS AND WOOD SLIDING GLASS DOORS

Pella®

wood casement windows

...only ones to offer exclusive Rolscreen feature

Clients often have the mistaken idea that windows are pretty much alike. That is, until you tell them about PELLA WOOD CASEMENTS. For, only PELLA offers an inside screen that *rolls up and down!* Besides that, inconspicuous storm sash remain in place the year 'round. After wrestling with conventional screens and storm sash, clients regard these two PELLA features as sheer luxury. Yet, chances are PELLA WOOD CASEMENTS run no more than the windows and equipment you might be using. Countless arrangements are possible with 18 standard ventilating units in up to 68 in. glass height by 24 in. glass width. Full specifications in Sweet's. Consult classified telephone directory for nearest U. S. or Canadian PELLA distributor. ROLSCREEN COMPANY, PELLA, IOWA.



ARCHITECT: PAUL ALBITZ

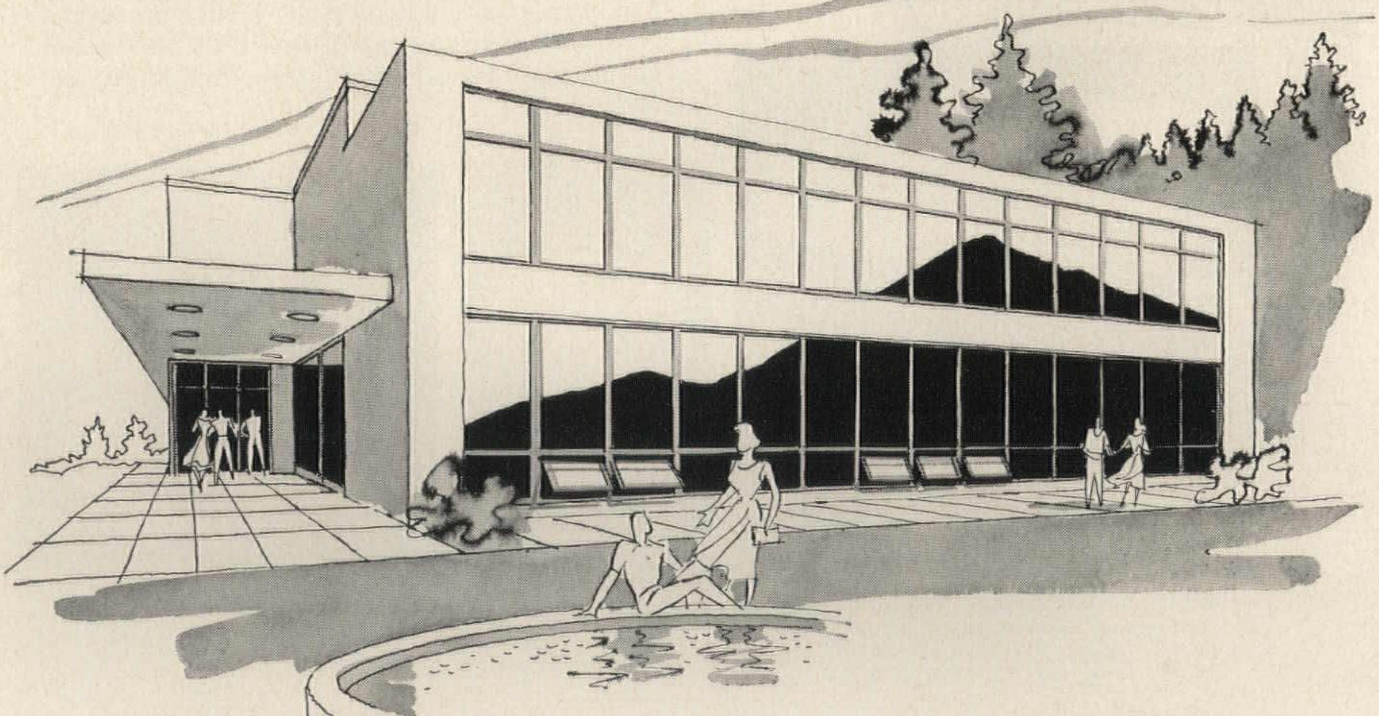
Pella®

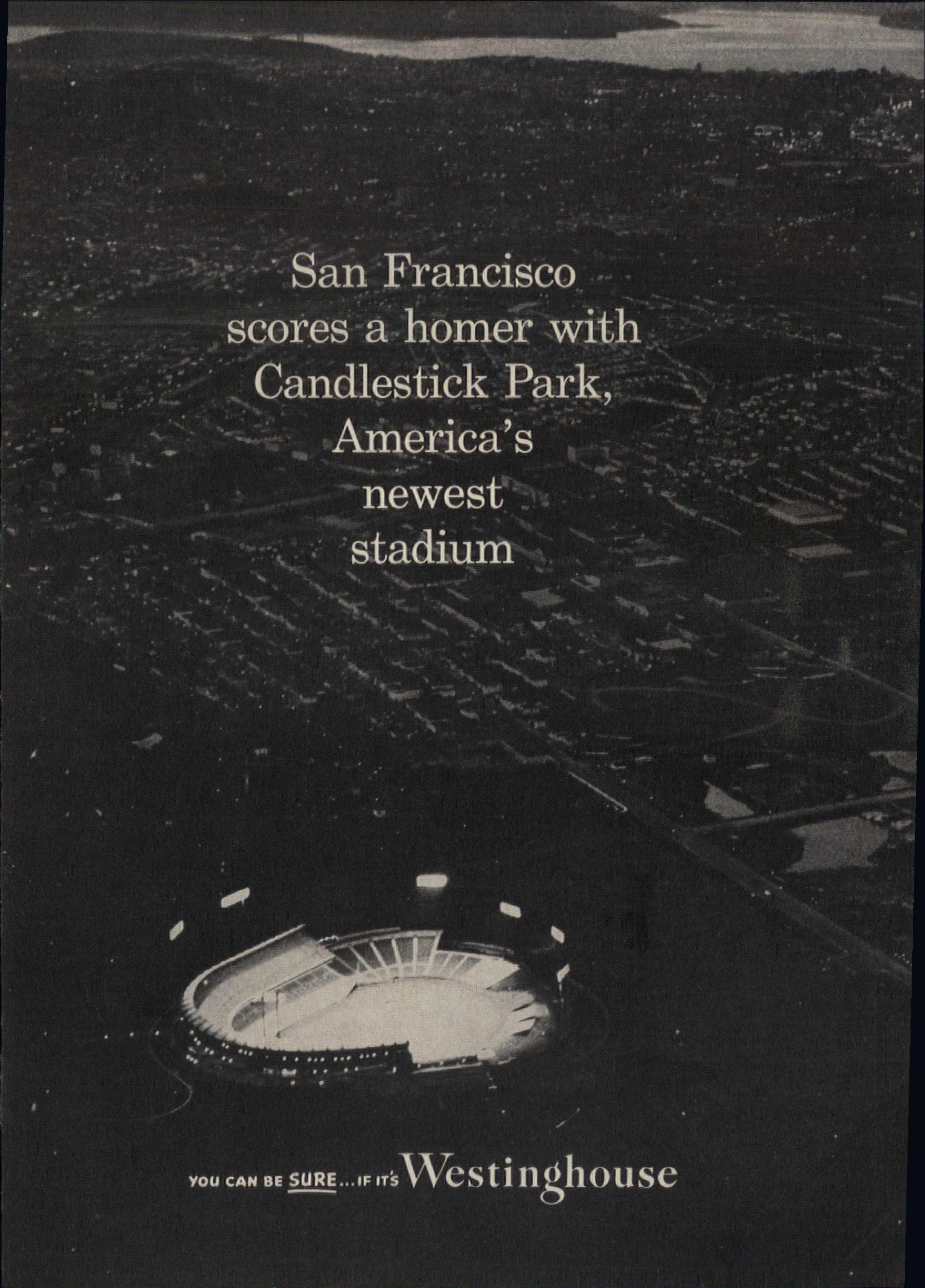
mp windows

massive fenestration for recreation building

PELLA WOOD MULTI-PURPOSE WINDOWS adapt imaginatively to plans that call for extensive glass areas. In a full range of fixed and ventilating sizes, these pleasingly proportioned windows provide virtually limitless design possibilities. Used as fixed and awning vent combinations, MP WINDOWS function efficiently in a building that requires good natural ventilation. The next time you work on a municipal, commercial or residential project, let these quality wood windows help execute your best ideas. Consult your classified telephone directory for the name of the nearest U.S. or Canadian PELLA distributor.

ROLSCREEN COMPANY, Pella, Iowa




San Francisco
scores a homer with
Candlestick Park,
America's
newest
stadium
YOU CAN BE SURE...IF IT'S Westinghouse

America's newest baseball arena is lit at night for maximum "playability" with 1147 Westinghouse Type VRC-20 1500-watt floodlights. The precise aiming of the lights was under the direction of Westinghouse Lighting Sales Engineer Reed Hansen, *(below)*, and they are designed to burn at over-voltage increasing their normal candle power 37 percent. This means that players under most conditions enjoy visibility as good as daylight gives without the glare and shadows that frequently plague them on sunny afternoons.

Westinghouse floodlighting system maintains IES standards of intensity for playing areas. The striking design of the wind baffle tops massive concrete stadium. Two of the eight floodlighting towers that are spaced around perimeter of stadium are shown here.

J-94143-2

Giants' new home is Powered-Up for maximum nighttime "playability"

San Francisco's Giants racked up a 3 to 1 victory to open their season and inaugurate their new home in the West, Candlestick Park—one of the finest baseball stadiums in America.

Candlestick Park is a massive concrete structure that has an air of being weightless and soaring. Utilizing precast and prestressed beams and supports, the stadium consists of two tiers of seats (some radiant heated) that provide maximum "seeability" for 45,000 fans—with the upper deck topped by a unique wind baffle. To challenge the teams, foul lines extend 335 feet, and it's 420 feet straight from home plate to the fence. A giant scoreboard not only keeps tabs on the game in progress but also on action in both major leagues. A press, radio and loge-seat mezzanine, dressing rooms, refreshment areas and an 8700-car parking lot complete the impressive installation.

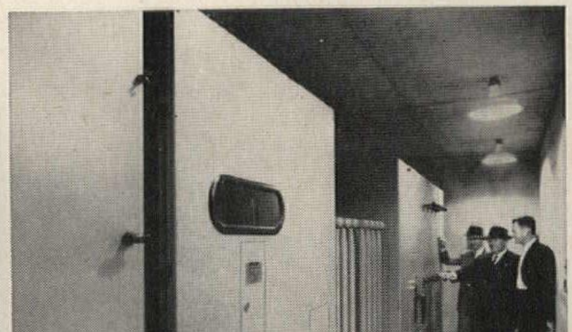
The careful attention applied to the architectural design and construction extends to the electrical distribution system serving the stadium. To give the field maximum "playability" at night, 1147 1500-watt Westinghouse floodlights make this one of the best-lighted baseball diamonds in the country. Included in the electrical system are eight power centers (one for each lighting tower), master lighting control panel, individual lighting panelboards, dry-type transformer, motor

(cont.)

YOU CAN BE SURE...IF IT'S Westinghouse

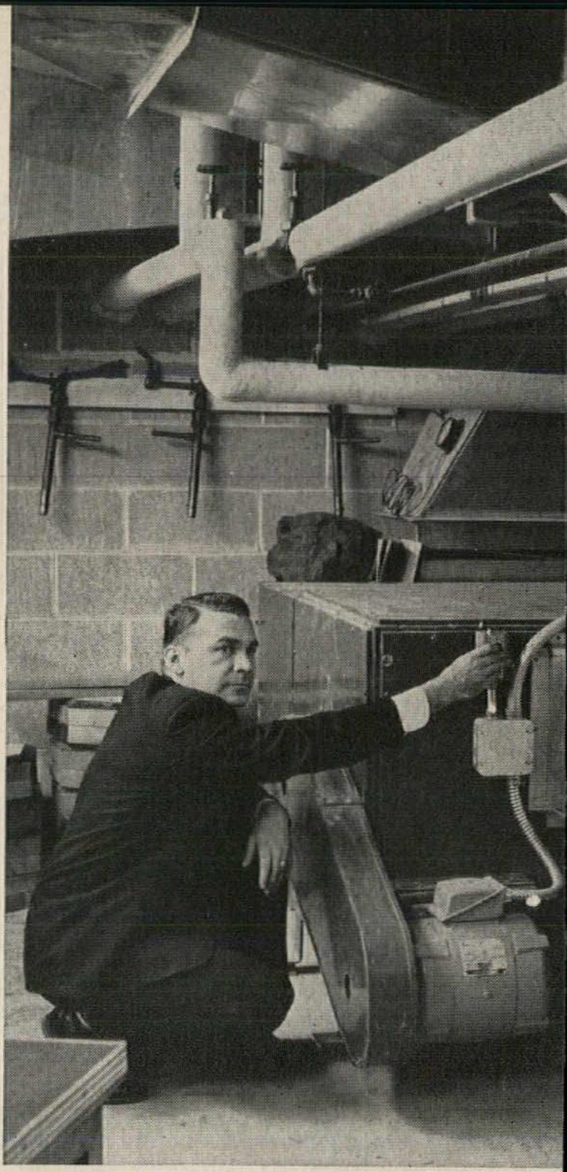
J-94143-3

Checking scale model of Candlestick Park are Lyle E. Patton, Consulting Electrical Engineer; John S. Bolles, Architect; Walter A. Haas, President of the San Francisco Recreation and Park Commission; and Raymond S. Kimbell, General Manager of the San Francisco Park Department.



Economical power distribution for Candlestick Park was achieved with eight Westinghouse unitized power centers of 750- to 225-kva ratings, each having plenty of expansion room. Each power center steps 12-kva primary power down to 120/208 volts to serve lights and electrical equipment. Inspecting one center: M. P. Buswell, Westinghouse Area Sales Manager; C. L. Harney, General Contractor; and L. E. Patton.

Motor control and protection are afforded by the Westinghouse motor control center under examination by H. G. Dechene of Brayer Electric; L. E. Patton; and D. G. Hartman, Westinghouse Sales Engineer. Such control centers group all controls together in interchangeable, space-saving, easily installed modular units. Starter units control and protect motors for air distribution units from centralized location.



Lighting for concourse and corridors is controlled and protected by Type NLAB panelboards located around stadium. Relays and control switches installed in this panel allow remote operation from centralized point. Seen examining this attractive flush mounted panelboard in stadium concourse are H. G. Dechene and G. R. Brayer of Brayer Electric Co.; and Spence Pors, Westinghouse Distributor Salesman.

Comfortable heating for Giants' locker room and clubhouse area is provided by Type AH horizontal air distribution unit, one of four in Candlestick Park. The inherent design of stadium construction, with widely separated points of heating demand, is an excellent application of Sturtevant air handling equipment.

Giants' new home *(cont.)*

control center, air handling equipment and motors. All are Westinghouse products, chosen for their ability to provide dependable, uninterrupted service. Careful attention to future uses for the stadium produced an electrical system capable of expansion. For example, the field lighting and related power supply equipment can be easily enlarged to provide the extra illumination required for nighttime football games. For information about how the Westinghouse products that Powered-Up Candlestick Park can meet your electrical needs, call your nearby Westinghouse Electrical Construction Engineer. Or write, Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pennsylvania.

OWNER: San Francisco Stadium Inc., for City and County of San Francisco
ARCHITECT-ENGINEER: John S. Bolles, San Francisco
E. Elmore Hutchison, San Francisco
CONSULTING ELECTRICAL ENGINEER: Lyle E. Patton, San Francisco
GENERAL CONTRACTOR: Chas. L. Harney, Inc., San Francisco
ELECTRICAL CONTRACTOR: Brayer Electric Co., San Francisco
WESTINGHOUSE DISTRIBUTOR: Westinghouse Electric Supply Co., San Francisco

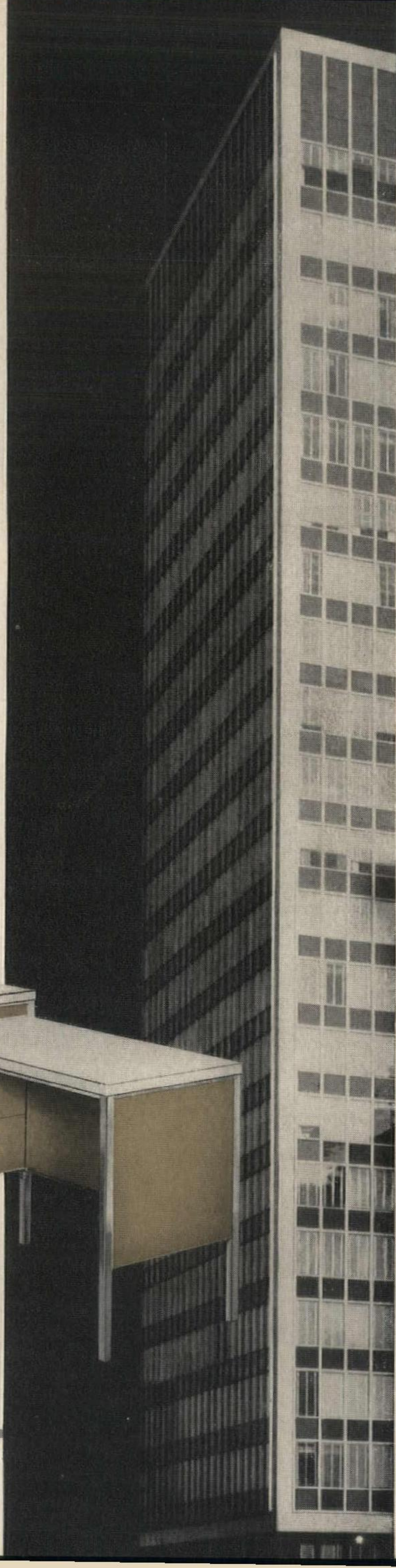
J-94143-4

YOU CAN BE SURE... IF IT'S Westinghouse

Tough, durable Micarta® is ideal surfacing for Candlestick Park's refreshment counters. This hard-working plastic surface is immune to scuffs, knocks, hot liquids and rough treatment . . . is easily cleaned, never needs refinishing. Shown are Tom Morse, U. S. Plywood Salesman; Joe M. Moore, Cabinetmaker; and Bill Lyle, Westinghouse Micarta Salesman, examining Micarta counter top.

THE CLEAN-CUT "ARCHITECTURAL LOOK"

Here you see one of the striking new 1000 SERIES desks by GF—designed by one of America's leading architectural firms. Functionally styled, with all-flush surfaces and clean uncluttered lines. Combines the modern "architectural look" with unmatched GF quality. Models for both private and general offices. For that new office building on your drawing board, specify this architect-styled beauty The General Fireproofing Company, Dept. Z-14, Youngstown 1, Ohio.

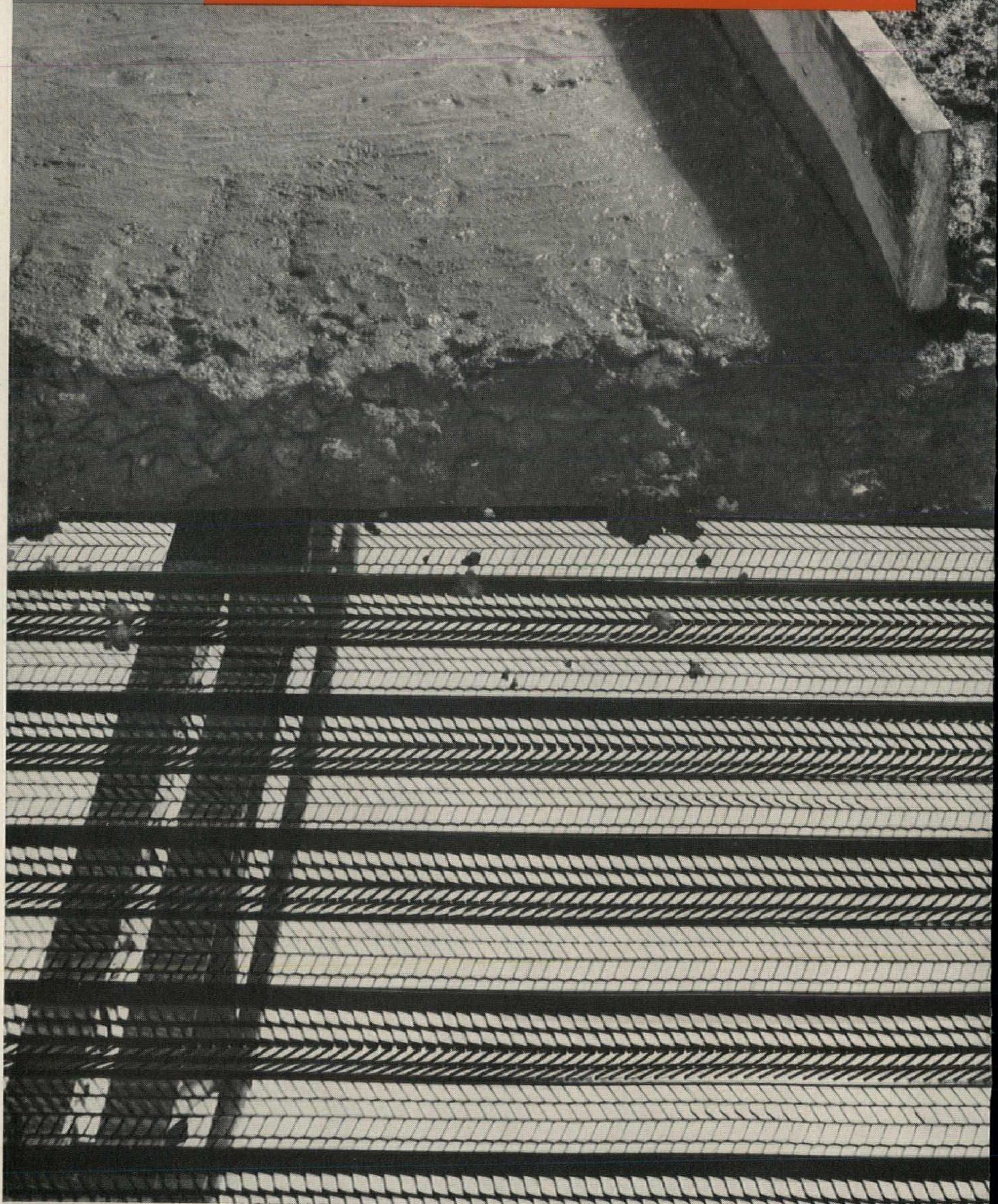


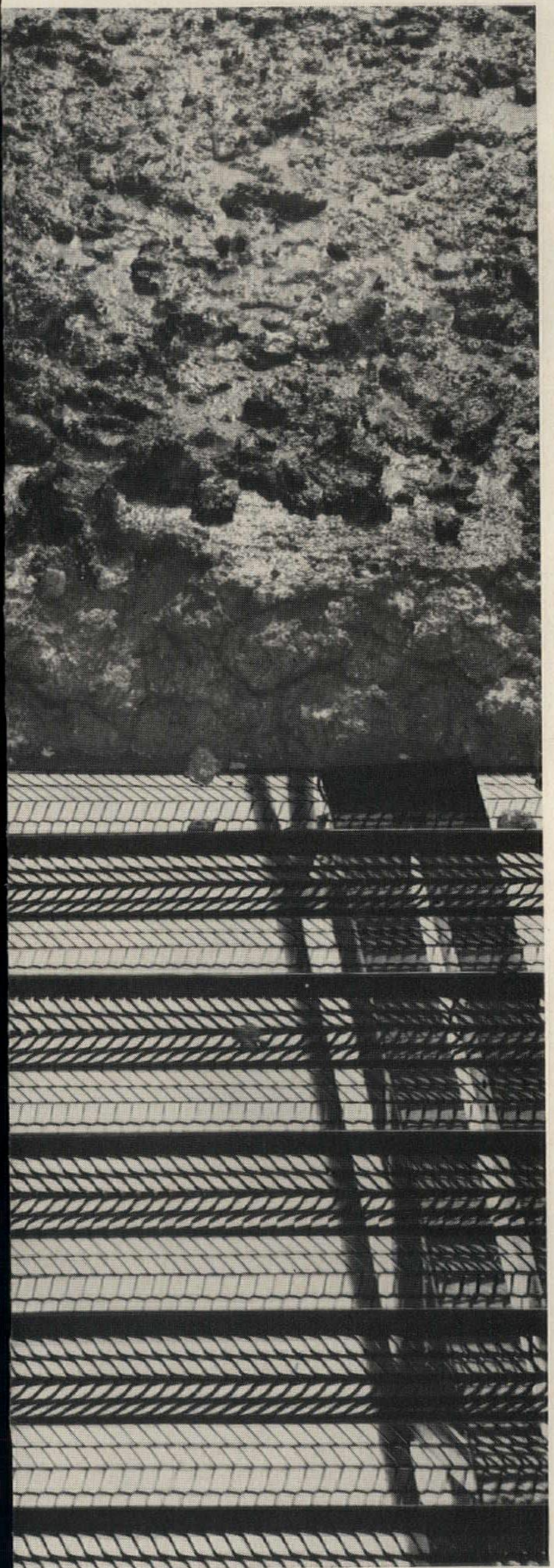
1000 SERIES BY **GF**

GENERAL FIREPROOFING
BUSINESS FURNITURE

Visit us at the OEMI BUSINESS EQUIPMENT EXPOSITION
Los Angeles Sports Arena • November 1-4

$^3/_8$" RIB LATH BY WHEELING





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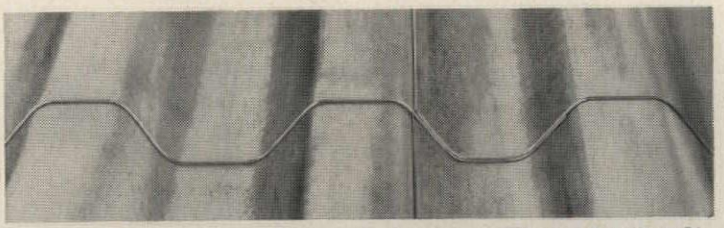

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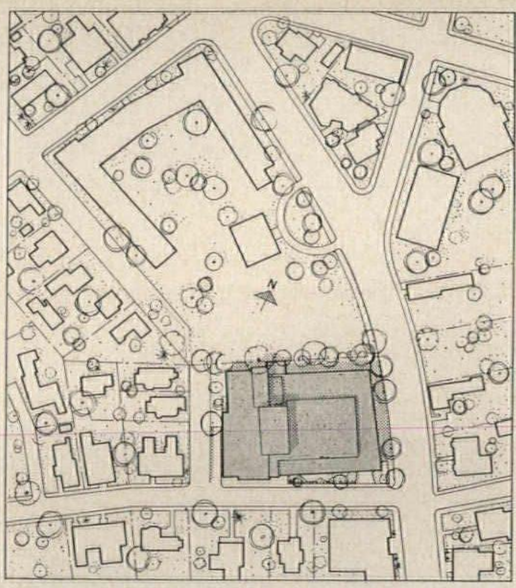
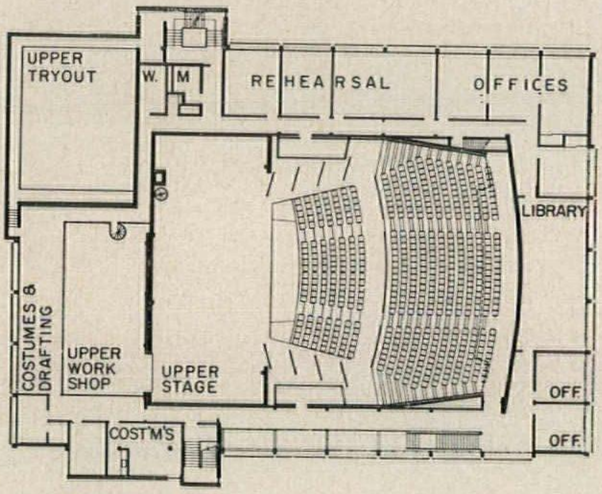
DRAMA CENTER FOR HARVARD

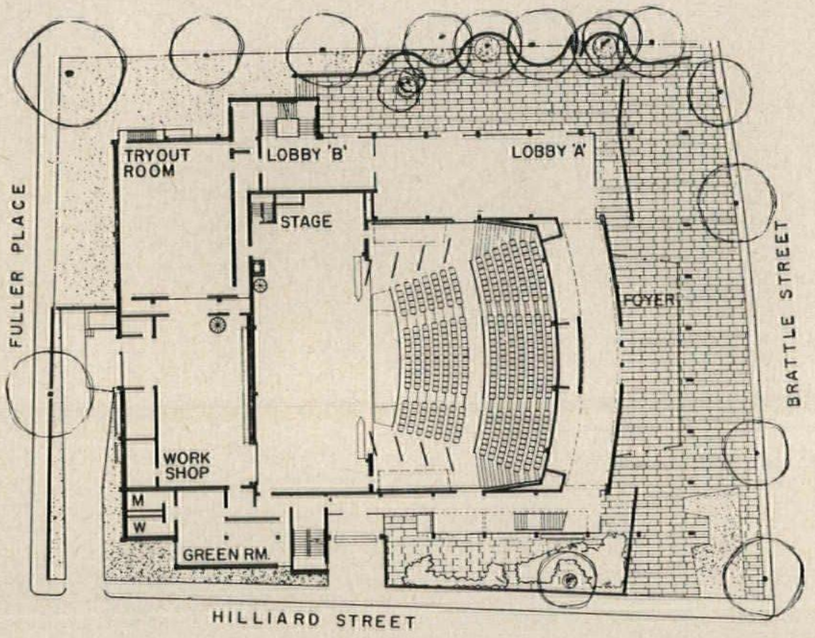
Joseph W. Molitor



Opposite page top: view from main street.
Bottom: view from side street.

NAME: *Loeb Drama Center*
OWNER: *Harvard University*
LOCATION: *Cambridge, Massachusetts*
RCHITECTS: *Hugh Stubbins and Associates; Gordon Anderson, Job Captain; John Wacker, Landscape Consultant; Color and Furniture, S. T. Lo*
STRUCTURAL ENGINEERS: *Goldberg, LeMessurier & Associates*
MECHANICAL ENGINEERS: *Delbrook Engineering, Inc.*
ELECTRICAL ENGINEERS: *Thompson Engineering, Inc.*
THEATER LIGHTING, STAGE EQUIPMENT & ELECTRO-MECHANICALS: *George C. Izenour*
ACOUSTICAL ENGINEERS: *Bolt, Beranek & Newman*
CONTRACTOR: *George A. Fuller Company*

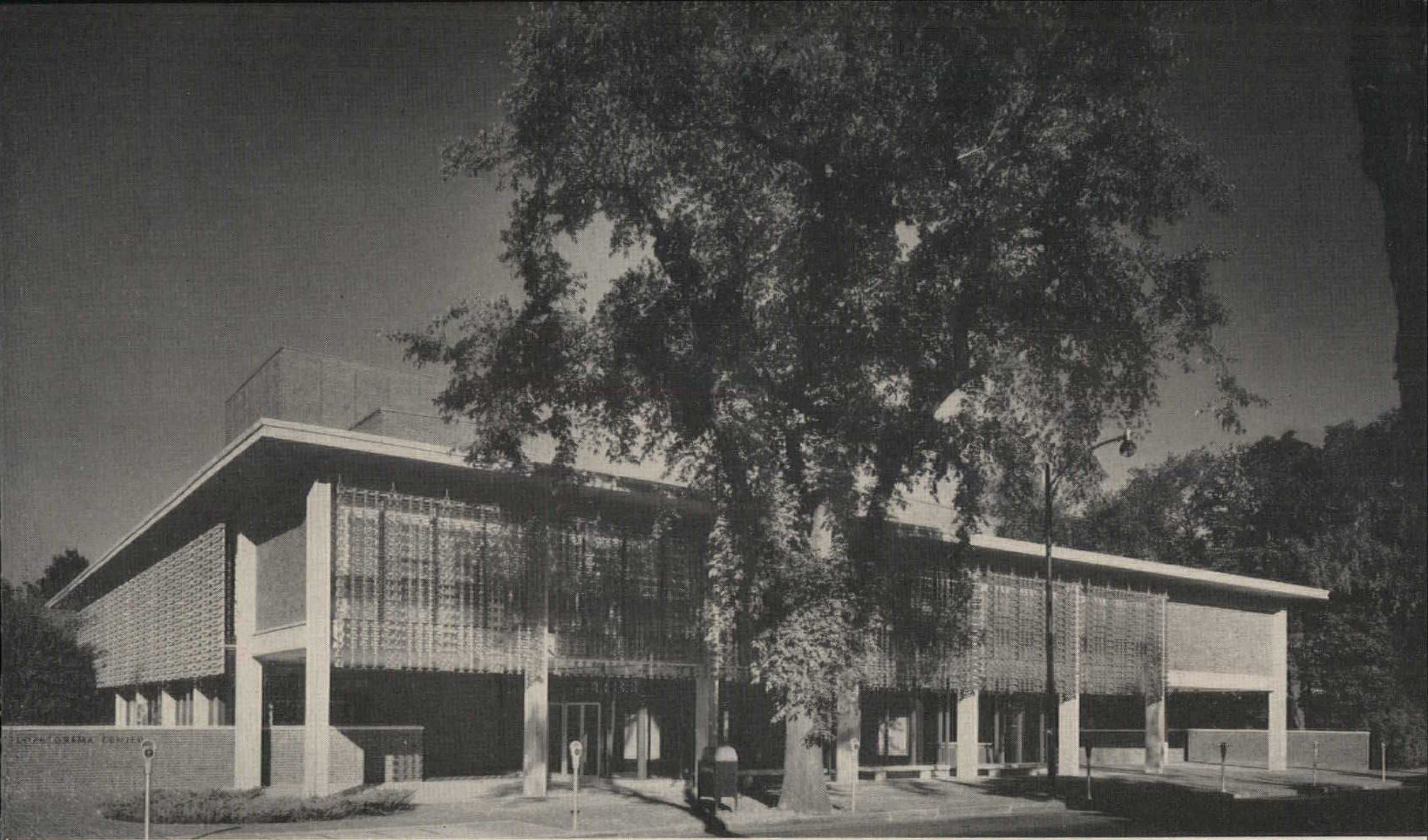




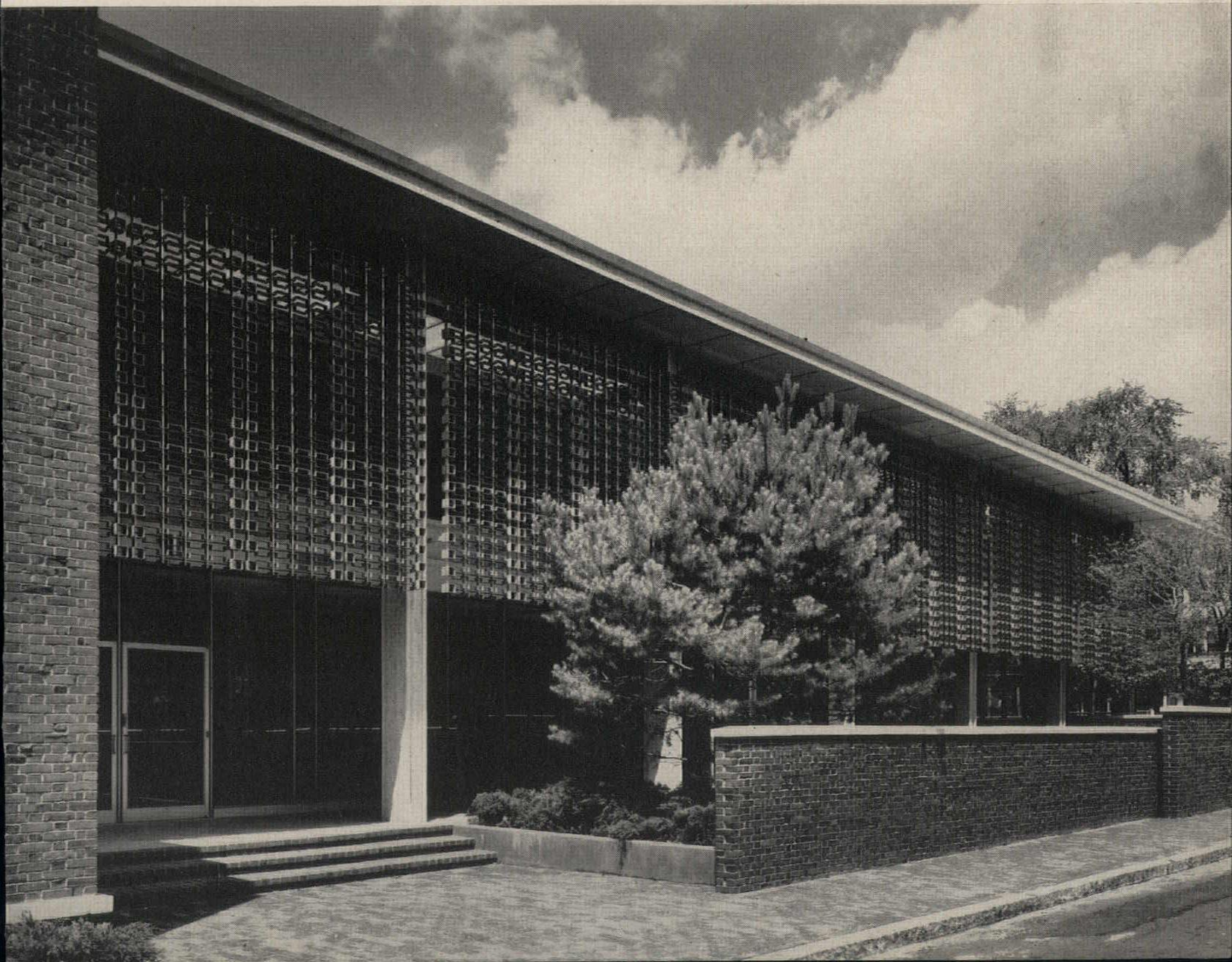
GROUND FLOOR PLAN

Harvard's new theater is such a mechanical marvel that many people who would otherwise care may not notice that it is first rate architecture first of all. When the curtain goes up this October for the theater's opening performance, 600 spectators will sit around the three sides of a projecting Elizabethan apron type stage, watching Harvard's extra-curricular drama group in a production of Shakespeare's *Troilus and Cressida*. The audience's position in relation to the stage, and the position and shape of the stage itself will be only one of three basic arrangements which are chosen in terms of their suitability to the play to be performed. Two stage hands can manipulate electrically driven components to transform the theater within fifteen minutes to the traditional proscenium type stage and seating of the Broadway theater, or to the theater-in-the-round arrangement frequently used in the off-Broadway experimental theater. There is much additional maneuverability within these three basic systems. This flexibility at Harvard's new center should encourage a great development in the arts of the theater and lovers of the drama have every right to be excited, but those who also love architecture will be rewarded by a good look at the building itself.

To take its place politely in a setting of small scale, predominantly residential buildings, the Loeb Drama Center had to conceal its great bulk. The site itself was small, costs had to be kept down and therefore the building could not spread in small units. An adequate stage tower must be a high, wide and deep element, often difficult to compose, and the drama center required many square feet of auxiliary space for classrooms, offices, workrooms and a rehearsal and tryout room with the same floor area as the working stage space. A compact, skillfully or-



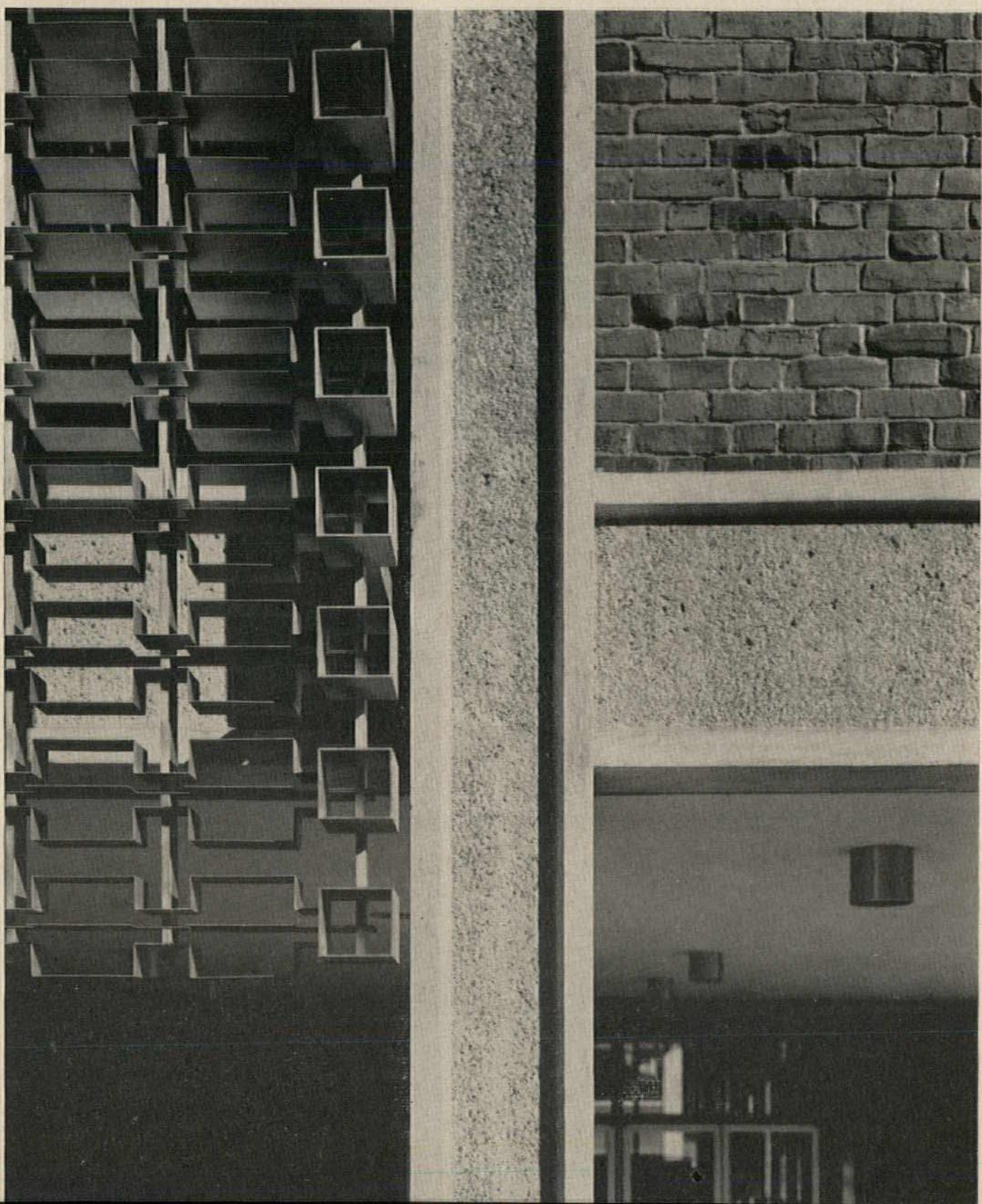
Joseph W. Molitor



Lobby overlooking terrace

Joseph W. Molitor

Bush hammered concrete and red brick contrast with aluminum sun screen



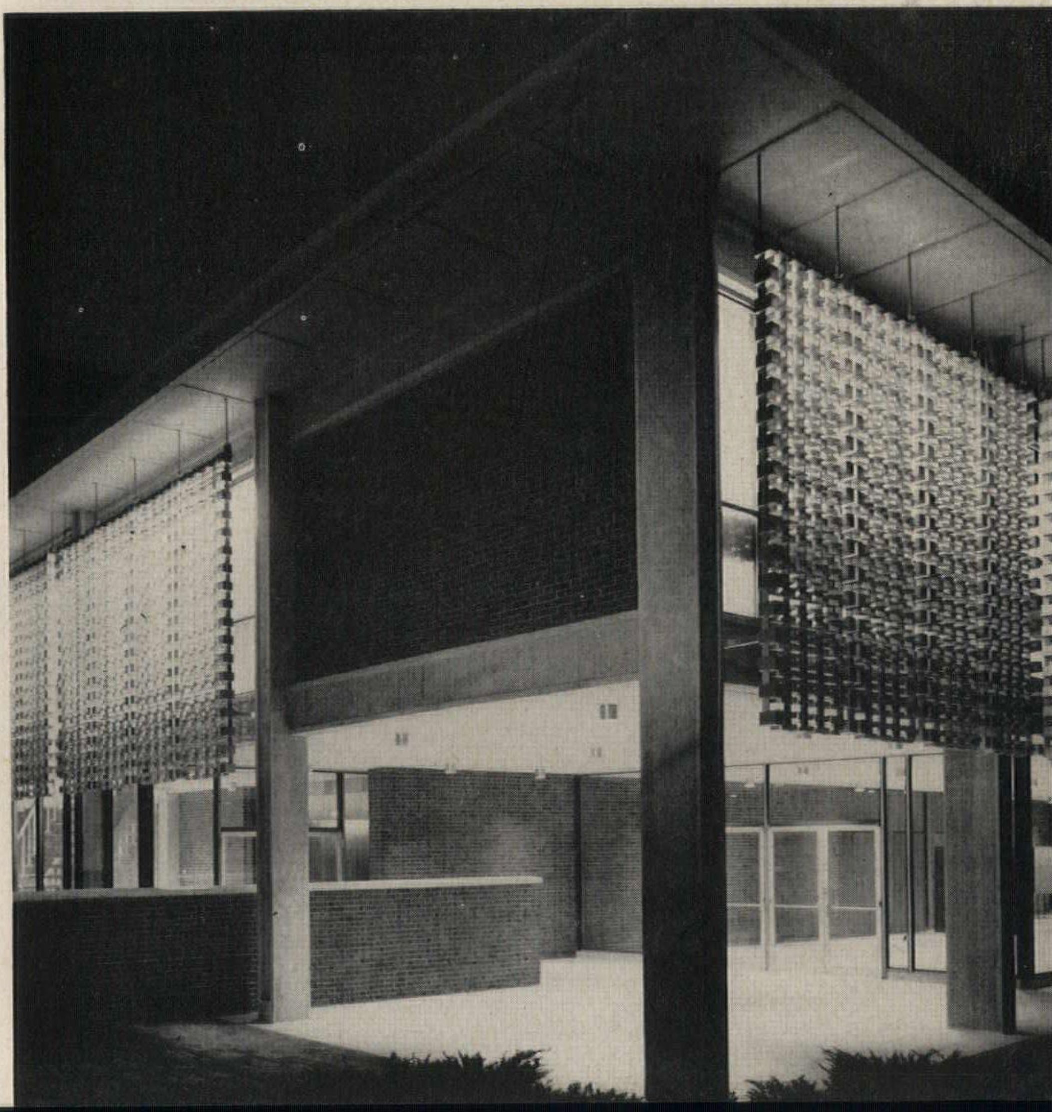
dered solution allowed a generous portion of the site to be developed as a garden entered from the lobby. The stage tower is set as far back from the street as possible to minimize its apparent bulk (see plot plan), and the height of the auditorium is concealed by the surrounding two-story element into which the smaller spaces are fitted.

The building not only works well, but it is handsome in the way that a theater should be. Before design began architect Stubbins and the theater's directors agreed on their objective stated as follows in an early report: ". . . though the theater must be beautiful, its builders must also remember that the play's the thing. The building must not be so architecturally exciting and excited, as building, that the plays produced in it will be overshadwoed by their frame. On the contrary, the auditorium should please the imagination in such a way as to release it, not captivate it. Certain museums and art galleries recently erected as monuments to their architects make the reminder necessary."

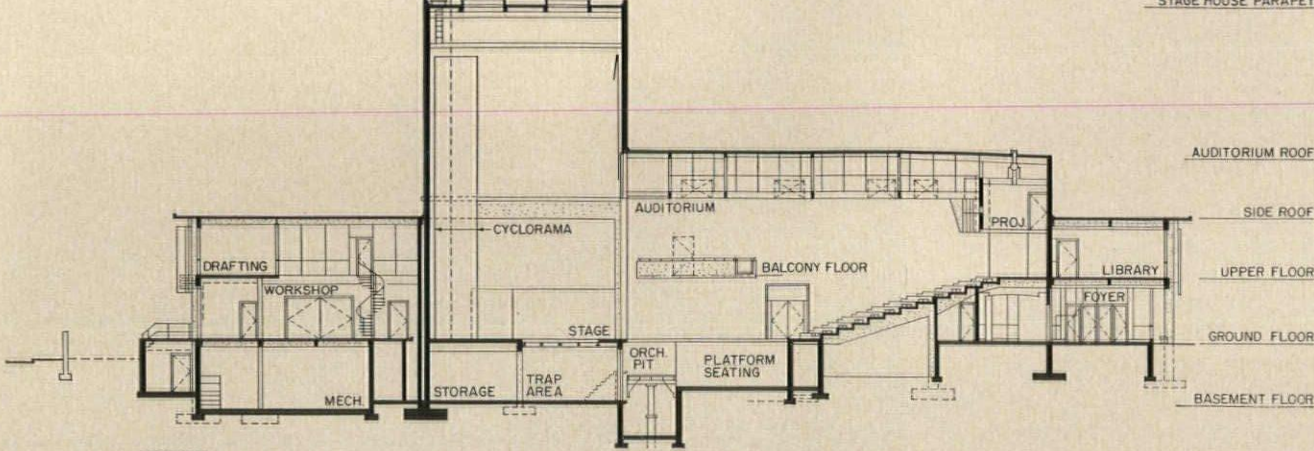
Two level tryout room exterior

Joseph W. Molitor

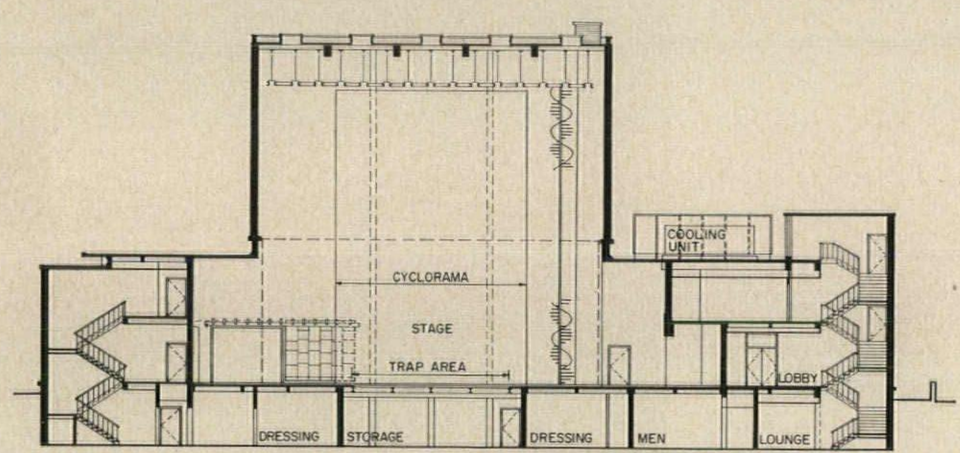
Main façade



Entrance



SECTION



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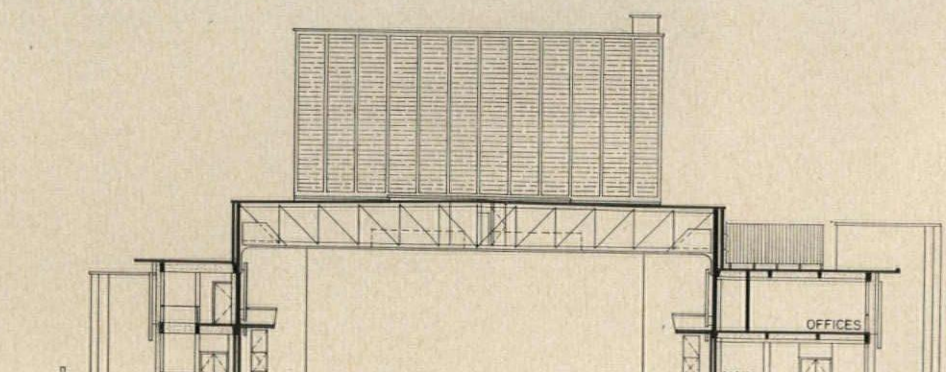
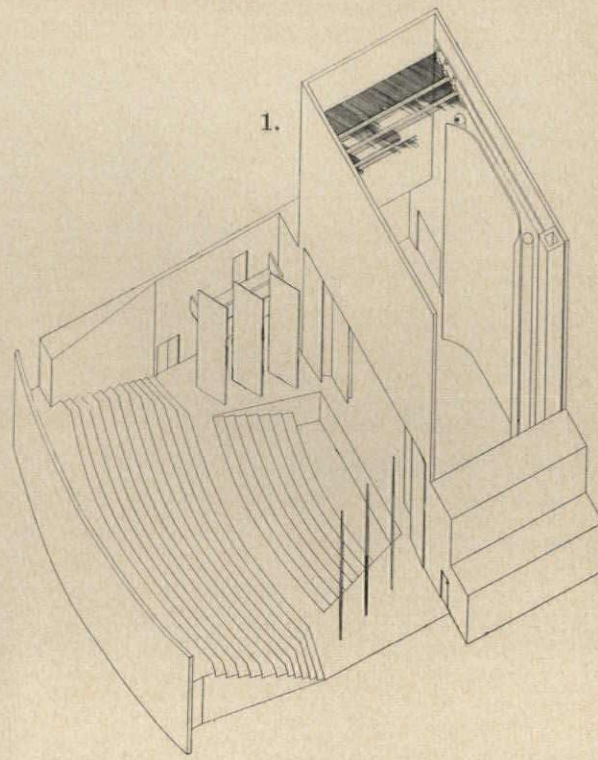


SECTION

Theater designer George C. Izenour has devoted his career to developing the mechanical and electronic systems which make convertible theaters possible, but this is the first one to be constructed. The Harvard theater uses his electronically controlled winch system which moves along a grid in the flies, raising and lowering and positioning flats according to a pre-set pattern. Izenour's pre-set lighting system is also used

1. Stage framed by proscenium with seats beyond is traditional type
2. Platform seating moved about pivot points on hydraulic controlled motorized wheels to opposite walls, side panels folded back, apron stage raised by hydraulic pistons to 3 ft above floor to level of stage. Remaining seats in auditorium are fixed. This is the Elizabethan type stage
3. Proscenium raised providing the full 60-ft width needed to swing platform seating to position on stage then lowered. Complete stage extension raised by hydraulic pistons. Side panels positioned to screen actors' entrances and exits. Fixed seats complete arrangement for partial theater-in-the-round. Complete theater-in-the-round was rejected by designers who feel that actors' entrances and exits should not be made through the audience

1.



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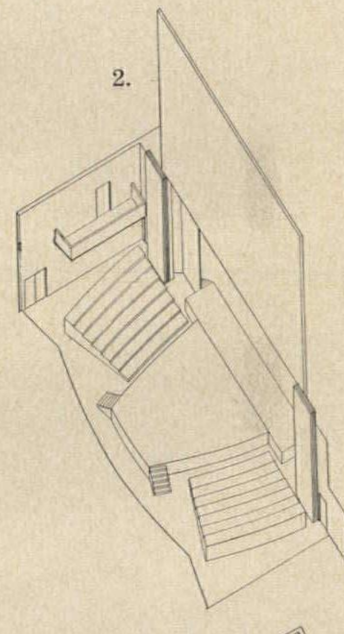

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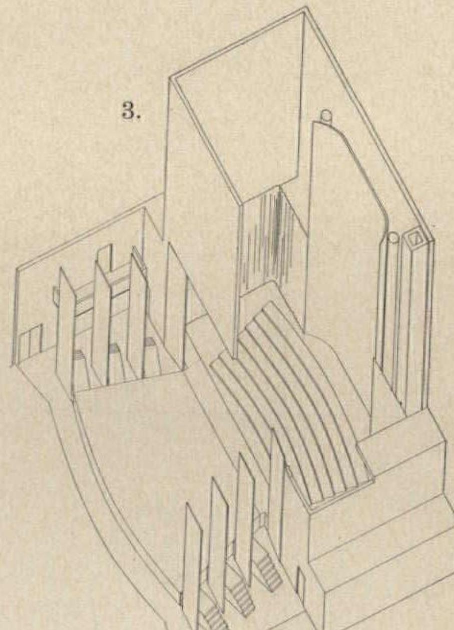
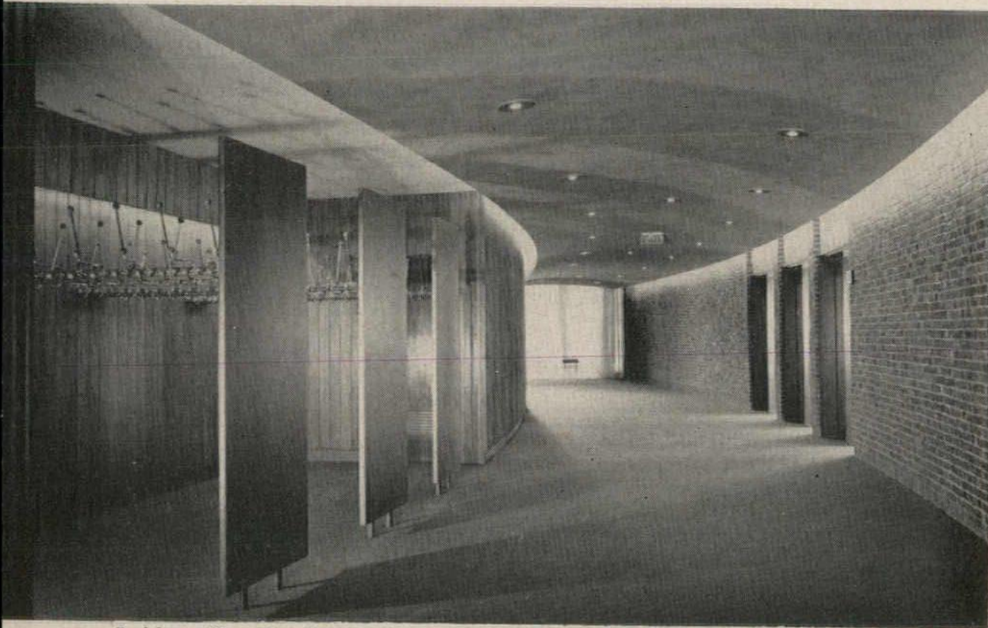


Lighting raft suspended below the auditorium ceiling is a screen for stage lighting. It also provides the proper acoustical properties required at the ceiling level

Joseph W. Molitor

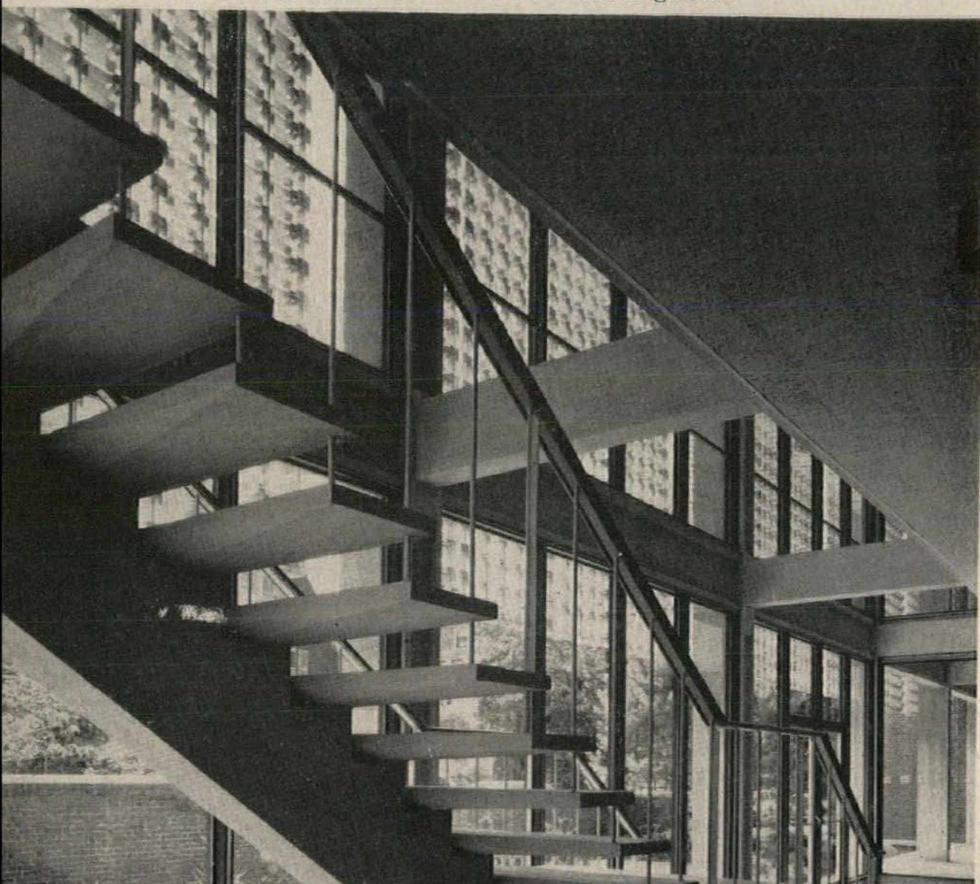
Stage and seating arranged for proscenium type performance. Cyclorama at rear will have movable side extensions to make a curved enclosure



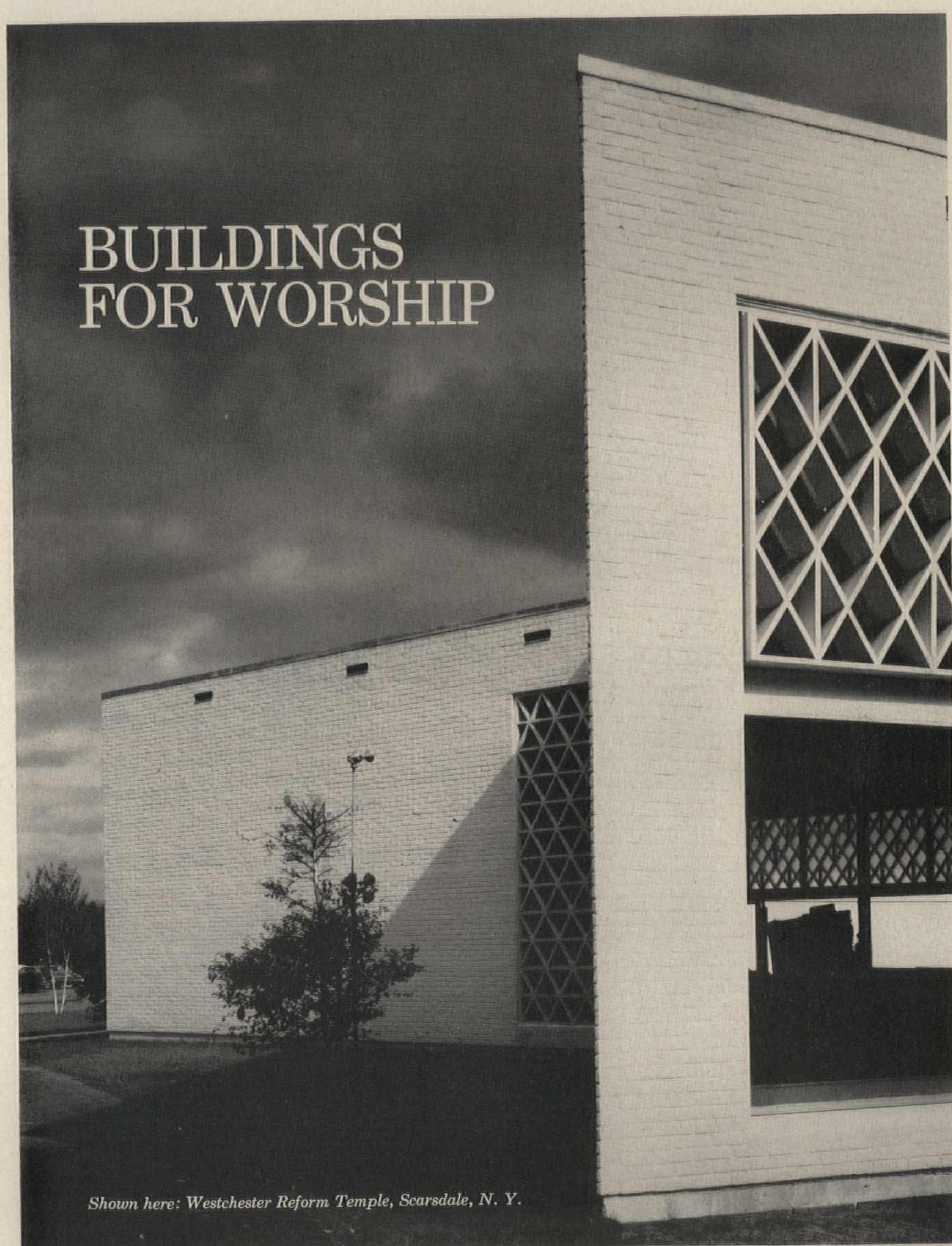
Joseph W. Molitor

Lobby off main foyer. Coat hangers were designed by architects

Secondary lobby faces side street and smaller garden

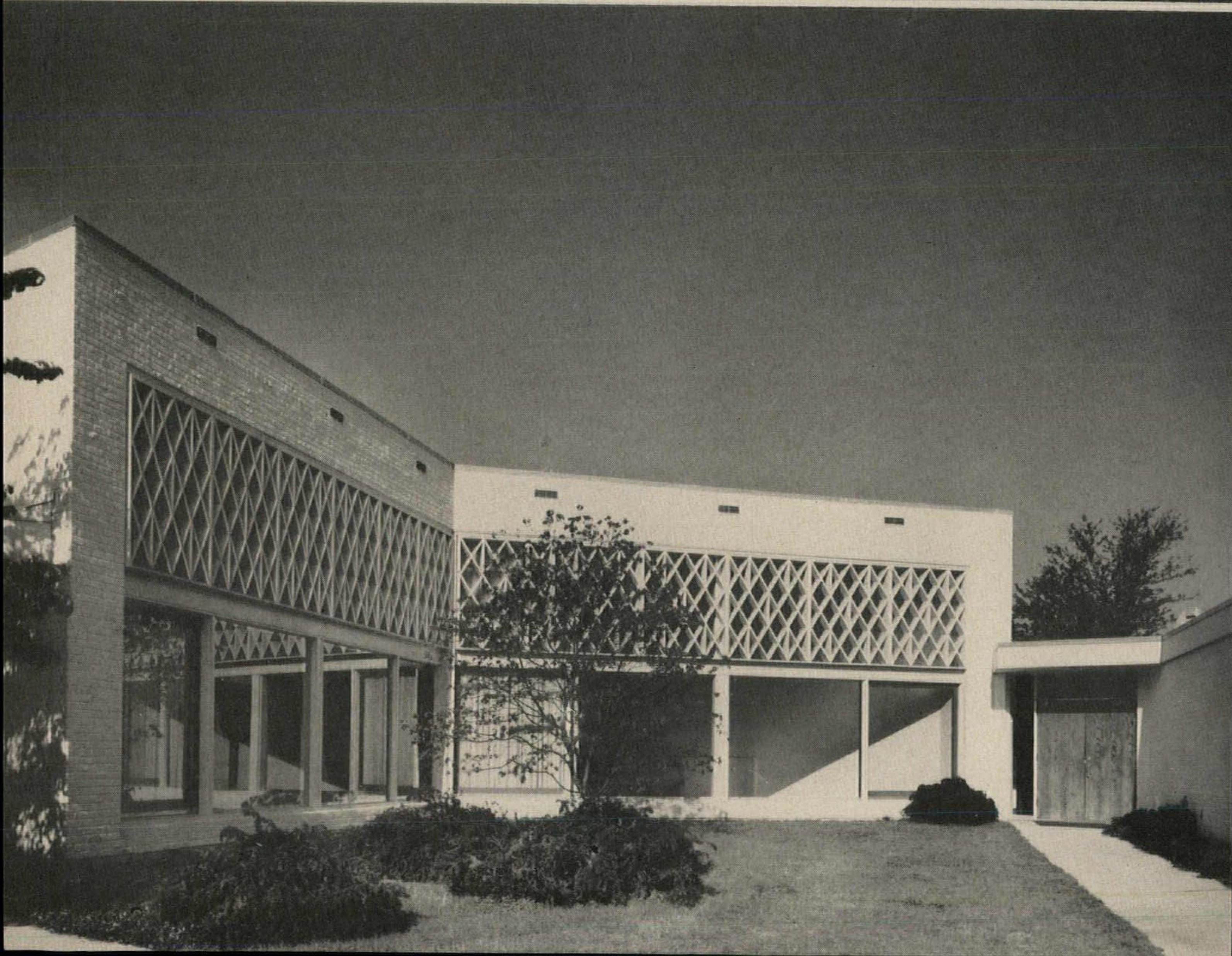


BUILDINGS FOR WORSHIP



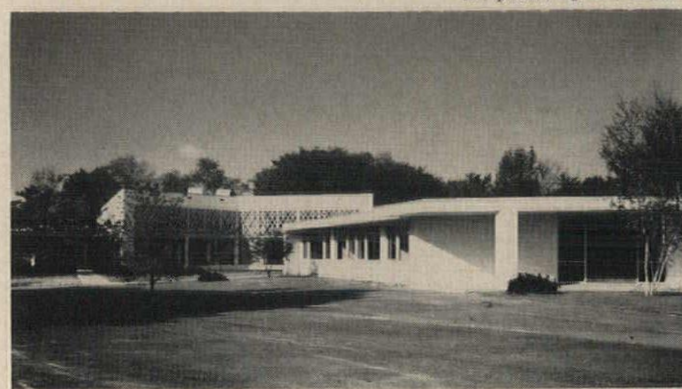
Shown here: Westchester Reform Temple, Scarsdale, N. Y.

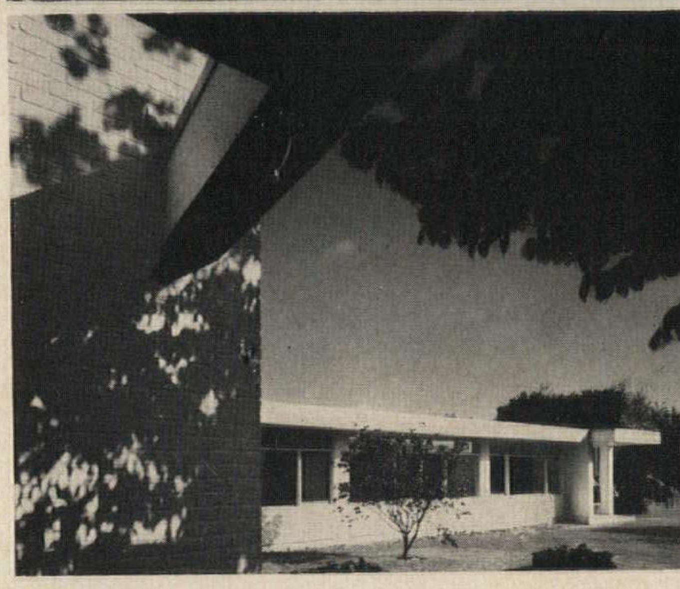
Three notable religious buildings that possess in common the attribute of good design; while each maintains, as well, the integrity of its own visual expression through the influences of form, structure, and material



Sanctuary Plan In A New (But Old) Shape

All photos by Ben Schnall





Westchester Reform Temple

LOCATION: *Scarsdale, New York*

ARCHITECT: *William W. Landsberg*

DESIGN CONSULTANT: *Marcel Breuer, F.A.I.A.*

LANDSCAPE ARCHITECTS: *Bye & Herrmann*

STRUCTURAL ENGINEERS: *Wiesenfeld, Hayward & Leon*

MECHANICAL ENGINEERS: *Gussow & Skidmore*

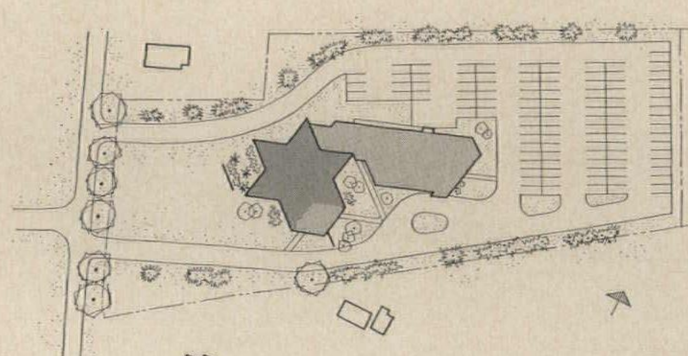
CONTRACTOR: *Westchester Construction Co.*

The sanctuary of this temple in suburban Westchester County is shaped in plan as a six-pointed Star of David. The resulting space becomes a religious symbol, is highly effective for a variety of uses, and holds considerable interest for its formal and functional conception—see plan, page 165, and accompanying caption. The star form also "reads" visually as one walks about the exterior of the building, and two of the exterior spaces created by the plan-shape serve respectively as sanctuary garden and entrance patio-garden.

The building is a simple bearing wall plus concrete slab-and-beam structure, finished on the exterior principally by whitewashed brick, with certain minor portions of sprayed stucco on block. The architect would have preferred field stone, but the budget would not permit its use.

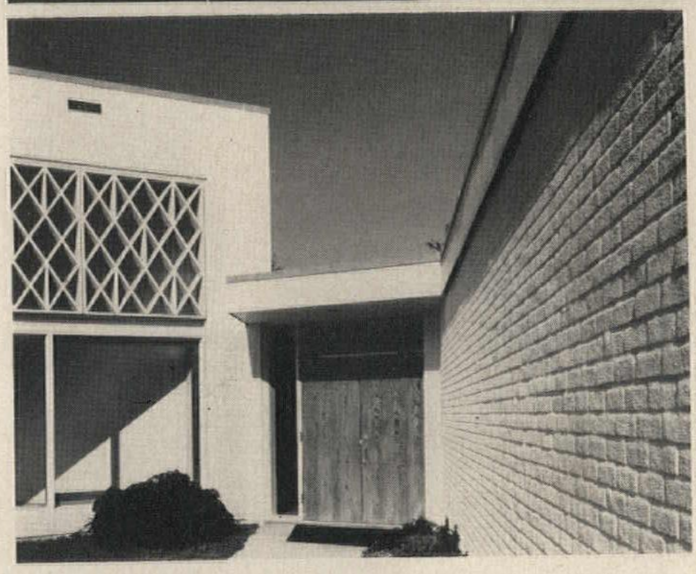
The building consists of two principal elements; the star-shaped sanctuary—identifiable in the photos by its lacy, decorative upper fenestration—and an extended lower element that houses classrooms, social area and kitchen, administrative office, and rabbi's study. The temple at present serves a congregation of 275 families, a group expected to expand to 400. Provision for such expansion has been planned, and will consist of future additional classrooms as well as a large hexagonal-shaped social hall towards the rear of the plot. Space is provided in the basement of the present building for such youth activities as scouting, etc.

The site is an extended rectangle set within a residential neighborhood. The building was placed well back from the street and given a park-like setting so it would be in keeping with its environment. The free-standing, whitewashed brick wall toward the street (left page, top) provides privacy for the glass-walled sanctuary and defines a sanctuary garden




EXIT

Scarsdale Temple

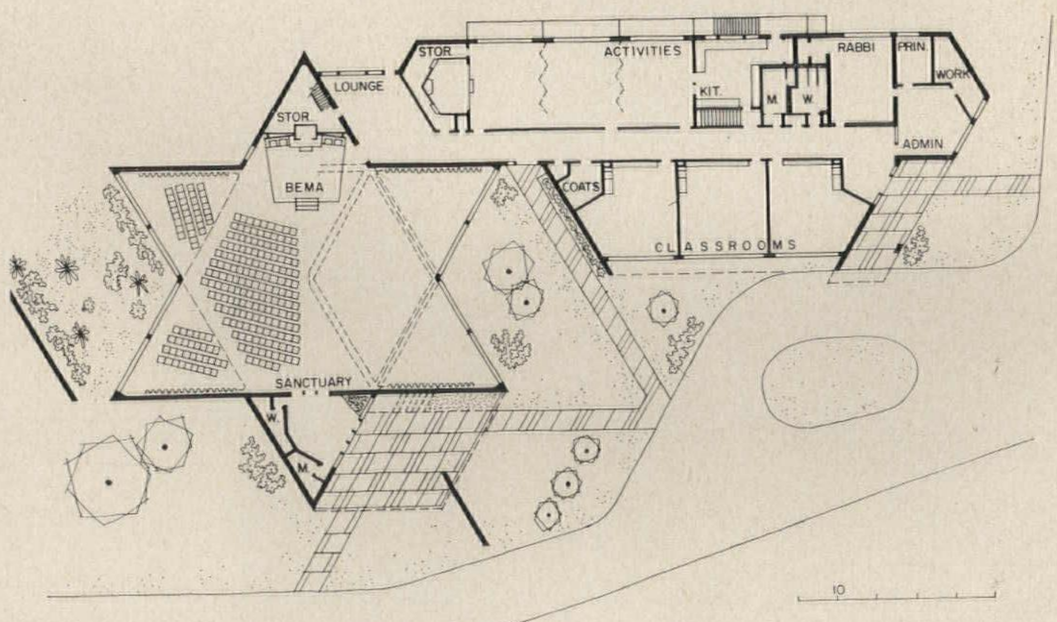


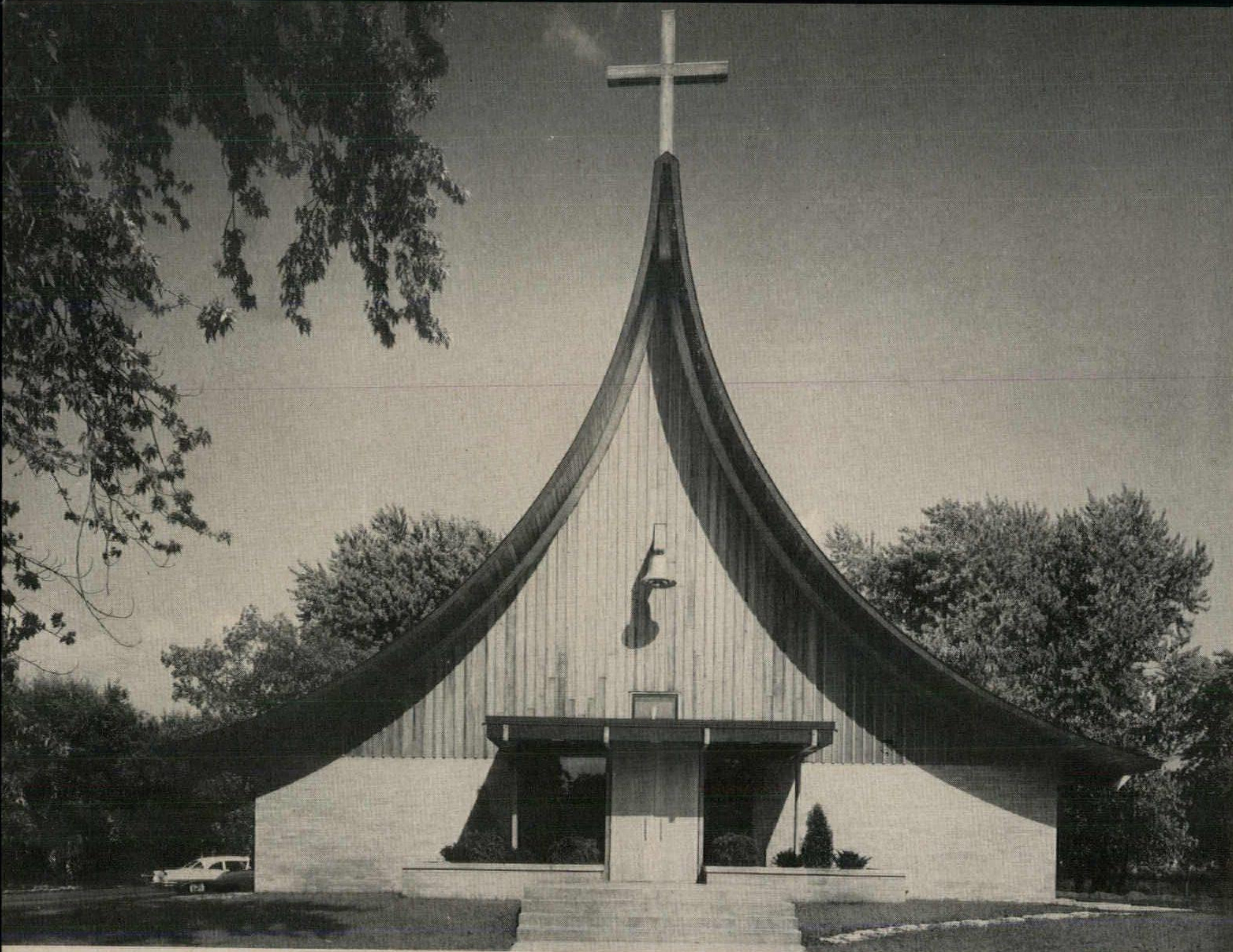
Beyond serving as religious symbol and intriguing esthetic idea, the Star of David-shaped sanctuary works extremely well for its intended uses. Each of the six pointed areas has a specific use, as does the total space when thrown open. The bema and altar form the focus for the interior and occupy one point; the entrance lobby opposite occupies another; the four remaining points—at the sides—can be closed off by floor-to-ceiling curtains to serve as classrooms. For the normal weekly attendance, the hexagonal-shaped central area functions as sanctuary, but during the High Holy days the entire space is used to accommodate the larger attendance. The architects explain that the floor-to-ceiling hangings further the tent—or tabernacle—idea; one of special significance in the Jewish faith, and related to the story of the flight through the wilderness.

Basically, this arrangement does not destroy the integrity or scale of a multi-use space in expanded form, which is so often the case in the more usual plan which adds, upon occasion, a large unintegrated area to the sanctuary for maximum seating. For good sight lines and more intimate contact with the speaker, the bema here extends forward into the central hexagon. For secular activities (lectures, concerts, etc.) a rolled-up screen of wood slats can be dropped from a ceiling recess to hide the Ark and choir loft, virtually transforming the space into an auditorium.

Color interest centers on the bema; the sanctuary having white walls, ice-blue ceiling, gray terrazzo floor, and dark oak pews designed by the architects. The bema carpeting is brilliant blue, the interior of the Ark a bright red-orange, brilliantly lighted.

Xanti Schavinsky designed the colored glass window to the left of the bema; the textile used for the sanctuary curtains was designed by Anni Albers





Surging Upward Thrust As Spiritual Expression

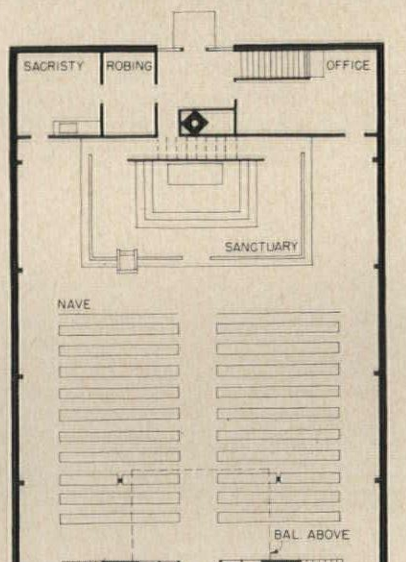
All photos by Hedrich-Blessing

St. Augustine's Episcopal Church
LOCATION: *Gary, Indiana*
ARCHITECT: *Edward D. Dart*
ENGINEER: *Donald S. Robinson*
CONTRACTOR: *Blake Barnard Corp.*

The dynamic, reaching lift of the curvilinear pointed arches framing the nave of this church makes for an unusually moving interior. The laminated wood arches begin the visual surge with a slow curve and extended cross-section near eye-level, and then spring upward in a faster reverse curve and constantly tapering section to virtually disappear in the semi-darkness at the apex. There is, of course, nothing new in such a concept—as a visit to any 13th century Gothic cathedral will show—but here its expression in modern idiom is uncommonly effective, possessing an almost primitive vigor.

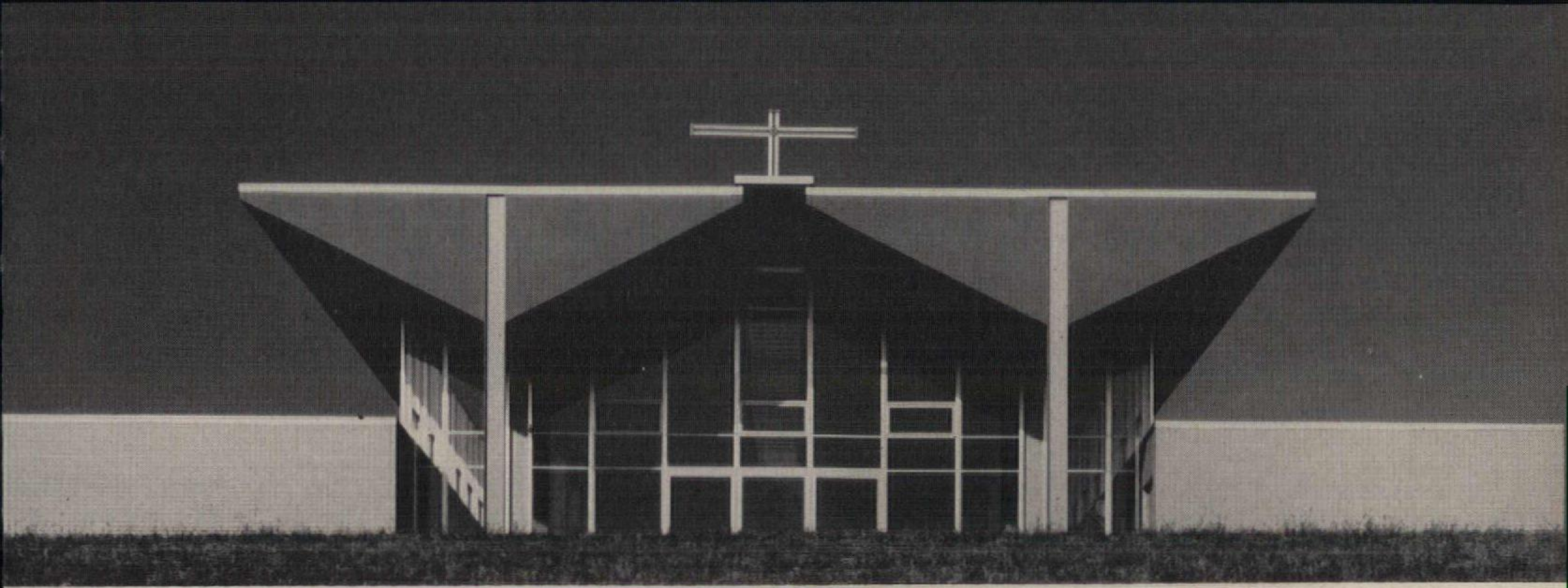
The award-winning church was designed for a congregation of 350, and its 52-ft-wide by 70 ft-long nave rises to an apex of 36 ft. The roof decking is of 4 by 6 T & G aromatic red cedar; the gable ends—both inside and out—are of vertical, rough-sawn redwood boards with battens. By way of contrast, the reredos wall and altar railing are of polished white oak. The Indiana limestone altar and oak altar furniture were designed by the architect.

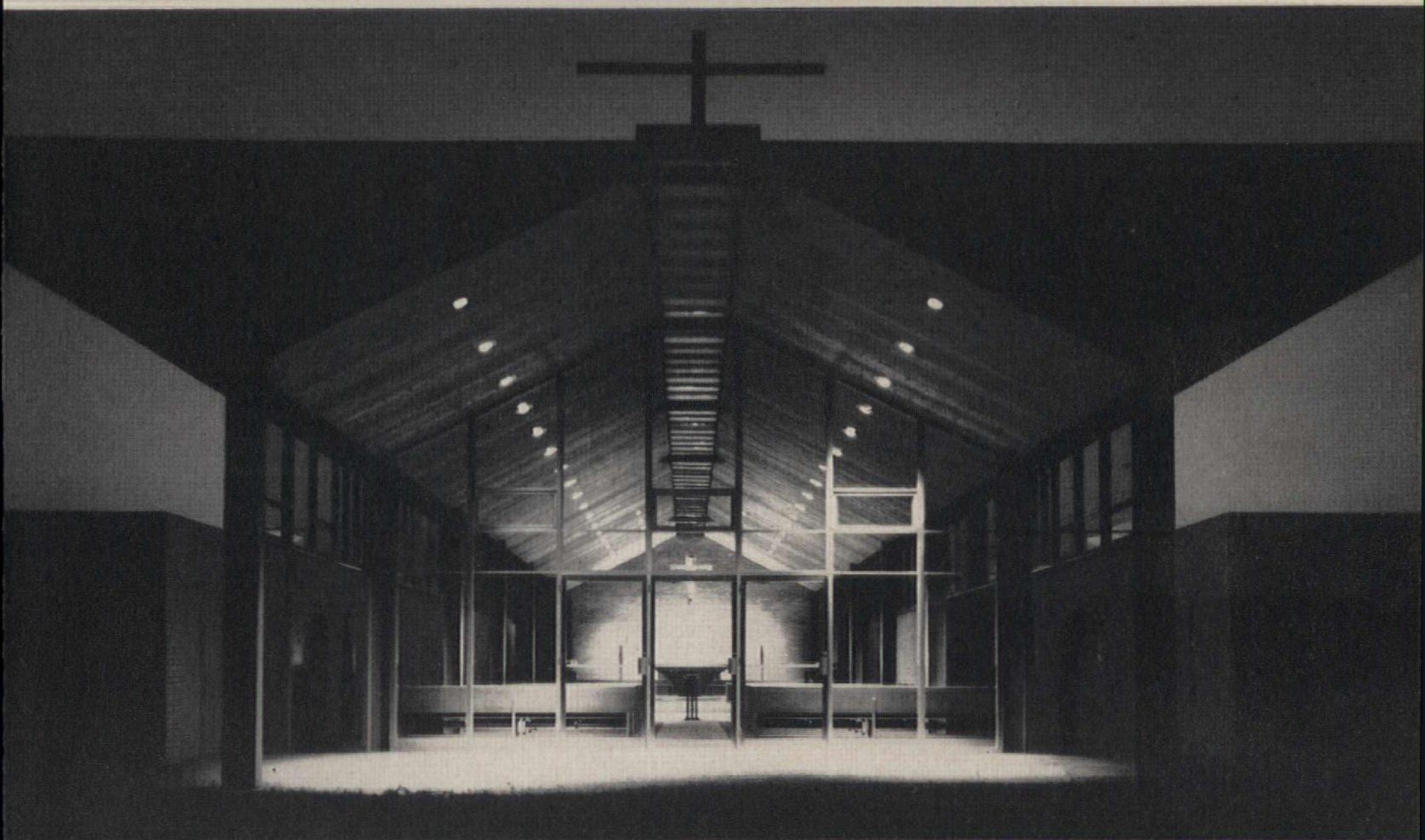
Controlled lighting is supplied mainly by small floods and spots, and serves to focus attention on the crucifix and altar, leaving the peak of the nave in near-darkness. The continuous exterior base for the building is of beige brick, surmounted on each side of the nave by narrow bands of glazing immediately below the eave line. This arrangement provides sufficient light for the pews, but again, the natural illumination falls off as the roof climbs upward, contributing further to the total interior effect.



St. Augustine's Episcopal Church

The rear (or east end) of the church is shown in the top picture: beige brick, vertical redwood boards, and fresh air intake grille. Next above, a view looking towards the rear of the nave, showing the choir loft over the entrance. The loft is supported by laminated wood beams and columns; its railing is composed of horizontally lapped redwood boards. Right, an interesting detail shot looking along the front wall toward the narthex porch and the brass church bell



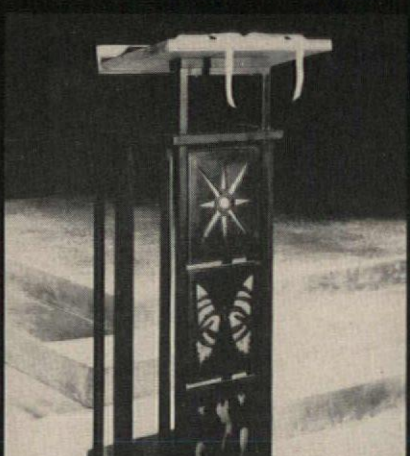


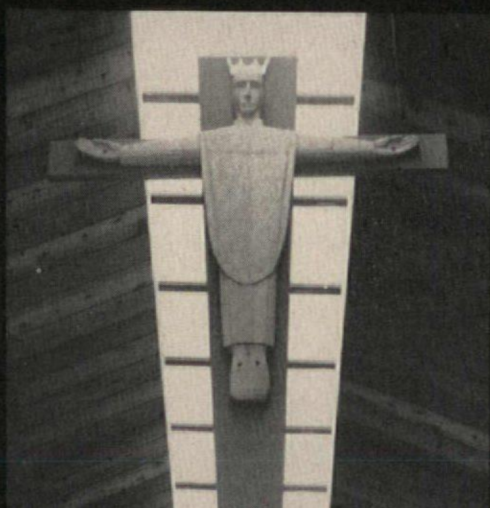
All photos by Marc Neuhof

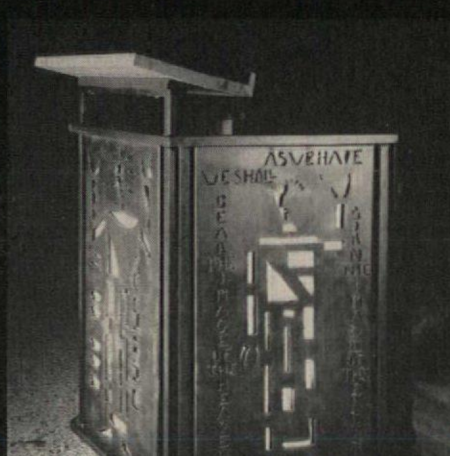
Dynamic Balance and the Joy of Daylight

St. Thomas-in-the-Fields Episcopal Church
LOCATION: *Gibsonia, Pennsylvania*
ARCHITECT: *John Pekruhn*
FITTINGS: *Janet deCoux and Eliza Miller*
STRUCTURAL AND MECHANICAL ENGINEER: *Robert Gibson*
ELECTRICAL ENGINEER: *Haydn Hargest*
ACOUSTICAL CONSULTANT: *Charles Williamson*
CONTRACTOR: *Uhl Construction Co.*

The twin rows of boxed-in, triangular trusses that shelter the nave of this church —poised as they are on single columns and joined only by a long, delicate web of skylight—build up a visual effect of dynamic balance; dramatic but not "stunty." If the trusses had been joined in conventional fashion and the skylight not placed at their meeting, the effect would have *(continued)*






ASWEHAVE
WESHALL

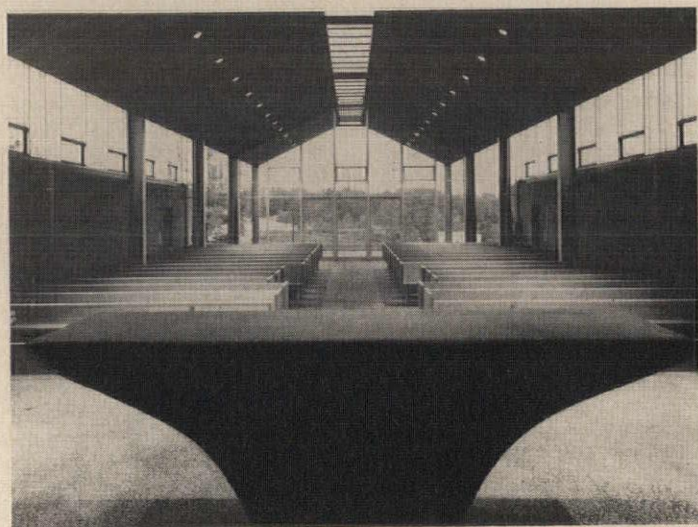
St. Thomas-in-the-Fields

been lost, and the liveliness of the spatial impression missing. As it stands, this most interesting nave enclosure, together with the handling of its daylighting, create a rewarding space for worship. From the entrance point, the principal lines of the structure (and of the daylighting) lead one's eye to the reredos wall, the altar, and the Christus Rex, which become the visual focus of the interior.

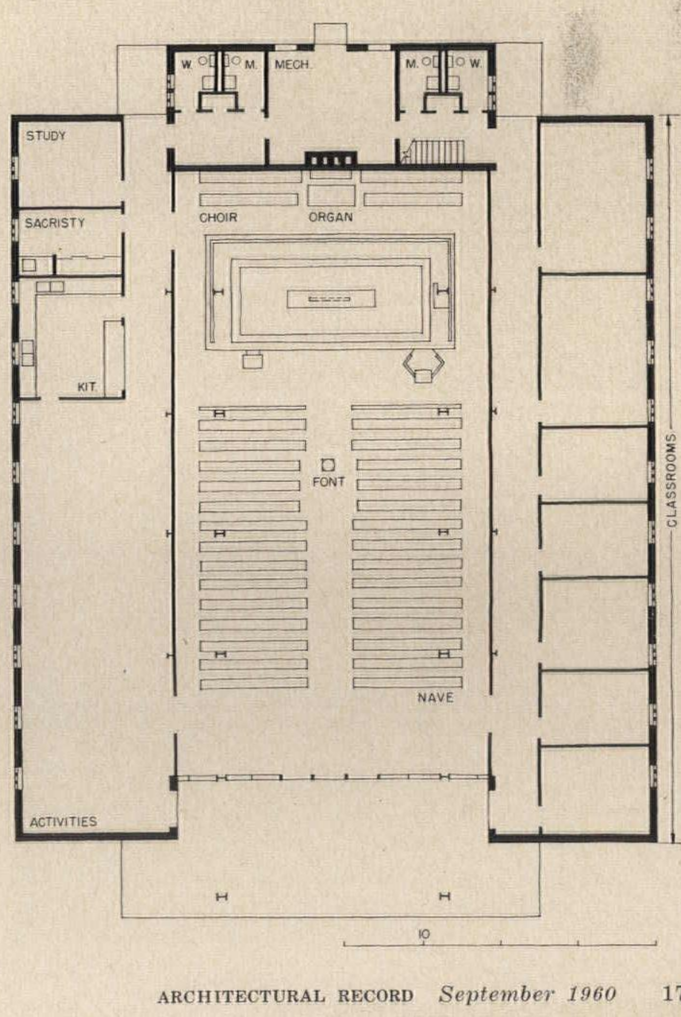
Natural lighting is thoughtfully handled: the truss soffits are pitched in such a manner that a flood of basic daylight enters from the long lines of clerestory sash; the skylight gathers and adds the brilliant "punch" light from the vault of the open sky; the all-glass (but shaded) entrance wall at the rear adds a balancing secondary glow.

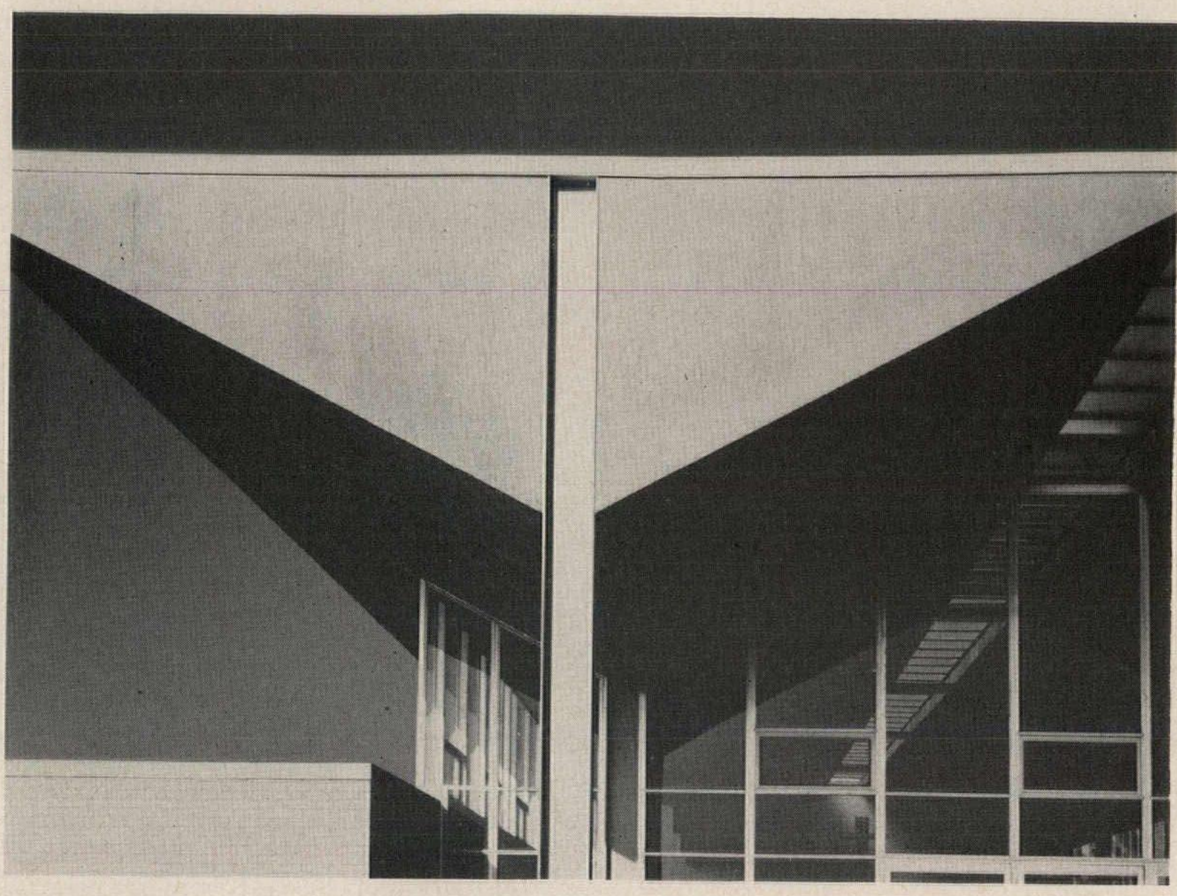
The notable liturgical furnishings—designed by two sculptresses who are members of the congregation—contribute a note of vitality to the interior. Janet deCoux, who was responsible for the interior arrangement of the church, designed the altar, which is carved from a block of black diorite; as well as the Christus Rex, of carved maple mounted on a painted cross. Eliza Miller designed the pulpit and lectern, both made of pierced black iron with enamel backing; and also the baptismal font, which consists of an enamel bowl, brass finial, and walnut base.

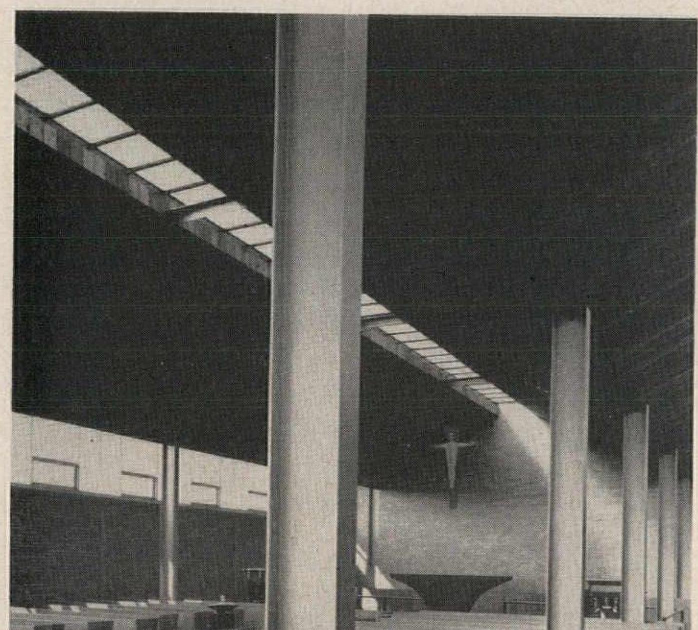
The church, which was designed to seat 200, is located on a 10-acre plot, yet to be landscaped. The nave is 40 ft wide, 80 ft long, and the skylight is 20 ft above the floor. Total cost of the building was $130,000.



Since the building was carried forward under a limited budget, the required elements were organized into a simple plan shape; a scheme that seemed to offer the greatest possibility for economy. The nave is flanked on one side by 7 classrooms, on the other by a social hall, kitchen, sacristy, and study. Above: a view looking over the altar to the rear of the church







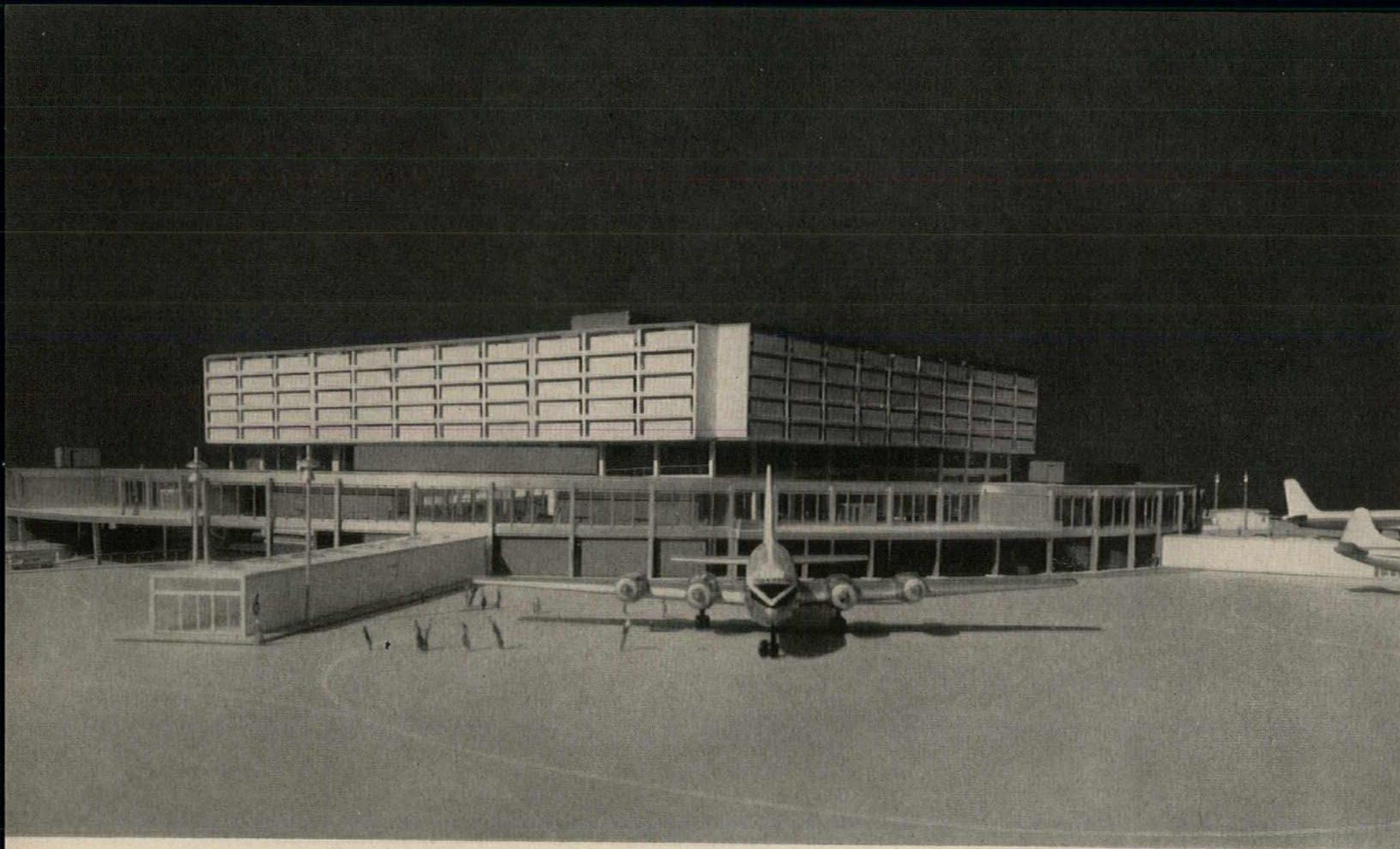
St. Thomas-in-the-Fields

MATERIALS AND FINISHES: top surface of the triangular steel trusses is covered with 5-ply built-up roofing on 2-in. gypsum plank supported by open-web steel joists; the truss soffits are clad with ¾-in. T & G cedar boards; the floor is exposed aggregate concrete; exterior and interior walls are of common brick; interior partitions are of wood studs, plastered; entrance doors and sash are aluminum; interior doors are flush wood; the heating system is gas fired

AIRPORTS

All of the airports in this study are good examples of the methods currently being used by architects for solving the many problems of jet terminal building design. Some of these problems, such as passenger circulation, baggage handling, and the like are the same as they were for conventional aircraft. If there has been any change in these problems, it is one of magnification. Jets allow more people to be transported in less time than was possible before. Thus the numbers of people passing through airports are increasing rapidly. Their baggage is a greater problem, because there is more of it. Other problems are new and peculiar to jets and prop-jet aircraft. Among these, the most important to the architect are those brought about by increased noise, hazard from the blast, and jet fumes. An examination of the buildings in this study (and in the articles preceding it in the RECORD, in March and April 1960) will give some indication of the variety architects are giving to terminal designs. Though all of the examples shown seem to function effectively to a degree, the extreme variety would indicate that no one solution can be assumed correct. Further development seems to be on the way.

A CONTINUATION OF THE ARCHITECTURAL RECORD AIRPORT SERIES BEGUN IN MARCH AND APRIL 1960

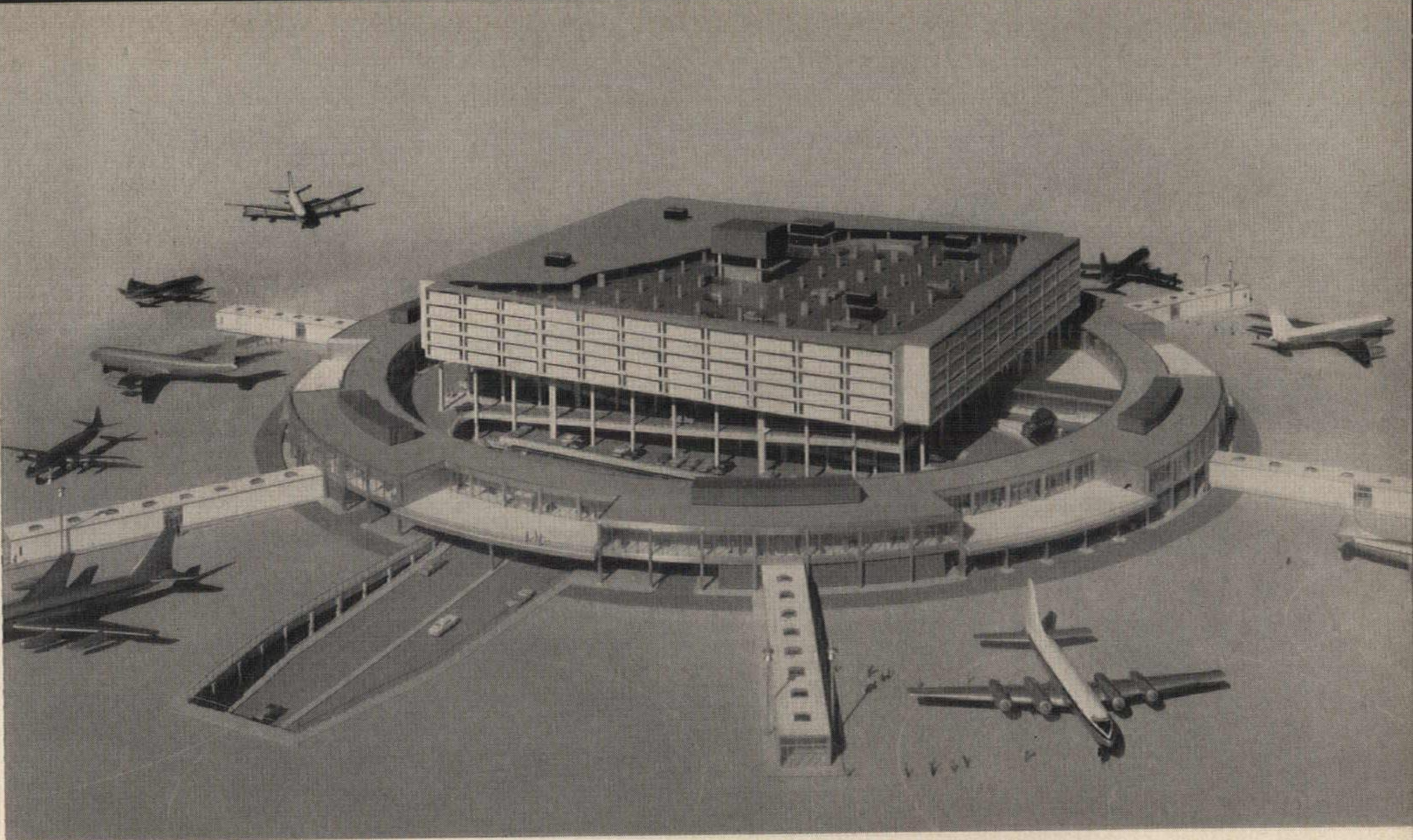


AEROQUAY NO. 1, TORONTO INTERNATIONAL AIRPORT, MALTON, ONTARIO

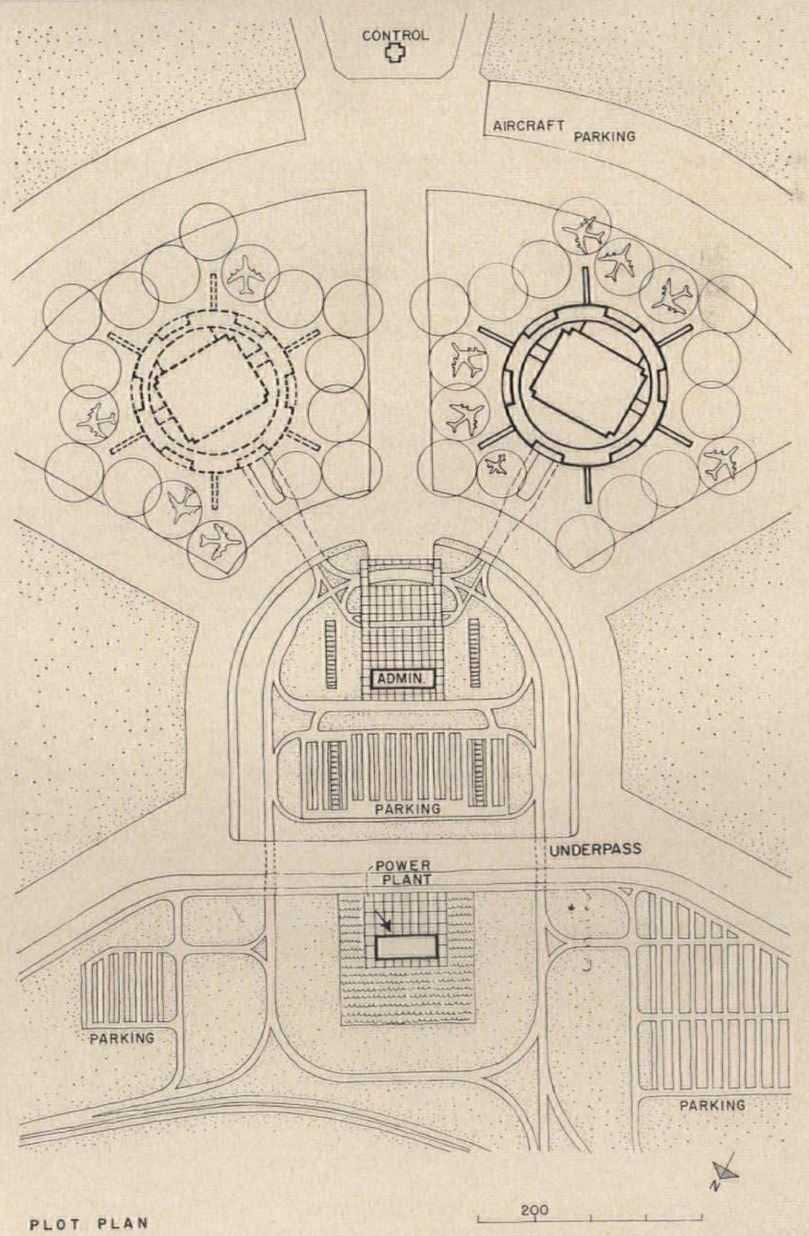
John B. Parkin Associates, Architects and Engineers; John B. Parkin, Partner-in-Charge; Lloyd S. Laity, Senior Designer; E. R. Wilbee, Assoc. Traffic, Parking, and Handling; R. F. Marshall, Assoc., Structural Engineering; J. E. Mews, Assoc., Mechanical Engineering; Wilbur H. Smith Assoc., Traffic Consultants

This airport design is based on the principle of expansion by multiplication of terminal buildings, rather than addition to one large building. The volume of the air traffic at Toronto has been increasing at a very high rate. Studies indicate that it will continue to do so. The design for this new airport for Toronto is based on this assumption. After study, the architects decided that a plan for a single air terminal which could be built now, yet retain the extreme flexibility needed for future expansion would leave much to be desired. Therefore, they discarded the traditional concept of a single building in favor of a complete terminal servicing a specified number of aircraft, this to be supplemented by other similar buildings when the traffic warrants. The architects call these buildings aeroquays. By adopting this concept, the possibility has been created for considerable expansion, limited only by the area available and airport operational problems. With the present master plan, up to four aeroquays may be constructed. They will surround a central administration and control building.

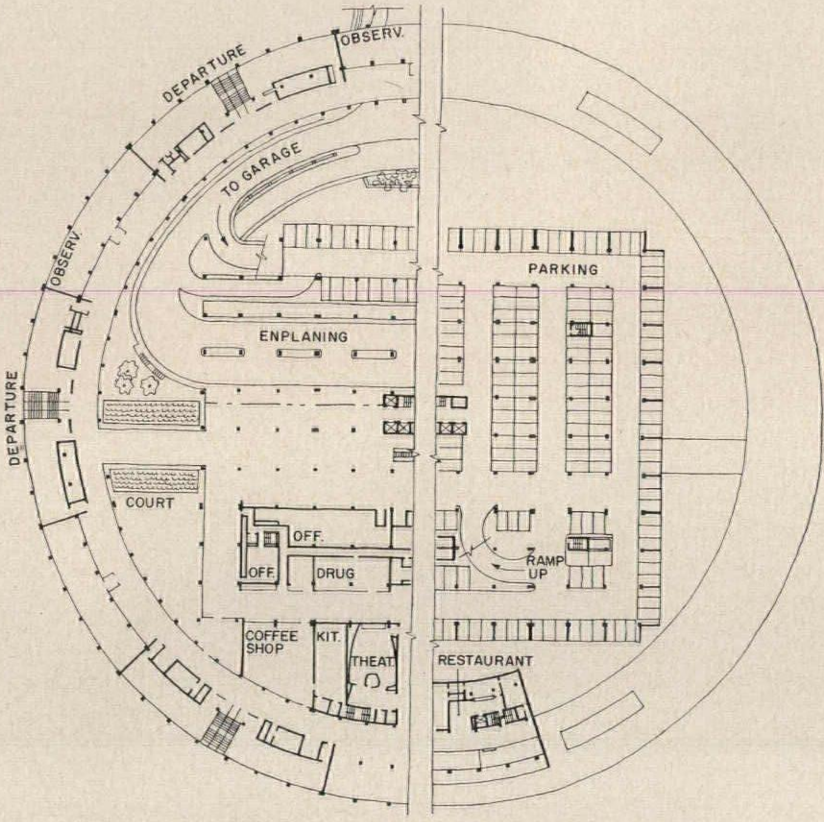
Each aeroquay will contain areas for all of the airline operational functions concerned with passengers, baggage, and aircraft servicing. Separate buildings will house the power plant, air conditioning equipment, administration, airways and airport control. Each aeroquay is an island, reached by grade-separated roadways. Each island contains its own automobile and pedestrian circulation system. Each has its own multi-level parking area. Passenger walking distances are shorter than is usual; maximum flexibility of movement for aircraft has been achieved; ground vehicular traffic on the ramp is kept to a minimum; passengers are protected from danger and annoyance; access and parking operations are efficient; snow removal from roads and aprons is fast and economical.



As may be seen in the views above and the site plan, each aeroquay is basically a multi-story building, composed of a rectangular core structure surrounded by an annular ring. Automobiles and other types of ground transportation approach the center structure underground via a grade-separated access driveway, then proceed up ramps to parking areas located, for the most part, on the upper floors. Elevators are provided in the center of the building for access to the passenger floors. The central structure houses, in addition to parking areas, various passenger and operational areas, including ticketing, baggage areas, concessions, customs and other government agencies, and airline operational areas. From here passengers may enter the annular ring which functions as a concourse, waiting area, and observation platform. Short fingers radiate out from the annular ring to the aircraft boarding stations. While these are one-story at present, provisions have been made for conversion to allow second level boarding

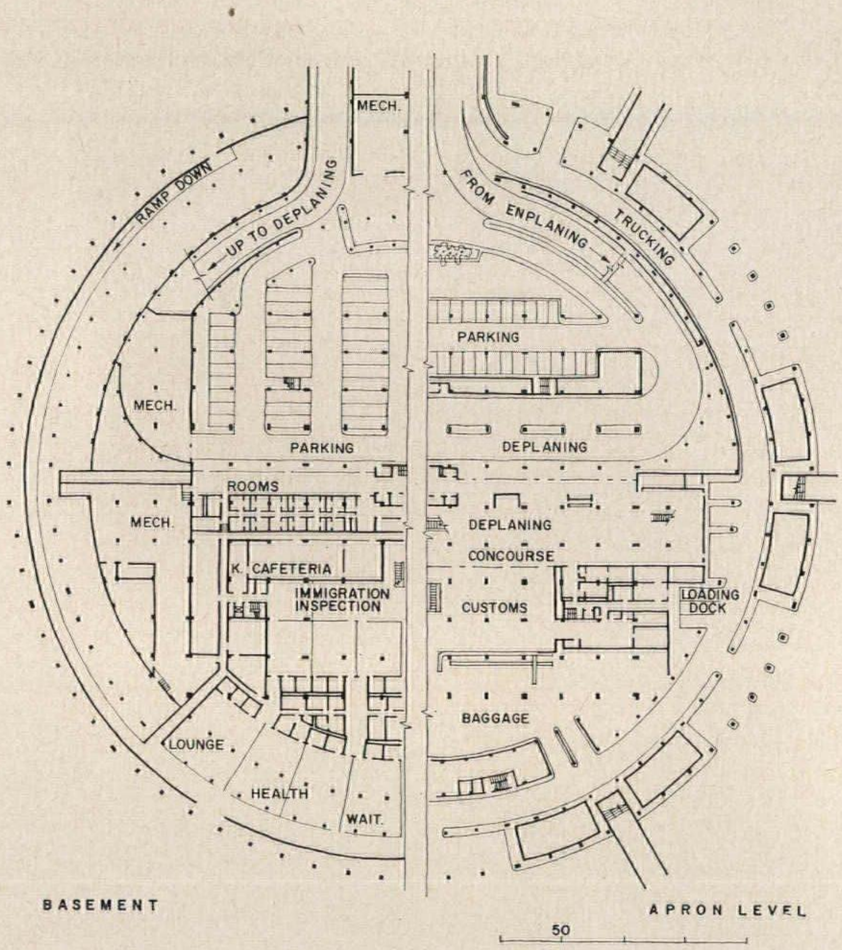


PLOT PLAN



SECOND FLOOR

RESTAURANT AND TYPICAL GARAGE FLOOR



BASEMENT

APRON LEVEL

Toronto

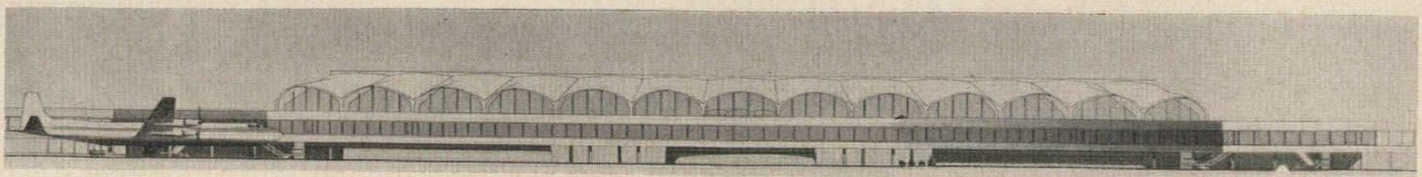
As may be seen in the plans, the annular ring structure has four levels. The central building will have ten stories. The number of stories may be modified, as required, to provide the amount of parking needed. Enplaning passengers enter the building in their automobiles on the ground level, and proceed to the enplaning temporary parking area on the second floor or directly up the ramp to the upper story parking areas. From here, they may use the five large elevators to reach the enplaning level of the building. Ticket offices and various concessions catering to their needs are located on this level. Deplaning passengers enter the building from the fingers on the apron level. They may go directly to the baggage rooms or to concessions. Temporary parking for deplaning passenger ground transportation and private automobiles is provided. Elevators are available for reaching the upper level parking areas. All passenger areas of the building are air conditioned and sealed for passenger comfort and for protection against the noise and fumes of the jets. The building structure will be steel frame.

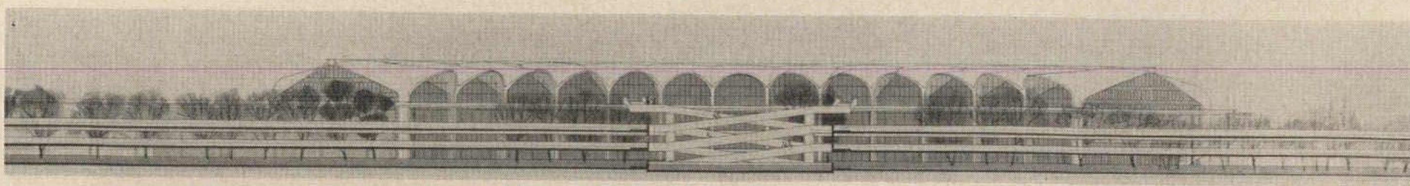
INTERNATIONAL AIRPORT, SAN FRANCISCO, CALIFORNIA

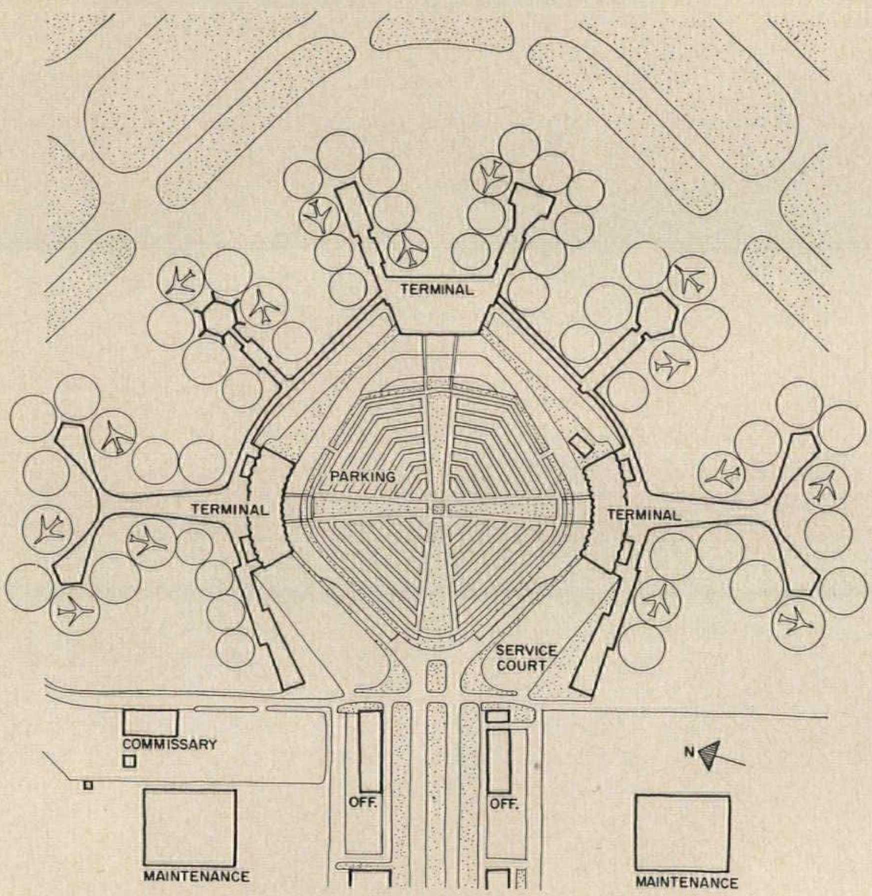
Welton Becket and Associates, Architects and Engineers; Wilsey and Ham, Civil Engineers; John A. Blume & Assoc., Structural Engineers; Dudley Deane & Assoc., Mechanical & Electrical Engineers

San Francisco is the fifth ranking air hub in the United States. It is one of the country's fastest growing airports. The buildings shown here have been planned to meet the present needs efficiently and allow for foreseeable expansion. The existing air terminal building was completed in 1949. It has facilities for handling more than 3 million passengers annually. Its design was based on an estimated volume of this number of passengers in 1960. In actuality, the volume had passed the 3 million passenger mark before 1957. When it became apparent that the airport would grow much faster than had been anticipated, the city engaged the Becket organization to make a master plan of the airport. The present layout is the result.

The master plan developed by the architects is based on the concept of decentralization of operational and passenger activities. The method used is the provision of a number of complete terminals, each serving a specific number of aircraft and passengers. The terminals are grouped around a central multi-story parking facility. The buildings are interconnected with covered, enclosed walkways and a two-level belt driveway running around the parking facility. Each of the new terminal buildings will contain approximately 300,000 sq ft of floor area. They will be constructed one at a time as the growth in traffic volume demands. When the terminals have been completed, in about ten years, the airport will have facilities for handling 60 jets simultaneously. The volume will be over 10,000 passengers per year. The design of the airport was predicated on the imminence of almost exclusive use of jet from this airport, expected increases in the size of the individual jet aircraft, as well as the large increase expected in the traffic volume.



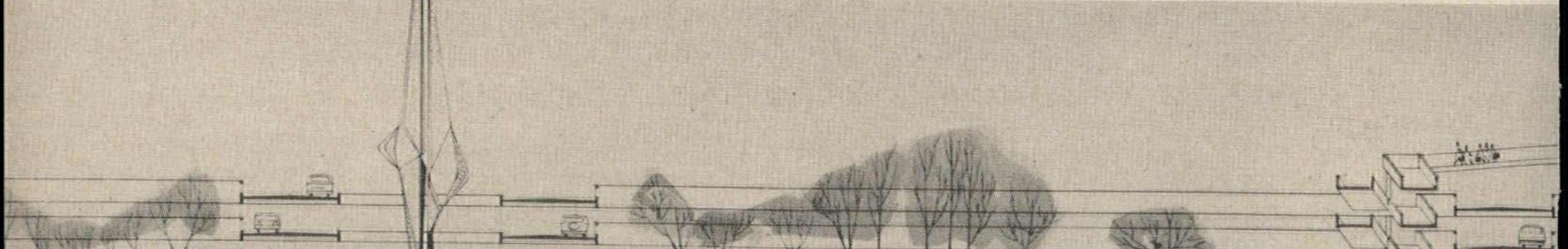


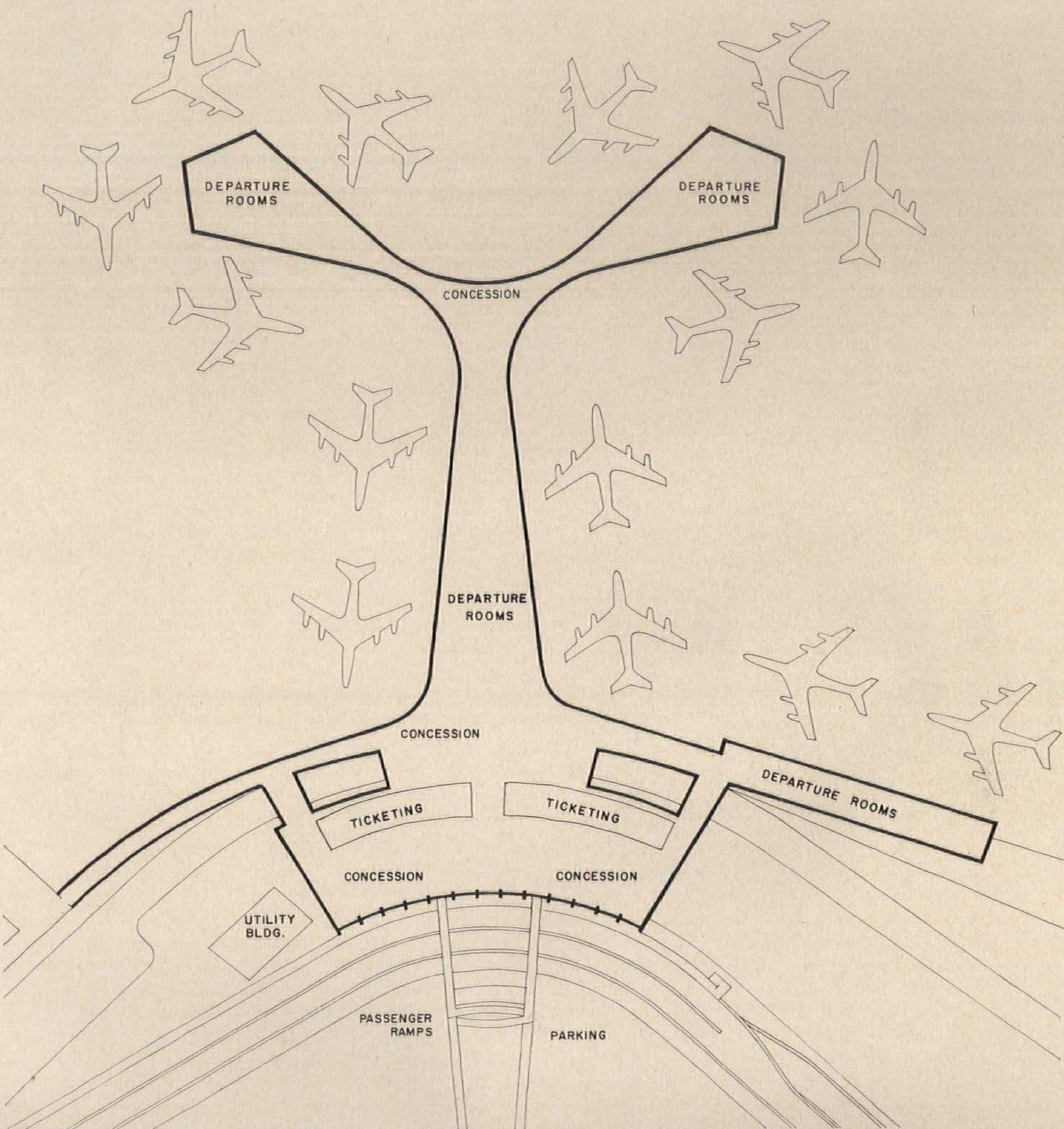


PLOT PLAN

San Francisco

The new facilities at San Francisco are additions to the existing air terminal building shown at top, center in the site plan. In the first stage of the new program, one of the terminal buildings (shown on the opposite page) will be built, the other to follow when increases in traffic require it. The three-level central parking area is gained via the access roadways and ramps. From here, ramps and overpasses lead to the terminal buildings. Each of the terminal buildings will have complete facilities for passenger, baggage, and aircraft handling. The terminal buildings are essentially two level structures. Each will contain areas and facilities on the second floor for enplaning passenger check-in, ticketing, and related functions including boarding of aircraft. On the ground level, provisions are made for deplaning passengers, baggage claim and related operations. Movable bridges will be used for aircraft loading and unloading. These will operate from the fingers




DEPARTURE ROOMS
DEPARTURE ROOMS
CONCESSION
DEPARTURE ROOMS
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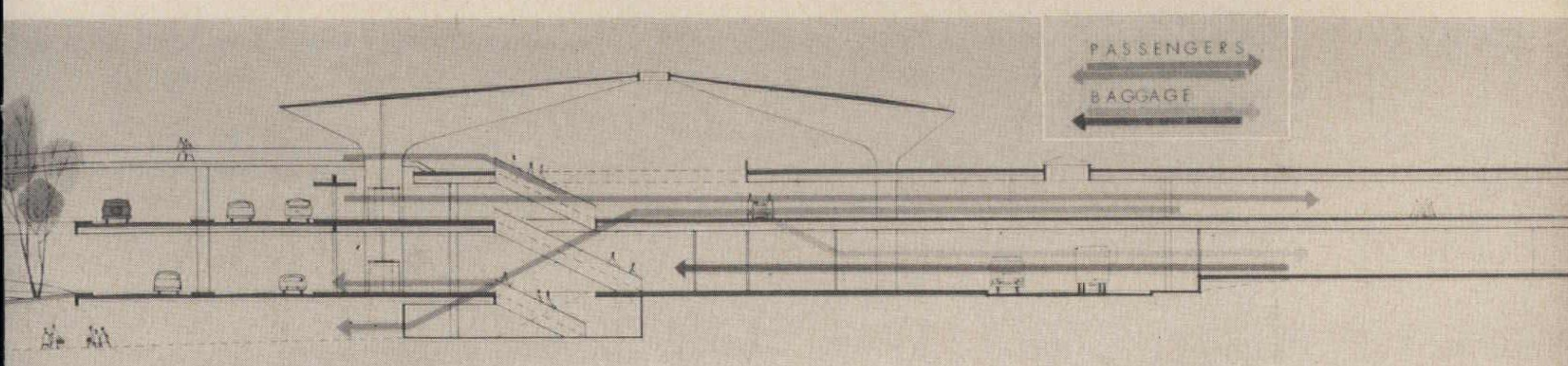
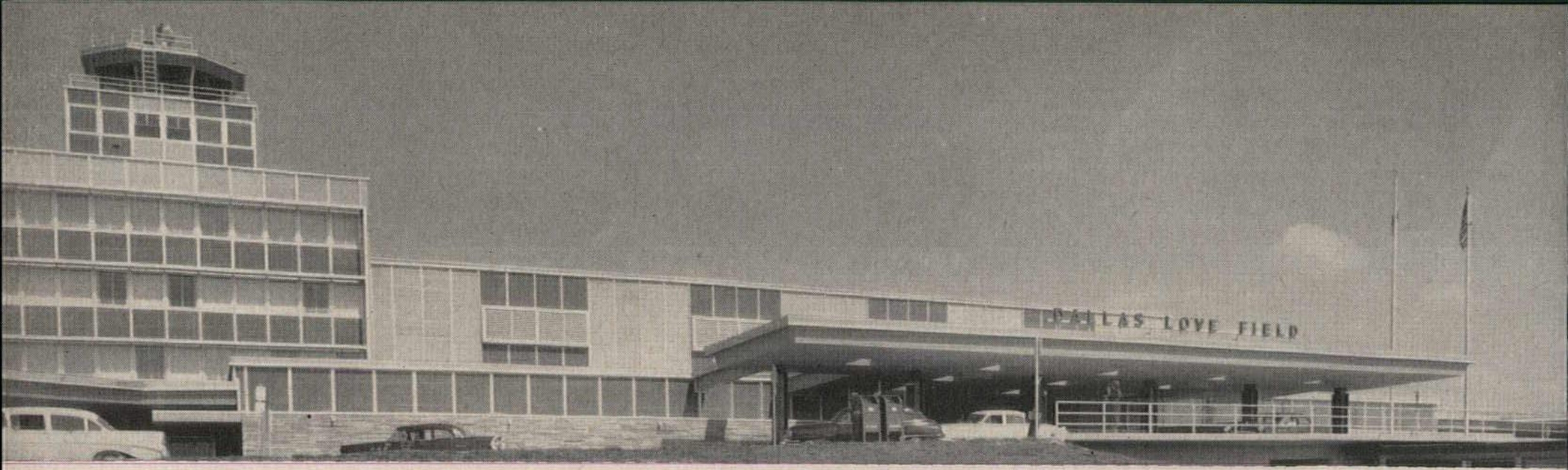
UTILITY BLDG.
PASSENGER RAMPS
PARKING


PASSENGERS
BAGGAGE



TERMINAL BUILDING, LOVE FIELD AIRPORT, DALLAS, TEXAS

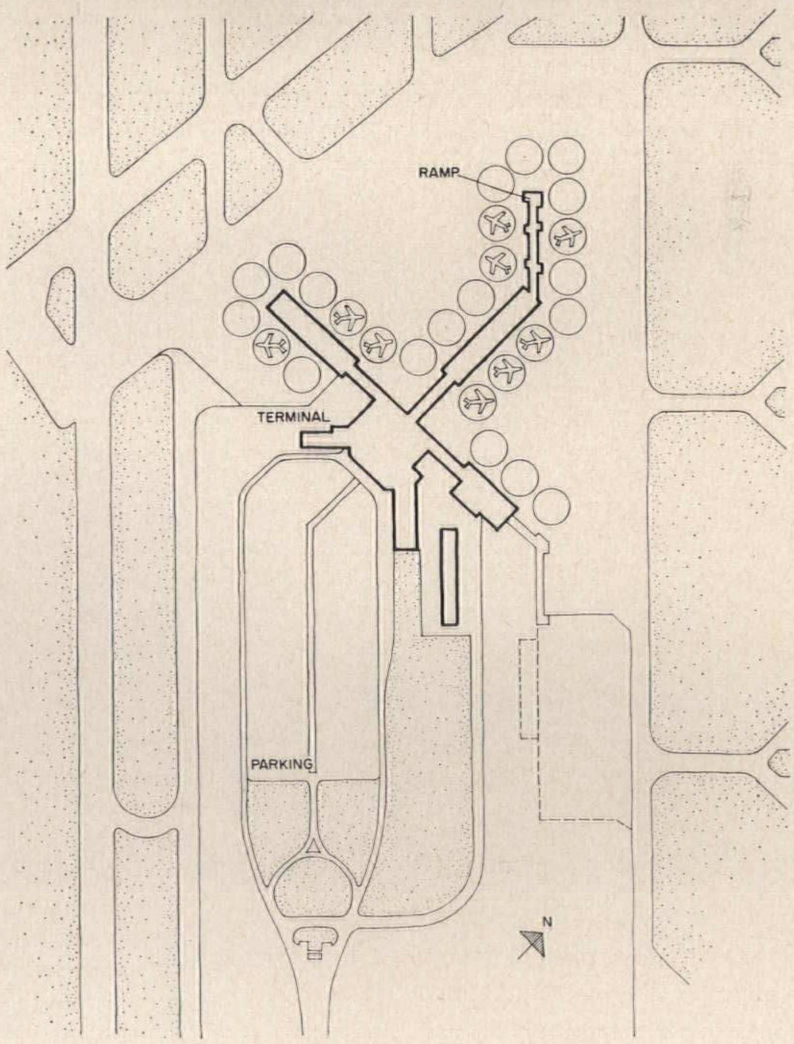
Broad and Nelson and Jack Corgan, Associated Architects & Engineers; Zumwalt Vinther, Mechanical and Electrical Engineers; T. C. Bateson Construction Co., Contractor

After considerable study, the architects for the Dallas airport terminal decided to use a one-story scheme. This is somewhat out-of-the-ordinary for a large terminal today. The Dallas airport is large by any standards. It had to be designed for the needs of over 6,000,000 passengers and visitors a year. In passengers, air mail, and cargo carried each year, it is the largest in the Southwest, about eighth in size in the country. Because of this great volume, the problems of passenger movement through the terminal and airline operational problems are acute.

In most of the larger terminals now being designed and constructed, two-level circulation systems are being used. In these systems, passenger movements may be restricted to one level, or enplaning and deplaning operations may be carried out on separate levels. The architects for the Dallas air terminal designed a one-level scheme. This eliminated the need for passenger movement up and down on escalators or stairs. To provide for free vehicular travel on the ramp without crossing of such traffic with passenger circulation, each finger is ramped up on an easy incline and then down toward its far end. The ground level was graded slightly down at the point where the finger is highest. Thus, enough grade separation was produced for vehicles to pass under the fingers. In order to allow passengers to move freely across the elevated section of the fingers, two-way moving sidewalks were installed at these points. Baggage problems have been solved at Dallas by providing enplaning passengers with entrances directly connected with individual airline ticket offices and by placing the baggage claim area on the opposite side of the building. In this way, passengers get rid of their luggage immediately after entering the terminal and reclaim it just before departing.

Squire Haskins photos

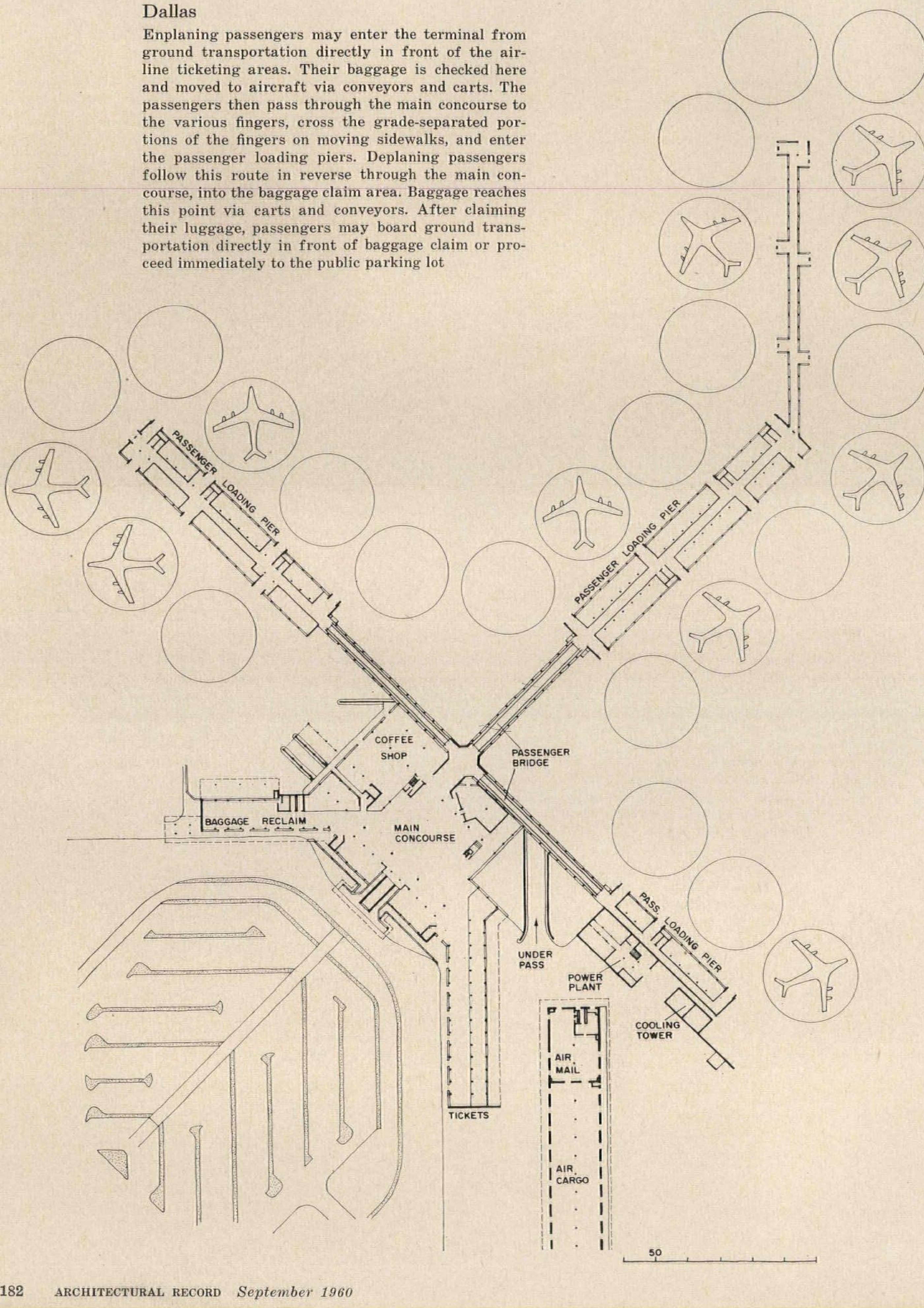
The general layout of the Dallas airport is based on the principle that the best place for the terminal building is mid-field, between the runways. This reduces the distances aircraft must taxi on take-offs and landings and therefore speeds up operations. The necessity for aircraft to cross one runway to reach another was eliminated. The passenger terminal is essentially a one-story building with a mezzanine, and one story fingers and departure lounges. Additional stories placed over portions of the building contain operational and office areas. Mail and cargo operations are carried on in a separate building. Parking for 1750 automobiles is provided in front of the main building. This area is convenient and easily accessible from the passenger and public sections of the terminal. The control tower is located over the main concourse of the building. Above the ceiling of the lobby is an attic with catwalks for use of maintanance men. Thus, light fixtures, air conditioning distribution systems, electrical and communication systems may be repaired without disturbing operations or annoying the public

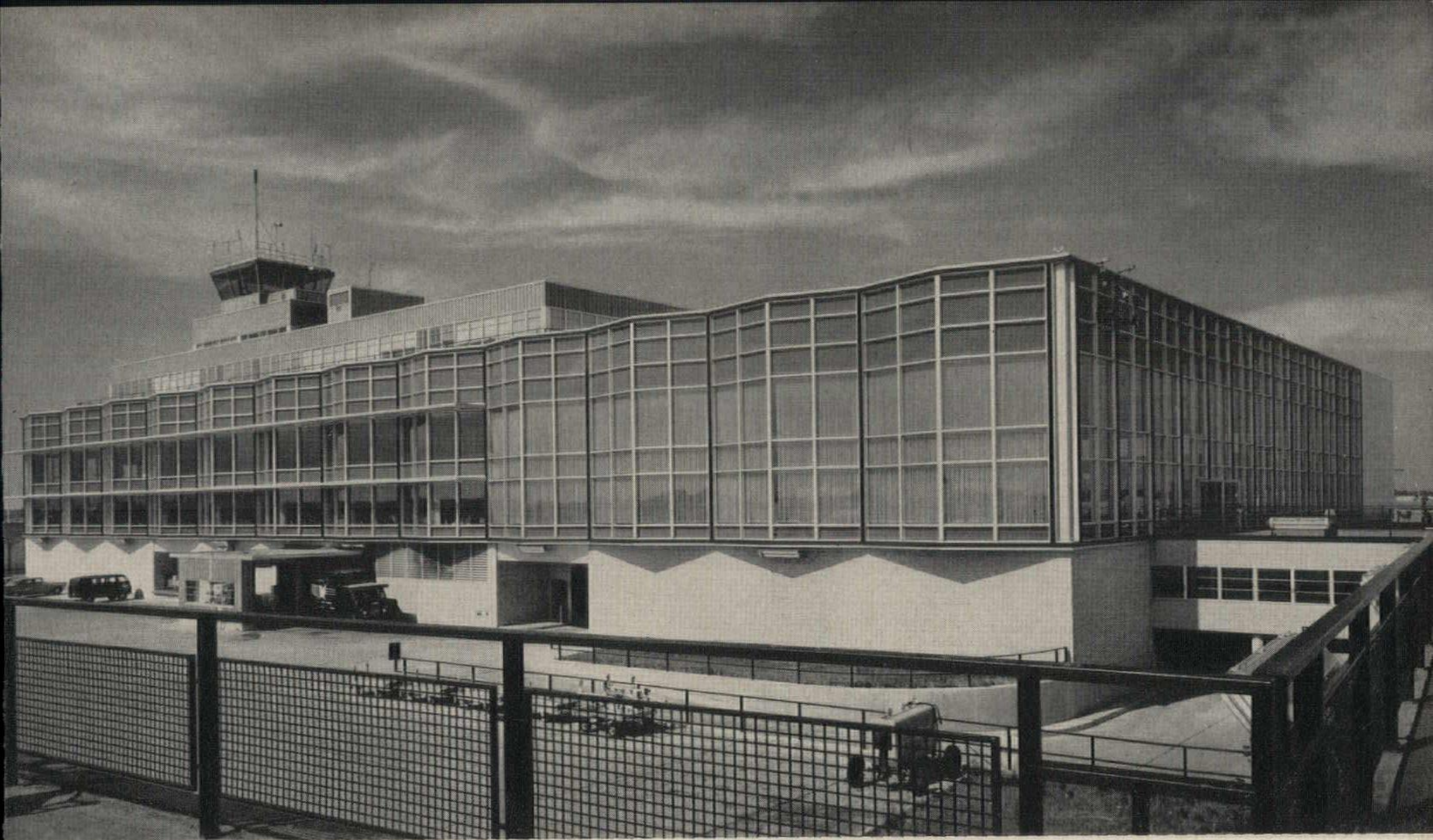


PLOT PLAN

Dallas

Enplaning passengers may enter the terminal from ground transportation directly in front of the airline ticketing areas. Their baggage is checked here and moved to aircraft via conveyors and carts. The passengers then pass through the main concourse to the various fingers, cross the grade-separated portions of the fingers on moving sidewalks, and enter the passenger loading piers. Deplaning passengers follow this route in reverse through the main concourse, into the baggage claim area. Baggage reaches this point via carts and conveyors. After claiming their luggage, passengers may board ground transportation directly in front of baggage claim or proceed immediately to the public parking lot





Lens-Art

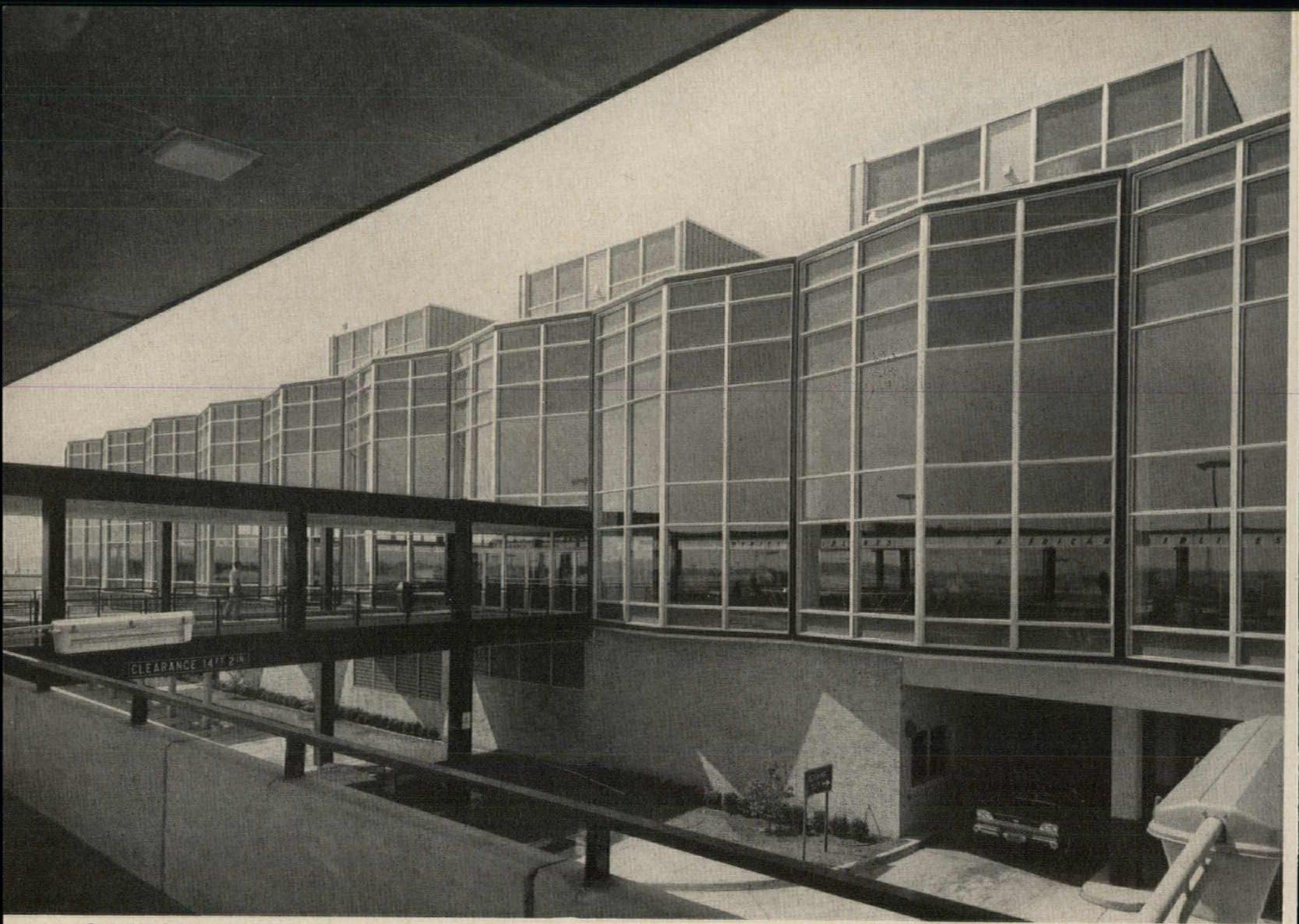
TERMINAL BUILDING, DETROIT METROPOLITAN-WAYNE COUNTY AIRPORT, ROMULUS, MICHIGAN

Giffels and Rossetti, Architects-Engineers; Landrum & Brown, Airport Consultants; O. W. Burke Company, Contractor

This airport terminal building is a simple and straightforward solution to the operational and passenger problems of present-day airports. The design of the terminal is based on C.A.A. projections of a peak-hour load of 775 passengers for the present first-stage building. The facilities were designed for expansion to allow for an expected increase in peak-hour volume to 1550 passengers in 1968.

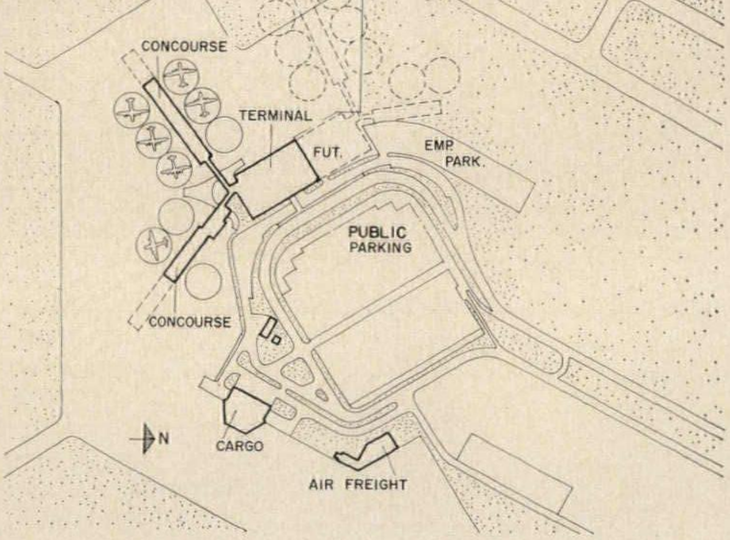
The first stage, now complete, consists of a three-story building, with a mezzanine between the second and third floors, and a partial basement. The mezzanine contains a dining room, observation areas, a large lounge, and a club room. The basement area is used for employe facilities, storage, and mechanical equipment rooms. Expansion will be accomplished by adding a third floor and extending the present building to the north. Eventually, the size of the building will be increased to almost double that of the present area.

The concept of the terminal and its auxiliary buildings involves the separation of passenger and operational functions from those of freight handling. Separate buildings are provided for cargo and air freight. The main terminal contains spaces for all other required functions. The third floor contains general administrative offices and a hotel with 36 rooms. Parking for passengers is provided for in front of the terminal between the driveways; employes park in a separate area north of the building. Passenger circulation is on two levels within the terminal; enplaning passenger functions are located on the second level, those for deplaning passengers on the ground floor. Fingers are single-level with departure lounges located on approximately 150-ft centers. Passenger areas are spacious and there is little cross-circulation.



Lens-Art photos

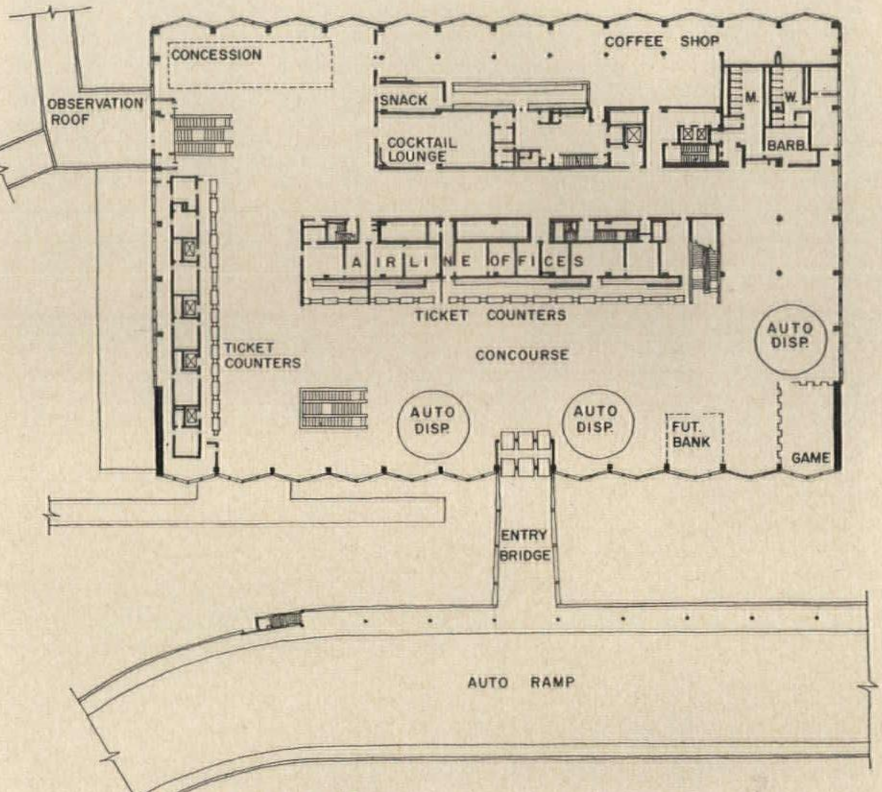
Above: view of the ground side of the terminal building, from the auto ramp at the second level. Shown are the pedestrian entry bridge and the ground level truck entrance. Left: two views of a departure lounge, showing its relation to the concourse and the seating arrangements. Below: master plan of the airport terminal and its auxiliary elements



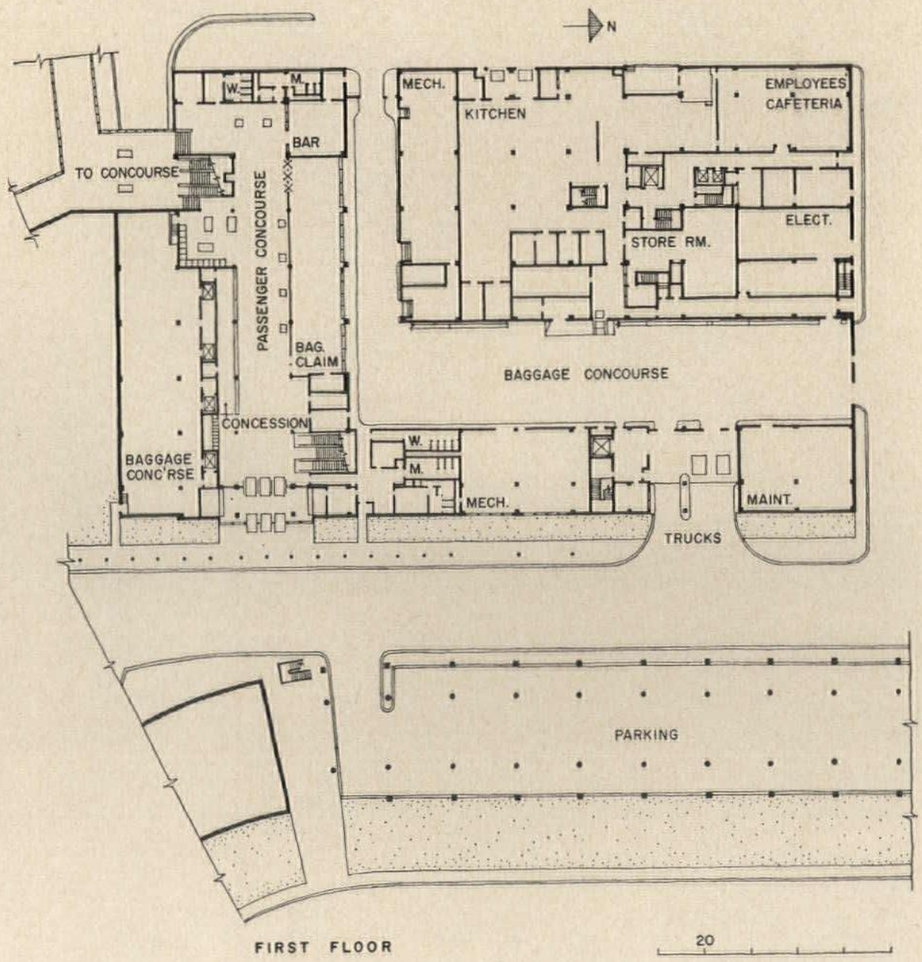
PLOT PLAN 200

Detroit-Wayne County

As indicated in the plans, the passenger areas of the terminal building are located on the first and second levels. In addition, a lounge, dining room, and other auxiliary spaces are included on the mezzanine. Enplaning passengers reach the building in automobiles or other ground transportation via the auto ramp on the second level. Entry from the ramp is by a bridge across the first level roadway. Ticket counters are located directly in front of and to the left of the entrance doors. It seems appropriate that in this airport for the motor city, the first thing the passengers see upon entering are two automobile displays which flank the entrance. Concessions are removed from the direct line of passenger traffic, but are conveniently located. Passengers may move from ticketing directly to the moving stairs which connect with the fingers. Deplaning passengers enter the building from the fingers, turn right and enter the passenger baggage concourse. From here it is only a short distance to the exits on this level, where ground transportation is located



SECOND FLOOR



FIRST FLOOR

Lens-Art photos

Detroit-Wayne County

Left, top: two views of the baggage-handling areas. The top view shows passenger claim areas, located on the ground floor. A spacious passenger concourse is provided. Individual baggage rooms may be closed-off from this area by overhead doors when necessary. The second view shows the conveyors used for transferring baggage between floors. Typical treatment of a private office and a portion of the main floor lobby and mezzanine are shown in the other views. The building structure is reinforced concrete frame on the first floor, structural steel frame above. Exterior walls are 4-in. concrete block (faced with brick or terra cotta) and aluminum-framed glass curtain walls. All of the walls are insulated with 2-in. glass fiber batts. Interior partitions are exposed concrete block in public areas, 2-in. solid plaster in private office areas

In recent years Italian architecture has been turning away from the esthetic established by the European modern movement towards a more experimental and more specifically Italian approach.

This new phase has provoked a number of uneasy critical comments, particularly in England, where some have expressed concern over what one English writer called "a drift from functional integrity."*

Most Italian architects, however, do not consider that recent developments represent a drift away from the basic principles of modern architecture. On the contrary, they see them as an attempt to apply these principles to Italian practice in a more responsible manner.

Recent Work of

THE BBPR STUDIO

On the following pages the RECORD presents an analysis of the recent work of a leading Italian architectural firm, the BBPR Studio. This group, which pioneered in establishing modern architecture in Italy, has also been a leader in the developments of the last few years.

Architects Belgiojoso, Peressutti, and Rogers (the fourth partner, Balfi, was killed in the war) summarize their architectural philosophy in these words:

Lodovico B. di Belgiojoso

Enrico Peressutti

Ernesto N. Rogers

"We have always regarded modern architecture as admitting of all kinds of solutions in keeping with the human quotient, as it is a method for controlling the imagination, not a rule with fixed forms.

"From the masters we have learned not to imitate past styles, but in designing a new organism we strive to put it into a 'sympathetic' relationship with its surroundings, whether natural or man-made.

"We believe that to be modern means to express in a present-day and authentic idiom the whole of experience; that is, to bring the whole of the past to life in our own history.

"Our work moves confidently towards this difficult goal."

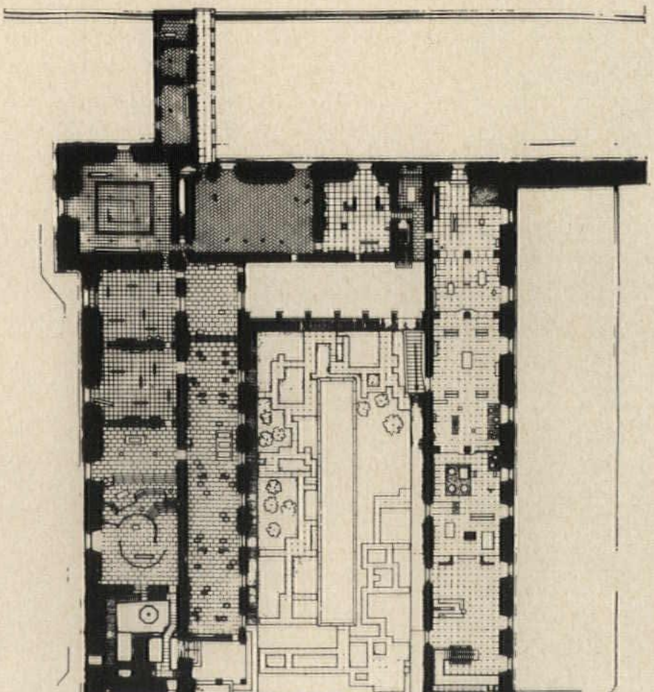
* Prof. Robert Gardner-Medwin in the *Journal of the R. I. B. A.* October 1958, p. 411

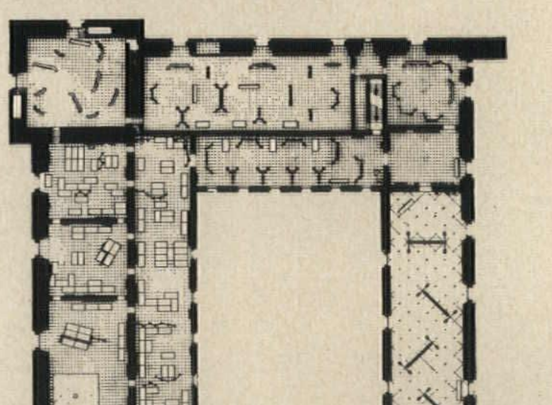
Recent Work — BBPR Studio

A REDESIGNED MUSEUM FOR MILAN'S CASTELLO SFORZESCO

Neither museum design nor the remodeling of historic buildings has ever had much of a place in the canon of modern architecture. They were not the type of program that was likely to appeal to the theorists of an architectural revolution. Nevertheless, such problems do exist, particularly in Italy, a country rich in both historic buildings and museums.

When the BBPR Studio undertook the remodeling of the Museum at the Castello Sforzesco in Milan, they had to apply the principles of modern architecture to a situation where there were few precedents to guide them. The sensitive manner in which they preserved the original character of the building, and the undogmatic but uncompromisingly modern approach that they brought to its design, marked a turning point in Italian architecture; and ushered in a period of experimentation in the firm's own work that still continues at the present time.





Left: Ground floor plan. *Above:* Second floor plan. *Top:* Modern glazing installed in the original window embrasures

Sforzesco Museum

In this building we see a pioneering architectural statement of the modern philosophy of museum design, which holds that it is preferable to display a few choice objects with care, rather than fill every available space with the entire resources of the collection

Recent Work—BBPR Studio

THE VELASCA TOWER IN MILAN

STRUCTURAL ENGINEER: *Prof. Arturo Danusso*
ASSISTANT: *Franco Ordanini*

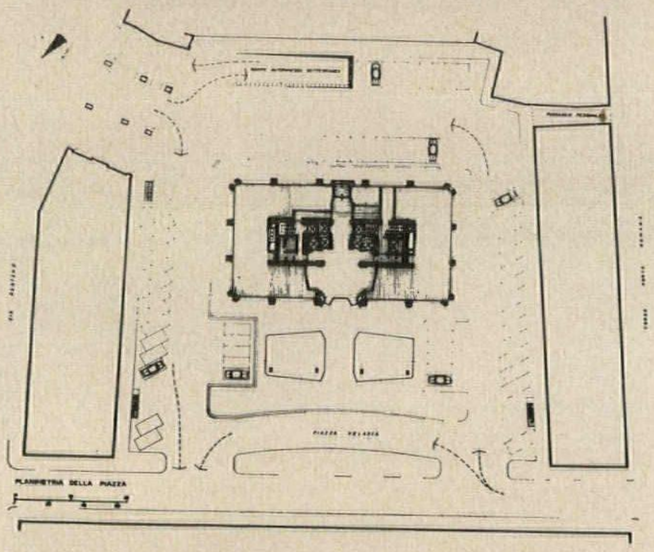
Model photograph of an early study for the Torre Velasca, designed for construction in steel. Compare with executed building in reinforced concrete, above

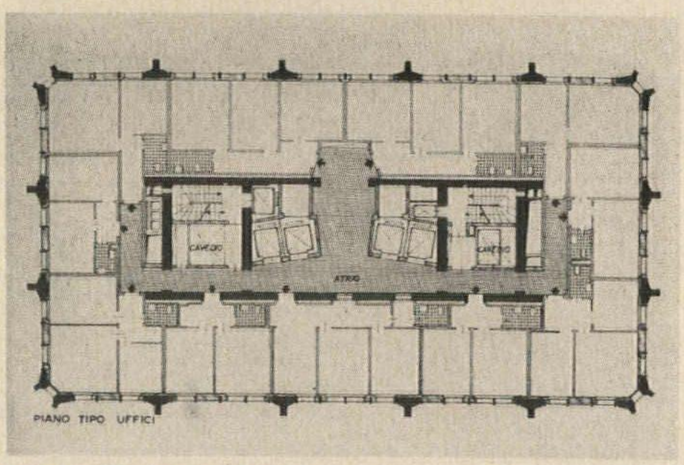
Velasca Tower, Milan

From the Sforzesco Museum, the BBPR firm went on to design the Torre Velasca in Milan, and few recent buildings have puzzled the critics more.

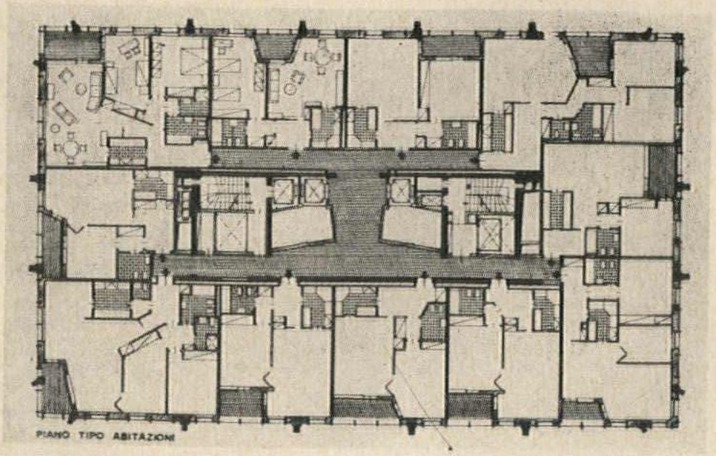
The project began as the steel-framed structure shown in the model photograph on the preceding page. A combination office tower and apartment house, the apartment floors were allowed to project slightly, expressing the fact that, with their services, they required a greater total floor area than the office space below. When this design went out for estimates, however, it was discovered that building conditions in Milan would make it 25 per cent cheaper to erect the building in reinforced concrete. The change of material necessitated modifications in the design, but the architects determined to keep the optimum floor plan sizes and make the resulting reinforced concrete structure strongly expressive of the forces involved.

It was fully in accord with modern movement theory to make the form of the building the direct expression of its dual function and to put the necessary structure to an esthetic use. In practice, however, the European modern movement is far more of a system of established forms than many people care to admit. As the architects moved away from the protection of this system, their esthetic necessarily became experimental; and there has been considerable controversy in evaluating the success of the experiment.

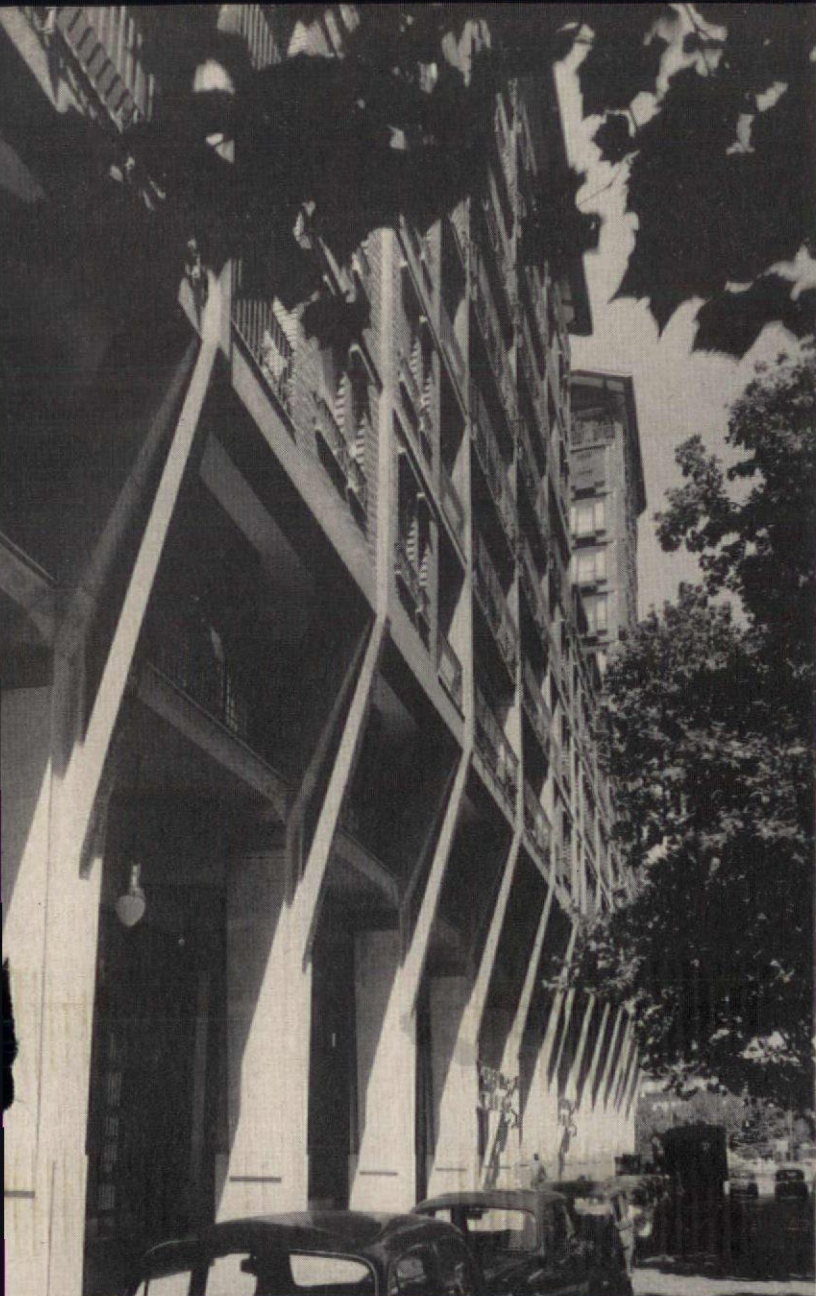


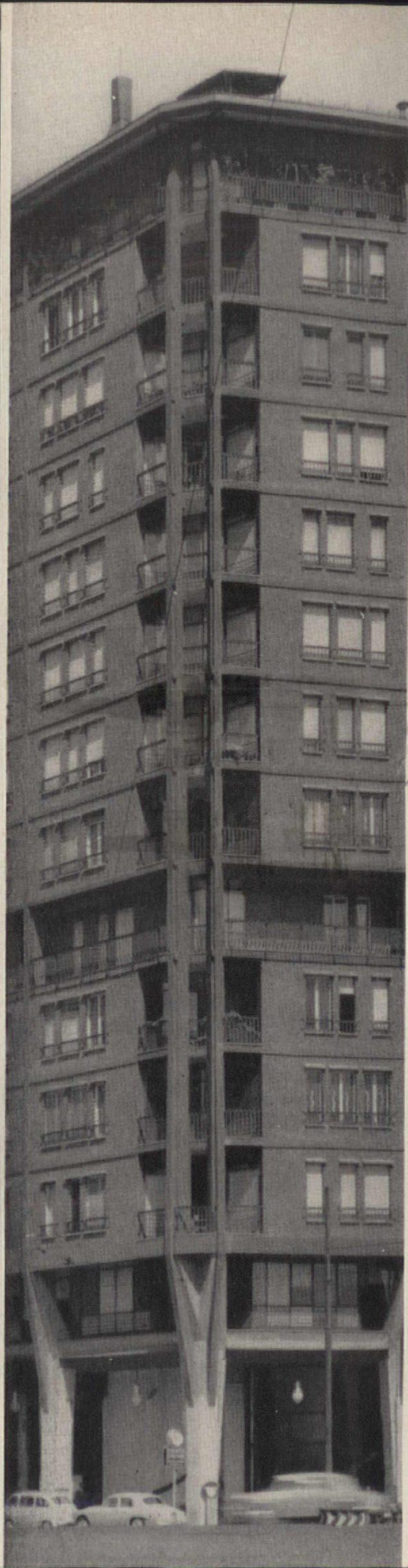


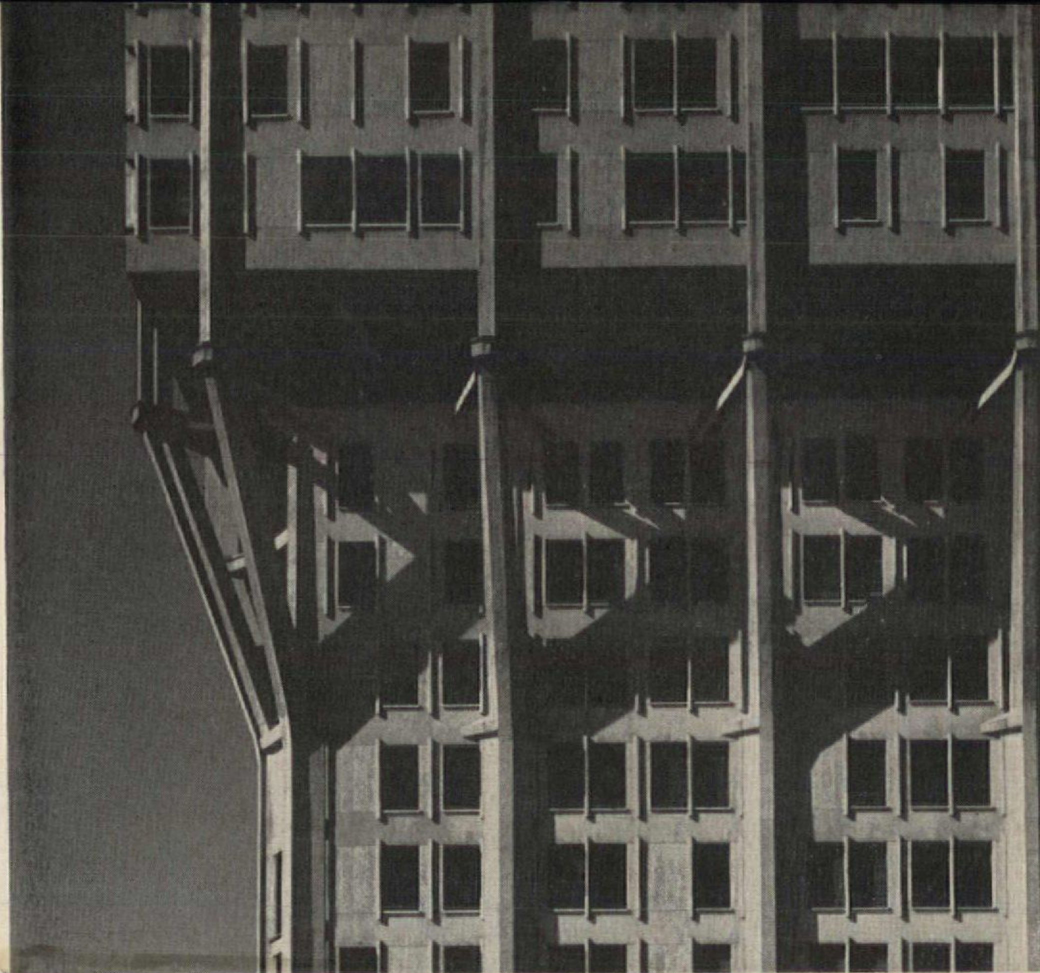
TYPICAL OFFICE FLOOR

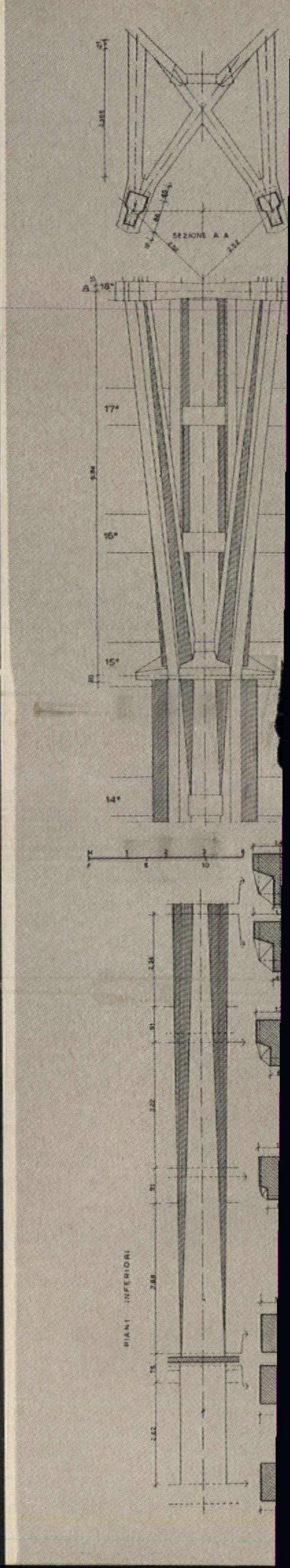


TYPICAL APARTMENT FLOOR







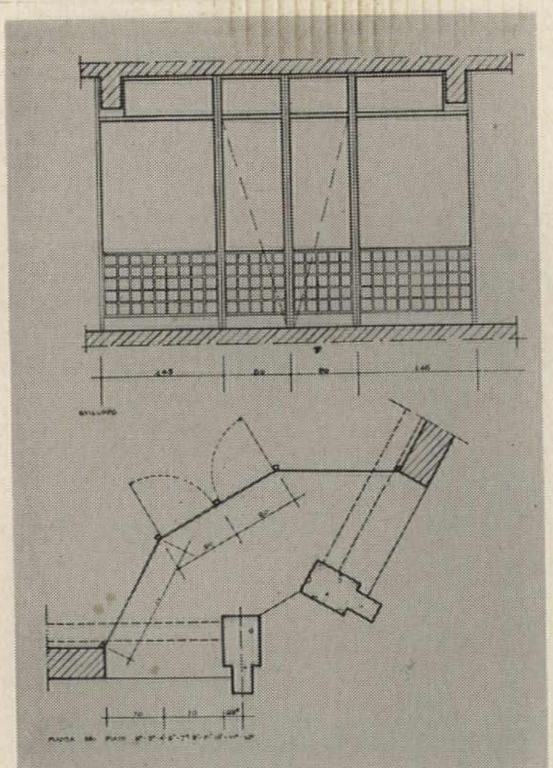

SEZIONE A A
18°
17°
16°
15°
14°
PIANI INFERIORI

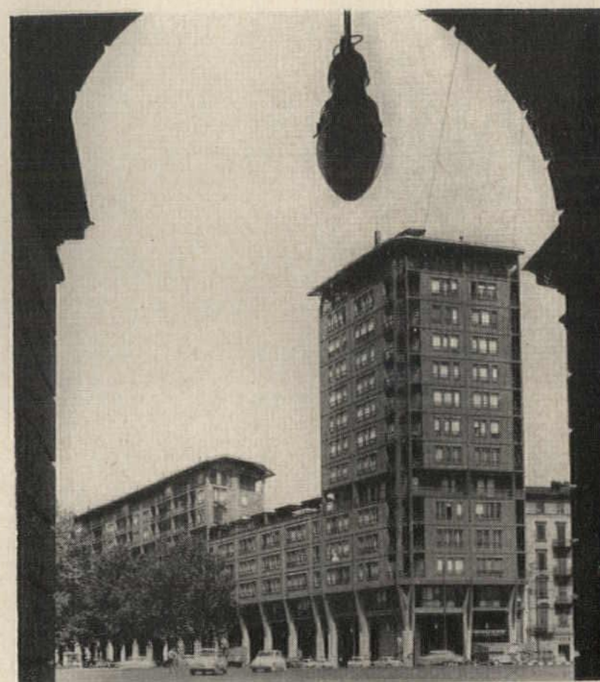
Recent Work—BBPR Studio

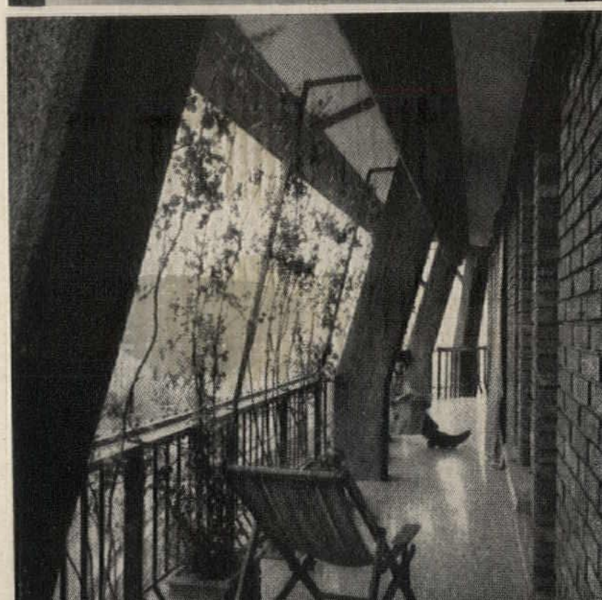
APARTMENTS AND OFFICES IN TURIN

ASSOCIATE ARCHITECT: *Gian Franco Fasana*
STRUCTURAL ENGINEER: *Prof. Giulio Pizzetti*
ASSISTANT: *Alvaro Redaelli*

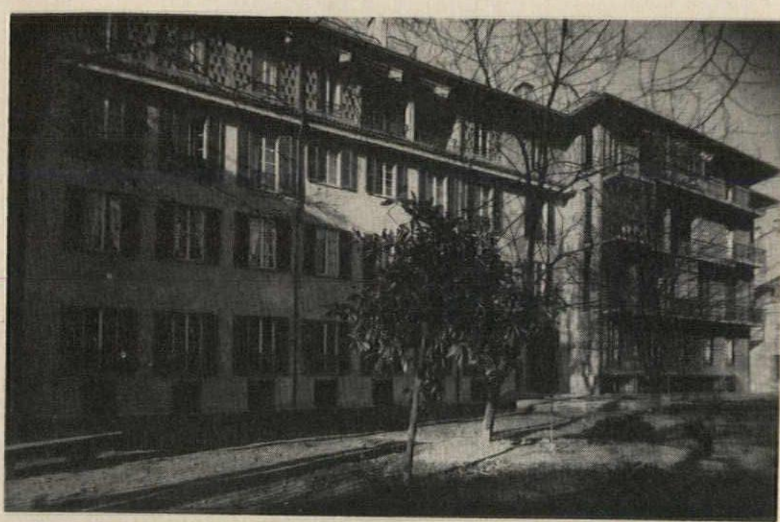
One of the major problems confronting modern Italian architecture is the need to design such traditional necessities as arcades and balconies. Both are an important part of Italian living patterns and neither was incorporated in the modern architectural esthetic that came to Italy from northern Europe. This combination office building and apartment house in Turin demonstrates the BBPR Studio's answer to this problem, achieved within the framework of the structural system first developed for the Torre Velasca.







Detail of one of the balconies shown in the photograph at left. Above right: The building framed by a traditional arcade across the street. Right: Top floor balconies



Recent Work—BBPR Studio

APARTMENTS ON THE VIA CAPPUCCIO IN MILAN

STRUCTURAL ENGINEER: *Aldo Favini*

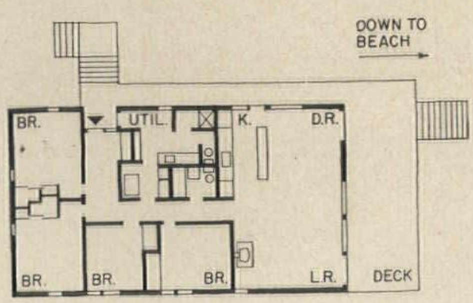
This apartment house, an addition to a seventeenth century structure that was damaged during the war, shows how the BBPR Studio interprets the problem of bringing a modern building into harmony with an older one through careful attention to materials and scale. Notice, however, the breaks in the floor slabs where the architects have varied the ceiling heights.

Photos courtesy Casabella, Casali, Fortunati, Fotogramma, Peressutti, Publifoto. Drawings courtesy Casabella

FIVE RESORT HOUSES

Nishan Bichajian

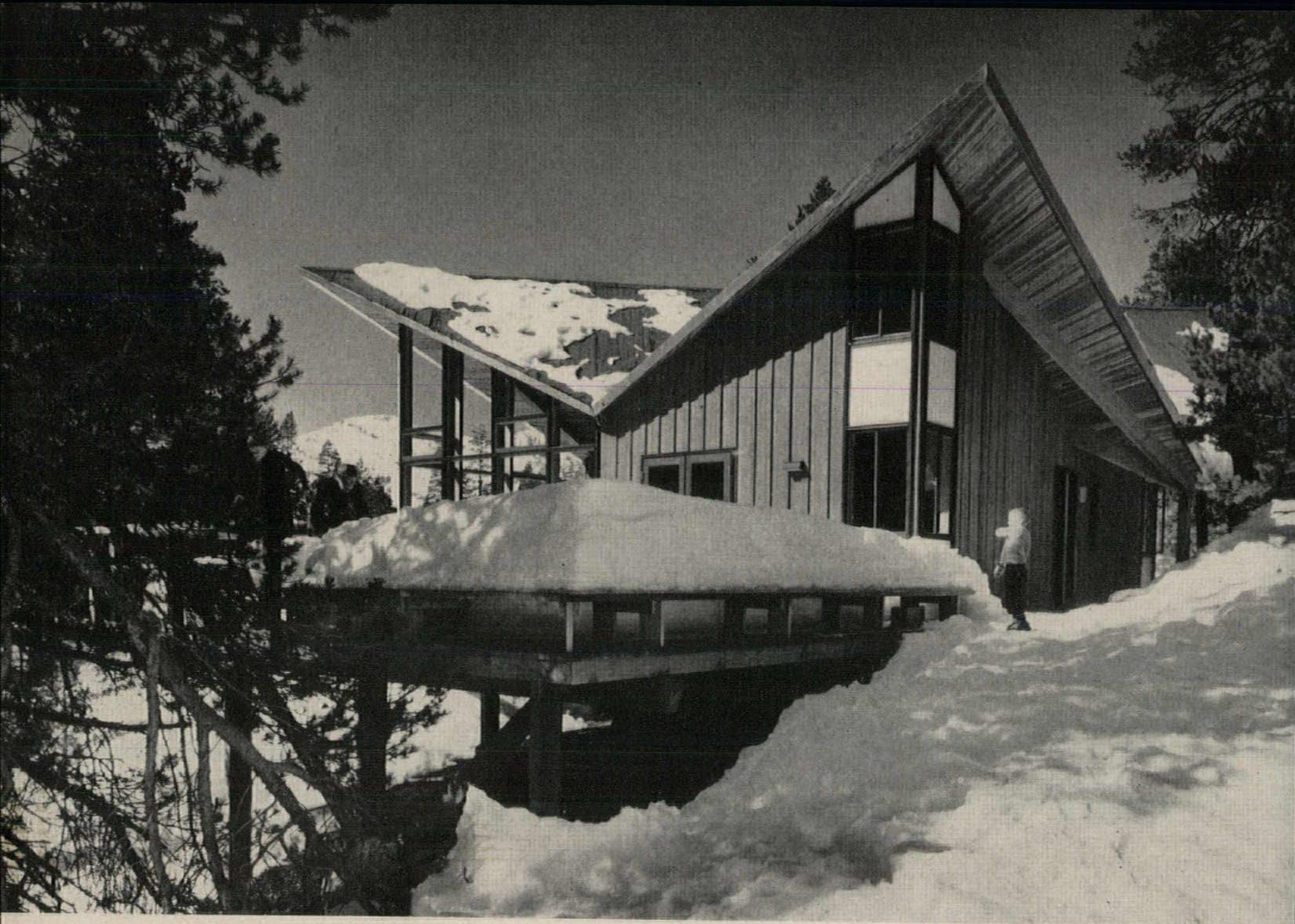
1. Hamilton & Goody, Architects



Beach house for Mr. and Mrs. L. William Spear, Gloucester, Massachusetts. William M. Read, Contractor. Frank J. Heger, Structural Engineer. Haley & Aldrich, Soil Engineers.

This trim and relatively compact beach house is designed to accommodate a small army of people. The Spears have five children who range in age from two to ten years. Two bedrooms are converted into dormitories by bunks, one room for girls, one for boys, with total space for eight children. Bunk beds are also used in a bedroom planned to house summertime student help. Living, dining and kitchen areas are all opened into one big family space with a deck. A mud room adjoins the entrance, and serves for "bath house" and laundry.

The house is supported on 12 concrete piers bearing on pads 5 ft below the surface, guarding against tides and sand. The house won the 1960 Boston Arts Festival Architectural Award in the Residential Category.

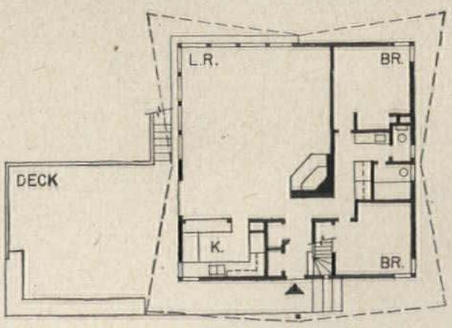


2. George T. Rockrise, Architect

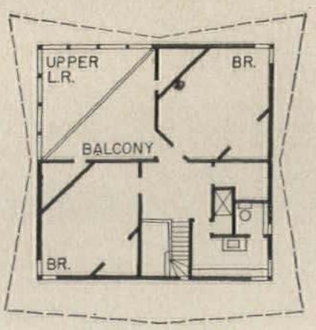
Lodge for George T. Rockrise, Squaw Valley, California. William B. Gilbert and Associates, Consulting Structural Engineers. Squaw Valley Construction Company, Contractor.

Comfort and economy are extremely well provided for two families (the owners and guests) in this mountain lodge in the High Sierras. The building is exactly 32 by 32 ft square, built on a 4-ft module, and has three levels for lowest cost, greatest use of view, ease of heating and privacy. The main level has general living areas, plus a suite for the children, with bunk rooms, laundry, and compartmented bath. Above this are two adult bedrooms, bath, and a den-guest area on a balcony. The basement (as yet unfinished) contains a game room, toilet, heater room and storage; access is via outside stairs, inside trap door and ladder. Basement walls are concrete block. Stud framing is surfaced with cedar boards and batts on exterior, fir plywood and cedar inside. Roof is of laminated 2 by 4's on edge.

Ernest Braun



FIRST FLOOR



SECOND FLOOR

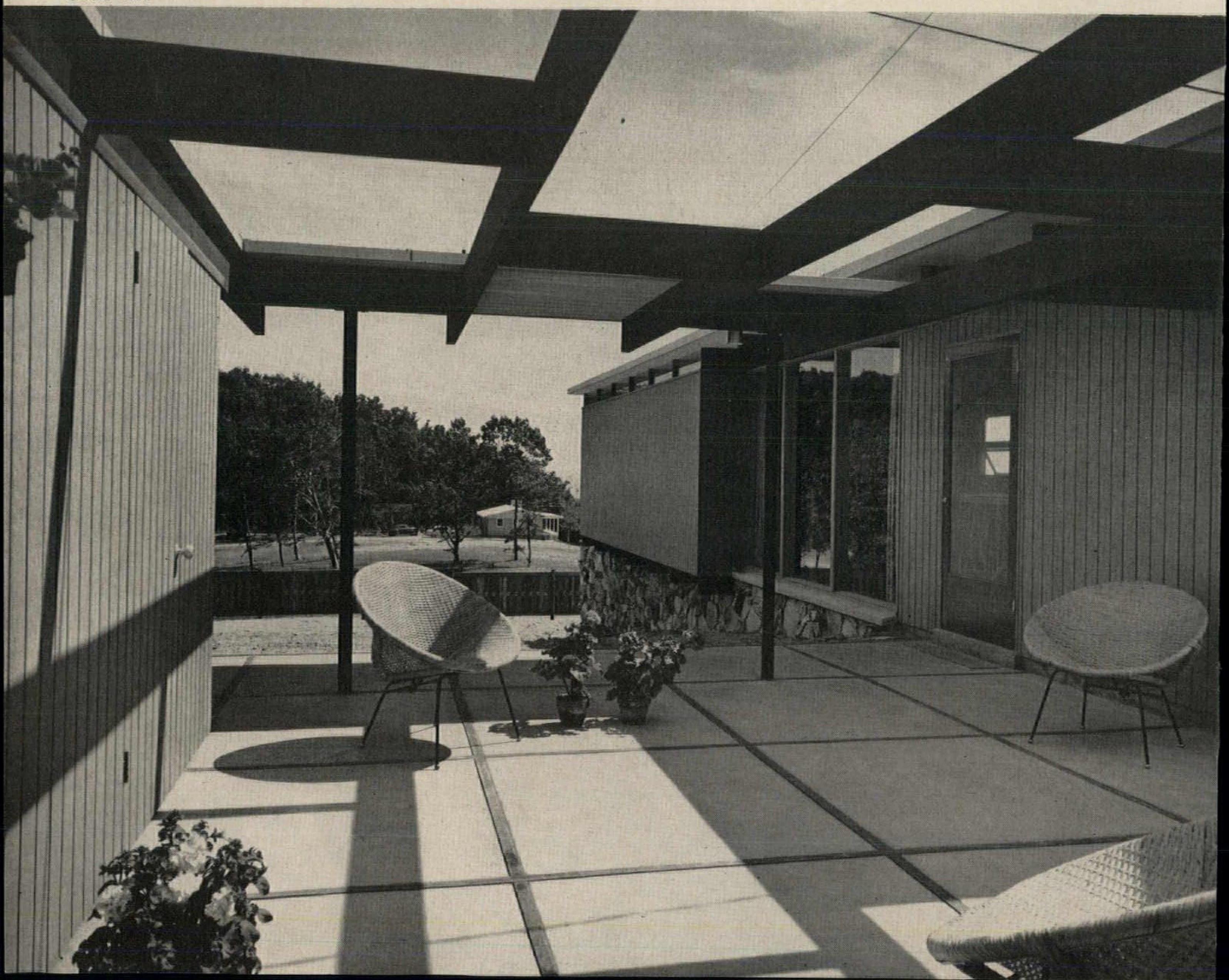
3. J. & G. Daverman Co., Architects

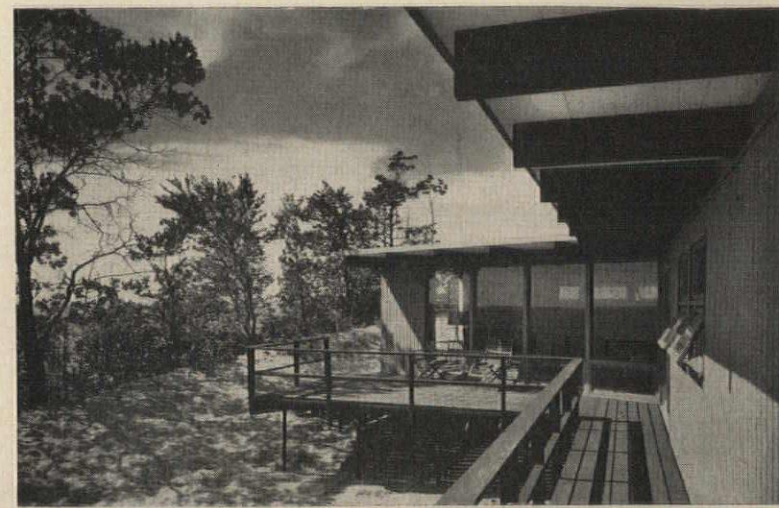
Summer home for Mr. and Mrs. Herbert G. Daverman, near Holland, Michigan

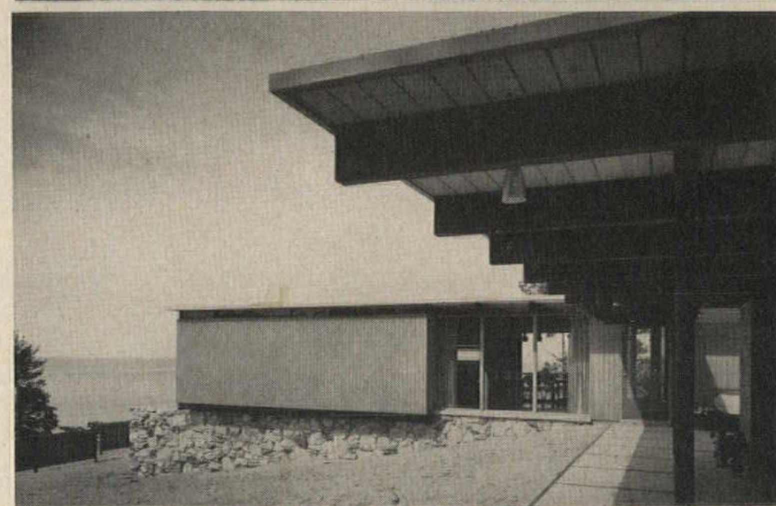
This pleasant, practical and easy-to-keep lakeside summer home was planned for an architect, his wife, and their three teen-age children. It is situated on the east coast of Lake Michigan, two miles north of the Holland channel in a rather secluded area of drifting dunes. The crest of the site is 90 ft above the shore. All rooms face the view and have direct access to outdoor board walks and a stair to the beach. Three-foot overhangs and a cluster of trees to the northwest give protection from the sun.

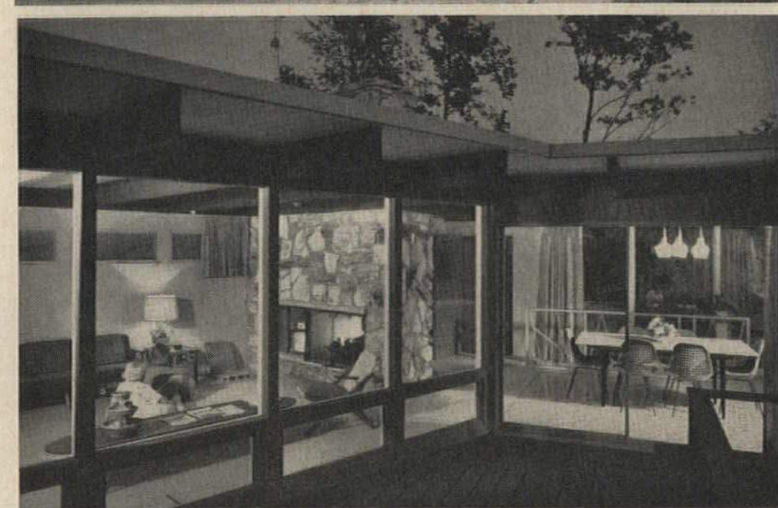
The structure is post and beam, on a 4-ft module. The exterior is grey-stained plywood and stone. Interiors are of dry wall construction, with the exception of the sandstone fireplace. The lower level floors are vinyl tile over concrete on grade; on the main level, floors of kitchen and dining areas are surfaced with vinyl tile, and carpet is used in living room, master bedroom and bath. Heating is by forced-air, oil-fired plant.

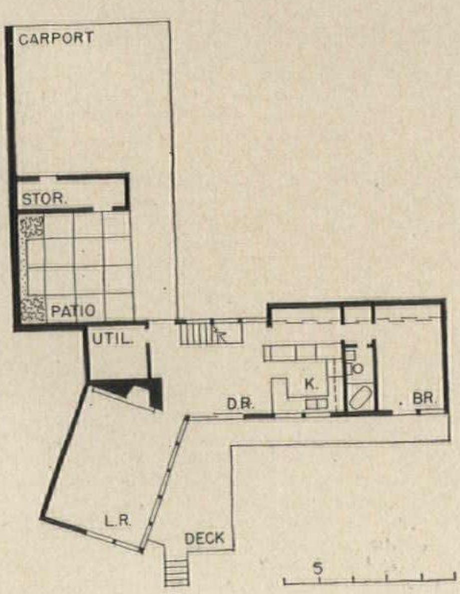
Gerald Gard







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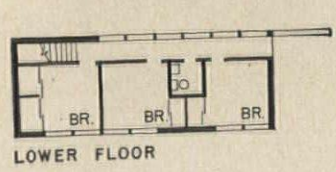
BR.
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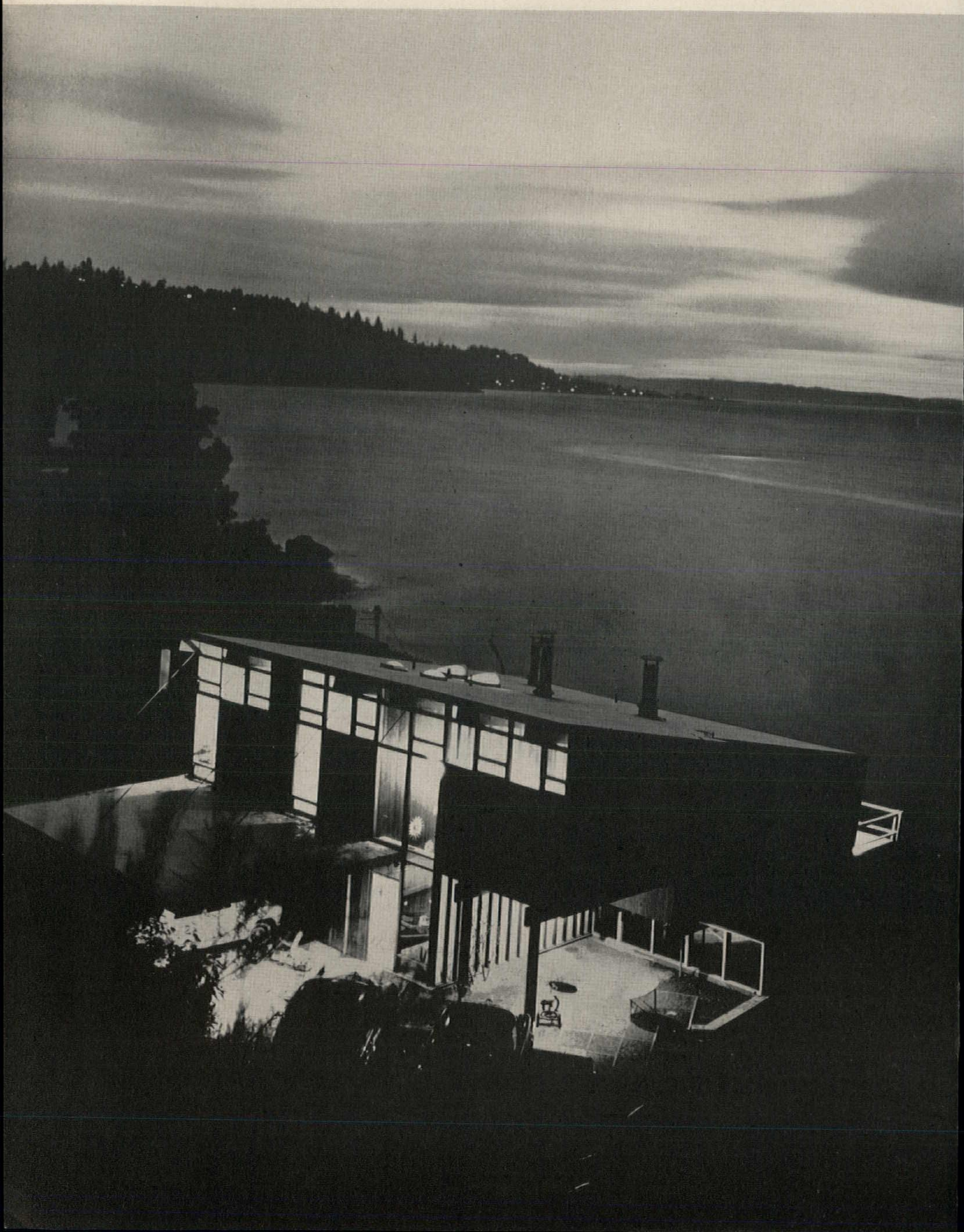
LOWER FLOOR

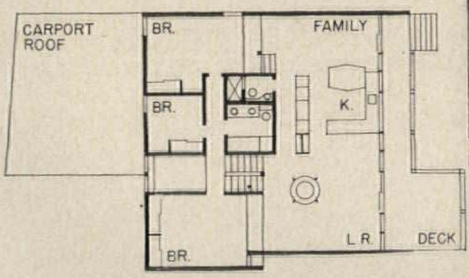


4. Harold I. Nesland, Architect

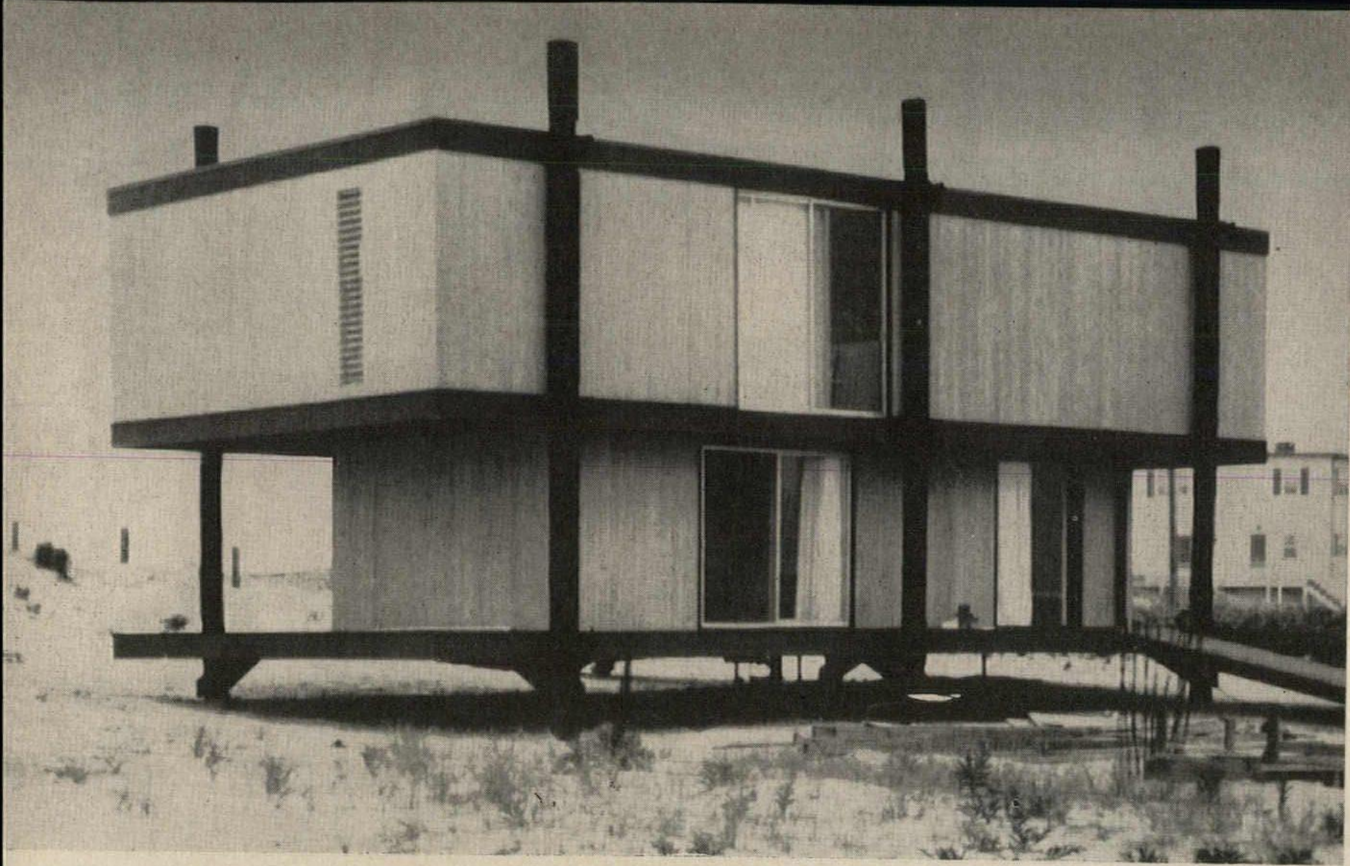
House for Mr. and Mrs. Gordon H. Cheney, Seattle, Washington. Kane & Ervin, Engineers. Frank Haupt, Contractor.

A sweeping view of Puget Sound and the Olympic mountains dramatize the resort atmosphere of this waterfront house. The plan is a split-level one, with portions of the house raised above the ground to provide parking areas, sheltered patios, access to the beach for boats, beach activities, and boat storage. The entry is at road grade; at the same level are rooms for crafts, workshop, furnace and storage—stairs lead down to boat storage and beach.

Living areas are at a half level above the entry, and bedrooms are up another half level. Construction is post and beam, with cedar exterior. The carport roof is hung from the house by ¾-in. tie rods to avoid posts in a restricted parking and turn-around area. The entrance hall is two stories high, and is separated from the adjoining patio, and the master bedroom above by a plastic screen.



Art Hupy



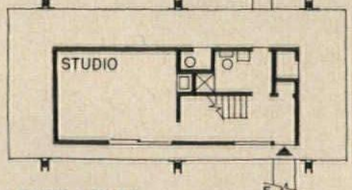
5. Peter Blake and Julian Neski, Architects

Beach House for Miss Evaline Ness, Surf City, New Jersey

A structure strongly recalling traditional dock construction is used for this year-round beach house. Located behind a sand dune facing the Atlantic Ocean, the entire house is suspended within a network of six piles driven directly into the sand. Main rooms, with adjoining screened porches, are on the upper level to make the most of the ocean view and the breezes. The lower level is set back to afford a covered deck all around.

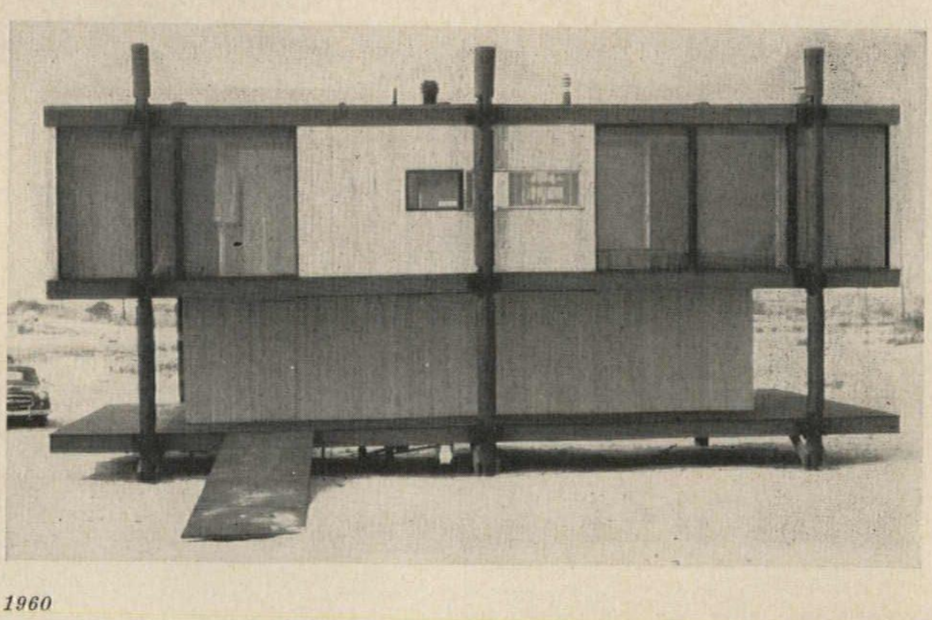
Girders are hung from the piles by steel brackets; beneath the lower level, 3 by 8 braces are bolted to each side of the piles. Walls are stud frame, with 1 by 4 diagonal bracing let-in.

The colors are fairly neutral, with bright accents: the piling is black creosote finish; beams and fascia are stained charcoal grey; decking is deep brown, and siding is natural weathered grey. The doors throughout the house are painted orange and yellow ochre.



UPPER LEVEL

LOWER LEVEL



OFFICE BUILDINGS

● RECENT EXAMPLES

One Hundred California St. Building, San Francisco, California

Leader Federal Building, Memphis, Tennessee

Equitable Life Building, Pittsburgh, Pennsylvania

Phoenix-Rheinrohr AG Building, Dusseldorf, Germany

● PLANNING OFFICE BUILDINGS FOR AUTOMATION

IBM Datacenter, Time and·Life Building, New York, N. Y.

Bank of America, One South Van Ness Building, San Francisco, California

BUILDING TYPES
®
STUDY 286

All photos by Roger Sturtevant

HEADQUARTERS BUILDING COLUMNS FRAMED OUTSIDE

Headquarters, Bethlehem Steel Company
One Hundred California Street Building

LOCATION: *San Francisco, California*

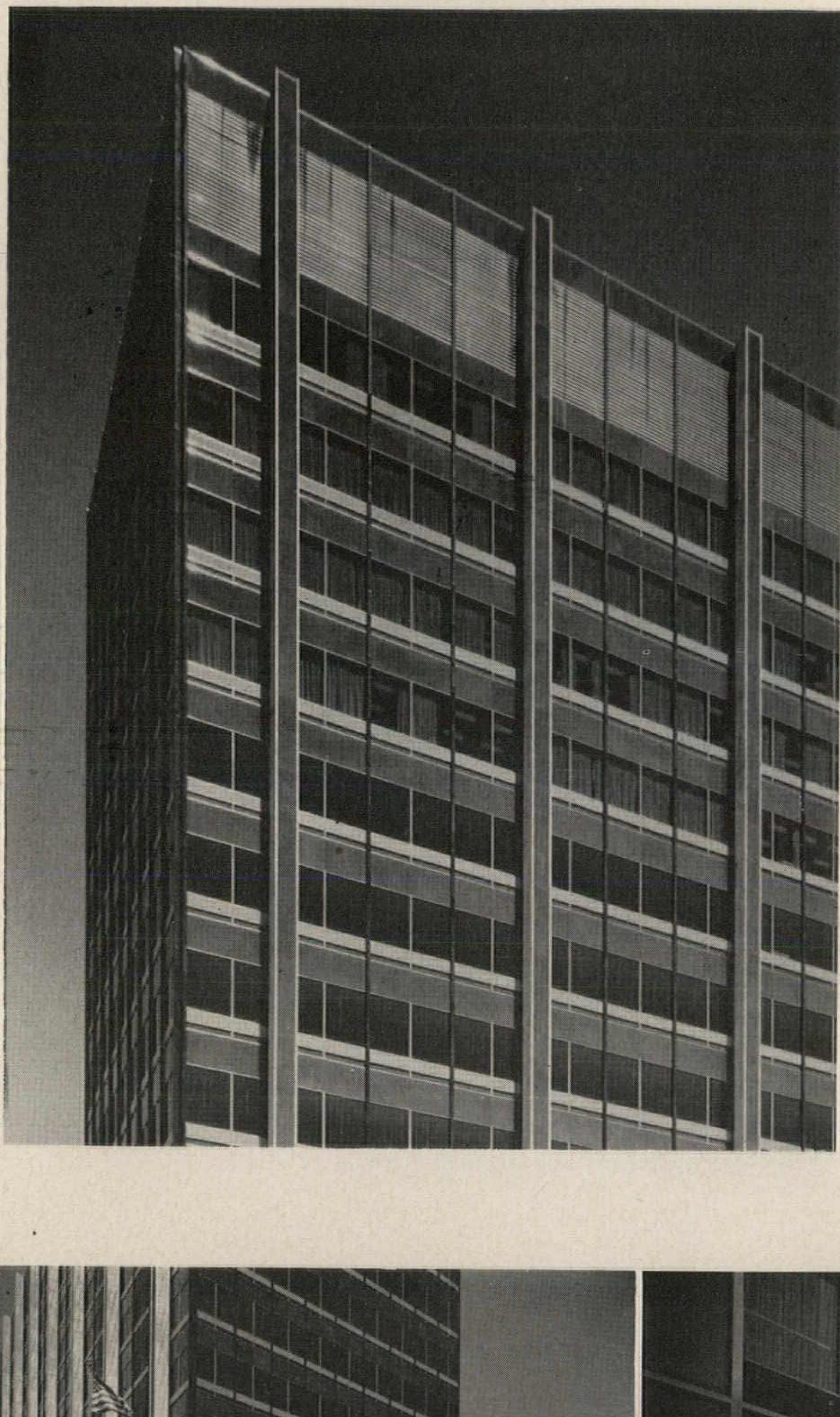
ARCHITECTS: *Welton Becket and Associates*

STRUCTURAL ENGINEERS: *Hayes & Little and John A. Blume & Assoc.*

MECHANICAL ENGINEERS: *Dudley Deane & Assoc.*

CONTRACTORS: *Swinerton & Walberg Co.*

By locating the exterior columns outside of the walls, the architects of this office building have found a way to free the curtain wall from the hard-to-detail joints between columns and wall. For added measure, the scheme used results in office floor areas free of all columns other than those in the interior. As usually required in California earthquake areas, the building structure has been designed to withstand seismic loads. More unusual are the instruments which have been placed within to record the effect on the building of any future tremors. The two accelerometers used will keep records of accelerations, while eight displacement gages measure building displacements during earthquakes and severe windstorms.

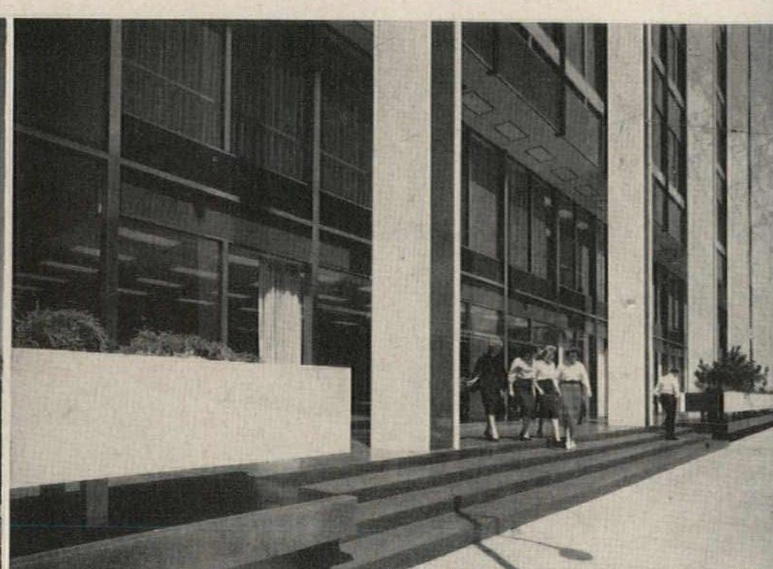


One Hundred California St.

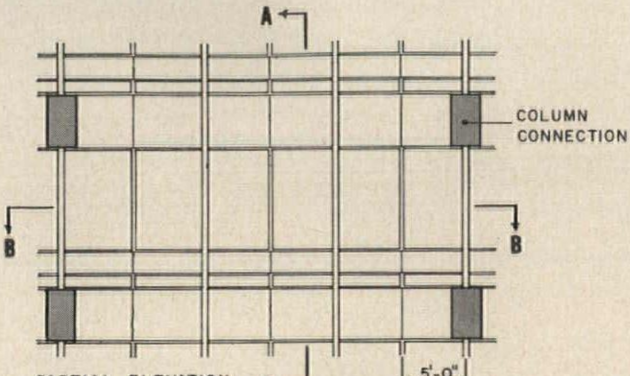
The most immediate impression of this building when seen from the outside is that resulting from the strong verticals of the free-standing columns. Since these occur on only two sides of the building, there is no real appearance of verticality on the remaining sides. This creates an interesting change of pace as one walks around the site. To add to the illusion, the white marble on the sides of the columns shows from one direction, while from the other the strong black of the granite is visible, outlined by thin lines of marble. A great amount of importance attaches to this building visually, since most of the buildings in the surrounding area are considerably lower and much older.

As may be seen in the closeups of the building entrance, the setback from the street, the plaza, the lofty ceiling height of lobby, and the low platform on which the building sits result in an undeniable feeling of majesty and refinement in the overall effect.

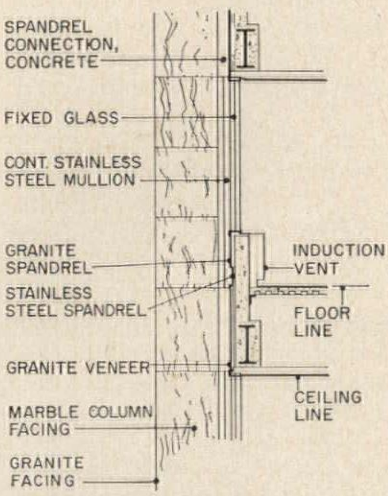
The curtain wall, which sheathes the building, consists of a stainless steel frame into which alternating bands of black granite, gray granite, and gray-tinted glare reducing glass have been inserted.



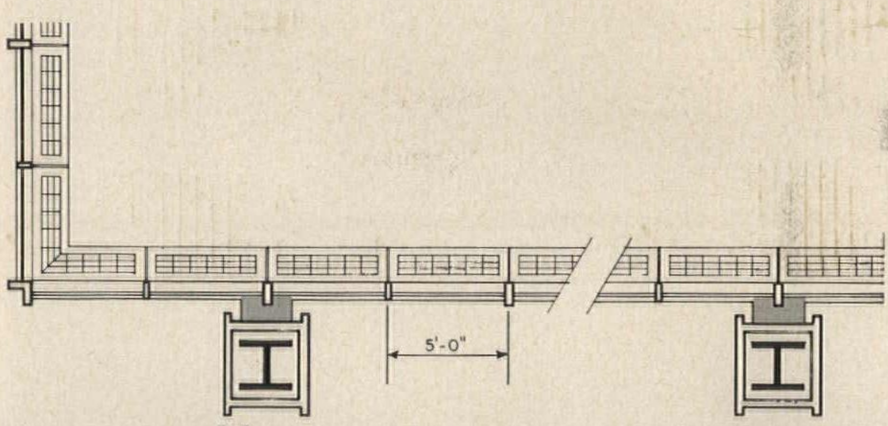
The details on this page show the handling of the curtain wall in this building. Exterior columns are free-standing, allowing space for the walls to pass behind them. At each floor, the columns are tied back into the main structure with steel box girders, fireproofed with concrete. Wall panels are stainless steel and two shades of granite



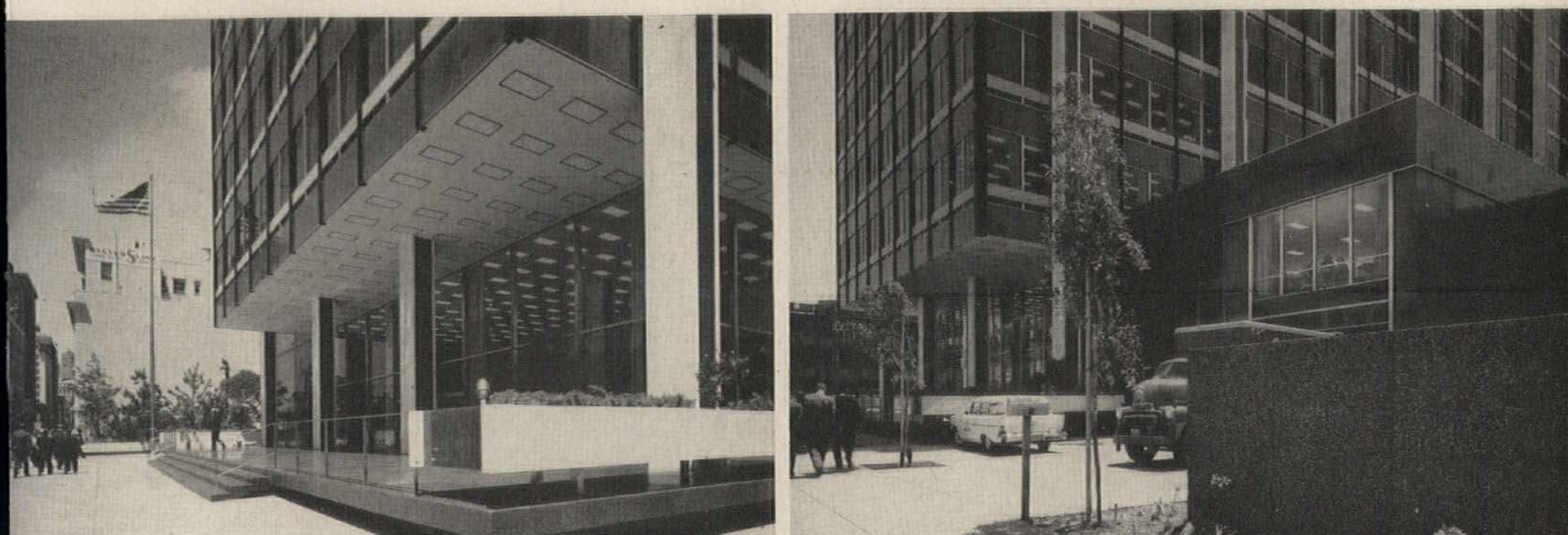
PARTIAL ELEVATION



VERTICAL SECTION **A-A**



HORIZONTAL SECTION **B-B**

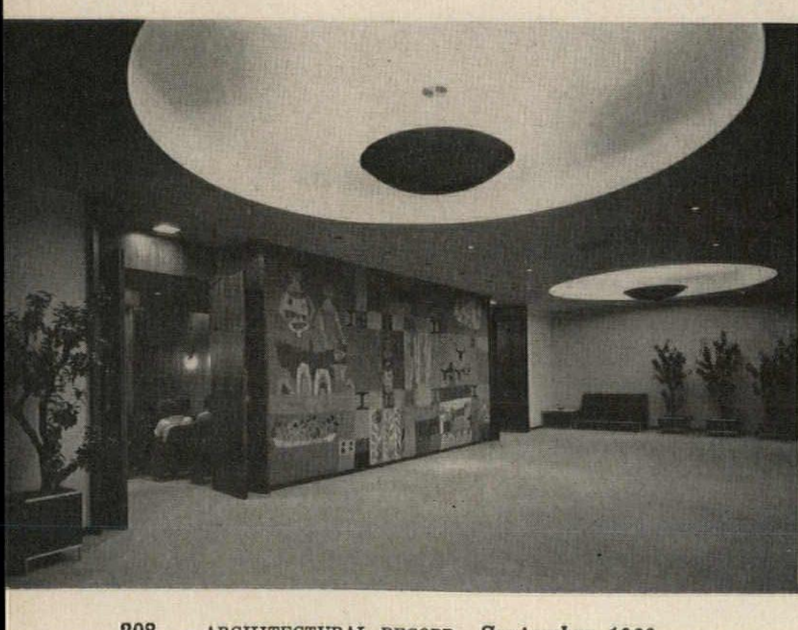


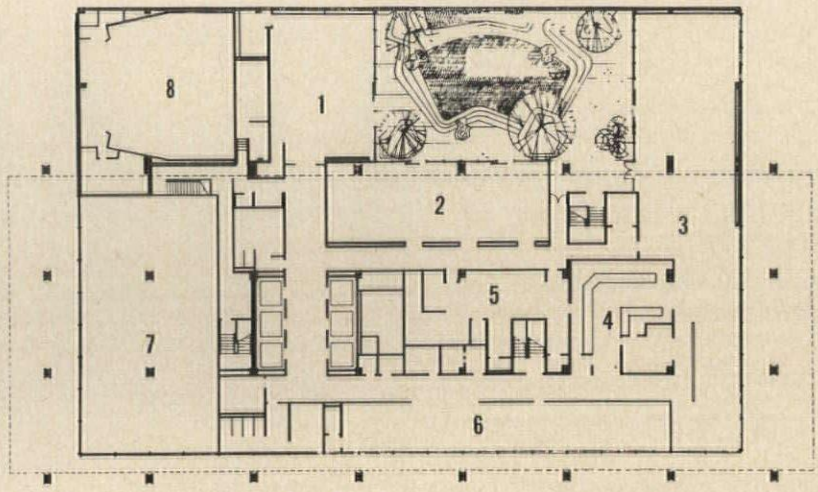
One Hundred California St.

The black granite and white marble of the exterior are also used for the interior lobby column covers. A second island similar to that shown at the left, is placed at the opposite end of the main lobby.

The two views at the bottom show the entrance lobby of the auditorium and the interior of the auditorium itself. This is used for company meetings, schools, and the like. The abstract mural is a needlepoint tapestry depicting important aspects of life in the Western states. Materials used in these spaces are beige carpeting and vinyl-covered walls and ceilings, natural walnut on the walls flanking the stage, a beige stage curtain, and crimson vinyl upholstery.

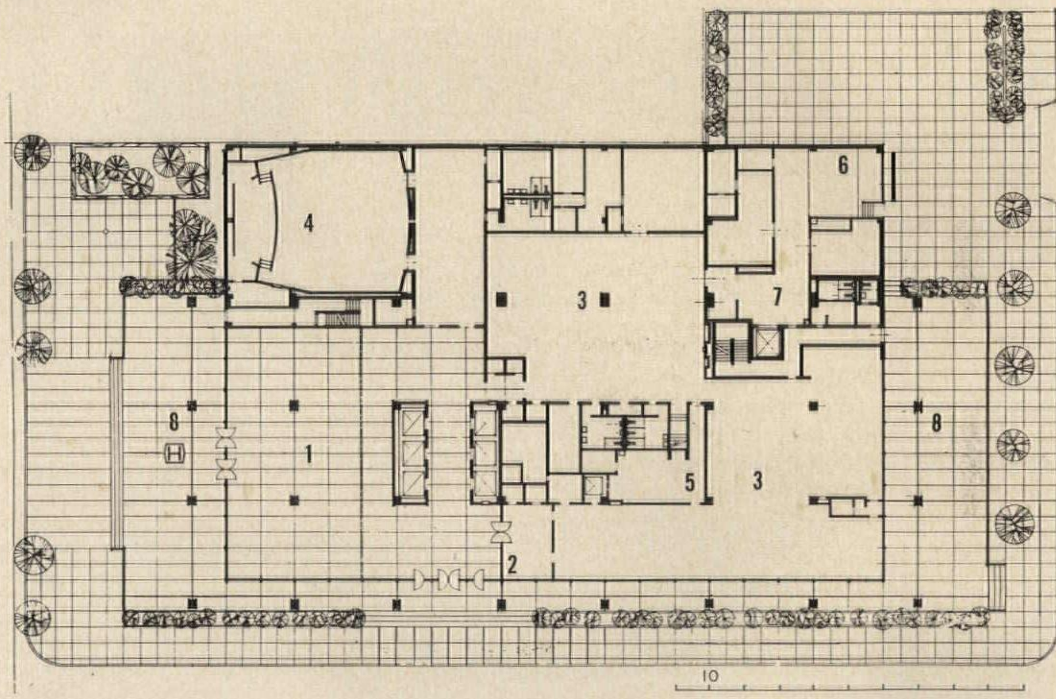
A walled garden court, located on the second floor is landscaped with trees, grass, rocks, and a fountain. The company library and executive dining rooms (opposite page) are located adjacent to the garden, as is the employe cafeteria. The dining areas have been simply handled, with subdued colors and materials, restrained furnishings. These areas are pleasant and inducive to quietude. Colors in the library are a bit more daring and perhaps somewhat out of character for this sort of space.





SECOND FLOOR

1. Library
2. Exec. Dining
3. Cafeteria
4. Serving Area
5. Kitchen
6. Office Area
7. Upper Lobby
8. Upper Auditorium



GROUND FLOOR

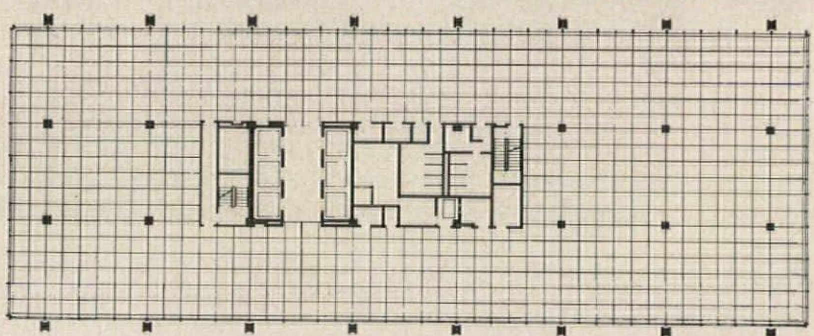
1. Main Lobby
2. Receptionist
3. Office Areas
4. Auditorium
5. Mail Room
6. Loading Dock
7. Receiving & Storage
8. Platform

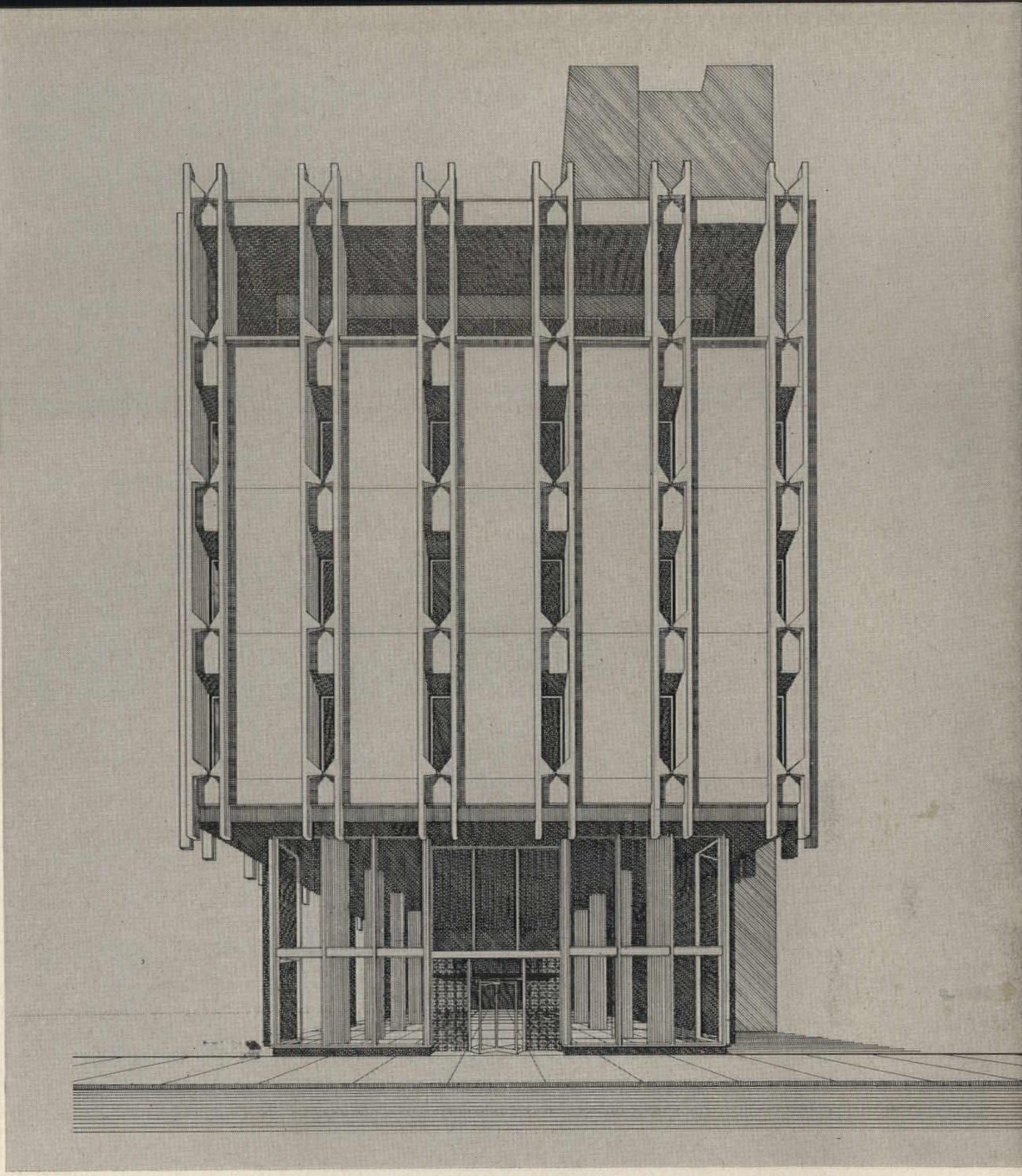
One Hundred California St.

Working interior spaces of the building are handled in a straightforward, efficient manner. Most corridors are similar to that shown at right, top. Most have square recessed fixtures in the corridor proper and circular at the elevators. Some corridors are furnished with movable partitions, as shown. Nearly all of the office partitions are movable.

The office tower floors are much alike. A typical floor plan is shown. The module is 5 ft by 4 ft 6 in. Offices for district or department managers (below, right) are placed, for the most part, in the corners of the building. These usually have adjoining space for members of the manager's department. Semi-private offices are partitioned, as shown below, left, with movable walls of glass.

The structure of this building is fireproofed steel frame, with a lightweight concrete floor fill over steel decking. The frame was designed to resist wind loads, without resorting to lateral walls. All frame joints were designed with full continuity, using shop-driven rivets, shop welding, or high-strength bolts as needed. Steel box girders frame the free-standing columns into the building structure proper.





SMALL OFFICE BUILDING FOR A DOWNTOWN BANK

Leader Federal Building

LOCATION: *Memphis, Tennessee*

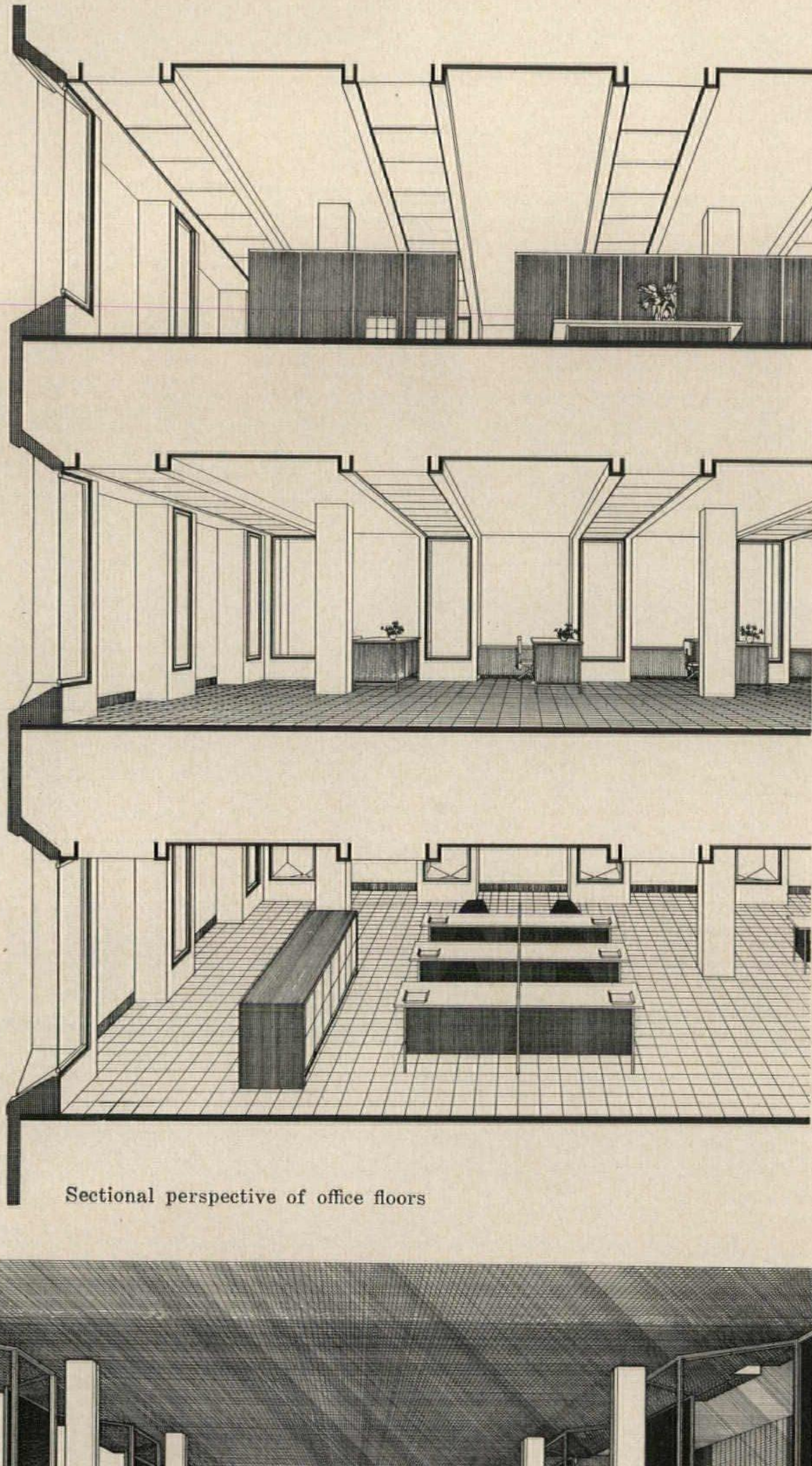
ARCHITECT: *Office of Walk C. Jones, Jr.*

DRAWINGS: *Francis Mah*

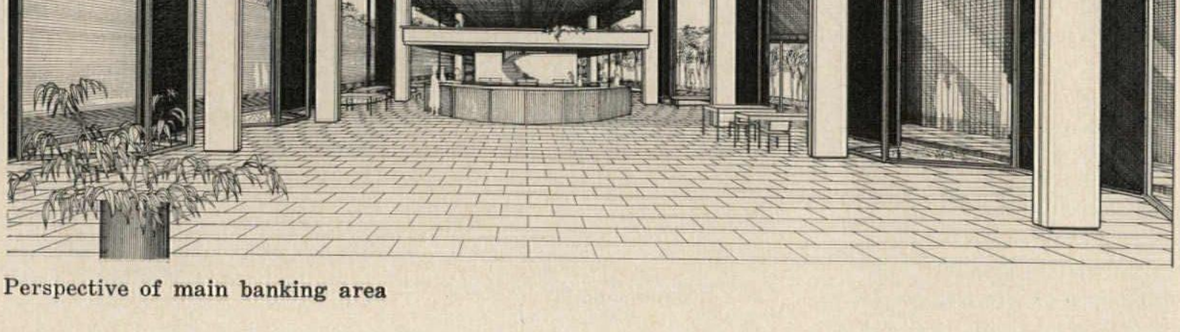
STRUCTURAL ENGINEERS: *Merrill and Mann*

MECHANICAL AND ELECTRICAL ENGINEERS: *Allen and Hoshall*

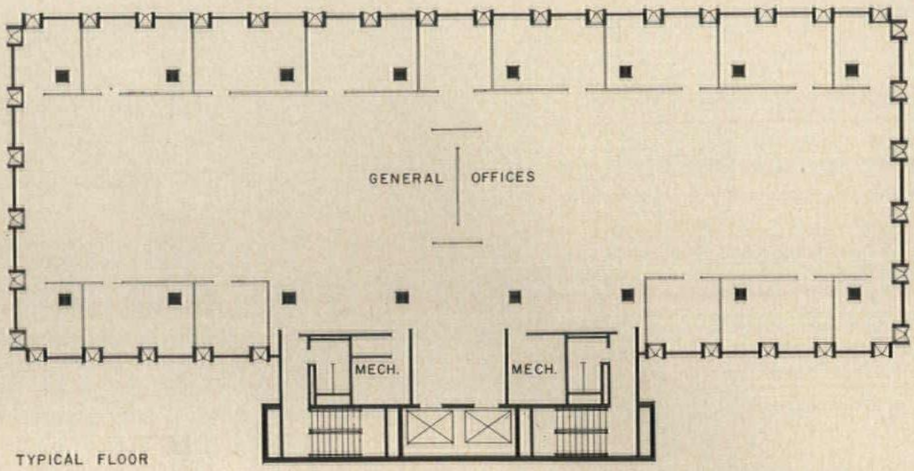
CONTRACTOR: *Dougherty-Liddell Construction Co.*

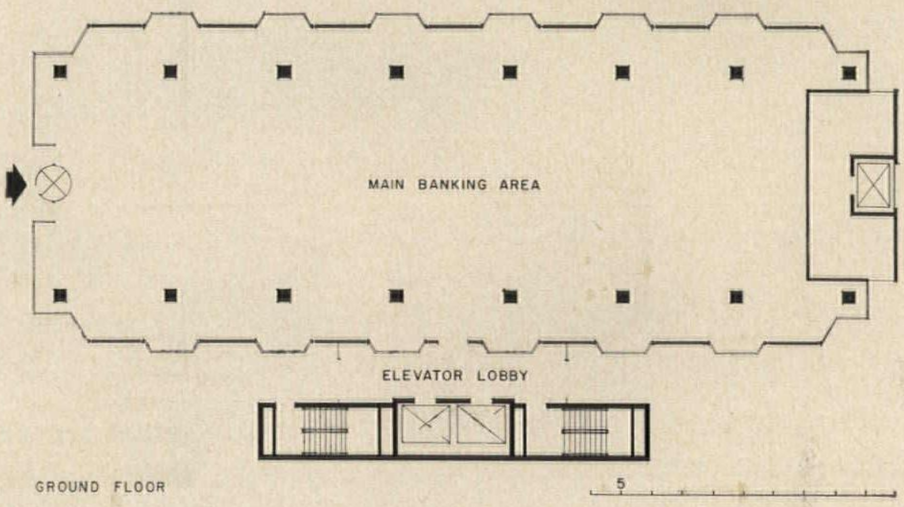


Sectional perspective of office floors



Perspective of main banking area





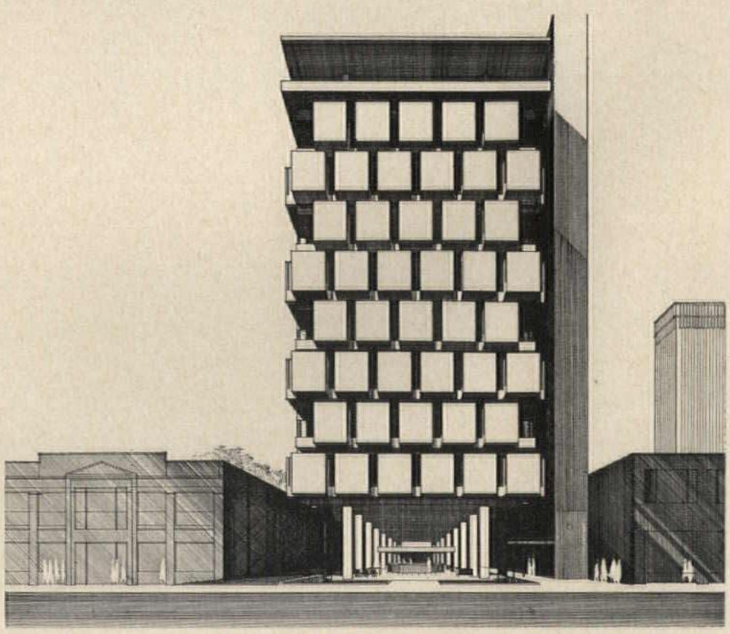
Leader Federal Bank

Here is a small office building for a downtown site that preserves an appropriate scale and does not look like a fragment of a Manhattan skyscraper. Its success on this score is particularly significant because the project began as the far larger building shown in the preliminary study at right. The program was subsequently modified to comprise five stories instead of ten, and the design recast to conform to the new size.

In the original project the treatment of the office floors was based upon a strongly expressed system of modular alcoves. In the revised version these alcoves have been retained, but their prominence has been reduced and their arrangement regularized. The projecting alcoves make corresponding recesses for the windows, providing the building with a sun-control device which is an integral part of the architectural concept. *(See section at left)*.

The structure is of welded steel with the upper floors cantilevered out 10 ft 6 in. on each side and 8 ft at the ends. The exterior walls of the upper floors are composed of 5 in. insulated pre-cast concrete panels with an exposed aggregate finish.

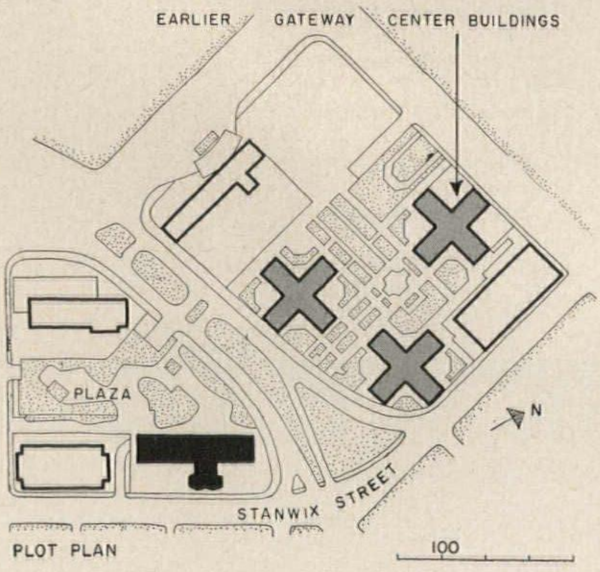
The accommodation consists of the ground floor banking area, a basement, and four floors of offices. Elevators, stairs and service areas are organized into a service tower which separates the bank building from an adjacent store and permits the main block to be treated virtually as a freestanding unit.



Preliminary design study for a ten story building, showing earlier arrangement of alcoves

Harold Corsini

PITTSBURGH OFFICE BUILDING HAS EXTERNAL SERVICE TOWER



Four Gateway Center Building

LOCATION: *Pittsburgh, Pennsylvania*

OWNER: *Equitable Life Assurance Society*

ARCHITECTS: *Harrison and Abramovitz*

ASSOCIATE ARCHITECTS: *Schell and Deeter*

STRUCTURAL ENGINEERS: *Edwards and Hjorth*

MECHANICAL AND ELECTRICAL ENGINEERS: *Meyer, Strong and Jones*

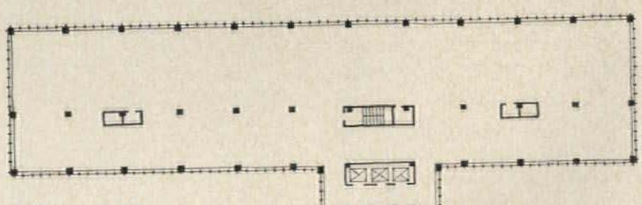
GENERAL CONTRACTOR: *George A. Fuller Co.*

The latest addition to the office capacity of Pittsburgh's Golden Triangle development is this building at number Four Gateway Center, which provides 400,000 sq ft of rentable area at a cost of $16,000,000.

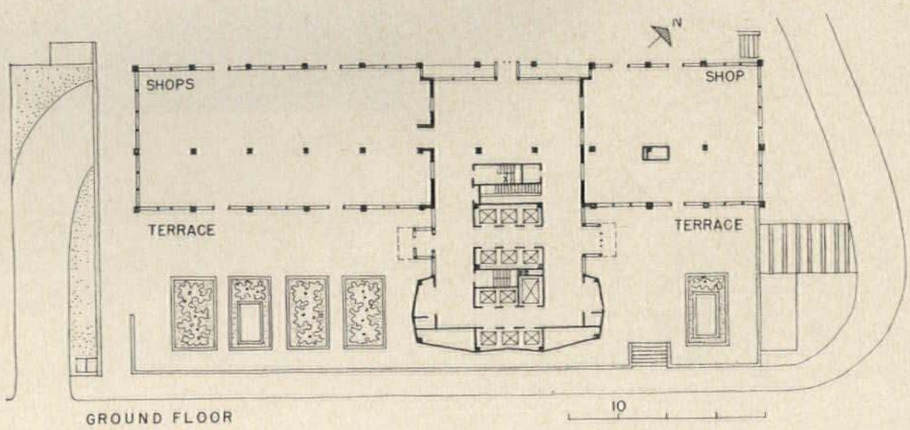
A 22-story, free-standing tower clad in glass and stainless steel, the building occupies a corner site and adjoins a landscaped plaza that forms the roof of a 750-car underground garage. (See site plan). A separate tower of irregular shape, containing elevators and most of the mechanical equipment and services, is joined to the building on the Stanwix St. side, so that the office space itself is virtually uninterrupted.

The windows are of green-tinted, heat-absorbing glass, and the spandrels are of charcoal gray structural glass units with a green tint. Mullions and muntins are of stainless steel. The mullions, of a specially designed section, project to give the facade a strong vertical emphasis.

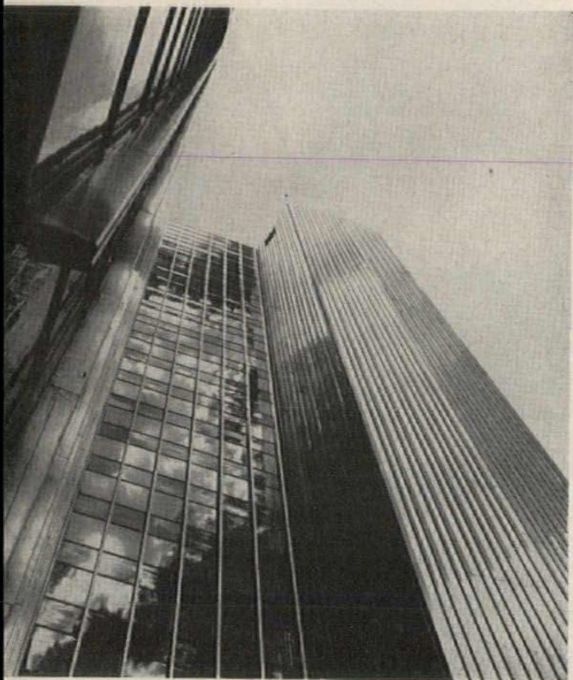
The service tower is brought into harmony with the curtain walls of the main building by means of its stainless steel cladding. This cladding is made up of two sizes of faceted panels with a natural finish, alternated with narrow stainless steel strips of a charcoal gray finish. (See detail next page.) The result again is a strong vertical emphasis. In this way the external service tower is related to the main block, and becomes far less of a contrasting element than it would have appeared in a different material.



TYPICAL FLOOR

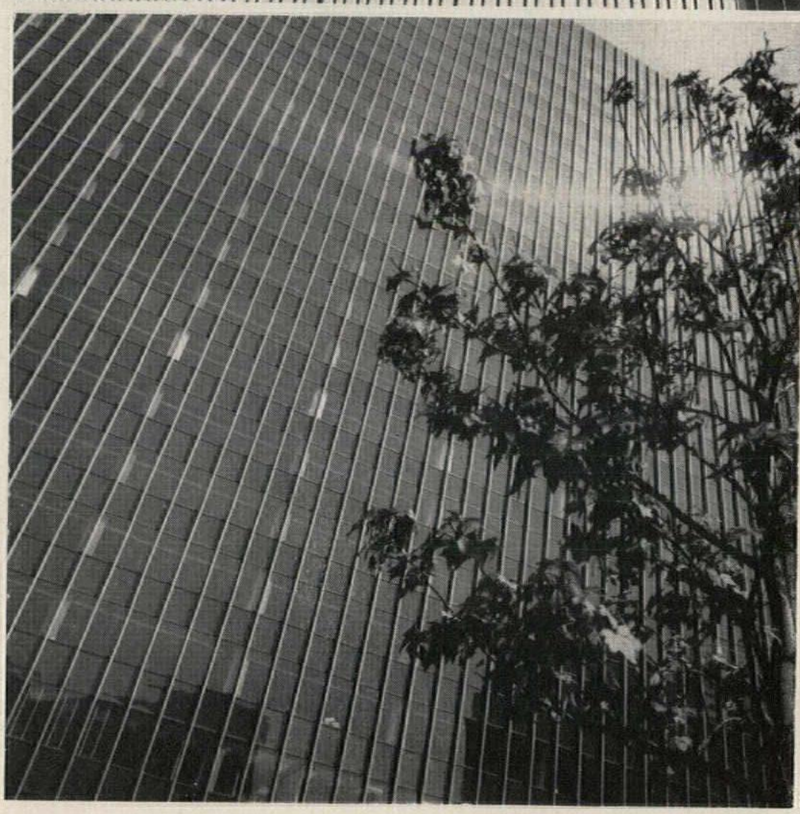


GROUND FLOOR



Newman Schmidt

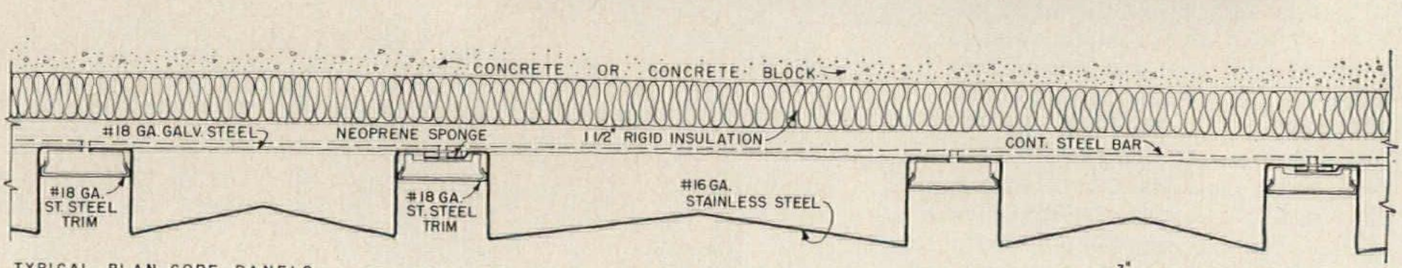
Newman Schmidt



Harold Corsini

Gateway Building

Cladding of the service tower is of faceted 16 gage stainless steel panels with a number 4 finish, alternating with charcoal gray 18 gage stainless steel strips which clip over the joints. The mullions are also of 16 gage stainless steel. Spandrels are of charcoal gray structural glass which has been given a green tint to match the daytime appearance of the heat-absorbing glass windows



TYPICAL PLAN CORE PANELS

GERMAN OFFICES WITH A VIEW

Offices for Phoenix-Rheinrohr AG

LOCATION: *Dusseldorf, German Federal Republic*

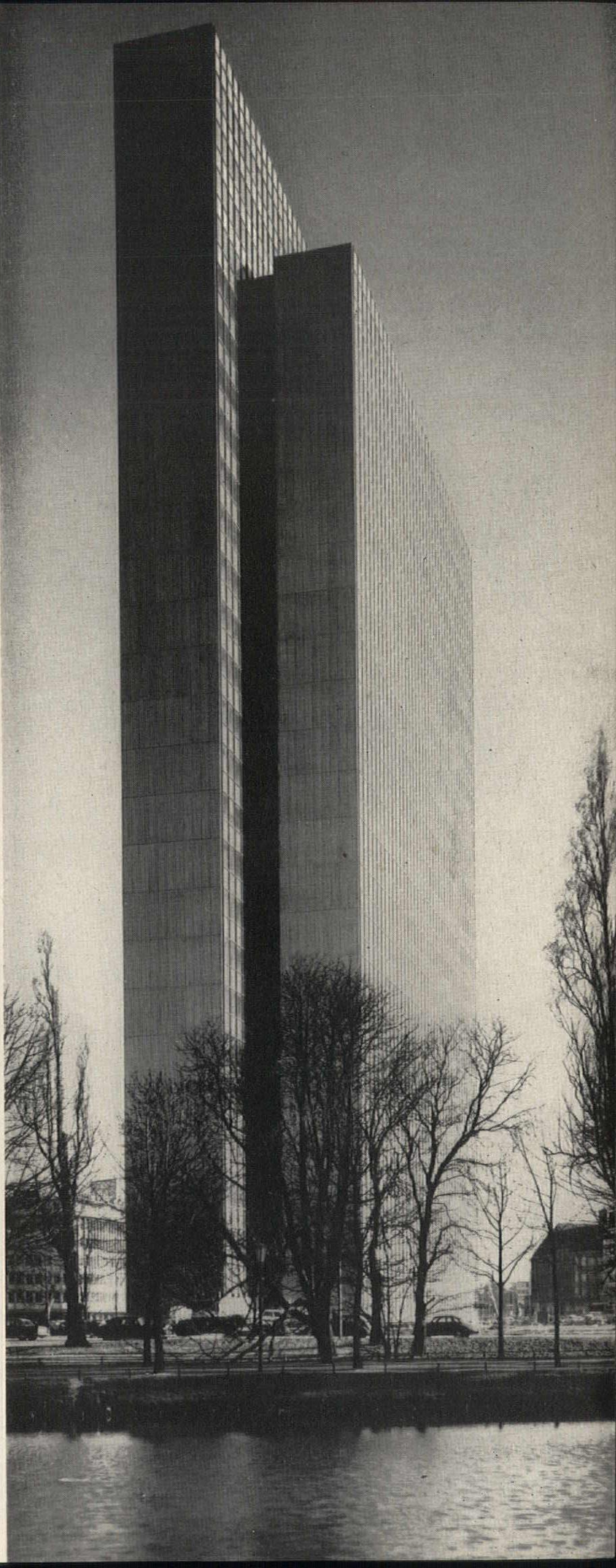
ARCHITECTS: *Dr. Helmut Hentrich and Hubert Petschnigg*

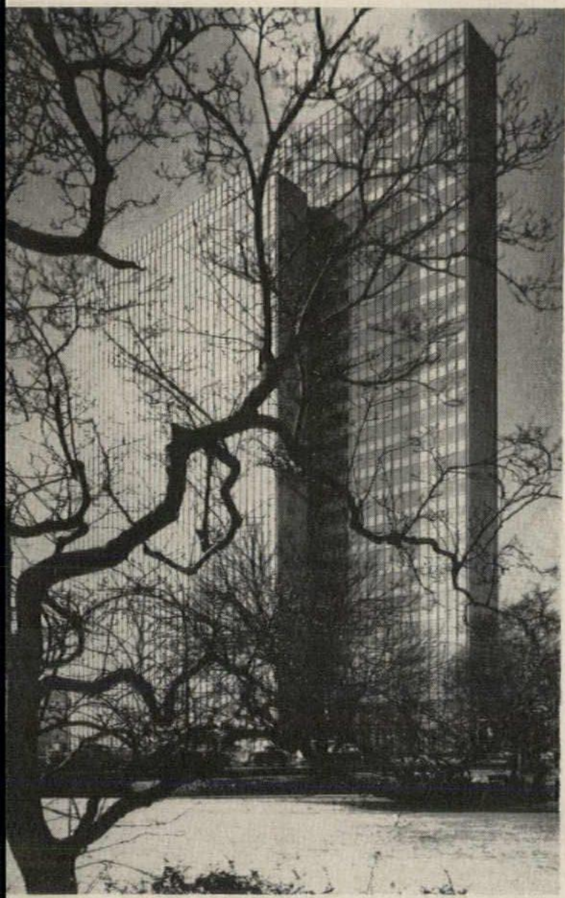
ASSOCIATES: *Fritz Eller, Erich Moser and Robert Walter*

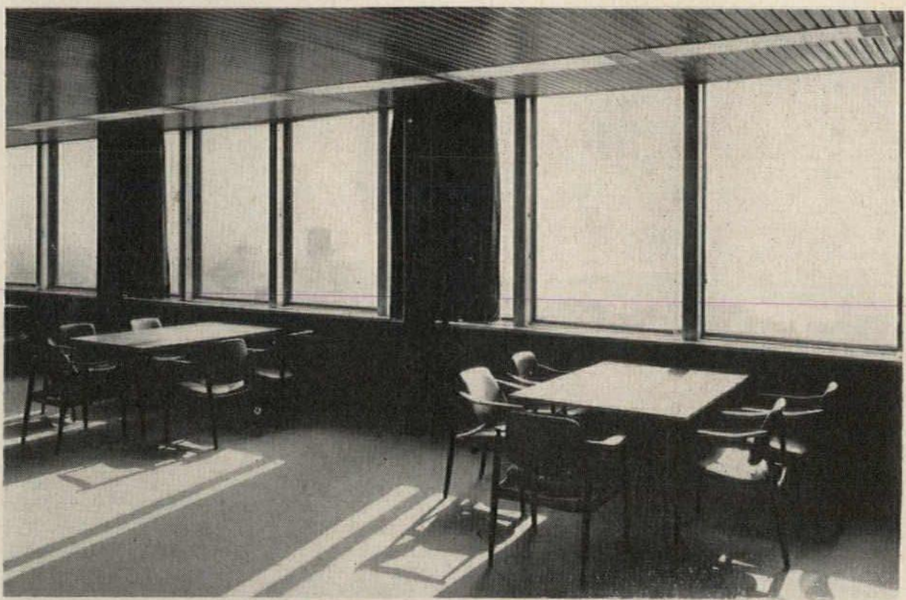
This new administration building for Phoenix-Rheinrohr AG takes advantage of a commanding situation overlooking a park to provide an unusual amount of light and view for its office accommodation. No part of the office space is more than about 23 ft from the windows; and the floor plan is the result of the interaction of this requirement with the exigencies of the site and the disciplines of modular design. The outcome is a building of considerable subtlety, clearly articulated into three separate blocks, but bound together by its proportional relationships. In some ways this building is very American, with its stainless steel, glass and aluminum curtain walling, its total air conditioning, and its external window-washing devices. At the same time, its highly intellectualized organization gives it a purely European scale.

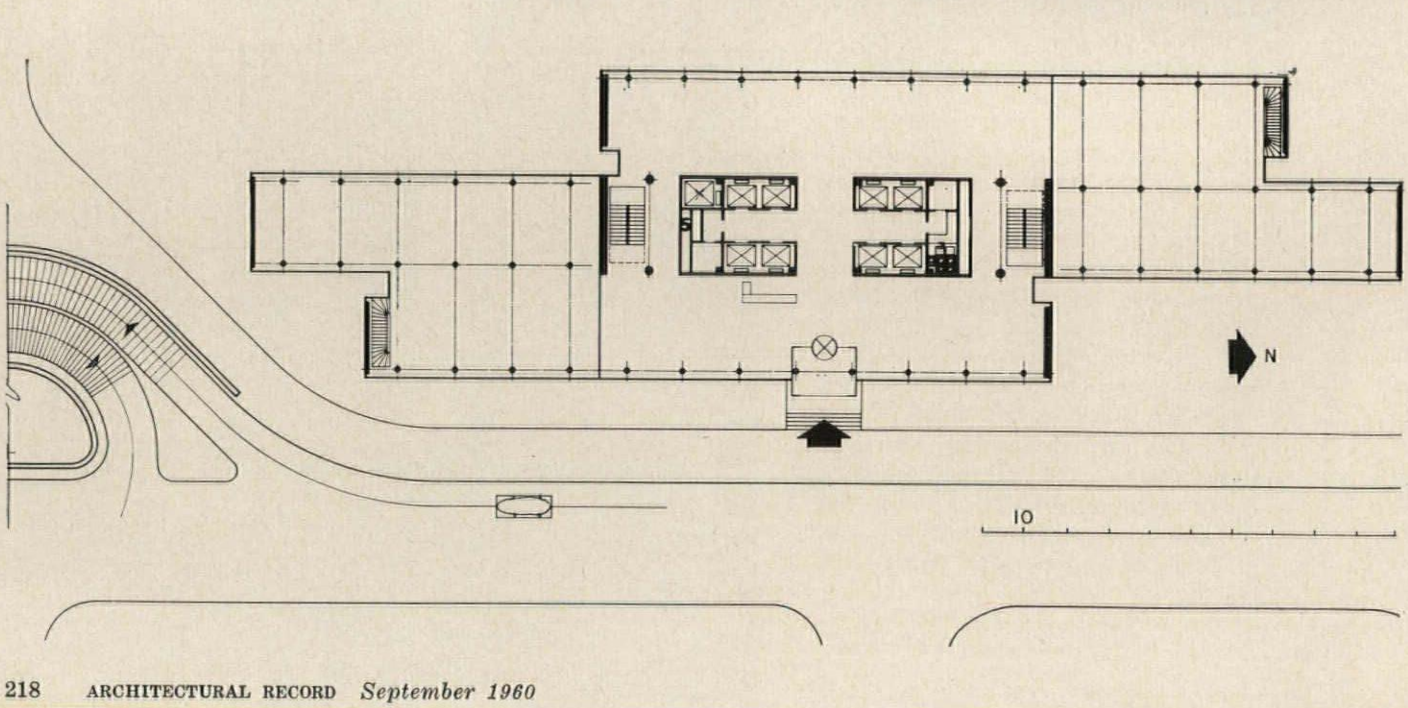
The accommodation includes seventeen general office floors and two executive floors, with a large restaurant and kitchen on the 20th and 21st stories. The three top-most floors of the central block house the mechanical equipment, and there is an underground parking garage for 280 cars.

All photos by Arno Wrubel





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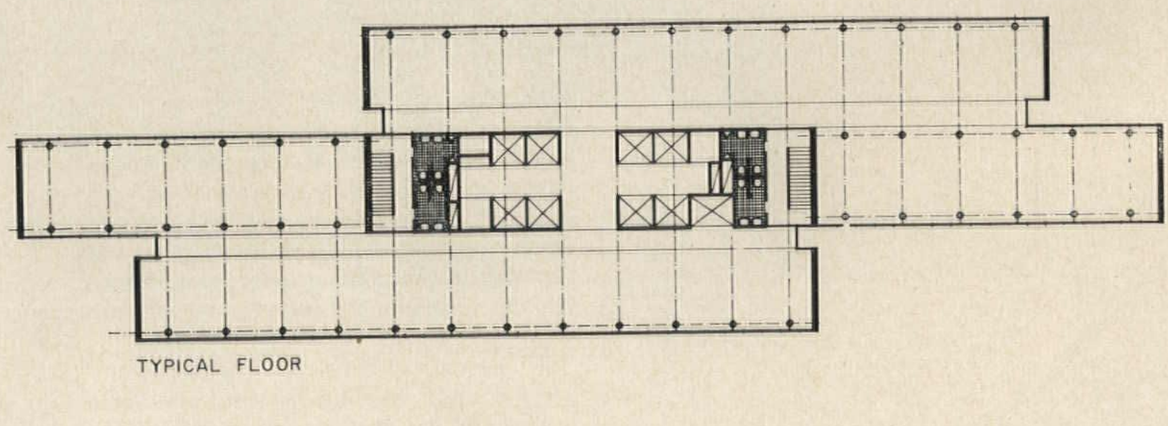
German Offices

At far left: The building seen from across the neighboring park. Interior photos show the way in which various types of accommodation all have ample natural light. Plans repay study, spaces are equally, but not symmetrically, disposed about both axes



TYPICAL FLOOR

Opposite page: Ground floor and site plan. The entrance and exit ramps for the underground parking are at far left

Planning Office Buildings For Automation

One of the more startling developments in the increasingly complex world of the architect is the growing use of electronic data processing machines for the automation of business functions formerly performed by people. The main thing these machines have to recommend them is that they are able to perform such tedious, boring tasks as inventory control, payroll accounting, and myriads of similar jobs, with great speed and extreme accuracy. However, EDP systems make some demands, too. They are finicky in the extreme as to the environment they require in which to perform. They are heavy and space-consuming.

Some principles architects and engineers need to know in designing office buildings for these systems are contained in the pages following.

The material in this article was developed from data supplied by the Data Processing Division, International Business Machines Corporation, White Plains, N. Y., and Air Research Associates, New York, N. Y.

Many architects and engineers who design office buildings will no doubt inevitably be engaged by a client who expects to have a computer, or more correctly Electronic Data Processing (EDP), system installed in his building. While the needs for particular systems will ordinarily be highly individualized and complex, some general principles concerning the architectural and engineering aspects involved in planning a building for these machines can be set down. In this way, one who is faced with the design of a building which will house an EDP system may provide himself with some of the background he will need for the more detailed considerations he will be faced with later.

The use of computers for scientific or engineering calculations is well known. The use of EDP systems for the automation of ordinary business operations such as inventory controls, bank operations, clerical functions, and the like is newer and perhaps not so familiar. Yet, business installations outnumber scientific or calculating computers by more than two to one. All predictions point toward rapid growth in the use of EDP in offices and the application of the principles to ever-widening fields.

EDP systems are highly demanding of the architect and his consultants. The machines refuse to function under conditions of high humidity and high or low temperature which employes might put up with. The installations are heavy and place concentrated loads on building floors. Large areas are required for the placement of many of the systems, and for the maintenance and servicing of the machines. Electric power with low variations in voltage and frequency must be furnished to the systems. Many of the systems require a raised or double floor to accommodate the large number of cables interconnecting the machines. Because of the nature of the problems involved in the design of office building spaces for EDP installations, an examination of some of their more important aspects should be of value.

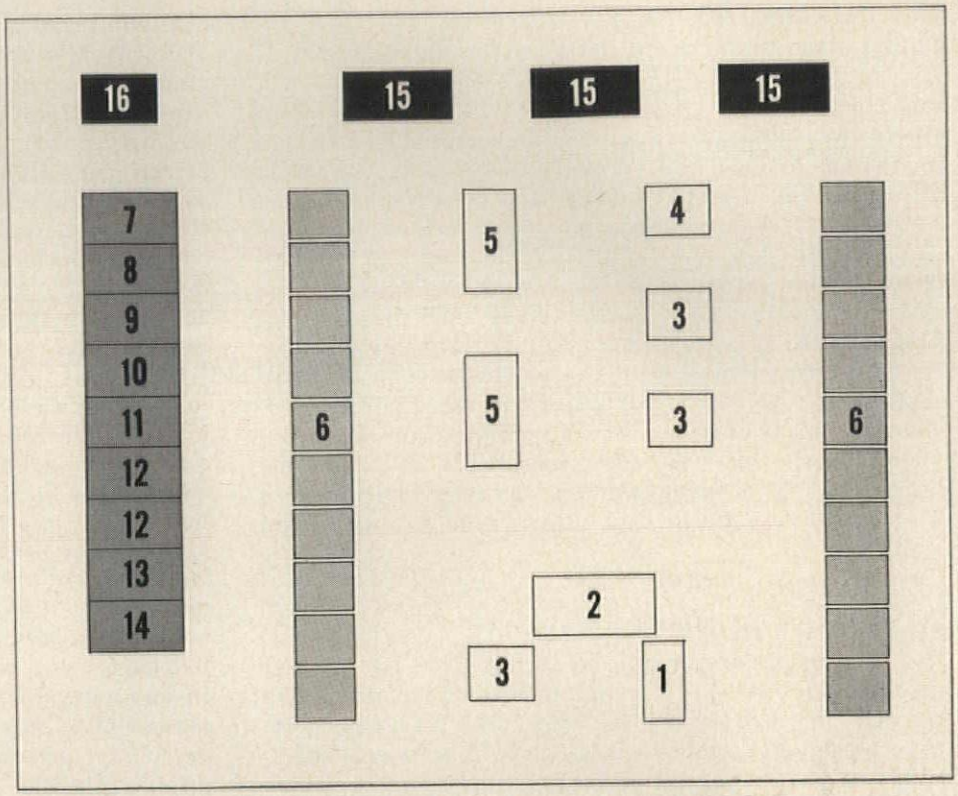
The architect working on an office building which will contain an EDP system will naturally turn to the companies that produce them and to consultants who specialize in the field for detailed answers to the specific design problems. However, an examination of some of the more general and important aspects of planning should give him some background for later and more detailed study.

What is an Electronic Data Processing System?

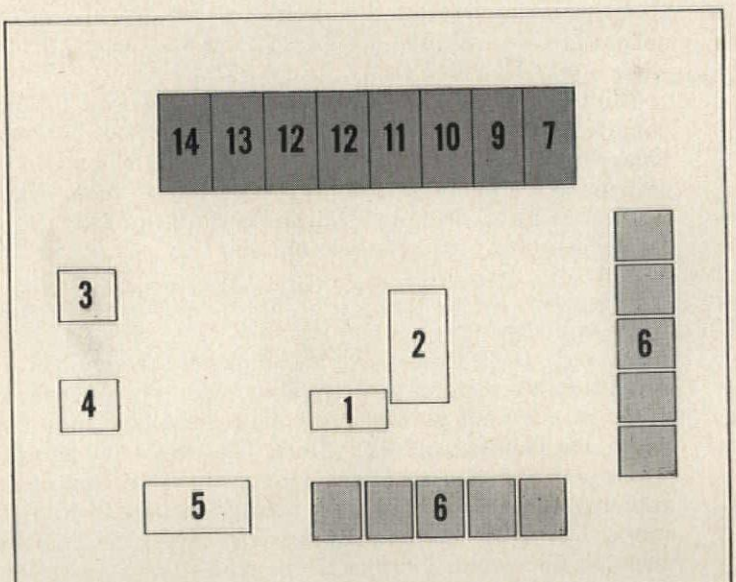
The National Office Management Association defines a computer as "a device capable of accepting information, applying prescribed processes to the information, and supplying the results of these processes . . . from internally-stored instructions, as opposed to calculators on which the sequences are impressed manually from tape, or from cards."

This is to say that computers are devices which may receive their original instructions from tape or cards, but which also store required information within themselves. Of late, the experts in the field have tended to use the word "computer" to specifically describe devices which perform problem-solving calculations but to employ "Electronic Data Processing System" (EDP) or more simply, Data Processor, to describe the general type of the devices.

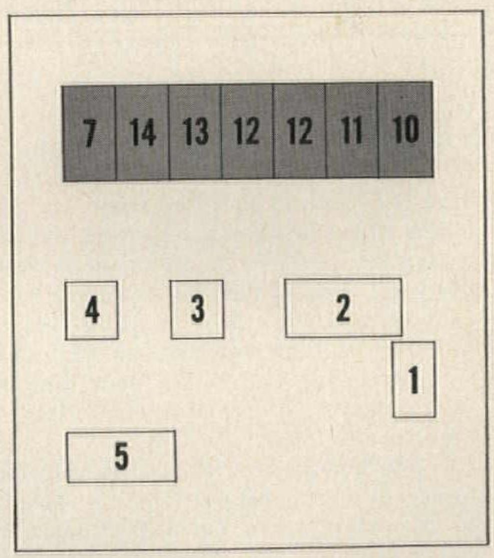
1. CUSTOMER ENGINEERING CONSOLE
2. CONSOLE CONTROL UNIT
3. CARD READER
4. CARD PUNCH
5. PRINTER
6. MAGNETIC TAPE MACHINE
7. CONVERTER
8. DISK STORAGE CONTROL
9. TAPE CONTROL
10. CORE STORAGE (MEMORY)
11. CORE STORAGE CONTROL
12. ARITHMETIC AND PROGRAM CONTROL
13. INPUT/OUTPUT CONTROL
14. INPUT/OUTPUT SYNCHRONIZER
15. DISK STORAGE
16. REMOTE COMPRESSOR



SCHEMATIC LAYOUT: TAPE/DISK STORAGE EDP



SCHEMATIC LAYOUT: TAPE EDP SYSTEM



SCHEMATIC LAYOUT: CARD EDP SYSTEM

These schematic floor plans give some indication of the units which might be used to make up three different Electronic Data Processing systems, all based on the IBM 7070 series of machines. In practice, numerous variations of the above are possible for different purposes and problems. The plans shown are not intended to be typical, but only as examples of some of the principles involved

How Does EDP Work?

In the simplest terms, an EDP system is composed of four major parts: Input, Storage (Memory), Processing, and Output. In practice, the input will ordinarily be in the form of instructions sent to the machine by a person operating a keyboard, from punch cards, or from punched paper tape. The newer and more sophisticated high-speed systems often employ magnetic tape inputs. The storage or memory units are all magnetic devices. They include drums, disks, tape, and a system of magnetic cores. Most EDP systems have employed vacuum tubes in their processing units, but newer machines utilize transistors almost exclusively. The term "solid state machines" comes from the basic characteristics of transistors. Output components are similar to the input devices. Results may be fed to keyboards, punch cards, punched paper tape, or magnetic tape. In addition, it is possible to feed the output information to high speed printers.

Schedules and Timing

It is imperative that planning for an EDP installation should begin very early. Programming of the operations the machines are to perform often takes a year or more, before the actual components of the system can be selected. A year or more will usually be required between the time the system layout is approved and delivery of the equipment. Architectural and engineering considerations concerned with the building itself require a certain amount of time. The total number of months needed from the time of the decision to install an EDP system will, of course, vary with the individual problems. But, in all cases, the complete process will be spread over quite a long period. It is imperative that adequate time be allowed.

General Requirements

The first consideration in the planning of an EDP system is the provision of adequate space of the particular kind required. Proper and adequate power must be provided. Air conditioning requirements must be determined (often six times as much as for a normal office will be needed). Space must be provided for housing the air conditioning equipment. Ceilings must be high enough to allow machine installations and, more often than not, a hung ceiling and raised floor will be necessary. The floors must be designed for the high loads to be placed upon them.

Work flow to other areas is highly important in order to obtain the utmost efficiency. Flexibility and expansion problems are acute, since EDP has a way of outmoding itself very quickly. Also, experience shows that many companies begin with systems performing limited functions but soon discover other operations that lend themselves to automation.

Space Planning

The areas required for EDP installations vary considerably. For example, one of IBM's more limited capacity systems, the RAMAC 305 requires about 370 sq ft, while the same company's big 705 III system may take up 3,500 sq ft. Actual space requirements for a given installation can be finally determined only by a layout of the work flow and of the machines themselves. In addition to the space for the system proper, auxiliary areas are needed for air conditioning equipment, testing, storage, and the like. Space is often required for printer form stands, card files, work tables, desks. Storage must usually be provided for permanent master document files, EDP cards (or in newer machines, magnetic tapes). These areas should be carefully located to minimize unnecessary travel time. A bulk storage room is usually required for the storage of spare filters, transformers, and other large parts.

Floor Strength and Construction

The units which compose an EDP system are heavy. Point loads on the floor may often run as high as 1,000 pounds. Even when the loads can be distributed, it is usually necessary to design the floors for 150 psf loadings, or more. As EDP installations become more common, it may be feasible to construct some buildings with all of their floors stressed for the loads of these systems. In most cases, it probably will not be economical to do so. In any case, EDP system locations will require close study and selection, followed by design for the loadings to be encountered.

Currently, the preferred method of solving the load distribution problem is by the provision of a secondary floor raised over the building floor slab. An installation of this type may have other important advantages: interconnecting power cables and receptacles may be concealed, yet remain easily accessible, the space between the floors may be utilized for housing air conditioning ducts or plenums, future changes in the layout may be effected with a minimum of lost time and expense, machines may be added easily.

While a secondary floor with raceways may be employed, a free access type, allowing complete directional freedom, is preferred. This type of floor is composed of square or rectangular panels, supported at their edges on a structural grid, and raised to the required height on pedestals of metal or other material.

Air Conditioning

Electronic Data Processing Systems require very close control of air temperature, humidity, and dust. If any of these is not held within certain prescribed limits, the machines cannot perform. Thus, the provision of adequate air conditioning is necessary. If the cooling of an office space fails, its occupants might continue to do their work, but EDP cannot. Because of this, the recommended, and usual, solution is the provision of a separate air conditioning system serving the EDP system alone. This system will be required to operate on the cooling cycle all year round.

In many cases, the preferred location for the EDP air conditioning system is in a room adjacent to the Data Processing machines themselves. However, if lines must be run to a cooling tower many stories away on the roof, this may prove too costly. In some cases, the tower might be located on a ledge or setback roof. Those who have had considerable experience in the design of EDP installations recommend installation of as much standby equipment as possible. Since EDP rental or purchase costs are so high, any time when the system is inoperative can be financially disastrous. It will often prove more feasible to minimize shutdowns through the use of standby equipment than to risk costly delays.

There is considerable variation in the air conditioning requirements of various EDP systems. For example, the IBM Ramac 305 dissipates heat approximately equivalent to five tons of air conditioning while the same company's 705 III system heat dissipation equals about 33 tons. The new IBM 7070 requires about 11 tons of air conditioning. When this machine is in operation, the temperature must be maintained in the 65 to 90 degree F. range, and the humidity betwen 20 and 80 per cent. When inoperative, power off, the limits are 50 to 110 degrees F. and 0 to 80 per cent RH. High efficiency filters are required for use with these machines. If a mechanical filter is used, it must be rated at a minimum of 20 per cent efficiency by the Bureau of Standards discoloration test using atmospheric dust. Electrostatic plate type filters must be rated at 85-90 per cent efficiency by the same test. Special filtration will be necessary if the installation is exposed to corrosive gases, salt air, or unusually severe dust conditions.

Companies producing EDP systems recommend the installation of temperature and humidity recording instruments. Through the use of the records provided by these instruments, it will be easier to insure that the air conditioning system is operating continuously with the required efficiency. In this way, correct functioning of the Electronic Data Processing System itself may be more nearly assured.

Acoustical Treatment

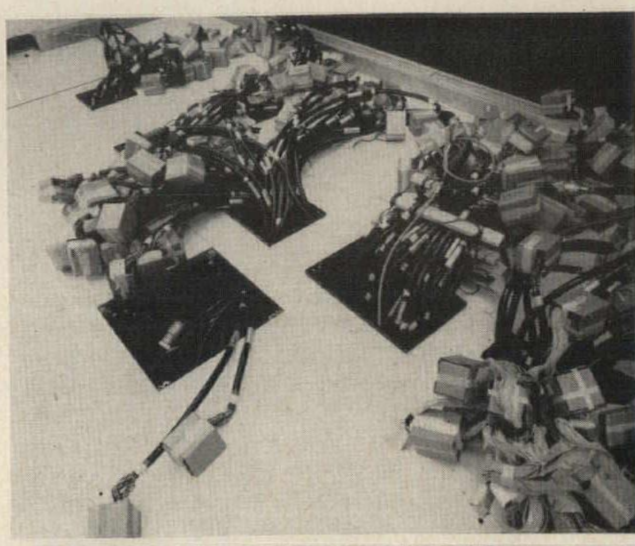
Many of the units in an EDP system produce considerable noise. The worst offenders are such components as the card machines, printers, and blowers. For the comfort of the system operators, acoustical treatment of the area is desirable. The acoustical problems in an area containing an EDP installation are similar to those in other moderately noisy office building areas and may be solved by the usual methods. However, attention should be paid to the vibrations set up by the machines. Floor and wall construction should be capable of retarding the transmission of the vibrations of the machines to other areas of the building.

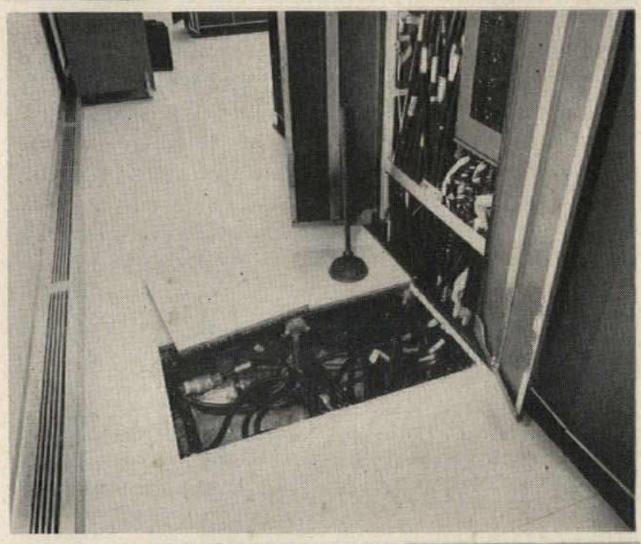
Illumination

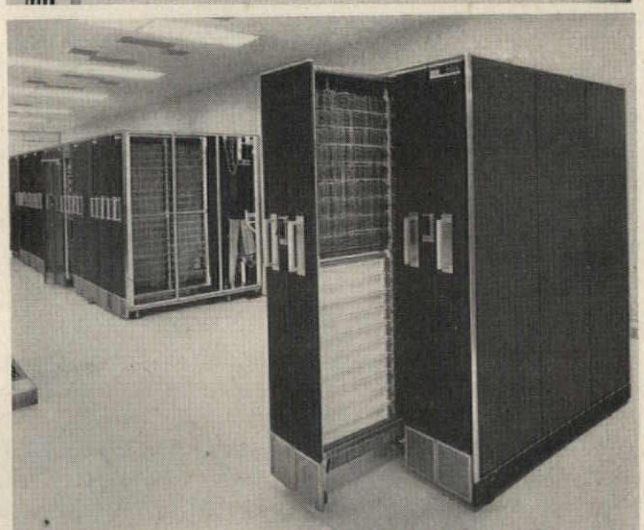
A minimum average general illumination of 40 ft-candle measured 30 in. above the floor is recommended by systems manufacturers for all machine areas. Low levels of illumination are required for easy observation of various console and signal lights. Therefore, direct sunlight should be avoided. In larger installations, general lighting should be zoned, so that portions of the lighting may be turned on or off as required.

Vibration

An EDP installation ordinarily cannot be made in an area that is subject to large amounts of vibration. In general, the machines can withstand a sustained vibration up to 0.25G (G=gravitational acceleration). Intermittent vibrations somewhat greater than this can be withstood, if







In cases where a double floor system is used for an EDP system, the wiring for individual units is brought up from the chase through an opening formed by removing one or more floor panels (top view). The middle view (a unit with its wiring installed) shows how an additional panel may be removed for servicing or maintenance, while the bottom view shows machines in place, one ready for internal servicing their frequency is less than 25 cycles per second. In more extreme cases, steps for overcoming the problems may be recommended by the manufacturers.

Electrical Power

Data Processing systems place heavy loads on the electrical system of an office building. The system requirements for circuit flexibility, the need for power source dependability, and safety requirements further complicate electrical design. Exact specifications vary considerably for various installations. However, a look at the requirements for one system, the IBM 7070 might serve as an indication of the general needs. The 7070 system operates on a 208 or 230 volt, 3 phase, 60 cycle supply, and requires approximately 37 KVA. The source voltage may have a total variation of ± 10 per cent of the rated voltage including transient and steady state. Frequency must be within ±½ cycle. Both 60 cycle and 400 cycle power are distributed within the system, the 400 cycle being produced by a convertor contained in the EDP installation. Line to line voltage and frequency tolerances within the system are the same as the power source tolerances. Separate feeders from the main distribution panel of the building are most often used. However, if the building power cannot be maintained within the tolerances, a separate transformer or motor alternator may be necessary. If a transformer is used, it should be fed from the highest primary source available. The Data Processing system feeder should feed no loads other than those of the system. The distribution panel for the processing system should be located in the EDP area. Ordinarily, all units of the system are designed for cable entry from the floor or from under the floor beneath each machine.

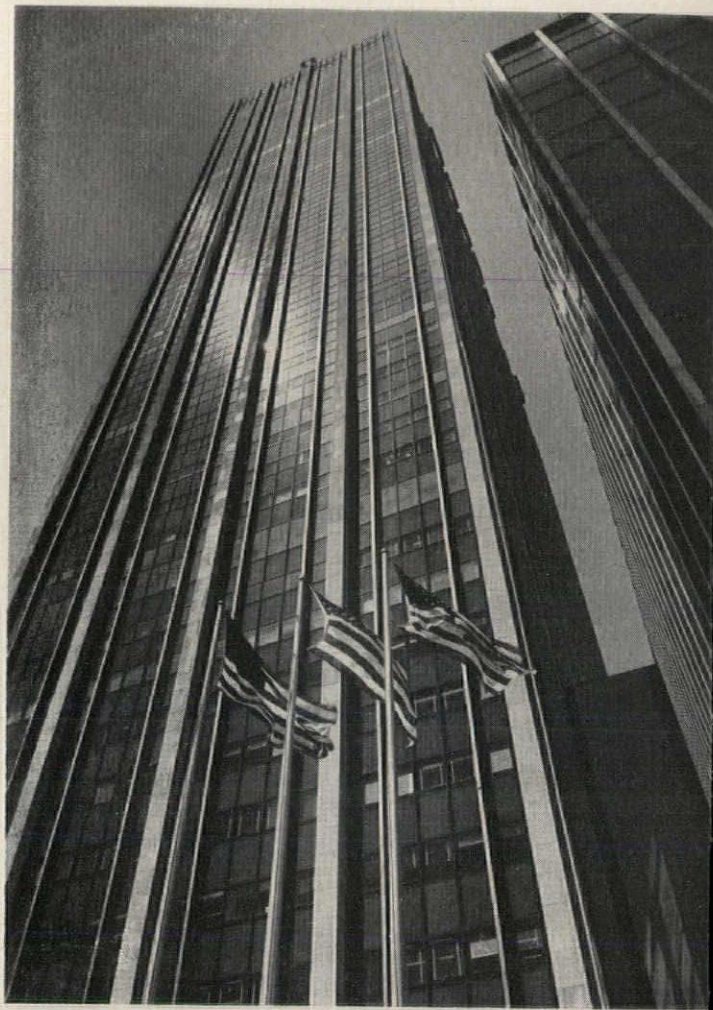
Lightning Protection

Manufacturers recommend that lightning protection be installed for the secondary power sources of the systems in cases where the utility company provides lightning protectors on the primary, where primary power is supplied by an overhead power service, or where the area is subject to electrical storms or other power surges.

Tape Storage

The use of magnetic tape for feeding and receiving information from EDP systems is rapidly becoming more commonplace. Tape must be protected from dust, and from extremes of humidity and temperature. Under the usual conditions of frequent use, acetate base tapes should be stored at a temperature of 65-90 degrees F., 40-60 per cent relative humidity. If exposed to temperatures outside this range (from 40 to 120 degrees F.) for more than four hours, tape should be hermetically sealed in dust proof containers, and subsequently reconditioned in the atmosphere of use for a length of time equal to the time spent outside the use atmosphere. Other tapes (polyester base, and the like) can withstand temperatures of 40-120 degrees F. and 0-80 per cent RH.

When not in use, tapes should be stored in dust proof containers in a vertical position. Tapes must not be placed in contact with magnetic materials or subjected to magnetic fields of greater than 50 oersteds intensity.



Richard H. Altho

IBM Datacenter

LOCATION:
Time and Life Building, New York

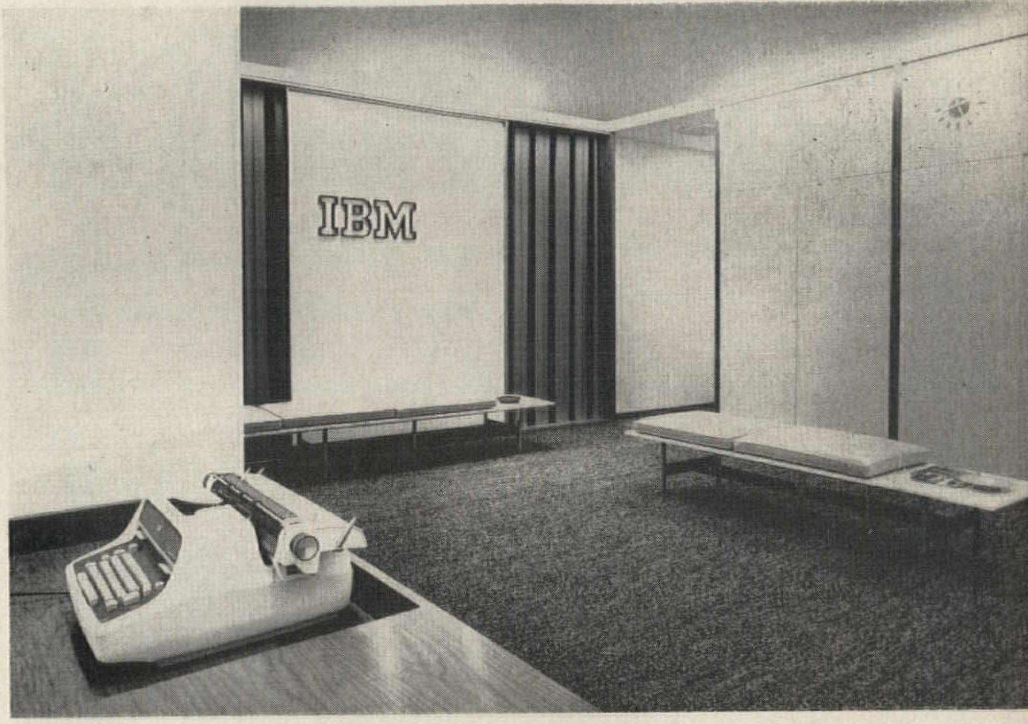
ARCHITECTS:
Harrison & Abramovitz & Harris

STRUCTURAL ENGINEERS:
Edwards & Hjorth

MECHANICAL ENGINEERS:
Syska & Hennessy, Inc.

DATACENTER ENGINEERING AND INTERIOR DESIGN:
Air Research Associates

CONTRACTORS:
George A. Fuller Company and John Lowry, Inc.



DATA PROCESSING MADE AVAILABLE TO ALL

The Datacenter, shown on these pages and in the closeups on page 223, is one of a number IBM has established in various parts of the country. Their purpose is to make Data Processing available to businesses needing these services, but which do not require complete installations of their own.

The Center was designed to perform almost any process its customers might require, within the limitations of the systems installed. As newer systems are developed or users come up with newer problems, the Center may easily be converted to meet the changing demands.

The entire machine area of the Center has a raised floor, composed of 18-in. by 18-in. cast aluminum panels supported at the corners on pedestals and brackets. The floor panels are covered with ⅛-in. vinyl tile. For the most part, movable partitions are used within the EDP area. These are set on top of the raised floor and attached to the ceiling. All have dense mineral fiber cores, for sound absorption. The air conditioning system is separate from that of the rest of the building. Cool air is introduced under the raised floor, and enters the rooms through perimeter floor diffusers. Return is accomplished through the hung ceiling, without ducts.

Roger Sturtevant

SERVICE CENTER FOR THE WORLD'S LARGEST BANK

Bank of America,
One South Van Ness Avenue Building

LOCATION: *San Francisco, Calif.*

ARCHITECTS: *Wurster, Bernardi & Emmons*

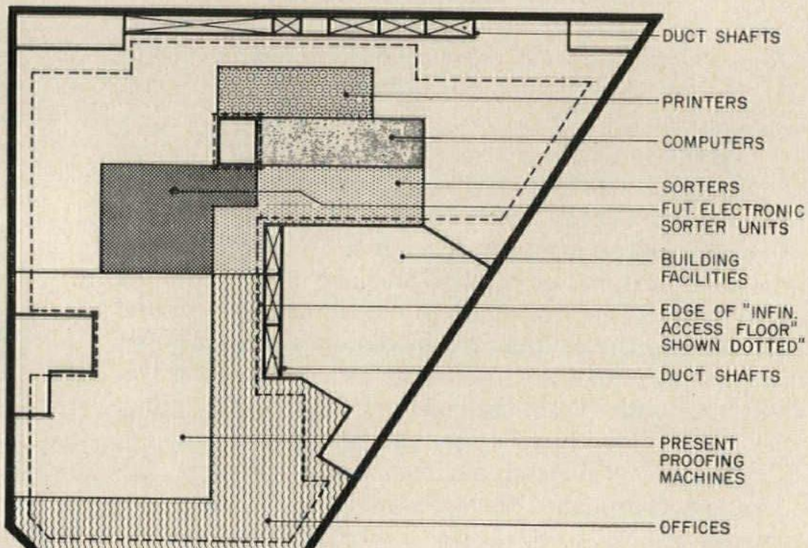
PROJECT ARCHITECTS: *Don Stover and George Kennaday*

STRUCTURAL ENGINEERS: *L. H. and B. L. Nishkian*

MECHANICAL ENGINEERS: *Gayner Engineers*

BUILDERS: *Swinerton & Walberg*

PROJECT COORDINATION: *Continental Service Company*



PLANNING FOR MODERN BANKING PROCEDURES

*by Donn Emmons**

The Bank of America's new building at One South Van Ness Avenue, San Francisco, now nearing completion, was designed for two kinds of banking procedures. One is the normal method, using familiar office machines such as tabulators, comptometers, typewriters and so forth, operated directly by persons; the other, although gradually becoming normal for certain functions in banking, is still revolutionary enough in its use of electronic processing machines to involve some unfamiliar planning requirements.

There is an unavoidable paradox in designing such a building. Although the over-all building program was real and tangible, the detailed building program in regard to certain areas had to be based on unknowns. The operations of some departments, for instance, are now handled on ordinary office equipment; but there is no doubt in any one's mind that electronic equipment will eventually be developed which will be applicable to many of these operations. But what size, shape, weight and mechanical demands these machines of the future will have is presently unknown and unpredictable. Space needs for such departments, and to some extent their structural and mechanical needs, are therefore difficult if not sometimes impossible to define exactly.

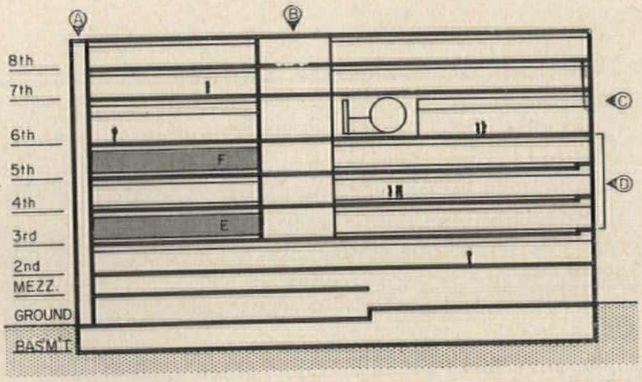
Flexibility is Essential

In a program such as this, one factor was inevitably predominant: the need for providing areas which could be used with complete flexibility. This meant not only large, relatively open spaces and services of all kinds, but provision for easy addition of other services or adaptation of services to new needs. Developments in the field of electronics are so continuous and so rapid that provision for future possible equipment has to be basic to the architectural solution. It is realistic to expect that progress in the design of electronic equipment could obviate many of the services now essential to its operation.

One aspect of the building program for One South Van Ness was always certain: large floor areas would be needed. The site at Market and South Van Ness Streets met this requirement and provided an imposing location for the building as well. The importance of large floor areas in a building such as this cannot be over-emphasized, especially in connection with the departments in which electronic machines are used. Expansion of such departments is efficient and economic only if it can be done horizontally. Thus an ERMA (electronic recording machine accounting) system, with a capacity for handling a quarter of a million accounts, can grow machine by machine as the need arises, each new machine being placed in line with its predecessors. The ERMA installation at One South Van Ness, like the other electronic departments there, has plenty of room—60,000 sq ft—in which to grow.

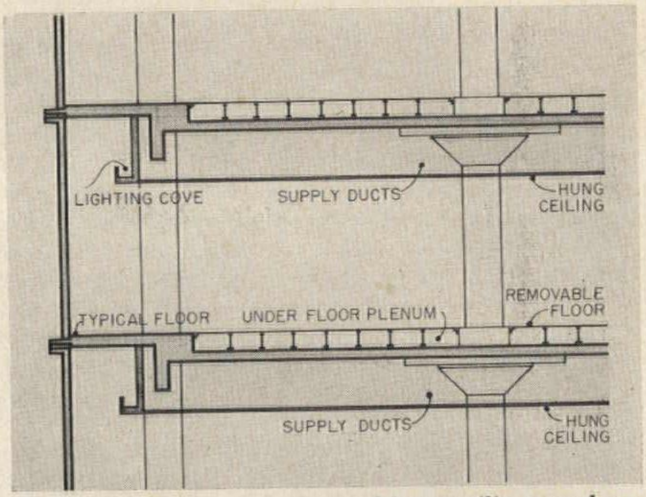
In this building—eight stories high for the time being, but designed to take an additional five floors—three floors have been specifically designed for electronic ma-

*Partner-in-charge, Wurster, Bernardi and Emmons, Architects

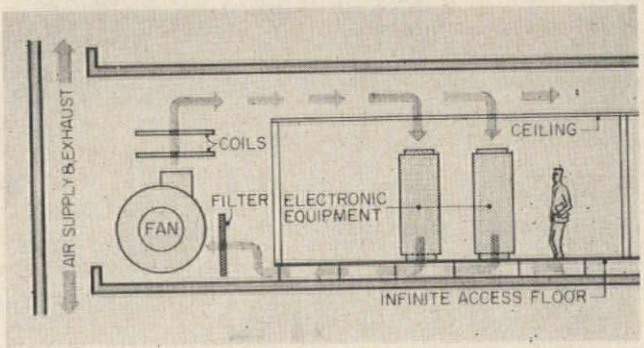


A. Secondary Riser Shaft
B. Primary Riser Shaft
C. Primary Air Supply & Exhaust
D. Three Infinite-Access Floors
E. E.R.M.A. (Electronic Recording Machine Accounting)
F. Electronic Data Processing Center

The section above shows the location of the air conditioning for the data processing area. The third, fourth, and fifth floors of the building are depressed 12 in. to form a space for wiring and air conditioning ducts for the EDP areas. Air conditioning equipment is located on the sixth floor above these areas



The double floor construction and hung ceilings used are shown in this detail. Air conditioning ducts supplying the EDP machines are contained in the space above the hung ceilings. Cool air is supplied directly into the top of each machine from this space, return air carried off within the floor space



The cycle of air conditioning for the data processing machines is shown in the diagram. Cool air is supplied to each floor through the central riser shaft, enters through the top of the data processing machines and is exhausted into the floor space from the bottom of each into the infinite-access floor space chines such as ERMAs and Data Processors. These are the third, fourth and fifth floors. The other five floors are of conventional design and will be used for typical banking administrative functions. The three special floors also include some typical administrative functions; these have been located on the building's perimeter to take advantage of the floor-to-ceiling windows. On these floors the departments which consist largely of machines are located in the interior areas.

This simple and direct solution confined the quite considerable amount of special services—electrical loads amount to as much as 600 kw per floor—needed for the machines within one area on each floor, freeing the remaining areas for other functions.

Double Floor Construction

The building is of reinforced concrete frame construction, with typical connections for the slab floors at exterior walls. But on the third, fourth and fifth floors, at varying distances (typically, nine feet) from the exterior walls, there is a large depressed area 12 in. deep, which forms a plenum for the mechanical services needed for the electronic machines. Cables for electric wiring, air exhaust lines from the machines and other services run in this space.

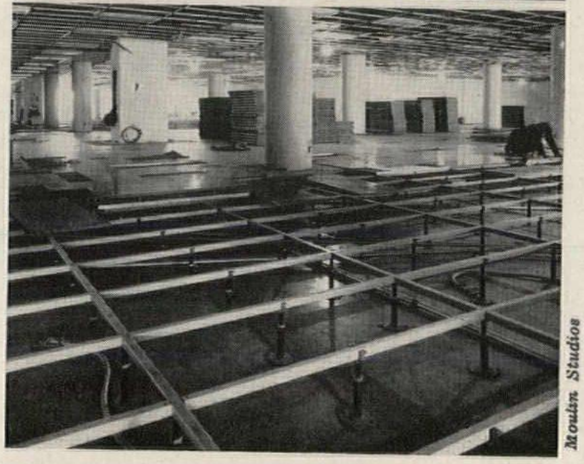
Floor panels over this area are supported on steel pedestals set on the concrete slab at intervals of 2 ft and 2 ft 6 in. This finished floor is set level with the slab at the outside wall (the pedestals are adjustable) and with the curbing around columns. All floor panels in this "infinite access" area are, of course, removable for access to wires and ducts. The machines rest directly on the finished floor; their weight is transmitted via the pedestals to the slab below which is designed, as are all slabs through the seventh floor, for a 250 psf live load. The eighth floor, and the five future floors above it, conform to the San Francisco code requirement of 150 psf.

Air Supply to Computers

Since electronic machines are very much more sensitive to temperature and humidity than are human beings, tolerating only a three-degree range, atmospheric control is of extreme importance on the floors where the machines are located. This is effected by providing special air handling units (fans, filters, exchange coils) for the third and fifth floors (located on the third and sixth floors) for more exact temperature and humidity control and for further filtering of the air that goes directly to the machines. Lines for this supply run above the hung ceiling; exhaust lines take off from the under side of the machines and run in the plenum formed by the double floor. Thermostats in each machine area control conditions; mixing of hot and cold air to meet requirements is done at the distribution point for each area.

This special equipment is, of course, in addition to the central air conditioning system located on the sixth floor, in the physical center of the building. (Basement, ground and mezzanine floors are serviced from a separate system in the basement; another mechanical floor will be added later when the upper five floors are added.) The critical air conditioning needs of the machines required that the air conditioning equipment be located as close as possible to the machines; the sixth floor location was an economical as well as a practical solution to this requirement. Cooled air is sent into a centrally located

One South Van Ness Building



Moulin Studios

The illustrations show the installation of the raised floor in the data processing areas of the building. At the top may be seen the adjustable-height steel pedestals which will carry the metal lateral and longitudinal support members. In the other view, the support members have been placed and the floor panels are being laid

shaft from which it is fed at each floor into the ducts that run in the space above the ceiling. The return cycle from the seventh and eighth floors is separate from that of the floors below.

The hung ceiling stops short of the exterior walls and forms a cove which provides for the air returns. These run to the riser shafts and thence to the sixth floor mechanical room. On the sixth floor louvers on all three sides of the building supply from an exhaust to the outside.

Architectural Implications

All in all, the architectural implications of electronic machine installations, as we have experienced them in designing the One South Van Ness Building, might be summed up in the fact that although the large floor areas which these machines require may necessarily be unusual in detail, the building as a whole is really a conventional envelope in which to contain them. Flexibility as a controlling principle of design, is not new in either commercial or industrial buildings; essential as it is here, its demands are familiar ones. What is unfamiliar is, again, the detail; in particular here, the detail of the specific machine's requirements which are largely mechanical and electrical.

Architectural Engineering

Building Components—a New Department

A not-so-quiet revolution is taking place in materials and equipment for building. Even when life was simpler, keeping abreast of new developments was no easy chore. But now, with pressures to further mechanize assembly of buildings, to control the indoor environment, to provide for more flexibility in interiors, to reduce maintenance and to cut costs, this problem has become serious indeed. Such matters have always been a concern of the AE section, but to serve better this area of interest, ARCHITECTURAL RECORD is adding a new department: BUILDING COMPONENTS: *Application and Specification of Materials and Equipment.* Each month it will feature a technical article by a specialist in the field involved plus the comprehensive reporting available in our regular Product Reports and Office Literature sections. Leading off the new department in this issue is "Aluminum Finishes" by J. H. Goodyear, which covers in detail the various methods for achieving texture, color and gloss, together with the characteristics and architectural applications of available alloys.

The Meaning of Materials

Frank Lloyd Wright wrote a series of articles on "The Meaning of Materials" for ARCHITECTURAL RECORD in 1928 in which he said, "To know intimately the nature of materials is essential to knowing how to use the tools available, to make use of those materials sensibly or artfully." Today the scientist can manipulate molecules to produce materials of wierd and wonderful characteristics to endure the rigors of outer space. So knowing materials, and first of all the needs, is not only a problem but an opportunity for architects and engineers. The pace is now so rapid that the architect may yet have that ideal building material (dubbed "gleepsite" by architectural students) which will withstand all weather, be a perfect thermal and sound barrier, and span miles in a micro-thin sheet.

Plastics and Fire Safety

Present building codes would permit more plastics to be used than are going into buildings, according to a study on fire safety aspects of plastics just completed by the Southwest Research Institute. Some of the conclusions of the study, which was made for the Manufacturing Chemists Association, Inc. are: 1) many building officials lack an understanding of the nature of plastics, and, conversely many people in the plastics industry are unfamiliar with pertinent elements of codes and code administration; 2) many of the fire safety standards in codes are based on arbitrary definitions of fire hazards; 3) the noncombustibility and fire-resistance requirements are major factors limiting use.

Sound and Seating

Anthropologically, we are a bigger people than we were a century ago, and this, indirectly, has caused some surprises in the acoustics of recently built concert halls. The halls have been less reverberant than was predicted by classical formula. Until recently, scientists assumed that the lowering of reverberation time due to the absorption of sound by the audience was directly proportional to the number of people in it. No account was taken of how widely spaced the seats were. (Today seats are farther apart for comfort's sake, and aisles are wider for safety.) Dr. Leo Beranek of Bolt, Beranek and Newman, Inc. has shown in the June issue of *The Journal of the Acoustical Society of America* that reverberation time is not related to the number of people, but rather to the area that the seats and aisles occupy. As an example of what could happen, the reverberation time for the Royal Festival Hall in London turned out 33 per cent less than was anticipated, resulting in a "crisper" sound than designed for.

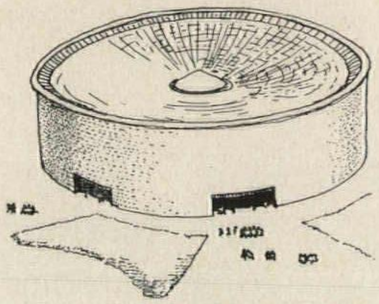
This Month's AE Section

SUSPENSION STRUCTURES

by Seymour Howard, Architect, Associate Professor, Pratt Institute

While suspension structures date back to the rope bridge, the principle has seldom been applied to buildings. In single-story structures, where it is most applicable, the hung roof must handle uplift of wind, unbalanced loads such as snow, and, most particularly, the ravages of vibration (flutter). The nature of these forces and methods of stabilizing structures against them are discussed here. The sketches are by the author.

French Pavilion, Zagreb, Yugoslavia, 1935. Single layer of cables; 110-ft diameter, sag/diameter ratio, 1/11. Roof is 14-ga sheet steel hung from steel compression ring. Bernard Lafaille, Engineer



Municipal Stadium, Montevideo, Uruguay, 1957. Single layer of cables; 308-ft diameter, sag/diameter ratio, 1/11. Roof is precast slabs with prestressed grouted joints. Mondino, Viera and Miller, Architects; The Preload Co., Inc., roof consultants

Of the various methods of spanning a space, suspension systems have a special appeal to the imagination because of their potential efficiency in the use of material and the long spans possible. Steel, aluminum or fiber can be used to their maximum advantage in the form of cable or rope. All the loads can be carried in direct tension; there need be no reduction in the allowable stress on account of the danger of buckling. The drawing of steel into wire form increases the proportional limit to stresses in the order of 160,000 psi, instead of 30 to 40,000 psi for structural steel, and the breaking stress to over 220,000 psi*. What economy of material and lightness this seems to promise!

Why, then, apart from the familiar suspension bridge, are so few permanent structures of this type actually built?

The answers to this question constitute the limitations of suspension systems. New buildings will be successfully designed and constructed using tension as the principal type of stress if these limitations are understood and transcended.

MULTI-STORY SYSTEMS

Cables for vertical supports

One of the suspension systems which crops up perennially in architectural projects is shown in Fig. 1. (As far as I know it has never been used in a completed building.) A series of floors are supported by tension cables which are fastened to an overhead truss; a design like this by Amincio Williams of the Argentine received considerable publicity in the late 1930's.

Paul Chelazzi's "Suspen-Arch" system for multi-story buildings is essentially the same, with the substitution of several "Suspen-Arches" at various levels instead of the single truss at the top (see Fig. 2). The principal advantage claimed for this type of construction is that the cross sectional area of vertical elements is reduced to a minimum, and that, as a result, the plan provides maximum flexibility in floor layout.

The Limitations are:

1. Although the area of the tension cables is small, the addition of necessary fireproofing around them must not be forgotten.

2. The spacing of vertical supports is determined by the floor framing system. Therefore the limitations on the layout of offices is essentially the same as if the floor were supported on columns. Neither a column nor a hanger is a welcome obstruction in the middle of a room.

3. Considering the building as a whole, vertical loads must travel a path about three times as far to get to the ground as in normal columnar design. (Any system with trusses or other main transverse supports at intermediate levels will reduce this distance somewhat.)

4. Wind forces must be resisted entirely by the central compression shaft. With conventional columnar framing, on the other hand, the stiffnesses of all of the columns can help resist horizontal forces.

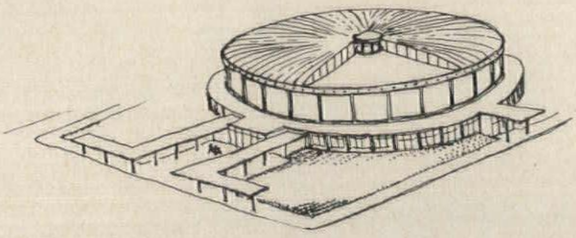
5. The tendency of floors to swing horizontally can be eliminated by correct fastenings to the compression shaft. These must permit relative vertical movement, because the central shaft will shorten under loading while the cables will lengthen.

6. Although methods could be devised to precast the floors on the ground and then raise them by the cables to their final position, the compression shafts and trusses would have to be constructed first. This would be an extra expense as compared with conventional columnar design.

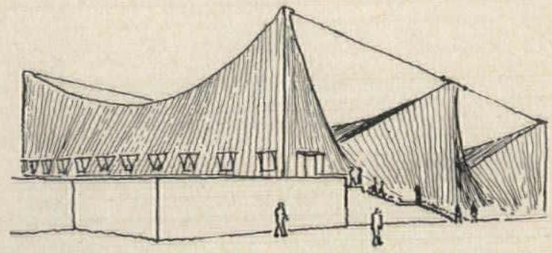
Cables for horizontal supports

These would essentially be adaptations of the single-story systems described below. Not much has yet been done, although Lev Zetlin has been studying some with a 200-ft

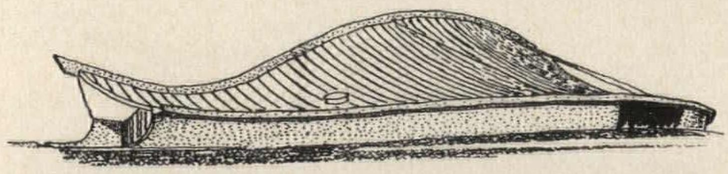
* The Modulus of Elasticity (E) for a single wire (29 million psi) is not changed by wire-drawing, but the effective E when the wires are twisted into cable form goes down to 24 million psi for galvanized bridge strand and to 20 million psi for the more flexible galvanized bridge rope. This reduction does not occur in the main cables of suspension bridges, which are spun in place with the wires parallel.



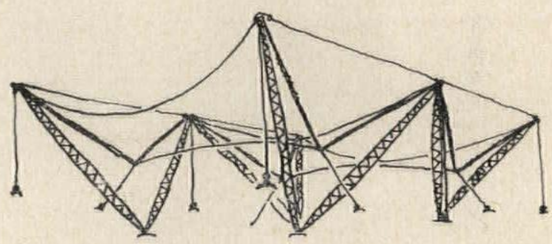
Municipal Auditorium, Utica, N. Y., 1960. Double layer of cables; 240-ft diameter, sag-diameter ratio, 1/12. Prestressed cables hung between concrete compression ring and steel tension ring. Gehron & Seltzer, Architects; Frank Delle Cese, Associated Architect; Lev Zetlin, Structural Engineer



Marie Thumas Pavilion, Brussels Fair, 1958. Steel cables, trussed steel masts, plastic roofing. Plan area 121 by 174 ft. Bottom sketch shows principal supports, guys and boundary cables. Guys are anchored at different levels because of sloping site. Baucher, Blondel, Filippone, Architects; Rene Sarger, Structural Engineer, Batellier, Assistant



David S. Ingalls Hockey Rink, Yale University, 1958. Concrete spine supports steel cables which are covered by 1 5/8-in. wood planking. Concrete side walls, lyre-shaped in plan, serve as anchorages. Extra guy wires were used to stabilize the spine against unsymmetrical wind and snow loads. Eero Saarinen and Associates, Architects; Douglas Orr, Associated. Severud-Elstad-Krueger, Structural Engineers



clear span, using his double, prestressed cable system, described later in this article.

SINGLE-STORY SYSTEMS

The hanging roof

If there is one general category for classifying the limitations of hanging roofs, it is MOVEMENT. Under this broad heading can be grouped most of the problems which can be foreseen.

Non-destructive movements

1. Changes in shape due to moving loads. One of the advantages of tension structures is the simplicity with which one can visualize the shape of the tension elements under a load. A perfectly flexible cable or string will take a different shape for every variation in loading; this is the familiar "funicular curve" or "string polygon." Two extreme cases are shown in Fig. 3. On the left is the catenary curve, formed by a cable

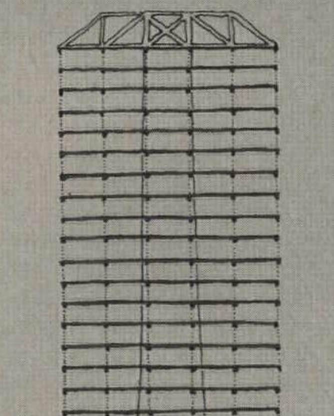


Fig. 1. HANGING FLOORS

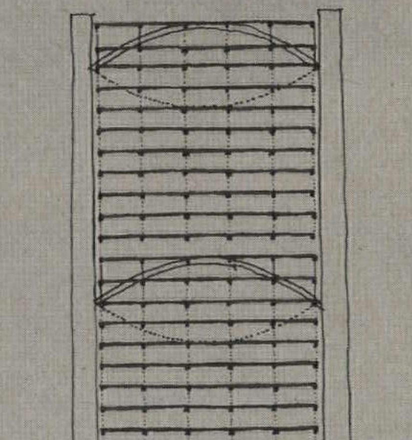


Fig 2. "SUSPEN-ARCH"

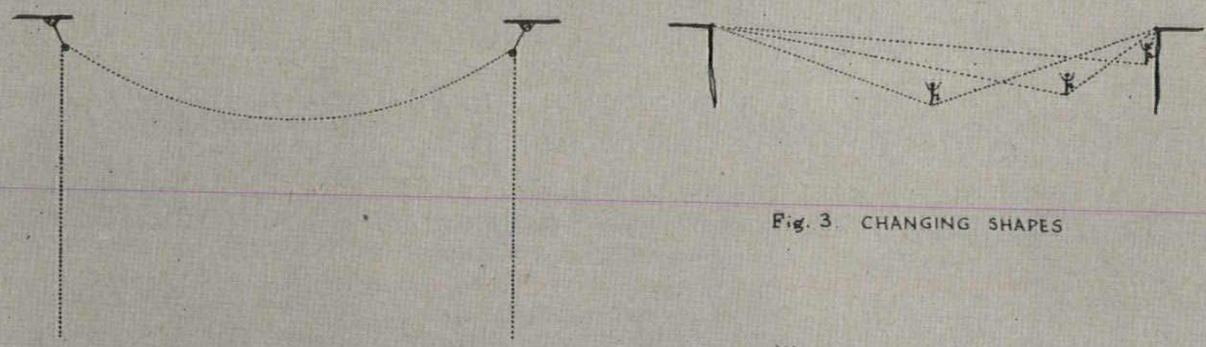


Fig. 3 CHANGING SHAPES

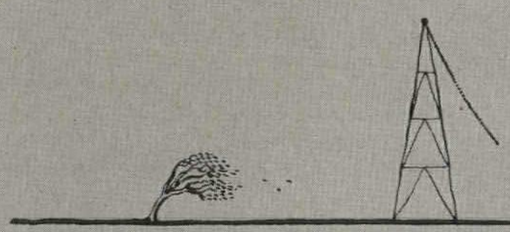


Fig. 4 STEADY WIND

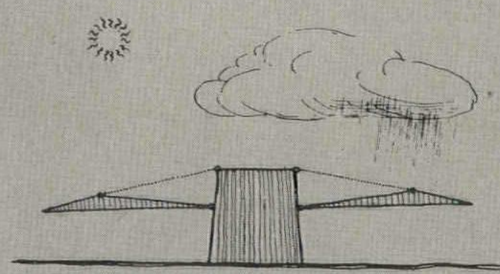
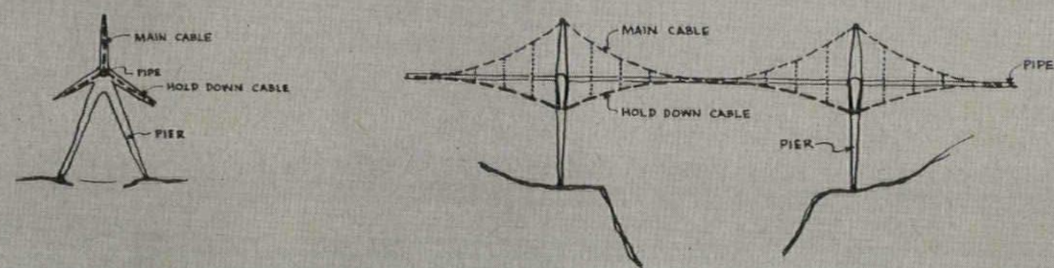


Fig 6 HEAT AND COLD



SECTION AT CENTER SIDE ELEVATION

Fig 5 WIND-BRACED SUSPENSION SYSTEM FOR PIPE LINE

hanging over frictionless pulleys under the influence of its own weight; the weight of the vertical portion is exactly equal to the tension at the supports and the lower end just touches the directrix of the catenary. At right is a cable fastened at each end, and supporting a moving load; cable weight is neglected. Since the length of the cable is fixed, the moving load describes an ellipse with the end fastenings as foci.

The net or membrane in three dimensions corresponds to the cable in two, and gives the picture of a surface which resists forces only by direct tensile stresses. Anyone who has seen acrobats jumping on a circus net or trampoline can understand what is involved.

2. Changes in shape due to unsymetrical loading, such as snow, over only a portion of the roof are essentially the same as those due to moving loads. In both cases, the greater the live load/dead load ratio, the greater the movement.

Prestressing can be used with the same general effect as an increase in the dead load.

3. Changes in shape due to wind loads. On a single circular cable, a steady wind will act like a statical horizontal load, as in Fig. 4. On a roof surface it will act principally as an upward force (suction), unless the slope is over about 30°. Some means of resisting this must be provided: secondary tie-down cables curving upward (see Fig. 5), tie-down guy wires, an excess of dead weight.

The magnitude of the wind force is not the serious aspect of this problem. See below for the potentially destructive dynamic effects.

4. Temperature changes must be considered. These can be provided for by hinges which permit rotation as cable lengths change, etc., as in Fig. 6. Particular care is required with structures which are partly outdoors and partly indoors.

Potentially destructive movements

VIBRATION. Flapping, rippling, fluttering and galloping.

Every mass has its own natural period of vibration with its fundamental and higher modes. The period depends on the density of the mass, on its geometrical distribution or shape and on the magnitude of the stresses set up by its own weight and other permanent forces acting on it. The most familiar example is a stretched wire, whose musical note depends on material, length and tension (see Fig. 7).

The number of half-waves formed by the vibrating wire is always a whole number; therefore one of the clues to controlling vibration is an irregular spacing of framing members, ties and supports. In a piano, for example, the hammers strike the strings at the seventh points in order to avoid the seventh harmonic.

When an external pulsating force is applied to such a mass, like a cable, it will be set in motion. This motion can be represented by an infinite number of superimposed modes of vibration. If one of these modes coincides with the natural frequency or fundamental mode of the mass, resonance will ensue. The amplitude or deflection will be increased and the effect of the pulsating force may also be increased. This process may continue until the structure is destroyed.

Types of exciting forces

The general idea of resonant vibration is a familiar one. How may it take place? The possible causes of vibration include:

1. Wind. This is the most usual and the principal danger to suspended structures (see below).

2. Movement of vehicles and the operation of reciprocating and rotating machinery on the structure or on the ground nearby.

3. Sound. Examples: Thin glasses shattered by a musical note; teeth "set on edge"; the vibration of a church interior with the low notes of the organ; pneumatic machinery.

4. Friction may cause squeaks and chattering if part of structure moves due to temperature changes, racking by the wind, etc.

WIND. The flapping of simple suspended elements like a flag, a sail or a canvas awning is very familiar, but how does the wind really act to cause a rhythmic force? A few examples, taken from J. P. DenHartog's "Mechanical Vibrations" (4th Edition, 1956, McGraw-Hill) will help to clarify this:

1. Kármán vortices. If a steady wind blows against a cylinder or other obstruction, the wake is made up of a vortex street (see Fig. 9). The shedding of these vortices on the leeward side causes forces to act on the cylinder at right angles to the direction of the wind, first from one side and then from the other. The period or frequency: $f = 0.22\frac{V}{D}$ (V is velocity; D is diameter).

This is evidently the cause of the high-pitched hum heard from power lines when a strong wind blows and the cause of fatigue failure when resonance occurs. It is also the cause of vibration failures which often occur in steel industrial smokestacks with winds of about 30 mph. Springs and small shock absorber type dampers have been developed to prevent these failures.

A Kármán vortex about 39-ft long was the cause of the famous Tacoma Bridge collapse, which occurred under a steady 42-mph wind. The deck twisted about 45° from the horizontal in both directions until it broke (see Fig. 10). The deck was rebuilt, using a box section instead of the original H section, thus increasing the resistance to torsion a hundredfold. The new section was made up of open trusses on the sides and an openwork deck to prevent the formation of large eddies or significant pressure differences between the upper and lower surfaces (see Fig. 11).

2. Dynamically Unstable Shapes. The force of the wind on a prismatic shape is usually not in line with the direction of the wind. In analyzing its effect, the force is divided into two components: drag and lift, parallel and perpendicular to the direction of the wind, as shown in Fig. 12. The magnitude of these will vary with changes in the angle of attack and with the section. Thus a cylinder will have no lift, while an oblong shape will. Some shapes are found to be unstable; this means that if the wind blows at certain angles, the lift force causes them to wobble. A rectangular section is unstable if it is held more or less across the wind as in Fig. 12, a half-cylinder even more so. This effect can be felt by dragging a flat board through water.

The dynamic stability of a given shape can be determined only by experiment. If suspension roof structures are to find more general use, experiments will have to be performed to determine the dynamic stability of various surfaces.

An example of this instability is the galloping transmission line. When a power wire becomes covered with sleet, it loses its symmetrical circular shape and becomes elongated, changing from a stable to an unstable section (see Fig. 13). The wind can now lift it, and a wire of 300-ft span rises about 10 ft, until the stretch of the wire pulls it down again. The frequency is very slow, on the order of once a minute; the wire will gallop up and down for many hours, as long as the wind blows steadily and the sleet remains on the wire. Similar action occurs with a sail turned parallel to the direction of the wind.

DAMPING

A structure or part of a structure which has been set in vibration by a single force will not continue to vibrate forever. Even tuning forks or piano strings will gradually stop due to air resistance and internal friction In a structure it is usually necessary

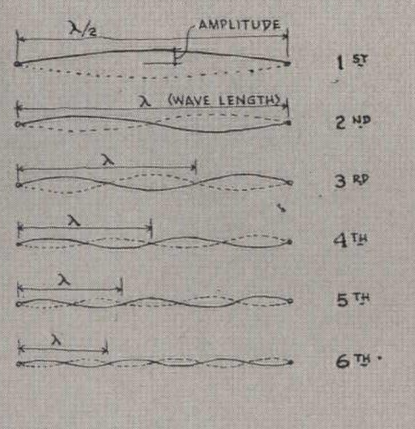


Fig. 7 MODES OF VIBRATION

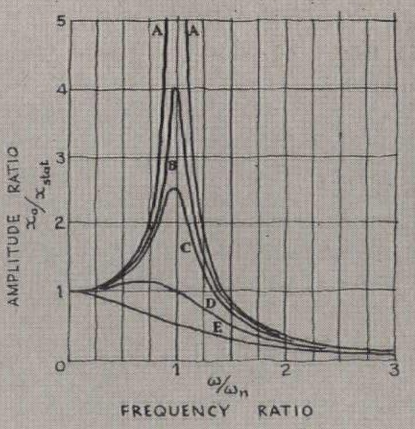


Fig. 8 VIBRATION WITH VARIOUS DEGREES OF DAMPING

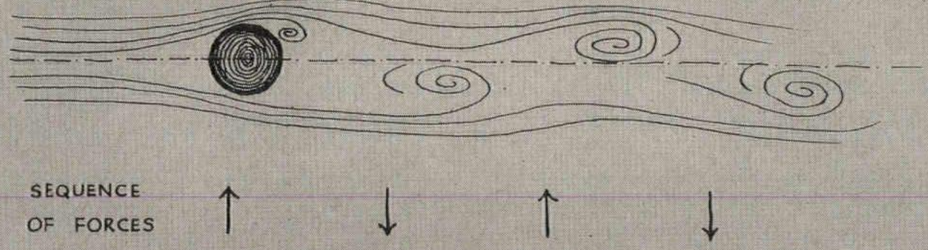


Fig. 9. VON KÁRMÁN VORTEX STREET

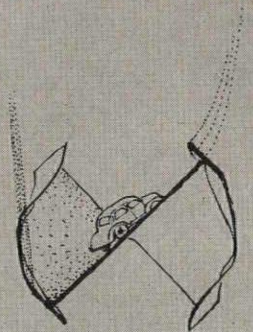


Fig. 10. TACOMA BRIDGE, 1940

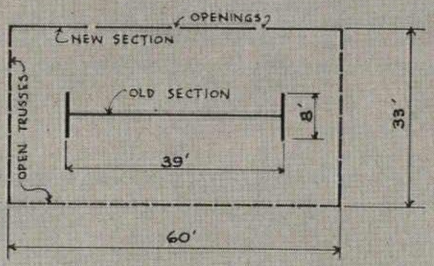


Fig. 11. DECK OF TACOMA BRIDGE

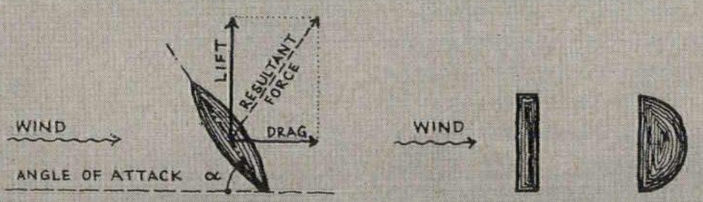


Fig. 12. LIFT AND DRAG: DYNAMICALLY UNSTABLE SHAPES

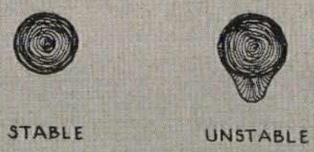


Fig. 13. ICE COVERED WIRE

to eliminate vibration completely or to have it damped as quickly as possible.

If a damping force can be provided which acts in the opposite direction to that in which the structure is moving when vibration starts, and if that force is proportional to the velocity of the structure (the faster it moves, the greater the damping force), vibration can be prevented or greatly diminished. This is often called viscous damping because a small plunger in a dashpot filled with viscous liquid will provide this type of resisting force. This is similar to the action of the cylinder of a door closer.

A spring alone is not sufficient for viscous damping. Although it may change the period of vibration and prevent or reduce the transmission of vibration from one part of a structure to another, its resisting force does not increase proportionally to the velocity but only proportionally to the displacement. In other words, the further down the structure is pushed on the spring, the greater the force of the spring pushing it up; but the resisting force of the spring does not increase any more or any less if the structure moves down against it quickly or slowly. Also, during its motion in one direction, the spring stores up energy which is released back into the structure as the spring moves in the opposite direction. With viscous damping on the other hand, the energy is dissipated within the "dashpot".

The diagrams of Fig. 8 show graphically the effect of damping. The abscissas measure the relationship:

$$\frac{\omega}{\omega_n} \text{ OR } \frac{\text{period (freq.) of exciting force}}{\text{natural frequency of structure}}$$

The period of the exciting force may be the period of the external force (such as machinery) or the period of vibration of the self-excited force (such as the Kármán vortex street or the changing lift pattern of an airfoil surface).

The ordinates measure the relationship:

$$\frac{x_o}{x_{stat}} \text{ OR } \frac{\text{amplitude of vibration due to exciting force}}{\text{amplitude of deflection due to a statical force of same magnitude}}$$

The curves plot the effect of various degrees of damping, from none to perfect. Thus, curve A, with no damping ($c/c_o = 0$), shows that the amplitude or deflection goes to infinity at resonance; i.e. the structure would be destroyed. For curve B, with a damping of ⅛ of critical ($c/c_o = 0.125$), the amplitude at resonance is four times as great as the statical deflection. For curve C, $c/c_o = 0.20$; curve D, $c/c_o = 0.50$. With curve E, showing critical or perfect damping ($c/c_o = 1.0$), the

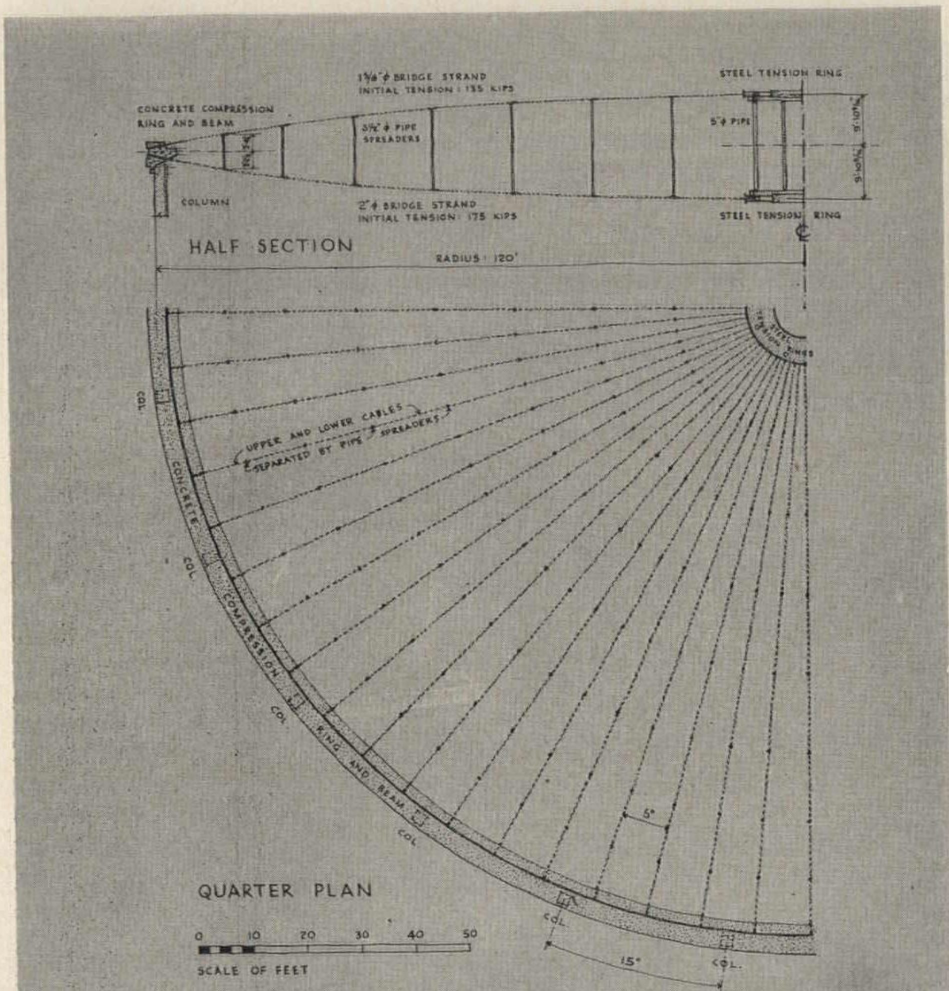


Fig 14 PRESTRESSED DOUBLE DOME ("BICYCLE WHEEL" ROOF)

amplitude is always less than the statical deflection, showing that the damping has no effect if the exciting force is applied very, very slowly, but an ever increasing effect as the period of the exciting force increases.

EXAMPLES OF SUSPENSION STRUCTURES

Apart from the suspension bridge, there is to date no generally accepted body of "good practice". Relatively few buildings have been built. The field is new; experiments and patents are many. Pioneers include such engineers as: Fred Severud and Lev Zetlin in the U.S.; Frei Otto in Germany; Bodiansky, LeRicolais, Bernard Laffaille and René Sarger in France.

Principal elements

1. Compression. Towers, masts.

2. Tension. Main cables and hanger members.

3. Stiffening. For holding down against wind up-lift, for preventing vibration, for maintaining shape under unsymmetrical loading. May be trusses, diagonal tension stays, guy wires, secondary cables with a curvature upward (these may be prestressed) and the dead weight of the structure itself.

4. Anchorage. For vertical components, may be the ground (bedrock), the weight of concrete deadmen or the dead weight of part of the structure such as side walls. For horizontal components, may be bedrock, the resistance to sliding of concrete deadmen, or part of the structure such as a floor, deck or a circumferential ring.

The most promising principles for roof surfaces seem to be:

1. Use two families of cables, one curved downward (concave) and one curved upward (convex).

2. Prestress both families of cables, so that they will always be in tension and never go slack, no matter what the loading. This will require anchorages or edge supports able to withstand forces at least three times as great as if not prestressed. Force instead of mass is being used to prevent flutter but a good deal of mass reappears in the anchorages.

If followed correctly for every part of a roof surface, these principles will ensure a "rigid" tensile membrane which can carry any vibrations in loading by corresponding variations in the tensile stresses in the surface. They may not by themselves prevent vibration, however. For this further study is required.

Some examples embodying these principles are shown in Figs. 15 through 18.

The Prestressed Double Dome or "Bicycle Wheel" Roof

This roof (Fig. 14) was developed by the engineer Lev Zetlin of New York for the Municipal Auditorium of Utica, N. Y., designed by Gehron and Seltzer, architects, completed this year. (See ARCHITECTURAL RECORD, August, 1959.)

Its main characteristics are: two sets of cables, one curved upward, one downward, both prestressed. This was done by jacking them apart and inserting the pipe spreaders. The compression ring is under a constant radial horizontal load of about 300 kips per pair of cables, which generates a compressive force of about 3500 kips in the ring. The vertical dead load is only about 8 kips per pair of cables or about 13 lb per sq ft (not including the compression ring). The prestressing enables both sets of cables to share in supporting the dead and live loads. Note how the use of intermediate spreaders enables the cables to be attached to the compression ring at relatively steep angles. The cables can thus carry greater vertical forces for a given total tension.

As vertical loads increase, the tension in the upper family of cables will diminish while that in the lower family will increase. As vertical loads decrease due to wind suction, the reverse will occur. As long as the initial prestressing force is not completely cancelled out, neither family will go slack and the horizontal pull on the compression ring will be constant.

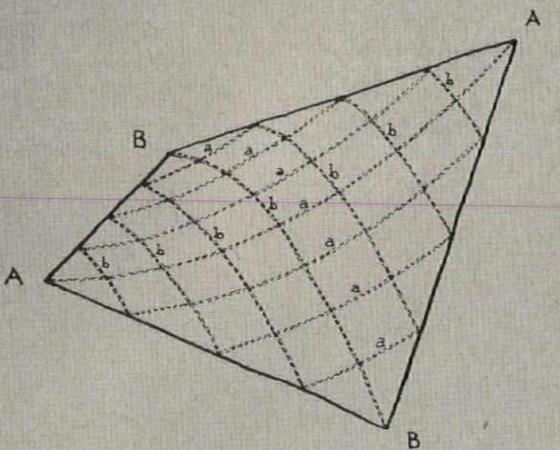


Fig 15 HANGING ROOF, NEGATIVE CURVATURE

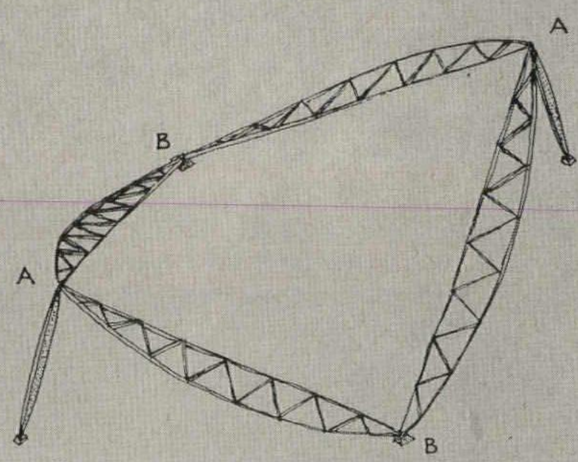


Fig. 16. SUPPORTING FRAMEWORK

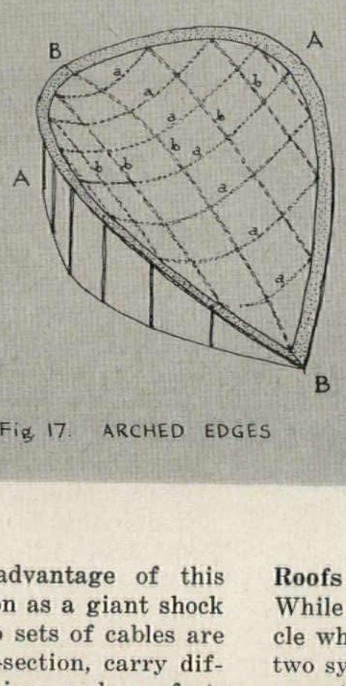


Fig. 17. ARCHED EDGES

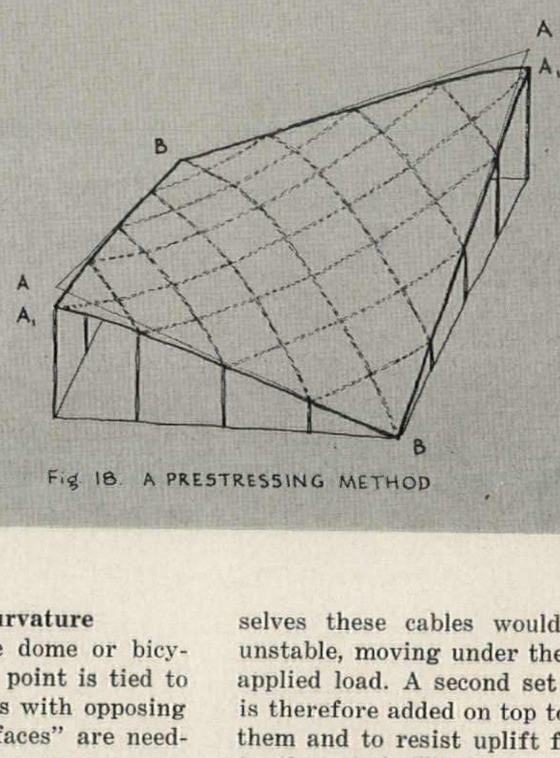


Fig 18. A PRESTRESSING METHOD

The greatest advantage of this system is its action as a giant shock absorber. The two sets of cables are of different cross-section, carry different initial tensions and are fastened together by spreaders which are spaced unequally. No matter how the tensions in the two families of cables may vary, their frequencies and wave lengths will differ. Because they are connected by the spreaders, the upper family thus damps any vibration which might start in the lower cables and vice versa. The damping is perfect, corresponding to curve E in Fig. 8.

Although this example shows a 240 ft span, spans up to 1800 ft are possible and would give greater economy per sq ft.

Certain features such as the intermediate spreaders and the use of large prestressing forces are patented (application Serial No. 653,129, April 16, 1957).

Roofs of Negative Curvature

While in the double dome or bicycle wheel roof every point is tied to two systems of cables with opposing curvature, two "surfaces" are needed to accomplish this.

The negative or anticlastic surfaces offer another possibility. Their basic characteristics are shown in Figs. 15 through 18.

Fig. 15 shows a straight-edged surface, with the high points marked A and the low B. The framework necessary to support the surface is indicated in Fig. 16; the struts at A are necessary for the stability of the structure as a whole, the two points of support at B being insufficient unless they were built in as moment connections.

From the edges hang the principal cables, curved downward, which we can call family "a". Hanging under its own weight, each cable will describe a catenary curve. By themselves these cables would be very unstable, moving under the slightest applied load. A second set of cables is therefore added on top to stabilize them and to resist uplift forces due to the wind. These are all curved upward; call them family "b". The points of intersection of the cables all lie on a surface of negative curvature. (Only if all the "a" family cables follow the shape of identical parabolas and if all the "b" family cables follow the shape of identical parabolas would the surface be a true hyperbolic parabola.)

In order to resist the considerable bending set up in the edge beams, structures have been built with the edges curved into arch form so as to resist the pull of the cables by compression alone. Fig. 17 shows this design, which is familiar from the North Carolina State Fair Pavilion (William Dietrich, Architect; Matthew Nowicki, Consultant; Severud-

Elstad-Krueger, Structural Engineers), and which is also familiar from Frei Otto's work in Germany. Note that the edge arches need some vertical support from mullions to assure the stability of the entire structure. In simple hanging roofs of this kind the "b" family of cables is only moderately prestressed and flutter must be prevented by the addition of guy wires attached at critical points and coming off more or less perpendicular to the surface.

The next step is to provide so much prestress in the "b" cables, thus also prestressing the "a" cables (or vice versa), that the surface will be much more resistant to any changes in loading and will act like a rigid membrane.

How to prestress the cables is the difficulty. One solution has been patented by René Sarger and the C.E.T.A.C. (patent No. 1,156,041, Paris, 20 August 1956) and used by him for the French pavilion at the Brussels Fair and other structures. It consists in lowering the points A by pulling down on the edge beam. The inner chord of the edge beam remains in the same vertical plane but is now curved in this plane along the line BA_1, as shown in Fig. 18. The surface remains approximately that of a hyperbolic paraboloid, but not exactly the same one as before. The weight of the side walls plus footing anchorages at the bottom of the mullions are used to hold the edge down.

It is important to distinguish the action of the various roof shapes which follow the hyperbolic paraboloid:

1. *The thin-shell surface,* acting as a membrane under uniform vertical loads. Tensile forces follow the lines corresponding to the "a" family and compression forces follow the "b" family. The magnitude of these membrane forces is the same at every point and the compression and tensile forces cancel each other out at the edge. This leaves only a shearing force of the same magnitude, which the edge can support as a relatively slender column.

2. *The hanging roof, not prestressed.* Under uniform vertical loading no forces can be carried by the "b" family. The relatively large horizontal forces needed to support the ends of the cables of the "a" family require the edges to be designed as beams, supported at A and B. These horizontal forces will vary considerably with changes in snow and wind loads.

3. *The prestressed suspension roof.* In order to prestress both families of cables, at least three times as large horizontal reactive forces must be permanently provided by the edges. But, for any variation in loading on the roof due to snow or wind, the prestressed surface will now act similarly to the thin-shell roof, up to the point where the "compressive" force set up in the "b" family cancels out the initial tension.

Weights. Prestressed suspension roofs have been built in this shape and also as conoids (as at the Brussels Fair) with remarkably light dead loads, on the order of 3 lb per sq ft for cables and planking for spans of over 200 ft in both directions. However these light loads were achieved only at the cost of very heavy edge beams and vertical supports which brought the average weight up to about 40 psf.

It would appear therefore that suspension systems for roofs will be most suitable and economical when the edge anchorages do not have to be constructed for that purpose alone but can be provided by some elements of structure which are already necessary for other reasons. These might be stadium seats hanging over their bases, the lean-to shops and maintenance areas of a hanger, floors surrounding a central hall or along two ends of a hall, such as one might find in a museum (see Fig. 19).

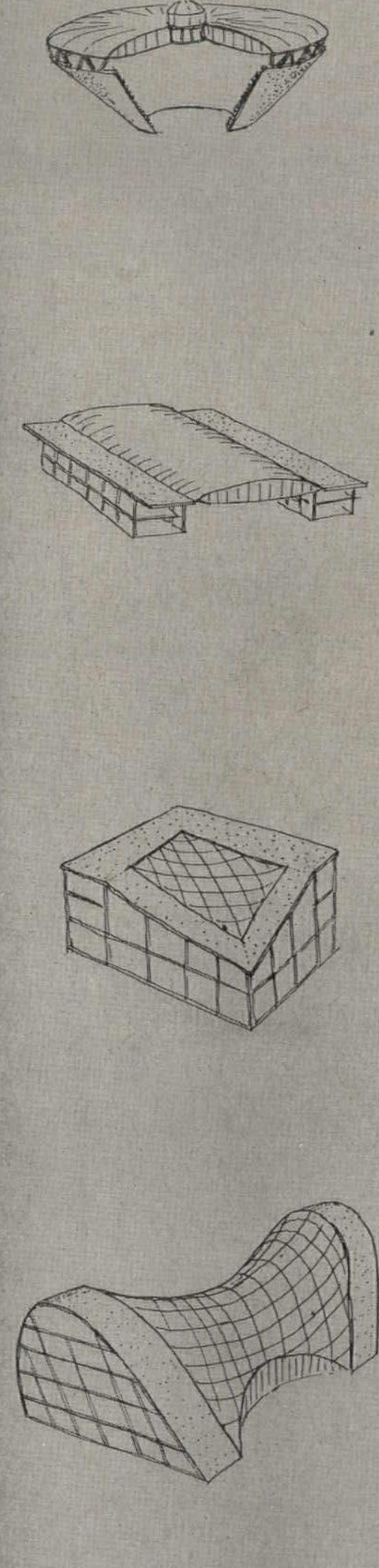


Fig. 19.

SUSPENSION STRUCTURES

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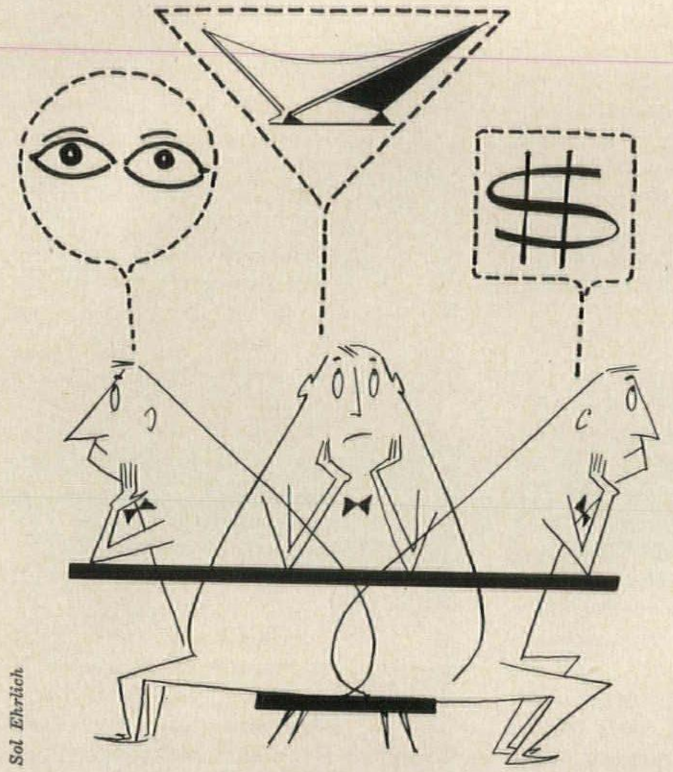
TECHNOLOGY IN ARCHITECTURE:

A Contribution — and a Challenge



Sol Ehrlich

*by Mario G. Salvadori**

In the midst of the uproar created by the architect's current—and vocal—examination of the challenge presented by a burgeoning building technology, and his reappraisal of his own proper role in meeting that challenge, Professor Salvadori here strikes a note calculated to bring out the harmonies inherent in the hubbub. He fully recognizes science's contributions to, and impact on, architecture. Yet he sees for the architect not a new role but a recasting of the oldest rule of all: that of the master-builder. It is no more necessary for the architect of today to be able to design a mechanical system than it was for the builder of yesterday to be able to carve a gargoyle. What is needed, now as then, is for the architect to comprehend the building requirements, to communicate those requirements to the specialists who work with him, and to direct their skills toward a goal that only he can see in all its aspects. To Professor Salvadori, technology is far from a threat. For those who can grasp its true implications, it represents a unique opportunity to reinstate the timeless definition of architecture as not alone the art but also the science of building.

Modern man faces today a technological culture that—actively or passively—pervades his whole life, influencing his daily chores, his economy, his politics, his future. As a result, the architect, who combines a necessary and vital interest in the psychology and the physiology, the sociology and the economy of his fellow human beings with his wish to plan and build not only the private room, the home and the office, but also the town and the region (if not as yet, perhaps, the entire world in which modern man is active), feels more directly than almost any other professional the impact of technology.

The Role of Technology

Since the United States seems to be recognized today as one of the leading nations in the fields of both architecture and technology, it is of interest to find out what the relationships between the two are in this country, both from the viewpoint of what has been achieved so far and of what may be achieved in the future. Certainly the influence of the collaborating engineer on architecture is deeply and often healthily felt. Moreover, this influence is increasing daily because of the essentially technological character of today's most important architectural problems.

Many of these problems emphasize, by their very nature, the importance of the structure, and cannot be solved without the intimate, early and continued collaboration of the structural engineer. It is he who must decide what is feasible and what appears an impossible dream; it is he who must establish the structural system through which the architect's concept will be materialized.

The Engineer's Contribution: New Materials and Structures

In this country, wood has been the classical material for small buildings, while steel, for a long time, has had a practical monopoly on large structures. Little that is really new has been developed in the field of extruded steel sections, but steel is now playing an important role in another form—the cable, which today allows the economic construction of large tensile structures whose design often requires the collaboration of the aerodynamicist as well as the structural engineer to investigate and minimize the problems of vibration and flutter.

Aluminum too is gaining popularity in a variety of structural applications that go from bridges to the new curtain wall, an economical and rapidly assembled facade element which is one of the more striking esthetic solutions suggested to architecture by building technology, and which is actually changing the face of many an American avenue.

Nevertheless, it is reinforced concrete that has, under the impact of a variety of economic factors, most successfully entered during the last few years many fields formerly monopolized by other materials. Continuity of structural behavior and freedom of form allow the creation of concrete structures that bear little

* Professor of Civil Engineering and Architecture, Columbia University. This article is based on material prepared for international broadcast by the Voice of America as one of a series of lectures on American architecture

resemblance to the architectural types of the past, and architects have been more than eager to adopt reinforced concrete in the solution of their problems.

The Engineer's Contribution: New Construction Techniques

Although it is only during the last half-century that the American architect and engineer have thus competed with their colleagues abroad in the use of new materials and in the development of new structural concepts, the American builder has for at least a century been at the forefront in field of construction. Indeed a new era in construction opened up when the engineer put at the disposal of the architect entirely new methods of assembly for many types of buildings.

In concrete construction, to take only one example, precast-prestressed elements put together with tremendous reductions in form costs have already become a solution typical of repetitive structures. The concrete thin shell has been adopted by so many architects in the last ten years that innumerable shell structures now dot our landscape.

In this field as in many others, European examples were at first followed, but by now new and exciting "native" forms have been developed for particular types of roofs. And here too building know-how (inspired perhaps by a high ratio of labor to material costs) has led to the ingenious solution of special construction problems.

Shells have been poured on shaped earth mounds; concrete pneumatically applied to nylon balloons has allowed the inexpensive construction of one-family houses; cantilevered folded plates suspended from, and post-tensioned by, steel cables have offered an economical answer to the airplane hangar problem.

The Engineer's Contribution: New Mechanical-Electrical Services

Although the influence of the engineer on architecture was limited to such structural solutions until a relatively recent date, one of the great revolutions in architecture was produced by the evolution of new services, for which the mechanical and the electrical engineers were entirely responsible.

For example, the vertical development of the tall building and, in particular, of the skyscraper would have been inconceivable without the simultaneous development of improved means of vertical communication. (Automation has now given us elevators safely usable in public buildings one hundred stories high, in which the operation of the single cabin is in the hands of the passenger, and in which the synchronization and the optimalization of vertical traffic is governed by a master station.)

Another recent achievement of mechanical and electrical engineering is the development of air conditioning systems so reliable that climate's role in the daily life of the population is minimized. The function of the window has been reduced to that of allowing daylight to enter a closed space. And in situations in which it is felt that daylight is not essential, or may even be detrimental, windows have been abolished altogether. Both light and air are supplied by artificial means, thus creating a completely new type of environment for people to work in.

Is Technology Enough?

This is not the place or the time to discuss whether such achievements are to be considered desirable or not. The essential point is that our technology has reached such perfection as to make these results possible, economical, and acceptable to large masses of the population. Purely technological triumphs are changing the daily life of the United States citizen at an accelerated rate.

One may wonder if this intrusion of engineering in the field of architecture is a positive contribution in all of its aspects, or if sometimes it may not endanger the free development of modern architecture. In this connection, we may mention the opinion advanced by some outstanding engineer-architects to the effect that structure is the all-important ingredient of architecture, and that if one could only make sure that a structure is entirely correct, the architecture it supports would necessarily be good architecture. In other words, some engineers feel that good architecture is a natural by-product of correct engineering.

This is indeed a dangerous, and at least in one man's opinion, an erroneous theory. While no one could challenge the fact that good architecture cannot be obtained unless its structure is properly considered and designed, it is hard to see that the opposite is true. Correct structure must be considered a *necessary* condition of good architecture, but is not a *sufficient* condition of it.

As a corollary to this truth, it seems illogical to fear that the engineer will ever supplant the architect in his profession. Such fear has been expressed in recent times by some outstanding American architects, and represents the fear of the humanist confronted by the increasing power of the specialist in our culture.

But if architecture is to maintain its character of an encompassing art and science, if the whole man is to be its field of interest, it is hard to believe that the engineer may be feared. The engineer, by training and natural tendency, is used to dealing with inanimate matter rather than with human beings, to using the purely logical and rigid approach of the scientist, rather than the intuitive and fluid approach of the artist.

The Engineer's Challenge

All the same, one must recognize the fact that today some of the best known builders are engineers and not architects, and that their instinctive love of beauty makes their structures extremely beautiful. There is no doubt that the influence of such engineers is bound to be felt and that wherever the architect puts himself in a subordinate position because of his lack of interest, training and knowledge in technology, the exceptionally endowed engineer will take over. The best man always did and always will win, whether he has the correct label or not.

Thus the architect in the United States must fear the intrusion of the exceptionally endowed engineer, just as the structural engineer may fear the intrusion of the exceptional architect with a deep interest in structures.

One may, at least, consider the new freedoms created by our advanced technology as real dangers to the achievements of the architect. Art is sublimated by limitations of its own choice and by the unrelenting search for truth within the confines of these limitations. For centuries the themes and the solutions available to the architect have been essentially the same, so that the evolution of architecture, although occurring in spurts, has been altogether smooth and continuous. All of a sudden incredible problems and unexpected methods of solution have become available. How can we be amazed if our country has developed, together with a lively interest in architecture, an almost chaotic situation?

Too many possibilities have been opened up too suddenly, and the American architect finds himself so free as to be, at times, lost. The question often asked by the architect of the engineer is: "*Can* this structure be built?", while it should properly be: "*Should* this structure be built?" With the range of materials available today and with the technological knowledge at our disposal, almost anything can be built. This unlimited freedom is bound to produce, at times, poor results.

The Architect's Answer: Better Communication

One could ask whether the situation briefly outlined above has parallels outside the United States. The answer is, of course, that in our times basic situations in the professions are common to the whole world, but that specific aspects of the same problem may appear in different form in different parts of the world.

It must be emphasized in this connection that the training of the architect in the United States is not as technologically and scientifically thorough as it is in other nations. Thus, the architect finds himself at a disadvantage in discussing technical problems with his collaborating engineers for lack of a common language. On the other hand, the training of the civil, mechanical, and electrical engineer does not take into account the needs of the architect. No engineer has, because of his training, an insight into the problems of architecture, and only a few individuals are capable of understanding the demands made on them by the architect.

Since the difference in knowledge between a civil engineer and an architect in the field of structures is less accentuated in Europe than in the United States, it will be found that the discourse between the architect and the engineer occurs with less difficulty in Europe and that more architects will make decisions directly on structure there than here.

Actually, there are examples in Europe of men who are at the same time architects, engineers and contractors. For them difficulty of communication is non-existent because the architectural problems are unified by a single personality. Is this automatically conducive to better architecture?

It is, if the communication between the professions is so poor as to give an advantage to those who have no communication problems, even though these individuals may lack complete knowledge in the separate fields of architecture, engineering, and construction. It will not be conducive to better solutions if the group of independent, outstanding professionals is capable of thorough communication.

Possibly the worst solutions are obtained when a totally superior architect, without a solid technological background, cows the engineer into accepting all his ideas, or when the outstanding engineer, almost totally ignorant in non-technological fields, cows the architect into an acceptance of his own tenets. This is the origin of the purely utilitarian architecture of some of our modern cities, as well as of some cities abroad, and of the Beaux Arts esthetics still in use in numerous architectural offices the world over.

The Architect's Answer: Productive Collaboration

More and more the demands of society require solutions obtainable only through the collaboration of small and efficient groups of experts in adjoining fields. An electronic computer or an airplane is such a complicated organism that no one of its creators is capable of understanding all of its parts.

Similarly architecture today has become too complex a science for any single person to hope to encompass the whole of it. Modern architecture is rapidly becoming a group activity, and, perhaps, this is the essential reason why the United States has excelled in it: the tradition of collaboration is deep in our culture and we have developed modes of collaboration in which the members of the group maintain their identity and their intellectual freedom.

This country has some of the largest architectural firms in the world, with offices in which as many as 200 architects and engineers work on difficult problems. One would expect a loss of personality and, possibly, a lowering of standards in such large offices, unless one knew that the organization of these offices is not on the basis of one large group, but on the basis of a large number of relatively small groups, each one with the entire responsibility of a given problem, but ready to merge into larger groups whenever the occasion or the necessity for such collaboration arises.

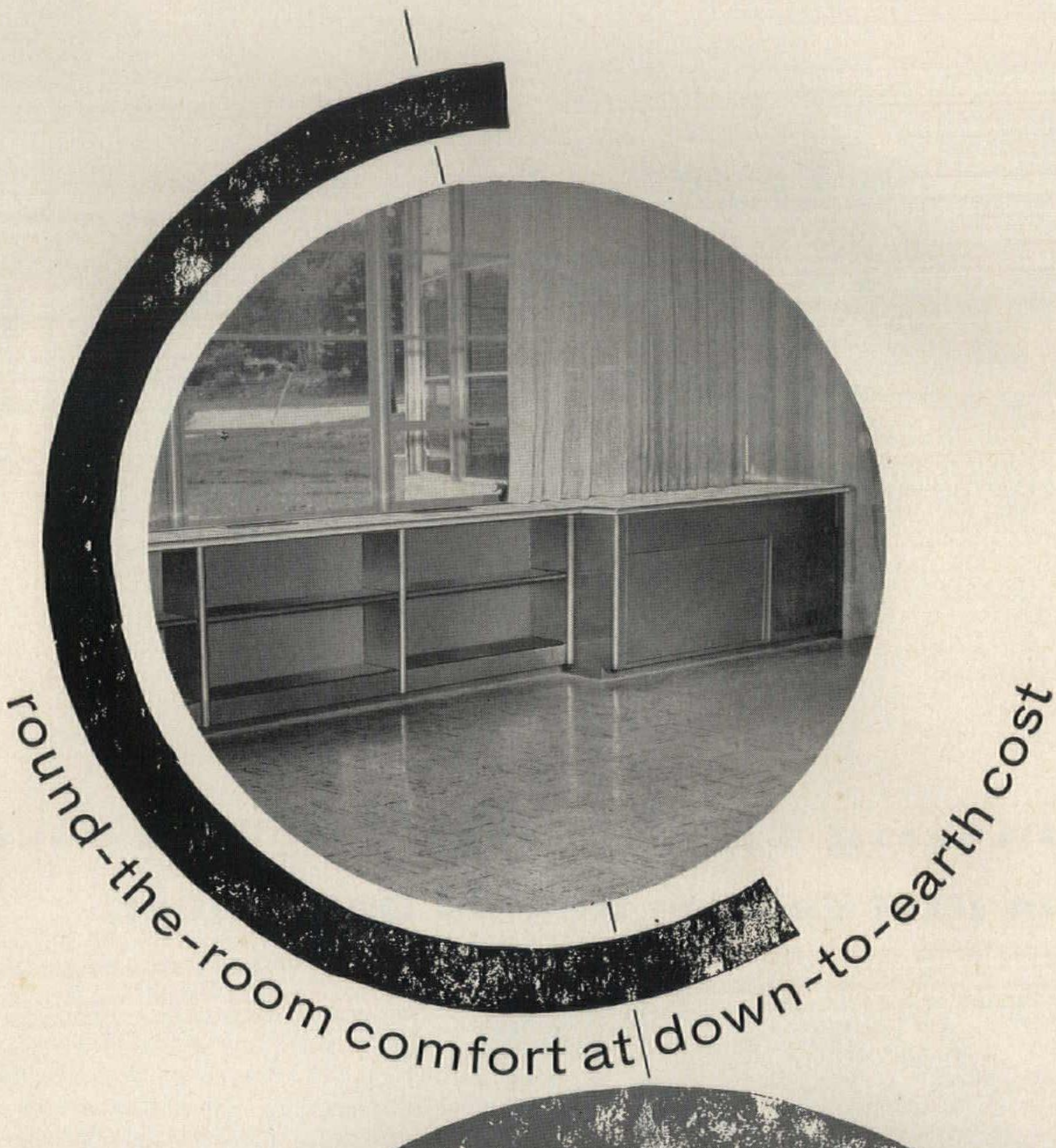
Moreover, the highly specialized field of engineering is ready to serve the architectural offices in the United States by means of temporary collaborations in particular fields. Our economy permits the establishment of specialized groups interested in designing only bridges, or only office buildings, or only factories, or only hotels, and this specialization is bound to produce a better kind of product. This is why a certain excellence in technological details is one of the primary characteristics of our architecture. Our roofs do not leak, our plumbing works almost without failure, our elevators do not break down.

Taking Stock: New Horizons Ahead

One may consider this a byproduct of our high standards of living, and no one can doubt that our standards are both the result and the cause of our technological and architectural superiority. But comparing our achievements with those of other countries as technologically developed as ours, one cannot deny that technology alone could not have produced such results.

Our architecture is the final product of many currents and many influences. We have adopted as our own some of the greatest architects in the world, who came to us from other countries. We have perfected technological ideas originated in our own factories or imported from Europe. We have reached a level of architectural achievement of which we may be proud, not because it is ours, but because it is the result of our efforts and of the best efforts of everybody else.

The staunch individualist, the ivory tower artist who does not recognize his debt to predecessors and contemporaries, may be dejected at the thought of a civilization based upon group activity, but those who can grasp the meaning and the essence of collaboration will be elated at the thought of the new horizons open to our culture.



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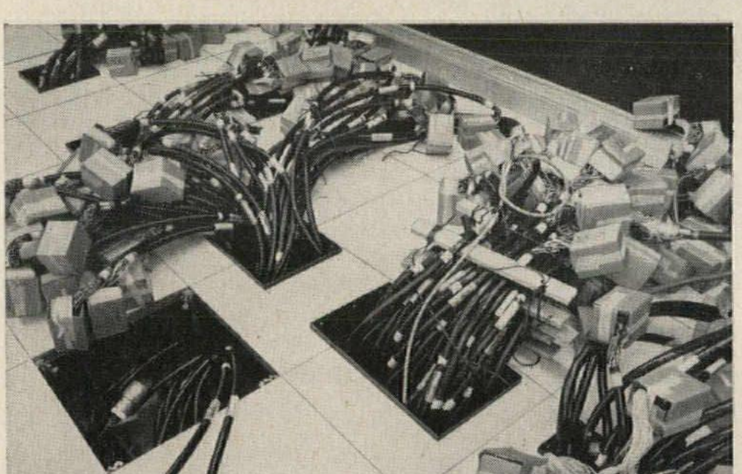

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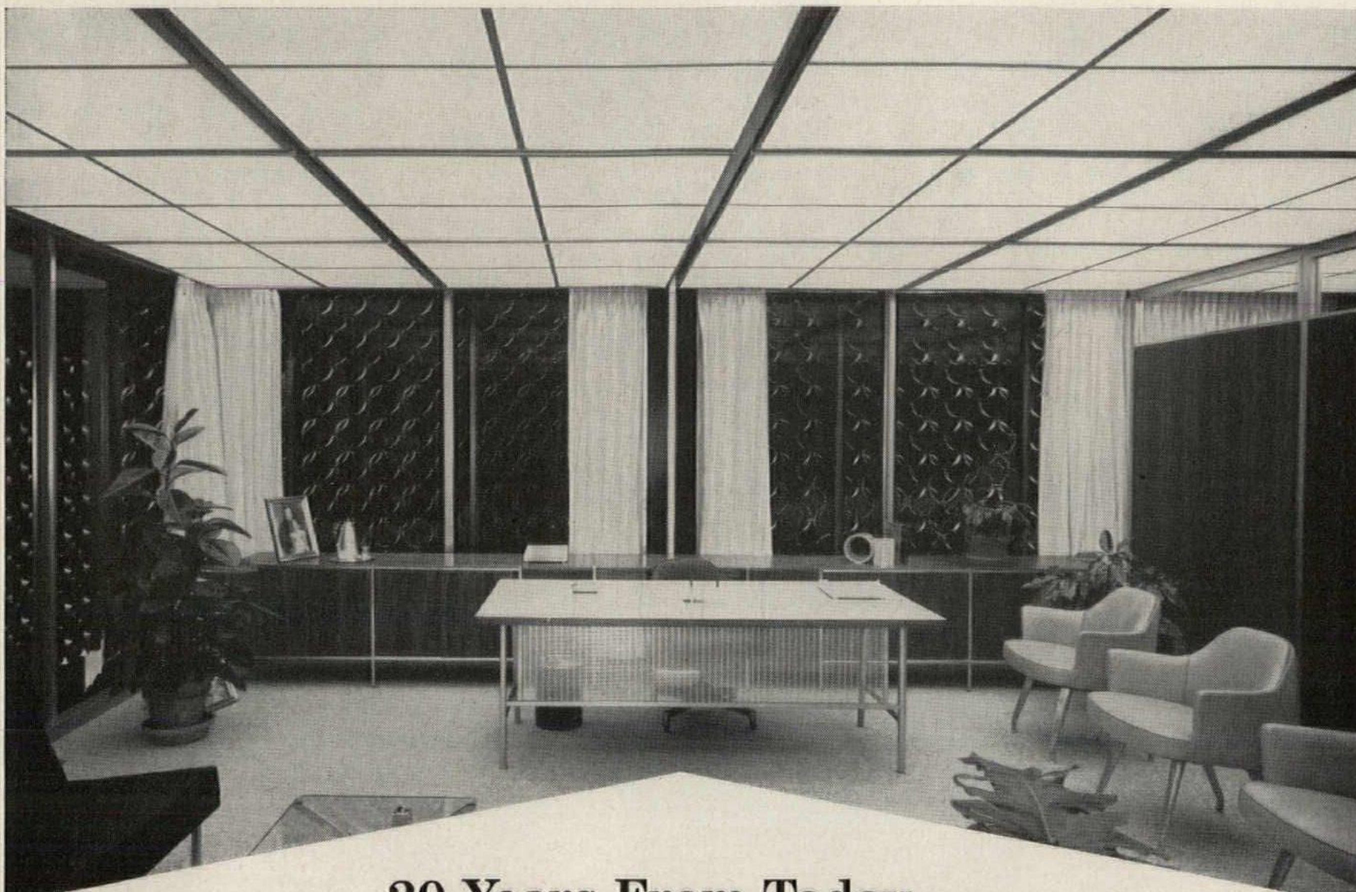

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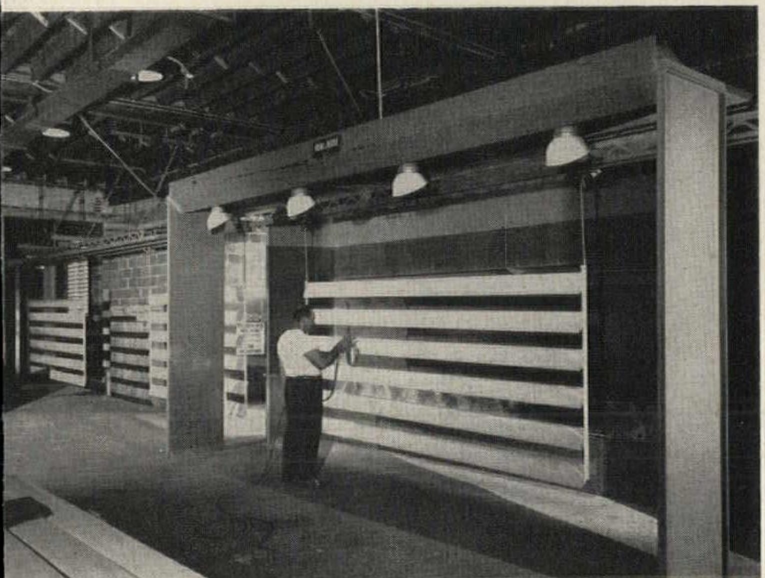
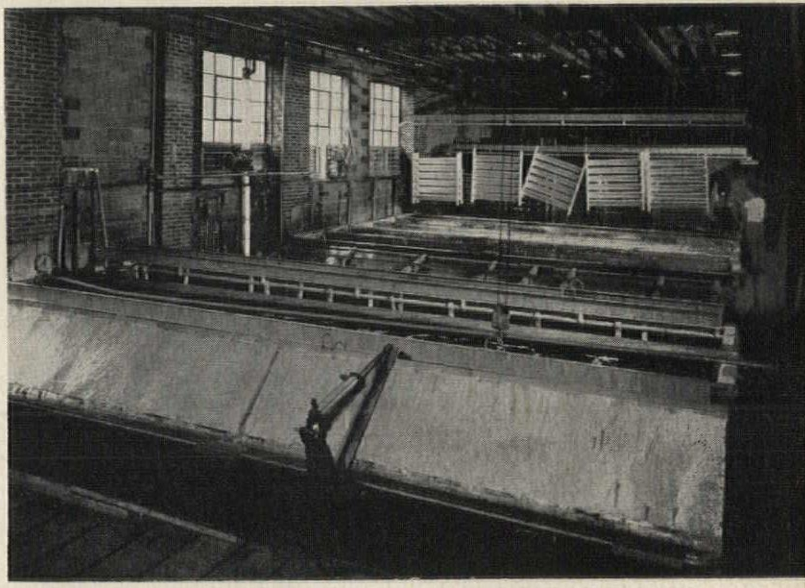
ALUMINUM FINISHES

by J. H. Goodyear, Consultant for Metal Finishing

Photos from Construction Specialties, Inc.



Booth for spraying an epoxy color coating on sunshade blades



Tanks for cleaning, etching and anodizing aluminum louvers

Aluminum as a building material offers the architect exceptional design versatility. First, it has a unique combination of physical properties: light weight, strength and resistance to atmospheric corrosion. Second, it is available in large sheets of good workability and an almost unlimited variety of extrusions. Third, it can be specified in practically any type of finish.

Finishing procedures allow such a wide range of texture, color and gloss that the most exacting esthetic requirements can be satisfied, but many architects and designers haven't had the opportunity to obtain the basic information concerning these many variations. Even if they have had such an opportunity, they have often become confused, and justifiably so, by the nomenclature of the various processes and the properties that can be expected from them.

In order to realize the potential of aluminum and its finishes, two basic factors must be understood: (1) the material, with its variations in shape and alloy, and (2) the finishes, including pretreatment, the principal coating and the supplementary treatments.

MATERIAL

Basically, there are three standard forms of aluminum used in architectural components—sheets, extrusions and castings. Usually the form or forms used are based on the economy of fabrication, properties needed or effect desired. A discussion of the factors influencing the selection of these forms is beyond the scope of this article, but it is possible to describe the available alloys for each. Unfortunately the alloy of the aluminum shape to be used and its influence on the final appearance are often overlooked.

In many cases it is just as important to specify the type of alloy as to specify the color. Table 1 (page 249) lists the alloys normally used in architectural components, their relative properties and applications. While there may appear to be duplication, actually each alloy has certain characteristics which may influence whether or not it is more useful than another. Some of these characteristics are of minor importance in architectural application, so only the pertinent alloys are listed in the table. Many of the alloys on the list are presented in two different conditions, i.e., normal and anodizing quality. All the alloys listed can be anodized, but where optimum in clarity and surface uniformity is required, those listed as anodizing quality should be used. Also, these alloys, along with Anoclad 10, should be used where color anodizing (with the exception of gray) is to be the final finish. If a dark gray finish is desired, then RF-40, Anoclad 20, or No. 5 sheet should be used. Both 3003 and 5005 are considered general purpose sheets and usually can be interchanged. The yield strengths of 5005 and 5050 in the full-hard condition differ by only about 10 per cent. Therefore, the properties of 5005 generally apply to alloys 3003 and 5050 as well.

When the application calls for extrusions, the problem of proper alloy selection is not as difficult. The general purpose alloy is 6063. If the application is critical from a strength standpoint, then the 25 per cent higher yield strength of 6061 may be necessary. The only other alloy that must be remembered is 4043 for gray anodized coatings.

In castings for spandrel panels, 43 is the general purpose alloy and, after anodizing, is a color match with 4043 sheet and extrusions. Casting alloy 214 is used where a color match, after anodizing, is required with a 6063 extrusion and/or normal building sheet.

FINISHES

There are six primary types of finishes, and combinations of them, used in architectural work: 1) mill-finish, 2) mechanical finishes, 3) chemical finishes, 4) anodized coatings, 5) paints and coatings, 6) porcelain enamels.

Mill Finish

This is the most familiar and is, as the name suggests, the finish of the raw material as it comes directly from the mill. It might be expected that such a finish would be uniform; however, there tends to be considerable variation from one batch to the next for several reasons. First, the degree of brightness is influenced by the amount of rolling or working of the sheet or, in the case of extrusions, the temperature of extruding, the speed, condition of die, and so forth. Second, it is influenced by the linearity of the metal resulting from the rolling or extruding operation. The appearance of mill finish and many of the subsequent finishes is also influenced by whether the material is viewed parallel or perpendicular to the work direction.

It has been proven by tests of thousands of mill-finish samples, under all types of atmospheric conditions, that aluminum has a high resistance to weathering. As the material weathers, however, there is a change in the surface color and gloss. Weathering produces a tenacious light gray patina. Along with this discoloration there is also a loss of metallic sheen. The appearance of weathered aluminum is not unattractive, and such weathering greatly reduces the variations in the surface mentioned previously.

The rate of discoloration is dependent upon the atmospheric environment, proceeding very slowly in clean atmospheres away from seacoast. Weathering in industrial areas is accompanied by the accumulation of carbonaceous materials, and under these conditions the surface takes on a dirty and streaked appearance unless cleaned occasionally. Fortunately, the normal weathering products do not stain adjacent materials because of their tenacity. It should be noted that a rough pitting type of oxide does form on those areas which are protected, such as the eaves of a roof. This is caused by atmospheric dirt setting up a pitting type of corrosion, unless washed away by rain. Condensation at these locations also has a detrimental effect.

Mechanical Finishes

These finishes can provide variations in sheen and texture. The surface can be polished to a high reflective mirror finish, or abraded to a dull satin sheen by abrasives and wire brushes. Combinations of bright and satin can give very interesting high lights. Dull satin sheen can also be achieved with sand or grit blasting. In sand blasting, the degree of roughness can be controlled by the particle size or abrasive used. Variations on the same panel from dark grays to satin whites can be obtained by blasting the surface at random, followed by chemical finishing. Another mechanical process is the embossing or pressing of the metal to various surface contours. The pattern may be small in scale or, on the other hand, have larger configurations to break up the flatness of the surface and add rigidity to the sheet. Texturing can also be obtained by perforation.

The weathering characteristics of mechanical finishes without any subsequent top coat for protection are similar to those of aluminum with a mill finish. In fact, the weathering will often be more severe, since the rough surface will have a tendency to accumulate atmospheric dirt and accelerate corrosion.

Chemical Finishes

Probably the most popular method of changing the surface condition from metallic shine to satin sheen is by chemical treatment. The use of chemicals to etch the surface can be regulated to a certain extent to give various degrees of roughness and sheen. Generally this type of controlled pitting is accomplished with alkalies together wih various additives, but there are also various acids and combinations that can be used. The cost of obtaining satin finishes chemically is considerably less than by mechanical means. Again, this finish has the same weathering characteristics as bare aluminum, unless protected with a subsequent coating.

Recently, several conversion-type chemical coatings have been made available for architectural use. One that has been used only sparingly is *Alrok*. Developed by the Aluminum Company of America it was designed primarily as a paint base, but the coating itself, which has a light gray to yellow green color, has been used architecturally. Its main features are reduction of glare, increased corrosion protection over bare aluminum and addition of color to the surface. (The color sometimes may be mottled.)

Another chemical coating used in architectural components is known as "Architectural Alodine." This coating can produce surfaces which range in color from clear to various shades of green. If properly applied, "Architectural Alodizing" is uniform and, visually, gives a low reflectivity but there is reportedly no reduction in its reflectivity of radiant heat. The cost of this coating and other so-

ALUMINUM FINISHES: 1

by J. H. Goodyear, Consultant for Metal Finishing

TABLE 1: SHEET ALLOYS

Alloy Designation	Applications	General Properties & Finish Characteristics
SHEET ALLOYS		
1100	Panels, flashing	Low strength sheet with superior formability, good anodizing and corrosion characteristics
1100 (anodizing quality)	Same	Specially processed for superior anodizing characteristics
3003	Panels, duct work, gutters, flashing, general purpose alloy	Medium strength sheet with good formability; may show some structural streaking in anodizing and etching
3003 (anodizing quality)	Same	Specially processed for superior anodizing characteristics
Alclad 3004	Roofing, siding	Not normally anodized—high corrosion resistance and higher strength than 3003
5005	Panels, duct work, gutters, flashing, general purpose alloy	Properties similar to 3003—better anodizing characteristics and corrosion resistance than 3003
5050	Panels facia, mullions, spandrels, sun shades	Good strength with good formability, good corrosion resistance; one of the better anodizing alloys
5052	Same	High strength; good corrosion resistance, especially in salt atmosphere; good anodizing characteristics with thinner coatings
6061	Panels, facia, mullions, spandrels, sun shades, rolled structural shapes	High strength; good corrosion resistance and anodizing characteristics
RF (Reynolds) 50 Anoclad 10	Reflectors, panels, covers	Low strength, excellent finishing characteristics
RF—40 (Reynolds) Anoclad 20 (Alcoa) #5 Architectural sheet (Kaiser & Olin)	Panels, spandrels, mullion covers, sun shades, facia	Medium strength, anodizes with gray color or darkens other anodizing colors; good corrosion resistance
Alumilite 31 32 33 41 42 43	Panels, spandrels, mullion covers, etc.	Specially processed alloys for superior anodizing properties
X8013 (Kaiser)	Panels, spandrels, covers, etc.	Special alloy which turns gold on anodizing
EXTRUSION ALLOYS		
6061	Structural members	High strength with good anodizing characteristics; good corrosion resistance
6062	Same	Similar to 6061 with better extrusion characteristics
6063	Mullions, window members	Good strength and extrusion characteristics; good anodizing properties
Anoclad 10 (Alcoa)	Mullions, window members, etc.	Specialty material for good anodizing; good strength
Anoclad 20 (Alcoa)	Same	Specialty material for gray anodized coatings
CASTING ALLOYS		
43	Spandrels, hardware, etc.	Low strength; gray coatings when anodized
214	Same	Fair strength; clear coatings when anodized
356	Same	Good strength; dark gray coatings when anodized

TABLE 2: ALLOY COLOR MATCH *(Note: With 30 Minutes Anodized Coating)*

Alloy	Good Match	Excellent Match
1100	5005	
4043		43 (Casting)
5005	1100, 5050, 5052, A214 (Casting)	6061 (sheet) 6061 (extrusion) 6063 (extrusion)
5050	5005, 5052, 6061, 6061 (extrusion), 6063 (extrusion), A214 (casting)	
5052	5005, 5050, 6061, 6061 (extrusion), 6063 (extrusion), A214 (casting)	
6061	5050, 5052, 6063 (extrusion), A214 (casting)	5005, 6061 (extrusion)
6063 (extrusion)	5050, 5052, 6061, 6061 (extrusion), A214 (casting)	5005

ALUMINUM FINISHES: 2

by J. H. Goodyear, Consultant for Metal Finishing

TABLE 3: DESIGNATION OF FINISHES

Olin & Kaiser	Alcan	Alcoa	NAAMM	Appearance	How Obtained
NF	NAF		NA-O	Natural	Mill-finish
C1	CE	R1	NA-5	Satin texture	Caustic etch
CC1	CC			Natural to straw, gray and green	Chemical conversion coatings
A1	AN*	204		Clear	Anodic coating (Sulphuric type) .0004-in. thick
A2	AN*	215		Clear	Anodic coating (Sulphuric type) .0008-in. thick
AP1	AP2, 3 & 4			(As specified)	Paints, lacquers and enamels
AP2	AP5			(As specified)	Porcelain enamel
S				(As specified)	Any finish not specified
M1	ME4		NA-1	Lustrous	Mechanical polish with 320 grit
M2	ME5	A1	NA-2	Mirror	Mechanical polish and buffing
M3	ME1	E	NA-3	Coarse satin finish	Mechanical finish giving parallel scratch lines 120 to 140 grit
M4	ME2	D	NA-4	Medium satin finish	As above; 140 to 180 grit
M5	ME3	C1	NA-5	Fine satin finish	As above; 180 to 220 grit
M6	ME6	C2	NA-6	Hand rubbed	Mechanical finish; stainless steel wool #0 and neutral soap solution
M7		K	NA-7	Matte finish	Stainless steel wire brush; wire diameter .0095 in.
M8			NA-8	Fine satin finish for uneven surfaces	Mechanical finish; Vonnegut wheel #220 grit
M9		G4	NA-9	Matte finish; gray appearance after anodizing	Sandblast, 16-20 mesh
M10	ME7	G3	NA-10	Rough texture	Sandblast; 40 to 50 mesh
M11	ME8	G2	NA-11	Fine texture	Sandblast, 100 to 200 mesh
M12			NA-12	Textured	Shot blast; appearance varies with size of shot

NAAMM (National Association of Architectural Metal Manufacturers) designations are tentative pended recommended designations of the Aluminum Association. (See also Metal Curtain Wall Manual published by NAAMM.)

TABLE 3A: Reynolds Metals Designation *This system is based on a 4 digit designation. The digit significance is as follows:*

1st Digit—Application	2nd Digit—Color	3rd Digit—Preliminary Finish	4th Digit—Special Processing Information
3xxx—Architectural Interior	x0xx—Clear (gray in Silicon alloys)	xx0x—Mill finish	
4xxx—Architectural Exterior	x1xx—Blue	xx1x—Chemically Brightened	
5xxx—Automotive	x2xx—Green	xx2x—Buffed	
6xxx—Appliance	x3xx—Yellow	xx3x—Belt sanded	
	x4xx—Red	xx4x—Sand blasted	
	x5xx—Gold	xx5x—Satin finished	
	x6xx—Black	xx6x—Caustic etch	
	x7xx—Brown	xx7x—Buff and Chemically brightened	
	x8xx—Unused	xx8x—Reylite	
		xx9x—Unused	

called conversion coatings is relatively low when compared to the anodic coatings suitable for architectural application. Their main disadvantage is low abrasion resistance.

Another type of finish not to be overlooked is chemical brightening. This is done by treating the aluminum surface with certain chemicals, usually acid. The brilliancy will not be retained unless it is protected by a subsequent coating.

Anodized Finishes

What is meant by "subsequent coating?" One of the more popular of these is obtained by anodic processing, also known as anodizing, *Alumiliting* (Alcoa), and various other proprietory trade names. Basically, the process consists of making the piece to be finished the anode in an electrochemical reaction. Various electrolytes can be used, but sulfuric acid is employed for most architectural applications. Briefly, what happens in this process is the build-up of an artificial oxide many times thicker than that produced by nature. This oxide is inherently a corrosion-resistant film, transparent in nature. These coatings alone add nothing to the aluminum in the way of texture or color. Their function is to cover the pretreatments and to act as a type of chemical bond for subsequent treatments. There are exceptions to this rule in that those alloys which have a specific element added may produce a colored anodic oxide. The high-silicon alloys such as 4043 produce a dark gray coating.

Other beneficial properties of anodic coatings include enhanced corrosion resistance and retention of the original appearance with minimum maintenance. Also the anodic surface is quite hard and thus gives resistance to abrasion and erosion.

One of the gravest errors that can be made in anodic coatings for architectural purposes is to use insufficient thickness. Under no circumstance should this coating be less than .004-in. thick, and in an atmosphere contaminated with salt or industrial fumes, it should be increased to .008 in.

Unfortunately, thick coatings may pose a problem. While it is basically true that these coatings are transparent, they tend to be tinted by the elements in the aluminum alloys. Just as the high-silicon alloys such as 4043 tend to give dark gray coatings, so the other additive elements in the various alloys produce a similar effect, but to a lesser degree. Since this effect increases with the thickness of the architectural coatings, care must be taken in selecting alloys, particularly those that will be adjacent to each other in a structure. Table 2 (page 250) gives a list of matching alloys. This table is based on the following effect of alloy content on the tinting of anodized coatings: the 1xxx series gives clear coatings due to its purity; the 3xxx series shows slight yellowing due to manganese; the 4xxx series varies from light gray to black, depending upon the amount of silicon present; the 5xxx series shows slight gray tones; and the 6xxx series very light gray tones.

It is impossible to predict the exact increase in corrosion resistance of anodizing over unprotected metal, since corrosion activity depends upon the environment, but it can be said that the life of the original appearance will be greatly increased.

Colored Anodic Coatings. The anodic coating is very porous in the unsealed condition. This property allows the coloring of the coating with certain pigments and dyes which are sealed in place by the use of boiling water, metallic salt solutions or various other means. When properly applied, with the right preliminary treatment, the resulting coatings have beautiful porcelain-like colors.

In the early years there was considerable difficulty with the permanency of the colors. This fading and streaking was due to various factors. First of all, the light-fastness of the dyes used in early color anodizing was inadequate and untested in the field. Secondly, the applicator was not aware of the necessity for very rigid controls during the various stages of the process. Color anodizing at its best is a very difficult process and has many variables. Finally, the actual technology of processing was still in the inception stage.

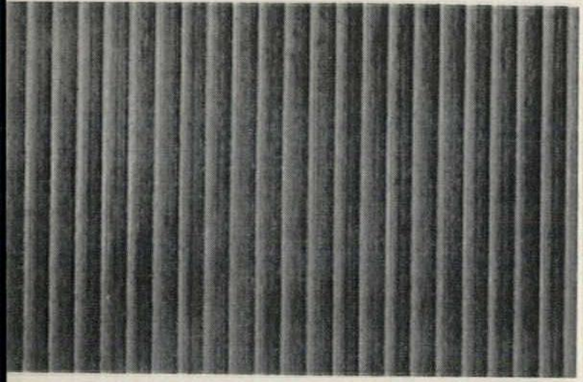
In the last ten years, however, new dyes have come into existence, and the processor has learned why it is necessary for him to control every variable precisely. Whether or not sufficient developments have been made is still in question. There appears to be agreement that the dark gray coating produced by high silicon alloys and the golds produced by the use of ferric ammonium oxalate have good longevity. Some of the major aluminum companies and manufacturers of the dyes feel that they now have five to 10 colors which will meet the requirements of permanency required in a monumental building. In any case, an architect who is considering color anodizing should get reliable advice.

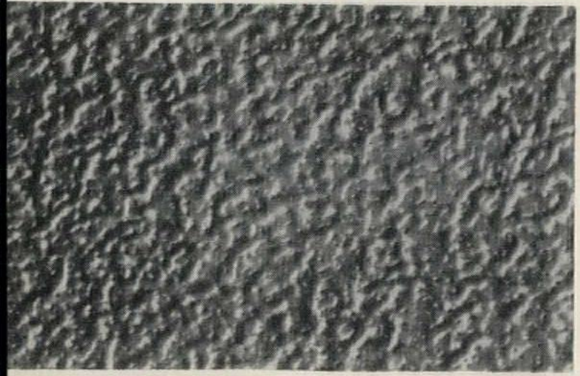
A new anodizing process developed by Kaiser Aluminum & Chemical Corporation, known as *Kalcolor*, develops its color from the alloying materials used in the base metal, similar to the dark grays produced by high silicon alloys. While inherently this method restricts the hues available it should give excellent color fastness. Such colors are appreciable only when the coatings are quite thick, so the corrosion resistance and endurance under outdoor exposure should be quite good. Cost factors in the picture are the thickness of coating required, and the care necessary in production to assure uniform dispersion of the alloying element.

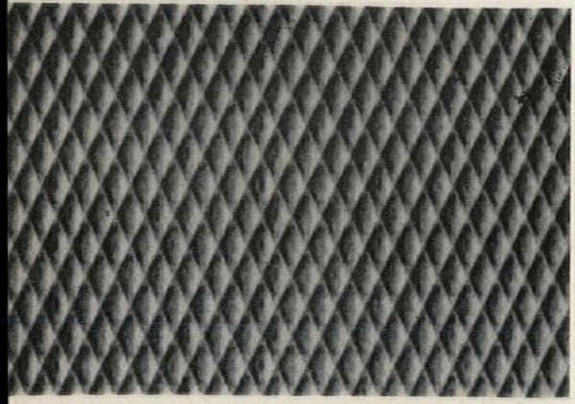
Paints and Coatings

It might be said that by far the most important technological developments are the new organic coatings introduced in the last 10 years. To cover all the organics and their variations is beyond the scope of this article, but the architect should be familiar with certain types.

The class of organic used to the greatest extent in the architectural field is probably the clear protective coatings. Two types are most prevalent—the methacrylics and the half-second butyrates. These coatings are non-yellowing lacquers which were developed primarily to provide temporary protection to mill finish and chemically-finished components. They are applied to windows, louvers, etc., to prevent pitting, discoloration and staining from mortar, as well as to give protection from damage during shipping and erection. These coatings have proven in the field that they are more than temporary coatings and have histories of five- to 10-year lives. The retention of the lacquers on the surface greatly aids self-cleaning and protects against oxidation and dis-







coloration. The lacquers have good adhesion and, if properly applied, will not peel or spall. All surfaces which are mill-finished, etched, mechanically finished or anodized should be protected with a similar lacquer coating with a thickness of at least .0006 in. Care should be taken to select a lacquer which will not yellow when exposed to sunlight.

Of the opaque coatings, the alkyds have been used to greatest extent in the past. They have good adhesion, flexibility, hardness and color retention. They were the dominant coating for many years, mainly because none better were available. Yet they have their shortcomings. The life of these organics is less than that required for most architectural uses. To give the exact anticipated life is impossible because of the environment and other factors, but it is generally agreed that somewhere in the neighborhood of eight to 12 years is the anticipated life.

The alkyds are now being replaced in many applications with some of the newer developments such as the vinyls, acrylics and epoxies. These are the coatings of the future. This may appear to be ambiguous as far as the vinyls are concerned because they have been in existence for quite a few years, but it is only lately that formulations have been developed that bring out their full potential.

It has been said that the most outstanding development in the organic field is the introduction of epoxy resins. These resins formulated into coatings have shown very intriguing properties. There is no question as to their ability to withstand almost all known reagents. They are almost completely impervious to moisture. Unfortunately, the scientific evaluation of the newer epoxy formulations is based on two to three years of longevity and short-time accelerated tests. Even so, when these results are compared to those available from other types of organics, the epoxies are outstanding.

Formulations first developed with epoxies showed bad chalking characteristics. Many formulations have been developed in the last few years to reduce this to minimum. One manufacturer has reported that the chalking characteristic of a newly developed formulation is superior to that of alkyds. It is believed that these organics will have at least twice the longevity of the alkyds.

Porcelain Enamel Coatings

There is no doubt that porcelain enamel is a quality coating. Its durability is outstanding when applied on aluminum. It resists impact and corrosion, and increases the rigidity of the sheet as much as 60 per cent. Sheets so coated may be cut and shaped without fear of progressive spalling along cut edges. And because of the ceramic nature of porcelain enamel, permanency and self-cleaning properties are outstanding. At present, the cost of this coating is higher than some of the ones mentioned earlier, and because the coating must be fired at high temperatures, certain processing difficulties are encountered as well as the deterioration of the physical properties of certain alloys. However, it is likely these difficulties will soon be mitigated.

DESIGNATIONS

Because of the many variables and complexity of the finishing of aluminum, the designation of coatings becomes correspondingly complex. It is further complicated by the fact that a standard system has not yet been established in the industry. Table 3 gives the present designations as used by five of the major aluminum producers in the United States and Canada. It should be noted that, with the exception of Reynolds, each operation has a specific symbol. But since several different operations may be performed to obtain a specific finish, several of the symbols may be grouped. As an example, suppose we take the designation of Aluminum Company of America—204 A1 R1. This symbol would then be translated as mechanically polished, caustic etched, and anodized for 30 minutes.

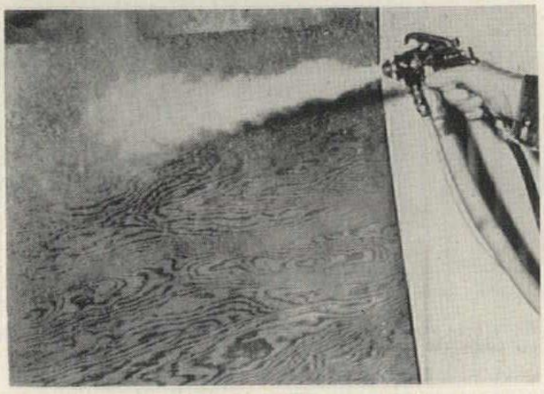
It can be seen how complicated and exacting the science of aluminum finishing can be. This is especially true if the architect is not familiar with the many possibilities and variables. It has been aptly said, "The surface treatment can be manipulated in so many ways that aluminum becomes the metal with a thousand faces".

Roofing Roller Controls Membrane Thickness

A new pressure-fed roller is said to increase efficiency of application and control of coating thickness when used to apply roofing systems based on fluid coatings of Du Pont's neoprene and *Hypalon*, synthetic rubbers which cure to form elastic membranes permanently adhered to the roof deck.

The *Levelcoater* roller delivers the elastomeric material by air pressure to a specially designed rotary roof mop at a rate controlled by the operator via a valve on the applicator handle. The application equipment also includes an air-operated, piston type drum pump with a capacity of 2¼ gallons per minute. Designed to fit through the bung of a standard 55-gallon drum, the pump is powered by a 20-cubic foot air compressor. A 100-ft neoprene air hose and fifty feet of solvent-resistant fluid hose are supplied with the unit, as are two rotary roof mops in 6- and 18-in. sizes.

All parts of the applicator are light-weight and non-sparking. Since the device gives a closed system from shipping container to working surface, it eliminates air contact which might cause webbing before application. *Aeroil Products Co., Inc., Wesley St., South Hackensack, N. J.*



Fiberglass-Resin Coating Resists Corrosion

Fiberglas Flake, a spray coating that provides a corrosion-resistant surface for metals, wood and concrete, has been developed concurrently with a special De Vilbiss spray gun unit for applying it.

A homogeneous mixture of *Fiberglas* flakes, resin, fillers, accelerator and pigment (if desired), the coating has shown virtually no deterioration in accelerated weathering tests, and equally good results in laboratory tests. The flake reinforcement of the resin is said to increase impact resistance and hold shrinkage to a minimum, thereby improving the adhesive properties of the coating. In addition, crawling or sagging of the coating is eliminated by the high shear force between the layers of flake and resin. The problem of pinholes found with some types of protective spray coatings now on the market is minimized by the isolation of voids with many layers of flake glass, and by rolling the coating after spraying to give the desired smoothness and orient the flakes.

When a pigment is specified, the coating combines protection and decoration in a single application: a 20 mil thickness is roughly equivalent to 50 coats of paint.

This combination is expected to make the coating highly useful as a liner for concrete flooring, as a water sealant for concrete block and slab walls, and as an exterior coating for steel, as well as for those applications where corrosion is a major problem. *Owens-Corning Fiberglas Corp., 717 Fifth Ave., New York 22, N. Y.* or *De Vilbiss Co., 300 Phillips Ave., Toledo 1, Ohio*

Sprayed Epoxied-Vinyl Forms Versatile Protective Coating

Plastics to solve protective coating problems are said to have taken a long step forward with an epoxied-vinyl membrane film that is especially adaptable as a water-vapor barrier above or below ground.

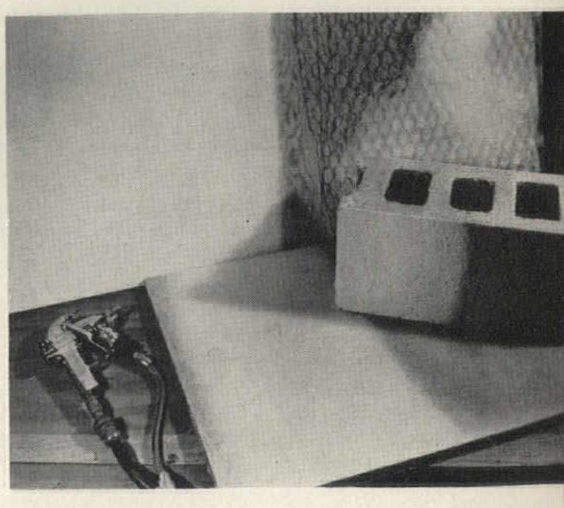
Sprayed on surfaces in a two-part system consisting of primer and coating, *REN-Coat* results in a durable elastic film which protects against the effects of weather, corrosion, moisture and water, hard impact, temperature change (between −65 and 150F), chemical attack and aging. Because it is nonporous, the coating can be easily washed with mild detergents and warm water.

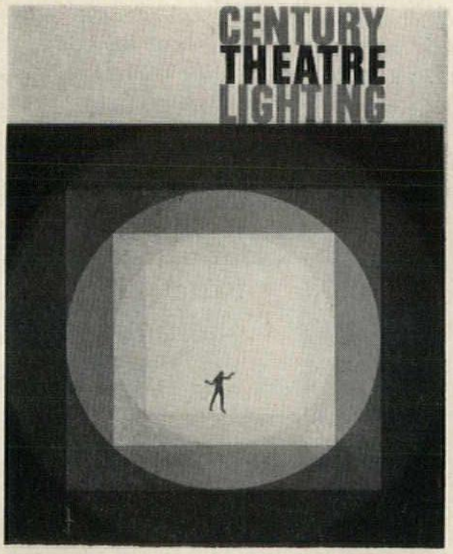
Three basic types of coatings, designated RC-961, RC-971 and RC-981, are applied over an all-purpose primer, RC-950, whose molecules bond the film so tenaciously to the substrate that structural movements will leave the adhesion between coating and surface undisturbed. Rapid surface curing protects the film while the curing cycle is completed (within seven or eight days without further treatment).

REN-Coat, which comes in numerous color combinations or to match existing surfaces and natural wood materials, is usually applied in 6 to 10 mil thicknesses, but applications up to 40 mils thick are possible on ferrous and non-ferrous metals, masonry, concrete, wood and other types of materials. Extensive field and laboratory tests have shown that each mil equals about one year of wear.

The *Ren-Coat* system was developed by the R. L. Stevenson Co. of Seattle about six years ago and has undergone use-testing since then. Its versatility is demonstrated in the photograph (right) which shows application of the membrane to plywood, sheet metal, cement block and wide gage chicken wire. *Ren Plastics, Inc., Dept. RP-66, 5422 S. Cedar Rd., Lansing 9, Mich.*

more products on page 258





CENTURY THEATRE LIGHTING contains authoritative information on all types of stage lighting and lighting control systems, including the latest electronic types. Documentary articles on lighting, and comparative charts on the performance of different types of instruments, are supplemented by complete lighting layouts for ten different types of performance areas, ranging from the simple lecture platform to school stages to a large outdoor amphitheater. Architectural details show the requirements for installing stage lighting instruments in wall and ceiling slots, booths, and so forth. 101 pp. *Century Lighting, Inc., 521 West 43rd St., New York 36, N. Y.*

Electric Console Unit Heaters
Describes, and gives data on performance, selection and application, dimensions, and operation of *Chromalox* Console Unit heaters. Specifications are also included. Bulletin F21100, 8 pp. *Edwin L. Wiegand Co., Pittsburgh 8, Pa.*

Commercial Aluminum Windows
(A.I.A. 16-E) File folder contains full-, half- and quarter-size details, and specifications, on *Alenco* line of commercial aluminum windows. *Albritton Engineering Corp., P. O. Box 31, Bryan, Tex.*

General Bathroom Products
Describes and illustrates bathroom medicine cabinets and chrome accessories. *General Bathroom Products Corp., 1056 N. Wood St., Chicago 22, Ill.*

Facts and Counsel
. . . *on Elevator Planning* outlines the advantages of professional counsel in planning for elevators, escalators or other vertical transportation, and discusses the role of the consultant firm from initial analysis to final check-out. 12 pp. *Charles W. Lerch & Associates, Elevator Consulting Engineers, Board of Trade Bldg., Chicago 4, Ill.*

Natco Structural Clay Products
(A.I.A. 10-A-B) Describes and illustrates complete line of glazed and unglazed tile and brick for interior and exterior applications in a variety of industrial, commercial and residential installations. Catalog No. S-60, 24 pp. *Natco Corp., 327 Fifth Ave., Pittsburgh 22, Pa.**

Fact Book
. . . *of Commercial Electric Kitchen Equipment* lists and describes in detail (electrical specifications, performance and price) twenty-one major categories of equipment, including ranges, ovens, coffee makers, steam cookers, refrigeration equipment, waste disposals, and others. 84 pp., $1. *Food Service Magazine, 2132 Fordem Ave., Madison, Wis.*

Unistrut Metal Framing
. . . *Construction and Maintenance Handbook* (A.I.A. 14-G) gives application and installation information, specifications, and methods of attaching mechanical and electrical equipment to structures using *Unistrut* metal framing. Engineering and performance data, and a basic introduction to the *Unistrut* system are also included. Catalog No. 710, 36 pp. *Unistrut Products Co., 933 W. Washington Blvd., Chicago 7, Ill.**

Metal Flooring and Stair Tread
(A.I.A. 14-A-1) Gives plate and panel sizes; tables of safe loads; and design, specification and installation data on steel and aluminum flooring and stair tread. Solid and open types in a number of patterns and openings, including material with slip-resistant surface, are covered. Technical Bulletin 50-9, 12 pp. *Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill.**

Limestone Specifications and Details
(A.I.A. 8-B-2) Illustrates various finishes and installations of Indiana limestone; and gives physical characteristics, product and setting specifications, detail drawings, charts on load bearing requirements of limestone lintels and on heights of regular and modular brick courses, and anchor and support details. 28 pp. *Indiana Limestone Co., Inc., Bedford, Ind.*

Finpipe Radiation
(A.I.A. 30-C-41) Describes, illustrates, and gives technical and selection data on the *Sunnywall* Type N fin-pipe radiation system for forced hot water or steam radiation heating of commercial, institutional and industrial buildings. 24 pp. *Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.**

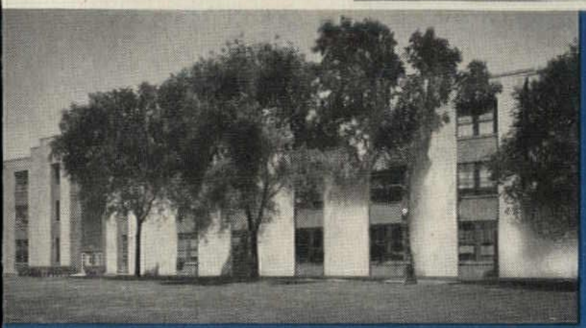
What You Should Know
. . . *About Interior and Exterior Weatherstripping* discusses weatherstripping against drafts, noise, dust, leaks and light; and describes the various types of weatherstrip materials and their use. 14 pp. *Pemko Mfg. Co., Emeryville, Calif.*

Fluorescent Lamp Ballasts
Buyer's Guide ATC-110 provides up-to-date information on *Kool-Koil* ballasts, *Advanguard* thermally protected ballasts, and SHO, VHO and *Powergroove* ballasts. *Advance Transformer Co., 2950 N. Western Ave., Chicago 18, Ill.*

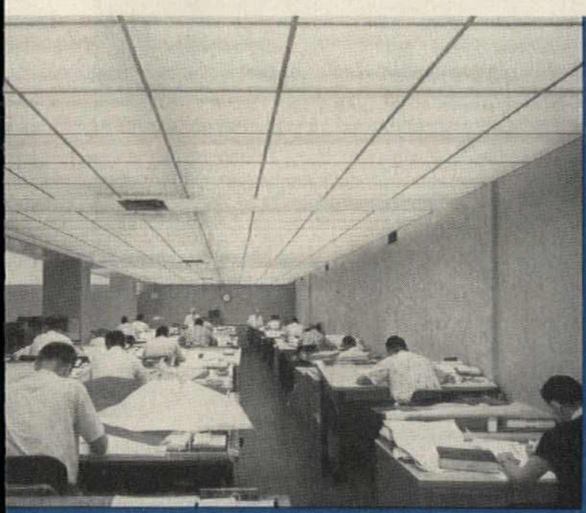
**Additional product information in Sweet's Architectural File*

more literature on page 258

COMMONWEALTH EDISON COMPANY
TECHNICAL CENTER
MAYWOOD, ILLINOIS
ENGINEERING DEPARTMENT



American plastic louver diffusers equipped in Panelaire luminaires.



provide – shadowless easy seeing illumination – improves efficiency – lessens fatigue for accurate speedy work...

Lighting Products suspended lighting Panelaire luminaires equipped with AMERICAN PLASTIC 45° x 45° shielding louver diffusers, installed in the engineering department of the Commonwealth Edison Co. Technical Center, Maywood, Illinois.

The system provides 150 footcandles (maintained) of high level illumination, with the utmost in visual comfort of soft, smooth blend-in diffused light on the working plane.

American louvers are impervious to discoloration from years of exposure to fluorescent light. They provide extra toughness and flexibility, high resistance to abnormal abuse, and lighter weight for easy maintenance.

American louvers is our one and most important product – Designed, developed, manufactured and patented by the American Louver Company.

Available in ....

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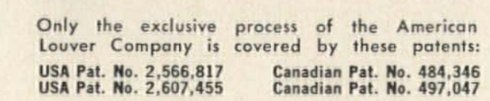
LOUVERS IN WHITE ALSO AVAILABLE IN PASTEL COLORS, PINK –GREEN –YELLOW– BLUE AND LOW BRIGHTNESS.

Special sizes, cuts, shapes or grooves can be supplied to meet your particular requirements.

Only the exclusive process of the American Louver Company is covered by these patents:

USA Pat. No. 2,566,817 Canadian Pat. No. 484,346
USA Pat. No. 2,607,455 Canadian Pat. No. 497,047



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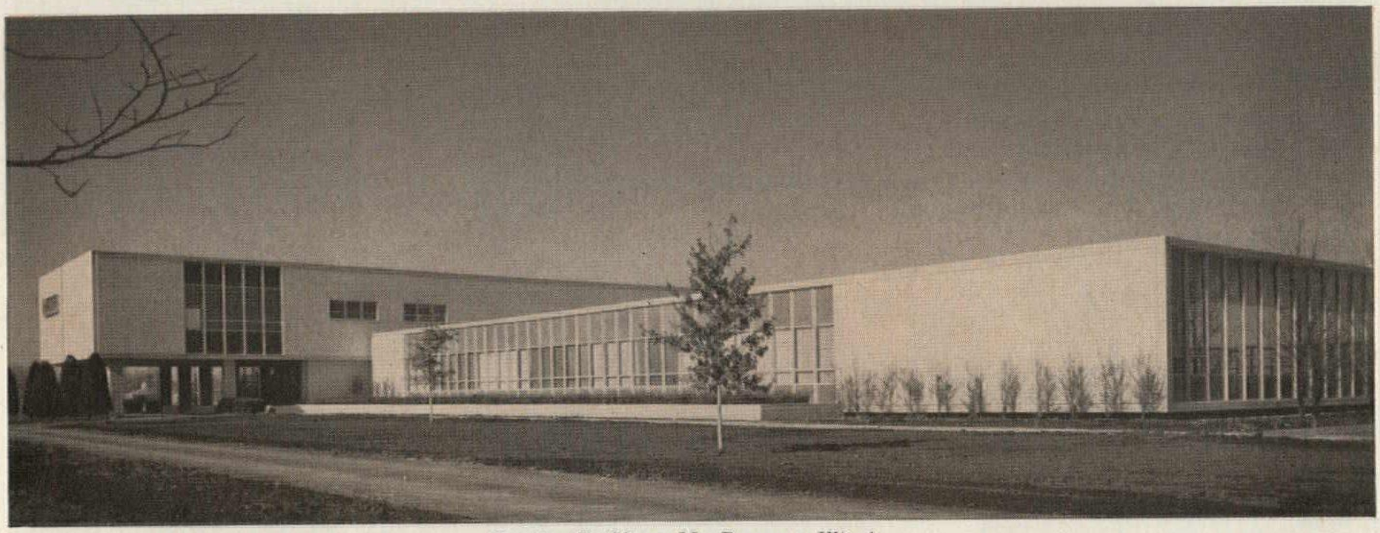
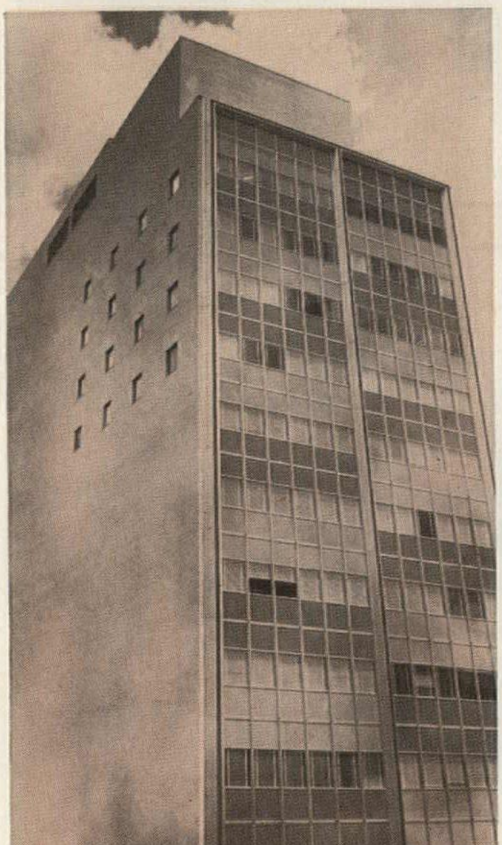


Bruning Building: Mt. Prospect, Illinois.



211 N. Ervay Building: Dallas, Texas.

Carlton Motel: Dallas, Texas

Residence: Saginaw, Michigan.

Suggested Specification for Silaneal

From Dow Corning Bulletin AIA File No. 3F.

"Brick having suction above 20 grams per minute (per 30 sq. in. of bedding surface) shall be treated at the brick plant with Silaneal® (manufactured by Dow Corning Corporation). The Silaneal concentration shall be adjusted until the brick pass the following test:

Allow bricks to air-dry 24 hours after treatment. Weigh the brick and place bedding-side-down in 1/8-inch of water. Remove after 60 seconds and weigh again. The average increase in weight shall lie between 1/3 and 2/3 gram per square inch of surface tested (between 10 and 20 grams for a nominal 4 x 8 brick having a bedding surface of 30 square inches).

Brick having suction below 20 grams, but which may have a tendency toward efflorescence or other staining, shall be sprayed with Silaneal® on the face and two ends only. Treatment concentration shall be of sufficient strength to control efflorescence and staining."

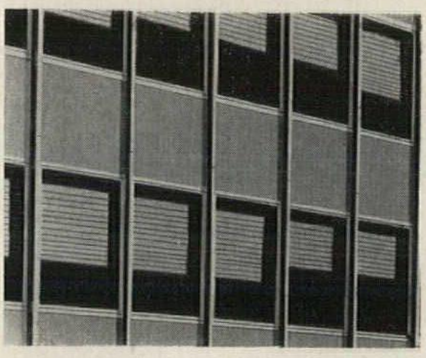
NOTE: There are several brick manufacturers who produce brick having low suction which already perform similar to a Silaneal treated brick. Little improvement in efflorescence control and reduction in dirt pickup could be accomplished by treating this type of brick with Silaneal. Silaneal treatment would not improve the laying properties of this type of brick.

CORPORATION MIDLAND, MICHIGAN

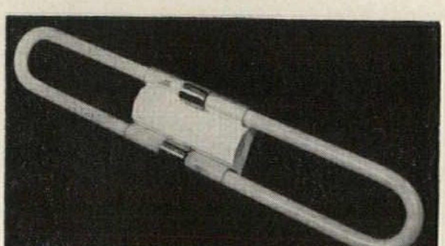
branches: ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

continued from page 253

Ceramic Tile Adhesive
Miracle MA-200 Golden Stripe ceramic tile adhesive combines all the best features of rubber, resin and latex-type tile adhesives in one product. Tile can be applied to the wet adhesive up to approximately three hours after spreading, depending on temperature and humidity. There is also more coverage—up to 70 sq ft per gallon as compared to the usual 50 sq ft coverage of ordinary tile adhesives. *MA-200* will bond to any hard, dry surface, is non-flammable and is formulated so there is no slippage. *Miracle Adhesives Corp., 205 Pettit Ave., Bellmore, N. Y.*



Flexible Curtain Wall System
Series 400, a curtain wall system for high-rise structures, is simply erected in independent mullions and one-story units consisting of sash and panel frame. Although light weight, Series 400 is fabricated from substantial aluminum extrusions. These standard sections are designed for weather-tight seal and provide for expansion and contraction. They also meet the requirements for resistance to air infiltration and weathering, and can be installed largely from the inside. *Albro Metal Products Corp., 944 Longfellow Ave., New York 59, N. Y.*

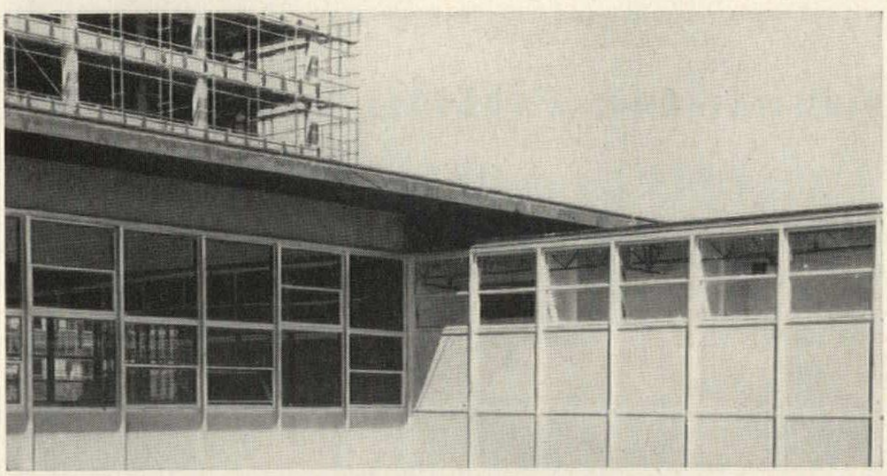


Elliptical Fluorescent Fixture
A new lighting fixture holds U-lamps made by bending standard 8-ft lamps into 4-ft U-lamps and 6-ft lamps into 3-ft U-lamps, both of which give off as much light as the straight lamps. Snapping two U-lamps into the $8\frac{1}{2}$- by 12- by 4-in. fixture creates a 6- or 8-ft long ellipse. A socket with snap-in contacts on the base pin gives excellent electrical contact, and cantilevers the tubes so that they are suspended from the fixture without sag. The fixture itself can be easily attached to all types of raceway channels or to standard 4-in. boxes, resulting in a substantial reduction in installation cost. Other advantages are ease of replacement of ballasts, fixtures and lamps, and ease of shipping and handling due to the reduced size of both fixture and lamps. Although the system was designed to produce evenly distributed, high-level light in conjunction with luminous ceilings, the fixtures and U-lamps could also be used in large areas such as warehouses, supermarkets and industrial plants, where bare fixtures are normally used. *Transolite Corp., Dept. A14, 515 Madison Ave., New York 22, N. Y.*

more products on page 262

Engineering laboratories at the new Convair (Astronautics) plant, San Diego. All exterior aluminum is protected against atmospheric staining and oxidation with a clear, colorless coating of Butyrate lacquer.

WEATHER-RESISTANT BUTYRATE LACQUERS PRESERVE THE NATURAL BEAUTY OF ALUMINUM



Butyrate lacquer, applied immediately after fabrication, protects the aluminum-framed sections, manufactured by Metalco, Inc., of Emeryville, California, from mortar staining and abrasion during erection and from weathering afterward.

Factory-applied coatings of Butyrate lacquer provide long term protection for outdoor aluminum.

Clear and colorless, Butyrate lacquers won't yellow, even under prolonged exposure to sunlight. They withstand oxidation and discoloring...have high strength and flexibility...and are little affected by salt spray or temperature change.

Aluminum surfaces, when protected with Butyrate lacquers, require little in the way of cleaning and maintenance. Usually, the action of rain alone will keep the finish clean and attractive.

This combination of features plus resistance to mortar and plaster staining makes Butyrate lacquers especially advantageous for use on outdoor architectural aluminum...siding, spandrels, curtain walls.

Your client's interests are well served when you specify a protective coating of Butyrate lacquer on all exterior aluminum surfaces. Butyrate lacquers can be easily applied in the aluminum fabricator's plant and are available from lacquer manufacturers in all parts of the country.

An informative 15-minute, 16mm. sound color film has been produced especially for viewing by those who design in or specify aluminum for outdoor applications. Would you like to see it? See below.

ARCHITECTS! ENGINEERS!

Take these steps to get the complete story on preserving exterior aluminum surfaces.

1. Send for Eastman's catalog on Butyrate lacquers for aluminum. It tells you how these lacquers are effectively preserving architectural aluminum surfaces in all sections of the country.

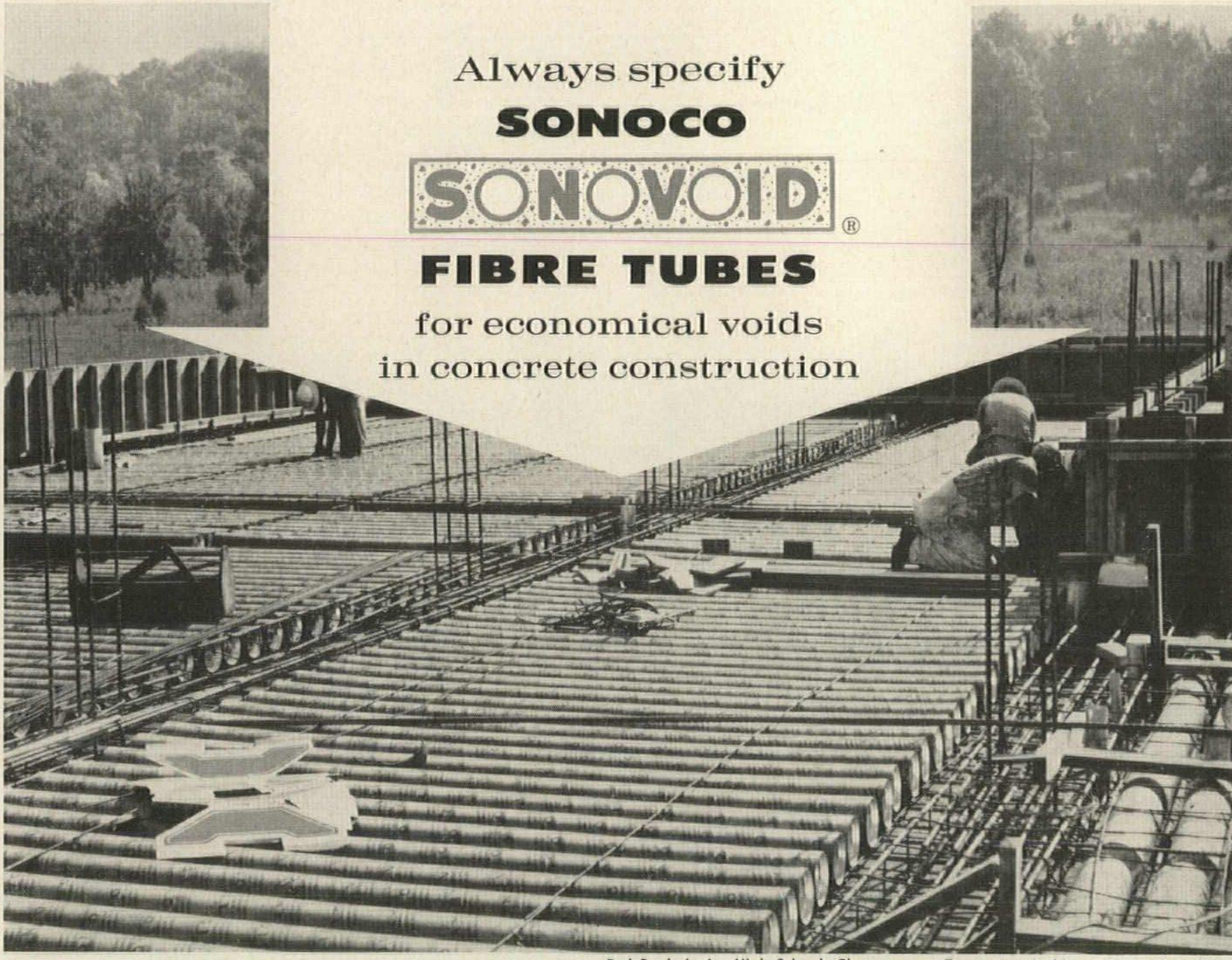
2. Check Sweet's Industrial Construction File, Sweet's Architectural File, or see 15-M of the A. I. A. Alphabetical Filing System for specification details.

3. Send for sound color film. Please indicate the date you are planning to show the film and an alternate date.

The finest lacquers for aluminum are made with

Eastman BUTYRATE

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; Atlanta; Boston; Chicago; Cincinnati; Cleveland; Detroit; Greensboro, North Carolina; Houston; Kansas City, Missouri; New York City; Philadelphia; St. Louis. **West Coast: Wilson & Geo. Meyer & Company,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.



Red Bank Junior High School, Chattanooga, Tennessee, Architect: Bianculli & Palm,
Contractor: L. A. Warlick Contracting Company

In Concrete Slabs, VOIDS Make Longer Spans Practical and Economical

Used in all types of buildings, voided flat concrete slabs combine economy of construction with great design flexibility. By forming voids which displace non-working concrete, SONOVOID Fibre Tubes permit the use of longer span flat slabs without excessive weight.

Such flat concrete slabs mean greater freedom in locating partitions, greater ease of cantilevering, and reduced building cubage. And, since dropped ceilings are unnecessary, finish surfaces can be applied directly to the concrete soffit.

For contractors, flat slabs form faster and easier, and voids in the slab save concrete and reinforcing steel. Lightweight, easy handling SONOVOID Fibre Tubes are especially designed to form such voids quickly and economically.

Plan cost-saving voids in concrete floor, roof, and lift slabs, bridge decks, and precast members . . . and when you do, specify Sonoco SONOVOID Fibre Tubes. Available 2.25" to 36.9" O.D. in standard 18' lengths or as required. Can be sawed—end closures available.

See our catalog in Sweet's
For full information, slab design tables, and prices, write

SONOCO
Construction Products 5116

SONOCO PRODUCTS COMPANY, HARTSVILLE, S. C. • La Puente, Calif. • Fremont, Calif. • Montclair, N. J. • Akron, Indiana • Longview, Texas • Atlanta, Ga • Brantford, Ont • Mexico, D. F.

The Sinko Manufacturing and Tool Company produces a colorful selection of plastic louvers ideal for all types of commercial establishments. Sinko THIN-CELL louvers molded from EVENGLO polystyrene come in a complete range of whites and pastels . . . molded-in for permanent beauty. A Sinko plastic louver transmits shadow-free, glare-free light into every corner of the room . . . it's the finest in softly-diffused illumination. EVENGLO polystyrene is a versatile Koppers plastic that can be molded in any size, shape, or color. EVENGLO is durable . . . economical. When you build or remodel, specify fixtures made from EVENGLO. For more information on EVENGLO polystyrene, or for a list of manufacturers using EVENGLO, write to Koppers Company, Inc., Plastics Division, Dept. AR-90, Pittsburgh 19, Pennsylvania. Offices in Principal Cities • In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario.

KOPPERS PLASTICS

another first from **Bilt-Well**
by **Caradco**

The Super Three

...one basic double-hung removable window in three price ranges

removable

BILT-WELL

Super-therm

double-hung unit

with double insulating glass

removable

BILT-WELL

Super-hold

double-hung unit

with ingenious sash holding device

For Ultimate Design Flexibility Specify

BILT WELL WOOD WORK

by Caradco

removable

BILT-WELL

Super-lift

double-hung unit

with flat overhead balance

Designed with the builder in mind. One basic window in three models. Each has its own major selling feature. Engineered right and priced right for every home you build. All far surpass FHA minimum standards for weather tightness to provide maximum fuel savings. Easy to install. Save labor costs. Make the homes you build more readily salable.

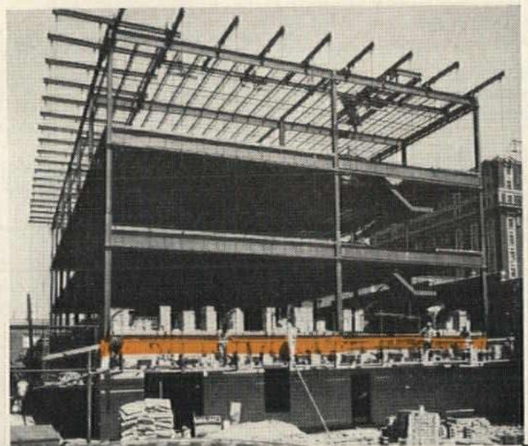
Look at all these BILT-WELL features:

1. Unitized sill construction.
2. Patented BILT-WELL jamb liner of 8 mil anodized aluminum.
3. Anodized aluminum weather stripping.
4. New jamb adjuster that eliminates blocking.
5. Top quality Ponderosa pine, water-repellent treated frames.
6. Standardized for all types of construction.

Manufactured by **CARADCO, Inc.** *Dubuque, Iowa*

"Permanent, Low Cost COPPER ARMORED SISALKRAFT is Easy to Apply,"

Say Masonry Contractors



Copper Armored Sisalkraft is used for flashing on new Erie, Penn. office building.
Owner-builder: Baldwin Bros.
Masonry Contractors: Fratto S. Stadler

This quality flashing material is pure electro-deposit copper laminated to tough kraft paper and reinforced with steel-like fibres. For little additional cost it provides all the benefits of much heavier copper. To quote a contractor: "This flashing fits in better than other competitive types of flashing with our steel framework and masonry construction."

Available at sheet metal supply houses and building material dealers in weights of 1, 2 and 3 oz. of pure copper per sq. ft. Write our Main Office in Attleboro, Mass., for samples, complete data and suggested specifications.

COPPER ARMORED SISALKRAFT, now shipped in cartons for better handling and protection —

. . . is absolutely waterproof and permanent as pure copper with permanence rating of zero

. . . is flexible, free of pin holes, can be cut, bent

. . . for use on all concealed flashing, termite shields, electrostatic shielding

reinforced paper, foil and plastics for construction, industrial packaging and agriculture.

SISALKRAFT

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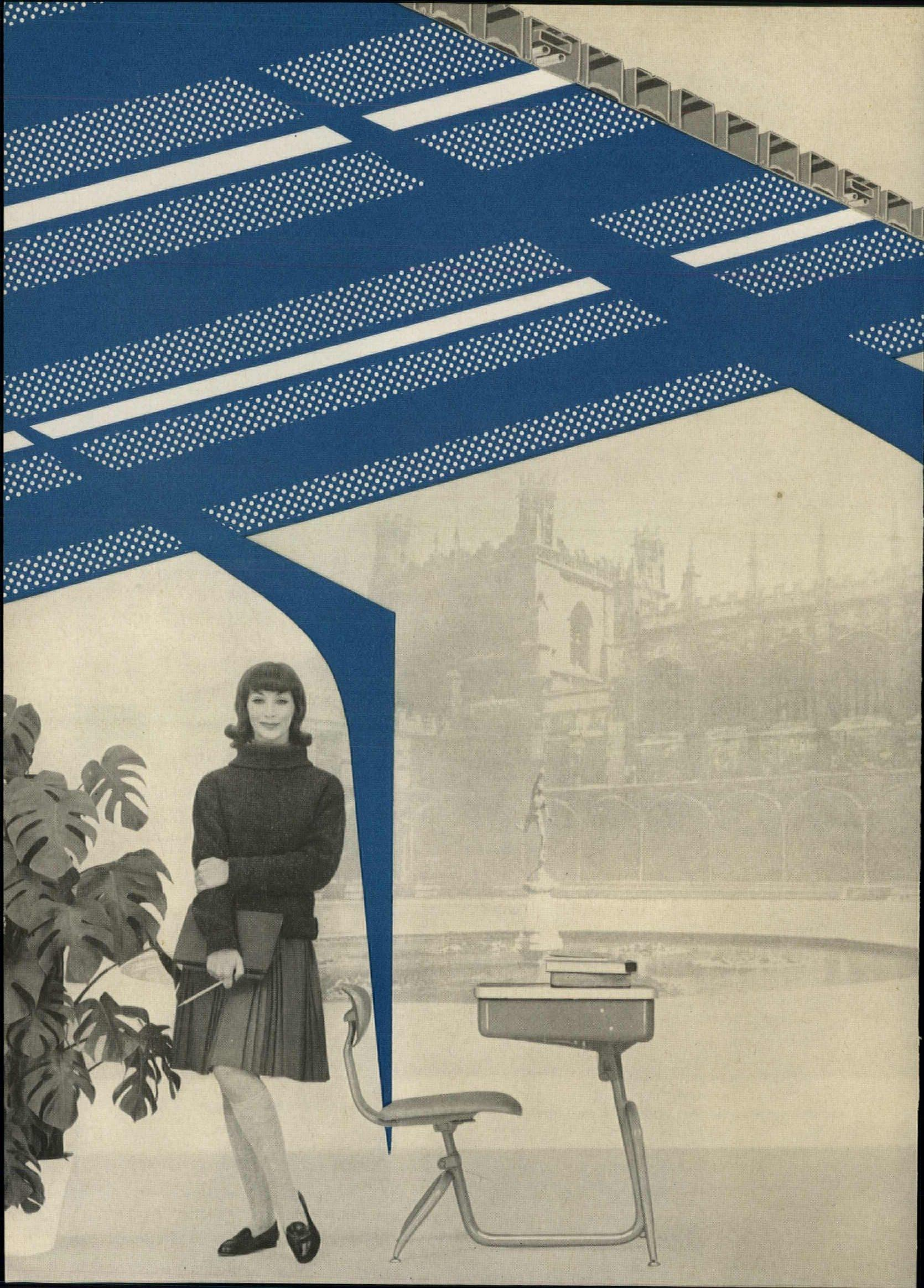


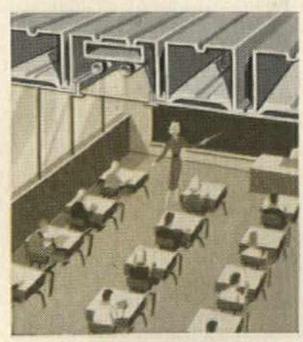
a sound approach to structural ceilings

If students were never noisy, *any* kind of steel panels would be ideal for school ceilings. Steel offers long-span design. It can be painted any color . . . or economically washed. And steel panels never crack, warp, or burn. But, because students *are* noisy, Fenestra pioneered an *acoustical* steel ceiling panel.

This steel acoustical panel costs less to install. It is a perforated modular unit backed up by a patented, pre-formed, arched glass-fiber sound attenuation pad. It performs as many as five different building material functions: acoustical correction, insulation and roofing support, integral lighting, long-span structure, and finished flat ceiling. It spans up to 34′, eliminates the need for bar joists.

Costs less to maintain. It can be washed or painted. Nothing to become loose or fall off. And in years to come, Fenestra acoustical steel paneling will still retain its original appearance.

Fenestra has been a pioneer in this better kind of sound conditioning for over 30 years. Can our research and engineering service help you? Call your local Fenestra representative (he's in the Yellow Pages); see Sweet's File 2c/Fe; or write: *Fenestra Incorporated, Dept. AR-07, 2252 E. Grand Boulevard, Detroit 11, Michigan.*



Long-span acoustical "D" steel ceiling panels provide highly efficient noise absorption at all sound frequencies.

PRODUCTS FOR THE NEW AGE IN ARCHITECTURE

Fenestra

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Steel and aluminum curtain-wall systems

Steel and aluminum residential windows

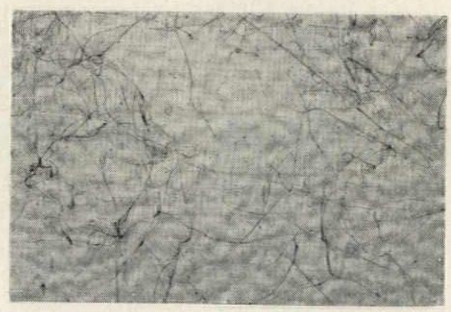
Engineered windows for industrial, institutional and monumental buildings

Hollow metal doors

Light gauge steel structural systems for floors, roofs, walls, and electrified floors

Product Reports

Stainless-Clad Welded Steel Tubing
Welded carbon steel tubing clad in stainless steel is now available in diameters up to 3½-in. OD, with composite wall thicknesses up to ¼ in., at a cost considerably below that of stainless steel tubing. The Type 302 stainless steel cladding is mechanically bonded to the carbon steel tubes and polished to a fine surface finish. The tubing, which comes in lots of 2500 ft or more, meets wear and appearance requirements for both structural and ornamental applications. *Standard Tube Co., 24400 Plymouth Rd., Detroit 39, Mich.*

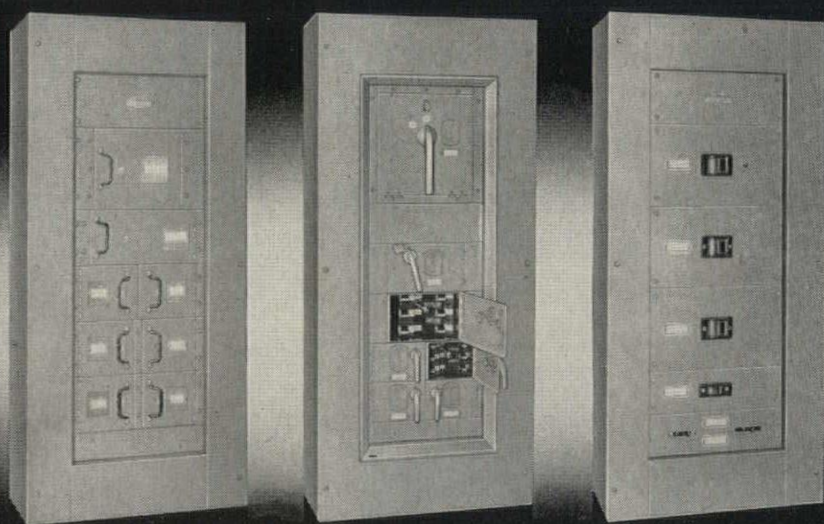


Epoxy-Fiberglass Wall Covering
Armobond, a fiberglass-reinforced epoxy coating, produces a continuous tile-like protective surface when applied to wood, metal, plastics, all types of masonry, wallboard and particle board. It is waterproof, resistant to abrasion and chemical corrosion, and economical: about one-half the cost of tile and one-third the cost of vitrified block. The coating is applied by rolling on a clear epoxy, letting it dry to a tacky state, and laying on a layer of fiberglass, over which another coat of epoxy is applied. Successive layers of epoxy and fiberglass may be built up, depending on the required thickness. The epoxy, which can be supplied in any specified color, may also be used alone. *Deerfield Coatings, Inc., South Deerfield, Mass.*

Now there's one just right for any installation...

FRANK ADAM

Feeder Panelboards



Your preference—with or without doors!

BRANCHES

KSF HINGED TYPE...

Fusible switch, 30 to 600 amps.—250-v. AC or DC; 2 and 3 poles, single and double throw.

S-A-W TYPE...

Quick-make, quick-break fusible switch, 30 to 600 amps.—250-v. AC or DC; 600-v. AC, 2 and 3 poles.

CIRCUIT BREAKER TYPE...

Automatic protection, 15 to 800 amps.—250-v. AC or DC; 600-v. AC, 2 and 3 poles.

See our catalog in SWEETS

All FA feeder panelboards are UL approved.

From Frank Adam's complete line of feeder panelboards you can specify those that perfectly meet the needs of any project, small or large.

"Add-On" feature provides space for the easy and economical addition of future branches as required by merely installing enclosures with temporary blank space covers.

Many other exclusive engineering innovations that guarantee more dependable safety and efficient performance have made this Frank Adam competitively-priced equipment first choice among architects and engineers who insist on getting the quality they specify.

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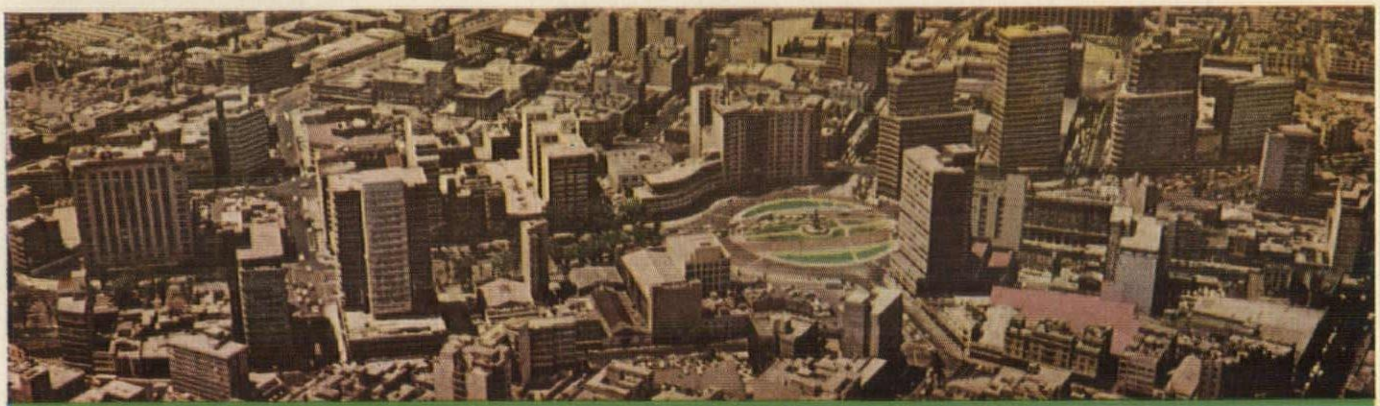
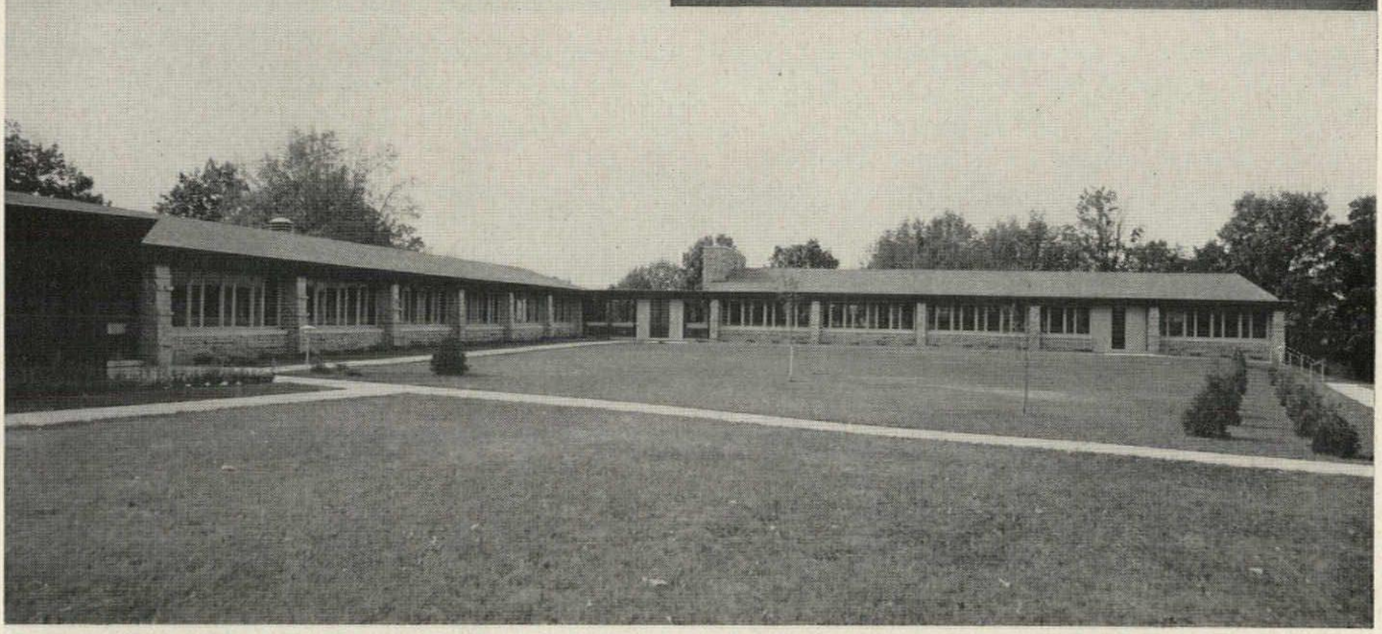
Title...

Mail to Frank Adam Electric Co., P. O. Box 357, Main P. O., St. Louis 66, Mo.



Add the practical warmth of QUALITYBILT Wood Windows



for buildings with charm, distinction, and livability

Qualitybilt WOODWORK

Entrances • Doors • Frames • Sash • Blinds Casements • Glider Windows • Sliding Doors Screens • Combination Doors • Storm Sash Garage Doors • Mouldings • Interior Trim • Sash Units • Louvers • Kitchen Cabinet Units • Cabinet Work • Stairwork • Disappearing Stairs "Farlite" Laminated Plastics

● Here is a pleasing example of Qualitybilt Casement Windows combined with rugged stone . . . creating a warm, friendly atmosphere to the entire building. This is just one more instance of the wide range of architectural treatments possible with Qualitybilt's complete wood window line. And . . . the superior insulating characteristics of Qualitybilt wood windows allows even more liberal use of window areas without sacrificing comfort or adding to heating and cooling costs!

You'll get complete details in Sweets Architectural and Light Construction File, or by contacting . . .

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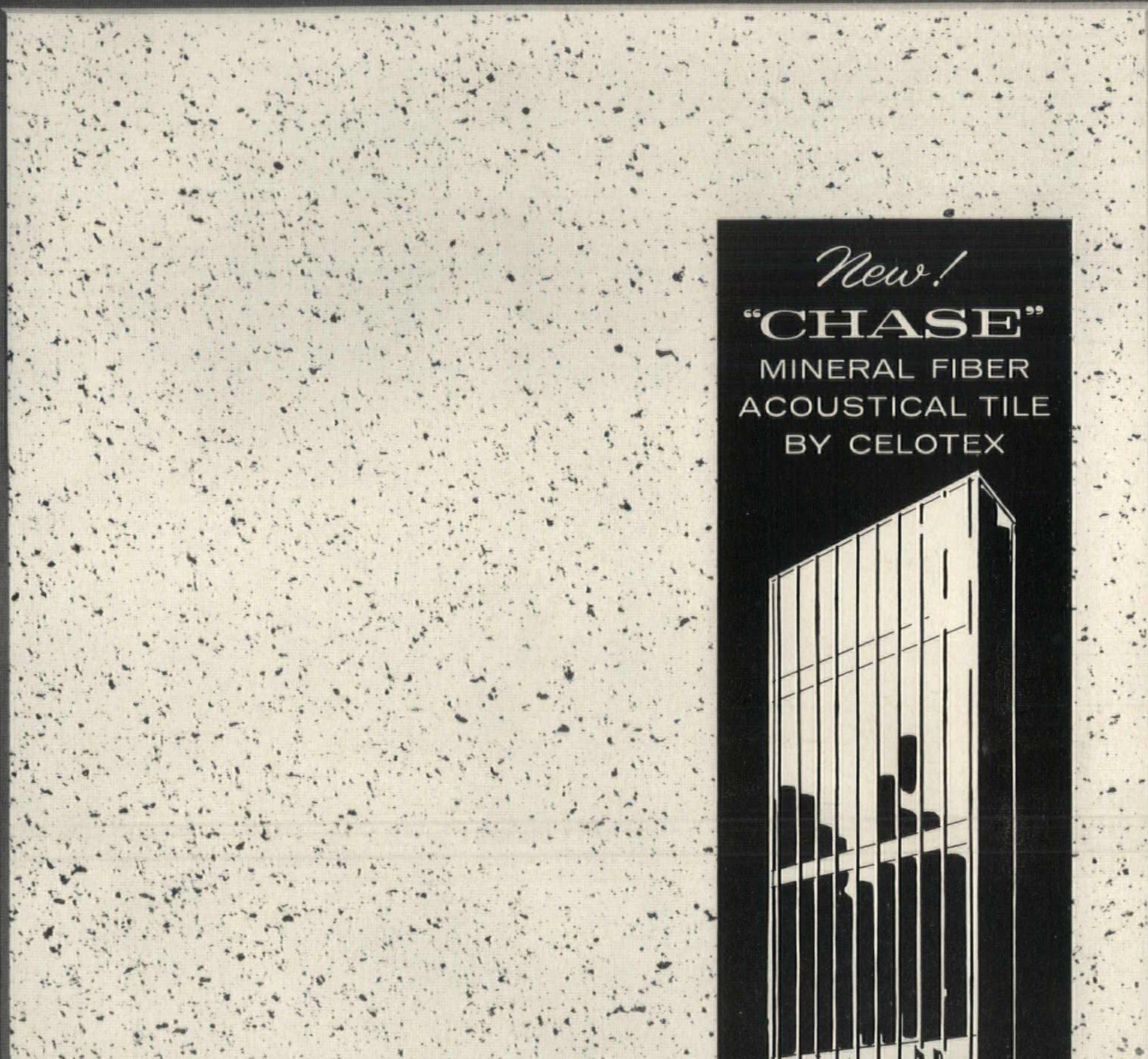
TILE SHOWN AT ABOUT 2/3 ACTUAL SIZE



Originated for New York's New Chase Manhattan Bank Building

NOW A STANDARD CELOTEX PRODUCT!

Custom-created for almost 1½ million square feet of ceiling in the 60-story tower of No. 1 Chase Manhattan Plaza, new Chase is a subtle version of classic fissured Celotone® mineral fiber tile... natural travertine texture, but with a lighter, less pronounced, non-directional fissuring.

Your Acousti-Celotex distributor will be glad to show you a sample of Chase and many other new exclusive acoustical products... and will demonstrate advanced suspension systems that integrate components for lighting, air conditioning, movable partitions and sound conditioning.

THE CHASE MANHATTAN BANK BUILDING
Architect: Skidmore, Owings and Merrill • Builder: Turner Construction Company
Ceilings: Jacobson & Co., Acousti-Celotex Distributor

- **INCOMBUSTIBLE.** Like all CELOTONE® mineral fiber tile, new Chase complies with Fed. Spec. SS-A-118b, Class A, Incombustible and carries the U.L. label.
- **INSTALLATION.** New Chase Tile is available in 12" x 12" size with bevel edge: butt joint for adhesive application, or with kerfed edges for suspension system.

If it's "by CELOTEX" you get QUALITY... *plus!*

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REGISTERED U.S. PAT. OFF.
SOUND CONDITIONING PRODUCTS

Products to Meet Every Sound Conditioning Problem... Every Building Code
The Celotex Corporation, 120 S. La Salle St., Chicago 3, Illinois
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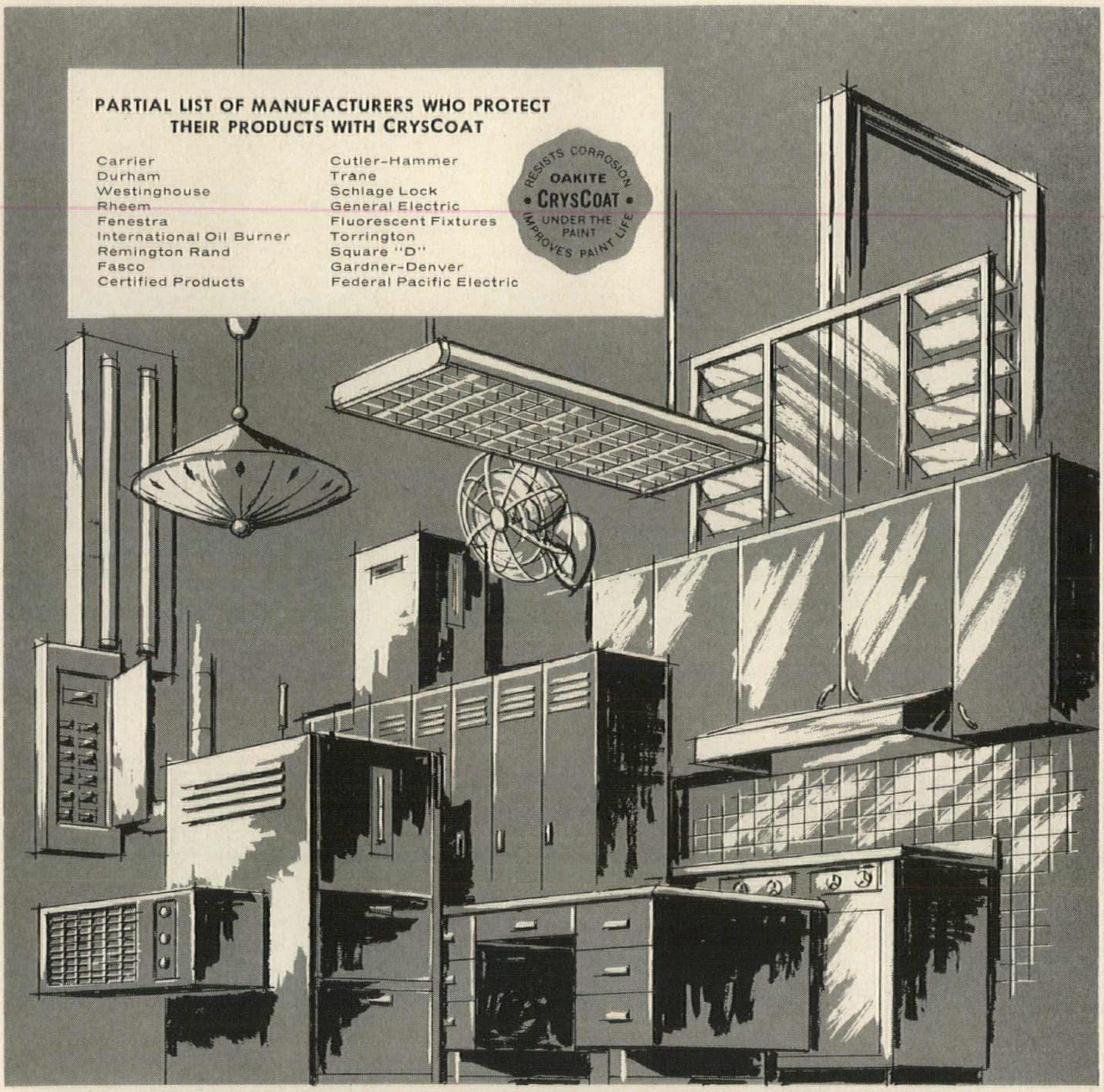


In your specifications it pays to name products with finishes protected by CrysCoat®

When you specify Oakite CrysCoat as a pre-paint treatment for the steel products in your plans, you are specifying a top quality phosphating process for bonding paint to metal. It means the products will be protected against under-paint corrosion, unsightly peeling, and creeping rust surrounding accidental paint damage.

To the advantage of architects and building owners everywhere, a wide variety of steel products is now being CrysCoated. Write for more information about CrysCoated products. Oakite Products, Inc., 83 Rector Street, New York 6, N. Y.

CrysCoat paint-bonding treatment makes architectural products look better . . . last longer

OAKITE®

over 50 years' leadership in industrial cleaning — Est. 1909 — SCIENCE

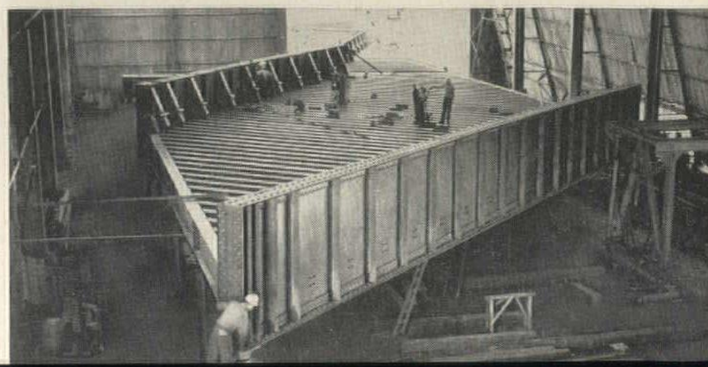
This bridge which spans the wide Missouri at Mobridge, South Dakota, is the largest bridge between the Mississippi River and the West Coast and includes these MVSS all-welded plate girder spans.
Superstructure Contractor:
John F. Beasley Construction Co.

Neither traffic, nor flood stop the "span-power" that MVSS generates to expedite a job. 11 bridges in 5 months is a record just set. At this very moment 6 MVSS plants are completing fabrication for 5 more bridges simultaneously.

26 rivers, highways and railroads spanned . . . in 17 months . . .

***MVSS HAS IT**—1100 men and their manpower . . . six completely equipped fabricating plants . . . three erection companies . . . add up to MVSS *span-power.*

Completely shop assembled bridges, too.—For this State of Illinois bridge (considerably skewed and on a 3.54% grade) MVSS fabricated 717 tons; three spans were shop-assembled and reamed while assembled. CTA bridge crosses over Congress Expressway, Chicago.



MISSISSIPPI VALLEY

STRUCTURAL MV SS SERVICE **STEEL COMPANY**

Six Strategic Plants. Chicago (Melrose Park) • St. Louis, Mo. • Flint, Michigan
Lansing, Michigan • Decatur, Ill. • Chattanooga, Tenn.

Office Literature

continued from page 254

Electrified Cellular Concrete Floors
(A.I.A. 17-A) Office Building Manual presents complete information on *Flexicore* electrified precast concrete cellular floor systems, with data on the design and detailing of the structure and the underfloor distribution system, and structural and electrical specifications. 32 pp. *Flexicore Mfrs. Assn., 297 S. High St., Columbus 15, Ohio* *

Public Pool Booklet
Discusses all phases of indoor and outdoor public pool installation, including such topics as location, plan or shape, elevation, size, depths, design, construction, and interior finishes (pool paints, *Marcite* and tiles). A section on mechanical equipment includes a visual location layout. *Paddock of California, 14600 Arminta, Van Nuys, Calif.*

Comfort Conditioning
. . . *With Light and Air* (A.I.A. 31-F-2, 30-E) Provides complete engineering and performance data on combination lighting fixture-air diffusers. Form OD-1040, 24 pp. *Day-Brite Lighting, Inc., 6260 N. Broadway, St. Louis 15, Mo.**

Specifier's Guide
. . . *for Mercury-Lamp Ballasts* contains prices, dimensions, wiring diagrams and other data for selecting and applying standard and special mercury-lamp ballasts. GEA-7056, 10 pp. *General Electric Co., Schenectady 5, N. Y.**

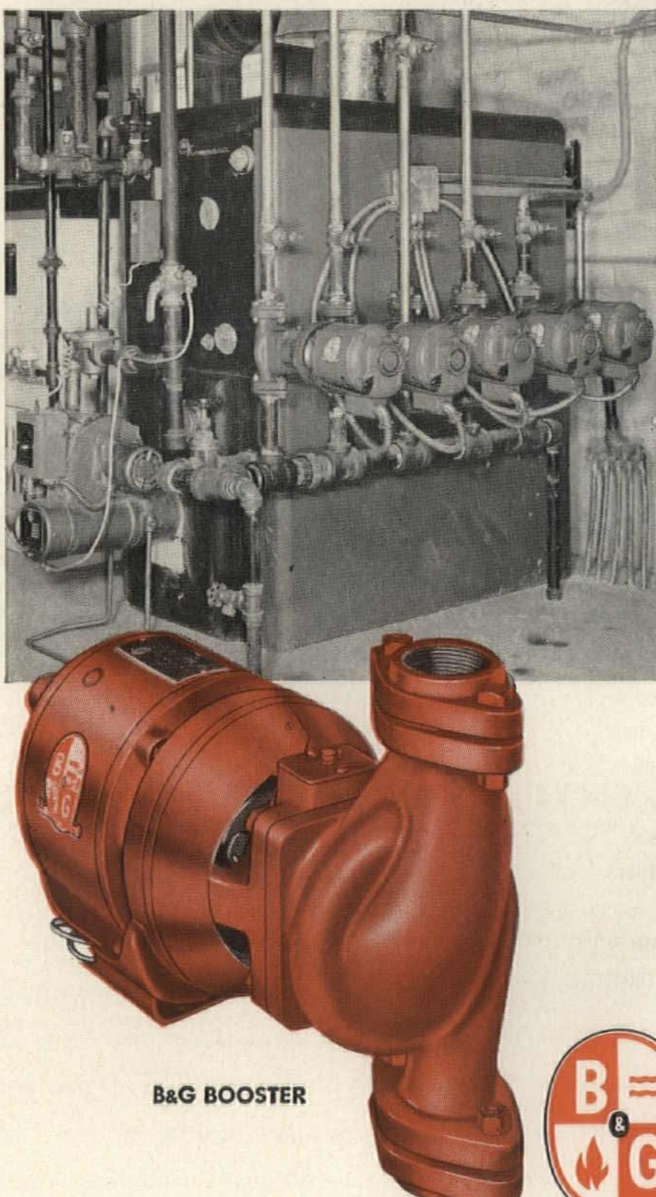
Air Intake Units and Unit Heaters
Gives construction and control details, complete performance data, and dimensions on gas- and steam-fired air intake units and steam-fired unit heaters. Bulletin A-117, 12 pp. *Hartzell Propellor Fan Co., Piqua, Ohio*

Buyer's Guide to Ryerson Tubing
Selection chart gives comparative listing of characteristics and typical applications of seamless and welded round, square and rectangular steel tubing. Technical Bulletin 12-10, 4 pp. *Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill.**

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

more literature on page 308

TENANTS SELECT THEIR OWN TEMPERATURE IN 25 APARTMENTS ZONED BY B&G *Hydro-Flo*® SYSTEM



B&G BOOSTER

Stratford Manor Apartments, Schiller Park, Ill., attracts tenants with such luxury features as *individually controlled Hydro-Flo* Heating for each apartment.

Five buildings, each with five apartments, are heated with one boiler in each building. Five B&G Boosters, together with auxiliary *Hydro-Flo* equipment, are installed on each boiler to provide thermostatically controlled circulation to individual apartments. Tenants receive all the comforts of *radiant hydronic* heating plus their own choice of temperature. Only a forced hot water heating system can provide zoning so effectively and economically.

The B&G *Hydro-Flo* Systems installed in these apartments have proved so satisfactory that the builder plans to install the same system in 92 additional housing units to be built.

B&G BOOSTER®... *key unit of the B&G Hydro-Flo System*

Engineered for compactness, silent operation and years of service, this electric pump circulates boiler water for heating. It is built by precision manufacturing methods which translate good design into a superior product. This key unit and other auxiliary *Hydro-Flo* equipment can be installed on any hot water boiler.

BELL & GOSSETT COMPANY

Dept. GI-32, Morton Grove, Illinois

Canadian Licensee: S. A. Armstrong, Ltd., 1400 O'Connor Drive, Toronto 16, Ontario

ALL THE ADVANTAGES OF WOOD—*and then some*

The Wolmanized® brand makes every piece of wood it's on—*something special.* This quality building material has all the traditional advantages of wood plus permanent termite and decay protection. The Wolmanized brand is the "Mark of Quality", identifying the finest pressure-treated wood. It is produced under license and by Koppers Company, Inc. itself . . . world's leading supplier of pressure-treated wood and wood products.

Wolmanized pressure-treated lumber is the simplest and most effective way to insure built-in protection against decay and insect attack. Use it anywhere wood is near the ground, in contact with masonry or where high humidity and moisture conditions prevail. Application is easy — standard building and finishing methods. And Wolmanized pressure-treated lumber is available as dimension stock, plywood and timber.

The cost for this assured protection is surprisingly little . . . about 2% of total costs in residential construction, even less in commercial and industrial structures. Next time you are looking for a long-life construction material, be sure to specify Wolmanized pressure-treated lumber. It's branded for your protection.

For the full story of Wolmanized pressure-treated lumber, how it is produced, where to use it, how to specify it and where to get it, write for the free 16-page booklet, "Safeguard Building Dollars."

W-83

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Koppers Company, Inc.
751 Koppers Bldg., Pittsburgh 19, Pa.

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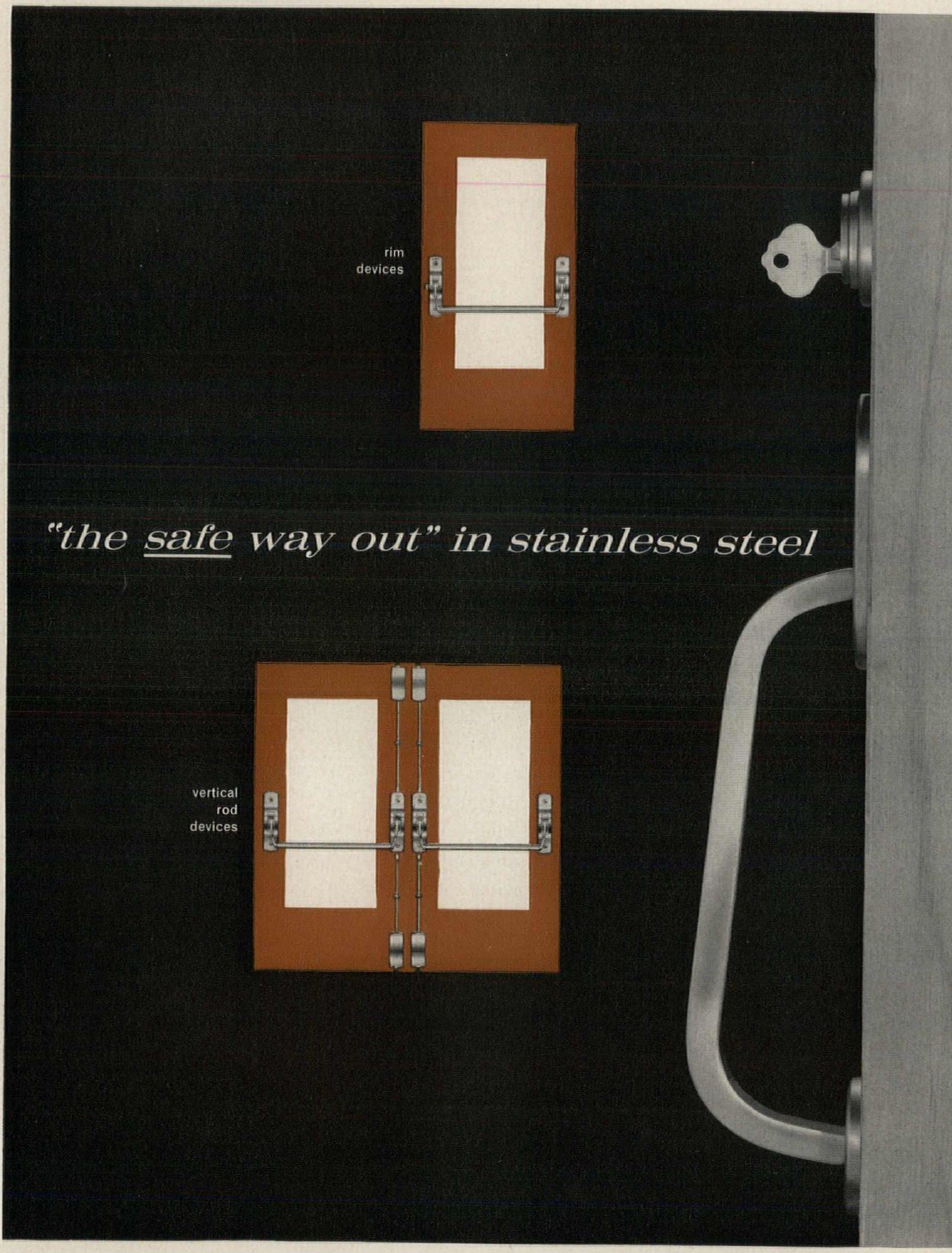
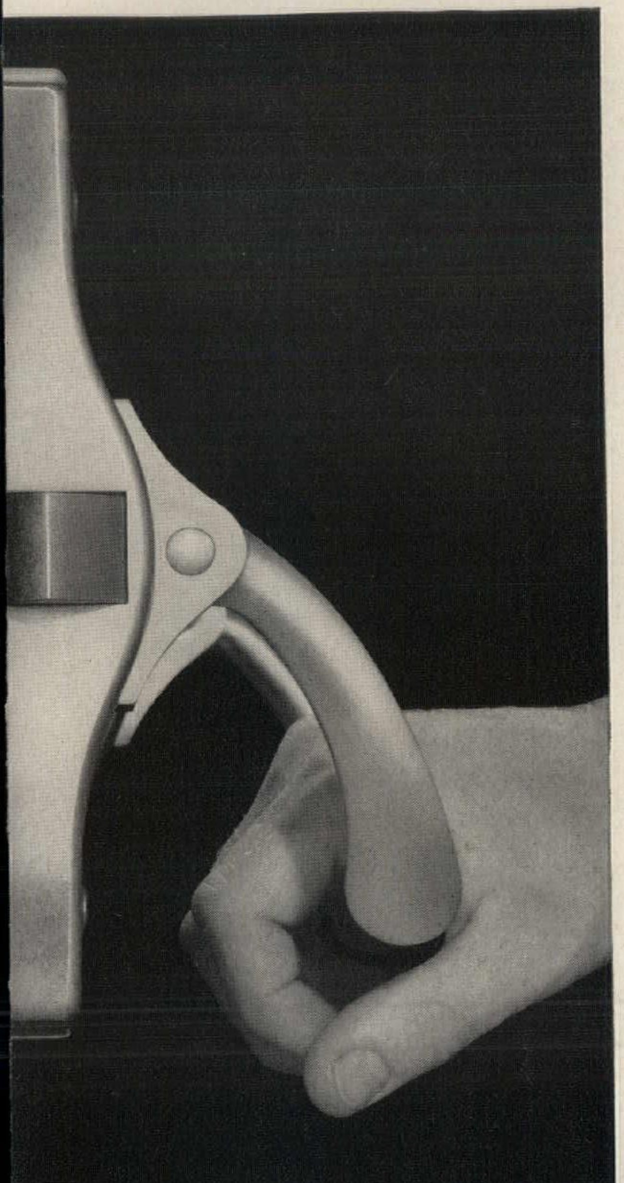
PRESSURE-TREATED LUMBER • TERMITE AND DECAY RESISTANT • CLEAN • PAINTABLE • ODORLESS • FIBER-FIXED


rim
devices
"the safe way out" in stainless steel
vertical
rod
devices


mortise
lock
devices

Office Literature

WRI Building Design Handbook
Gives complete property and design information on welded wire fabric reinforcing. *Wire Reinforcement Institute, Inc., National Press Bldg., Washington 4, D. C.*

Ventilating Sets
Provides engineering and performance data for complete line of direct-connected and v-belt driven ventilating sets. Catalog 1160, 18 pp. *Westinghouse Electric Corp., Sturtevant Div., Dept. 242, Hyde Park, Boston 36, Mass.**

Sealtight Products
. . . *for Concrete Construction* catalogs expansion joints, joint sealing compounds, control joints, sewer joint compounds, waterstops, curing compounds and many new products. Catalog 100. *W. R. Meadows, Inc., 26 Kimball St., Elgin, Ill.**

Packaged Fuel Burning Systems
Describes design and operation of packaged systems for burning oil, gas, and combination oil/gas. Bulletin 1270. *Orr & Sembower, Reading, Pa.*

Mercury Floodlighting Catalog
Describes, illustrates, and gives specifications for complete line of high-output mercury vapor floodlights in units and clusters for pole, wall, or surface mounting. Catalog MV660. *Stonco Electric Products Co., 333 Monroe Ave., Kenilworth, N. J.**

Low-Impedance Bus Duct
(A.I.A. 31-C-621) Gives application data (descriptions, drawings, dimensions, specifications, and engineering and test data) needed to lay out, specify and install low-impedance bus duct. Application Data 30-662, 20 pp. *Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.**

Sliding Gate Temperature Regulators
Includes features, applications, sizing charts, flow curve, sample specifications and complete engineering information on sliding gate and plate temperature regulators. Catalog J180-1, 8 pp. *OPW-Jordan Corp., 6013 Wiehe Rd., Cincinnati 13, Ohio.*

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

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If it gives you all of these standard features it is the genuine Nesbitt SILL-LINE. . . . No checkee, no takee!

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All accessories are expensively die-formed to compliment enclosure design and fit perfectly	✓
Eight-step rust-inhibited baked enamel finish in a choice of six modern decorator colors	✓
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Add Nesbitt's baked enamel finish — flawless result of an 8-step process under strict inspection.

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Sill-Line Radiation is made and sold by John J. Nesbitt, Inc., Philadelphia 36, Pa.

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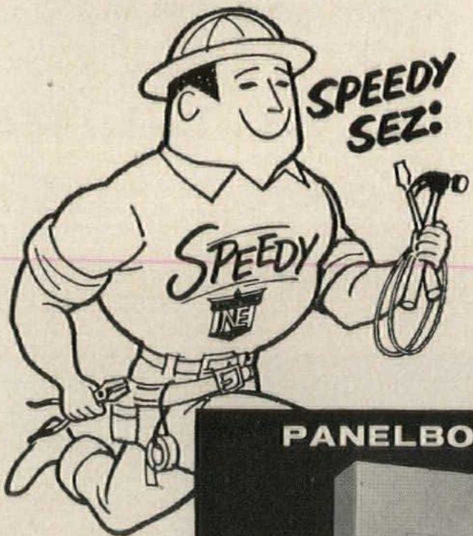

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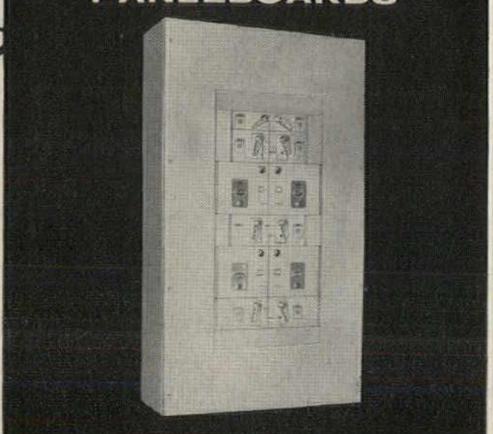

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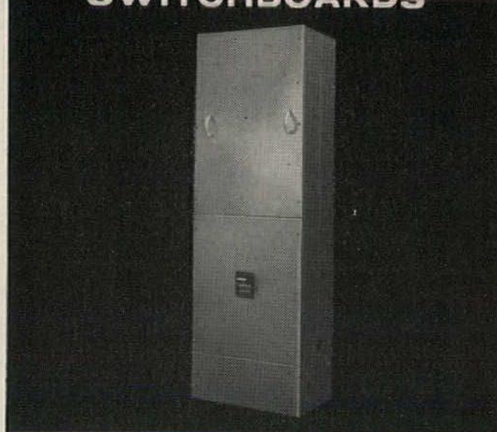

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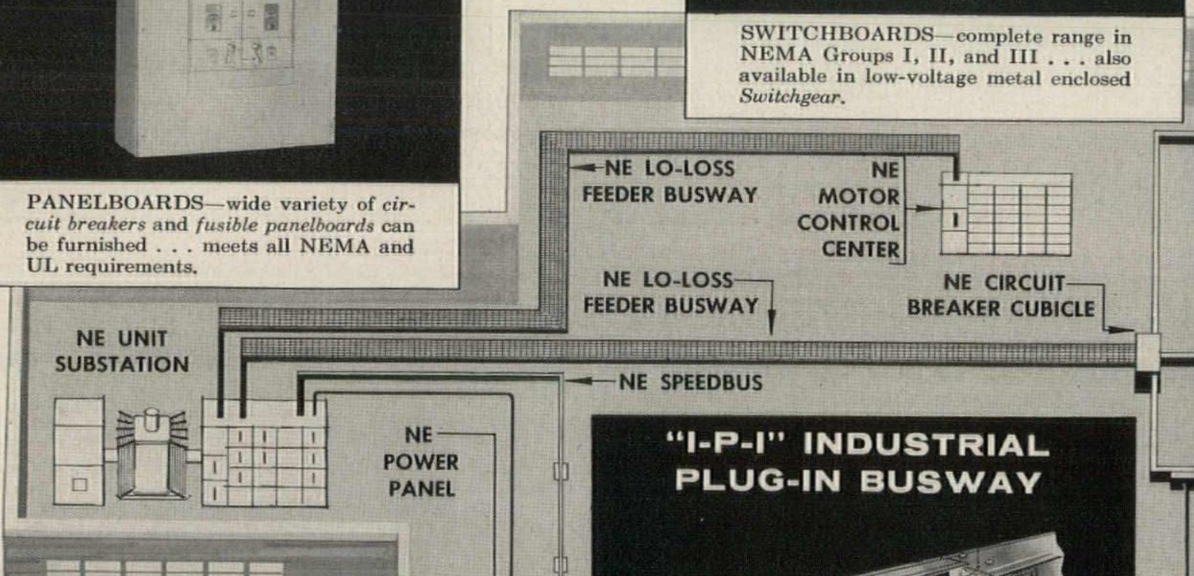
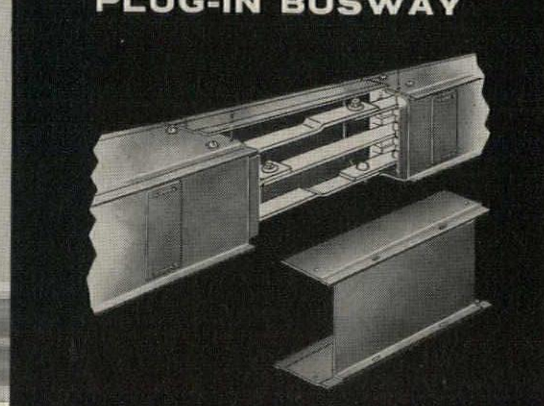


"I-P-I" INDUSTRIAL PLUG-IN BUSWAY



"I-P-I" INDUSTRIAL PLUG-IN BUSWAY—up to 1500 amps at voltages up to 600 . . . versatile and time-tested . . . complete range of take-off and protective devices.

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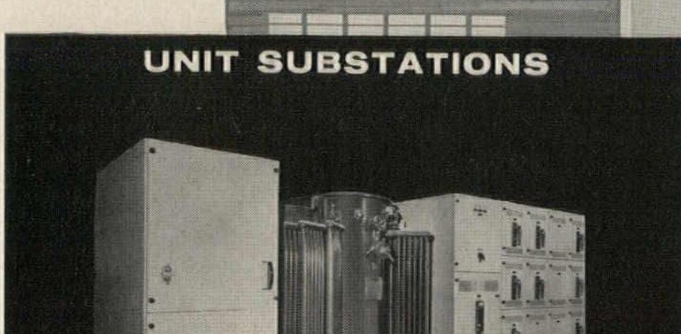
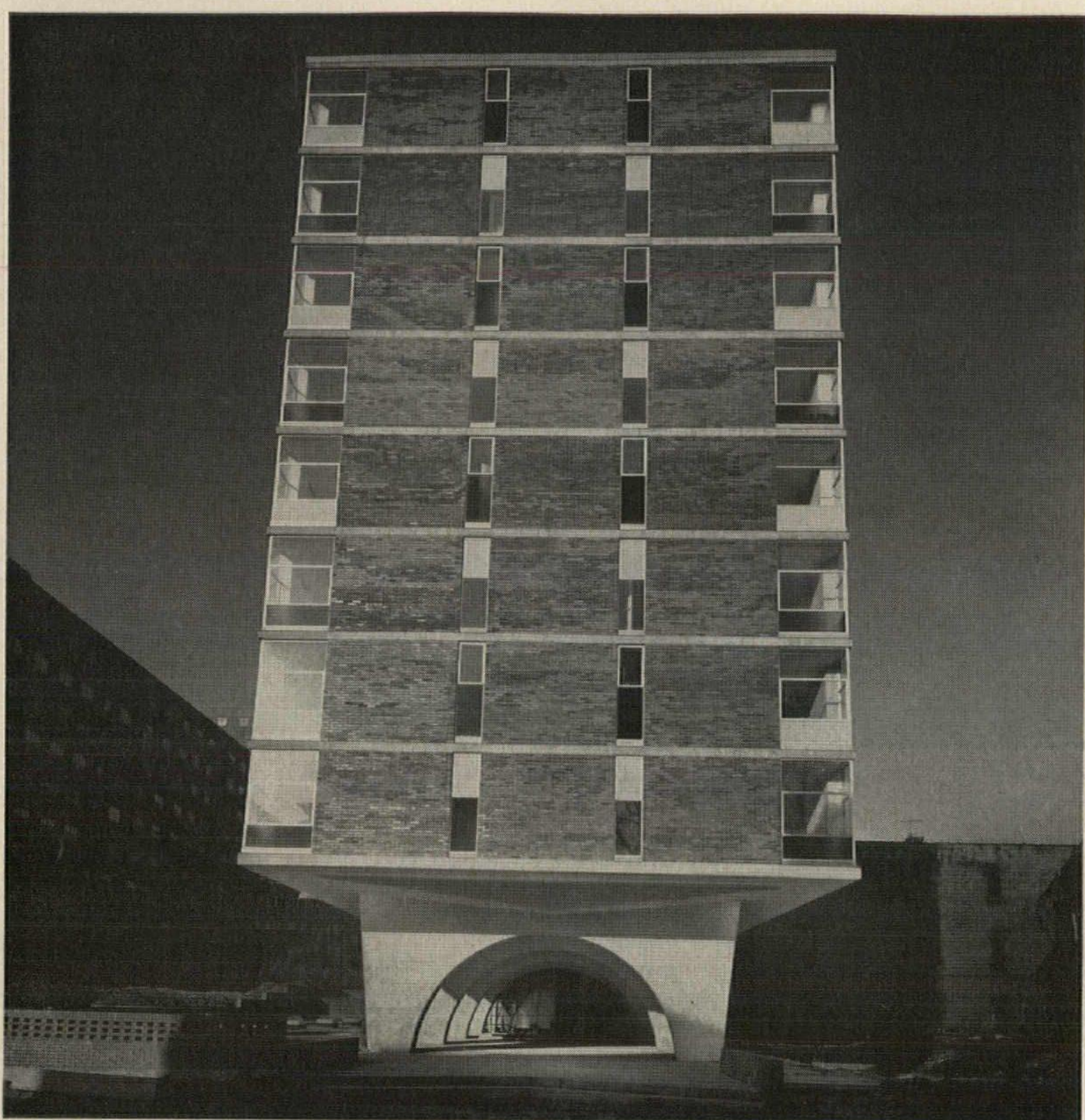
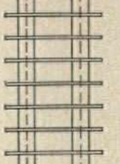


UNIT SUBSTATIONS—available as packaged units in Group I (600 Volts) and Group II (5 and 15 KV) . . . special and custom arrangements can be supplied.



Reinforced CONCRETE Arches

Support Luxury Apartment Building

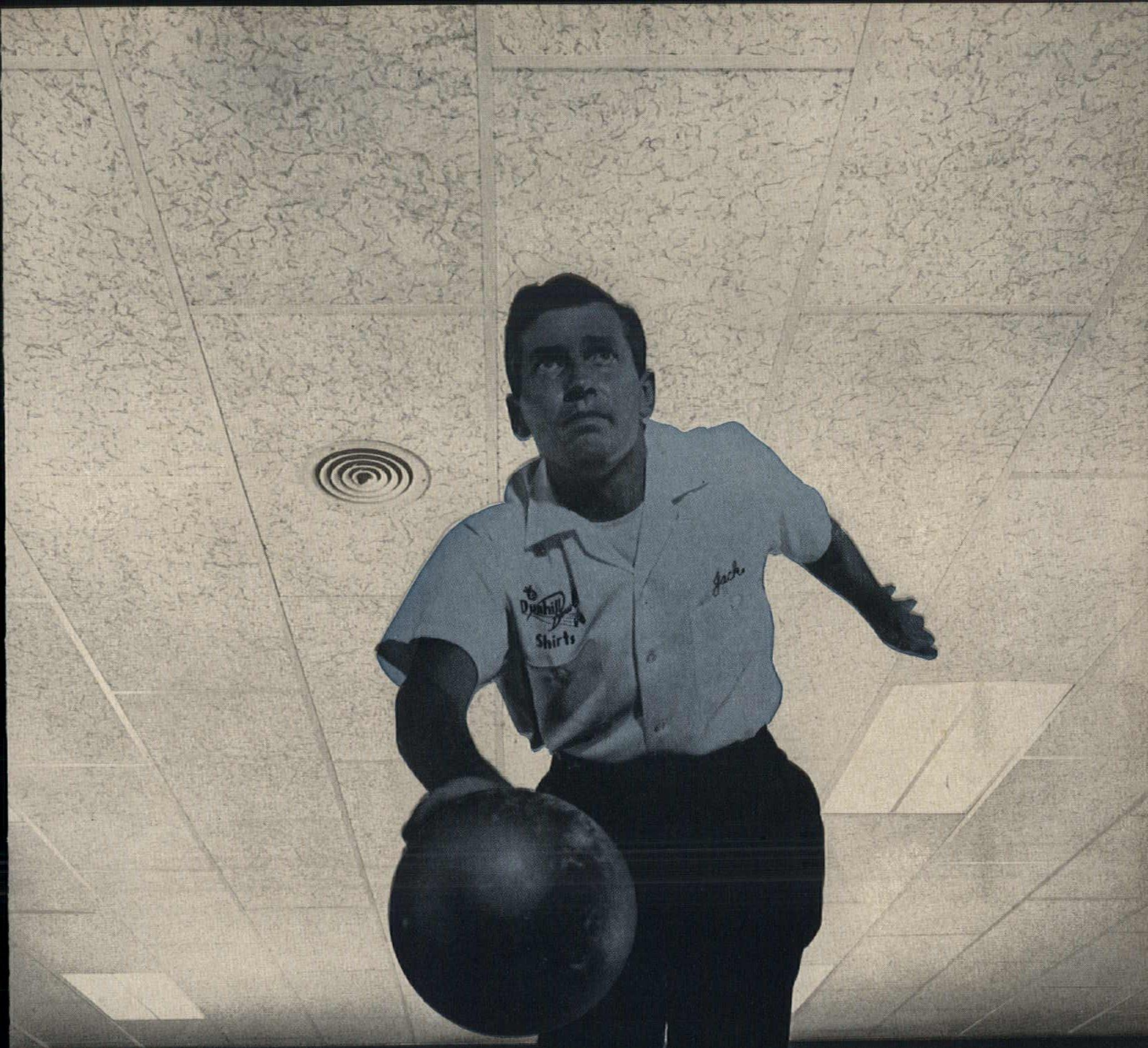


Proving that you can do the unusual with reinforced concrete is this luxury apartment building designed by Tasso Katselas. In this design, the entire first floor is supported directly on reinforced concrete arches which serve as an open colonnade leading to stairways and elevators. At ground level, the arches also support reinforced concrete columns extending the full height of the building, from which flat slab floors with continuous cantilevers extend around each side of the structure.

Only with reinforced concrete can you achieve such freedom of design. Before you build any type of building, investigate this more flexible medium of construction.

Concrete Reinforcing Steel Institute
38 South Dearborn Street, Chicago 3, Illinois

Neville House Apartments, Pittsburgh, Pa.
Architect: Tasso Katselas, Pittsburgh, Pa.
Structural Engineers: Gensert, Williams & Associates, Cleveland, Ohio
Contractor: Gratziano Construction Company, Pittsburgh, Pa.
Photos by Jay-Bee Studios



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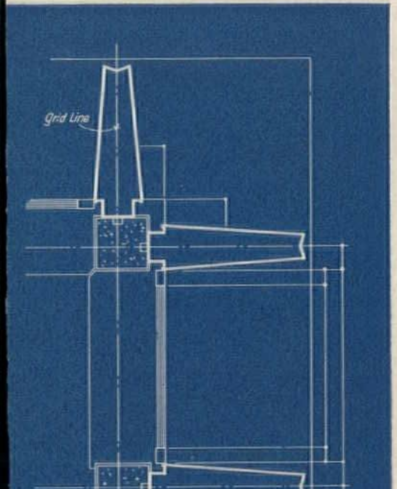

Here's an example of a beautiful classical-modern effect achieved through the use of narrow window bays and deep, vertical mullions of contrasting shades of anodized aluminum.

In designing the new Hunt Library at Carnegie Tech., the architects, Lawrie & Green, used Permatite fully reversible, vertically pivoted aluminum windows set in narrow, aluminum framed bays. Thirty-six inch deep mullions between windows not only act as functional sun shades, but also add to the distinctive architectural beauty of the building.

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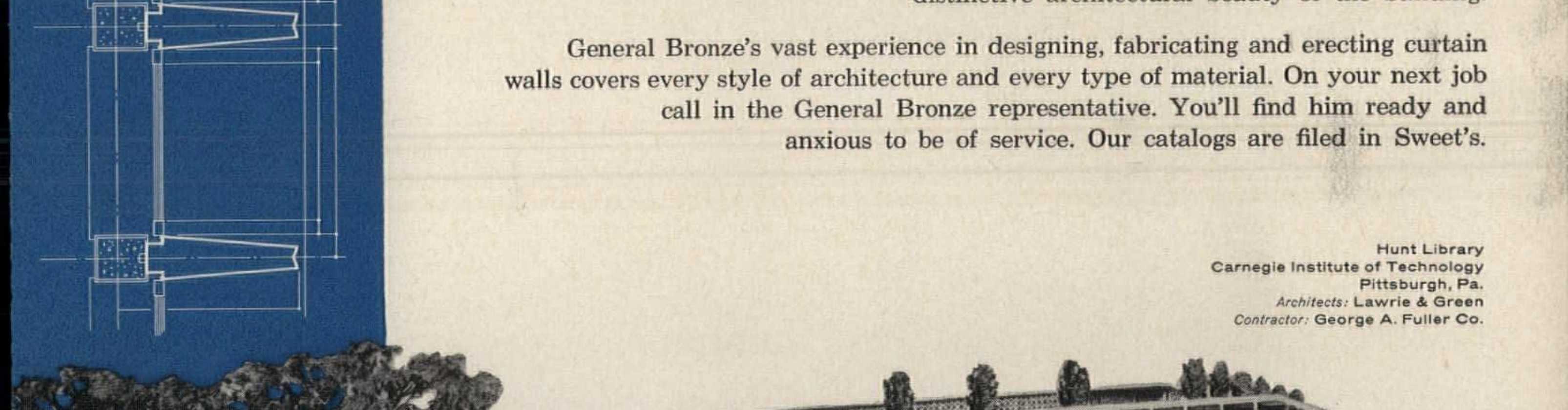
Hunt Library
Carnegie Institute of Technology
Pittsburgh, Pa.
Architects: Lawrie & Green
Contractor: George A. Fuller Co.



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GB ELECTRONICS DIVISION—Telemetry and Tracking Antenna Systems

On the Calendar

September

6-16 Second Production Engineering Show, theme, "Automation, Key to Manufacturing in the Sixties"—Navy Pier, Chicago

6-16 Machine Tool Show; of equipment and products which keep machine tools running—International Amphitheater, Chicago

7 -9 Joint Automatic Control Conference, sponsored by American Society of Mechanical Engineers, American Institute of Chemical Engineers, Institute of Radio Engineers, Instrument Society of America, American Institute of Electrical Engineers—Massachusetts Institute of Technology, Cambridge

11-15 62nd Annual Conference, American Institute of Park Executives—Long Beach, California

11-16 National Technical Conference, Illuminating Engineering Society—Penn-Sheraton Hotel, Pittsburgh

15-18 Annual Convention, Society of American Registered Architects—Statler Hilton Hotel, Dallas

25-29 42nd National Recreation Congress—Shoreham Hotel, Washington, D.C.

26-28 Ninth Annual Meeting, Standards Engineers Society—Hilton Hotel, Pittsburgh

26-30 Third Instrument-Automation Conference and Exhibit of 1960, sponsored by Instrument Society of America, and 15th Annual Meeting of I.S.A.—The Coliseum, New York

27-30 Sixth Annual Convention, Prestressed Concrete Institute—Statler-Hilton Hotel, New York City

October

5 -7 39th Annual Meeting and Chapter Presidents Conference, the Producers' Council—Drake Hotel, Chicago

8-16 10th Pan-American Congress of Architects—Buenos Aires

8-16 American Institute of Decorators Show, sponsored jointly by Resources Council of the A.I.D., the New York Chapter of the A.I.D., and the New York Herald Tribune; theme, "Decoration and Design 1961"—Seventh Regiment Armory, New York City

9-13 National Convention (third of three in 1960), American Society of Civil Engineers—Boston

11-14 Eighth Annual Workshop Convention, Architectural Woodwork Institute — Sheraton Park Hotel, Washington, D.C.

11-15 Annual Meeting, American Council of Independent Laboratories—Deauville Hotel, Miami Beach

17-21 48th Annual National Safety Congress—Conrad Hilton and other hotels, Chicago

17-21 National Metal Exposition—Philadelphia

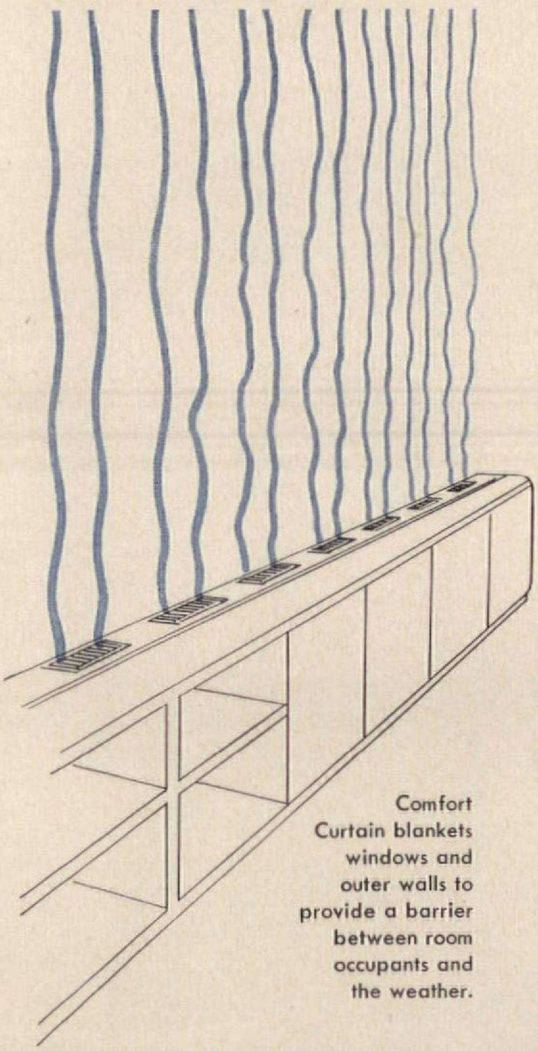
19-23 15th Annual Convention, California Council, American Institute of Architects—Yosemite National Park

23-26 Annual National Planning

continued on page 324

Pleasant Hill High School
Pleasant Hill, Missouri
Matthews and Hillman, Architects & Engineers
M. R. Erwin, Pres., Board of Education
H. Hall, Superintendent of Schools

Room by Room and Activity by Activity the Thermal Environment of Another School is Perfectly Controlled by LENNOX *Comfort Curtain*



Comfort Curtain blankets windows and outer walls to provide a barrier between room occupants and the weather.

Teachers like the individual temperature controls in the 12 classrooms of this new building. They have found that with Comfort Curtain they are able to provide a "climate" that stimulates learning, with students more alert and more receptive, which in turn makes their teaching all the more rewarding. With a Comfort Curtain System, individual classroom temperatures can be maintained within ½° of thermostat setting. Response is immediate, which permits rapid adjustment of the thermal environment to the changing requirements and uses of the particular room.

The Comfort Curtain System provides an air processing unit in each classroom which controls, blends and filters warm, return and fresh air as demanded. This air is distributed continuously *across the full length of the exterior wall* through functional, pre-finished metal bookshelf sections or wall ducts to eliminate cold spots, drafts and tired air. In the Pleasant Hill installation, gas fired heating sources, in approved construction heater rooms, are located on exterior walls between each two classrooms.

Individual Day-Nite thermostats have "no-occupancy" settings that save fuel by recirculating warm air when fresh air is not required—make after-hour use of individual rooms economical. Minimum structural requirements and ease of installation reduce both initial costs and over-all expenditures. As future building expansion is required, the modular design permits new units to be added economically. When desired, the Comfort Curtain System provides for present or future air conditioning on a room-by-room basis. Servicing of the entire system can be handled by any qualified local heating contractor.

For complete information about the Comfort Curtain System and its adaptability to in-the-room, two-room remote, central warm air, steam or hot water, heat pump, or electric heat sources, write LENNOX, 502 S. 12th Avenue, Marshalltown, Iowa, or phone your nearest Lennox office, listed below, and ask a technical representative to call.

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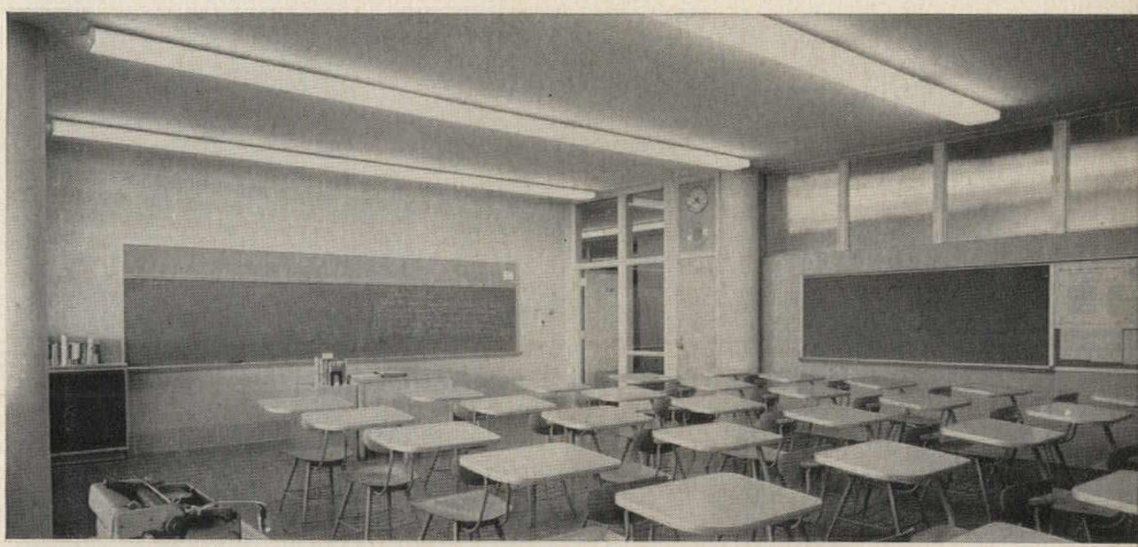
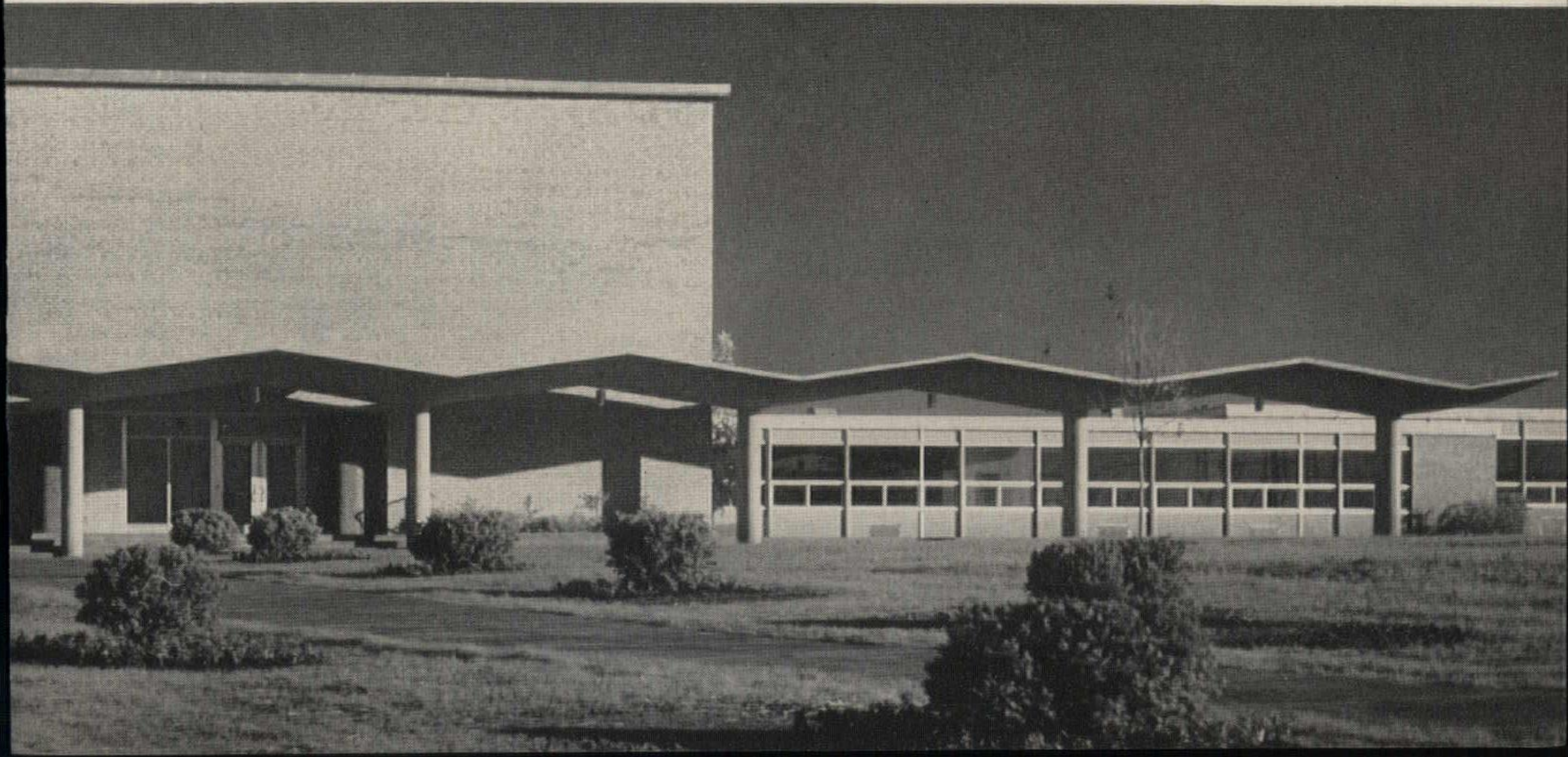
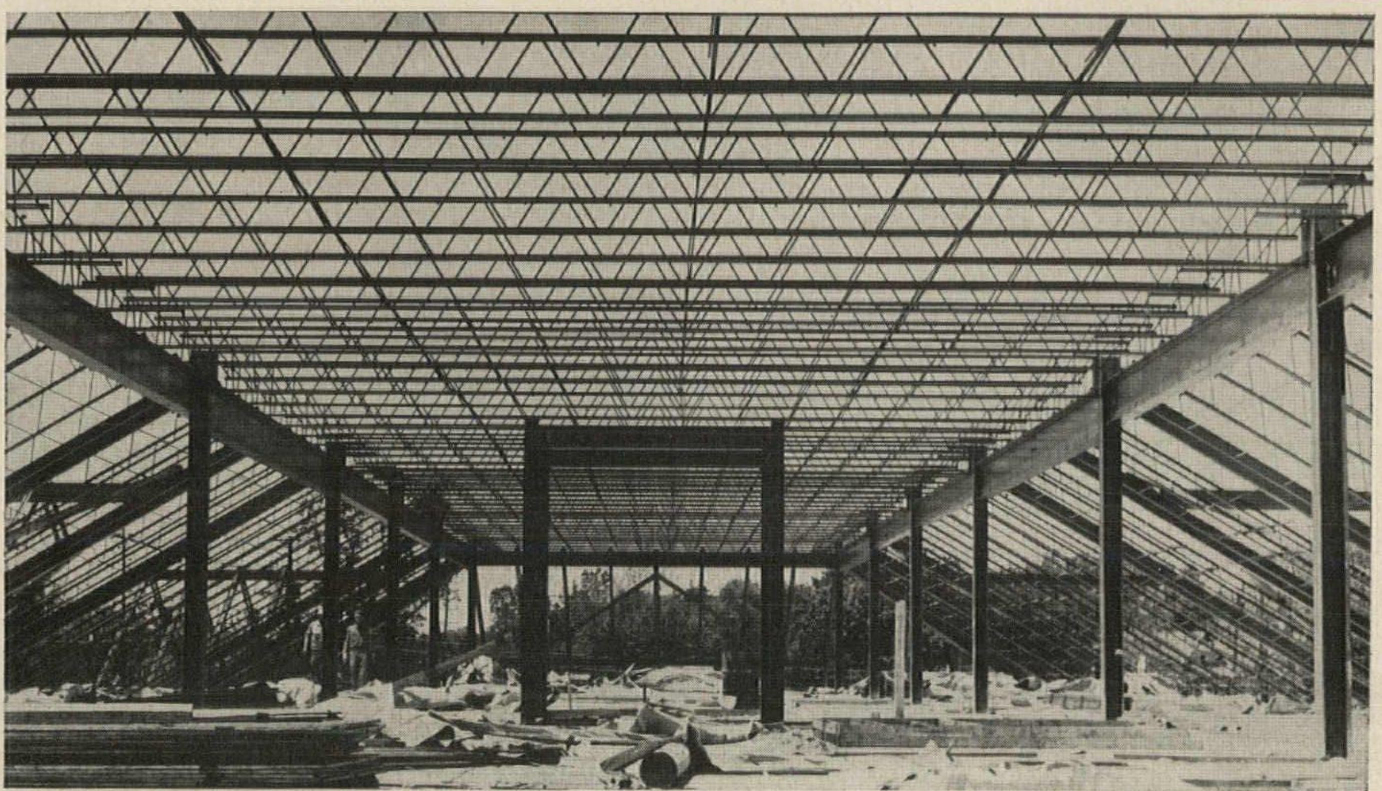


Molded acrylic plastic enclosures control light prismatically, eliminating glare.



Beneath a Handsome Williamsburg Exterior...



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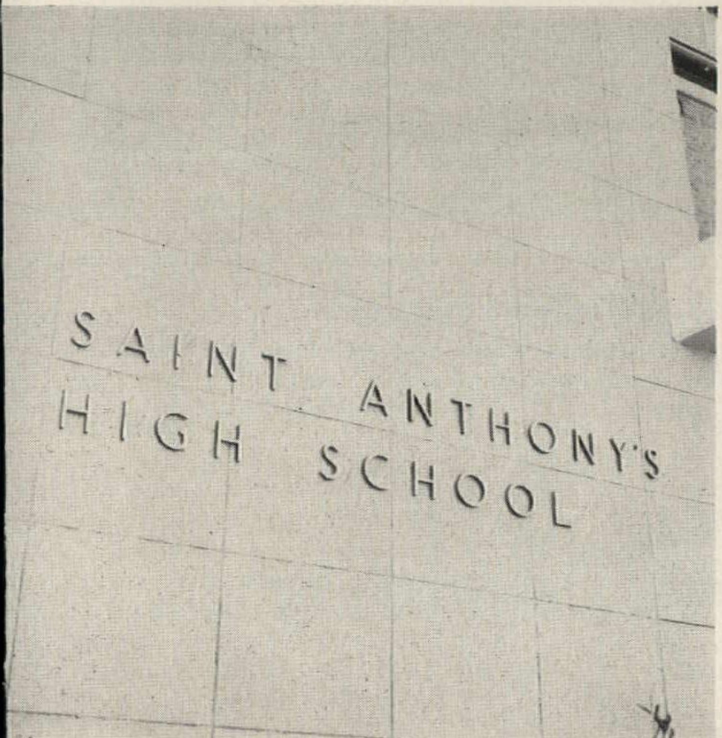

St. Anthony's High School. *The Lo-Blast Gas Burner keeps the entire building comfortably warm, from classrooms to the spacious gymnasium.*

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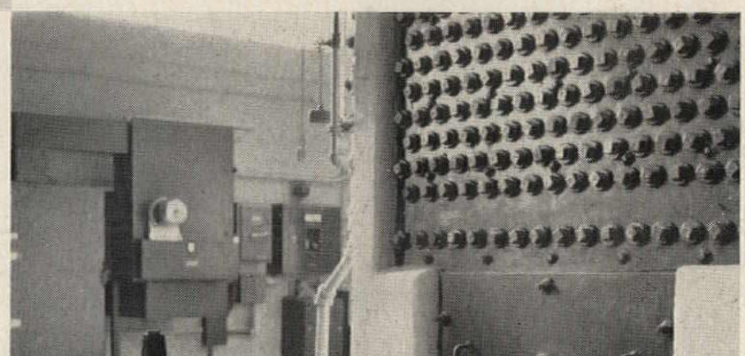

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FOR HEATING GAS IS GOOD BUSINESS!

Conference of Community Planning Association of Canada; theme, "Planning for the Smaller Communities"—Sheraton Connaught Hotel, Hamilton, Ont.

24ff 7th Advanced School for Home Builders, University of Illinois Small Homes Council-Building Research Council in cooperation with National Association of Home Builders; through November 2—University of Illinois, Urbana, Ill.

27-28 Sixteenth Annual Conference, American Society of Industrial Designers (open to business executives in fields of general management, marketing, manufacturing, engineering as well as to society members)—Edgewater Beach Hotel, Chicago

November

10-14 20th Annual Convention, Society of Industrial Realtors; included in proceedings will be exhibition "New Homes for Industry, North America"—Dallas

13-16 Seventh Annual Building Materials Exposition, sponsored by National Retail Lumber Dealers Association—Civic Auditorium, San Francisco

14-15 Conference on Prestressed Concrete—Biltmore Hotel, Los Angeles

14-16 Fall Conferences, Building Research Institute—Shoreham Hotel, Washington, D.C.

21-22 Conference on Prestressed Concrete — Sheraton - Palace Hotel, San Francisco

27ff Winter Annual Meeting, American Society of Mechanical Engineers; through December 2 —Statler-Hilton, New York

28-30 Semi-Annual Meeting, American Society of Refrigerating Engineers—Chase-Park Plaza Hotel, St. Louis

Office Notes

Offices Opened

Norman A. Hintz, James F. Browning, architects, and Edward A. Wilke, structural engineer, have set up offices at 2846 No. 85th St., Milwaukee 10, Wis.

Robert W. Kemp, architect, has opened a new office at 2649 No. 118th St., Milwaukee 13, Wis.

Heinz Brummel, architect, has set up offices at 4058 No. Downer Ave., Milwaukee 11, Wis.

Robert Joseph Pilc, architect, announces the opening of a new office at 244 5th Ave., New York 1, N. Y.

Allan Kenny, A.I.A., has set up offices at 3379 No. Green Bay Ave., Milwaukee 12, Wis.

Consulting engineer Wayman C. Wing announces the opening of his office at 411 7th Ave., New York 1, N. Y.

Max von Berlichingen, structural engineer, has set up new offices at Highway 141, Grafton, Wis.

New Firms, Firm Changes

The firm of Carl W. Pirscher and Associates, Architects A.I.A., 23255 Woodward Ave., Ferndale, Mich., is being joined by William R. Jarratt, A.I.A. The new organization will be known as Pirscher and Jarratt, Architects.

continued on page 332

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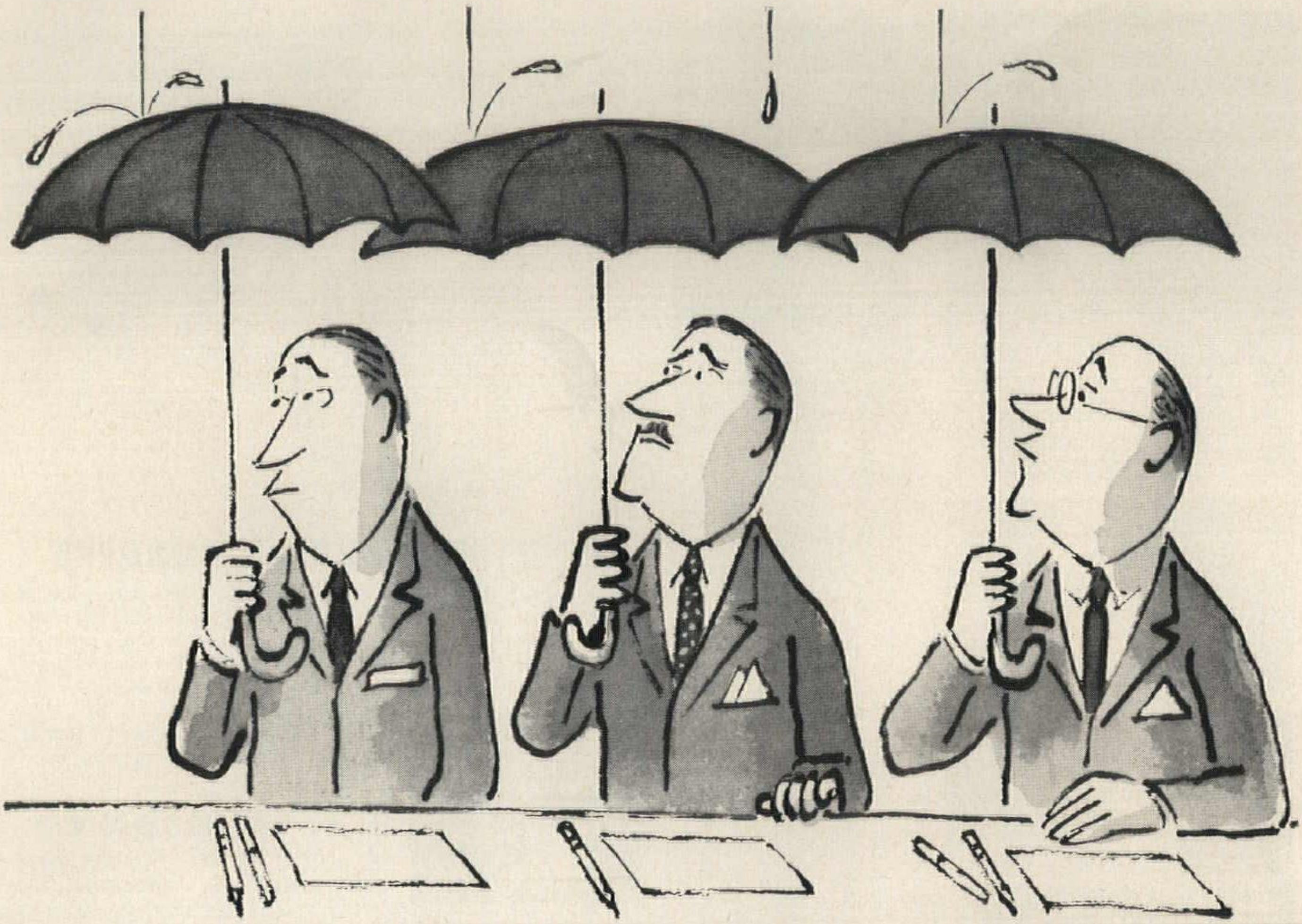

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AR-9

The firm of George M.D. Lewis, Registered Architect, 445 Kressler Court, Scranton 10, Pa., has added a new partner, Donaldson Berghauser, A.I.A. The new partnership is known as Lewis & Berghauser, Registered Architects. Edward Davis Lewis is junior partner in the firm.

Michael D. Schwartz, Registered Architect, announces the formation of Michael D. Schwartz & Associates, Registered Architects-Construction Coordinators. Associates are: James S. Gaspari, A.I.A.; Sid Dyer; and Sidney Schwartz, administrator. New offices are at 114 East 32nd St., New York 16, N. Y.

The formation of the firm of Kissinger-Jaroszewicz Associates, Architects, is announced by Stewart S. Kissinger, A.I.A., Mark T. Jaroszewicz, A.I.A., and Tobias J. Gersback. Their offices are at 1310 No. Telegraph Rd., Dearborn, Mich.

The firm name of Robert W. Talley, Architect, 805 Lovett Blvd., Suite 203, Houston 6, Texas, has been changed to Robert W. Talley and Associates.

Thomas and Hutton and Associates announces that the firm name has been changed to Thomas-Driscoll-Hutton, Inc., Architects and Engineers. Offices are still at 20 East Bay St., Savannah, Ga., in conjunction with Thomas and Hutton, Engineers.

Richard D. Riehl has joined Frederic P. Wiedersum Associates, architectural-engineering firm which has its headquarters in Valley Stream, L. I. Mr. Riehl serves as liaison between Wiedersum and school board members and administrators in Westchester, Long Island, and New York State.

Three new partners and four new associates have been admitted to the architectural firm, Sargent-Webster-Crenshaw & Folley, whose offices are in Syracuse, Watertown, Plattsburgh, and Schenectady, N. Y. The new partners are: Edward H. Wells, chief engineer; William Stevenson Young, general manager; and Robert W. Malmros, project architect. New Associates are: Donald P. Barner, chief specification writer; Edwin B. Bruce and Arthur C. Friedel, Jr., project architects; and John H. Deierlein, project architect.

The firm name of Ziegler, Childs & Paulson, Architects-Engineers, of 921 Bergen Ave., Jersey City 6, N. J., has been changed to the Office of Valdemar H. Paulsen, Architects. Mr. Paulsen became sole owner of the firm after the death of Christian H. Ziegler several years ago and the previous retirement of Fred S. Childs. Newly appointed associate members are Frederick W. Menne and Richard B. Rivardo.

The firm of Seelye Stevenson Value & Knecht, Consulting Engineers, 101 Park Ave., New York 17, has announced that subsequent to the death of senior partner Elwyn E. Seelye in 1959, the firm name remains the same and that the organization continues the practice of consulting engineering in structural, civil, mechanical, electrical, and highway engineering.

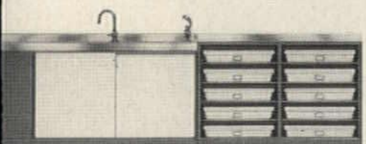
New Addresses

Aeck Associates, Architects, 180 Techwood Drive, N.W., Atlanta, Ga.

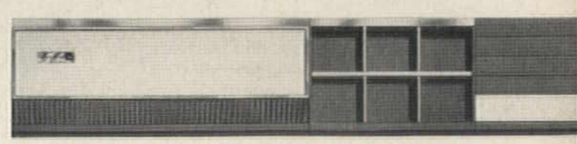
Sidney Astor, Architect, 170 5th Ave., New York 10.

Charles E. Broudy, Architect, 2016 Walnut St., Philadelphia 3, Pa.

IT'S HARD TO HIDE



SUCCESS



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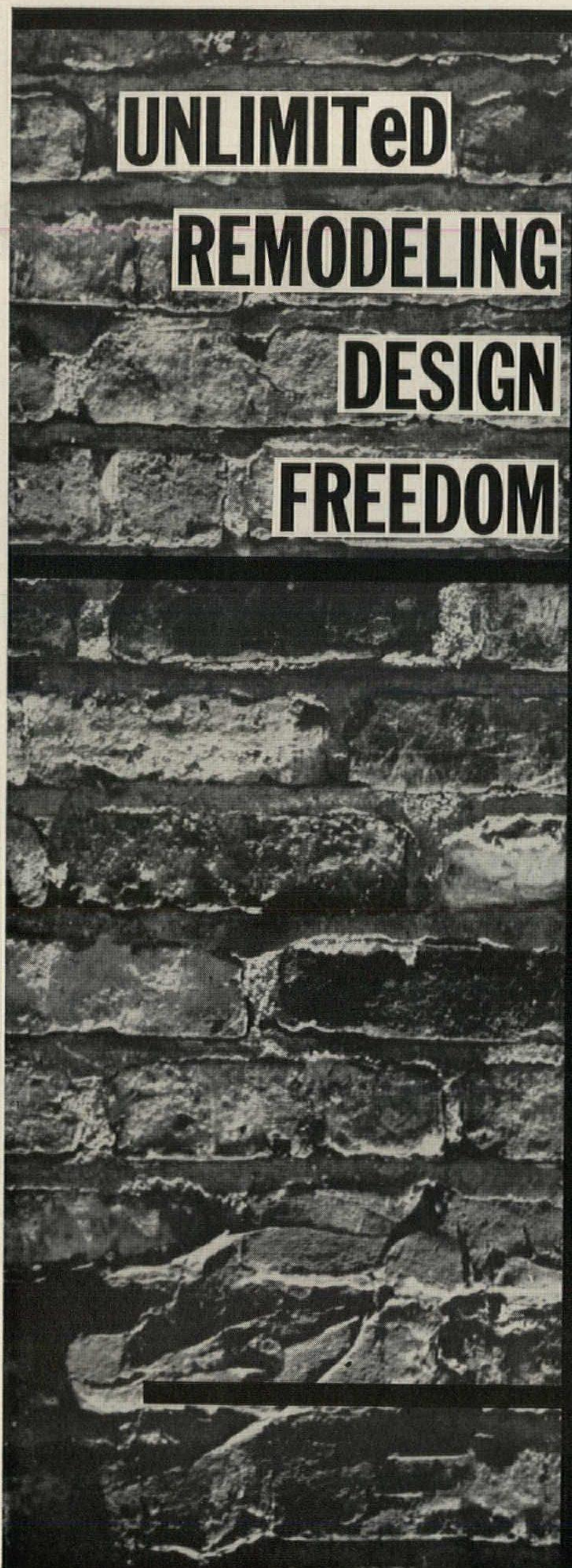

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Washington Topics

continued from page 72

Congress Allows $920.4 Million For 1961 Military Construction

Most of the appropriations for construction programs were cleared by Congress before it recessed for the conventions. Actions on funds for the Hill-Burton hospital construction program and for general civil works construction were the two notable exceptions. Further work on and clearance of these appropriations were held over till August.

A resolution pushed through before the recess allowed all agencies not covered by final appropriations action to operate on last year's basis until their specific money for fiscal 1961 could be cleared.

The compromise on the military construction measure already was reached before the lawmakers left Washington in July. The House had voted $867.1 million and the Senate increased this to just over $1 billion. The conference committee agreed on $920.4 million, divided among the services as follows: Army, $148.4 million; Navy, $162.5 million, and Air Force, $609.5 million. This compared with an appropriation for fiscal 1960 of $1.3 billion.

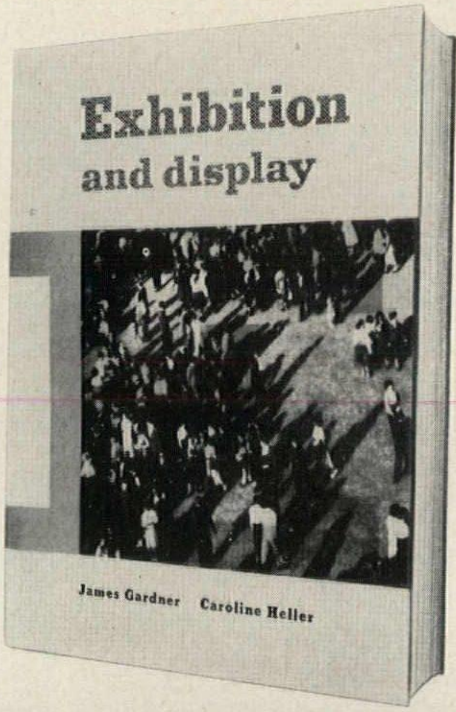
Final action also was taken before the recess on money for the public buildings program of the General Services Administration. The House first voted $144.8 million for building 20 projects. The Senate raised the amount to $171.9 million, urging that some of the increase go for fallout shelters in the new buildings. As the measure went to the White House, it contained $165.4 million.

Also in the Independent Offices appropriation measure was $20 million for elderly housing, $80 million for Federal-aid airport construction, $150 million for slum clearance and urban renewal, $6 million for a reserve of planned public works projects, and $75 million for construction and improvement of Veterans Administration hospitals.

Four Changes Mark Extension Of GI Home Loan Act

The GI home loan program of the Veterans Administration was ex-

continued on page 348



The new help in planning displays and exhibits

EXHIBITION AND DISPLAY

by James Gardner and Caroline Heller

190 pages, 8⅞ x 11½
over 350 photographs and line drawings

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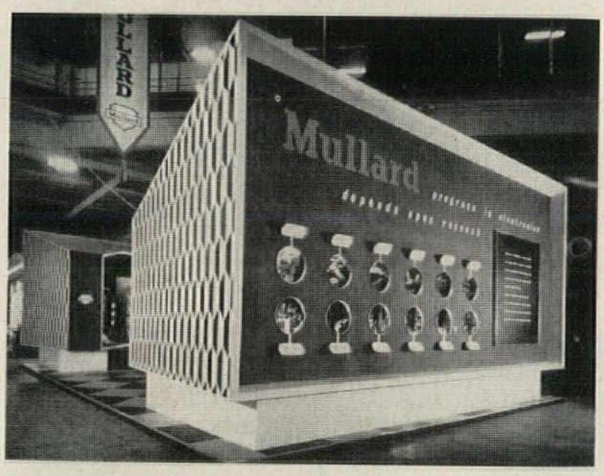
NOW you can profit from an authoritative, eminently practical guide in which every aspect of contemporary exhibition and display receives detailed analysis and evaluation. Its view ranges from individual store windows and sales floors, through industrial and government exhibits, to mammoth projects of international scale such as world trade fairs and expositions.

EXHIBITION AND DISPLAY studies the problems of designing exhibits to explain, create atmosphere, and sell — the three activities which, alone or in combination with each other, are the objects of any exhibit. It also examines the methods and underlying principles used to achieve these objects. Its thorough criticism of scores of displays apply the principles outlined in a practical way. For the specialist, there is a technical appendix on procedure.

The book's analysis is made more vivid by a lively collection of over 350 photographs and line drawings showing exhibitions good and bad, past and present, from nearly every continent.



Divided into three sections, EXHIBITION AND DISPLAY examines:

1. Principles—What exhibition can and cannot do, Displaying goods, Selling ideas, Circulation and stand layout, Catching the eye, Lighting, Words and Lettering, Special effects, Plants, Features; **2.** Practice—Goods and services, Ideas and information, Things for their own sake, Exhibition in the street, Analysis of the 1958 Brussels Fair; **3.** Procedure—(a technical appendix).

ABOUT THE AUTHORS

James Gardner is a leading designer noted for such projects as the British Pavilion at the 1958 Brussels Exhibition.

Caroline Heller has worked as writer and lecturer for the United Nations, the British Government, and a number of private corporations.

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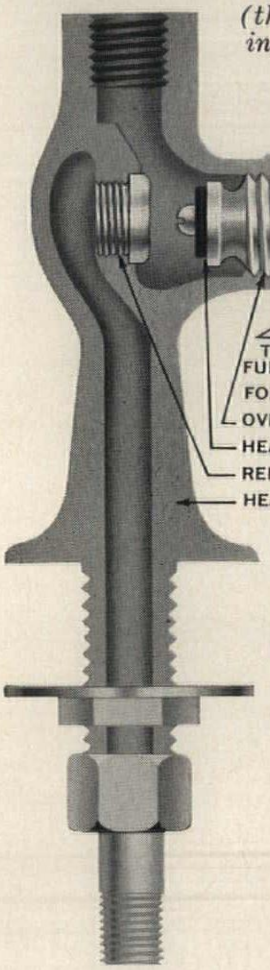

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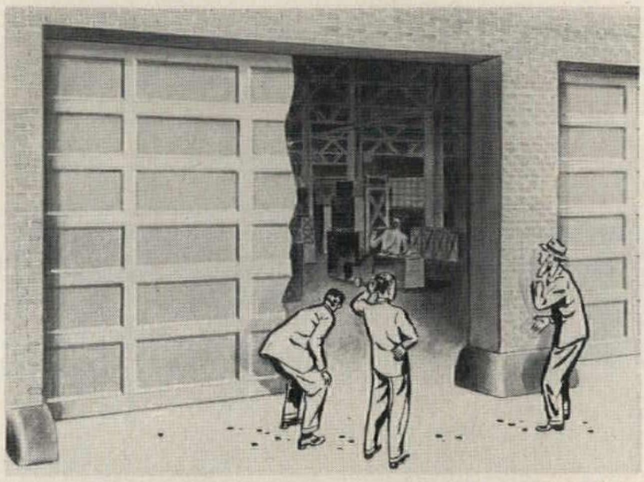

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"G-E Remote-Control Wiring saved us $20,561 in this N. Y. Telephone building - on installation alone!"

... Mr. H. J. Donnelly, Supervising Electrical Engineer New York Telephone Company, Albany, N.Y.

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"On top of the initial savings, we reduced our operating costs, because G-E master switching makes it easy for maintenance crews to turn ON only those lights needed, rather than lighting up whole floors. Switches at convenient locations save our men extra steps, too.

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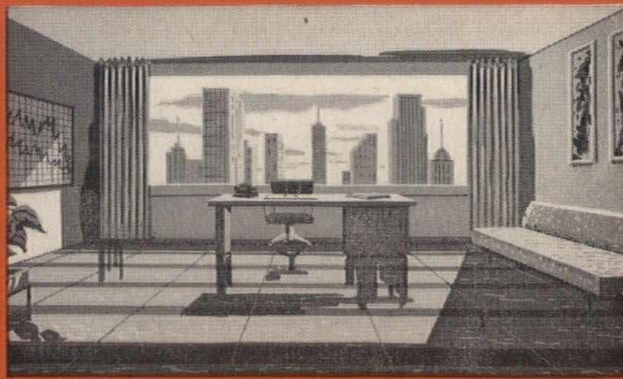

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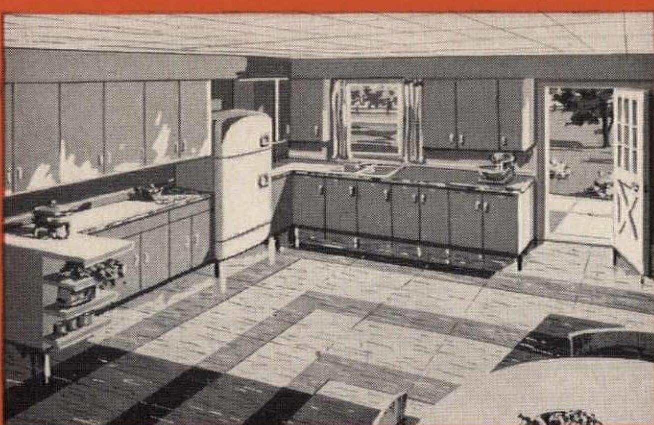

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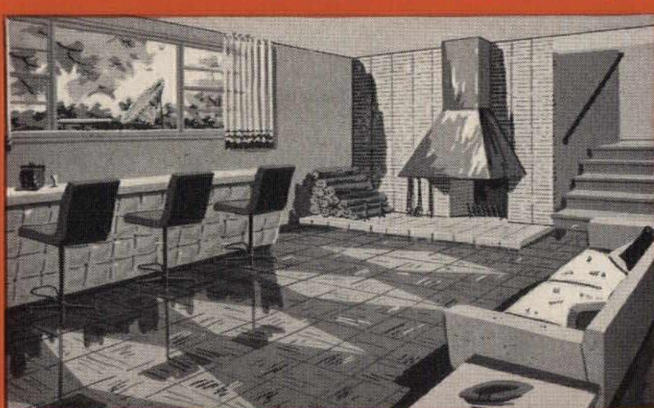

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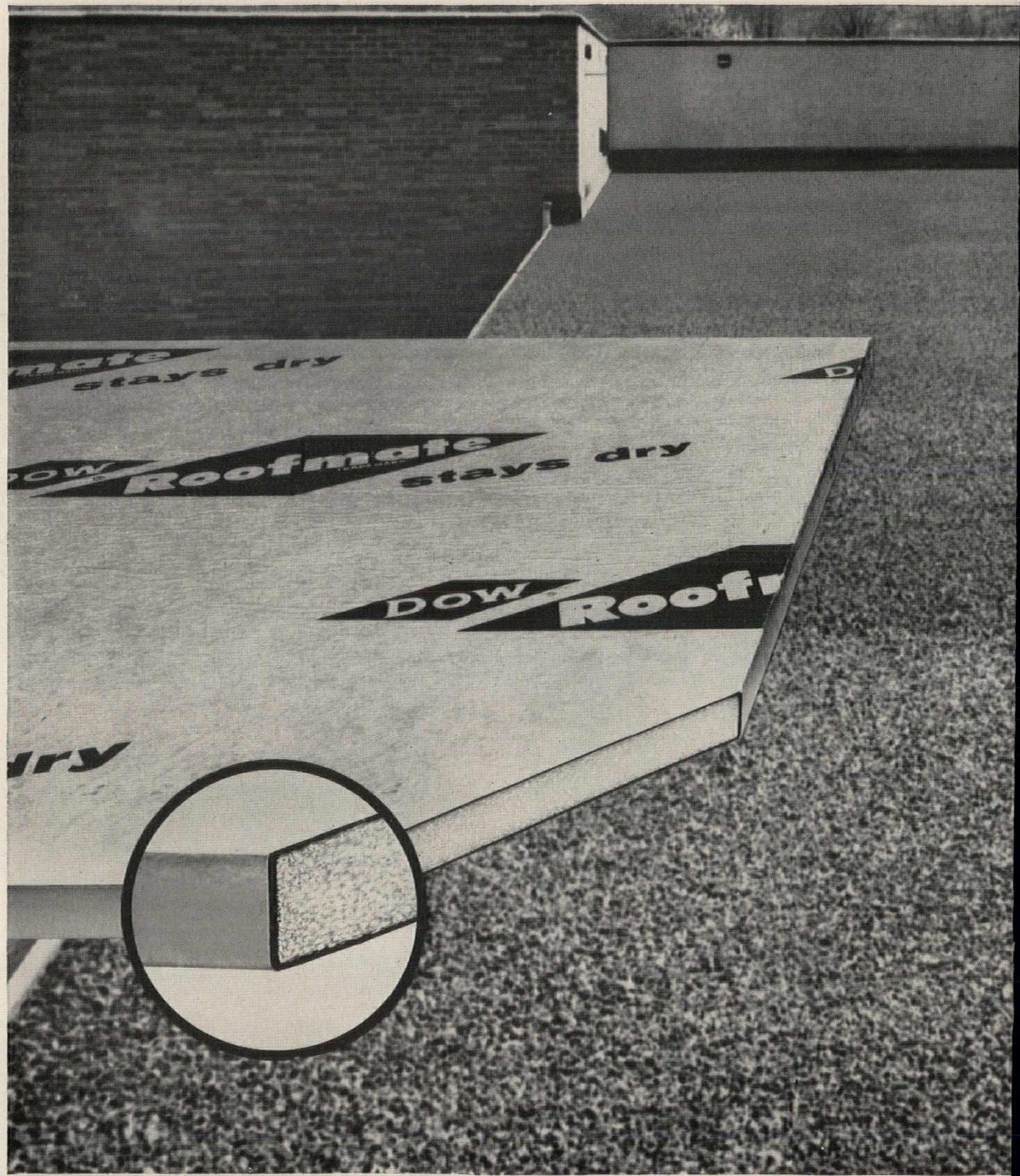

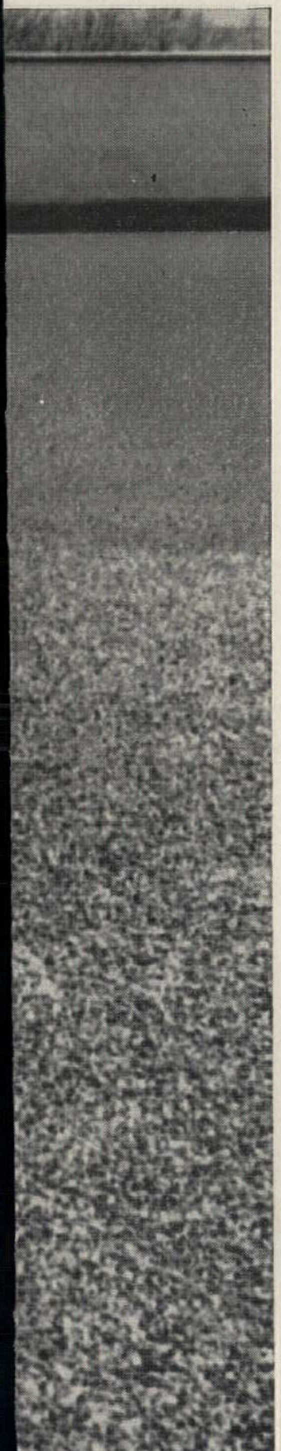

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That's why the insulating efficiency stays high permanently; why Roofmate keeps heat, water, moisture out, regardless of weather conditions.

Roofmate doesn't soak up water.* The millions of tiny non-interconnecting air cells in Roofmate provide high water resistance. This insulation can even act as its own moisture vapor barrier, eliminating the need for a separate vapor barrier. Water and moisture vapor won't pass through or build up inside Roofmate.

Roofmate has a rigid core of expanded polystyrene foam (Styrofoam®), enclosed in asphalt-laminated Kraft paper. The closed-cell structure of the foam core bars water and moisture vapor entry so effectively that foam of this type is used as unsinkable flotation material for floating docks! This same water resistance makes Roofmate a permanently effective insulating material.

Low "C" factor gives Roofmate maximum insulating efficiency with minimum thickness. This lightweight material is strong and rigid, too, spanning fluted steel decks without danger of cracking. In addition, the high moisture vapor resistance of Roofmate reduces the possibility of blistering.

Roofmate can be bonded to any conventional deck—poured concrete, pre-cast panels, poured gypsum, wood, steel—and the built-up roof can be applied directly over it using any of the conventional hot-applied systems.

The advantages offered by Roofmate add up to quick, easy installation for the contractor, long, trouble-free service life for the owner, and dependable, economical performance which the architect can plan on with confidence. For more information about Roofmate, contact the nearest Dow sales office, or write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Dept. 1702N9.

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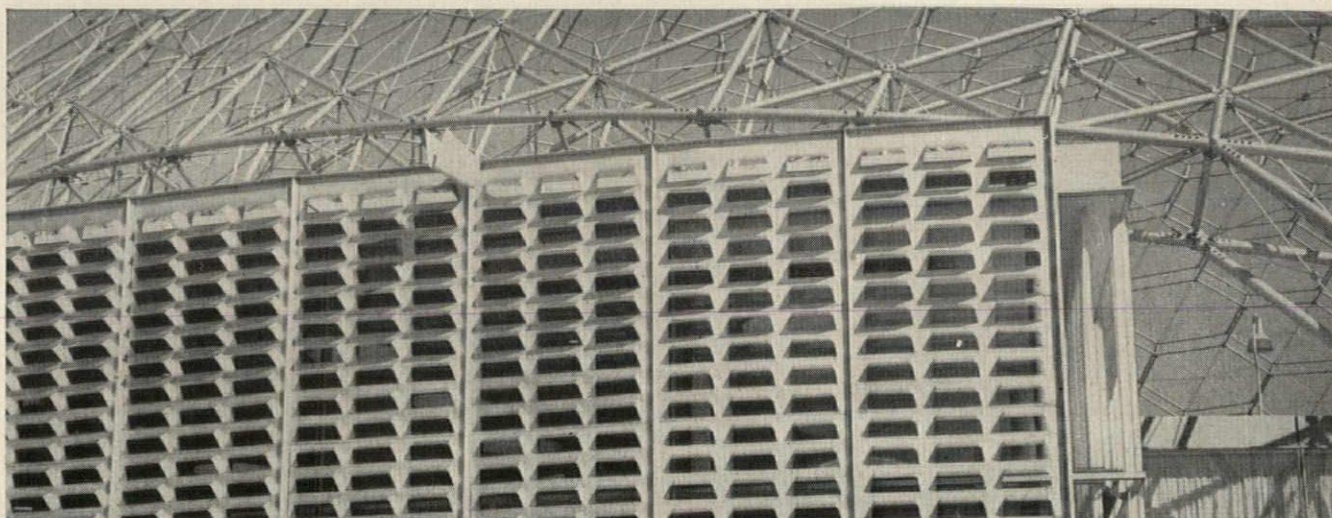


New American Society for Metals Building at Novelty, Ohio. Architect: John Terence Kelly, Cleveland, Ohio. Engineers and Builders: Gillmore-Olson Co., Cleveland, Ohio. Metals Contractor: Limbach Co., Pittsburgh, Pa.

New sunshade of Nickel Stainless Steel . . . radically beautiful, highly functional

Here's a new idea for combining enduring architectural beauty with practical savings in cooling costs.

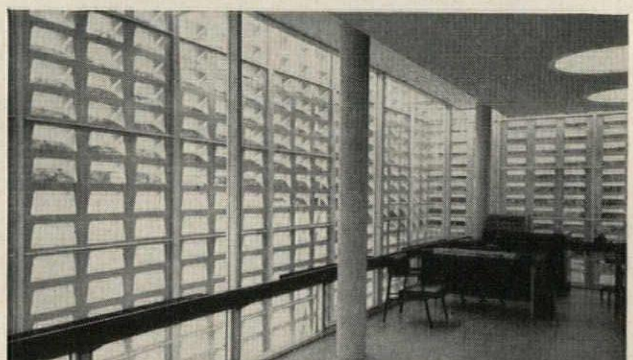
Every daylight hour, 4,000 of these electrically welded Nickel Stainless Steel louvers provide effective control of the sun's heat, shielding it out in summer and screening its glare in winter.

All parts of this sunshade on Ohio's new ASM Headquarters Building are press-formed from Nickel Stainless.

Interested in this dramatic new idea? Then consider the advantages of the screen's Nickel Stainless Steel construction. Its high strength-to-weight ratio gives you wide design flexibility...plus the economy of using lighter gauges for weight and cost savings.

And the gleaming beauty of Nickel Stainless is *lasting* beauty. It resists atmospheric corrosion and oxidation. Rainfall alone helps keep it clean.

See how other architects are using Nickel Stainless. Write for "Architectural Uses of the Stainless Steels."



On the inside, looking out. Light is pleasantly softened as it passes through the sunshade. Nickel Stainless louvers are finished in soft gold tone on the inside.

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PARAPLEX P-444

Quickly, easily Steeltex goes down at superbly designed Canevin High School, Pittsburgh, where 60,000 square feet of Steeltex support concrete floor slabs. Architect: Celli-Flynn, McKeesport, Pa. Contractor: Navarro Corp., Pittsburgh. Steeltex from Pittsburgh Steel Co. was specially commended for its installation features on this project.

Architect, Contractor Find . . .

Steeltex Saves 35 Cents per Square Foot

"I estimate we saved about 35 cents per square foot by using Steeltex instead of another material on the Baptist Hospital addition in Pensacola. Steeltex' quick installation also helped us meet our construction timetable easily."

Man speaking: President Raymond C. Dyson of Dyson and Company, Pensacola, Fla., general contractors.

Job: $1¾-million addition to Baptist Hospital. Here, Pittsburgh Steel Company supplied 70,000 square feet of Steeltex, the waterproofed, paper-backed wire mesh reinforcing used in the concrete floors and roof slabs.

Like Mr. Dyson, Architect Charles H. McCauley has used Steeltex for more than 20 years. He, too, knows Steeltex helps provide better construction at lower costs.

"I specified 100,000 square feet of Steeltex when the main hospital building was erected eight years ago," said Mr. McCauley. "Naturally, I specified it again when the addition was built. I think this shows I am enthusiastic about the qualities of Steeltex."

• Cost 30-40 Percent Less—Similar comments came from Cleveland where Architect Eugene W. Gray and Contractor William Passalacqua were responsible for constructing the new $600,000 Child Welfare Division Building.

Mr. Gray and O. E. Kronenwetter, chief engineer for Passalacqua Builders, estimated that 30,000 square feet of Steeltex in floor slabs cost 30 to 40 percent less than methods generally specified.

• On Pittsburgh Job—When Steeltex was combined with Pittsburgh Steel's wire mesh to support 60,000 square feet of concrete floor slabs at Canevin High School in Pittsburgh, Steeltex was specially commended for its installation features.

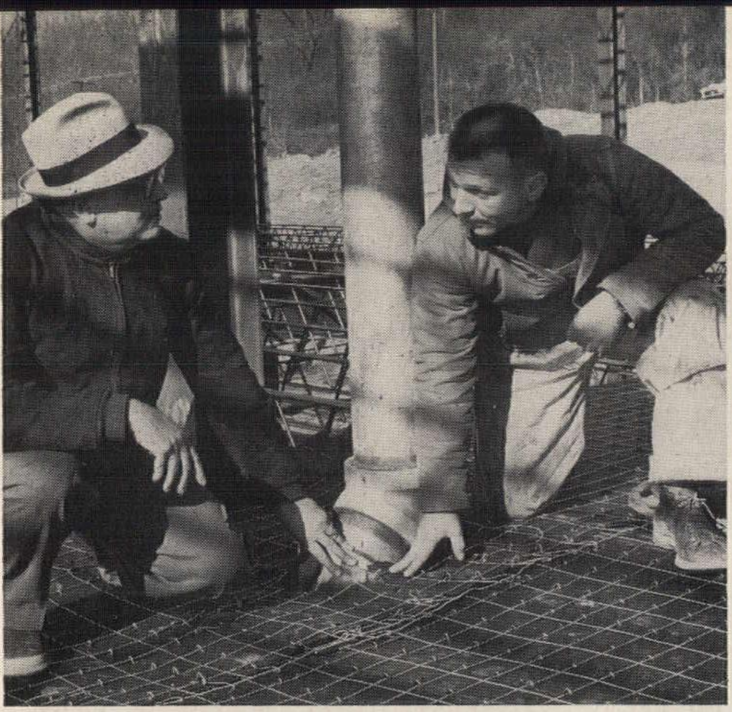
Joseph V. Cutuly, job superintendent for the general contractor, Navarro Corporation of Pittsburgh, likes Steeltex because "it takes more punishment during installation than a sheet metal, goes down faster and is much easier to handle."

Dean Regan, foreman of the crew that installed Steeltex in the $2½-million building, has used Steeltex on more than 55 jobs in ten years.

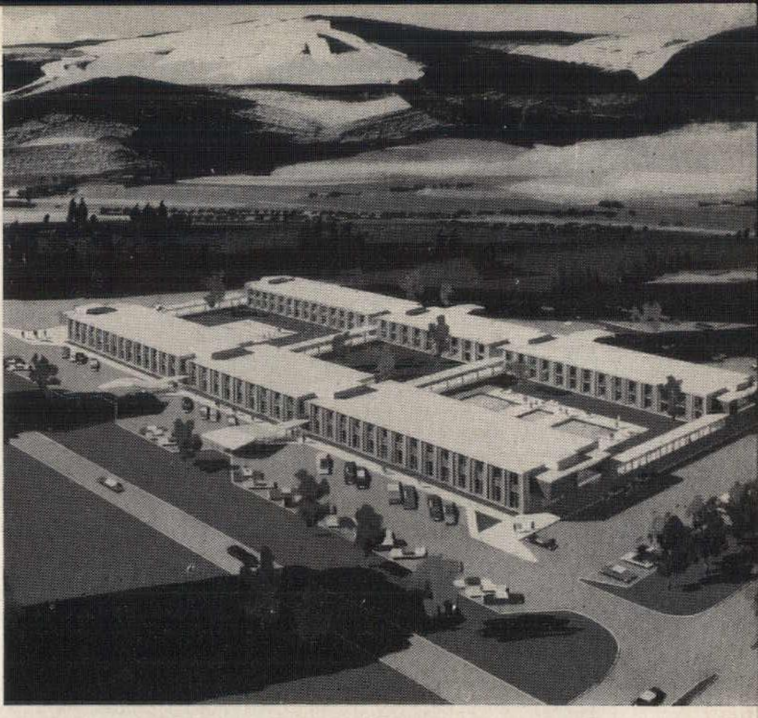
"Steeltex is very easy to install. Just unroll it, cut, tighten and clip," he said.

• Makes Stronger Slab—William B. Tabler of New York City, architect for the $2½-million Hilton Inn at the San Francisco Airport where 65,000 square feet of Steeltex supports the floors, pointed out additional Steeltex features. Said Mr. Tabler:

"Steeltex retains moisture and cement to a greater degree than lath. This makes a cleaner job. Also, the sag from the concrete cradled in the Steeltex gives additional lateral resistance which aids earthquake construction."



Snug fit of Steeltex around drain pipe at Canevin High School is shown by Joseph V. Cutuly, job superintendent (l.), and Foreman Dean Regan. Mr. Cutuly says, "Steeltex takes more punishment during installation than a sheet material, goes down faster and is much easier to handle."



At luxurious Hilton Inn, San Francisco Airport, 65,000 square feet of Steeltex in floor slabs aid earthquake construction. Architect: William B. Tabler, New York City. Contractor: Cahill Construction Co., San Francisco.

• **New Users Like Steeltex**—Steeltex also is endorsed by new users such as the architectural firm of Charles Bacon Rowley and Associates, Inc., and Ernst Payer, and Contractor Albert M. Higley Company, both of Cleveland. They teamed up on building the $805,000 Western Reserve Historical Society Museum in their city.

Superintendent Albert M. Higley Jr. estimated "perhaps a four percent savings was realized by using 11,500 square feet of Steeltex instead of placing conventional roof structures."

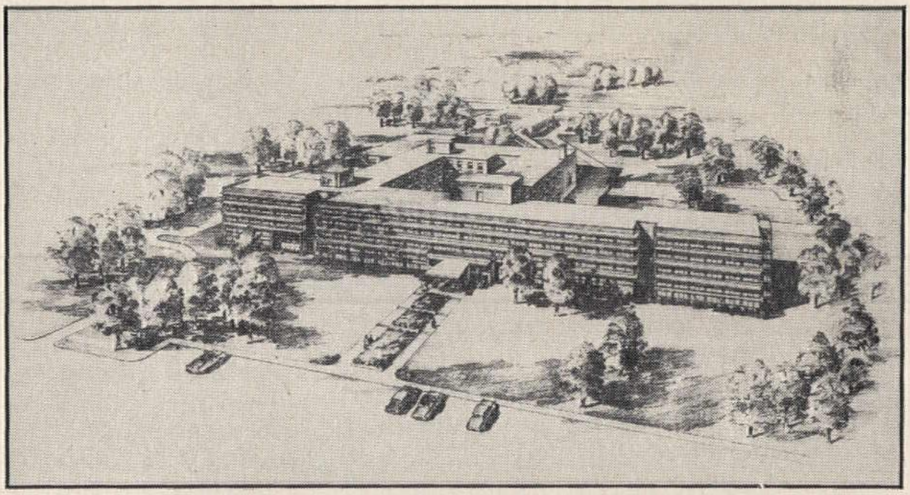
• **Will Use Again**—Another satisfied new user is Irving D. Robinson, architect for the new $325,000 Luria Brothers Building in Cleveland.

Mr. Robinson said: "This is the first time I specified Steeltex and I am sure I will use it many times again. Steeltex permitted work to continue on the floors without planking or scaffolding, although the concrete slab was not poured for many weeks after the 12,000 square feet of Steeltex were installed." Contractor for the job was J. L. Hunting Company, Cleveland.

Whether you are a veteran Steeltex user or a newcomer, you cannot afford to pass up using Steeltex on your next construction job.

Trained sales engineers are available to help solve your construction problems. Put them and Steeltex to work for you soon.

Contact the nearest Pittsburgh Steel Products sales office listed at right. Call today . . . you'll be glad you did.



$24,500 was saved on cost of material and labor by using 70,000 square feet of Steeltex in the Baptist Hospital addition in Pensacola. Architect: Charles H. McCauley, Birmingham. Contractor: Dyson and Company, Pensacola.

▶ **See Sweets Catalog Section 2-B**

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Steel

Washington Topics

continued from page 337

tended by Congress for two more years with four VA-recommended changes designed to make the Act more workable. Private home builders have not been too enthusiastic about their potential performance under the law in the years ahead.

The four changes are these:

1. Lenders participating in the program are enabled to obtain a guarantee on veterans' loans that were closed without first getting the required certifications of intent to occupy, as required by law. Previously, if the veteran occupied the home but the lender failed to obtain the certification of intent to occupy, the loan was not eligible for guarantee.

2. It now is required that the veteran's deposit or down payment on a home be put in a special account where it cannot be attached by the seller's creditors.

3. A special account is established in the U. S. Treasury for the VA, making program administration easier.

4. A technical amendment changes the wording to assist lenders and title companies.

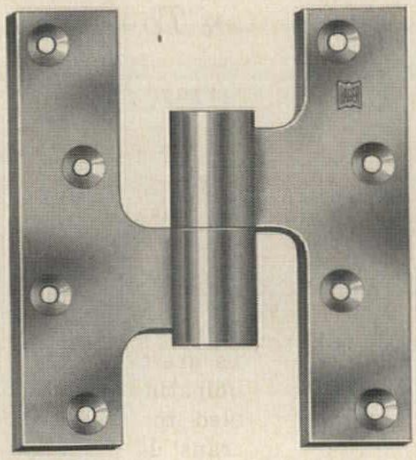
The two-year extension applies both to guaranteed loans and direct home loans for veterans of World War II and the Korean conflict. Both would have expired July 25 without the action. An additional authority of $150 million for the programs was thus assured.

Closer Planning Coordination Asked on Military Housing

The coordination of troop objectives with housing need has been pointed up by a report of the Senate preparedness subcommittee on military housing. The 135-page document calls for a closer coordination by the Department of Defense between military strength and the future needs of military family housing. In this respect, it supports previous reports from both appropriations and armed services committees of Congress.

The Senate subcommittee insists that there is an urgent and continuing need for a closely coordinated

continued on page 357



(Invisible pivot: ½" Stainless Steel pin, oilite bushing; greater ball bearing surface.)

FLAWLESS APPEARANCE
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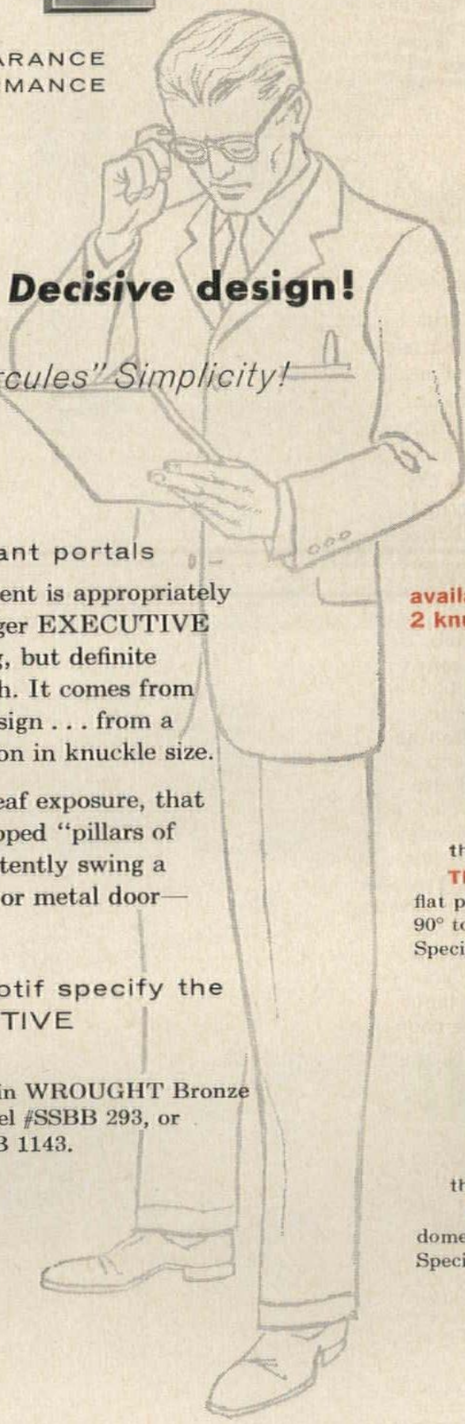

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...the pivot hinge with the *Decisive* design!

Impressive "pillars of Hercules" Simplicity!

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The architectural accent is appropriately modern; the new Hager EXECUTIVE Hinge gives a fleeting, but definite impression of strength. It comes from clean, uncluttered design . . . from a massive new dimension in knuckle size.

You sense, without leaf exposure, that these unetched, untipped "pillars of strength" will competently swing a massive heavy wood or metal door—forever!

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flat planed ends at 90° to perpendicular. Specify Detail A.

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DOMED
dome-shaped ends. Specify Detail B.

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EVERYTHING HINGES ON Hager!

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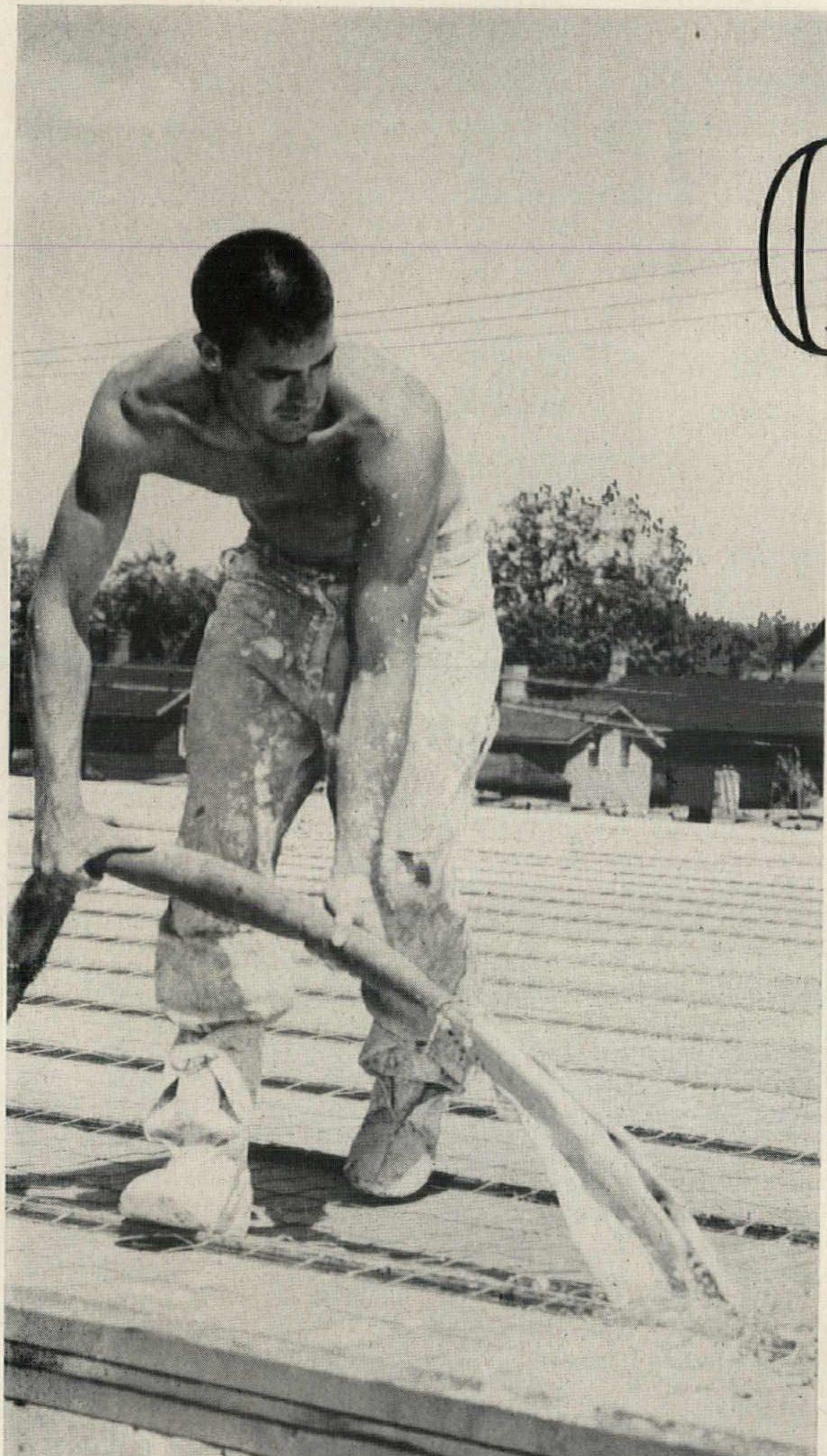
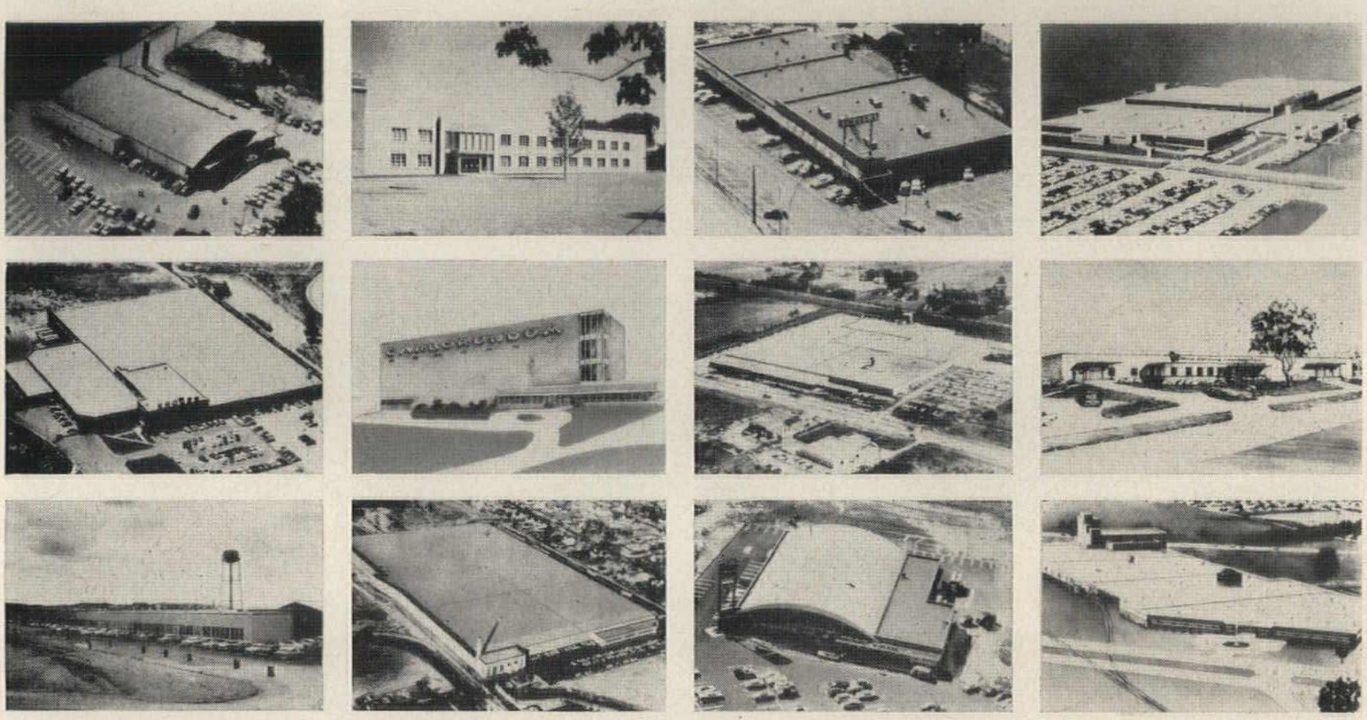


One deck for a dozen different jobs



All built with Gold Bond "Firefighter" Poured Gypsum Roof Deck

Supermarkets, schools, stores, fabricating plants, bowling alleys, roller rinks, hospitals . . . there is no limit to the use of this construction.

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1. Fire protection: Poured gypsum roof decks receive fire ratings of up to two hours. Gypsum's natural water supply is chemically locked into the deck itself — no fire can penetrate the slab until this water of crystallization has been driven off.

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3. Fast construction: An experienced crew can pour up to 20,000 feet a day. Gypsum sets in less than an hour—built up roofing application can start almost immediately.

4. All-weather construction: Gypsum can be poured in temperatures as low as 15°F. Heat generated from setting action protects the deck from freezing.

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In the new multi-million dollar Cobo Hall and Convention Arena in Detroit's civic center, galvanized *steel pipe* is used for water, drainage and vent systems. The reasons why?

1: Longer lengths of *steel pipe* meant fewer joints with commensurate installation economies. 2: Water, drainage and vent lines of *steel pipe* required less support. 3: Threaded joints on *steel pipe* made plumbing and aligning easier and quicker. 4: Low cost, durable *steel pipe*, with its built-in strength, will efficiently serve the millions of people who will use these quarters for conventions, exhibits and spectator sports for generations to come.

Steel pipe remains the first choice in outstanding buildings throughout the country. It is dependable, reliable and low in cost for gas, air and water transmission, fire sprinkler systems, electrical conduit, structural uses, radiant heating, snow melting, refrigeration and cooling . . . and it has always been easily and readily available anywhere in the country.

90% of domestic water, drainage and vent lines require horizontal suspension. Because steel pipe is easy to install and needs less support, significant economies are effected in installation.

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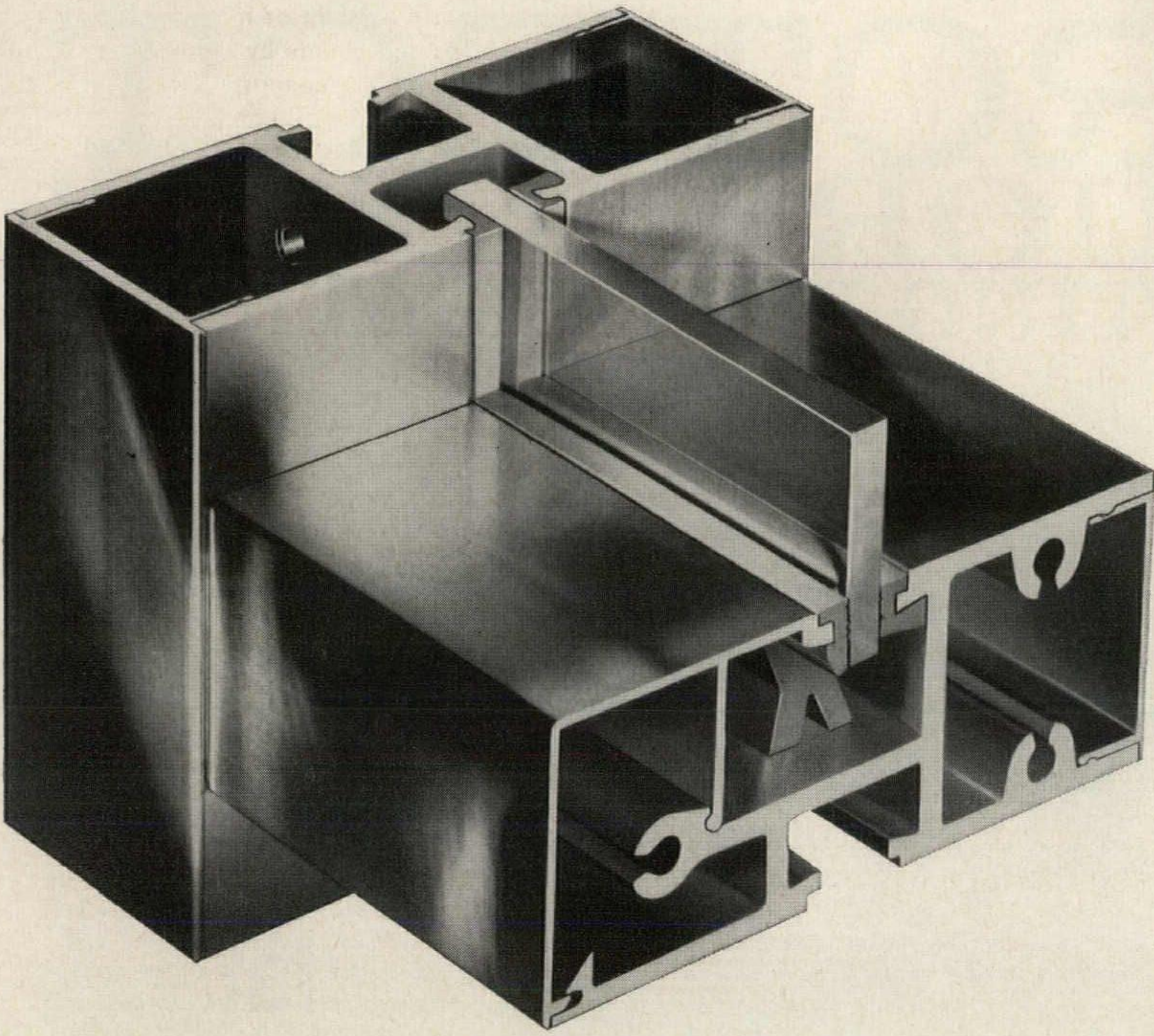

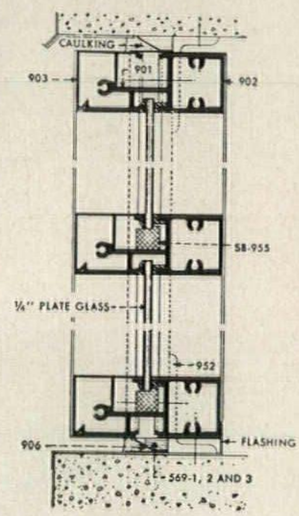

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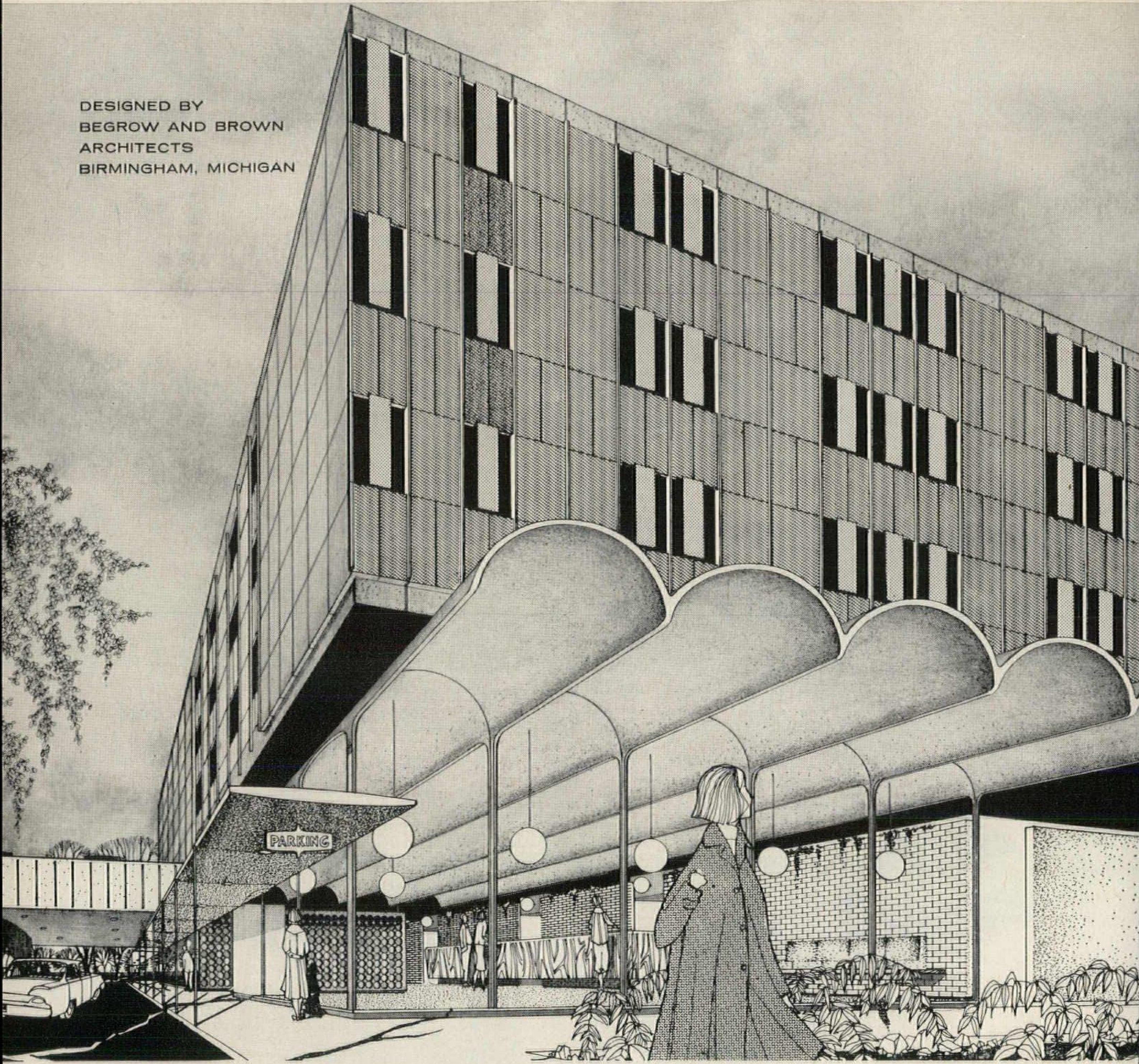

Newest expression in the fine art of creative construction / *Designed to use Haskelite Building Panels*

An outstanding architectural concept in fully exploiting the advantages of modern construction materials is shown above. This three-story office building, designed by the architectural firm of Begrow and Brown, would consist of a reinforced concrete structure with exterior panels and sash combined to form the curtain wall. Natural light is provided through transparent, tinted glass set into the panels.

Haskelite Curtain Wall Panels were incorporated in this design because they provide an exterior surface that is permanently insulated, moistureproof and corrosion-free . . . there is also the extra beauty appeal of facing color and texture. Haskelite panels are versatile, lightweight and exceptionally easy to handle on the job. A wide selection of panel facings (porcelain enamel, fiberglass, aluminum, stainless steel, cement asbestos and others by request), and insulating and non-insulating core materials are available.

Since Haskelite Curtain Wall Panels require minimum upkeep, a substantial saving is made in over-all building maintenance. Detailed information will be sent you promptly if you simply address your request to:

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Washington Topics

continued from page 348

family housing program geared to coincide with the long-range troop objectives of the Department of Defense.

The report represents the first time that military housing laws have been gathered together in a single volume and codified. Much of the document concerns itself with detailing the Capehart housing program, appropriated fund military housing and Wherry Act housing. The numbers of units constructed under each statute and the number under construction are given.

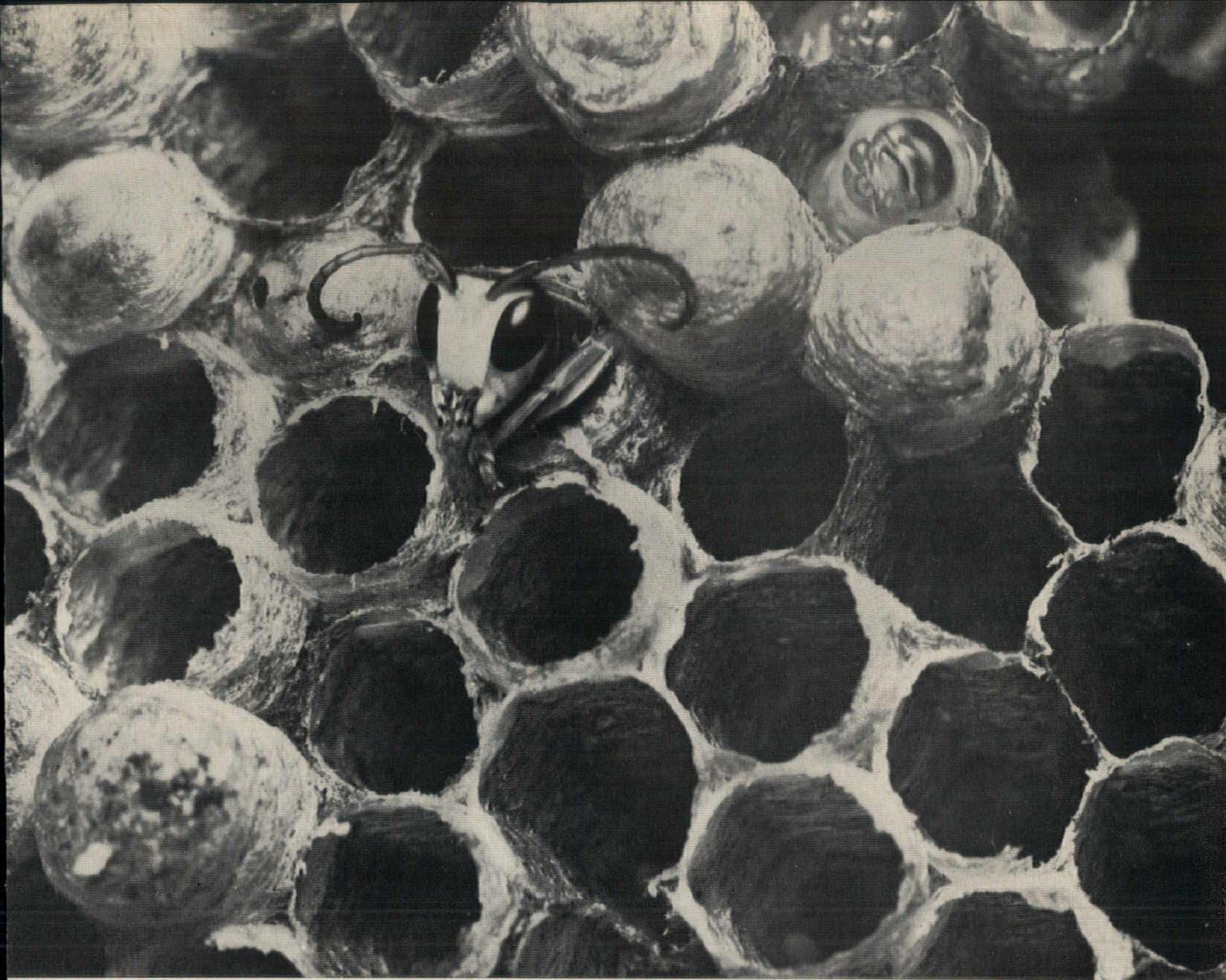
One of the significant conclusions reached is that the programs continue to list larger and larger deficits in housing for the military while projected troop strength plans show a drop in total military population.

Since 1955, troop strength in all three of the services dropped by 400,000—from 2,887,000 to 2,487,000—while at the same time the statements of deficits in housing have gone up from 247,000 units to 310,000.

Subcommittee Chairman Lyndon B. Johnson of Texas (then not yet the Democratic Vice Presidential nominee), said the report constitutes a call for closer coordination of planning rather than a criticism of the need for adequate housing facilities for the military. Only through such coordination can maximum utilization be made of available community housing with the resultant savings of defense dollars which might otherwise go to high priority weapons system programs, he added.

U.S. "Goals" on Housing Starts Opposed by N.A.H.B. Board

The National Association of Home Builders does not favor any move by the Federal government in the direction of establishing annual home start quotas. At its recent Board of Directors meeting in Washington, D. C., the organization officially opposed by resolution Federal legislation that would attempt to establish either as a maximum or a minimum any number of housing starts in any given year.



Meet an expert in light construction A hornet nest is one of the few geometric structures built by nonhumans. Hornets chew wood fibers to a pulp, then build their nest entirely of this home-made paper. Notice the design of these cells; they're hexagonal for space economy. This hornet nest is light, yet strong enough to protect against the elements. ☐ To achieve these same features in light man-made structures, we suggest USS AmBridge Steel Joists—both standard and longspan. They provide strong, lightweight and economical construction suitable for most any type of roof, ceiling or floor. AmBridge Joists have an underslung, open-web design for maximum headroom, and to accommodate pipe, ducts and conduit in all directions. AmBridge Steel Joists are easy to install. And once in place, they make a safe working platform. Want more information? Write to our Pittsburgh Office for your free copy of a 40-page catalog.

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Republic Recessed Steel Lockers fit into the wall, allowing full width corridors for greater student traffic and safety. Recessed flush with the wall eliminates sharp corners and other hazards. Cleaning and maintenance is easier, faster, and economical, too. No dust catching ledges or trim.

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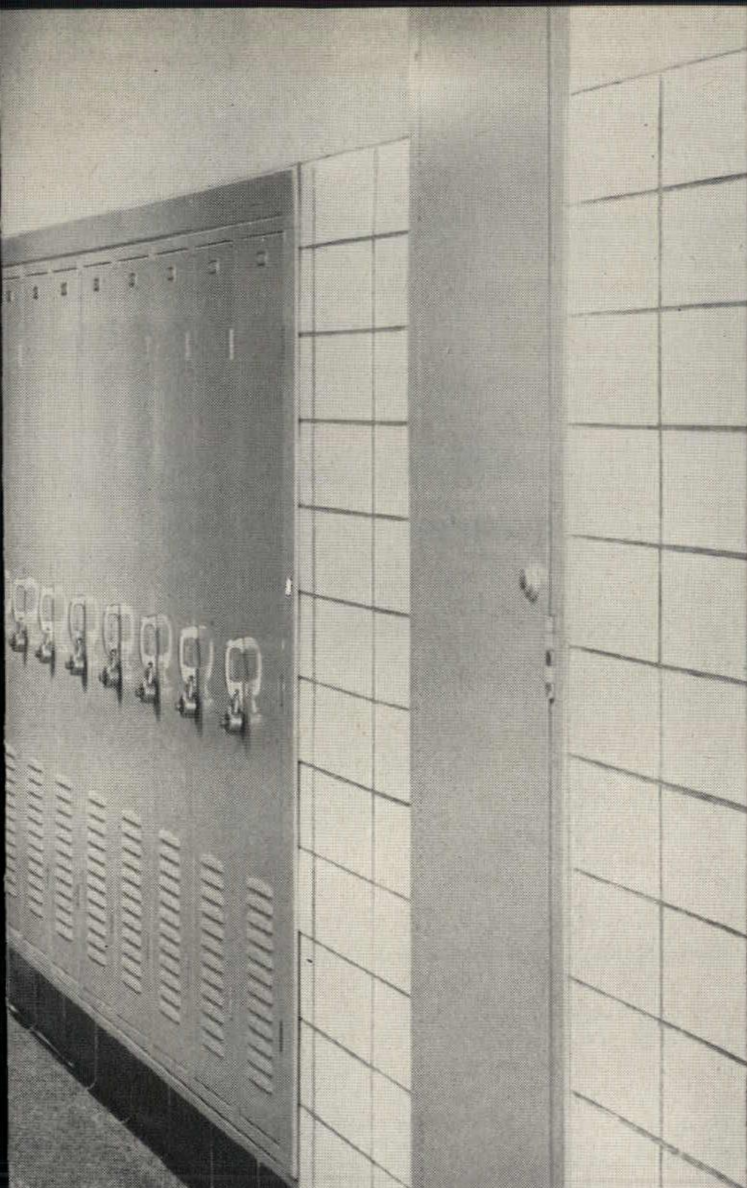
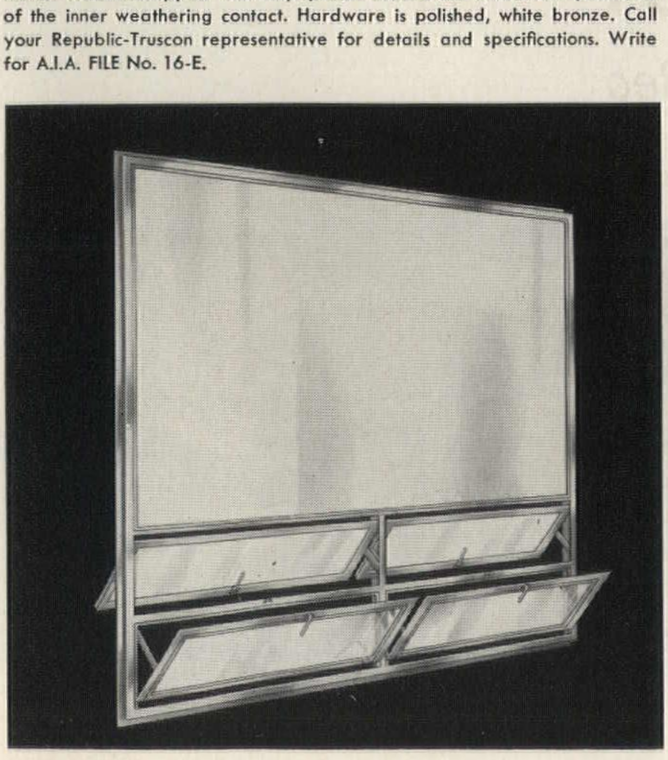
Your Republic representative will help you with your locker planning. He will assume full responsibility for complete installation. Call him today, or write direct.



TRUSCON ALUMINUM CLASSROOM WINDOWS offer the economy of large glass areas combined with a wide selection of projected ventilator arrangements. Weatherstripped with vinyl plastic around the entire vent perimeter of the inner weathering contact. Hardware is polished, white bronze. Call your Republic-Truscon representative for details and specifications. Write for A.I.A. FILE No. 16-E.



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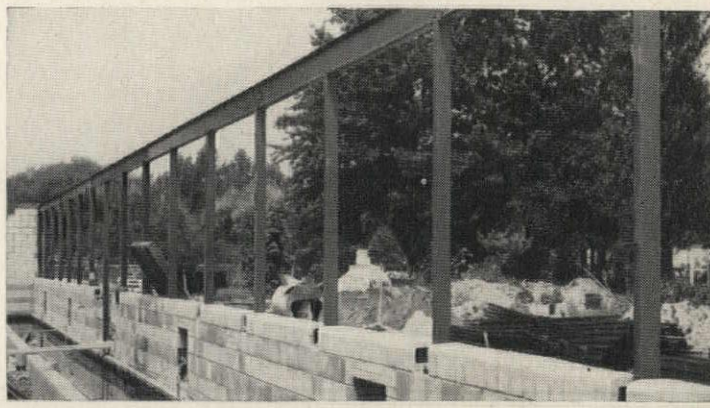

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A Washington Report

continued from page 68

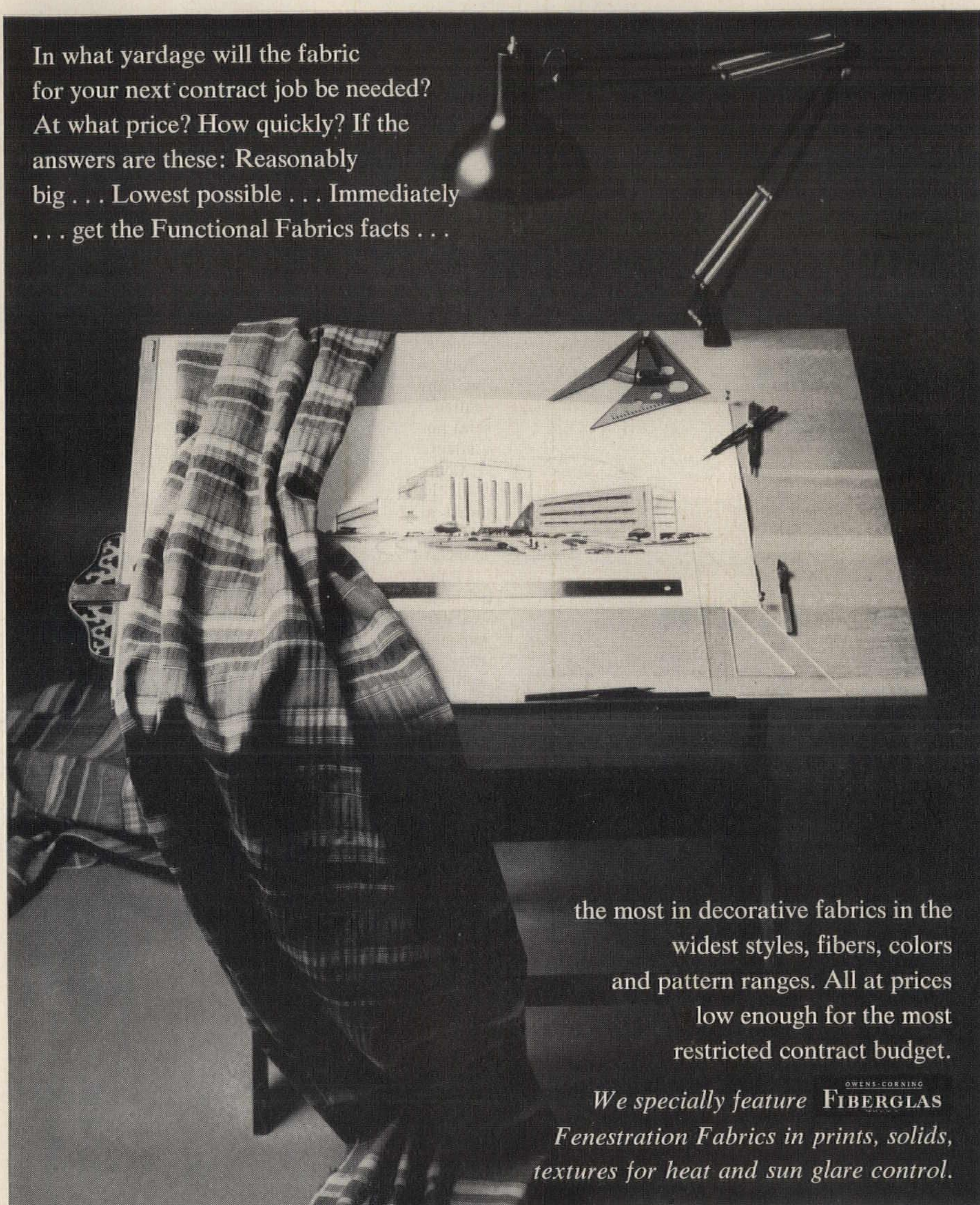
stalled so as to withstand sustained as well as impact pulls; mechanical appliances and contrivances can be selected on the basis of their proved safety; and adequate convenience outlets appropriately located will obviate the use of extension cords and lamp wires that stretch across one's path in the house.

"Special" or Suitable?

The special shelter needs of elderly persons and the effort to provide more suitable living environments for them have resulted in certain labels such as "special housing" and "housing specially adapted for the elderly," it is noted. Commenting on this, the paper states: "For workers in housing and related areas, these phrases have differing and sometimes unfavorable associations, being taken to connote: (1) proposals for providing segregated housing for the elderly similar to earlier European experiments; (2) expensive and unwarranted dissipation of the housing supply; or (3) a splintering of organized effort into yet another category of housing. Some have spoken against 'special housing for the aging,' arguing that good housing for the aged is also good housing for younger people. To some extent this is true; but by and large, existing and projected housing continues to be of the split-level variety with narrow doorways and small bedrooms, with stairs at entrances, and with such meager space for circulation as to preclude continued occupancy by persons—and particularly by infirm persons—of advanced age."

The report sets out many gaps in present housing knowledge—one of them: "We need needs-demands studies not only of present generations, but of future generations of older individuals—individuals who have experienced higher standards of living, and increasing amounts of leisure time, and have been planning ahead for their retirement."

To the extent of a limited supply, copies of the paper will be sent in answer to inquiries directed to Robert W. Kean, chairman, National Advisory Committee, White House Conference on Aging, Department of Health, Education and Welfare, Washington 25, D. C.



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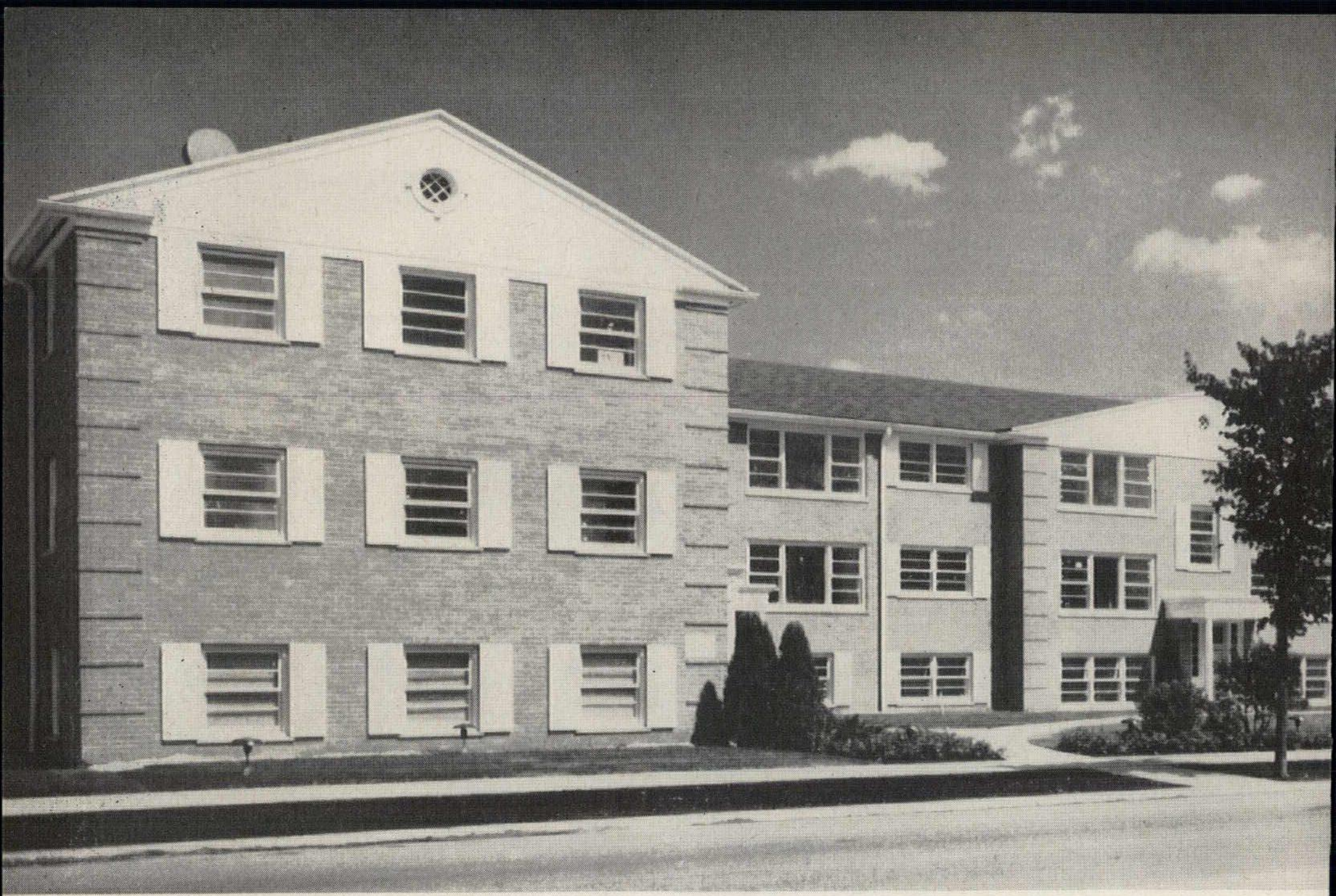
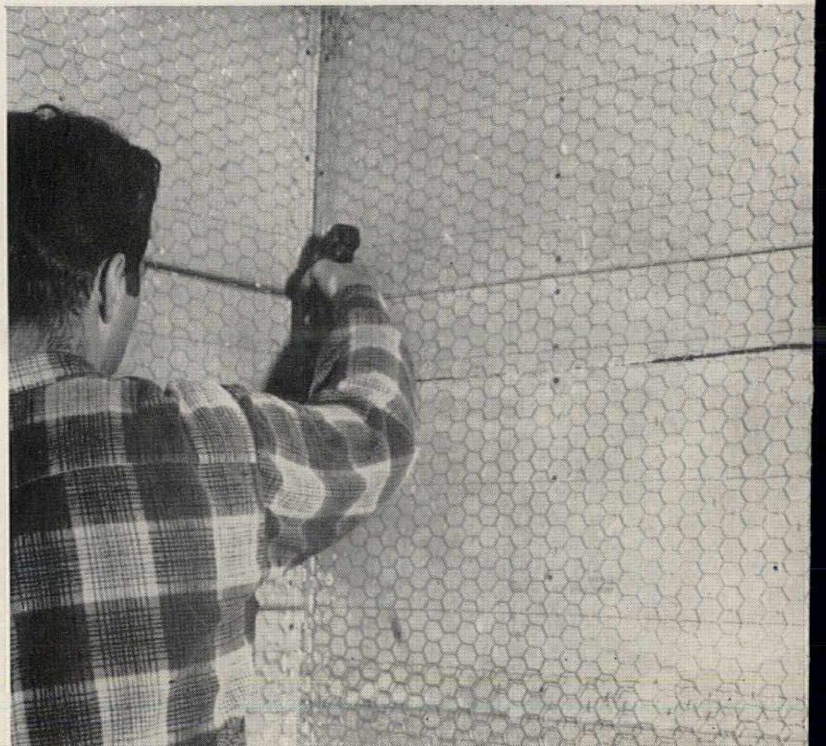


Chicago builders get greater crack resistance at no extra cost with the

KEYMESH® · KEYCORNER ·

Lasting beauty and low maintenance are built into the new Williamsburg Apartments located in Chicago, Illinois. That's because greater plaster-crack resistance is assured by reinforcing the lath and plaster walls.

Valenti Builders, Inc., Chicago, found it cost no more to get this extra reinforcing quality. By specifying Keymesh, Keycorner and Keystrip galvanized reinforcing lath, the builders got top quality reinforcement with greater resistance to cracks and fire.



Tiled bathrooms in the Chicago project have lasting beauty with KEYMESH reinforcement. The portland cement plaster reinforced with Keymesh provides a strong, maintenance-free base for the tile. You'll find Keymesh makes any gypsum lath and plaster wall stronger and more crack resistant.

Keymesh rolls out flat and laps without bulging . . . forms easily and cuts quickly. The open mesh permits rapid troweling and assures a full, even thickness of plaster. Keymesh, Keycorner and Keystrip are galvanized against rust.

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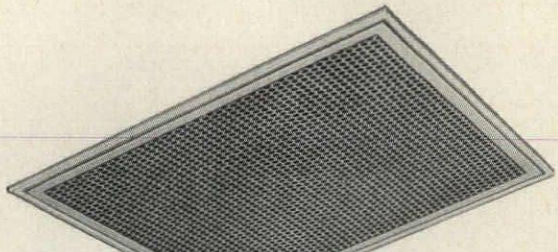

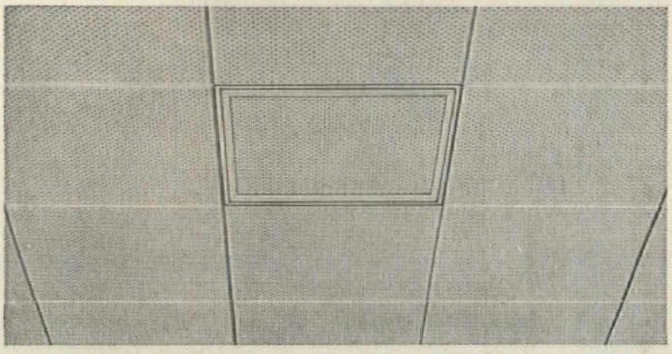

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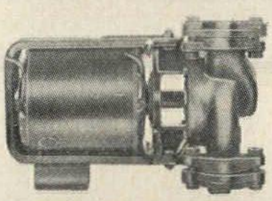

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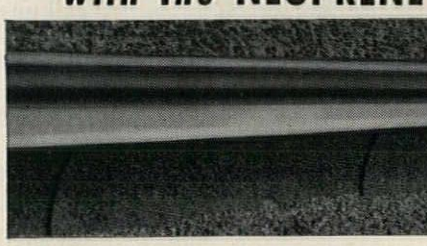
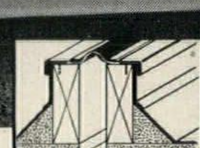
Solve Your EXPANSION JOINT Problems with *Expand-o-flash* with the NEOPRENE BELLOWS

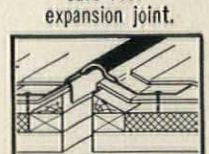


Expand-o-flash is made of weatherproof flexible neoprene, bonded mechanically and adhesively to metal edging and is installed with totally relaxed neoprene bellows to allow both sides of the joint to move freely in any direction. Stresses and metal fatigue are eliminated.

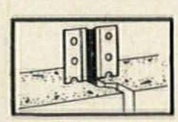
Expand-o-flash provides a continuous watertight seal all around the building both above and below grade.



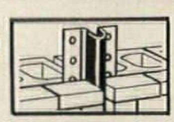
Curb roof expansion joint.



Low profile expansion joint.



Expand-o-flash in vertical walls.



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Required Reading

continued from page 95

Romanesque . . .

this case being more than 200 plates of really excellent photographs excellently reproduced. The text has been translated into English, and the captions are in both English and German, though somewhat more detailed in the latter.

Received and Noted

THE EARLY CHURCHES OF ROME. *By Emile Mâle. Translated by David Buxton. Quadrangle Books, 119 W. Lake St., Chicago 1, Ill. 253 pp., illus. $12.50.*

The English translation of a book by a famous French art historian, this is a work of great charm and seemingly effortless erudition, handsomely printed and amply illustrated. A perfect companion for a trip to Rome.

OLD HOUSES ON NANTUCKET. *By Kenneth Duprey. Architectural Book Publishing Co., 151 E. 50th St., New York 22. 242 pp., illus. $12.50.*

In the course of restoring his own house on Nantucket, the author of this book found no adequate study of the particularities of Nantucket domestic architecture and designed this book to fill the gap. The gap has been filled, at least partly, both lovingly and usefully. Numerous drawings and photographs trace both structure and detailing of the island's architecture, from the small houses of the early settlers through the Greek Revival houses of wealthy whaling Nantucket.

NORMAND'S PARALLEL OF THE ORDERS OF ARCHITECTURE. *Edited by R. A. Cordingley. Quadrangle Books, 119 W. Lake St., Chicago 1, Ill. 88 pp., illus. $5.*

A new edition of this old student's stand-by with its familiar cross-eyed caryatids, this book contains all of Normand's plates plus eight more from Mauch's German editions. There are also seven introductory plates giving a simplified method for setting up and drawing Renaissance orders, colonnades, arcades, and doors.

Discover the more than

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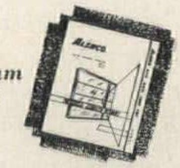

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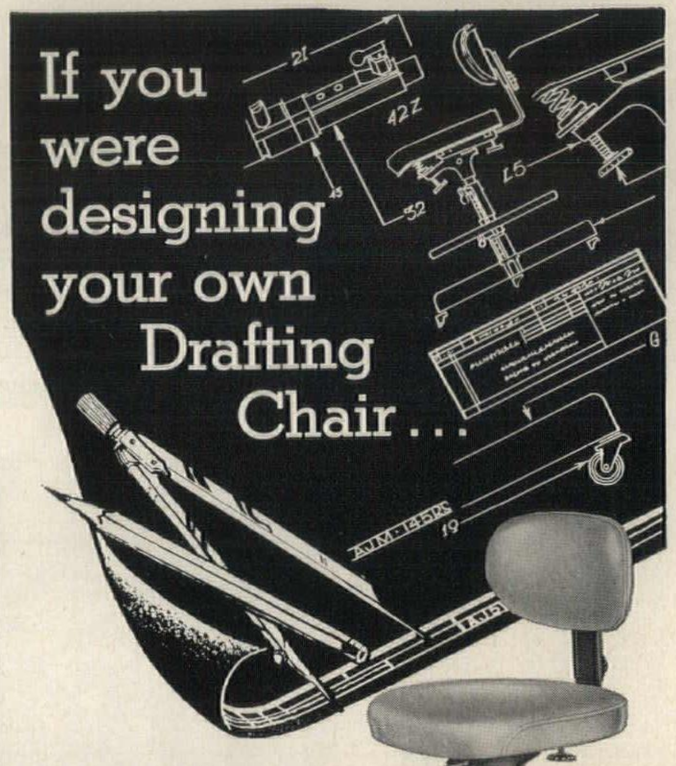

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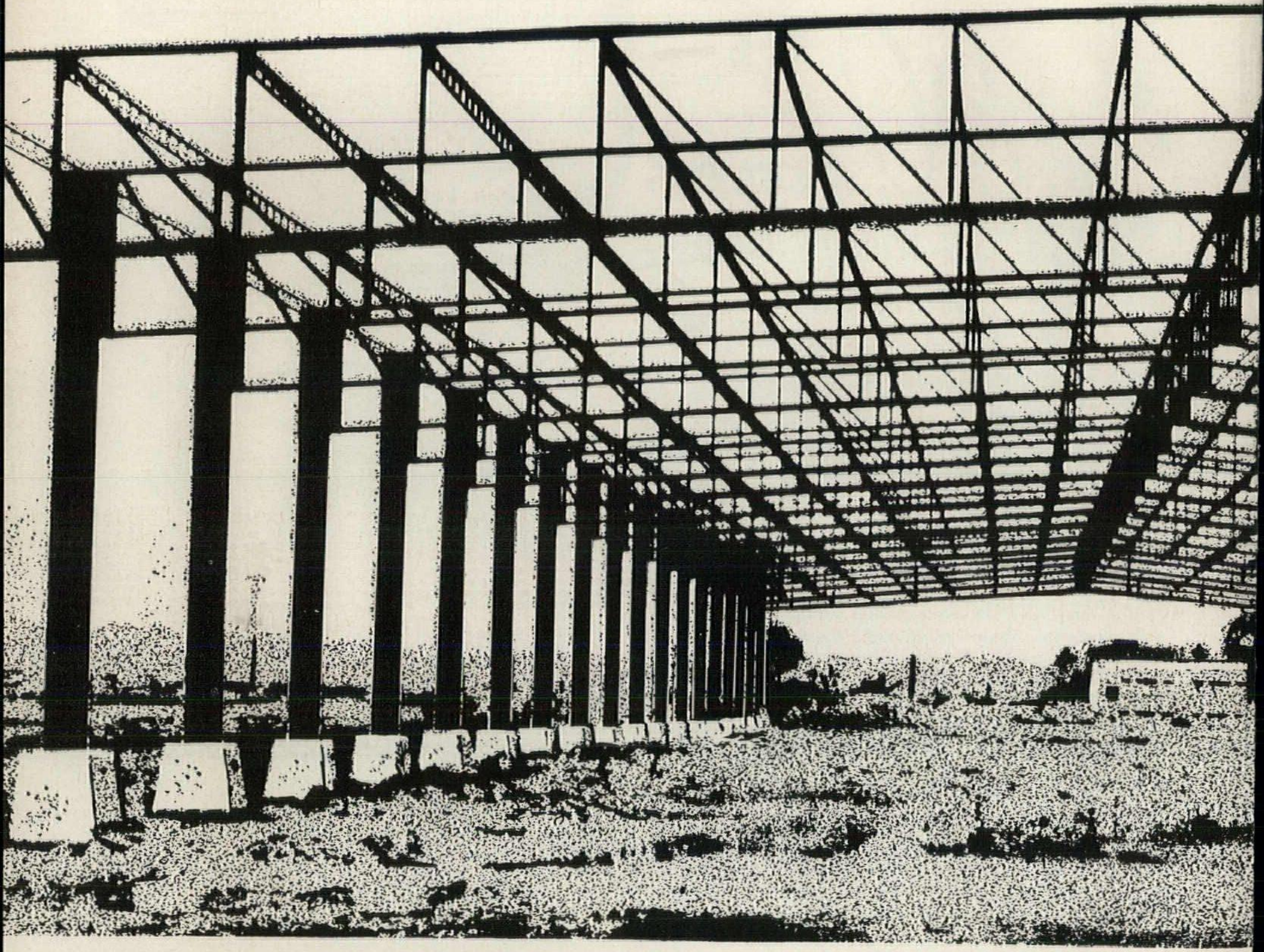
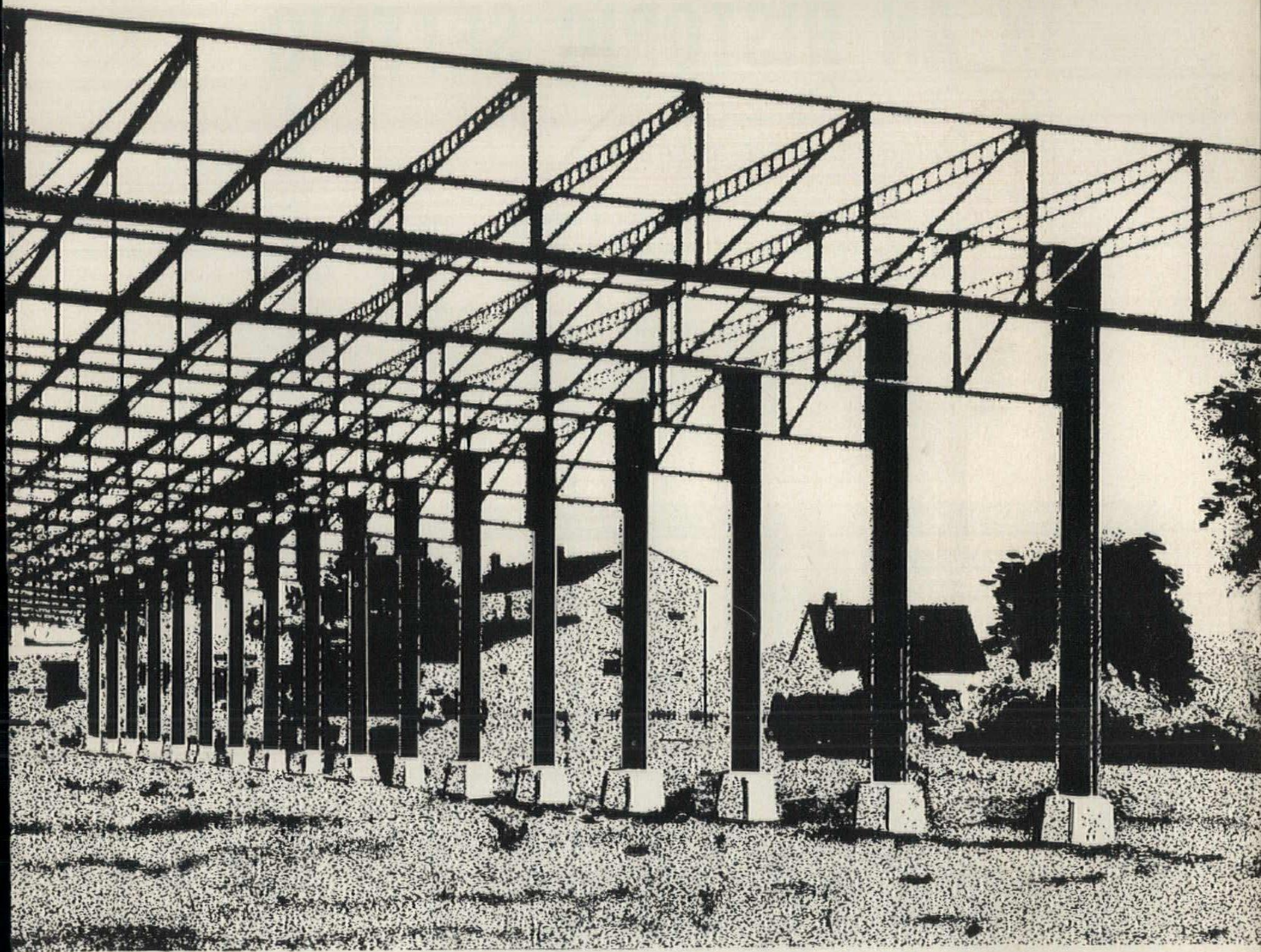


Steel pipe building frames make a strong structure lighter

Swiss Fabricating, Inc., of Pittsburgh, Pa., saves money for customers by using USS National Butt-Welded Steel Pipe for lower-cost, faster-erected building frames. This particular building will house an automobile sales agency consisting of a show room, parts and service departments and a body shop. The building is 350′ long with 80′ clear span steel pipe trusses.

Steel pipe is strong, yet it's light enough to cut the weight of a structural frame by approximately one-third. In a test performed on a 60′ clear span building designed to support 65 pounds per square foot roof load, a load of more than 182 pounds per square foot was safely handled through uniform loading. Deflection at



the peak was less than 3³⁄₁₆".

Because it weighs less, steel pipe reduces shipping costs. It also cuts maintenance costs, because there's less surface area. Less to clean. Less to paint.

USS National Butt-Welded Steel Pipe is ideal for many structural applications in buildings such as: trusses, columns, posts, scaffolds, towers, frames. It is available in sizes ½" thru 4" from your local National Tube Distributor.

For additional information, write National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. Ask for Bulletin #2, entitled "Pipe for Mechanical and Structural Applications."

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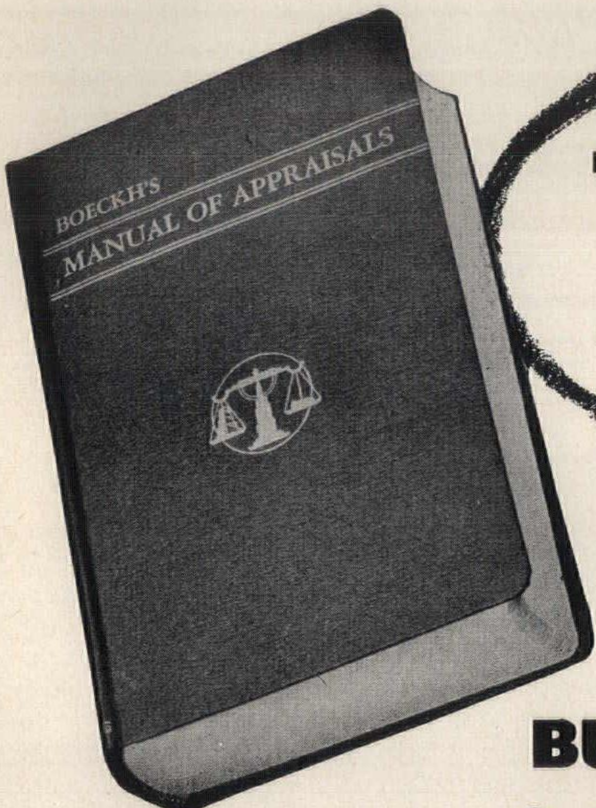

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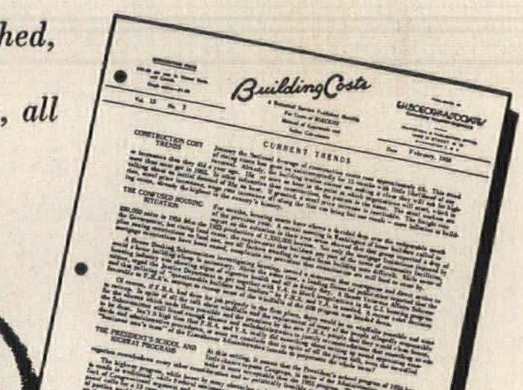

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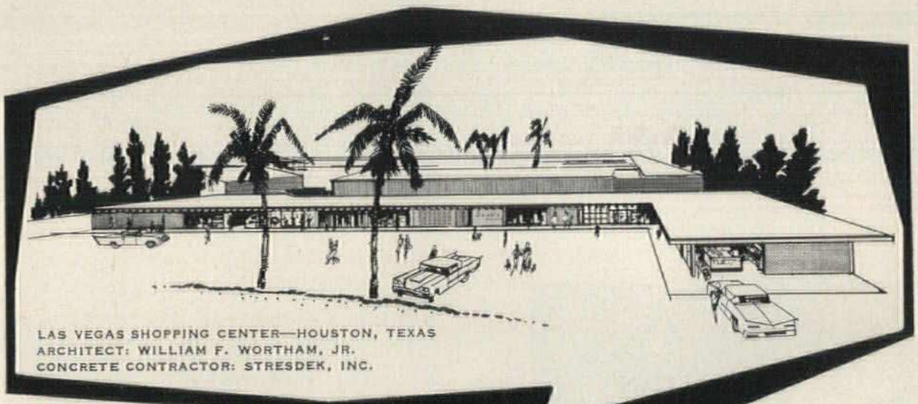

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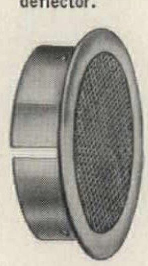

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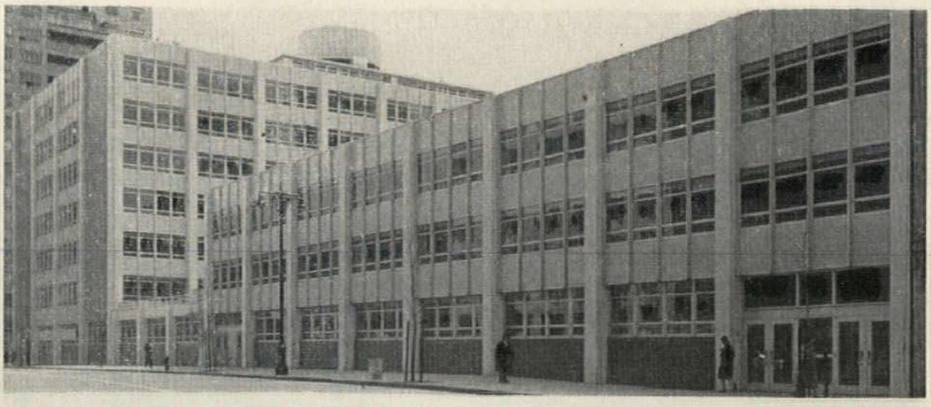
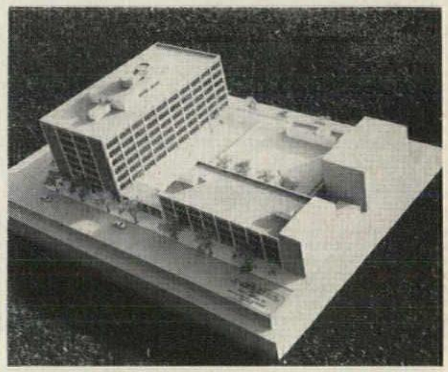
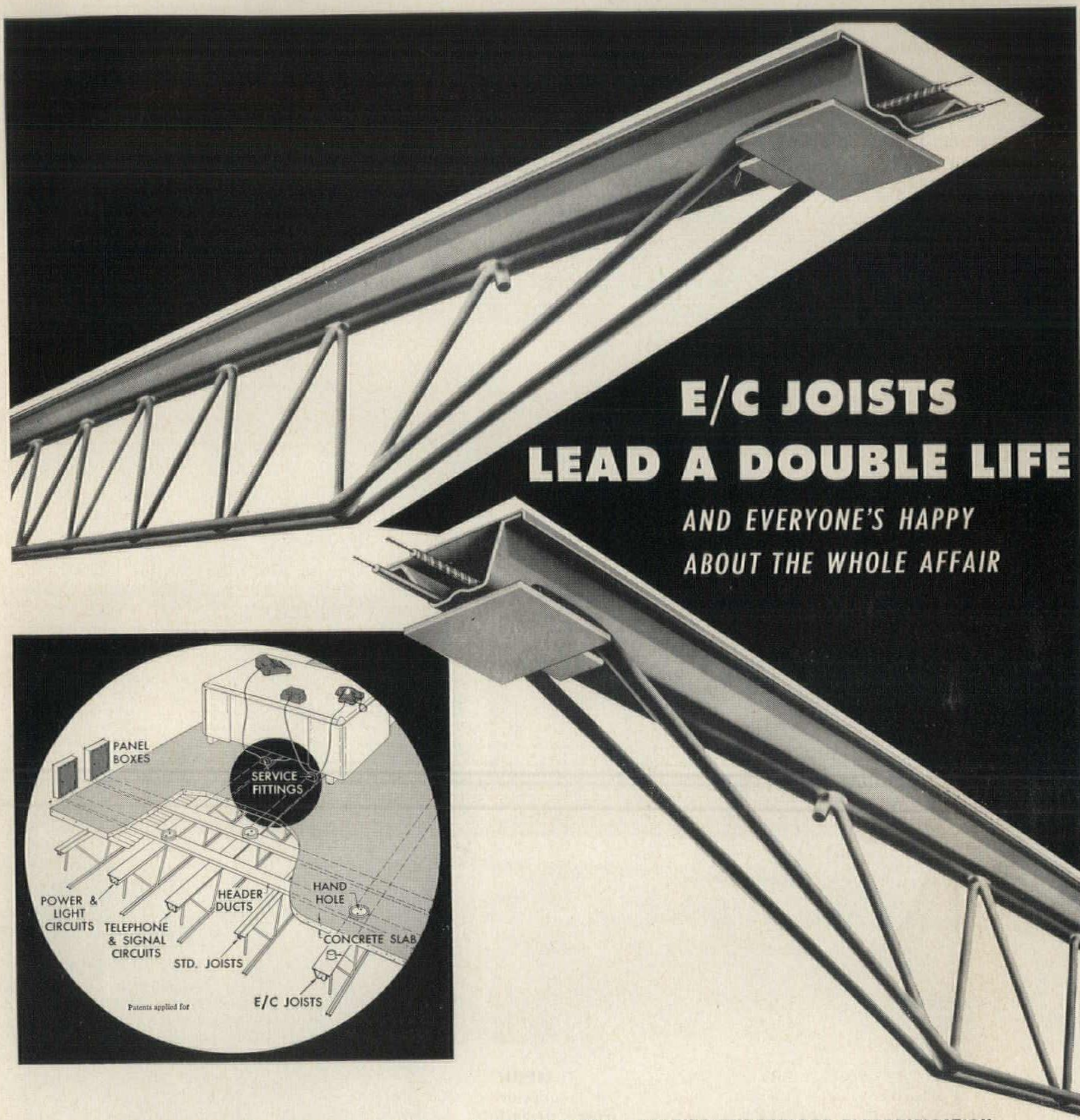


Architects Kahn & Jacobs and William Lescaze aimed at creating a "structure modern in concept, designed to nurture young artists, and intended to help train them to learn, to do, and to show what they have created."



The building is of reinforced concrete with curtain walls of windows and yellow porcelain enamel on aluminum. Blue brick end walls contrast with curtain wall openness. General contractor is the Plane Construction Company.

Accommodating some 3500 pupils in day and night classes, with a primary school whose enrollment is 650 an integral part of the eight-story structure, the new high school has many features: a 700-sq-ft glass-enclosed exhibition hall on the first floor, 500-seat auditorium, roof terrace playground and outdoor exhibit area, all convertible classrooms (except for fixed laboratory tables and darkroom equipment, stage and related facilities and auditorium seating), soundproof band practice rooms, ceramic work rooms with appropriate kiln facilities, areas for fashion design, an architectural drafting section and gymnasia with dividing walls.



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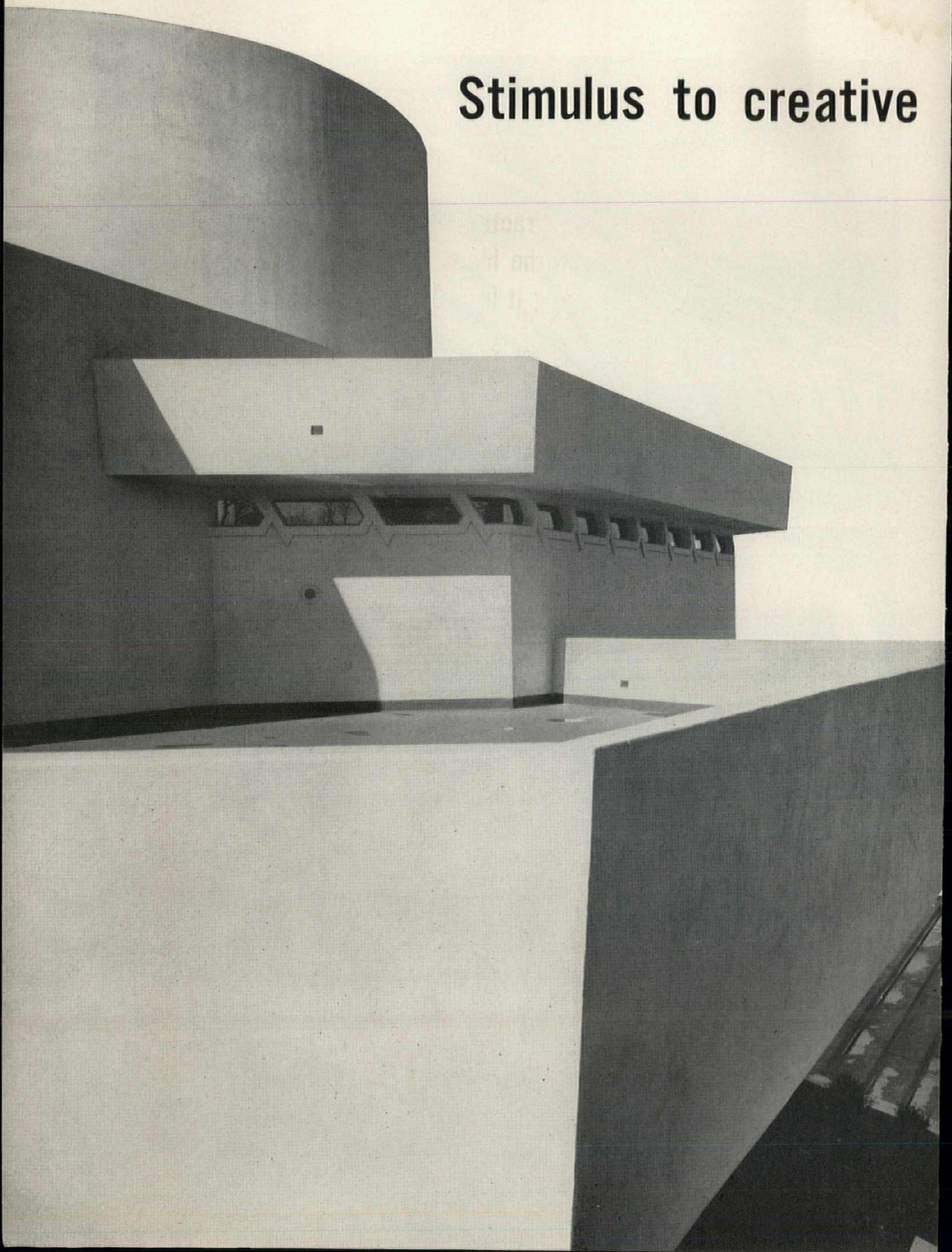

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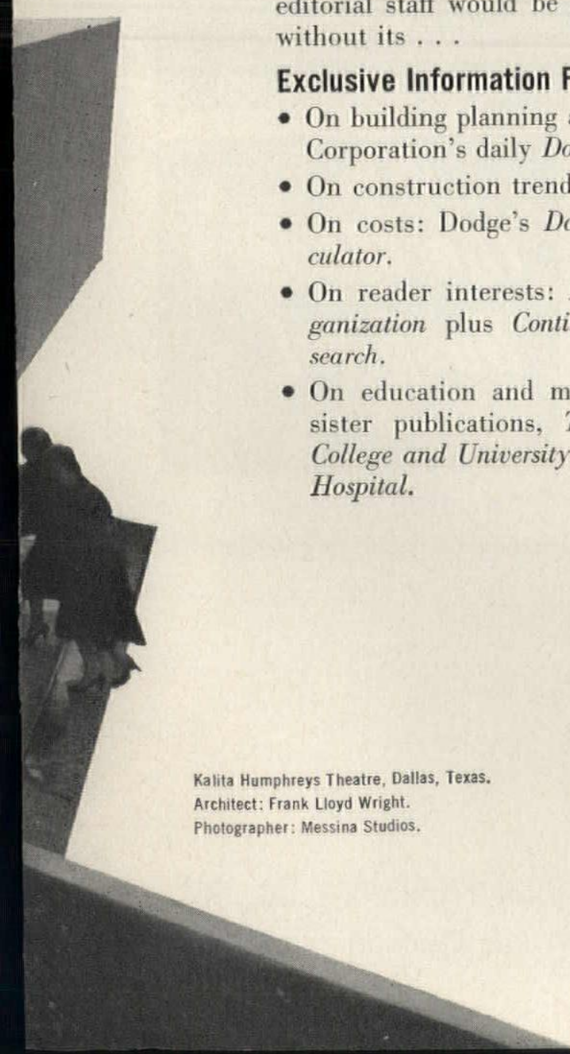

Kalita Humphreys Theatre, Dallas, Texas.
Architect: Frank Lloyd Wright.
Photographer: Messina Studios.

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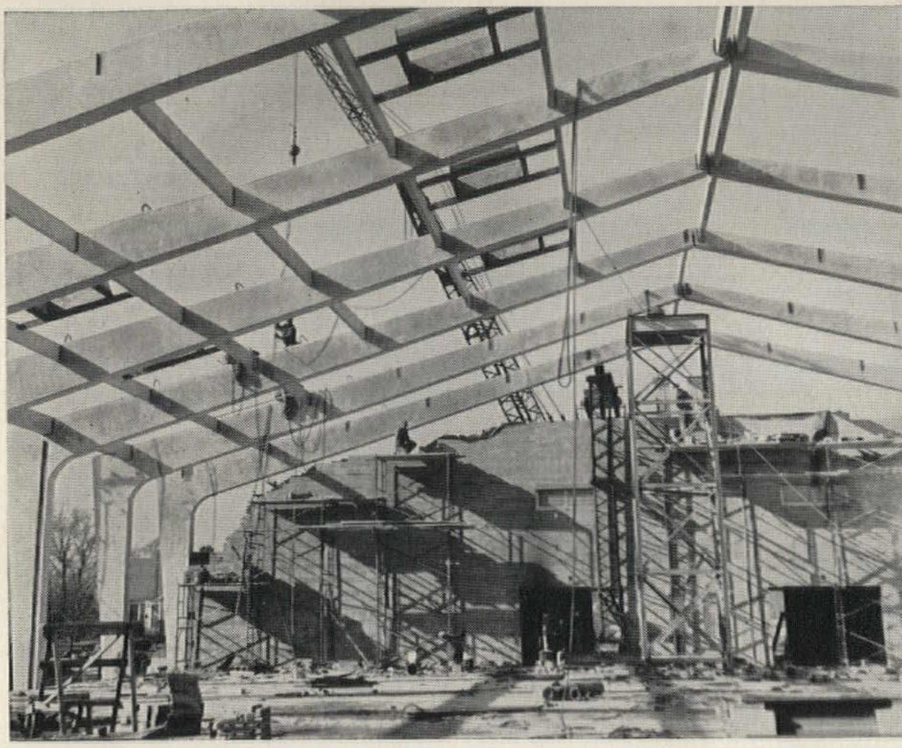

Jordan Sellars High School Gymnasium, Burlington, N. C. Unobstructed floor area is 100′ by 120′. Height at center of arch is 32′.

Architect: McMinn, Norfleet & Wicker, Greensboro, N. C.

Contractor: O. G. Thompson & Sons, Burlington, N. C.

Manufacturer Precast Units: Arnold Stone Company, Greensboro, N. C.

Ready Mixed Concrete: R. F. Kirkpatrick & Sons, Burlington, N. C.

8 PRECAST CONCRETE ARCHES FRAME 100′ WIDE GYM

Lehigh Early Strength Cement Cuts Casting Time

Attractiveness, durability, fire safety and unusual simplicity—all characterize the frame of this new gym and further prove the versatility of precast concrete. The huge arches were cast on the gym floor in half sections and raised into position. Precast concrete purlins, spanning 16 feet between arches, provide lateral stability.

For fast re-use of forms in casting both arches and purlins, Arnold Stone Company used concrete made with Lehigh Early Strength Cement. To quote Mr. M. A. Arnold, "Lehigh Early Strength Cement enabled us to complete the casting operations in half the time required with regular portland cement."

This is a typical advantage of Lehigh Early Strength Cement in modern concrete construction. Lehigh Portland Cement Company, Allentown, Pa.

As one crane raised and held the 18-ton arch half, another (on the right) guided it into position. The two halves were then welded together to form complete arch.

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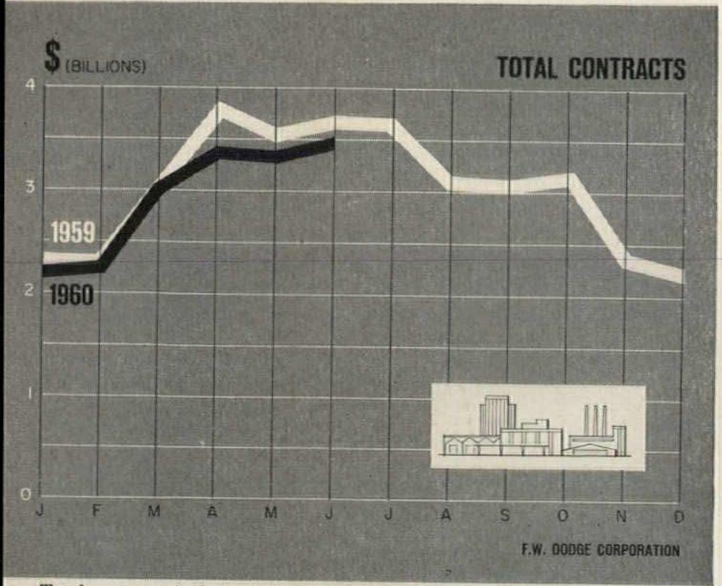
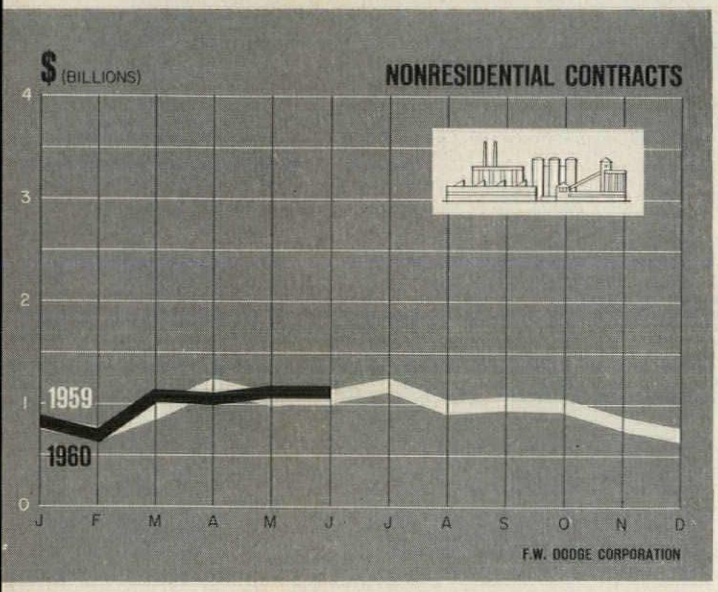
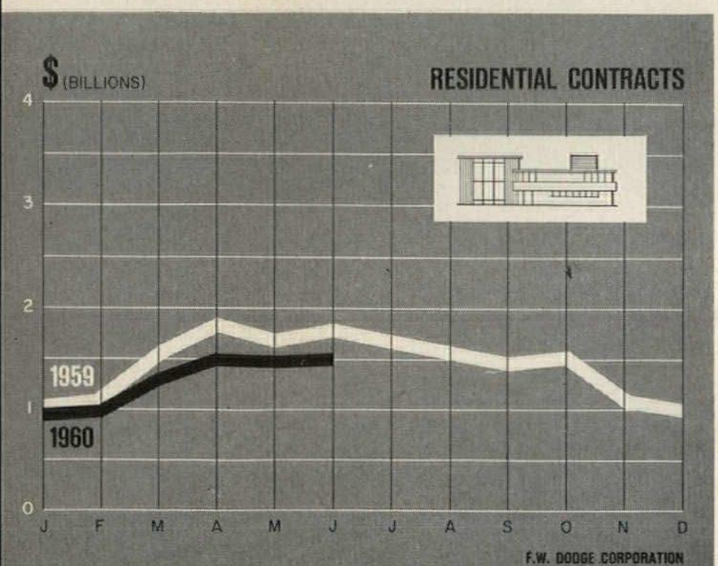


Total contracts include residential, nonresidential, heavy engineering contracts





BOOM IN OFFICE BUILDING

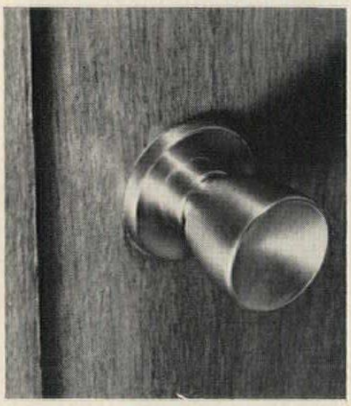
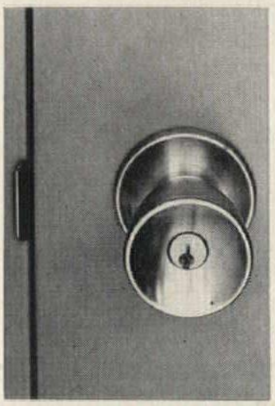
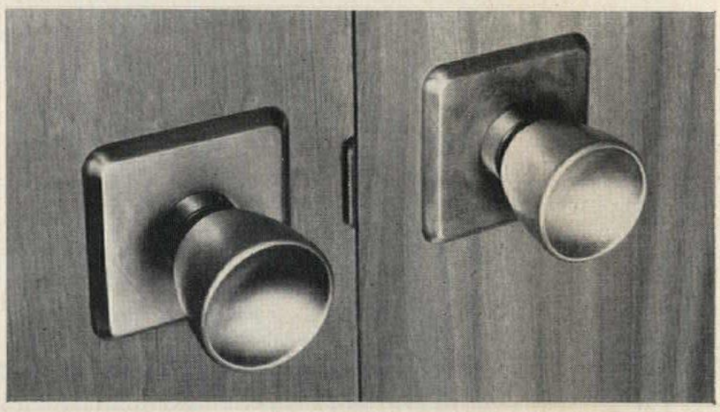
OFFICE BUILDINGS, to the surprise of many people, are continuing to enjoy a boom, as they have for the past several years. But there is a perceptible difference: this year, the big new office building contracts are spread around the country, and not concentrated on Manhattan Island. According to the large-project list compiled by Dodge, the big contracts in the first half of 1960 included three in the Chicago area, and one each in or around New Orleans, Los Angeles, St. Louis, Miami, and New York. Total office contracts in the first half of this year were $689 million, up 19 per cent over the same period of last year. This was the largest percentage increase reported for any building type, except jails and penitentiaries, which are having a boom of their own. Preliminary indications are that July was also an excellent month for office contracts.

THE MOST frequently asked question about office buildings is "Do we need them?" New floor space has been added at a fast pace during recent years, and it is natural to wonder whether we are approaching a saturation point. It can happen, of course. But so far, at least, no serious oversupply seems to have developed, even in New York, where so much of the new space has been concentrated. Part of the reason is the tremendous expansion in the amount of white collar work to be done in our complex society. An inkling can be gleaned from this: in the period 1950-1958, the number of clerical workers in the United States gained 19 per cent while the number of factory operatives actually declined. Finance, distribution and services have grown considerably faster than manufacturing in terms of employment, and even within manufacturing, white collar work has greatly expanded relative to production work. Office workers require offices; hence the sustained boom in office building.

STILL ON the subject of people, the growth rate of the population of this country in the past decade has jumped back up about to where it was in the Gay Nineties. There's one big difference, however; while the birth rate has been pretty high in recent years it is still well below the level at the turn of the century. The extra push in today's rapid population growth comes from what has been called "death control"—a very definite extension in the average length of life, which keeps more of us around longer.

GEORGE CLINE SMITH
Vice President and Chief Economist
F. W. Dodge Corporation



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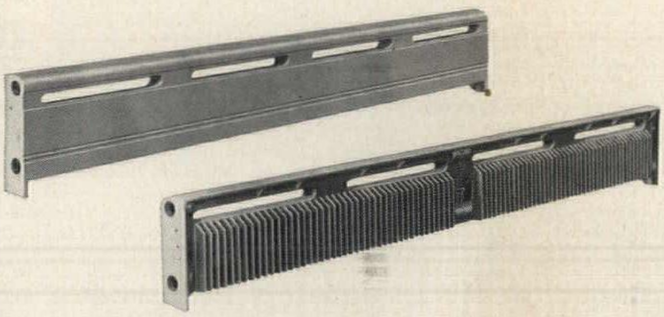

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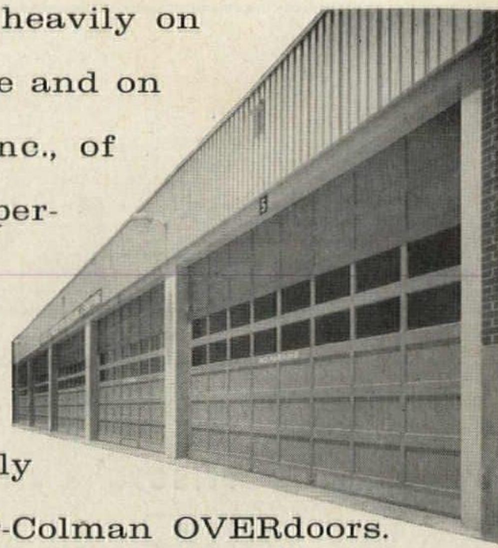

These OVERdoors form an attractive part of the building exterior yet are **COMPLETELY FUNCTIONAL.** Electrically operated OVERdoors assure quick opening, rapid access to loading docks and warehouses. Exclusive Cam Action Closing provides full positive closure – seals the building year-round against wind, dust, and weather. Barber-Colman builds a wide range of OVERdoors, Electric Operators and Radio Door Controls for industrial, commercial, and residential applications . . . see our catalog in Sweet's or write directly to the factory.

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