

# ARCHITECTURAL RECORD

**3** March 1960

*Building Types Study: Shopping Centers*

*Planning of Jet Airports*

*Theater by Frank Lloyd Wright*

*Recent Work of John Carl Warnecke*

*Full Contents on Page 5*



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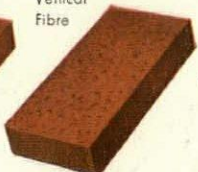
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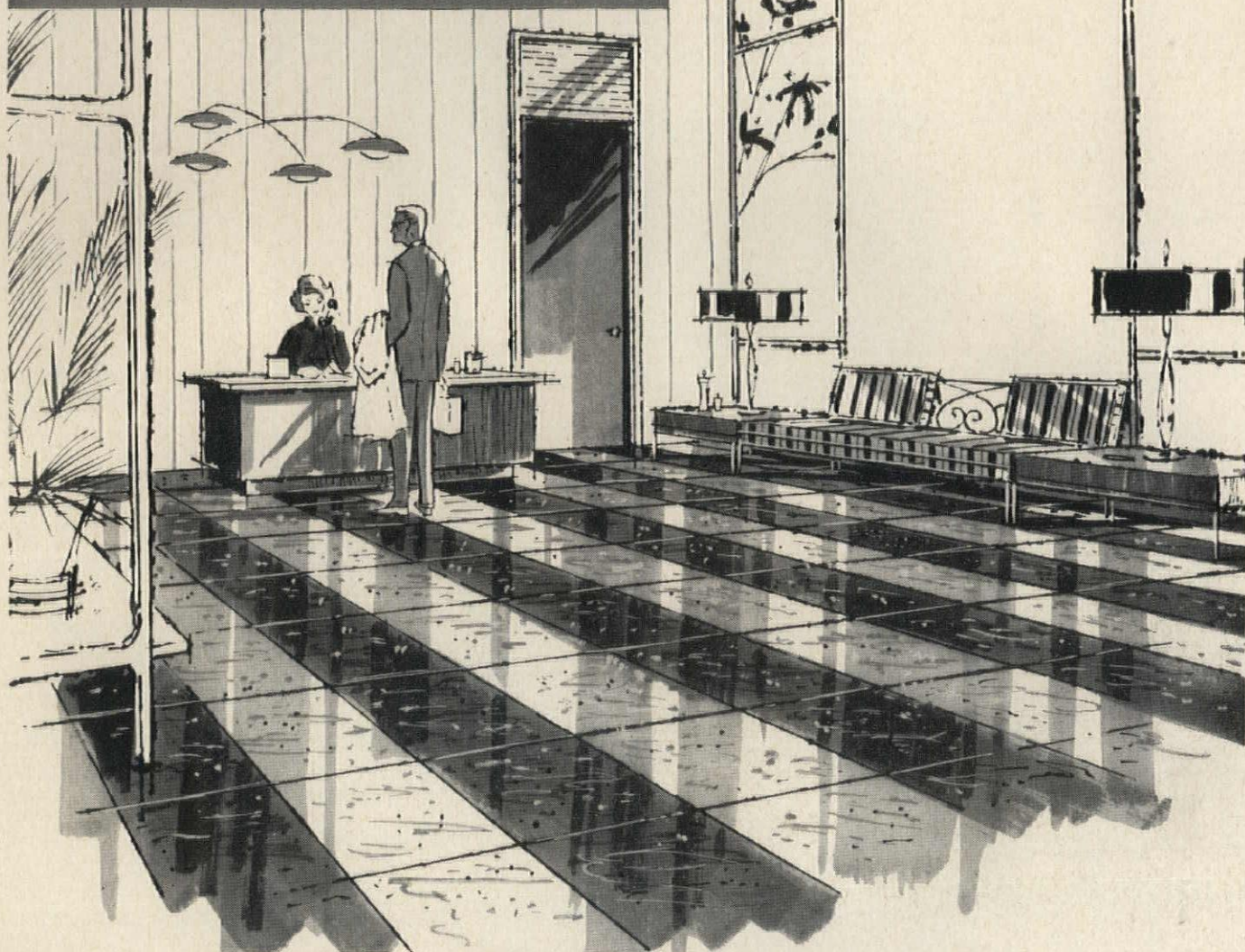


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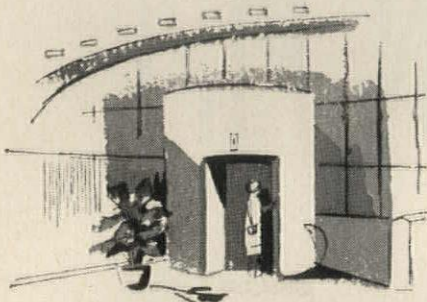
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# ARCHITECTURAL RECORD

March 1960

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Top: Model photograph of terminal building at Dulles International Airport. Below: Apron loading scheme. Ammann and Whitney, Eero Saarinen and Associates, Burns and McDonnell, Ellery Husted, Associated Architects and Engineers.

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# Coming in the Record

## ARCHITECTURE, LIFE AND ARCHITECTS

*Everybody wants criticism—in theory, anyway—but not everybody agrees on what criticism is. Every architect wants to do Architecture (with a Capital A), but when is Architecture? A highly literate outsider-looking-in, John Kouwenhoven, has some provocative comments on these far from unrelated matters.*

## BUILDING TYPES STUDY: HOSPITALS

*An analytical look at the variety of hospital facilities of high quality the nation is getting as architects across the country find increasing opportunities, even in very small communities, for this field of practice. (F. W. Dodge Corp. estimates this category will go up three per cent in 1960.) Five hospitals are included in the study; they range from very small to very large, offer urban, suburban and rural examples.*

## ARCHITECTURE AS MIES HAS MADE IT

*The 1960 Gold Medal of the American Institute of Architects will be awarded next month to Ludwig Mies van der Rohe, whose architecture is perhaps the most undeniable influence on all of modern architecture. A major article will provide a look at some of Mies' newest work and a backward glance at some of the great milestones along the way.*

OTHER F. W. DODGE SERVICES: Dodge Reports—Dodge Construction Statistics—Sweet's Catalog Services—Dodge Books—Dodge Mailing Service—The Modern Hospital—The Nation's Schools—College and University Business—Hospital Purchasing File—Chicago Construction News—Daily Pacific Builder (San Francisco)—The Daily Journal (Denver)—Real Estate Record & Builders Guide—Dow Building Cost Calculator.

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### Designing for Outer Space

The matter-of-fact little item that accepts the momentous as routine sometimes accents it more compellingly than a front-page banner headline. *Sic* the following announcement in the February issue of BRI's *Building Science News*: "The fifth annual Engineers, Scientists and Architects Day program to be held in Washington, D. C., Feb. 25, will feature the great challenge of the 1960's, space. Moderator will be T. J. Killian, Office of Naval Research, and papers will deal, among other subjects, with *Habitations in Space* (by Prof. P. A. Goettelmann, Catholic University) and *Engineering in Space* (by Dr. Hugh L. Dryden, Natl. Aeronautics and Space Admin.). Principal speaker will be Dr. James A. Van Allen, discover of the radiation belts in space, who will discuss 'The Radiation Environment of the Earth.' Program is organized annually by the D. C. Council of Engineering and Architectural Societies and the Washington Academy of Sciences."

### What Next for Building?

What was described as a major electronic breakthrough by Westinghouse Electric Corporation was featured in newspaper reports of interviews with Westinghouse president Mark W. Cresap Jr. a few weeks ago. The implications of Westinghouse research in "molecular electronics" in the construction of missiles, space vehicles, television sets, were said to be very sweeping. In response to a RECORD inquiry, Dr. S. W. Herwald, Westinghouse vice president, research, has suggested some possible implications for building: "Molecular electronics, as such, is most likely to affect the building construction industry through the changes it will make in the communication and entertainment equipment that is utilized. For example, it might make feasible economical mass usage of intercommunication throughout a building, office or home. Likewise, the economics of a television type picture added to this intercommunication media might become economi-

cally feasible. Another area which may be affected is that which controls the environment in any building. It is possible over the long term, for example, that molecular electronics might take over the complete power switching function within any building, and perhaps enable cost reductions in sensing computation equipment that would permit turning the power circuits desired on or off, simply by speaking the command into the intercommunications system previously mentioned."

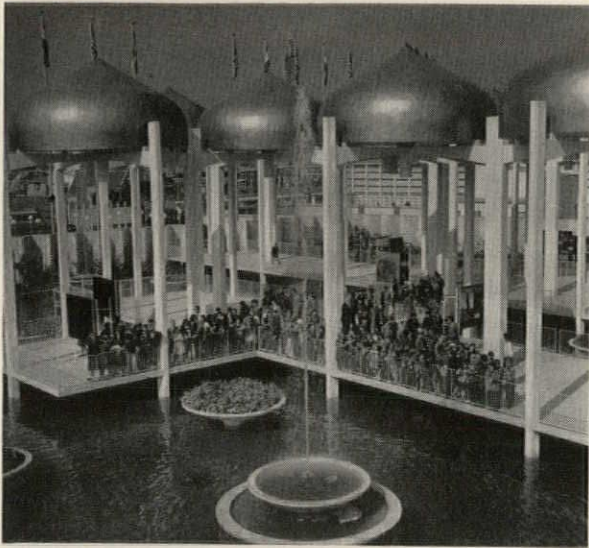
### A Word from the Client

Almost everybody has had his say about the Guggenheim by now, but the arrival of a little booklet on the well-publicized opening ceremonies of last fall is a reminder (because it includes the remarks on that occasion of Harry F. Guggenheim, president of the Solomon R. Guggenheim Foundation) that the client (if he is defined as the owner rather than the museum's director) has not really had much of a hearing. Is the Foundation a satisfied client? This is what Mr. Guggenheim had to say at the opening: "This building we open today is a complete break from the traditional museums of the past. The display of works of art for the benefit of the public has its genesis in the use, first of places of worship, and later of palaces of deposed monarchs and former residences of rich benefactors of the arts. These palaces of Medieval or Renaissance architecture were makeshift, ill-suited and inadequate for display. However, outworn tradition persisted even to the point of influencing the design of the galleries erected in the new world. In a revolt from this tradition, buildings of conventional contemporary design were adopted, but not too happily for the display of art. The architecture of this museum is not only an evolution but a revolution in design. We trust that the public, to whom it is presented, will find new interest in this creation of Frank Lloyd Wright and gift from Solomon R. Guggenheim." And: "In the creation of this building, Frank Lloyd Wright again has demonstrated his genius. The composition, the beauty

and the majesty of this building will make it live long among the architectural treasures of man." Allowing for a certain difference in mode of expression, Mr. Wright himself could hardly have sounded more transported.

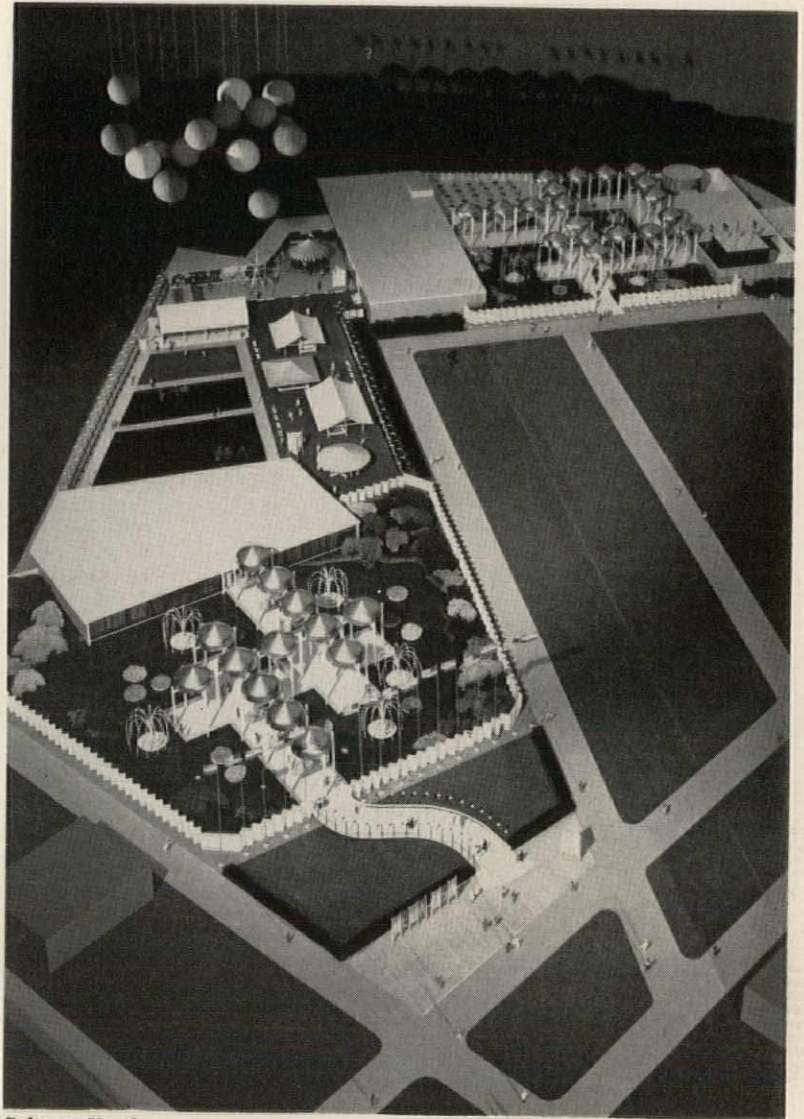
### Less Clutter, Please

In earnest, if not impassioned tones, Edward Larrabee Barnes last month urged the home furnishings world to please *please* leave the architect some space he could see. Addressing a luncheon meeting of the National Home Fashions League in New York, Mr. Barnes said: "If all our rooms were spacious, the bulk of furniture would not loom as a problem. But too often, by the time we have put in the bare essentials, the lower three ft of the room has been lost in a sea of chair backs and lampshades. We have sacrificed space for possessions. We have lost the floor plane and the bottom third of the room. It is not just a matter of too much furniture. The furniture itself is too complicated. Next time you drop a needle or a pin, get down on your hands and knees and study the bottom 18 in. of your living room. It is a strange world of assorted legs and twisted light cords that we accept only because we are used to it. . . . This is the world of cats and dogs and dust balls where the architect and the furniture designer are supposed to meet." Mr. Barnes forwarded suggestions for other areas where architects and designers might meet: in the design of forms ("there is a great need for impersonal modest design"); in the elimination of legs ("if each piece of furniture in our house could stand on one leg, we would have reduced the forest of legs by 75 per cent"); in the elimination of wires, and in built-ins, and in modular coordination ("of all the rooms in the house, the kitchen is the most technically advanced, and here there is the best collaboration between architect and manufacturer"). The aim of these efforts, of course, goes beyond gratification for the architect and profit for the manufacturer—for the householder, it could mean "an atmosphere of peace, serenity and room to think."



## Yamasaki Creates Domed Exhibit

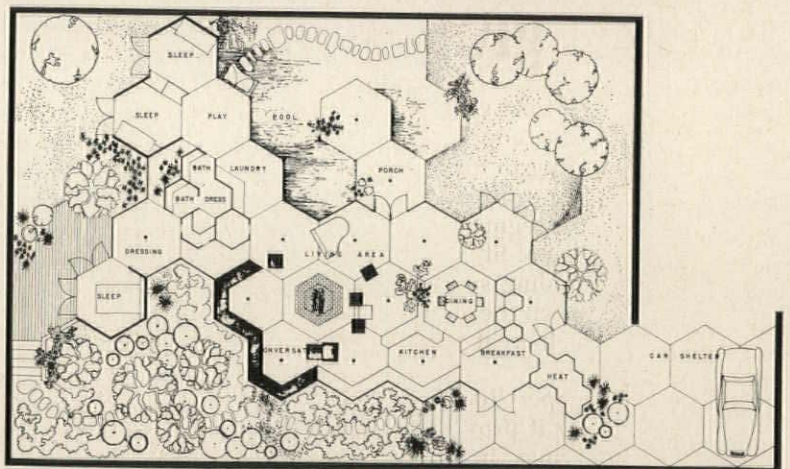
Minoru Yamasaki was the architect of the United States Exhibit at the first World Agriculture Fair, recently held in New Delhi, India. The four main exhibition buildings (see model photo at right) were surrounded by 32 precast concrete golden domes, each 17 ft in diam and 40 ft high. Above is a picture taken at the Exhibit, showing some of the domes. The four buildings contained research and other demonstrations, a barn, food displays, and demonstrations of atomic energy in agriculture. Frank Noftz & Associates designed the displays



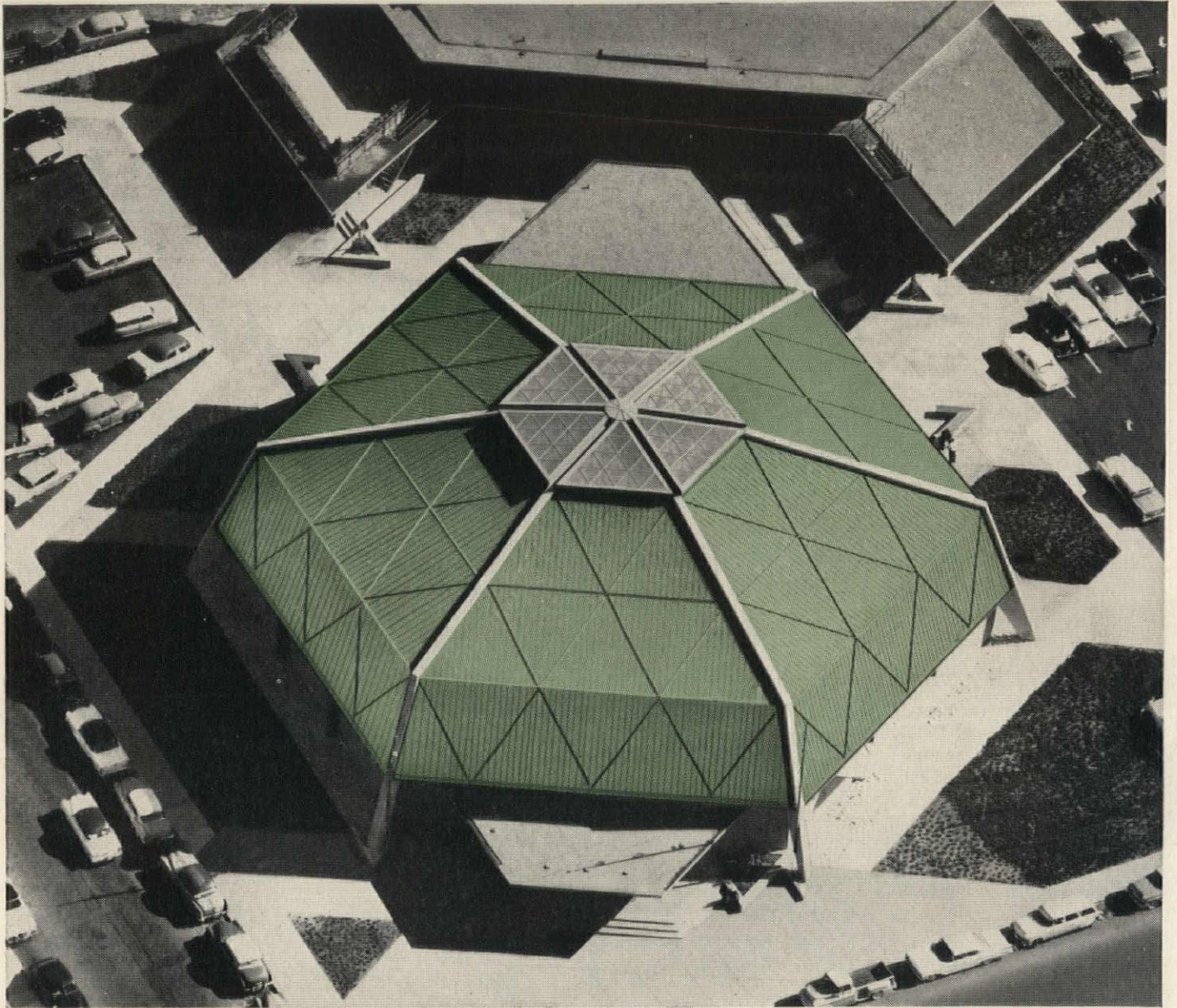
*Baltazar Korab*



## John Kelly Designs Canopied House



John Terence Kelly designed this "Space Age House," to be exhibited next month at the Cleveland Home and Flower Show. Mr. Kelly was named to design the structure by the Cleveland chapter, A.I.A. The house consists of 15 umbrella-like hexagonal frames 15 ft high, surmounted by copper canopies; sheets of glass form walls between canopy edges and ground. Sheets of clear plastic are used overhead in some areas. Bedrooms, baths, and certain other rooms have 7-ft walls



## Copper gives lasting beauty to outstanding design

Whether viewed from ground level or from nearby Golden Gate Bridge, the copper roof of the Longshoremen's Memorial Building in San Francisco contributes much to the modern architecture of the structure.

Although each segment of the hexagonal mansard roof appears to consist of fifteen separate triangular roof areas, actually the standing seam copper roof is continuous on each slope between the concrete bents. The diagonal copper battens which create the pattern are above the standing seams.

Economy Copper Roofing, an Anaconda product, was selected because it provides a lasting and beautiful roof covering at savings in material and installation costs. Weighing 10 ounces per sq. ft., the standard sheets 16" x 72" are easy to handle and eliminate waste in forming roof pans of desirable dimensions.

Write for our "Modern Sheet Copper Practices"—109 pages of drawings, specifications and general information on copper sheet metal work. The American Brass Company, Waterbury 20, Conn.

6019



Memorial Building of the International Longshoremen's and Warehousemen's Union, San Francisco. ARCHITECT: Henry Hill, San Francisco. The dome is sheathed with about 18,000 sq. ft. of Economy Copper Roofing installed by Fire Protection Products Co., San Francisco.

Economy Copper Roofing  
 an **ANACONDA**<sup>®</sup> product  
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## A.I.A.'s National Awards Program Cites Sixteen Buildings

In the 12th annual Honor Awards Program of the American Institute of Architects, 16 buildings (shown on these pages and pages 14 and 15) were cited. Five buildings "which demonstrate true leadership" in architectural design were selected by the all-architect jury to receive First Honor Awards. The jury also made 11 Awards of Merit.

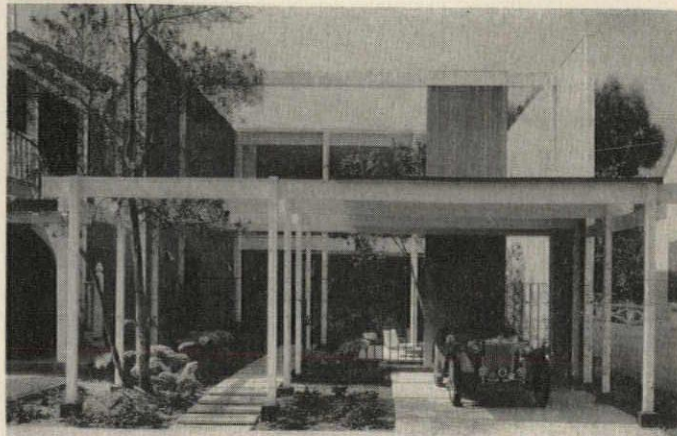
Members of the jury were: G. Holmes Perkins, F.A.I.A. (chairman), dean, School of Fine Arts, University of Pennsylvania; Alfred Shaw, F.A.I.A., Chicago; Harris Armstrong, F.A.I.A., Kirkwood, Mo.; Alfred L. Aydelott, A.I.A., Memphis; Henry L. Kamp-hoefner, F.A.I.A., dean, School of Design, North Carolina State College.

There were 289 submissions. The jury felt that "the designs selected represent an outstanding contribution to the cause of good architecture in at least one major aspect." Certificates will be presented to the architects and owners of the 16 cited buildings at the A.I.A.'s convention in San Francisco next month.

Mutual Insurance Company of Hartford. *Architects:* Sherwood, Mills and Smith. *Structural engineers:* Werner-Jensen and Korst. *Mechanical engineers:* Fred S. Dubin Associates. *Builders:* Industrial Construction Company

### FIRST HONOR AWARDS

*Marvin Rand*



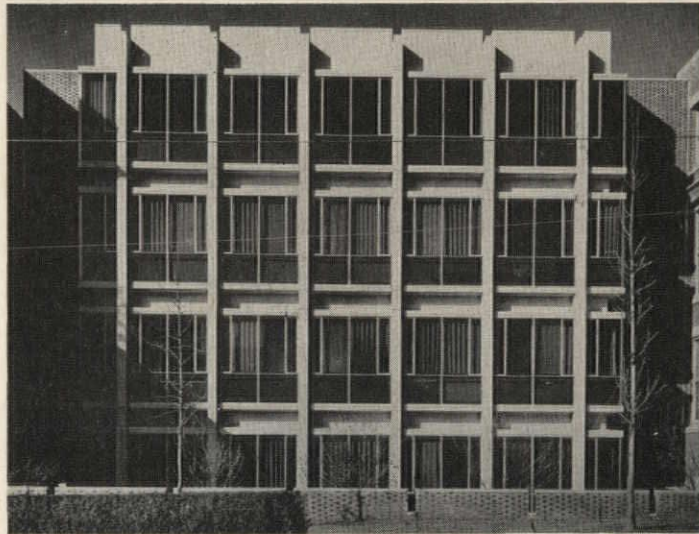
Residence for Mr. and Mrs. Richard Opdahl, Long Beach, Calif. *Architects:* Killingsworth, Brady and Smith; Edward A. Killingsworth, Jules Brady, Waugh Smith. *Decorator:* John Nicholson for Frank Brothers. *Contractor:* Al Dorsey



K. Teiger Fotograf

United States Embassy Office Building, Oslo, Norway. *Architects:* Eero Saarinen and Associates. *Associate architects:* Engh, Quam and Kiaer, associate architects; Henrik Kiaer, superintendent of construction. *Owner:* United States Government. *General contractor:* Nils S. Stiansen

Moore School of Electrical Engineering, University of Pennsylvania. *Architects:* Robert L. Geddes, Melvin Brecher, Warren W. Cunningham, Partners in Geddes, Brecher, Qualls, A.I.A. *Structural engineers:* Dorfman and Bloom. *Mechanical engineer:* Jack P. Hartmann. *Owner:* Trustees of the Moore School of Electrical Engineering, Dr. J. G. Brainerd, Director. *General contractor:* Joseph R. Farrell, Inc.

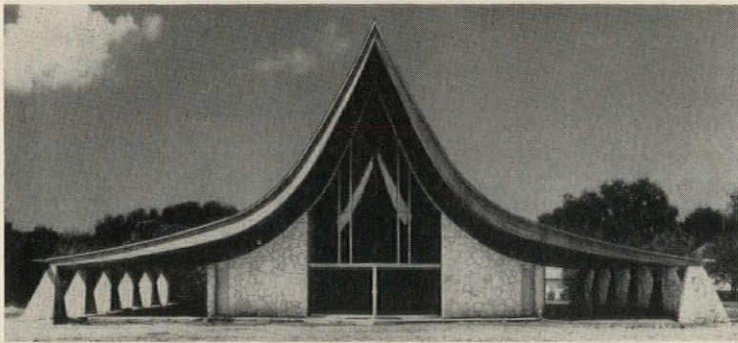


Lawrence S. Williams

George Knight

Blyth Arena (Olympic Ice Arena), Squaw Valley, Calif. *Architects:* Corlett and Spackman, A.I.A., Kitchen and Hunt, A.I.A., Architects Associated; William Corlett, Wendell Spackman, Robert S. Kitchen, Frank B. Hunt. *Engineers:* H. J. Brunnier, structural engineer; John M. Sardis, structural engineer; Punnett, Perez and Hutchison, consulting engineers; Kennedy Engineers, utility engineers; Vandament and Darmsted, mechanical and electrical engineers. *Developer:* Organizing Committee, VIII Olympic Winter Games. *Owner:* United States of America; administered by: Forest Service, U. S. Dept. of Agriculture. *General contractors:* Diversified Builders, Inc., general construction; York Corporation, refrigeration equipment; Independent Iron Works, Inc., bleachers



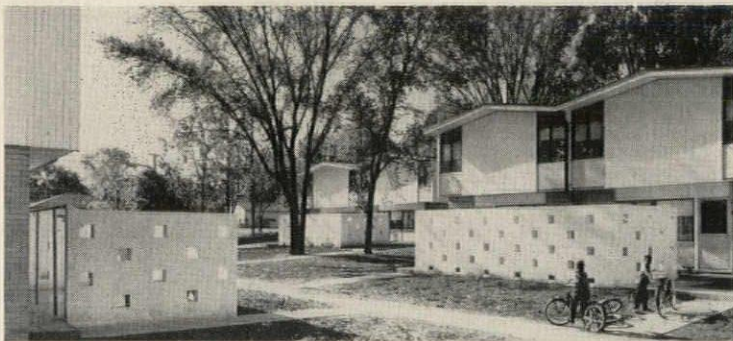


George Caerina

St. Paul's Lutheran Church (Fellowship Hall), Sarasota, Fla. *Architect: Victor A. Lundy, A.I.A. Owner: St. Paul's Lutheran Church. Contractor: T. T. Watson, Inc.*



The Church of the Redeemer, Baltimore. *Architect: Pietro Beluschi, F.A.I.A., and Associated architects: Rogers, Taliaferro & Lamb. Engineers: Henry Adams, Inc. Owner: The Church of the Redeemer. General contractor: Consolidated Engineering Company, Inc.*



Baltazar Korab

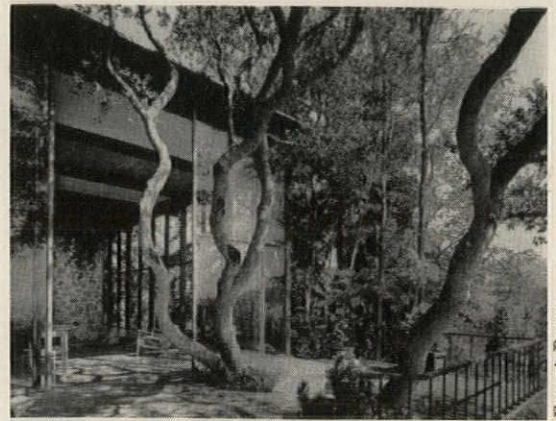
Clemens Homes (PHA Project Mich. 28-1), Mount Clemens, Mich. *Architects: Meathe, Kessler & Associates, Inc. Owner: Mount Clemens Public Housing Commission. Contractor: C. H. Reisdorf & Sons, Inc.*



Gabriel Benzur

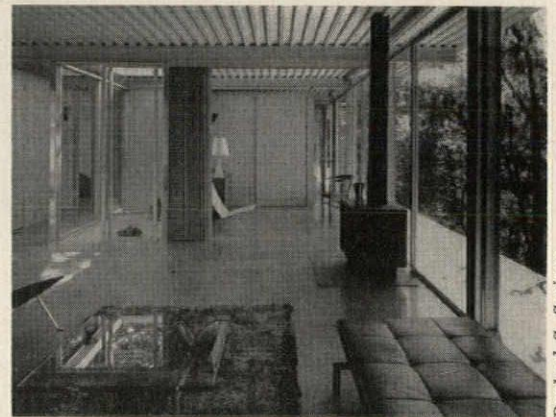
## 16 Buildings Cited in A.I.A.'s Program

### AWARDS OF MERIT



Ernest Braun

Residence for Alyn B. Reid, Mill Valley, Calif. *Architect: Lee Stuart Darrow, A.I.A. Structural engineer: Constantine C. Chekene. General contractor: Ralph Briggs*



Raphael S. Soriano

Builder's House (one of two pilot houses for hillside lots), Mill Valley, Calif. *Architect: Raphael S. Soriano, A.I.A. Owner, developer, general contractor: Frank McCauley*

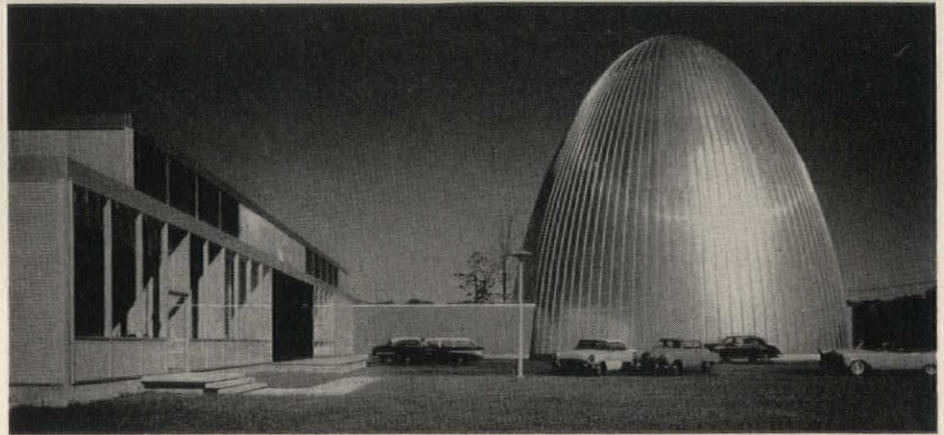
Lenox Square Shopping Center, Atlanta. *Architects: Toombs, Amisano & Wells. Landscape architect: Hideo Sasaki. Structural engineers: Mullen & Powell. Sculptors: Elbert Weinberg; Irwin Hauer (cooling towers). Owner: Samuel R. Noble Foundation. General contractor (except for Rich's and Davison's): Lenox Contracting and Engineering Company; Rich's contractor: Batson & Cook Company; Davison's contractor: J. A. Jones Construction Company*

International Minerals & Chemical Corporation, Administrative and Research Center, Skokie, Ill. *Architects:* Perkins & Will. *Engineers:* Perkins & Will. *Owner:* International Minerals & Chemical Corporation. *General contractor:* Turner Construction Company



*Hedrich-Blessing*

Industrial Reactor Laboratories, New Jersey. *Architects:* Skidmore, Owings & Merrill. *Reactor design engineers:* AMF Atomics. *Structural engineers:* Severud-Elstad-Krueger. *Mechanical engineer:* Guy B. Panero. *Owner:* Industrial Reactor Laboratories, Inc. *General contractor:* Turner Construction Company



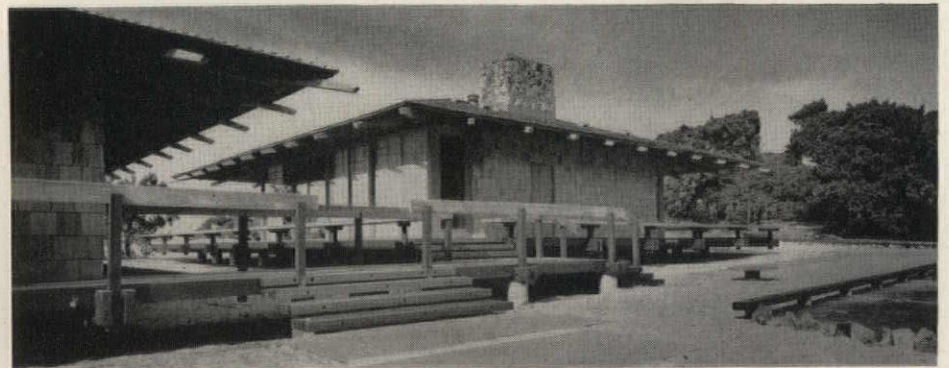
*Alexandre Georges*

National Airlines Nose Hangar, Miami. *Architects:* Weed Johnson Associates. *Engineers:* Ammann & Whitney. *Owner:* Dade County Port Authority. *General contractor:* Fred Howland, Inc.



*Joseph B. Brignolo*

Asilomar Housing, Asilomar Beach State Park, Pacific Grove, Calif. *Architects:* John Carl Warnecke & Associates. *Structural engineers:* William B. Gilbert & Associates. *Owner:* The Pacific Grove-Asilomar Operating Company. *General contractor:* Comstock Associates



© *Ezra Stoller*

The Capitol Park Apartments, Washington. *Architects:* Satterlee & Smith. *Owners:* Roger L. Stevens; James H. Scheuer. *General contractor:* Blake Construction Company, Inc.



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**SIMPLIFIED SYSTEM.** Lay Tufcor steel sheets . . . place insulating concrete . . . apply built-up roof.

**FIRE RESISTANT.** No combustible materials—steel and concrete. Exposed deck has UL fire-resistant rating. Saves on insurance and sprinkler cost.

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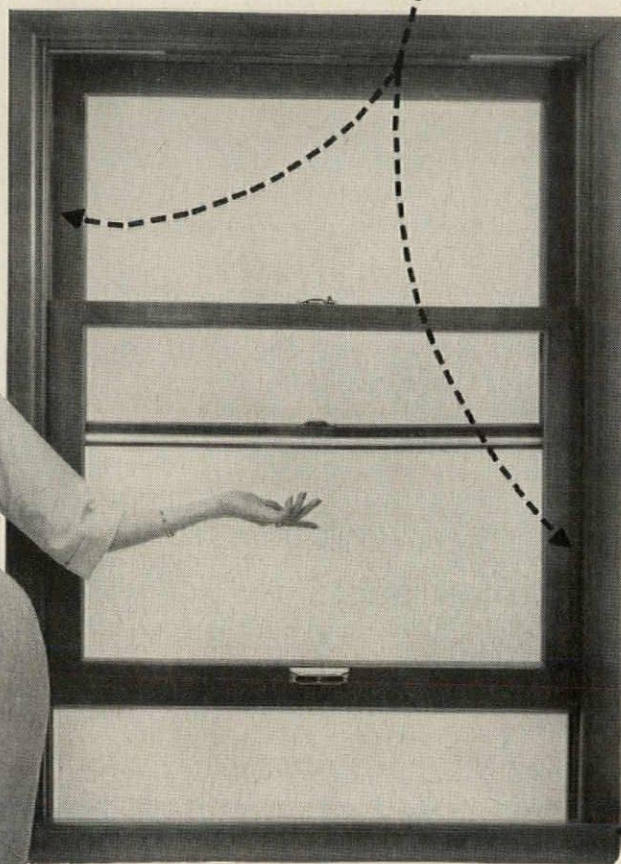
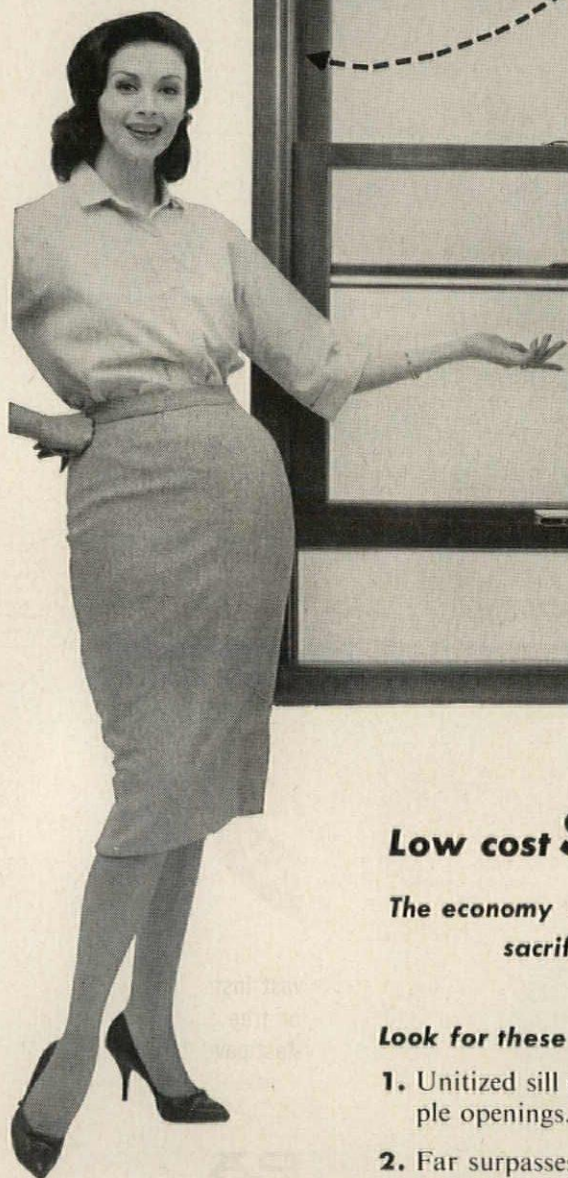
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**Deco Tread Mastipave**—Terra cotta with sandalwood and beige chips, black with chips of gray and green; in 3 foot wide rolls, 30 yards long and 9" x 9" tiles.

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**Grip Tread Mastipave**—With exclusive non-slip traction surface, terra cotta; in 3 foot wide rolls, 30 yards long.

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### FREE ILLUSTRATED BOOKLET

PABCO Floor Covering Division, Fibreboard Paper Products Corporation, Dept. AR, 475 Brannan Street, San Francisco, California.

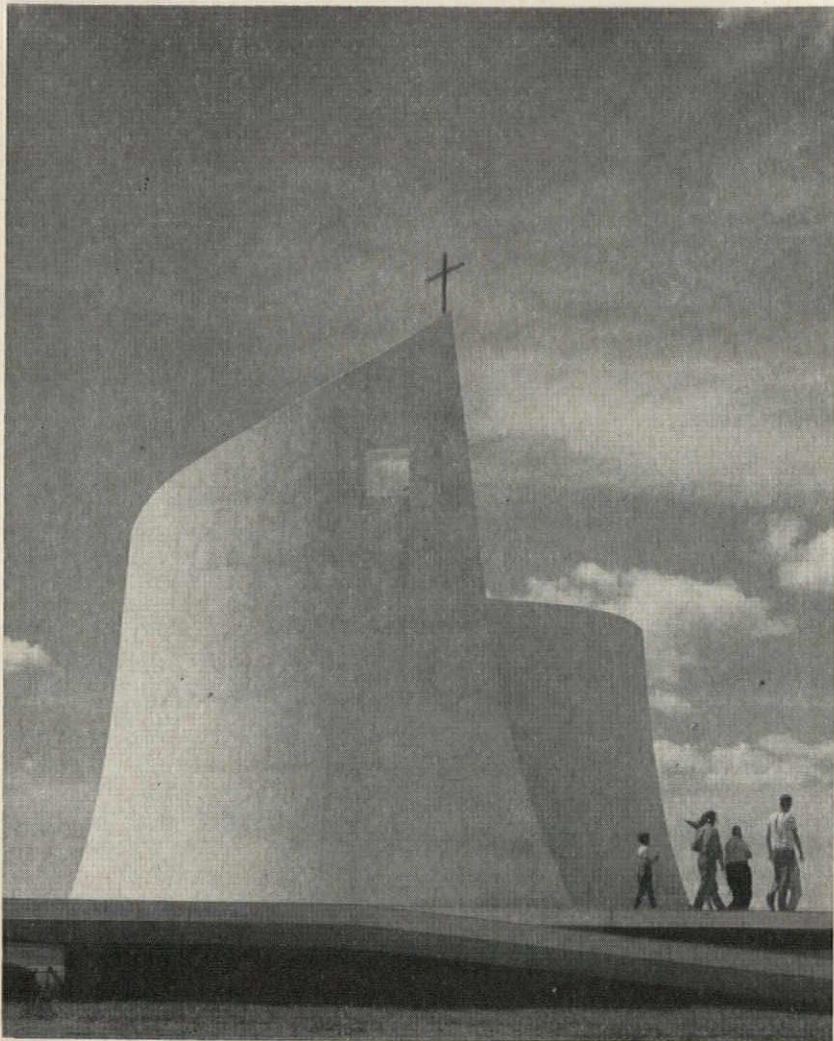
Please send me a free copy of your informative booklet on how PABCO MASTIPAVE will help solve my floor covering problem.

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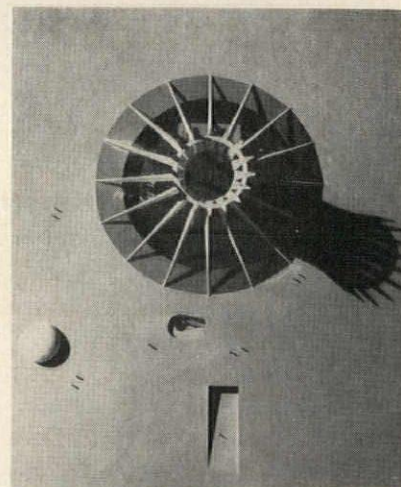
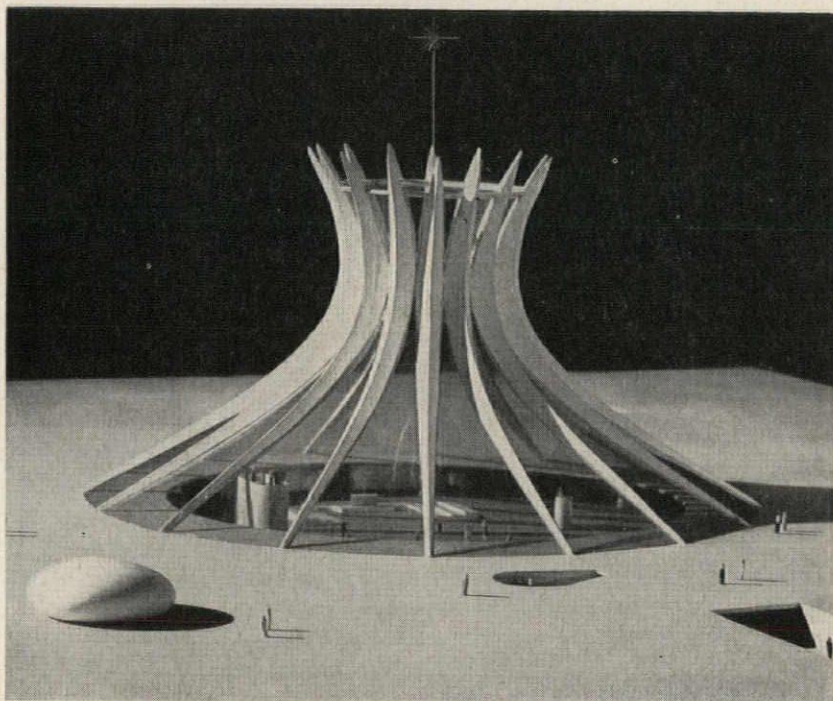


Chapel photos: Marcel Gauthier



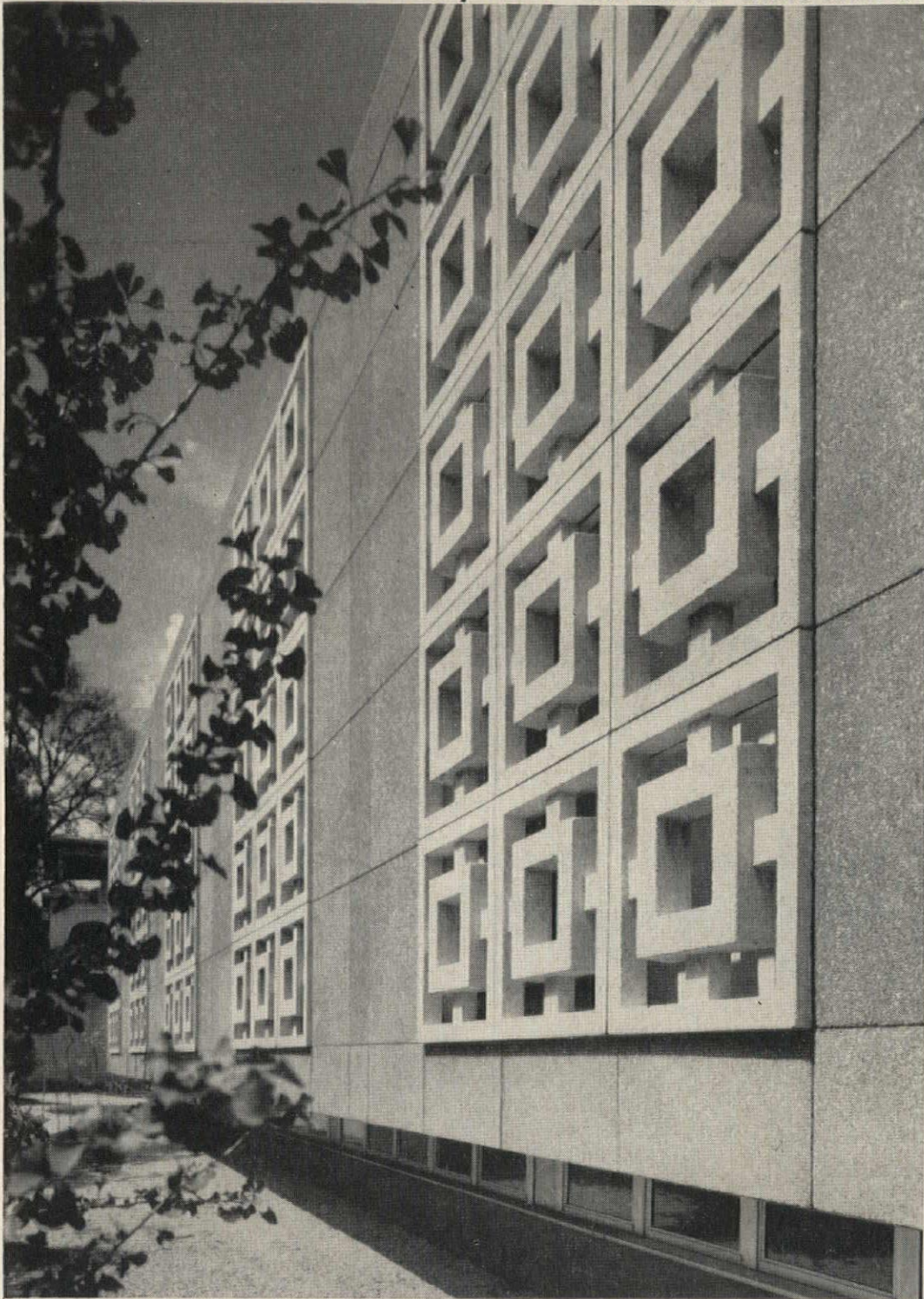
These two religious buildings at Brasilia, the new capital city of Brazil, were designed by Oscar Niemeyer, as were all other public buildings (Lucio Costa planned the city, which is scheduled to become the official capital next month; see AR, Jan. '59, pp. 14-15). At left and above are views of the completed Chapel of the President's Palace, a reinforced concrete structure surfaced with grayish-white marble. The entrance is between the beginning and end of the spiral wall. The entrance portal, inset with squares of glass, shows at right in the interior photograph. All walls are covered with gilded paper in an indented vertical design. (These four photographs are from a forthcoming book on contemporary church architecture by Albert Christ-Janer and Mary Mix Foley, to be published by F. W. Dodge Corporation)

## Brasilia: A Completed Chapel and a Planned Cathedral



The Cathedral of Brasilia, shown in model form, is to seat 4000. A depressed circle is framed with concave bents of reinforced concrete, anchored at ground level and secured near the top and inset with fumed brown refracting glass. Entrances are via underground passages. The main hall is a large open space. The separate round structure is the baptistry

Concrete panels made with Trinity White—the whitest white cement



Building: Mont-  
gomery County (Ala.)  
Courthouse

Architects: Pearson,  
Title & Narrows

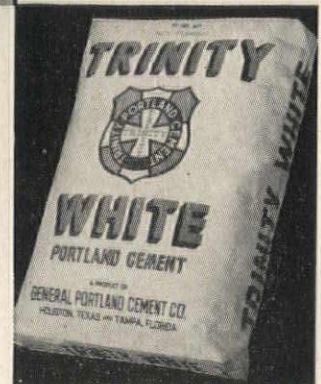
General Contractors:  
Bear Brothers Inc.

Panels Made by:  
Jackson (Miss.) Stone  
Co.

The white decorative panels were made with 100% Trinity White portland cement. The darker panels were made by combining 50% Trinity White with 50% standard gray cement.

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# How to choose an acoustical ceiling to help prevent room-to-room sound-transmission problems

Selecting the right acoustical ceiling now  
made easier with results of new AMA standard tests

**O**BJECTIONABLE sound transmission from room to room is a relatively new problem. It has grown out of the development of lighter weight construction materials and the need for more flexible interior planning. "Massive construction" formerly helped solve any problems before they arose. But now privacy from unwanted sound must be *planned* on the drawing boards.

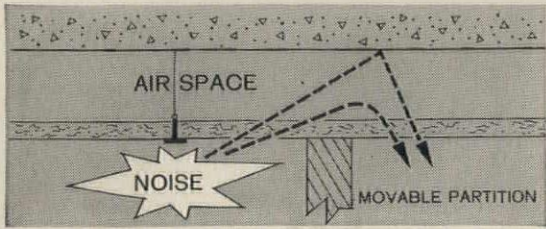
Acoustical ceilings are important factors in this planning. For example, where movable, ceiling-height partitions are to be used, the selection of the right acoustical ceiling material is the only practical and economical way to prevent sound transmission over the partitions. The diagrams on the opposite page explain why.

Which acoustical material is the "right" one? That depends on the layout of the interior, the effectiveness of the partitions themselves, the use to which the interior will be put, and cost. In all cases, the resistance of the ceiling material to sound transmission will be a vital consideration.

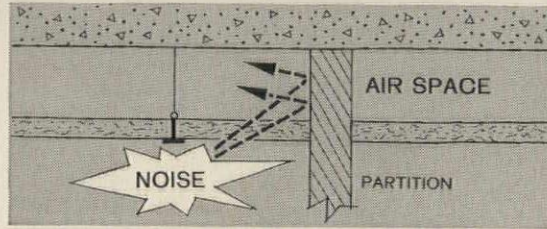
To eliminate the confusion caused by many "independent" tests, the Acoustical Materials Association (whose members include nearly every major manufacturer of acoustical ceilings) recently adopted a standard procedure for measuring the room-to-room attenuation factors of suspended acoustical ceilings. AMA tests have been performed on nearly every acoustical ceiling material. The results of the tests of Armstrong acoustical ceilings (as measured by Geiger & Hamme, Consultants in Acoustics) are shown in the table on the opposite page.

Tear out that page. Before you specify another acoustical ceiling for use above ceiling-height partitions, compare these test results with the AMA test results of any other materials under consideration. And, for a more comprehensive discussion of this whole problem, ask your Armstrong representative or your Armstrong acoustical contractor to show you the new color film, "Understanding Sound Transmission."

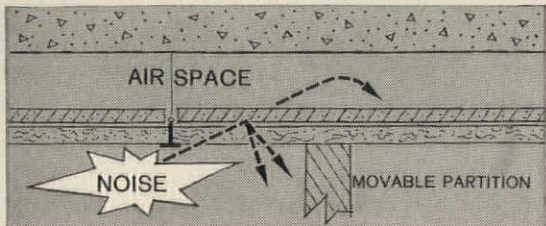
### Three ways to prevent sound-transmission problems



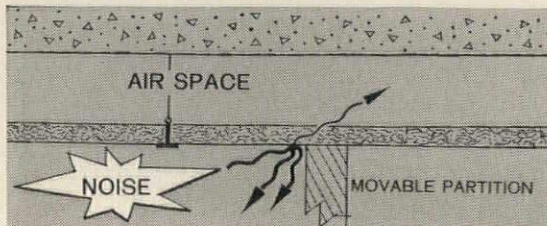
**PROBLEM:** With movable, ceiling-height partitions, serious sound-transmission problems can be created.



**1.** Extending the partitions upward to the floor slab destroys the partition's chief advantage—mobility.



**2.** Placing a layer of high-density gypsum board above the material is effective—but expensive.



**3.** Best solution is to select an acoustical material with good sound-transmission loss properties.

### Room-to-room attenuation factors (in decibels)—Armstrong Acoustical Ceilings

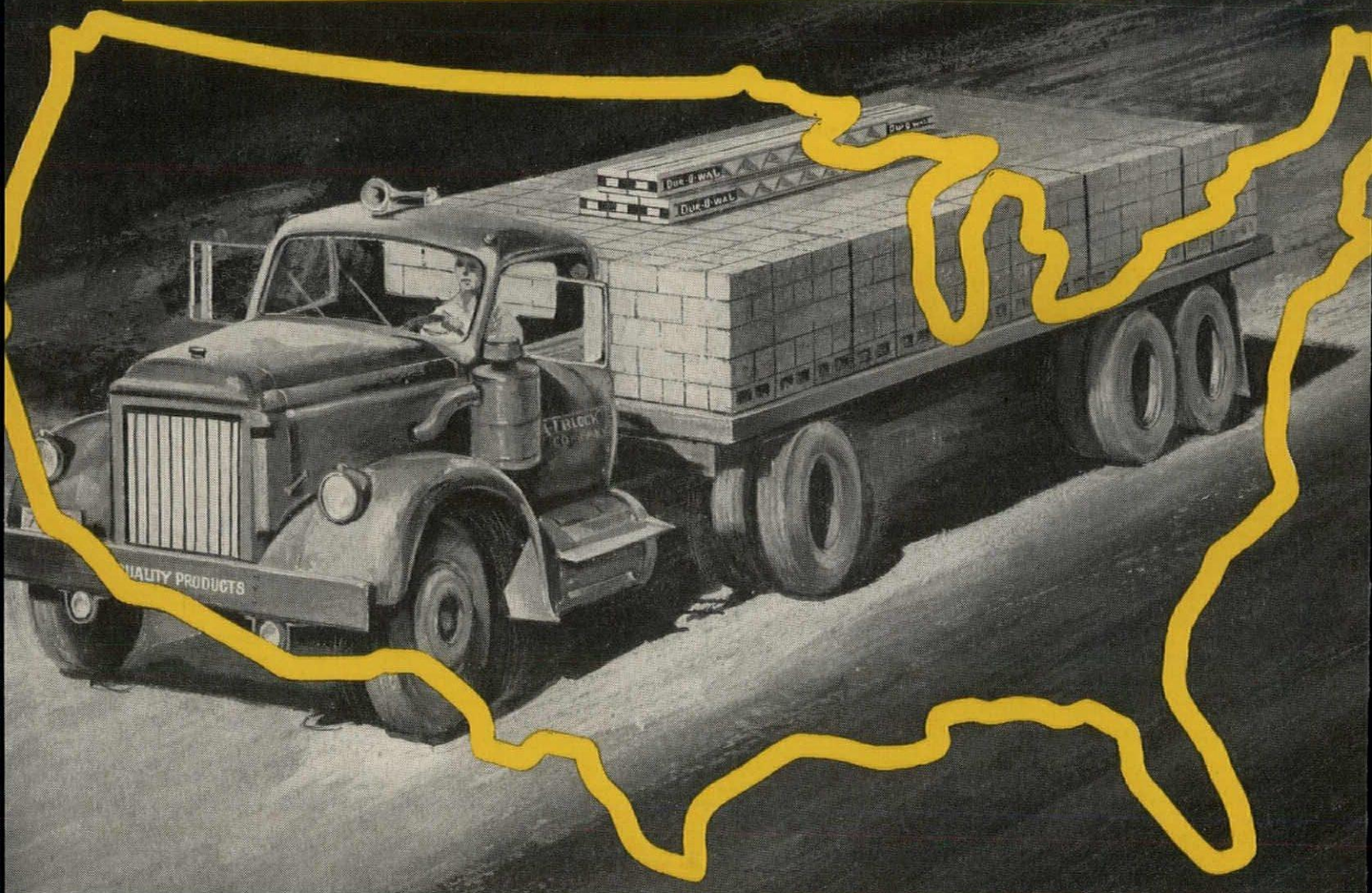
Frequency (in cycles per second)	Acoustical Fire Guard (12" x 12" x 5/8") A-7 FT*	Acoustical Fire Guard (12" x 12" x 3/4") A-8 FT*	Cushiontone (12" x 12" x 3/4") A-6 FT*	Minaboard (24" x 48" x 5/8") A-4 FT*	Travertone (12" x 12" x 3/4") A-9 FT*
125	31	27	29	24	29
177	32	34	27	31	31
250	29	29	29	28	25
354	33	34	35	31	26
500	36	39	40	35	28
707	39	44	45	37	29
1,000	44	50	50	43	32
1,414	51	58	56	50	37
2,000	57	57	56	54	42
2,828	60	59	58	57	50
4,000	59	54	49	56	55
Average attenuation factor	42.8	44.0	43.2	40.4	35.0

\* Geiger & Hamme Test Number

# Armstrong ACOUSTICAL CEILINGS

1860-1960 *Beginning our second century of progress*

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Fancy claims aside, this is the significant fact about Dur-o-wal: It is more widely wanted than any other type of masonry wall reinforcement.

Consequently, Dur-o-wal is more widely distributed—the *only* nationally distributed brand. Eight strategically located Dur-o-wal factories serve more than 8000 dealers who in turn serve every part of the United States. Wherever you build a ma-

sonry wall, you can get Dur-o-wal!

All this, of course, because Dur-o-wal—with its trussed design, butt-welded construction, scientifically deformed rods—obviously does the job. Standard Dur-o-wal used every second course adds 71 per cent flexural strength to a masonry wall. Get test facts from any of the Dur-o-wal locations below. See us in Sweet's Catalog.

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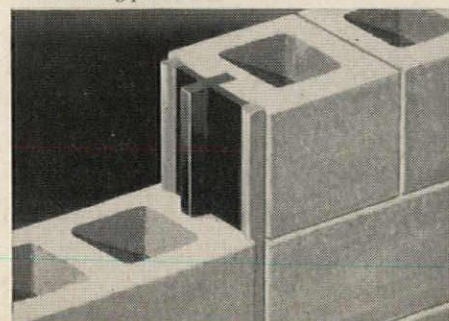
## Masonry Wall Reinforcement and Rapid Control Joints

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*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.*







—Drawn for the RECORD by Alan Dunn

“They’re home all right!”

### Mies Wins A.I.A. Gold Medal

Ludwig Mies van der Rohe, F.A.I.A., has won the 1960 Gold Medal of the American Institute of Architects. He was elected to receive the medal by the A.I.A.’s Board of Directors.



Mies will receive the award at the annual dinner on April 21, during the A.I.A.’s convention in San Francisco.

Mies, who was born in 1886 in Germany, came to this country in 1938. For some

years he was director of architecture at the Illinois Institute of Technology, where he designed many of the buildings. Among his other works are the 860 Lake Shore Drive Apartments in Chicago and the Seagram Building in New York (the latter in collaboration with Philip Johnson). Mies was the winner of the 1959 Royal Gold Medal for Architecture.

### Nervi Wins R.I.B.A. Gold Medal

Pier Luigi Nervi has been awarded the 1960 Royal Gold Medal for Archi-

itecture by the Royal Institute of British Architects. The Italian architect and engineer is noted particularly for his use of concrete. Among his works are: Flaminio Stadium, Rome; Stadium in Taormina, Sicily; Olympic Sports Palace, Rome (all AR, Dec., '58, pp. 107-118). He was engineer for the Palazzetto dello Sport, Rome (AR, May '58, pp. 207-209) and the UNESCO Headquarters, Paris (AR, Feb. '58, pp. 165-169). He is also the author of *Structures* published by F. W. Dodge Corporation).

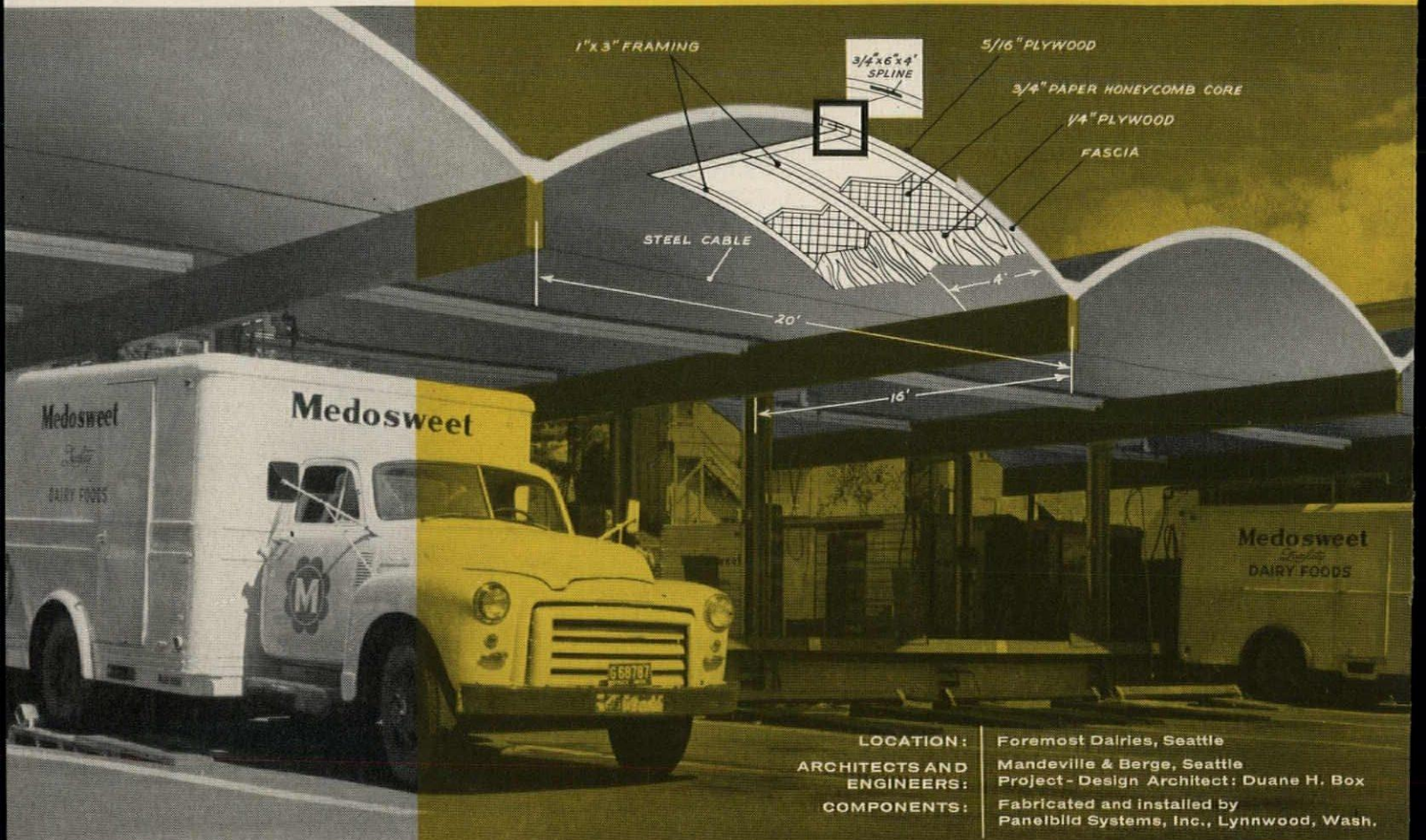
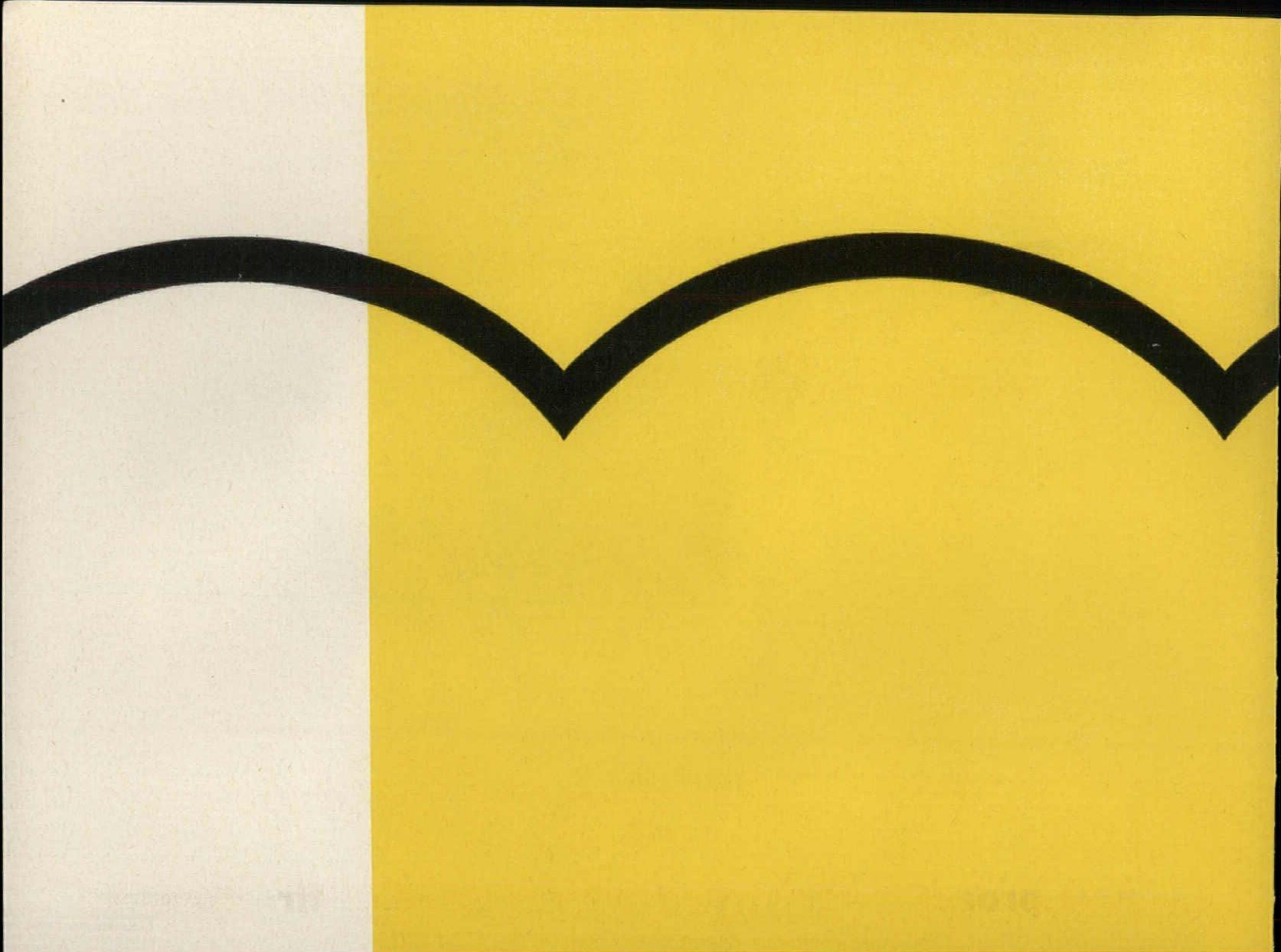
### A.I.A. Convention Preview

“Expanding Horizons” will be the general theme of next month’s annual convention of the American Institute of Architects, to be held in San Francisco (Mark Hopkins Hotel, April 18-22). The four major speakers will be: J. Robert Oppenheimer, director, Institute for Advanced Study, Princeton, N. J.; C. Northcote Parkinson, historian and author of *Parkinson’s Law*; Morton G. White, professor of philosophy, Harvard University; Wendell Bell, associate professor of sociology, University of California. Their talks will be related to architecture by

panels of architects whose members will include: Harry Weese, Henry Whitney, William W. Wurster, O’Neil Ford, George Fred Keck, Maynard Lyndon, Walter Netsch, Robert Alexander, Louis Kahn, Lawrence Anderson, and John Johansen. The convention program was worked out by a committee of the Northern California chapter under the chairmanship of Donn Emmons. A subcommittee formulated the professional program; its chairman was John Lyon Reid, and its members were Henry Schubart, William Stephen Allen, George Rockrise, Ezra Ehrenkrantz, and Elisabeth Kendall Thompson, senior editor and Western editor, ARCHITECTURAL RECORD.

In addition to the presentation of the 1960 Gold Medal to Ludwig Mies van der Rohe (see above), a number of other important awards will be conferred. The Allied Professions Medal will be presented to Francis Gibbs, partner in the New York firm of Gibbs & Cox, naval architects and marine engineers. The Edward C. Kemper Award for service to the Institute will be conferred on Philip D. Creer, F.A.I.A., partner in Creer & Roessner, Austin, Texas.

First recipient of a new annual award for architectural photography is to be Roger Sturtevant of San



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DAIRY FOODS

**LOCATION:** Foremost Dairies, Seattle  
**ARCHITECTS AND ENGINEERS:** Mandeville & Berge, Seattle  
**PROJECT - DESIGN ARCHITECT:** Duane H. Box  
**COMPONENTS:** Fabricated and installed by Panelbld Systems, Inc., Lynnwood, Wash.



## new approaches to structural design with fir plywood



THE GRACEFUL, repetitively curved roof of this loading dock translates an ancient architectural shape—the arch—into today's idiom with modern lightweight fir plywood components.

The floating, airy profile is deceptive. Actually, the roof has extremely high resistance to vertical loading. Construction went fast because of the large size of prefabricated plywood components, and in-place cost was substantially less than thin-shell concrete or a conventionally framed flat roof with the same span.

Capitalizing on fir plywood's high strength and workability, the vaulted roof system offers wide design flexibility through variations in radius, span and number of arches. The distinctive roofline is appearing on more and more schools, commercial buildings and homes.

In this application, 12 bays, 20 x 40 ft., and two half bays shelter 48 loading stations along a 260-ft. conveyor platform. Vault supports are beams and steel columns. Roof components are 4 x 13-ft. curved stressed skin fir plywood panels, used in pairs (spline jointed at midpoint of the vault) to form an arch with a 16-ft. radius and a 2½-ft. rise.

For basic design data on fir plywood or information about fir plywood components, write to Douglas Fir Plywood Association, Tacoma 2, Washington. (Offer good USA only.)



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## Meetings and Miscellany

Francisco. (Ken Hedrich, also an architectural photographer, received the Fine Arts Medal last year.) The 1960 Fine Arts Medal will be awarded to Thomas Hart Benton, painter, and the Craftsmanship Medal to William L. DeMatteo, silversmith.

Five foreign architects will be installed as Honorary Fellows. They are: Henrique E. Mindlin, Brazil; Santiago Agurto Calvo, Peru; Robin Boyd, Australia; Jose Gnecco-Fallon, Colombia; Hideo Futami, Japan. Also, Honorary Memberships will be awarded to four non-architects: Shirley Cooper, assistant executive secretary, American Association of School Administrators; James H. Douglas, Deputy Secretary of Defense; Raymond R. Tucker, mayor of St. Louis; Sir Leslie Monro of New Zealand, Ambassador to the United States and permanent representative to the United Nations.

### Worth the Winning

INTERNATIONAL COMPETITION FOR THE DESIGN OF A LIBRARY FOR TRINITY COLLEGE, DUBLIN. Trinity College plans a \$1.4-million extension to its existing 18th-century library; a harmonizing contemporary design is hoped for. The one-stage competition will be held under the rules of the Federation Internationale des Architectes. Members of the jury: Keyes DeWitt Metcalf, director, Harvard University Library; Sir Hugh Casson, professor of interior design, Royal College of Art, London;

Franco Albini, professor of architecture, Venice; Raymond McGrath, principal architect, Office of Public Works, Dublin. First, second, and third prizes: sterling equivalents of \$4200, \$2100, and \$1400 (the winner will receive a total of about \$65,000, including all fees). Judgment will be held next November. Details from: American Council for Trinity College, Dublin, 53 E. 93rd St., New York 28.

NATIONAL INSTITUTE FOR ARCHITECTURAL EDUCATION NATIONAL SPRING TERM COMPETITIONS. Three problems: *Elementary* (for students with at least two years of design study)—“A Gazebo in the Modern Manner”; Tile Council of America Prizes of two scholarships of \$500 each. *Intermediate* (for students and draftsmen with three and four years of training in architecture)—“A Coffee House on the Left Bank”; Kenneth M. Murchison Prize of \$150. *Advanced* (for graduating and post-graduate students or draftsmen)—“An Opera House”; Hirons Alumni Prize of \$200. A problem must be executed in any 10 consecutive days before May 16. Details from: National Institute for Architectural Education, 115 E. 40th St., New York 16.

PRATT INSTITUTE, SCHOOL OF ARCHITECTURE: the Frederic P. Wiedersum Grant of \$500. This new award, sponsored by the architectural firm of Frederic P. Wiedersum Associates, will be presented annually to an upper-class student of the School.

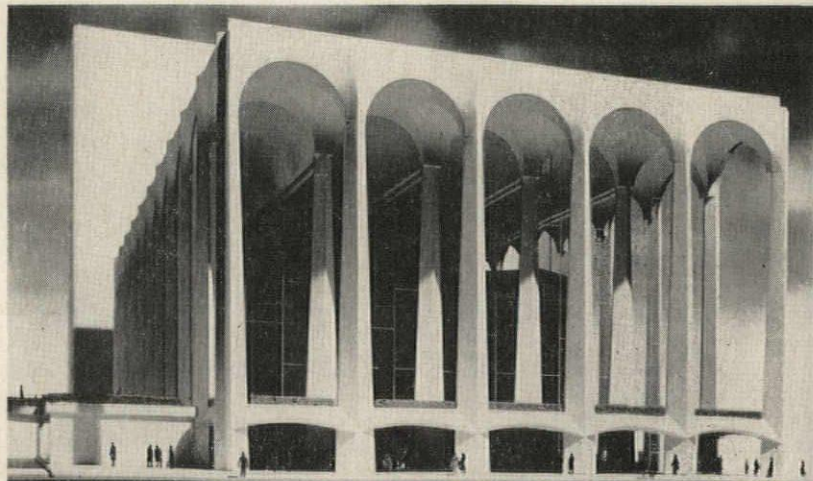
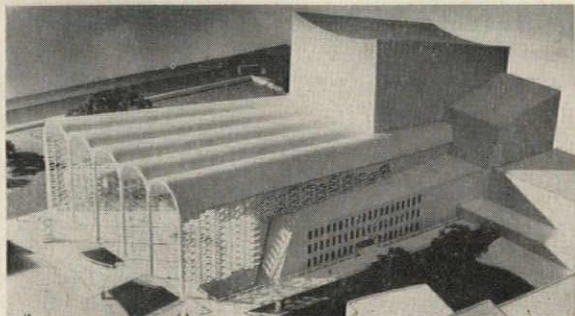
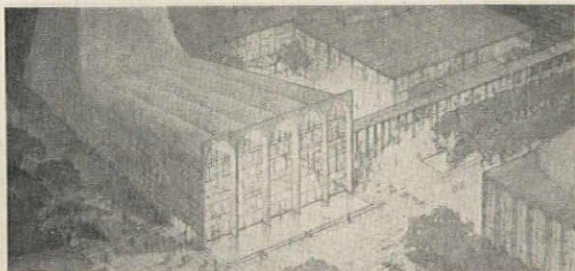
### MAJOR CURRENT COMPETITIONS

- National Competition for Designer-Craftsmen (Feb., p. 28)
- Second Annual Copper and Brass Achievement Award (Feb., p. 28)
- National Institute for Architectural Education National Spring Term Competitions (see above)
- Second Annual \$25,000 Mastic Tile Architects' Competition (Jan., p. 25)
- 13th Annual Engineering Undergraduate Award and Scholarship Design Program, (Feb., p. 28)
- International Competition for the Design of a Library for Trinity College, Dublin (see above)

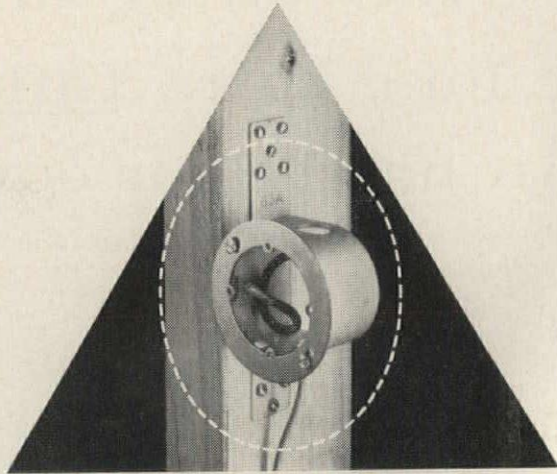
### Mason Wins Fitzpatrick Award

U. S. Housing Administrator Norman P. Mason has been named the first recipient of the newly established F. Stuart Fitzpatrick Memorial Award in recognition of his “outstanding individual achievement in the unification of the building industry.”

The F. Stuart Fitzpatrick Memorial Award was established last fall under the sponsorship of the American Institute of Architects, Building Research Institute, Producers' Council, Associated General Contractors, and National Association of Home Builders. The award honors the memory of Mr. Fitzpatrick, for 25 years manager of the construction and civic development department of the U. S. Chamber of Commerce and widely known and respected throughout the building industry.



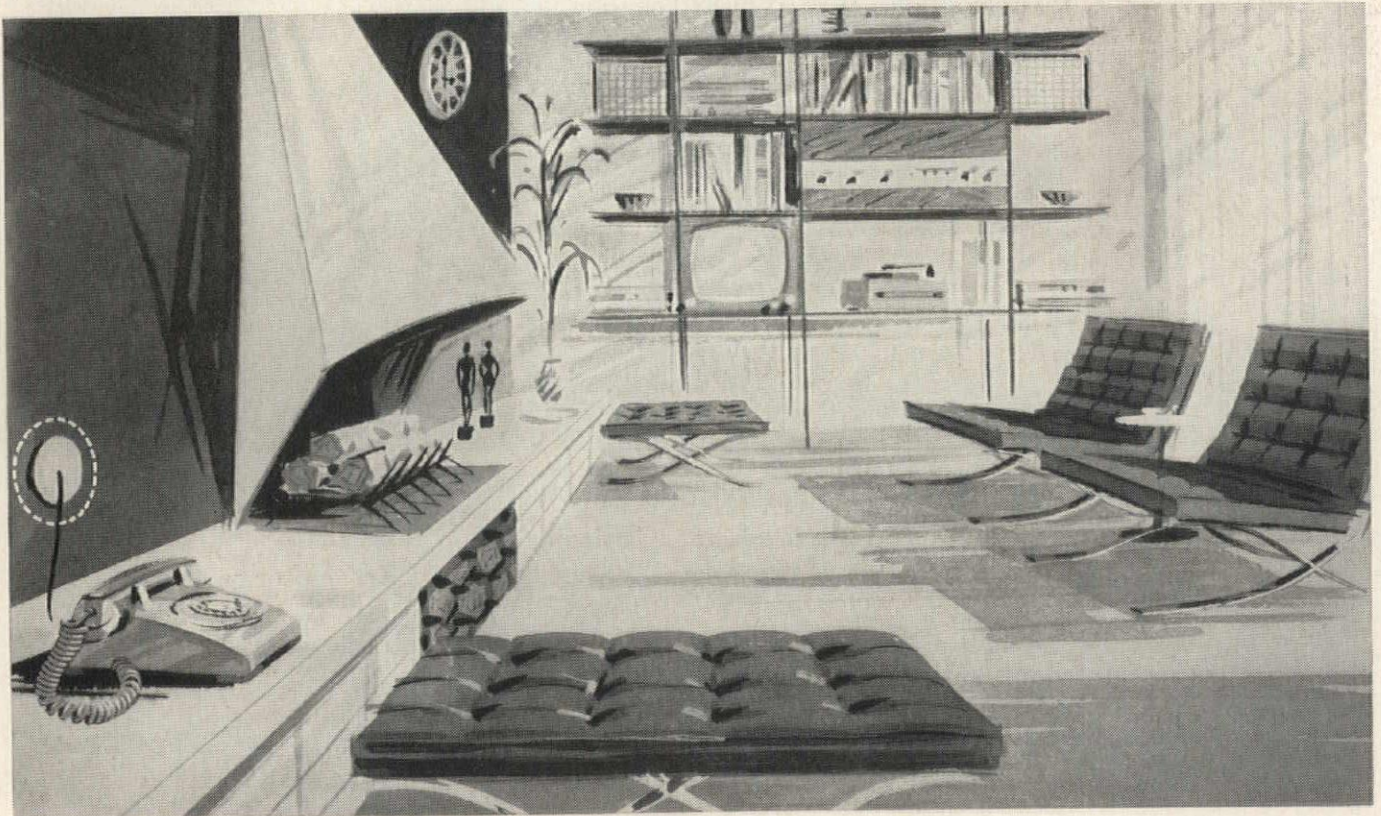
Above: A model of the latest conception—still subject to final approval—of the exterior of the new Metropolitan Opera House (Wallace K. Harrison, architect), to be constructed as part of New York's Lincoln Center for the Performing Arts. Left: Two earlier conceptions



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For details of home installations, see Sweet's Light Construction File, 11c/Be.

*Bell Telephone System*



**"Gulistan makes the setting sumptuous!  
And in the long run...Gulistan  
costs less than hard-floor coverings,"**

says **MITCHELL R. HOUSEY**, Proprietor, Maison Riviera Restaurant, Detroit, Michigan



Maison Riviera Restaurant. Custom carpet by Joseph C. Raymond, Interior Designer. Installed by Englander Furniture Shops, Inc.

*"We spared no expense in decorating this luxurious restaurant. But Gulistan actually keeps expenses down—it wears so well."*

With all these advantages—beauty, long wear, permanent mothproofing, soundproofing, safety—Gulistan needs so little care it cuts costs of floor

maintenance up to 50% over other kinds of flooring. In limitless colors and original designs. Ask your Gulistan dealer about them. Or let us work out a one-of-a-kind design carpet for you.

More distinguished restaurants, hotels, theaters, banks choose Gulistan than any other carpeting.

Write: Commercial Department AR-3, A. & M. Karagheusian, Inc., 295 Fifth Avenue, New York 16, N. Y.



**wood folding doors**  
*can be finished to go with  
 any color scheme*

CUYAHOGA SAVINGS AND LOAN ASSOCIATION OFFICE, ARCHITECTS:  
 DALTON & DALTON & ASSOCIATES, BUILDER: LEO W. SCHMIDT CO. INC.

Builder friends tell us, "The nice thing about PELLA WOOD FOLDING DOORS is the way they can be finished right on the job". Of course, you can also get them factory-finished in rich, genuine grains of **AMERICAN WALNUT, ASH, BIRCH, PHILIPPINE MAHOGANY, OAK and PINE.** PELLA WOOD FOLDING DOORS feature solid wood "Lamicor" construction to pre-

vent warping, and steel spring hinges give them their "live-action" operation. So, whether you paint them or install factory-finished units, your customer will like living with PELLA DOORS. For nearest U.S. or Canadian distributor consult your Classified Telephone Directory.

**ROLSCREEN COMPANY, Pella, Iowa**

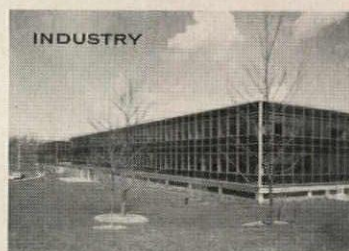
U. S.-Prepared Design Show  
Tours Indian Cities

International cooperation to further good design is exemplified in an exhibition now touring nine cities in India. "Design Today in America and Europe" opened last spring in New Delhi (where more than 100,000 people saw it); at the end of the tour, about a year from now, the objects shown will be used by the Indian government as the nucleus of a permanent design exhibition.



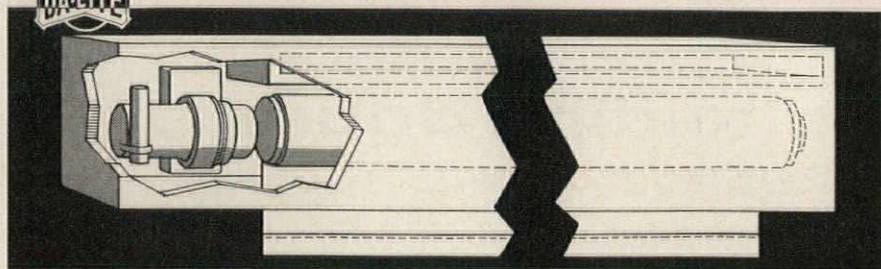
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Electrically-Operated  
Projection Screen  
Pre-engineered For Concealed Installation



The most practical product an architect ever specified! The exclusive Da-Lite Electrol® projection screen—enclosed at the factory for simplified on-job installation. Screen may be installed in a concealed position—or mounted on wall and finished to match. Da-Lite Electrol is ready for use seconds after control button is touched.

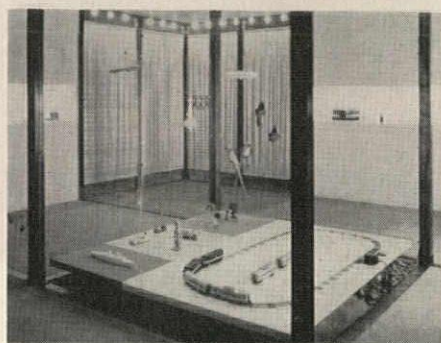
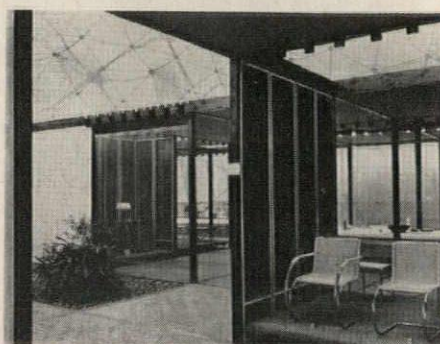
Da-Lite's quality-controlled projection screens are your assurance of years of trouble-free service. For over half a century, Da-Lite has built a reputation as the finest in projection screens for theatres, auditoriums and conference rooms!



Electrol Screens feature Da-Lite's famous White Magic glass-beaded screen fabric. Permits big-picture vision . . . with beautiful clarity and color. Specially-engineered electric motors are totally sealed, require no further lubrication. Screens are completely assembled at factory. Control switch and plate furnished.

**WRITE TODAY!**  
New technical bulletin gives complete details on operation and installation of electrically-operated Da-Lite projection screens and portable tripod models.

**Da-Lite®**  
SCREEN COMPANY, INC., WARSAW, INDIANA



The National Small Industries Corporation, part of India's Ministry of Commerce, requested the show to focus attention on the problem of product design in terms of India's rapidly developing small-scale industry. The U. S. government, through the USIA, provided one of Buckminster Fuller's geodesic domes to house it, and the Ford Foundation financed it. The 350 objects were selected by New York's Museum of Modern Art. George Nelson & Company designed the installation.

more news on page 44





Architect: Minoru Yamasaki and Associates. General Contractor: Darin and Armstrong, Inc.

## Reynolds "Jewel on Stilts" has INLOCK<sup>®</sup> leakproof gaskets

Dramatizing the multiplicity of uses for aluminum, the dazzling new Detroit headquarters building for the Great Lakes Sales Region of Reynolds Metals Company has Inlock Neoprene Structural Gaskets to protect its beauty against leaks permanently.

**Scintillating with aluminum** throughout, the nickname "jewel on stilts" fits perfectly. A major feature is the gold anodized sun screen on all four sides of the upper floors. Back of the screen, the curtain walls are leakproof with H-Type Inlock Gaskets.

**Leaks are locked out** by the separate filler strip which zips into place quickly. There's an everlasting pressure on the sealing edges, with no local pressure points. All joints and corners are injection molded.

**Unusual savings** are possible on maintenance costs with Inlock gaskets. They eliminate painting and recaulking, outmode mastic glazing methods. And installation from inside or outside is simple.

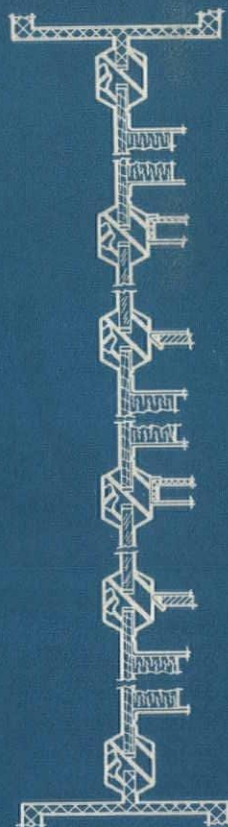
**Write or phone us** about your sealing problem. We will design a gasket to solve it perfectly. Inlock functional designs are patented, cannot be copied or duplicated. Send for latest catalog with many standard sections. Write Inland Manufacturing Division, 2748 Inland Ave., Dayton, Ohio.

Specify . . .

**INLOCK<sup>®</sup>**  
**NEOPRENE STRUCTURAL GASKET**



INLAND MANUFACTURING DIVISION  
 General Motors Corporation, Dayton, Ohio



One continuous Inlock Gasket, over 25 feet in length, at each vertical mullion—joins glass and panel sections of the 2nd and 3rd floors.

# 7 ways AIRCOUSTAT<sup>®</sup> can save you time and money

## Sound Traps . . . with Guaranteed Results



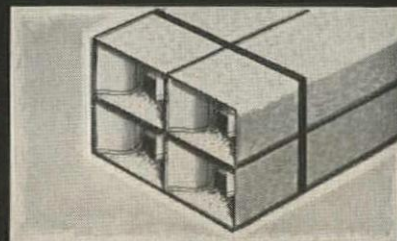
**1) Easy to select**—Just 3 steps to specify proper model. Save time, avoid errors.



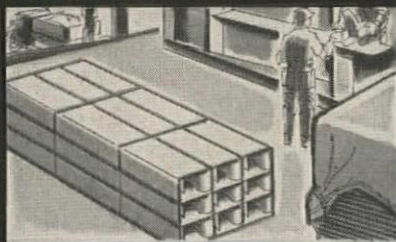
**2) Easy to handle**—No riggers or special equipment needed. Large units composed at job site.



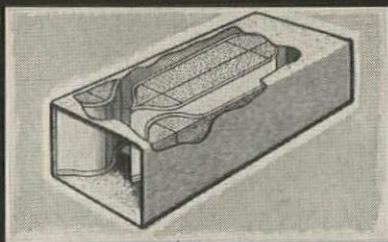
**3) Easy to install**—Units are installed the same as ductwork. Units have 2" extensions.



**4) Fits all duct sizes**—Big units are easily assembled from small Aircoustat units.



**5) No storage problem**—Units are delivered right to the job site, ready to install.



**6) No maintenance**—Units are fire-resistant, dust-proof and built to last a lifetime.



**7) Guaranteed results**—Solves every noise reduction problem. Units are completely reliable.

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AIRCOUSTAT selection is quick, simple and reliable. A choice of over 60 stock models, fabricated in 6 lengths, solves every noise

reduction problem. AIRCOUSTAT is built to give a lifetime of maintenance-free service.

Write today for your copy of the AIRCOUSTAT Selection Manual, a quick guide to the right unit or combination of AIRCOUSTAT units to eliminate duct-transmitted noise in all air handling systems. Write KOPPERS COMPANY, INC., Sound Control Department, 3003 Scott Street, Baltimore 3, Maryland.



## SOUND CONTROL

METAL PRODUCTS DIVISION

Engineered Products Sold with Service



## Denver banks on **terrazzo** for lasting beauty

The beauty of this floor at the Denver United States National Bank will last the life of the building, because it's colorful, durable terrazzo. Concrete-hard terrazzo stays new-looking in spite of heavy traffic. Maintenance costs are low, too, because terrazzo is so easy to clean. No refinishing, waxing or buffing. Savings of at least 20¢ per sq. ft. per year in cleaning can be realized.

And for this terrazzo installation, the specification was ATLAS WHITE portland cement. Its uniform whiteness helps bring out the true color tone of aggregates and pigments. Complies, too, with ASTM and Federal Specifications. For more information on the use of ATLAS WHITE in terrazzo, write: Universal Atlas Cement, 100 Park Avenue, New York 17, N. Y.



Denver United States National Bank — Architect: James Sudler Associates, Denver. Associated Designers: Maria Bergson Associates, New York. Contractor: N. G. Pety Construction Co., Denver. Terrazzo Contractor: J. B. Martina Mosaic Co., Denver.

WT-91



**Universal Atlas Cement**  
Division of  
**United States Steel**

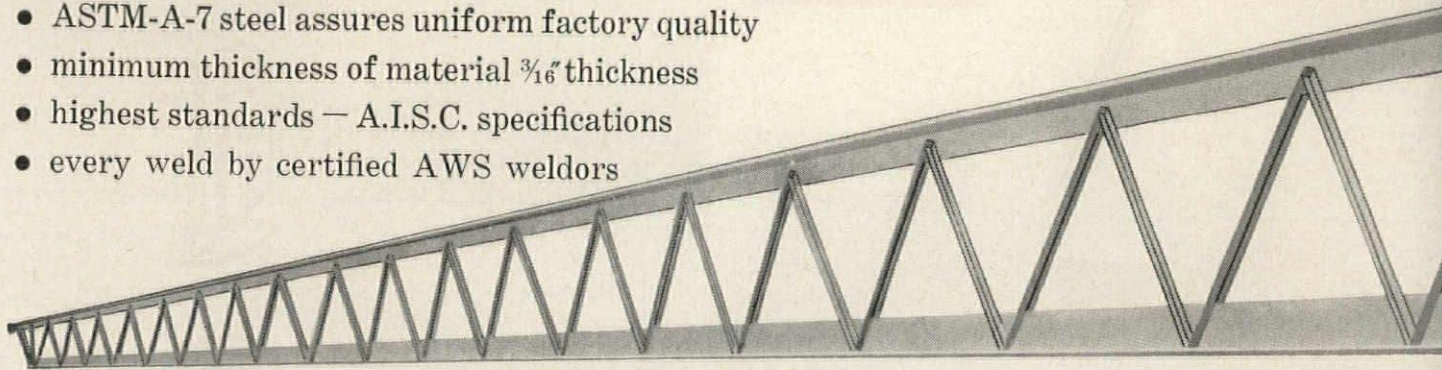
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1950: 65 feet long . . . 1955: 125 feet long . . .

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- modern T-Chord\* construction
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- ASTM-A-7 steel assures uniform factory quality
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- every weld by certified AWS weldors



*Opens new horizons for you in planning larger clearspan, column-free interiors.*

\*T.M. Reg.

**NEW *Young* DAMPER REGULATOR**

**withstands pressures to 50 psi**

This damper regulator, Model 409RD with #419RD end bearing, is designed specifically for ducts carrying high pressures or low vacuums.

The unit is capable of withstanding pressures of 50 lbs. per sq. inch without leakage. It is easily installed in round ducts from 4" to 8" in diameter.

Another regulator, Model 409FD with #419FD end bearing, can be installed in rectangular ducts or round ducts over 8" in diameter.

Write for detailed information.

See our catalog in Sweet's Architectural File.

**YOUNG REGULATOR COMPANY**  
20910 Miles Ave., Cleveland 28, Ohio



## *The Record Reports*

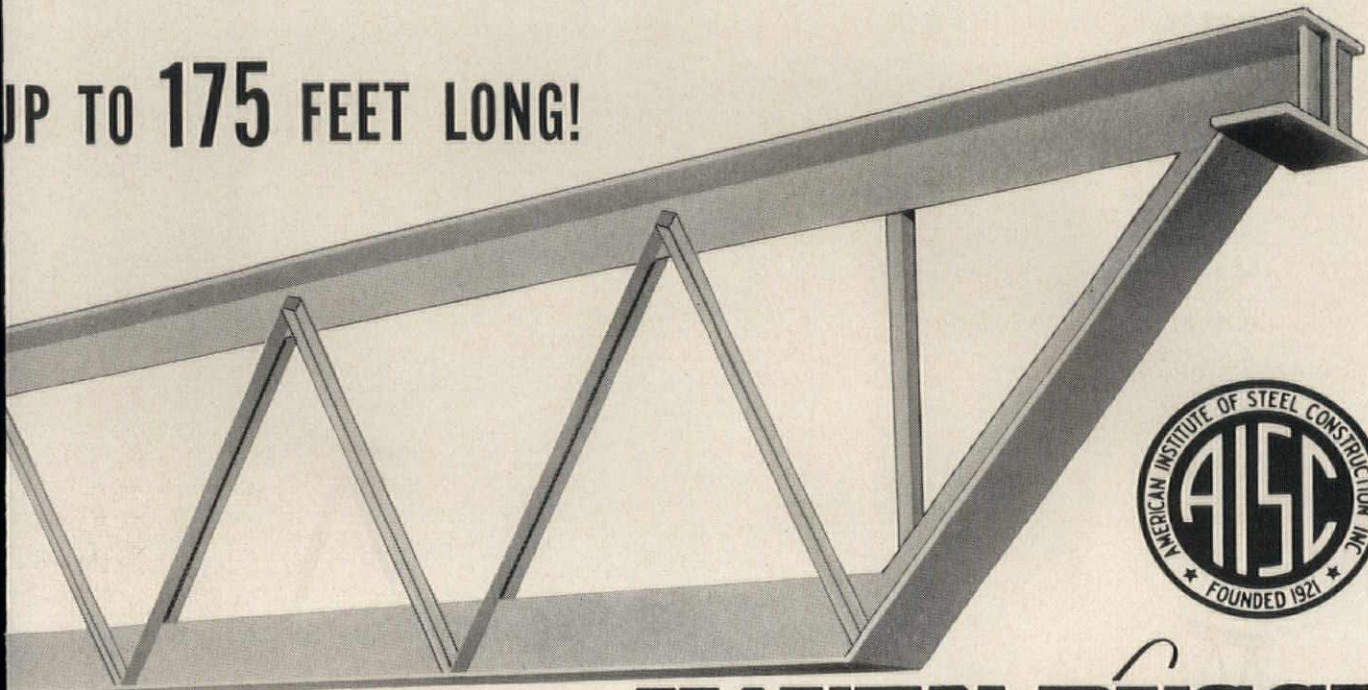
### Revised Zoning for New York Backed by City's Architects

Progress is being made on the immensely complicated job of framing a new zoning resolution for New York. There is widespread agreement that the present intricate, much-amended regulations dating from 1916 need to be replaced by a simplified set of rules intended to make possible more architectural variety, less crowding of people and automobiles, and more logical land use; but there is much less unanimity on how this is to be accomplished.

A proposed new resolution and detailed explanations were published a year ago in a 376-page report prepared for the City Planning Commission (James Felt, chairman) by Voorhees Walker Smith & Smith (now Voorhees Walker Smith Smith & Haines), New York architects who were special consultants to the revision. (See AR, April, '59, pp. 32, 36.)

Since then, the VWS&S report has been the object of detailed, intensive study by interested groups. The New York Chapter, American Institute of Architects, has now issued a 57-page report, based on months of study of the proposed new resolution. The report, which endorses the VWS&S proposals, presents the chapter's analysis of them and describes its recommendations for changes. The

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report was reviewed and endorsed by the Architects Council of New York City, composed of the A.I.A. chapters for the five boroughs and the Brooklyn Society of Architects and New York Society of Architects. The document was prepared by the New York Chapter's civic design committee (G. Harmon Gurney, chairman), through its special subcommittee on zoning. (The Metropolitan Association of Real Estate Boards, however, issued a strongly critical analysis—without counter-proposals—of the VWS&S proposals.)

Also in December, the City Planning Commission made public its proposed new zoning resolution, based on the VWS&S concepts, but containing many changes in both text and mapping. Hearings are to be held this month on this proposed resolution. Meanwhile, the organized architects of the city are planning to issue a statement on it. It seems likely that New York will get new and improved zoning fairly soon.

In general, the changes advocated in the two documents are of a detailed nature, intended both to add flexibility and to meet specific criticisms.

*more news on page 48*



J. Linerd Conarroe, Architect  
Chestnut Hill, Pa.

### For Enduring Charm

*... Specify*

Architectural METAL WORK  
by Fiske

Aluminum, Bronze,  
Stainless Steel and Iron

J. W. Fiske ARCHITECTURAL METALS, Inc.

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## Flexible wiring system for Jacksonville City Hall with SPANG

Underfloor Duct and Headerduct. Three-duct runs of Underfloor Duct in concrete slab construction carry electrical, phone and intercom wiring on first floor. Upper 15 floors are served by Headerduct in cellular-floor construction. Simplicity of Spang Raceway Systems provided a time-saving, trouble-free installation. Future wiring changes can be made quickly, easily without costly reconstruction, making City Hall modern for years to come. For full information, write to Spang.

Architect: Reynolds, Smith & Hills, Jacksonville  
 General Contractor: The Auchter Company, Jacksonville  
 Mechanical Contractor: Henley and Beckwith, Jacksonville  
 Electrical Contractor: Wesley Paxson Co., Jacksonville  
 Spang Distributor: Ace Electric Supply, Jacksonville



**THE NATIONAL SUPPLY COMPANY**

Two Gateway Center, Pittsburgh 22, Pennsylvania  
 Subsidiary of Armco Steel Corporation



## PRESTRESSED CONCRETE IN OUR 50th STATE

Owner, Developer and Contractor: Hawaiian Land Co., Ltd. Architects & Engineers: John Graham and Co. Prestressed Consultants: Ben C. Gerwick, Inc., San Francisco; Anderson, Birkeland & Anderson, Tacoma; Park & Yee, Honolulu Prestressed Concrete Fabricator: Hawaiian Dredging and Construction Co.



### ...HONOLULU SHOPPING CENTER WILL BE ONE OF NATION'S BIGGEST

All told, this huge complex — named Ala Moana — will cover 50 acres, have parking space for 7,000 cars and will cost some \$39,500,000 on completion of phase 2, including the 25-floor office building, 1441 Kapiolani.

The use of prestressed concrete is widespread; in the beams, girders and joists for the parking deck and the 25-floor office building, in street curbing, bumper strips in the parking areas, in lamp posts and in prestressed concrete piles which serve both as foundations and columns supporting the parking deck and mall level shops.

Like all good members of the national "family," the Ala Moana developers turned to the mainland for the ultimate in stress-relieved prestressing strand for the critical members in their project; in this case manufactured by Roebing.

For over a decade, the activities of Roebing in the prestressed concrete field have embraced all phases of this remarkable and economically rewarding construction method. Architects, engineers and builders have found — in many States, both old and new — that the quality of Roebing strand, as well as the quality of Roebing engineering

assistance, can't be had — for the same satisfaction — from anywhere else in the world.

We are immediately desirous of sharing with you our information, experience and data on prestressed concrete in all of its fascinating areas. Please address inquiries to Roebing's Construction Materials Division, Trenton 2, New Jersey.

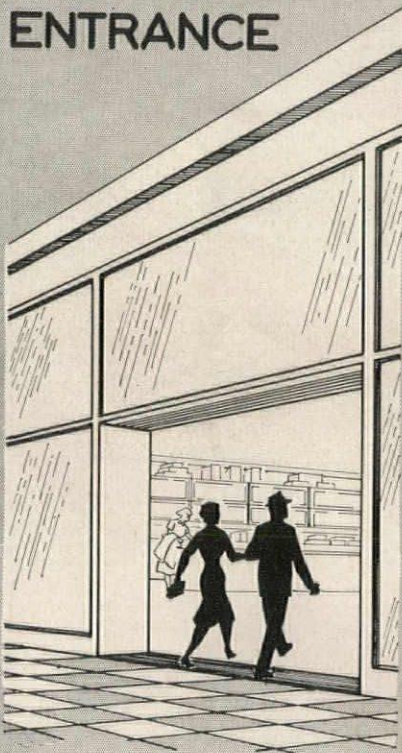
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## The Record Reports

### Pilot Development is Based On Studies by Architects

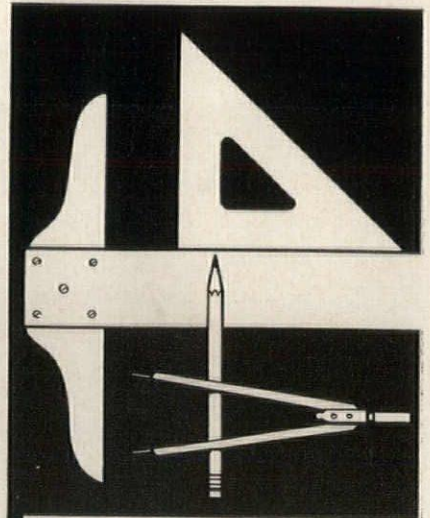
A residential community scheduled to be built on the outskirts of Pittsburgh is the result of a comprehensive program of research and planning by architects and other experts. East Hills, as the community is called, will consist of 1680 dwelling units of four types, and community facilities; the total area is 140 acres.

The development was initiated by ACTION-Housing, Inc., of Pittsburgh. That group asked ACTION of New York to prepare a report on housing needs in the Pittsburgh area. The Pittsburgh organization also commissioned a team of distinguished architects and planners to evolve a prospectus for the East Hills demonstration specifically. The members of the team were: B. Kenneth Johnstone, Pittsburgh architect and member of ACTION-Housing's board; Carl Koch and Gardner Ertman of Carl Koch and Associates, Inc.; José Luis Sert of Sert, Jackson and Gourley; Walter Gropius and Donald C. Freeman of The Architects Collaborative. Development and planning consultants were: Burnham Kelly, professor of city planning at M.I.T., and Martin Meyerson, vice president for research of ACTION and author of the report on Pittsburgh housing needs.

A key paragraph in the prospectus says: "The development will demonstrate the gains in design and construction that may be realized when designers are freed, within reasonable limits, from the restrictive provisions of conventional land and building regulations and controls. Innovations in materials, construction systems, services, and the use of labor will be encouraged throughout to the extent that they are tested and ready for large-scale construction. In the case of 250 units, provision will be made for the use of basic new approaches to overall housing design."

This demonstration development will thus consist of town houses, detached houses, walk-up apartments, and elevator apartments, grouped in four major areas. Rental units will be included, as well as units for sale.

more news on page 60



### Tips on savings in restaurant design . . .

Save money for your clients by creating modern restaurant plans that use paper—the personal food service.

All-paper food service makes *the big difference* in the cost of constructing and operating all types of food service operations. It reduces the capital investment required for cubage as well as kitchen equipment. Dishwashing and breakage are eliminated and service is faster where paper is used. But you will want to learn more, so—

#### WRITE FOR THIS BOOK



Get this 60-page manual of helpful information on all phases of food service, with cost studies and case histories of money-saving ideas from hundreds of restaurants and institutions. Write on your letterhead for a copy.

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**PAPER**

the personal  
food service



**"Most durable umbrella a store ever had"**  
 said the contractor about the Revere Copper Roof on  
**McInerny's Waikiki**  
 on the grounds of the Royal Hawaiian Hotel, Honolulu, Hawaii



**35,000 lbs. of Revere Cold Rolled 16 oz. Copper applied by Oahu Plumbing & Sheet Metal, Ltd.**

"As far as we know, this is the only specialty store of men's women's and children's apparel and accessories in the world with an all-copper roof," continued Mr. Francis F. Sen, President of Oahu Plumbing & Sheet Metal, Ltd. The roof is the batten seam type with the roof pans being prefabricated in our shop. The installation was made in accordance with recommendations made by Revere in their booklet, "Copper and Common Sense."

"Because of its exceptional flexibility in design we notice that more and more all-copper roofs are being specified by architects and designers who are seeking something different.

"This pleases us because we prefer to work with copper. It is easily soldered, and can be readily fabricated into any desired shape or form. You can do such a neat-looking job with copper."

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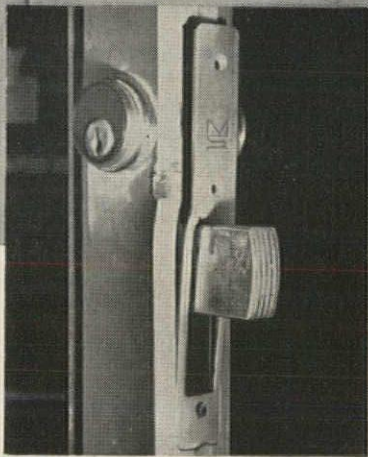


**ENTRANCE TO THE** fabulous McInerny Waikiki Store. Known as "The Jewel of the Pacific," it is one of the show places of the world, and is in Honolulu, Hawaii. Note how copper gutters blend into roof line; also unique treatment of down spouts (arrows).

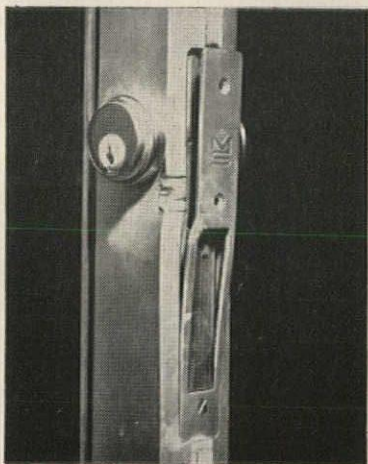


**MOST UNUSUAL ROOF EFFECT** is obtained by running batten seams on the diagonal. Copper was furnished by Revere Copper and Brass Incorporated. Architect: VLADIMIR OSSIPOFF, F.A.I.A.

no forced entry! protection...



Large photo shows door stile twisted by attempted burglary with MS Deadlock still holding • Lower photos reveal MS Deadlock in thrown and retracted position still operative.



This door stile was destroyed in a forced entry attempt...but *Maximum Security Lock held fast!*

Burglars attempted to force entry through nine store front doors in a Phoenix, Ariz., shopping center, but failed in each try because doors were guarded by Adams-Rite Maximum Security Locks, which made forced entry impossible without complete destruction of the stile or jamb.

These stores were saved from burglary because of the unique design of the MS Deadlock. Unlike standard lock bolts that vacate the lock when projected, the MS features a counterbalanced bolt with as much of the bolt retained within the lock stile as is projected. Thus a laminated bar of hardened steel bridges the opening between the stile and the jamb. The MS bolt cannot be forced out of the lock stile and burglars have found it impractical to cut through it.

Because of the greater protection that Adams-Rite Maximum Security locks afford, over 90% of the manufacturers of narrow-stile swinging doors use Adams-Rite locking devices on one or more of their products!

To give your client the maximum protection with beauty be sure to specify Adams-Rite Maximum Security locks for his narrow-stile aluminum swinging glass entrance doors.

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**in new Wood Hues**

Dramatic, modern design demands the complement of Matico—the truly modern flooring. That's why so many astute architects specify Matico's Wood Hues for their office designs. For here is the naturalness of wood expressed in a modern material that is easy to maintain, long on wear, low in cost. Available in both vinyl-asbestos and asphalt tile. For full details, mail the coupon below.

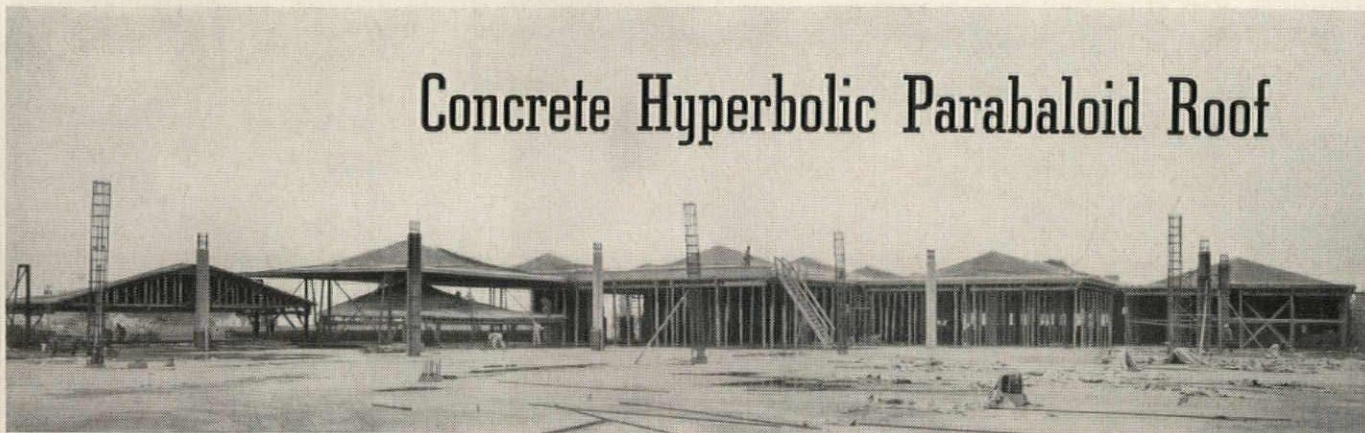
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Forward details and specification data on new Matico Wood Hues.

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# Concrete Hyperbolic Paraboloid Roof



Partially completed fireproof shopping center. Each of the 44 umbrella units is 48'6" x 46'3" and is supported by a single column. The completed building is 196' x 511'.

## Provides Large Unobstructed Floor Areas

At Bloomington, Minnesota, this new shopping center has been completed employing a very modern concrete hyperbolic paraboloid roof design—the first of its kind in the Minneapolis area. This type of roof design for single story structures provides large unobstructed floor areas at low cost.

Contractor planning on the job was precise. Careful scheduling and the use of Lehigh Early Strength Cement made

it possible to strip and re-use the unique concrete form system in less than half the time which would have been required with regular cement. Only four sets of forms were needed. Eight units—or bays—were poured per week.

This is another example of the advantages of Lehigh Early Strength Cement and modern concrete construction. Lehigh Portland Cement Company, Allentown, Pa.

## LEHIGH CEMENTS

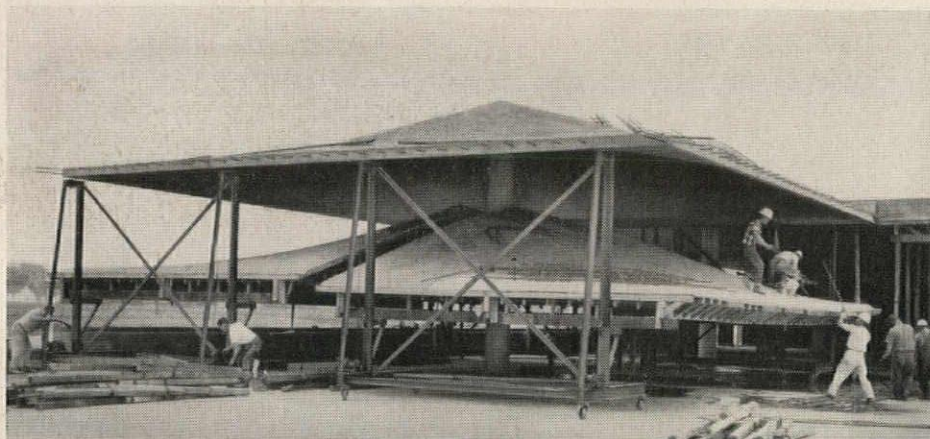
*Owner:* Bloomington Development Co.,  
Bloomington, Minn.

*Architects:* Manuel Morris & Robert E. Sixta  
Assoc., Kansas City, Mo.

*Structural Engr.:* Dutton Biggs,  
Kansas City, Mo.

*Contractor:* George Madsen Construction Co.,  
Minneapolis, Minn.

*Ready Mix Concrete:* Twin City Ready Mix  
Concrete Co., Minneapolis, Minn.



As set of forms is lowered, workmen place supplies of reinforcing on it. Form serves as elevator to carry bars to roof for assembly. Each half of the form weighs 4 tons. Four sets of forms were used cyclically for an efficient construction schedule.

Other workmen prepare reinforcing for more roof sections on top of completed concrete "dunes." Concrete shell is 3" thick.

# Climate by Chrysler



2 Park Avenue, New York City. Consulting Engineers: Sears and Kopf; Mechanical Contractor: Kennedy-Scheidel-Young, Inc.; Electrical Contractor: Theodore Kaish, Inc.

## Chrysler Air Conditioning tailored to tenant needs installed a floor at a time in 27-story building

During the past five years, scores of Chrysler air conditioners have been installed at 2 Park Avenue, New York City. What has been one of the longest air conditioning jobs in history has also been one of the most successful.

By handling this 27-story building zone by zone and floor by floor, about 1400 tons of Chrysler equipment have been installed . . . with an absolute minimum of inconvenience to tenants. As tenants move in or renew leases, they are consulted as to exact air conditioning requirements. Each then gets the system best suited to his needs.

This unusual method is flexible—Chrysler can supply packaged units, chillers or room units as needs demand. And it is economical—all air conditioning equipment taps into central electrical, water and air connections which serve the entire building.

Chrysler engineers worked closely with the consulting engineer and contractor during the advance planning of this complex air conditioning problem. They will be as happy to cooperate with you. For information on their services and Chrysler Air Conditioning equipment, write today.



Airtemp Division, Chrysler Corporation, Dept. M-30, Dayton 1, Ohio  
In Canada: Therm-O-Rite Products, Ltd., Toronto, Ontario

## LA's first skyscraper is high-strength bolted

The California Bank, at Sixth and Spring Streets, is the first commercial building in downtown Los Angeles that can be called a skyscraper. Its 18 stories rise 267 ft, towering well above the previous 150-ft restriction.

Time and money were saved in erecting the steelwork because Bethlehem High-Strength Bolts were installed quickly, with two-man teams.

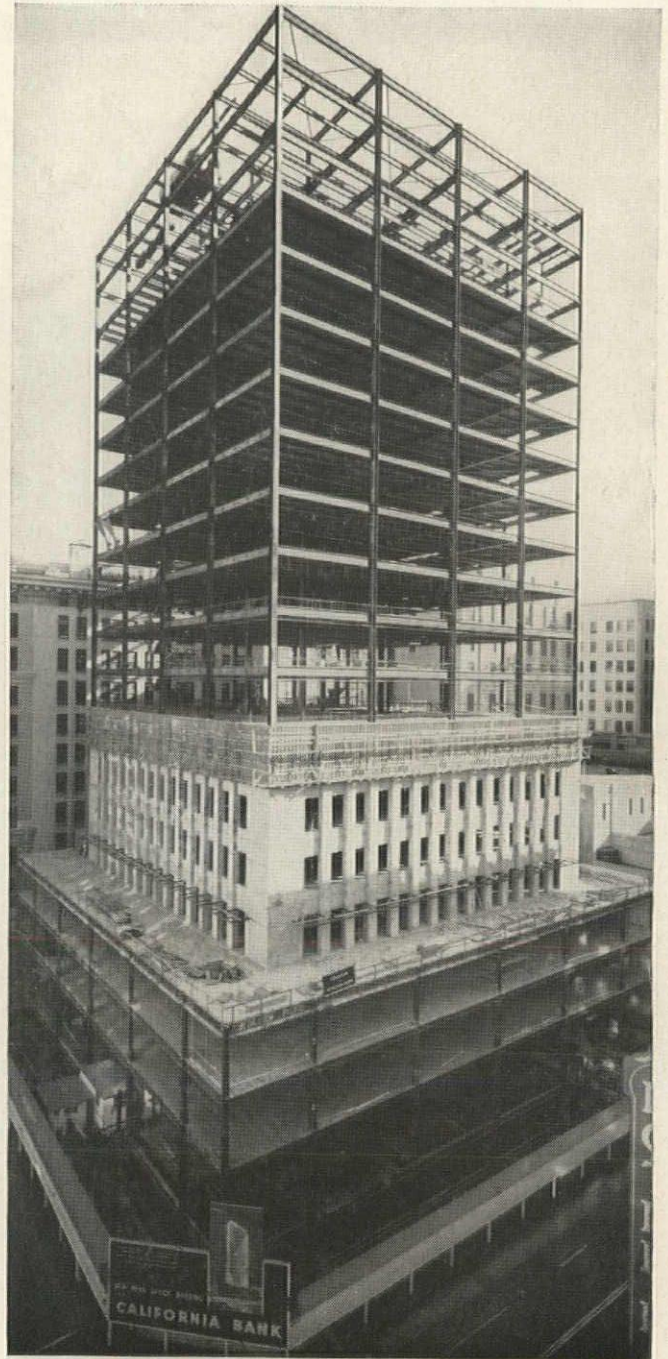
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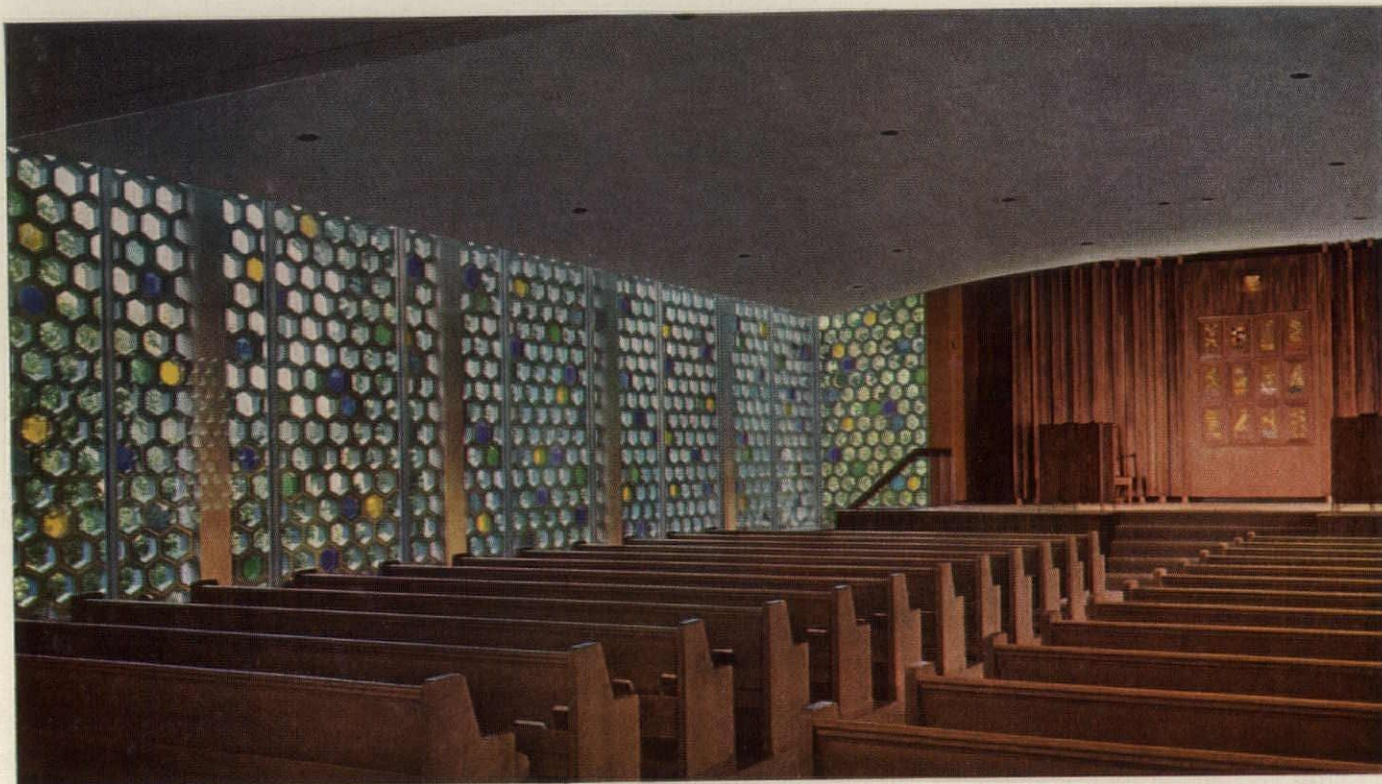
Export Distributor: Bethlehem Steel Export Corporation

# BETHLEHEM STEEL



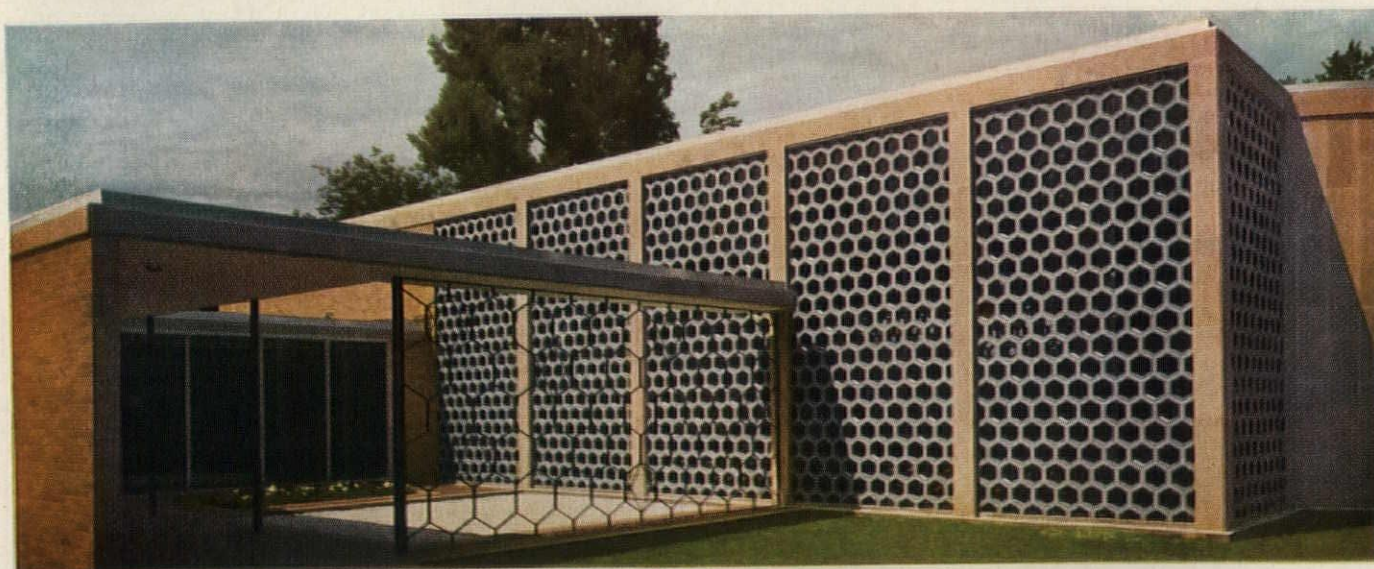
Architect and engineers: Claud Beelman & Associates; consulting structural engineers: Brandow & Johnston; general contractor: C. L. Peck Construction & Realty Co.; interior floor design: Henry Dreyfuss; fabrication and erection: Bethlehem Steel Co.





## INSIDE

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## 46 New Starts Proposed in Shift on Public Works Policy

*More Starts but Slightly Less Money Budgeted by President for 1961—  
Less for Federal Buildings, School and Hospital Grants—Congress  
Expected to Push Appropriation Closer to Current Expenditures Levels*

The most startling feature of the new budget for fiscal 1961 was the Administration's reversal of policy on starts for Federal public works projects.

Running against the Congressional wind for the past few years on this subject, the President now has reversed himself and proposes that work begin next fiscal year on 46 new jobs for the development of water and power. These would total more than \$645 million in initial cost. The Army Corps of Engineers alone would be starting work on 11 new navigation projects, 10 flood protection projects, a few beach erosion control jobs, and one multi-purpose project.

The total fiscal 1961 amount budgeted for Federal public works, including major national security building programs, is \$6945 million compared with \$7295 million estimated for the current fiscal period.

The Public Buildings Service, operating in the first full fiscal year of the public buildings act, will have funds for the start of 16 new Federal building projects if Congressional committees approve. The approval is considered virtually certain.

The new budget contemplated an outlay of \$170.6 million for civil public works activity in the General Services Administration, the major portion of which is for PBS. This compares with an estimated \$148.1 billion for fiscal 1960. New obligatory authority of \$230.3 million is called for in 1961 for GSA.

Planning progress determines the amount of funds asked. The \$48,022,000 Federal office building for San Francisco, for example, is included in the fiscal 1961 program, but no funds were asked for starting similar structures in Chicago and Denver. Plans for these latter two will not be sufficiently advanced in the fiscal period to justify a request for construction funds, PBS said.

First-year expenditure of \$35 million is required for the 16 Federal buildings in the budget; their ultimate cost was placed at \$154 million.

Nine projects in all were identified by PBS in the new list. In addition to that for San Francisco were the following by location and estimated cost: Toledo, \$8,183,000; Miami, \$9,243,000; Hartford, \$9,130,000; Bismarck, N. D., \$3,565,000; Memphis, \$11.5 million; Camden, Ark., \$887,000—all Federal office buildings; two Washington, D. C., structures, a Food and Drug Administration laboratory, \$17.4 million, and a new office building \$44,125,000.

Altogether, it was indicated that \$167.7 million worth of projects would be ready to go forward during the coming fiscal year; and these were to be started if committee approval was forthcoming. The major renovation and air conditioning of existing Federal buildings will be continued and planning will be started on other buildings to be constructed in subsequent years.

The budget message called attention to the 12-year \$900 million modernization program for Veterans Administration hospitals starting in fiscal 1961. This plan envisages an annual outlay of \$75 million for new construction and renovation. Outlays from the first year's increment would include \$53 million for construction of replacement hospitals at Cleveland, Ohio (800 beds), at Washington, D. C. (700 beds), at Martinez, California (500 beds). This leaves \$22 million in the first year of the program for modernization of existing buildings and for planning.

The VA said its plans for the next few years called for modernization work at 29 hospitals in addition to the new program for fiscal 1961.

Private architects and engineers are being retained for all the large replacement projects and VA spokesmen indicated this policy would continue as more and more work is put out in the long-range program.

Some construction programs were cut back rather severely in the new budget, but restoration of at least a portion of the difference between current and recommended amounts could be expected.

The President asked less money for the grants-in-aid program for Hill-Burton hospital construction, \$126.2 million compared with \$186.2 million this year; school construction in Federally-affected areas, \$44,390,000 compared with \$61,135,000, and waste treatment works, \$20 million compared with \$45 million. And authorizations for grants for construction of health research facilities would drop to \$25 million from \$30 million.

The State Department's foreign building program would be held at current levels under the budget proposals. Authorizing legislation presented by the State Department calls for an appropriation of \$17,372,000, the same amount estimated for this fiscal year. Total budget expenditures of \$18.2 million for fiscal 1961 are estimated, however, against \$15 million this year. The program involves the acquisition, operation, and maintenance of buildings abroad.

Fiscal 1961 outlays under the heading of major national security construction totaled more than \$1.6 billion, with new authorizations for this program estimated at something in excess of \$1.4 billion. This includes military public works expenditures of \$1354 million and Atomic Energy Commission outlays of \$277,663,000. The military portion breaks down this way—Army, \$286,200,000; Navy, \$247 million, Air Force, \$791 million, and interservice activities, \$29,860,000.

The new budget upped the estimated expenditures for the office of the architect of the capitol from \$28.9 million this year to \$54.2 million in fiscal 1961 with no new obligatory authority asked for next year.

Other construction expenditures estimated: National Aeronautics and Space Administration, \$75 million compared with \$45 million this year; Post Office Department, \$80 million compared with \$71.8 million this year, and Bureau of Reclamation, \$233.3 million as against \$180.7 million this year.



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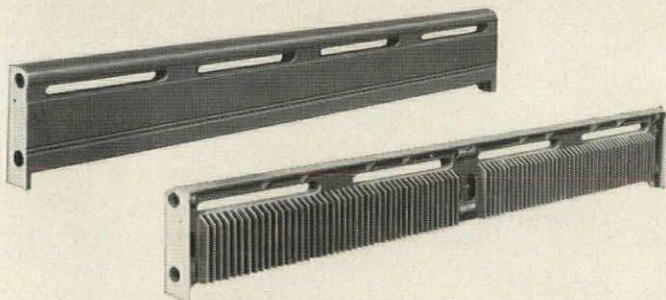
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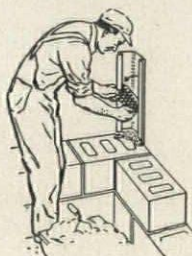
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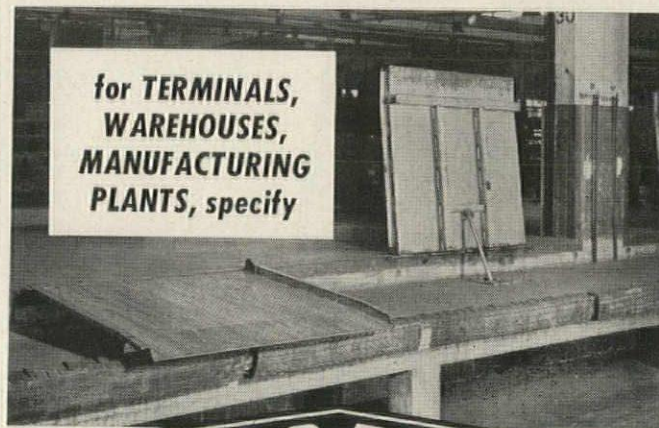
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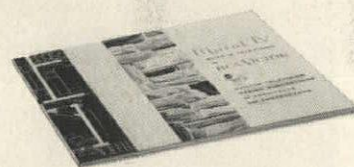
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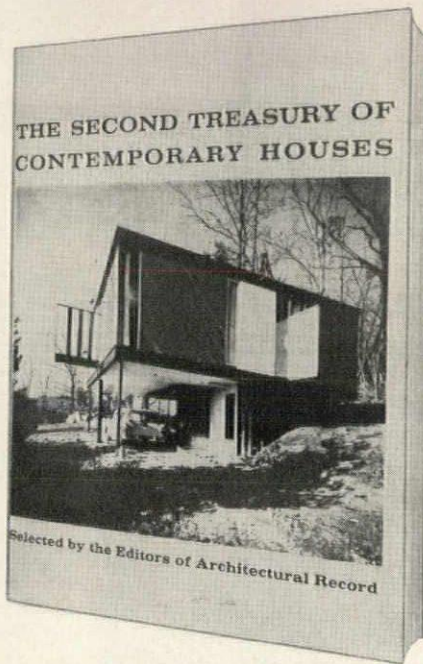


# Required Reading

## Great Variety Exhibited in Designs of Current Houses

THE SECOND TREASURY OF CONTEMPORARY HOUSES. *Selected by the Editors of Architectural Record. F. W. Dodge Corp., 119 W. 40th St., New York 18. 216 pp., illus. \$7.75.*

The editors of ARCHITECTURAL RECORD have assembled in this volume 44 houses from all regions of the United States and by many different architects. All the houses were originally published in the 1956, 1957, and 1958 issues of *Record Houses*, this magazine's special house annual. The same careful geographical and cost-range balance that has been true of each of the annuals has been maintained in this collection.



Among the architects represented are Marcel Breuer, Richard J. Neutra, Eliot Noyes, Paul Rudolph, and The Architects Collaborative. The houses differ greatly, as might be expected, but they have in common the fact that they were designed and built to be lived in and enjoyed.

The houses are shown and described in photographs (including a number in color), plans, details, and text. Special elements, such as lighting, stairways, heating facilities, kitchen arrangements, and bathrooms, receive particular attention. There also are examples of houses planned for future expansion.

The volume includes an article by Russell Lynes on "The American at

Home" and a text-and-picture story by A. Lawrence Kocher on "The New House for Family Living," in this case the house Ulrich Franzen designed for his own family.

## Viollet-le-Duc Reissued

DISCOURSES ON ARCHITECTURE. *By Eugène Emmanuel Viollet-le-Duc. Translated by Benjamin Bucknall. Grove Press, Inc., 64 University Pl., New York 3. 955 pp., illus. (2 vols.). \$25.*

The reader may understandably ask if this theoretical text by one of the most distinguished of 19th-century medievalists has any lasting significance today, outside of its inestimable value as an historical document. I think it does. If the *Stones of Venice* or the *Kindergarten Chats* can still speak to the present-day architect with a real immediacy that, say, Alberti, Palladio, or Vignola no longer have, then Viollet-le-Duc's writings certainly still have a potent appeal. His style of writing, although less concentrated than Le Corbusier's, has something of the latter's oracular flavor, and his rhetorical belligerence reminds one of van de Velde, Loos, or Wright. However, one ultimately senses an irresistible current of deep moral, almost righteous, indignation directed toward his opponents and enemies, a tone that strongly suggests Pugin or Ruskin—writers who are, after all, more nearly his contemporaries. Viollet-le-Duc reproduces from a secular, agnostic point of view many of the diatribes that are commonly associated with the propagandists of the English Gothic Revival. At the same time his overt attachment to a doctrine of technological determinism provides an unmistakable anticipation of our own "machine" art and architecture and its related movements.

The content of Viollet-le-Duc's *Discourses*, alternately historical, technical, and speculative, has a vitality as well as a non-eclectic universality that one would have thought possible only during the full flood of Renaissance Humanism. No facile dilettante, he was a scholar as well as an artist of major proportions in an age of specialization. The nature of his creativity may

*continued on page 68*

## Construction and the Law

LEGAL ASPECTS OF CONSTRUCTION. *By Walter C. Sadler. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. 387 pp., illus. \$8.50.*

The author's unusual combination of occupations—construction and engineering consultant, professor of engineering, and attorney-at-law—places him in an authoritative position to write on the many facets of the legal aspects of construction. His research indicates that a substantial cause of controversy and litigation in the construction industry is a lack of understanding of the proper business relationships involving the owner, financier, designer, and contractor connected with the typical building project.

After a general description of the building industry, Professor Sadler discusses all types of contracts; licensing of architects, engineers, and contractors (including comparison of the various state laws); and liabilities of the various parties. Some of the chapters typical of the book are: "The Owner's Responsibilities," "Defective Design and Construction," and "General Liabilities." Each is widely documented with legal case histories making available to the architect a much wider range of experience than he would ever be likely to gain in a lifetime of personal practice. The most thorough section explains disputes concerning "Rights at the Boundary." This is presumably the area of the greatest number of building and real-estate disputes and therefore, perhaps, will be the most interesting to the practicing architect.

For the attorney specializing in construction law, all cases are referenced and apparent contradictions noted. Of particular interest to this reader was the wide variation from state to state and from city to city in the statutes, ordinances, and common law concerning similar situations and the contradictory judgments awarded because of legal technicalities, regardless of the facts of the case in question.

A good dual lesson to be learned by all persons in the building business would be not only to try to avoid litigation by becoming thor-

*continued on page 68*



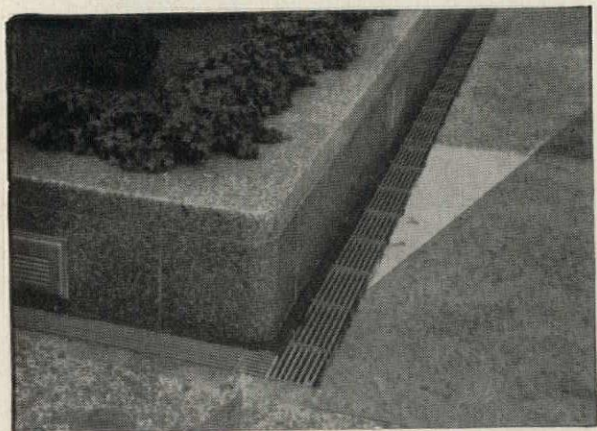
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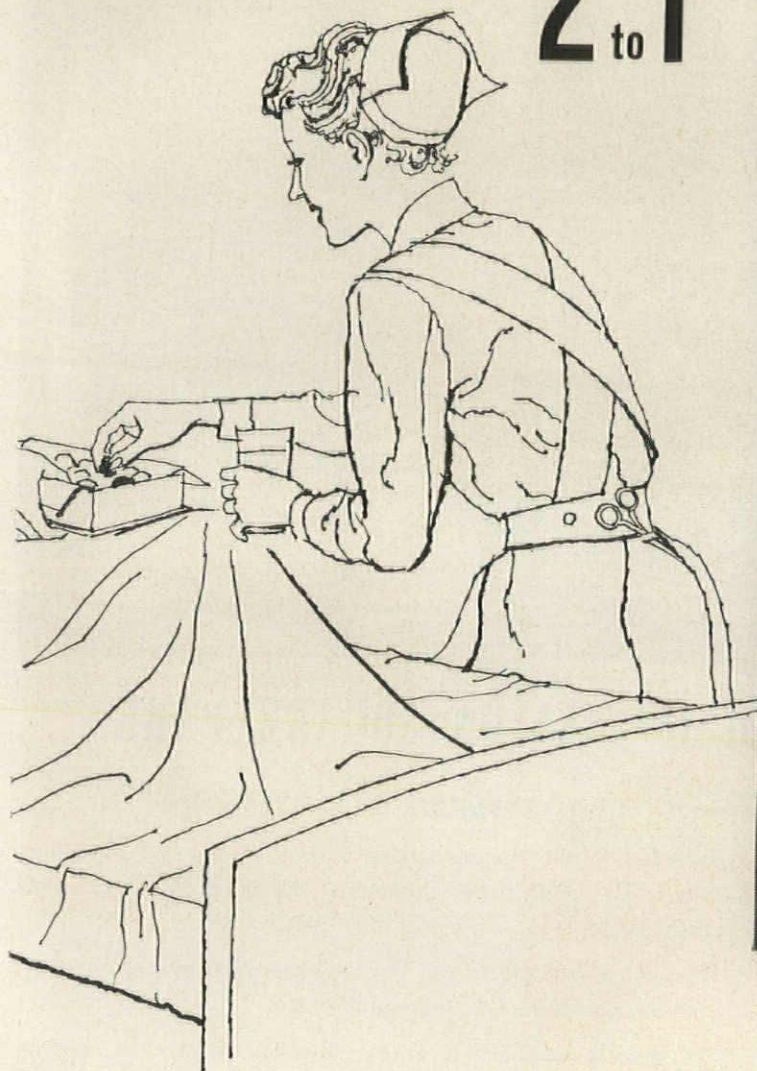
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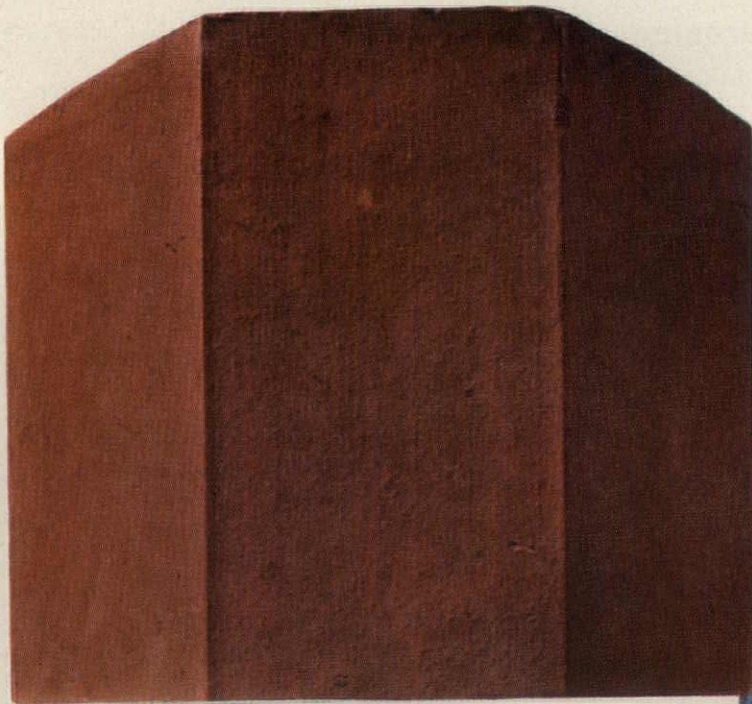
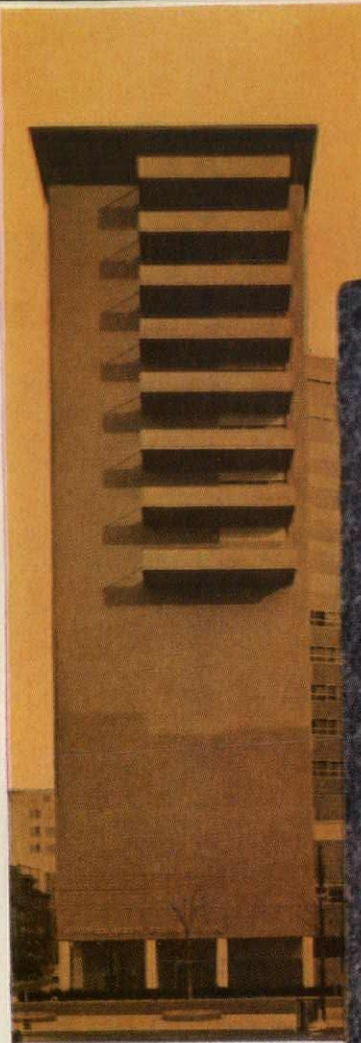
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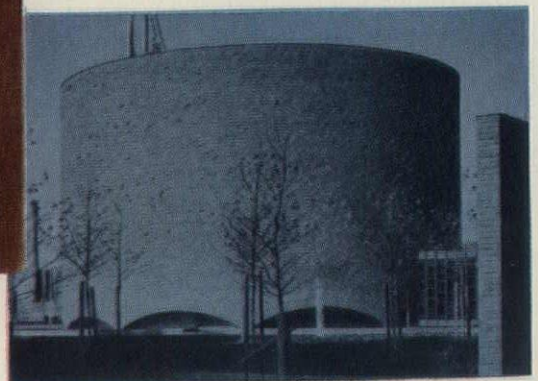
### ARTISTS AND THEIR WORKS:

Jefferson Medical College Hospital,  
Vincent Kling, Architect.  
Chapel, Massachusetts Institute of Technology,  
Eero Saarinen and Associates, Architects.



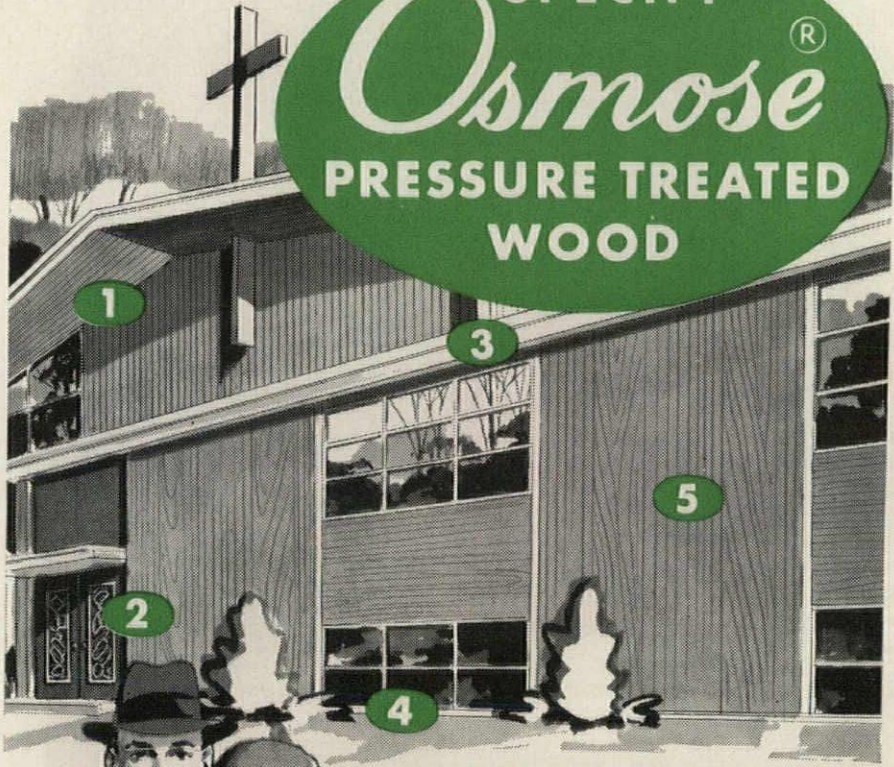
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## Required Reading

continued from page 64

### The Law . . .

oughly familiar with local laws governing the potential trouble spots outlined by Professor Sadler, but also to retain good legal counsel if a controversy arises despite precautions taken! —HERBERT M. NOYES, JR.

### Viollet-le-Duc . . .

seem elusive to the casual onlooker. Certain contemporary tastes, fondly attached to the simpler and plainer aspects of "functional" architecture, may find his original designs, especially those published in Volume II, vulgar, unlovely, and unfunctional. Others, more receptive or even revisionist in their preferences, may see in Viollet-le-Duc's inventions prescient forerunners of the nervously articulated architecture of the late 1950's. Or, to put it the other way around, perhaps the shifting of style and taste that is taking place as the 1960's begin is about to vindicate not just the theories but, equally, the architecture of Viollet-le-Duc.

The present edition of the Bucknall translation of Viollet-le-Duc's *Entretiens sur l'architecture* (Paris, 1863-72) is a facsimile of the Ticknor and Company (Boston) reprint of 1889, not of the "First American Edition Published 1889," as the verso of its title page tells us. In fact, the first American edition of Volume I, in an entirely different translation by Henry van Brunt, the co-architect of Harvard's Memorial Hall, was published in 1875. In the process of reproduction the plates for this new edition have suffered. The original hard, needle-like accuracy of the line cuts has become coarsened, and the result is too fuzzy. Even worse, the large fold-out plates of the earlier American and English editions (which were issued in a separate atlas by the French publisher) have, in the Grove Press edition, been printed across facing pages in such a way that the central portions of the illustrations are broken. Given this serious technical defect, and the high price of the new re-impression, the reader who feels impelled to acquire a copy of this important book

continued on page 338

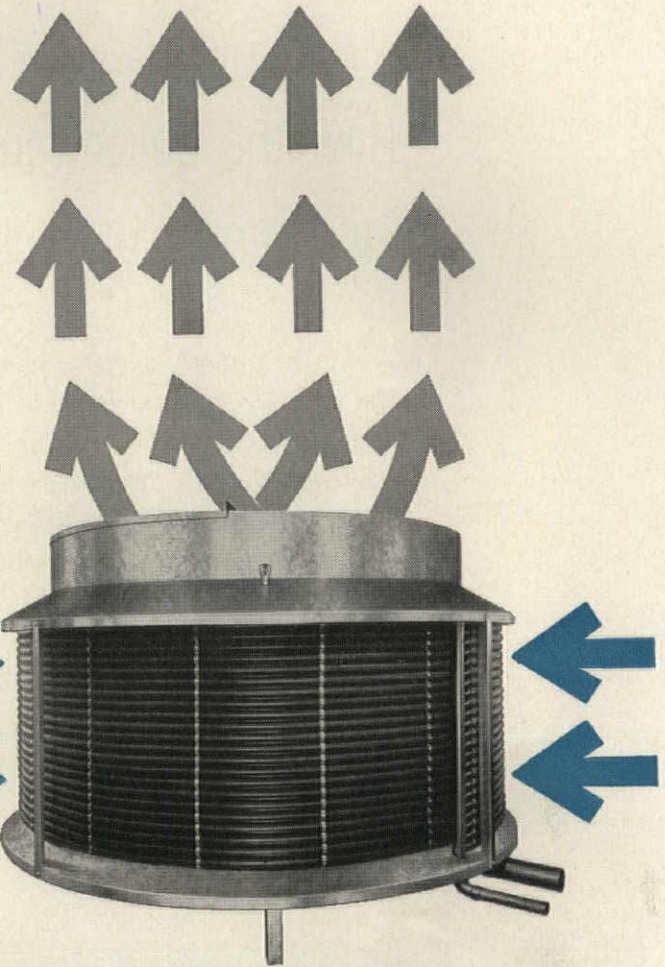
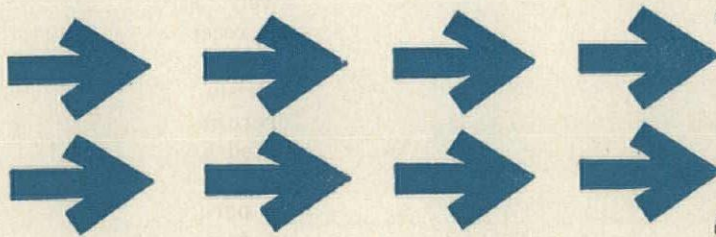


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**YUBA CONSOLIDATED INDUSTRIES, INC.**

Sales Offices in Atlanta • Buffalo • Chicago • Cleveland • Houston • Los Angeles • New York • Philadelphia • Pittsburgh • San Francisco • Seattle

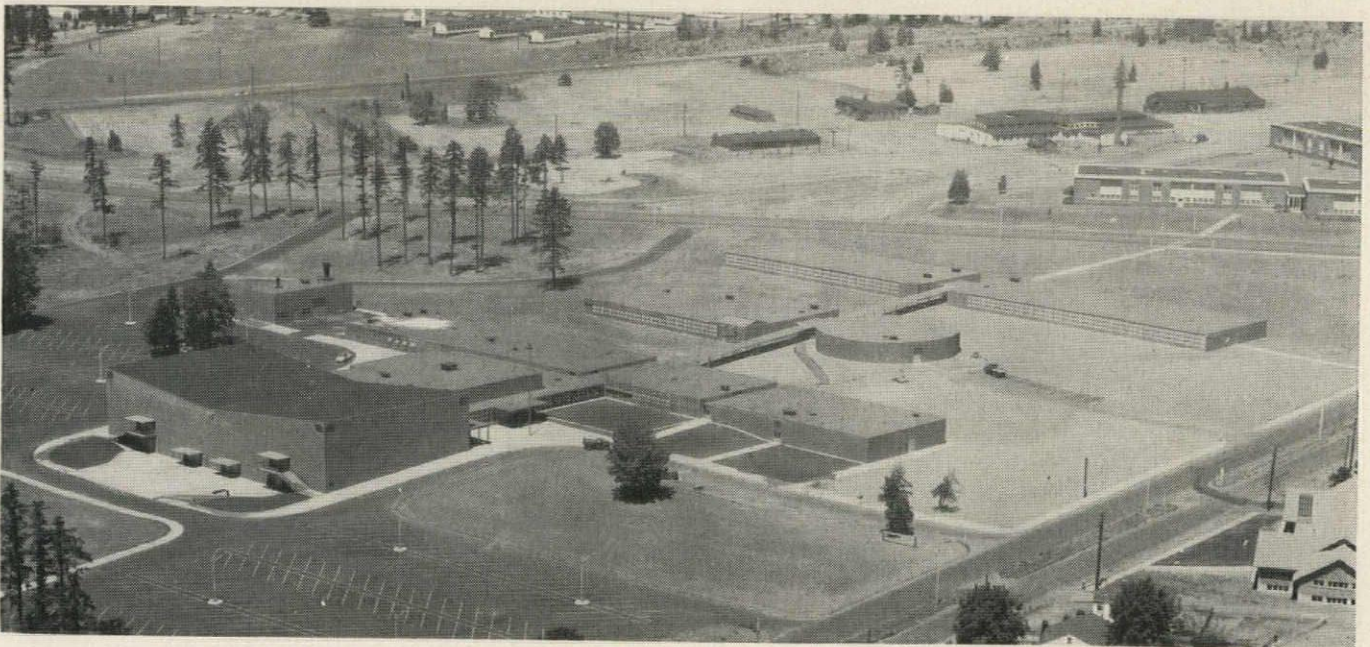
GOOD NEIGHBOR POLICY IN PLUMBING:

## How the boiler room of the Hudson Bay High School also serves the school across the street

*And a neighborly boiler room it is! From it, 100,000 feet of USS National Pipe, in the form of steam heat, plumbing, air and fuel lines, serves not only the Hudson Bay High School, Vancouver, Washington, but is used to pipe steam across the street to a vocational school, too. USS National Pipe in sizes from ½-inch through 12 inches was used.*

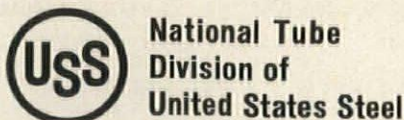
*Do you need quality pipe for power, heating and air conditioning installations? You'll get it when you ask for USS National Steel Pipe. If you'd like further information, or immediate assistance with your pipe problems, write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.*

USS and National are registered trademarks



Plumbing & Heating Contractor: Longview Plumbing & Heating Company. Mechanical Design: J. Donald Krockner & Associates, Consulting Engineers.

*The world's largest and most experienced manufacturer of tubular products.*



Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors  
United States Steel Export Company, New York



PLEXIGLAS letters and modular background panels at Bank of Old York Road, Abington, Pa. Architects: Haag & d'Entremont

BEST WAY TO SIGN A NAME...

**PLEXIGLAS**

Powerful identification can be combined with pleasing, dignified appearance when signs are made of PLEXIGLAS® acrylic plastic.

Designed in PLEXIGLAS, signs become solid areas of color and light—clean and legible by day, completely luminous from internal lighting at night. They resist weather and breakage, cost little to maintain. PLEXIGLAS makes possible the design of signs that meet the specific identification needs of any type of business, any type of building.

We will be glad to put you in touch with sign companies in your area who are experienced in the use of PLEXIGLAS.



*Chemicals for Industry*

**ROHM & HAAS  
COMPANY**

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

*In Canada: Rohm & Haas Company of Canada, Ltd.,  
West Hill, Ontario*

# 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

PERIOD	RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.		RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.	
	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
Oct. 1959	344.9	331.7	370.8	388.5	376.9	254.9	249.9	269.5	276.2	276.2
Nov. 1959	345.6	332.6	370.9	388.6	377.0	254.9	249.9	269.5	276.2	276.2
Dec. 1959	346.9	333.9	372.6	389.8	378.3	255.3	250.3	270.1	276.4	276.4
			% increase over 1939				% increase over 1939			
Dec. 1959	180.9	172.8	185.1	192.2	190.8	195.8	201.2	184.0	183.8	191.9

## ST. LOUIS

## SAN FRANCISCO

PERIOD	RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.		RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.	
	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel
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
Oct. 1959	306.9	297.5	317.0	332.0	326.0	303.3	287.8	327.7	344.2	334.3
Nov. 1959	307.3	297.9	317.6	332.8	326.8	303.3	287.8	327.7	344.2	334.3
Dec. 1959	308.0	298.9	318.4	333.4	327.6	304.7	289.2	329.5	345.6	335.7
			% increase over 1939				% increase over 1939			
Dec. 1959	179.5	179.3	168.2	178.3	175.3	188.5	191.2	180.7	183.5	188.1

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.:

$$\begin{aligned} \text{index for city A} &= 110 \\ \text{index for city B} &= 95 \end{aligned}$$

(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.

# STRAN-STEEL simplicity means speed and savings

A \$4,000,000 multiple-dwelling project in Memphis, Tennessee, proves the advantages that can be yours with Stran-Steel lightweight steel framing.

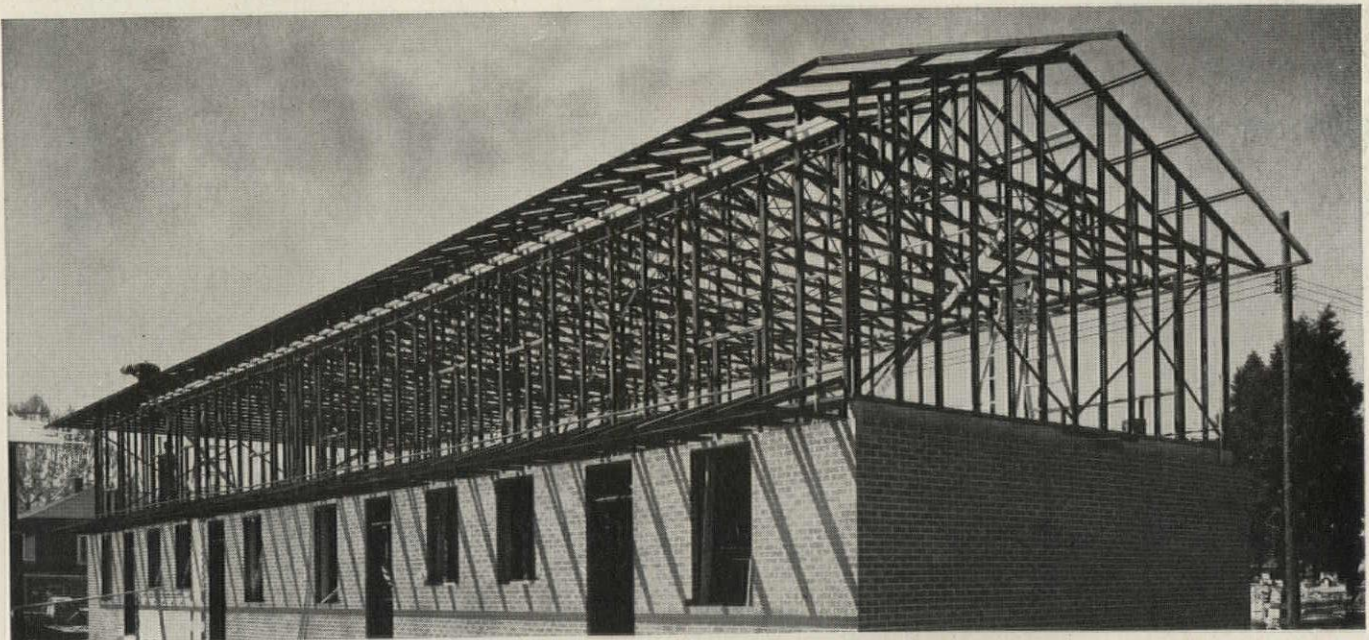
- Easy on-site assembly and hand construction eliminates need for crane rental, speeds job completion.
- Field sub-assembly brings factory economies to the job site.
- Practical Stran-Steel nailable floor joists were installed without cutting or detailed shop drawings. Joists for 90' buildings were installed in one day.
- Corrugated steel deck was nailed directly to joists in less than half the time—and cost—of welding.
- Sub-assembly of wall sections permitted the raising by hand and plumbing of second-story walls for 90' building in just 90 minutes.
- Strong lightweight trusses were raised manually and welded in place—one every five minutes.

Want production building economies like these? They're yours in noncombustible Stran-Steel structural components. Easily adaptable to your own requirements, they'll save you time and material. Your Stran-Steel dealer, a light steel specialist, will give you personal service and on-the-spot delivery. Get specifications on the complete line of Stran-Steel architectural products. Mail the coupon or phone the Stran-Steel Architectural Products dealer near you. He's listed in the Yellow Pages under Steel.



Eason, Anthony, McKinnie & Cox designed 31 Memphis project apartment buildings with Stran-Steel components. Sidewalls and trusses were assembled on wood jigs near building sites.

Every five minutes, workers lifted 31' trusses weighing only 140 pounds into place—including welding to the top channel of the load-bearing wall.



Perfect alignment of trusses shows straight roof eave. No shims were used. Hood houses lead pipes for radiantly heated floor. All steel in this 90' building was erected in three days.



Stran-Steel Corporation, Dept. AR-6, Detroit 29, Michigan

Please send more information on the uses of Stran-Steel architectural systems.

Name \_\_\_\_\_  
 Title \_\_\_\_\_ Phone \_\_\_\_\_  
 Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

STRAN-STEEL IS A DIVISION OF NATIONAL STEEL CORPORATION

# New locking service for commercial buildings

**SCHLAGE**® **PROTECTED**

# P

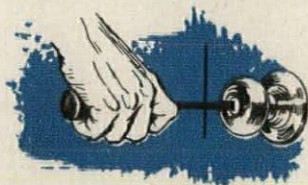
*Schlage's unique PSI service uses temporary cylinders to provide these benefits:*

- POSITIVE CONTROL OF MASTERKEYS
- FLEXIBILITY IN DECIDING KEYING ARRANGEMENTS
- SAVING ON CONTRACTOR'S HANDLING COSTS

## HERE ARE THE PSI BENEFITS

Locks delivered without permanent cylinders

Locks have a temporary plastic plug, which may be turned by a screwdriver. These locks are used to provide free passage through any door.



Color-coded aluminum cylinders provide on-the-job security

For doors requiring locking during construction, anodized aluminum cylinders can be installed temporarily. Keys in matching colors are issued; for example, a blue cylinder and blue keys for electricians. The color-coding immediately tells a worker which door his key unlocks.

This program simplifies the contractor's work because he can install any plastic-plug lock of the proper function without regard for ultimate keying. In addition, the aluminum cylinders are replaced before occupancy with permanent cylinders which have not previously been exposed on the job, thereby insuring close control over all keys.

Masterkeys never issued during construction

Since only temporary cylinders are used on the job, masterkeys are not needed. Keys are shipped with the permanent cylinders and installation is made under the supervision of the owner's representative, who keeps all keys under his control.

Schlage PSI Costs Nothing

This is a service of the world's leading manufacturer of cylindrical locks, offered at no charge.

**SCHLAGE**

**SCHLAGE PSI**

Decisions on keying can be made at any time at the owner's convenience.

No possibility of accidental invasion of security. No masterkeys on job.

Installation of locks is speeded and simplified as contractor need select only proper functions from case stock.

No need to build a keyboard. Schlage shipping carton serves as temporary keyboard.

**SCHLAGE**®  
CYLINDRICAL LOCKS

Schlage Lock Company Display Rooms in  
San Francisco — 2201 Bayshore Los Angeles — 3467 W. 8th St.  
Chicago — Merchandise Mart New York — Empire State Bldg.  
Vancouver, B. C. — 1290 Marine Drive

# SECURITY INSTALLATION

provides positive,  
easy-to-maintain security  
at every stage of  
building...and beyond

## ADVANTAGES

### OTHER SYSTEMS

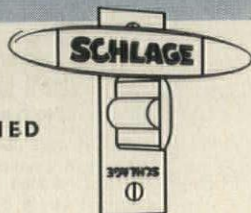
All detail on keying must be included in original factory order so the complete lock, with key, can be shipped.

During construction masterkeys are used or permanent cylinders employing a form of temporary keying that still allows permanent keys on the job.

Each lock must be itemized and laid out to find the exact lock for a specific door.

Contractor must build a keyboard and tag all keys.

AMERICA'S MOST  
DISTINGUISHED  
LOCK BRAND



Shipping carton is a temporary key-filing cabinet

All cylinders are shipped complete with the key and packaged in a key-control envelope for storage and easy access until actually needed. No need to build a keyboard.



No problem of matching keys to locks

Permanent cylinders and keys are packed together and, when the cylinder is installed, the key is placed back in the file envelope and returned to the shipping container for easy identification and future incorporation into a key-control filing system.

### CONTINUING SECURITY

The unique Schlage PSI system has these features which assure the continued integrity of the building's security system:



Security in factory handling

The job name is omitted from factory orders; material handlers know the job by number only. Thus, there is no possibility of anyone retaining a masterkey for future invasion of security.

No unauthorized masterkeys made

Schlage will not issue masterkeys for any existing job without written authorization from the existing owners.



Continued control of keying system

The final decision on keying can be delayed an indefinite time, subject to the decisions of the occupant. When a tenant moves in and determines his keying requirements, cylinders will be shipped from the factory, untouched by construction personnel. Subsequent tenant changes can be handled in the same way.

### SEE HOW SCHLAGE'S PSI CAN WORK ON YOUR BUILDING

For complete information on this unduplicated service, contact your Schlage representative or write P.O. Box 3324, San Francisco 19, California.



## the sure way to specify quality in commercial doors

The inherent fine quality of RO-WAY overhead doors for commercial and industrial applications is designed, engineered and built into every detail. You see it in RO-WAY styling—simple, quiet, attractive, to complement your building designs.

You see it in RO-WAY materials—selected kiln-dried woods, Dorlux® panels, extra heavy roll-galvanized hardware.

It's there in RO-WAY construction—with muntins, rails and stiles fit with cabinet-maker precision; mortise and tenon joints glued and steel-pinned for solid strength; sections rabbeted for weather tightness; millwork smoothly sanded for finest finish.

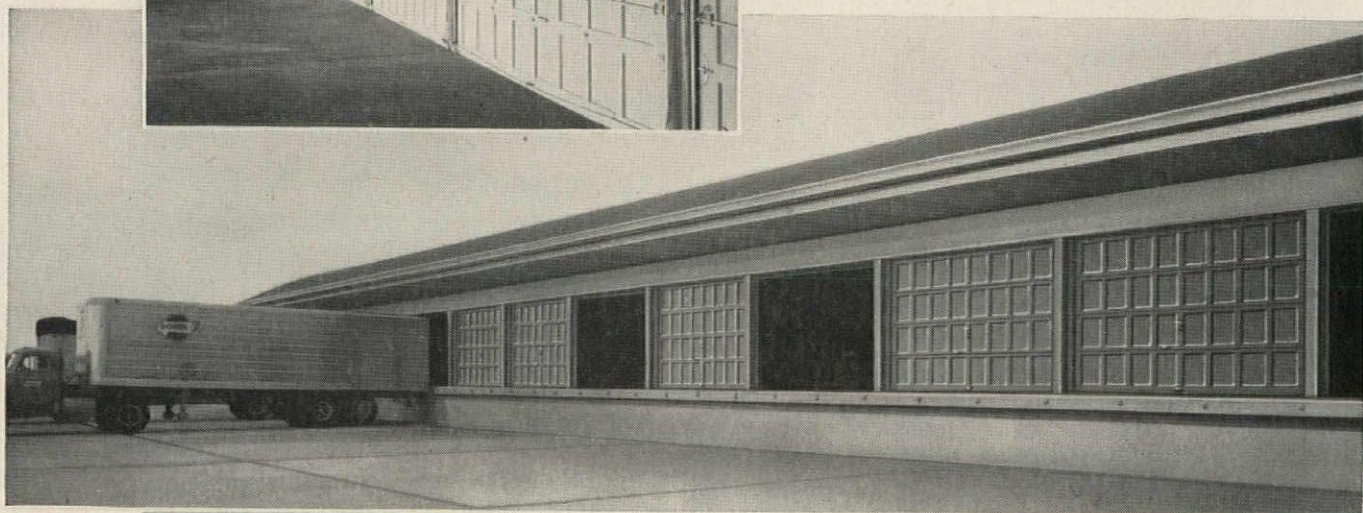
And it's readily apparent in RO-WAY performance—with specially designed track and hinges, quiet ball bearing rollers, and tension-balanced springs all working together for free and easy operation.

So doesn't it make sense to specify RO-WAY when you want to be sure of fine quality in overhead doors?

*For time-saving convenience, include dependable  
RO-WAY Electric Operators in your door specifications*



**ROWE MANUFACTURING CO.**  
1215 Holton Street • Galesburg, Illinois



*there's a Ro-Way for every Doorway!*

COMMERCIAL • INDUSTRIAL • RESIDENTIAL

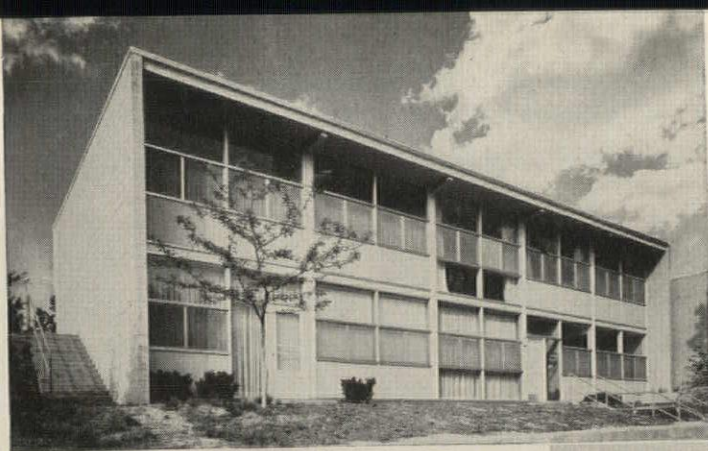
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OR WRITE FOR COPY







**AMERICAN HEREFORD BUILDING**  
Kansas City, Missouri

**Architect:**  
Joseph W. Radotinsky

**Owner:**  
American Hereford Association

**General Contractor:**  
Soinson Construction Co.

**Painting Contractor:**  
Theodore Lawrence Ptg. Co., Inc.

**P & L Products Used:**  
Oil Stain, Lyt-all Stippling Eggshell, "38"  
Pale Trim Varnish, Double Duty Primer

**ANTHONY MEDICAL CENTER**

Benton Harbor, Michigan

**Architect:**  
Keck & Keck

**General Contractor:**  
Pearsen Construction Co., Inc.

**Painting Contractor:**  
Independent Painting Co.

**P & L Products Used:**  
Alkatite Cement & Stucco Paint, Lyt-all  
Flowing Flat, "38" Pale Trim Varnish,  
Vitalite Enamel.



**NU-WAY SUPER MARKET**

Webster, Massachusetts

**Architect:**  
Domian & Salk

**Owner:**  
Daniel Dworkin

**General Contractor:**  
A. Mason & Sons, Inc.

**Painting Contractor:**  
Bernard S. Kuzava

**P & L Product Used:**  
Solidex

**GERTRUDE VANDERBILT  
WHITNEY GALLERY**

Cody, Wyoming

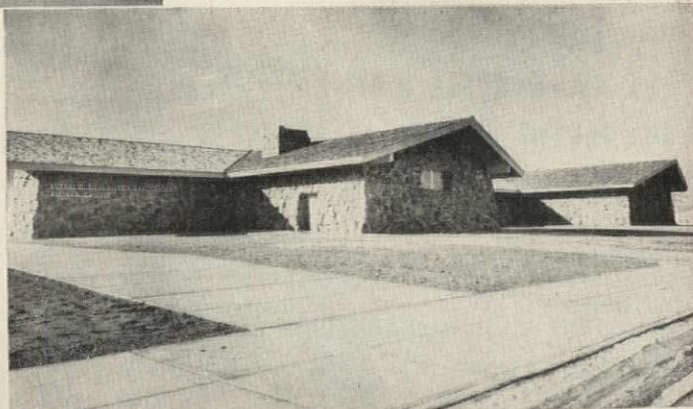
**Architect:**  
Tresler & McCall

**Owner:**  
Buffalo Bill Memorial Association

**General Contractor:**  
Hitz Construction Co.

**Painting Contractor:**  
M. L. Hastings

**P & L Products Used:**  
Alkatite Cement & Stucco Paint, "38" Pale  
Trim Varnish, Vapex Flat Wall Finish.



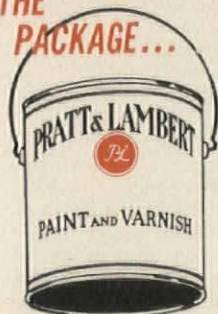
**WHEN CLIENTS WANT THE FINEST...FOR  
OUTSTANDING JOBS LIKE THESE...SPECIFY  
PRATT & LAMBERT PAINT AND VARNISH**

Professional-level, color planning service by experienced Pratt & Lambert representatives...the suggestion of distinctive color plans, in addition to recommendations of authoritative painting specifications, is available upon request and without obligation. Please write: Pratt & Lambert Architectural Service Department, 3301 38th Ave., Long Island City 1, N.Y., 4900 S. Kilbourn Ave., Chicago 32, Ill., 75 Tonawanda St., Buffalo 7, N.Y., 254 Courtwright St., Fort Erie, Ontario.

**PRATT & LAMBERT-INC.**

NEW YORK • BUFFALO • CHICAGO • FORT ERIE, ONTARIO

**CRAFTSMANSHIP  
IN THE  
PACKAGE...**



*the paint of professionals  
for over a century*

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*"I see a year-round air conditioning system that practically runs itself!"*



## YORK 3-Pipe Hi-I Induction System Heats and Cools Without Changeover

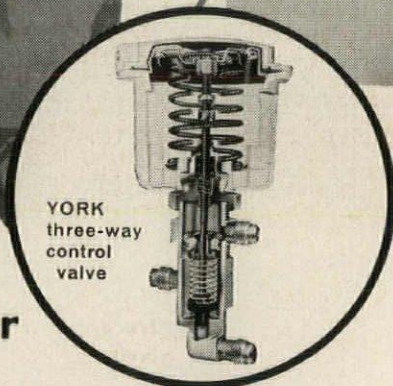
—Simplified system provides personalized comfort economically

**HOT AND COLD WATER AT EACH UNIT**—York-designed, non-mixing, 3-way control valve selects either hot or cold water and modulates the flow to the coils to provide the desired room temperature at any time of day, all through the year.

**HIGHER LEVEL OF COMFORT**—Having both hot and cold source at each unit means instant response and allows wider temperature variation from room to room. This provides greatest personalized comfort and satisfies each occupant's exact wishes.

**ELIMINATES MANY COSTLY COMPONENTS**—Initial cost of York's 3-Pipe System is competitive with regular 2-pipe systems. Eliminating duplicate zoning equipment, costly controls and excess air for heating offsets cost of third pipe, saves space.

**LOWER OPERATING COSTS**—Each unit functions as a separate zone receiving just the right amount of either warm or cold water to maintain desired space conditions. If neither heating or cooling is needed, there's no flow. *No wasted energy!*



**Another YORK Trail Blazer Concept Proved in Action at Staller-Hilton Hotel, Boston, Mass.**—York 3-Pipe Hi-I Induction System delivers instant personalized comfort to 1,300 guest rooms. Compact, modern induction units replaced radiators, provide heating and cooling in same place.

# YORK

YORK CORP., SUBSIDIARY OF BORG-WARNER CORP., 4303 GRANTLEY RD., YORK, PENNSYLVANIA



BORG-WARNER  
RESEARCH & ENGINEERING  
MAKE IT BETTER

Air Conditioning, Heating, Refrigeration and Ice-Making Equipment • Products for Home, Commercial and Industrial Applications

# permanent\* sight-saver Nucite glass chalkboards



## The finest writing surface available gives Nucite boards superior legibility

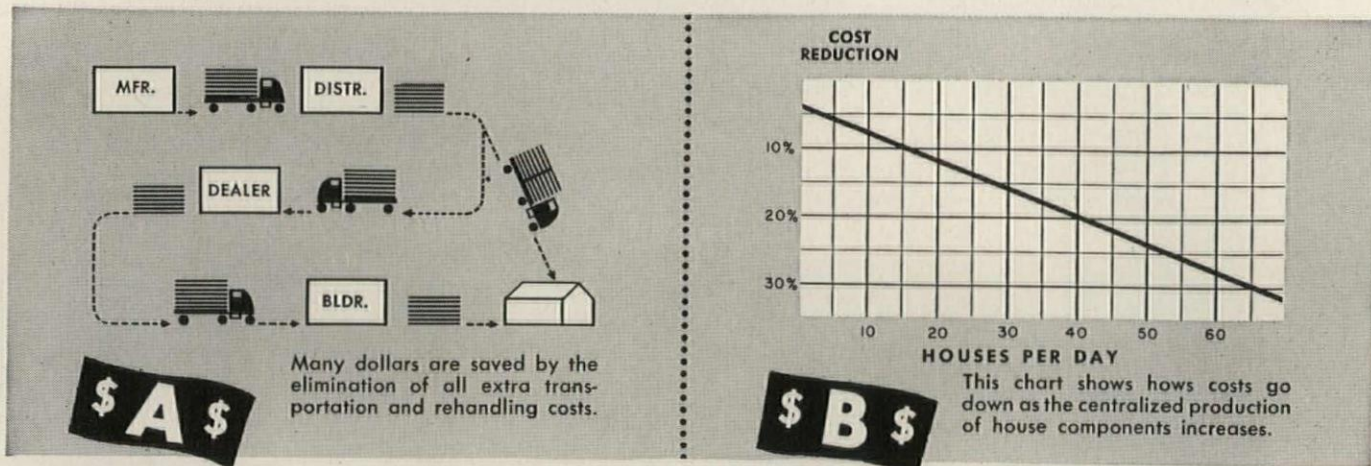
Ceramic enamel studded with aluminum oxide provides the incomparable writing surface of Nucite glass chalkboards. Close grained, it takes an even, smooth mark . . . never permits the chalk to skip . . . washes and erases easily. Installations nearly 20 years old retain their original color and texture . . . continue to provide superior legibility after an estimated 15,000 erasings and frequent washings. Five sight-engineered colors provide optimum contrast with white chalk to give the highest legibility with the least eye strain. Permanently fused to the polished plate glass base, the writing surface never fades, never becomes slick or shiny, never requires resurfacing. And because the glass base is tempered, Nucite chalkboards are highly resistant to damage—they're similar to the porcelain used in curtain wall construction. Yet, installed cost is comparable to that of steel boards. Send for sample . . . or see Sweet's <sup>23e</sup> Agents and distributors in all principal cities. Write for the name of the one nearest you.

Electrically driven chalk and corkboards are a specialty of the New York Silicate engineering staff. Thayer Hall, West Point, for instance, features

three vast motor-driven panels of Nucite chalkboard and Apex cork bulletin board placed one behind the other. Each panel measures 25 x 15 feet. A touch of a button sends any panel up a 30' vertical track into a storage loft. Raising all three reveals an auditorium-sized motion picture screen. This engineering service is available for consultation in any project. And we are always ready to advise on selection of chalkboards, whether Nucite glass, steel, Formica, composition or slate, and on glass door, swing leaf or changeable letter bulletin boards, since we manufacture them all.

\* In more than 20 years and 25,000 installations, we have never been called upon to fulfill the following guarantee: **the surface of Nucite glass chalkboards is guaranteed for the life of the building against fading, warpage, or becoming slick or shiny under normal classroom use.** • Should any Nucite glass chalkboard break within 20 years after installation, outside of willful or accidental damage, it will be replaced free of charge.

**NEW YORK SILICATE**  
BOOK SLATE COMPANY, INC. 600 Old Country Road  
Garden City, New York



## WITH P-B COMPONENTS

**Steps A and B save 15% for the Builder**  
—on any type or size of house

We have 24 years' experience in the building of the major house components. No other firm can offer you comparable experience. Many millions of dollars' worth of homes have been built by our method—known as Precision-Building. All this experience points to one fact...the centralized building of Precision-Built House Components—by the building materials distributor—cuts costs for everybody. To any builder—large or small—this means a saving of about 15% on wall, floor, ceiling, roof and gable components.

Two facts account for this saving.

**A**—When the distributor handles the fabrication, many unnecessary handling and rehandling costs are eliminated. The component parts come direct from the distributor to your site.

**B**—When the distributor handles the fabrication, you share in his far larger volume discounts—regardless of the volume of your activities.

Reduced handling costs and larger volume discounts on the materials are easily understood. You are saving money.

You are also increasing your selling strength—when you build with P-B Components. You are not limited to any type or size of house—any plan can be quickly detailed for P-B Components. You give the home buyer a top-quality, custom-built house—two to four months sooner than by conventional methods. You maintain a far smaller staff of skilled labor. You invest no money in expensive equipment. You are fully equipped to compete profitably with every type of prefabricated housing.

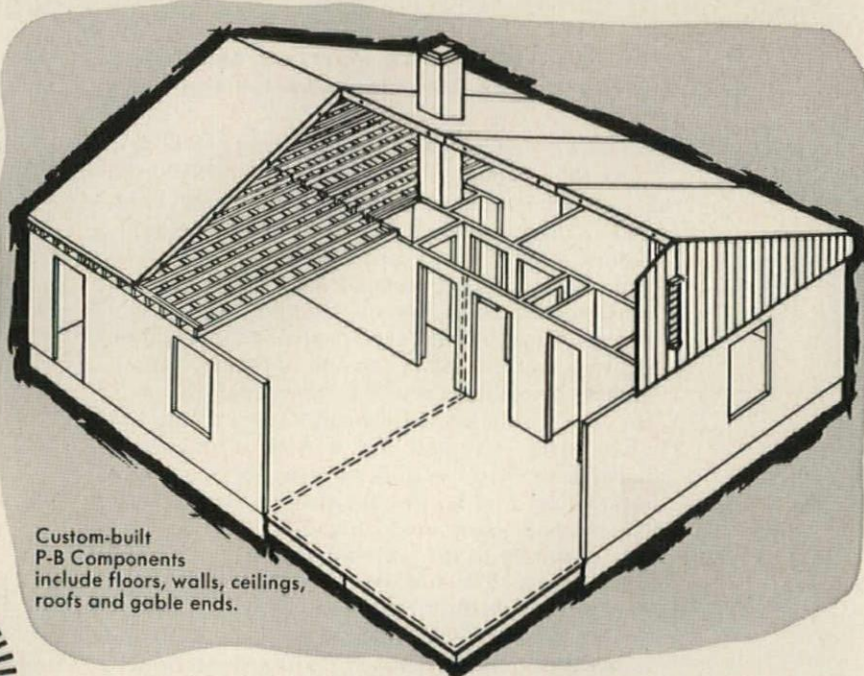
Your walls and partitions

are not of some limited arbitrary length or width, but *room-size*—with either exterior finish or sheathing applied and with the interior finish applied. They can even be wired for electricity. Floor components are built mainly 8-feet in width and of the length needed; the underflooring is insulated and the factory-finished flooring already in place. Ceiling components have the ceiling material already in place. Roof and gable components have the sheathing

already in place.

You buy your P-B Components through your local lumber dealer—custom-built to fit your plan—delivered to your site. (If he does not yet know about P-B Components, ask him to contact us.)


Take the time to get all the facts. Let us show you in detail just how this plan works for you—in your territory. Write or wire today—to Department C-6.



# HOMASOTE COMPANY

Trenton 3, New Jersey

Homasote of Canada, Ltd., 224 Merton St., Toronto 7, Ont.



**MUELLER**  
**BRASS CO.** <sup>®</sup>



a new symbol  
for all these  
**QUALITY PRODUCTS**  
for plumbing and  
heating from **ONE**  
dependable source

This distinctive corporate symbol is a new addition to the American business scene and will be found on the many diversified products made for the plumbing and heating industries by the Mueller Brass Co. of Port Huron, Michigan . . . your one dependable source for such products as Streamline solder-type fittings, copper tube and valves.



**MUELLER BRASS CO.**  
PORT HURON 8, MICHIGAN

ALSO MANUFACTURERS OF: REFRIGERATION VALVES, DRIERS, FITTINGS AND ACCESSORIES • FORMED COPPER TUBES • BRASS AND BRONZE ROD • FORGINGS • SCREW MACHINE PRODUCTS • IMPACT EXTRUSIONS • CASTINGS • ALUMINUM WINDOWS • ALUMINUM SHEET, COIL AND STRIP • POWDERED METAL PARTS • PLASTIC PIPE, CUSTOM EXTRUSIONS AND INJECTION MOLDINGS.

*Light as ALL Outdoors...*

# NEW SKYLIGHTS

*Fresh as ALL Outdoors...*

# NEW VENTILATED

**Exclusive, from JENN-AIR**

● **ILLUMINATION** . . . clear Astro-Lite domes transmit 92% of available light . . . translucent domes transmit up to 75% of available light . . . excellent light diffusion qualities

● **STRENGTH** . . . one-piece acrylic resin domes . . . less than half the weight of glass with far greater impact resistance . . . heliarc welding of extruded aluminum frame corners add strength, durability

● **WEATHERPROOF** . . . all units are designed to insure against water leakage

● **INSULATION** . . . optional double dome Astro-Lite units eliminate condensation, maintain temperature balance . . . acrylic domes offer 20% more insulation than glass

● **VERSATILITY** . . . the widest range of

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● **PERFORMANCE** . . . extra power for commercial, institutional and industrial applications . . . ventilator capacities to 4400 cubic feet per minute

● **SILENCE** . . . unequalled noise suppression meets hospital, classroom, library requirements . . . eliminates ductwork . . . every unit quiet-tested

● **BEAUTY** . . . lowest silhouette of any roof ventilating system . . . handsome exhauster housing harmonizes with Astro-Lite dome contours

● **ECONOMY** . . . easy, economical installation . . . permanent, maintenance-free construction . . . *single manufacturer responsibility.*

**JENN-AIR LEADS IN FUNCTIONAL IMAGINEERING**



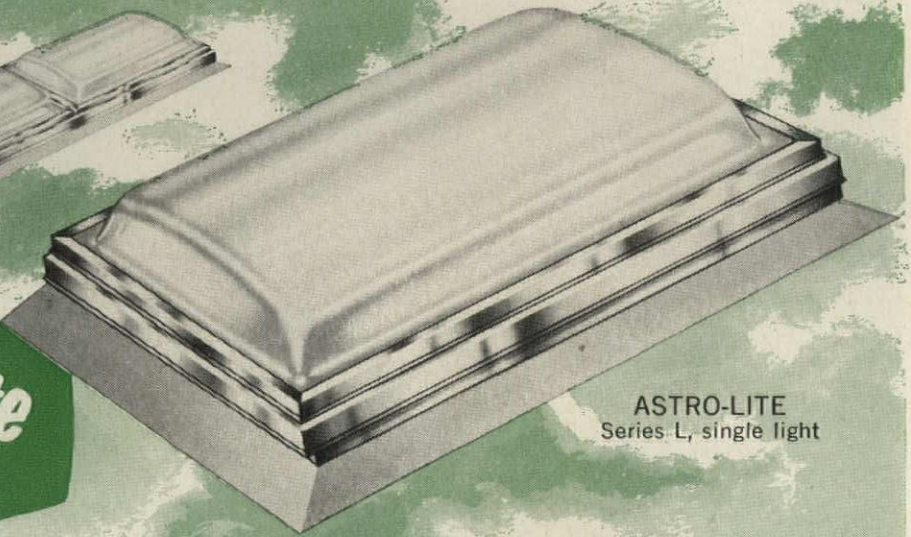
**JENN-AIR PRODUCTS COMPANY, INC**

ASTRO-LITE  
Series D, double light



**JENN-AIR**

**Astro-Lite**  
SKYLIGHTS



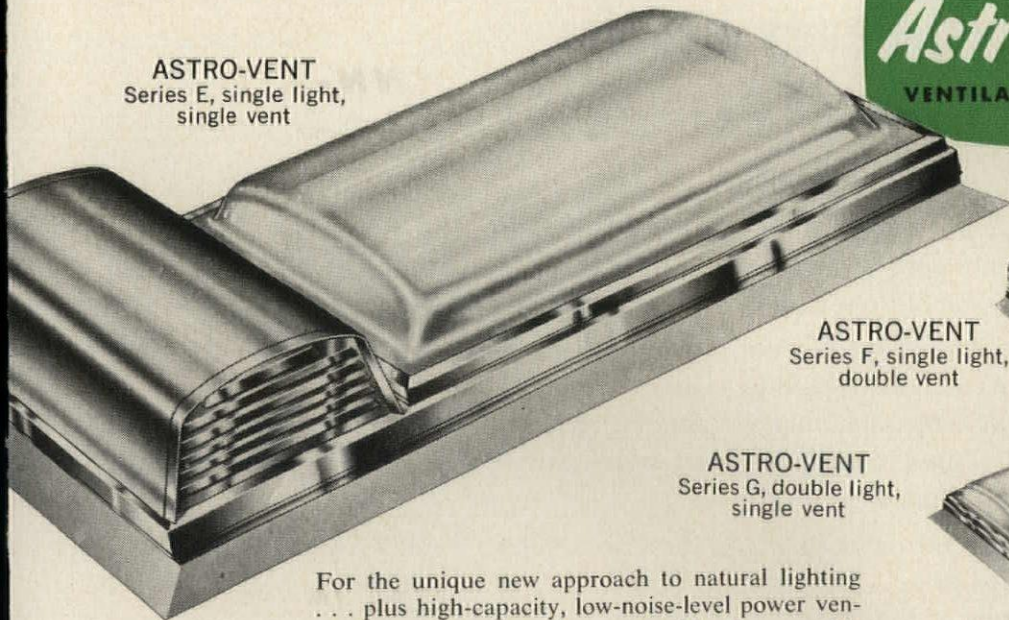
ASTRO-LITE  
Series L, single light

# SKYLIGHTS

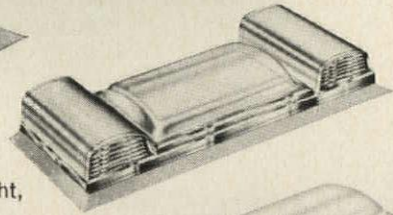
**JENN-AIR**

**Astro-Vent**  
VENTILATED SKYLIGHTS

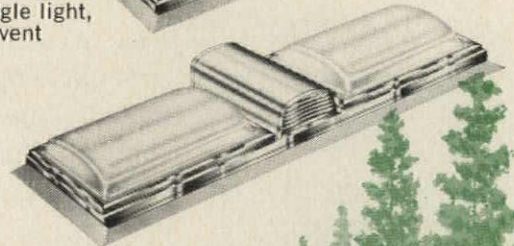
ASTRO-VENT  
Series E, single light,  
single vent



ASTRO-VENT  
Series F, single light,  
double vent

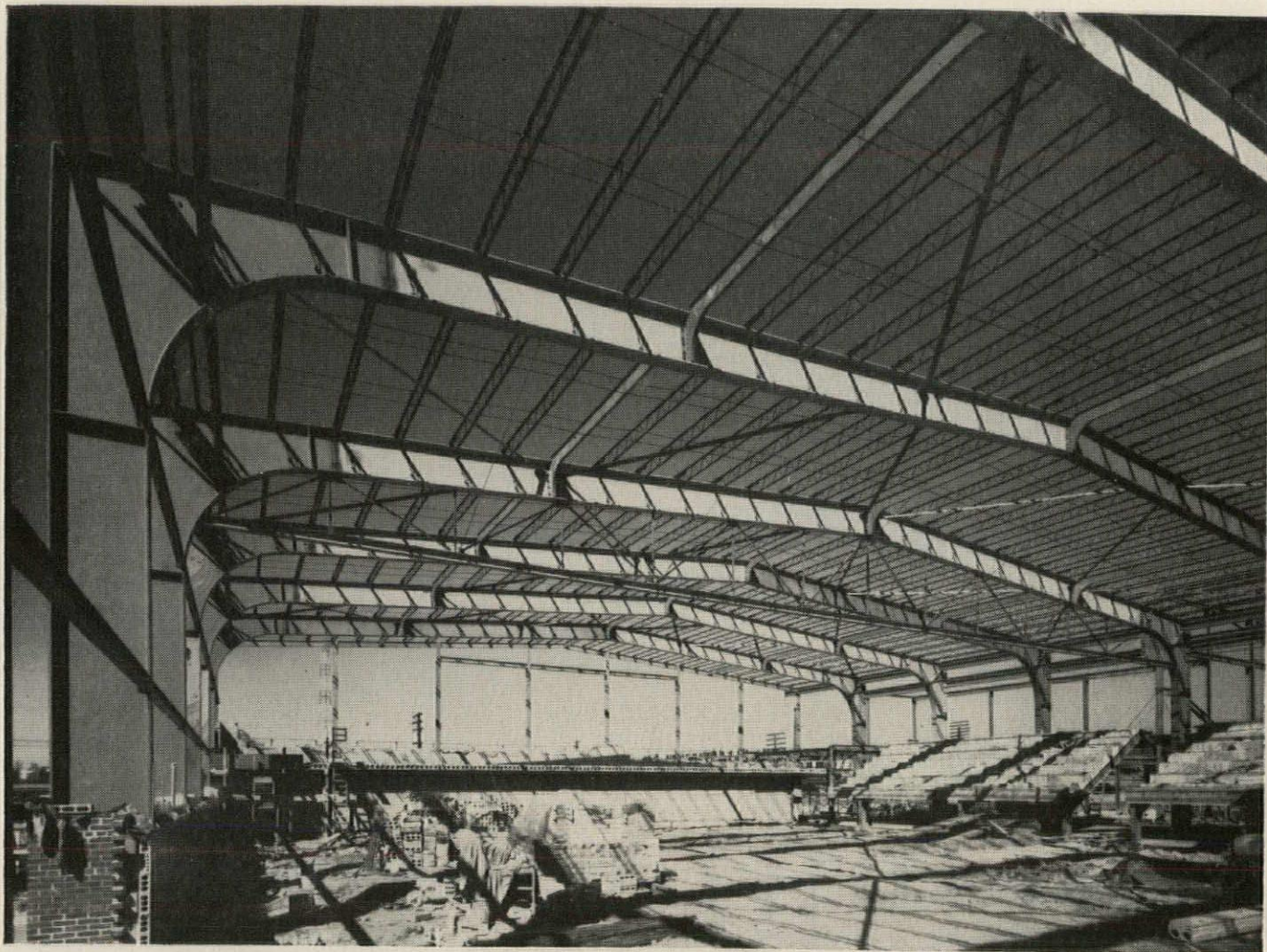


ASTRO-VENT  
Series G, double light,  
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## A Gym-Dandy Use for LACLEDE OPEN WEB STEEL JOISTS

A highly efficient type of construction was used for the modern new field house, O'Fallon Technical High School, St. Louis. The mammoth structure will house a gymnasium, auditorium and swimming pool.

Steel girders span the entire width of the building, leaving the floor area unobstructed by center columns. To provide maximum strength with minimum weight the roof was constructed with Laclede Open Web Steel Joists stabilized with continuous horizontal bridging.

General contractor for the project was Robert Paulus Construction Company, St. Louis, in cooperation with architects and engineers of the Board of Education, City of St. Louis.



**LACLEDE STEEL COMPANY**

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◆ Producers of Steel for Industry and Construction



Sub utility room



Sterile storage



# Hospital Casework by *St. Charles*

*Installed in Muskogee General Hospital, Muskogee, Oklahoma*



Central sterile supply



Nurses' station

HORSTMAN & MOTT, *Architects*

ROSS GARRETT & ASSOCIATES, *Consultant*



St. Charles acceptance and reputation as quality hospital casework is due to the careful attention given planning and construction details. Complete custom building, too, means casework flexibility to meet individual specifications, even to the most exacting demands.

**Send For Catalog.** This complete catalog, "St. Charles Hospital Casework," is available at request on your letterhead.



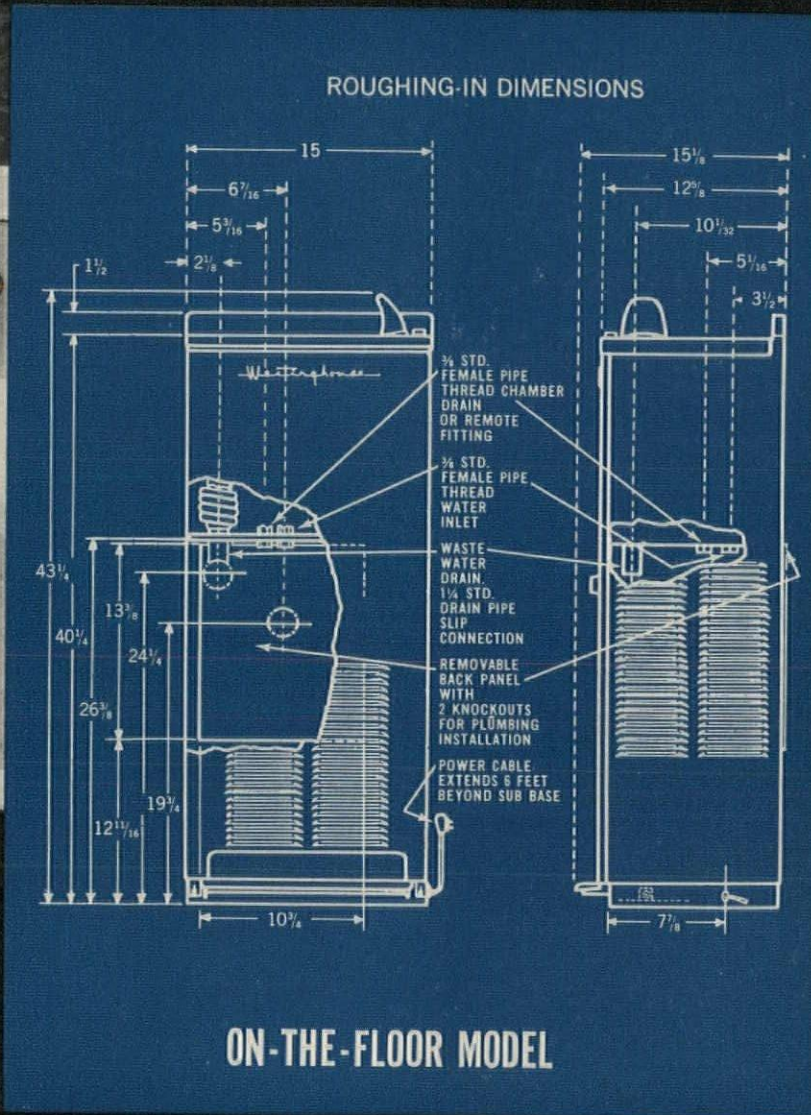
## *St. Charles*

CASEWORK SYSTEMS FOR HOSPITALS

St. Charles Manufacturing Co.,  
Dept. ARH-3, St. Charles, Illinois



# NEW FLUSH-TO-WALL WATER COOL



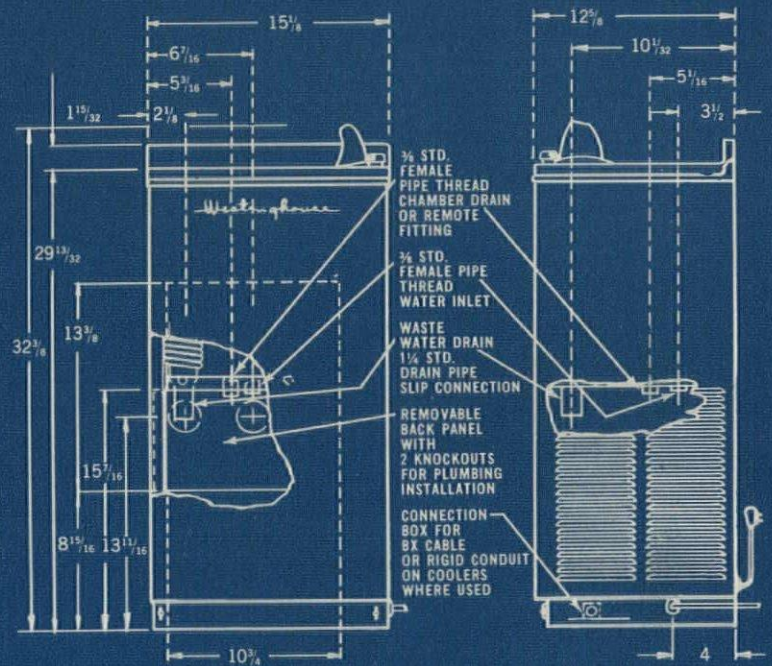
## EXCLUSIVE WESTINGHOUSE "WALL LINE"

**No unsightly plumbing—far faster . . . easier—less expensive to install.** Now, Westinghouse makes water coolers as up-to-date as today's architectural designs! No more exposed plumbing to mar clean, functional lines . . . or to catch trash and dirt. No more jutting into passageways and work areas. With the Westinghouse "Wall Line" all plumbing is concealed neatly inside. As a result, instead of the usual 18" to 22", these Westinghouse Water Coolers project only 12½", take 30% less space, keep corridors clear! New slip connections make installation far faster and easier, too. What's more, the Westinghouse "Wall Line" includes models for *on-the-floor*, *on-the-wall*, and *in-the-*

# ERS INSTALL NEATLY-ANYWHERE!



## ROUGHING-IN DIMENSIONS



## ON-THE-WALL MODEL

wall . . . offering you complete flexibility of design. On-the-wall models can be mounted on the floor to provide correct drinking height in schools. Get all the details on this exciting new line of coolers. Call your Westinghouse Water Cooler Distributor listed under "Water Coolers" in the Yellow Pages—or mail the coupon. Specify electrically refrigerated water coolers for schools, they are only slightly higher than non-refrigerated fountains.

YOU CAN BE SURE...IF it's **Westinghouse**

MAIL COUPON NOW

WESTINGHOUSE ELECTRIC CORP.  
Water Cooler Dept., Columbus, Ohio.

Please send me more information on your new Westinghouse "Wall Line" Water Coolers.

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ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

AR-3

## "We specify MP Plexiglas Drawer Trays"

*Pictured below: Block's - Glendale, Indianapolis*



For latest informative MP brochure and new "Clear-To-See" calculator wheel, without cost or obligation, mail coupon today.

**M**erchandise  
**P**resentation, inc.

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says **Justin Fabricius**, A.I.A.  
vice-president in charge of planning,  
Raymond Loewy Corp., New York

"We have found that MP Trays provide the unique features of practicality plus beauty that modern stores demand. In addition, we recognize the exceptional versatility of MP Trays for displaying a wide variety of merchandise to best possible advantage."

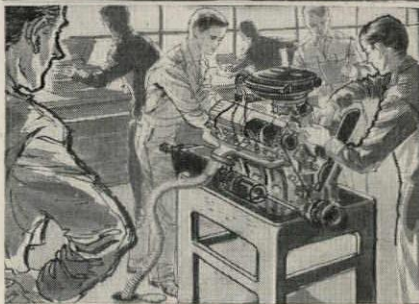
Hundreds of outstanding stores have been made more efficient, more attractive with MP Plexiglas "Floating Merchandise" Drawer Trays. Crystal-clear MP Trays keep all merchandise in view at all times to spur impulse buying, facilitate selection by salespeople, promote more multiple unit sales. A large variety of stock and custom sizes are available to assure maximum usable space, positive dust-free protection, unparalleled interior beauty.

Merchandise Presentation, Inc., Dept. R-30  
2191 Third Avenue, New York 35, N. Y.

Kindly send free calculator wheel and complete descriptive brochure on MP Plexiglas Drawer Trays.

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company \_\_\_\_\_  
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### LOW COST "PACKAGED" EXHAUST REMOVAL KIT

- Easily installed
- No rearrangement
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NATIONAL Systems remove poisonous carbon monoxide gas right at the source... the exhaust pipe... and carry it to the outside without heat loss in your shop. No rearrangement of your present shop layout necessary. Choice of 6 overhead or underfloor systems, which can be engineered to each individual application using standard "packaged" kits, including motor, blower, ducting, flexible tubing, etc., ready to install.

See our catalog in *Sweets Architectural File 31c/NA* and in *Sweets Industrial Construction File 18h/NA*—or write for catalog and details of **FREE** planning service.

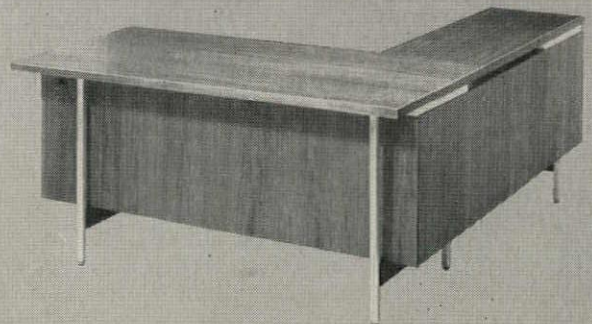
WORLD'S LARGEST MANUFACTURER  
OF EXCLUSIVE GARAGE VENTILATION EQUIPMENT

**NATIONAL SYSTEM**  
OF GARAGE VENTILATION, INC.

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Decatur, Illinois



## Crisp new design in wood office furniture



### The Template Group by LEOPOLD

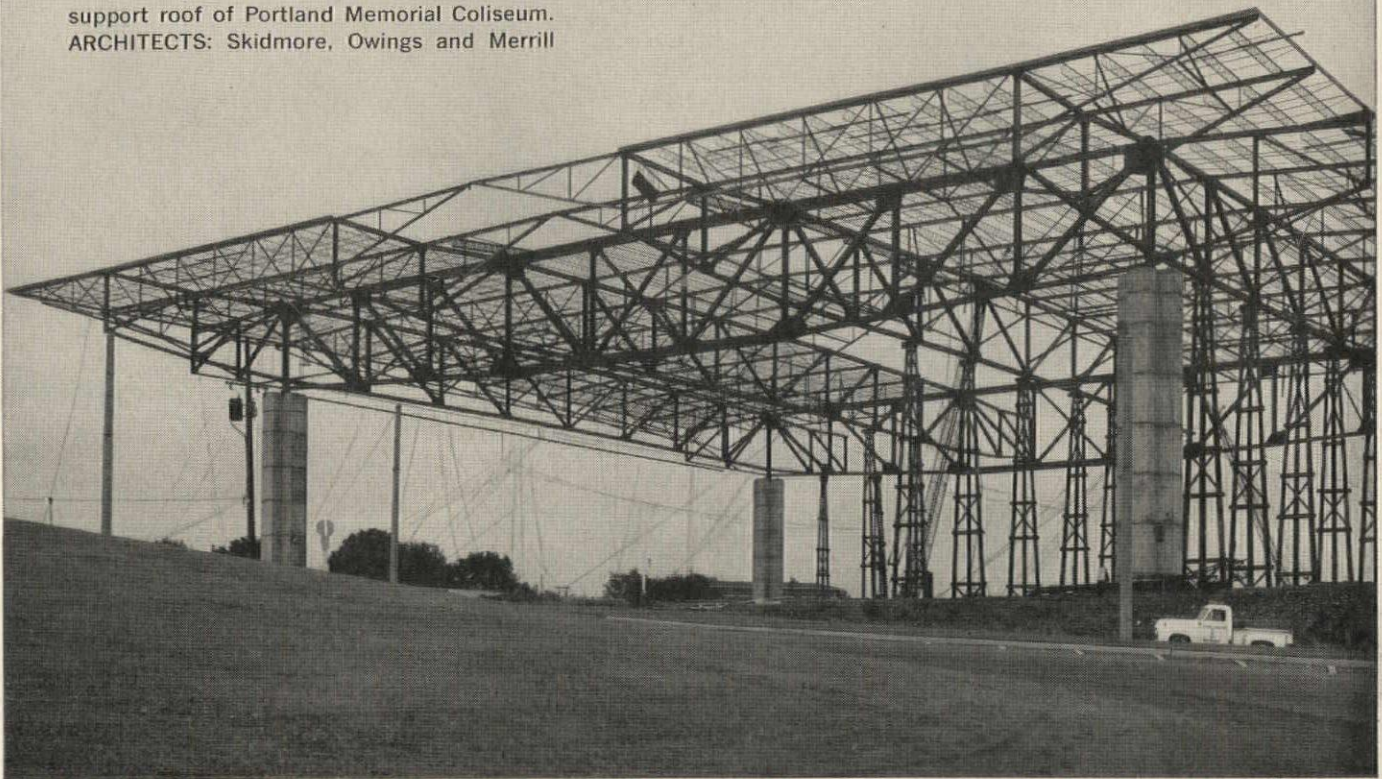
Now quantity production makes high styled furniture affordable and practical for the general office.

Architects, designers and decorators are invited to write direct for pricing and purchasing information.

The LEOPOLD COMPANY, Burlington, Iowa

# QUALITY-ECONOMY COMBINED

130,000 square feet of Macomber ALLSPANS support roof of Portland Memorial Coliseum.  
ARCHITECTS: Skidmore, Owings and Merrill



## MACOMBER ALLSPANS choice of the building industry... nationwide!

Cold rollformed ALLSPANS, up to 120 feet in length, assure architects, engineers and contractors maximum reserve strength unhampered by excess weight. This unmatched combination of structural quality and erection economy, job-proven in thousands of installations, is backed by 36 years engineering and fabricating experience — guided by quality control unsurpassed in the industry.

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**NEW DESIGN MANUAL**

Exclusive structural and economy advantages  
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1-60A

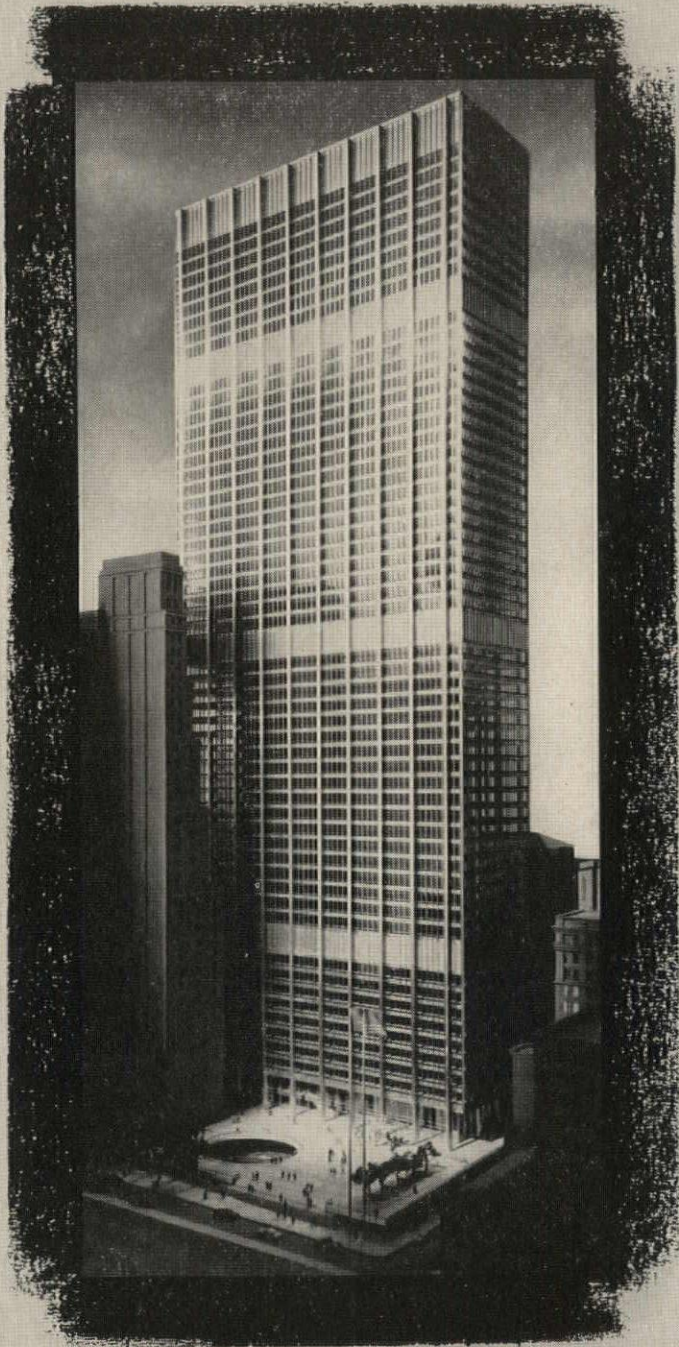


**MACOMBER**  
CANTON 1, OHIO

ALLSPANS • V-LOK • V-BEAMS • V-GIRDERS  
BOWSTRING TRUSSES • ROOF DECK • STRUCTURAL STEEL

See our  
Catalog  
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or write  
for copy

If glass is a chief  
visual element in your  
design, then the beauty  
of that glass should be  
a major concern in  
your specification.



Beauty of glass is largely a matter of the reflections seen in it. Wiggly reflections—which mar beauty—are minimized with *plate* glass.

*Twin-ground* plate glass gives you the truest reflections. And you always get twin-ground plate glass when you specify L·O·F  $\frac{1}{4}$ " *Parallel-O-Plate*® or *Parallel-O-Grey*®.

The Chase Manhattan Bank head office building, New York.  
Windows: L·O·F *Parallel-O-Plate* Glass.  
Architects: Skidmore, Owings and Merrill, New York.  
General Contractor: Turner Construction Co., New York.



## PARALLEL·O·PLATE GLASS

LIBBEY·OWENS·FORD GLASS CO. *a Great Name in Glass*

TOLEDO 3, OHIO

# NEW

## AS TOMORROW'S BUILDINGS



The superbly engineered new Oasis On-A-Wall wall-hung Water Cooler is elegantly styled for modern architecture.

**Because it's off the floor**, the Oasis On-A-Wall is easy to clean around. It's flush with the wall to save space and conceal plumbing.

**With its crisp, modern look**, the On-A-Wall is the first water cooler to have a cabinet of 20 gauge steel with mar-resistant Vinyl Laminate exterior finish of Silver Spice color. Recessed anodized aluminum grille has an ultra-modern basketweave pattern.

**Easily mounted**, the On-A-Wall has a stainless steel top, deep basin with anti-splash ridge, and the highest anti-splash back of any wall-hung cooler. It is available in two capacities—7 and 13 GPH.

**Write today** for attractive album prepared especially for architects and engineers. It has specifications and roughing-in drawings for the complete Oasis line of water coolers, including the versatile In-A-Wall that fits in an 8" wall. Or look in Sweet's AIA File No. 29-D-42.

**Yes, you can specify** Oasis with the utmost confidence because Oasis engineering has the finest record of trouble-free performance in the industry.



## OASIS WATER COOLERS

The Ebco Manufacturing Co., Dept. 5-P, Columbus 13, Ohio  
Manufacturers of the most complete line of water coolers. Distributed in Canada by G. H. Wood & Co., Ltd.



Forty-Second and Going Branch, First National Bank of Oregon, Portland, Oregon. Architects: Balzhiser, Seder & Rhodes, Eugene, Ore. Contractor: A. C. Edmon, Portland.

*Space provided:* main banking room, safe deposit vault, employees' lounge, men's and women's rest rooms, furnace room, storage area. *Structural framing:* double curved glulam beams spaced at 15'. *Exterior walls:* band sawn siding, brick. *Interior walls:* wood paneling, exposed brick, plaster, metal

*wall tile.* *Heating:* forced warm air duct system. *Ventilation:* refrigerant forced air system. *Lighting:* fluorescent and incandescent. *Floors:* vinyl tile over concrete slab. *Roof:* built-up felt and tar with crushed Haydite over striated Tim-Deck. *Area:* 3,950 square feet. *Cost:* about \$15 a square foot.



The ability of glued laminated timbers to be formed in almost any desired shape provides an ideal combination of distinctive design, beautiful appearance, and permanent, economical construction.

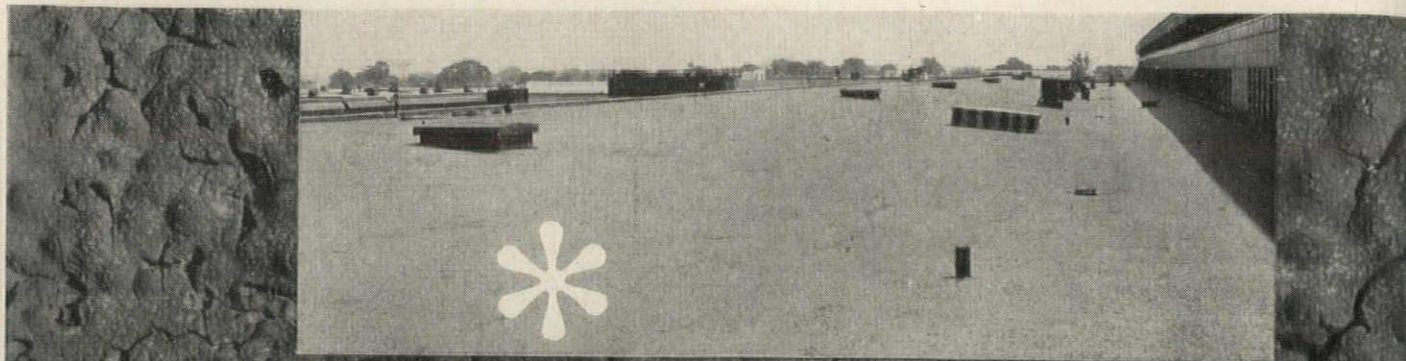
### TIMBER STRUCTURES, INC.

P. O. BOX 3782-A, PORTLAND 8, OREGON

Division Offices in Ramsey, N. J.; Schiller Park, Illinois; Dallas Texas  
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Member A. I. T. C.  
and Producers' Council



# WHAT HAPPENS NOW?

**PROBLEM: HOW CAN YOU KEEP THESE  
CRACKS FROM BECOMING LEAKS?**

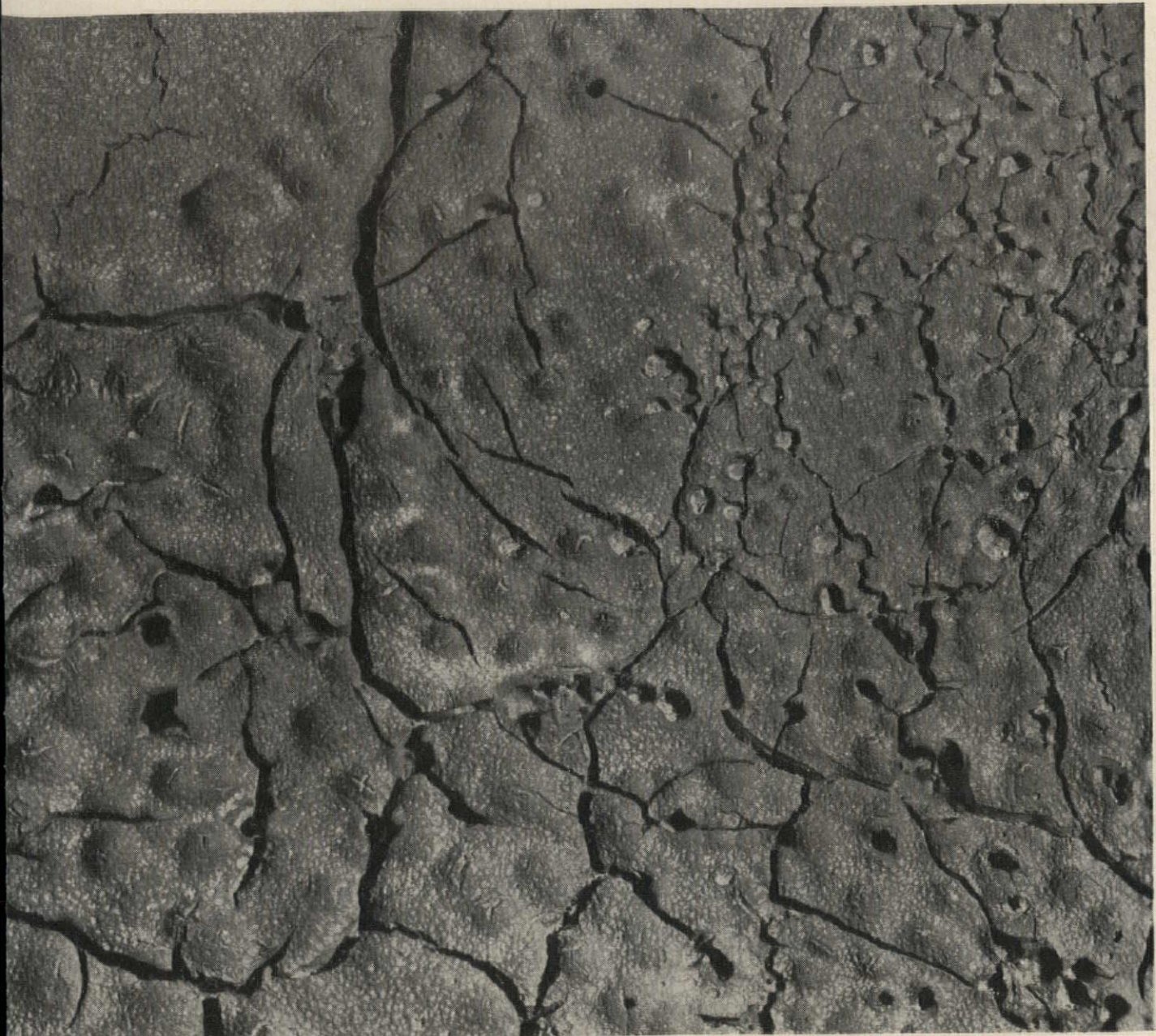


On any built-up roof, the bitumen is the waterproofing agent, not the felts. Felts reinforce or hold bitumen, keep it from flowing off the roof or from cracking due to normal contraction and expansion. They also slow down normal oxidation. But as the top pour coat of bitumen weathers, cracking ("alligatoring") opens a path for water to begin deterioration of the organic roofing felts below. And because the felts are "shingled in," water can wick through the top layer of felts down to the deck. The result is often premature roof failure. Absorptive felts also separate bitumen application (above); create a non-porous construction in which air or moisture which might become entrapped will produce blisters or cracks.

**SOLUTION: REINFORCE THE BITUMEN  
WITH PERMA PLY ROOFING FELTS.**



Unlike ordinary organic paper felts, Fiberglas\* Perma Ply\* felts are inorganic and porous. A Fiberglas Reinforced Roof (above) is of monolithic construction. The bitumen and porous Perma Ply felts weld together into a single layer of strongly reinforced waterproofing. Perma Ply becomes an integral part of the bitumen, not a separating layer. It reinforces the bitumen, tending to resist the normal tendency for asphalt to contract when the temperature drops. The porous mat of inorganic Fiberglas doesn't rot, char, or wick or trap air or moisture to cause blisters. Even should the top pour coat of bitumen weather away and crack, water can't penetrate the solid monolithic slab of asphalt reinforced with glass fibers if properly applied.



## ANOTHER REASON WHY A FIBERGLAS REINFORCED ROOF IS A BETTER ROOF!

Fiberglas bonded roofs are applied only by qualified Fiberglas Approved Roofers skilled in their craft—and rigidly inspected by Fiberglas roofing experts.

And Fiberglas Roof Insulation is the perfect companion for Perma Ply roofing materials . . . gives you another component for a long-lasting, quality roof from top to bottom. Fiberglas Roof Insulation is now available in the new 3' x 4' and 4' x 4' sizes. These larger boards cover more deck area faster. There are fewer joints and less chance for trouble due to roof traffic.

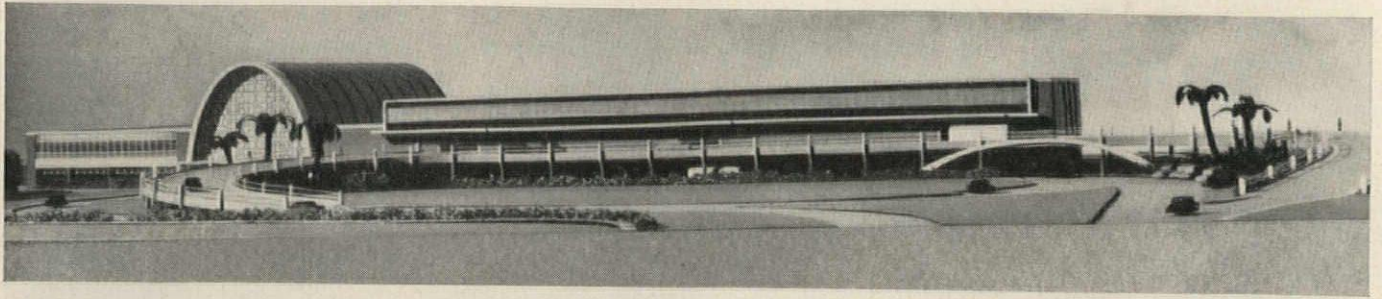
**Find out about** the advantages of Fiberglas Built-Up Roofing and Roof Insulation. For complete descriptive literature, write to: Owens-Corning Fiberglas Corporation, Dept. 68-C, 717 Fifth Avenue, New York 22, N. Y.

OWENS-CORNING  
**FIBERGLAS**  
INC. REG. U.S. PAT. OFF.

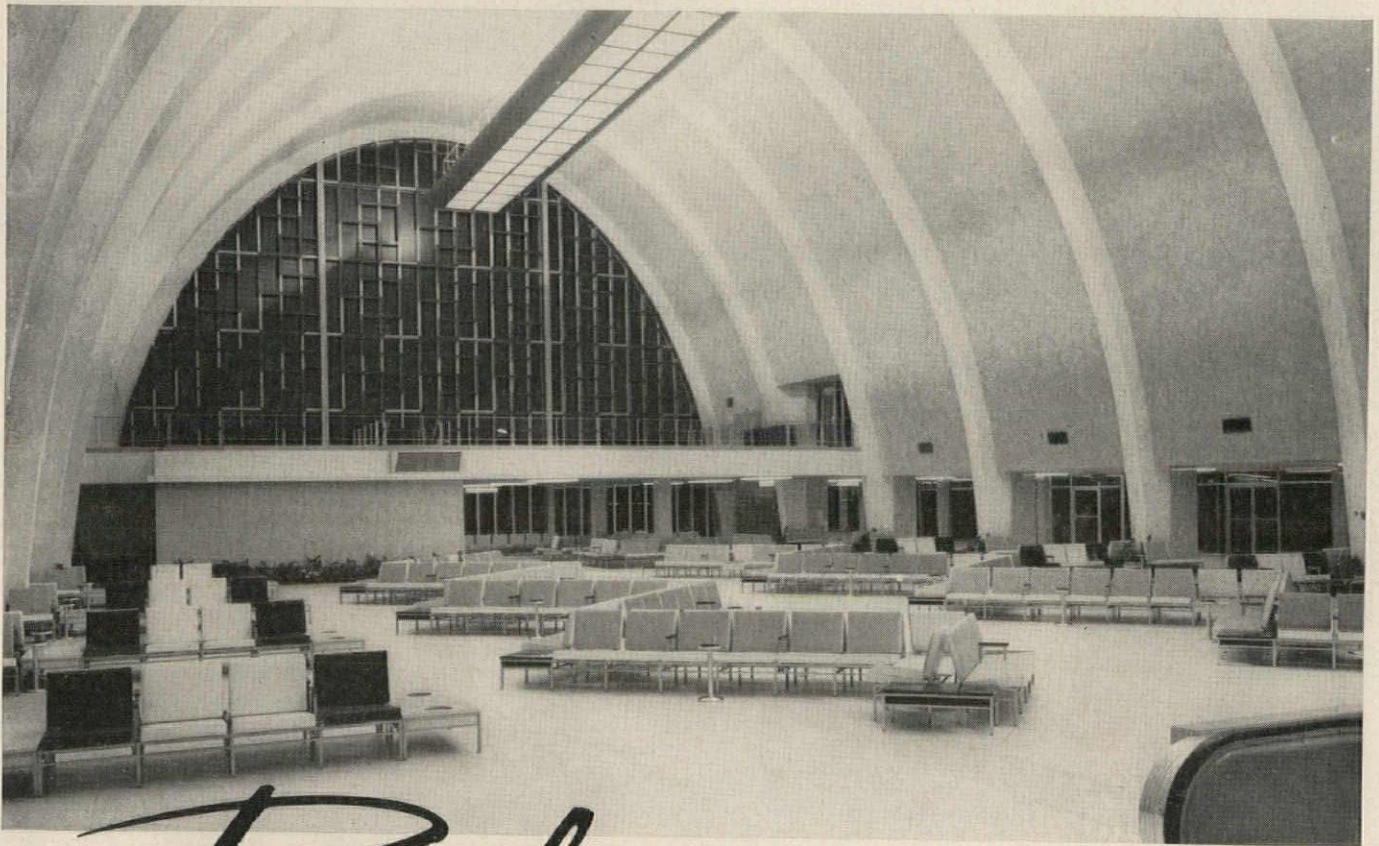
\*T.M. (REG. U.S. PAT. OFF.) O-C.F. CORP.

## at Moisant International Airport, New Orleans\*

architects: Goldstein, Parham & Labouisse; Herbert A. Benson—George J. Riehl



jet age travelers enjoy modern comfort and convenience...



## with *Royal*® VISCOUNT MODULAR FURNITURE

Between flights as well as in the air, travelers using the beautiful new Moisant International Airport are assured of the ultimate in functional, beautiful surroundings.

To enhance the atmosphere of the terminal building, and provide luxurious comfort for waiting passengers, Royal's new Viscount modular seating and tables were arranged in an informal zig-zag

pattern in the center of the lobby, framed by back-to-back groupings. All Viscount units are designed and engineered to fit together rigidly in any combination...easily re-arranged whenever necessary by loosening two hidden bolts.

Viscount offers architects the design freedom of infinitely variable groupings of seats, ottomans, tables—as well as over 50 attractive upholstery patterns and

colors. Impervious Royaloid table tops are offered in 20 arresting finishes and colors. Rigid one-piece leg-frames are 1" square tubular steel, all-welded, with flawless Satin Chrome finish.

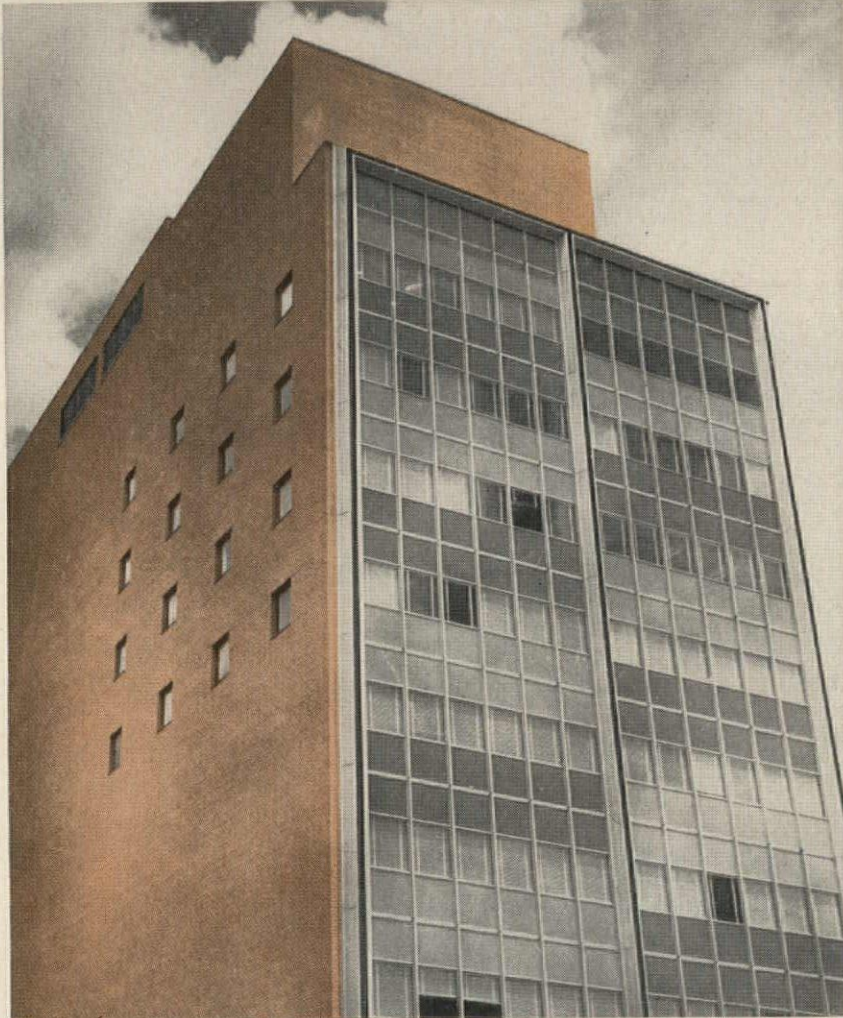
\*The terminal is a concrete, steel and glass structure in three levels, containing 304,000 square feet of floor space. The domed main lobby illustrated contains 18,400 square feet of waiting room, with the dramatic parabolic roof rising to 65 feet at its highest point.

Write for Royal VISCOUNT brochure 9026 for details

**Royal Metal Manufacturing Company**

One Park Avenue, New York 16, Dept. 20-C

# Brick Finds A "Protector"



## New Factory-Applied Treatment Keeps Brick Clean and Attractive

For centuries, brick has been one of the architect's best friends. But sometimes even this versatile material has a few faults, such as efflorescence and dirt pick-up, especially in the more decorative shades.

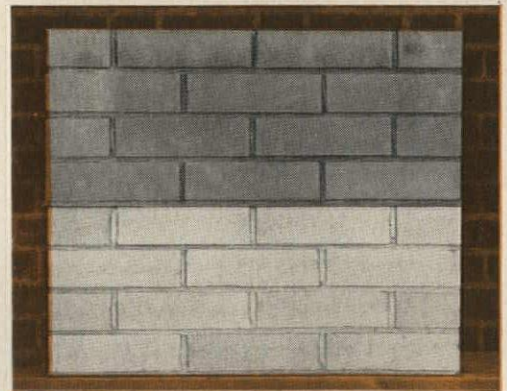
Now, chemistry has found a way to minimize brick staining and discoloration. It's Silaneal® . . . a treatment applied to brick *at the factory*. Already evaluated in tests prescribed by Structural Clay Products Research Foundation and thoroughly field-proven in numerous buildings, Silaneal preserves the beauty of even the most delicate hues of brick. And, as if this weren't enough, Silaneal also makes brick easier for the mason to lay up.

Silaneal makes brick water-repellent, so surface dirt is washed off by rain rather than being absorbed into the brick. Silaneal also prevents water from leaching salts from brick or back-up materials and then depositing

them on the surface . . . the cause of efflorescence. Thus, brick protected with Silaneal stay clean during storage and after installation. Their beauty is preserved.

Silaneal has the further effect of making brick easier to lay up. Reason: It gives brick what is known as a "controlled suction rate". Generally speaking, the lighter shades of brick have high initial absorption . . . they tend to suck the water from mortar very rapidly. This results in a poor mortar joint because there is insufficient water retained in the mortar to give proper hydration. Because Silaneal gives the brick a controlled suction rate, mortar stays workable longer . . . brick needs no soaking. Other benefits: More mortar can be spread at a time, and more courses laid before the joints are struck. Total benefits: protected beauty, easier construction, happier clients.

In the large picture you see one of many constructions using the new "beauty protected by Silaneal" brick. In this case the treated brick were supplied by Reliance



Clay Products. Architect: Wyatt C. Hedrick, A.I.A. Pictured above is a test wall in which all bricks are identical except that the bottom four rows were treated with Silaneal, whereas the top four rows were untreated. Note heavy discoloration of untreated brick after six months' exposure in northern climate. Bottom bricks are still like new.



For more information and names of brick manufacturers, write Dept. 5903.

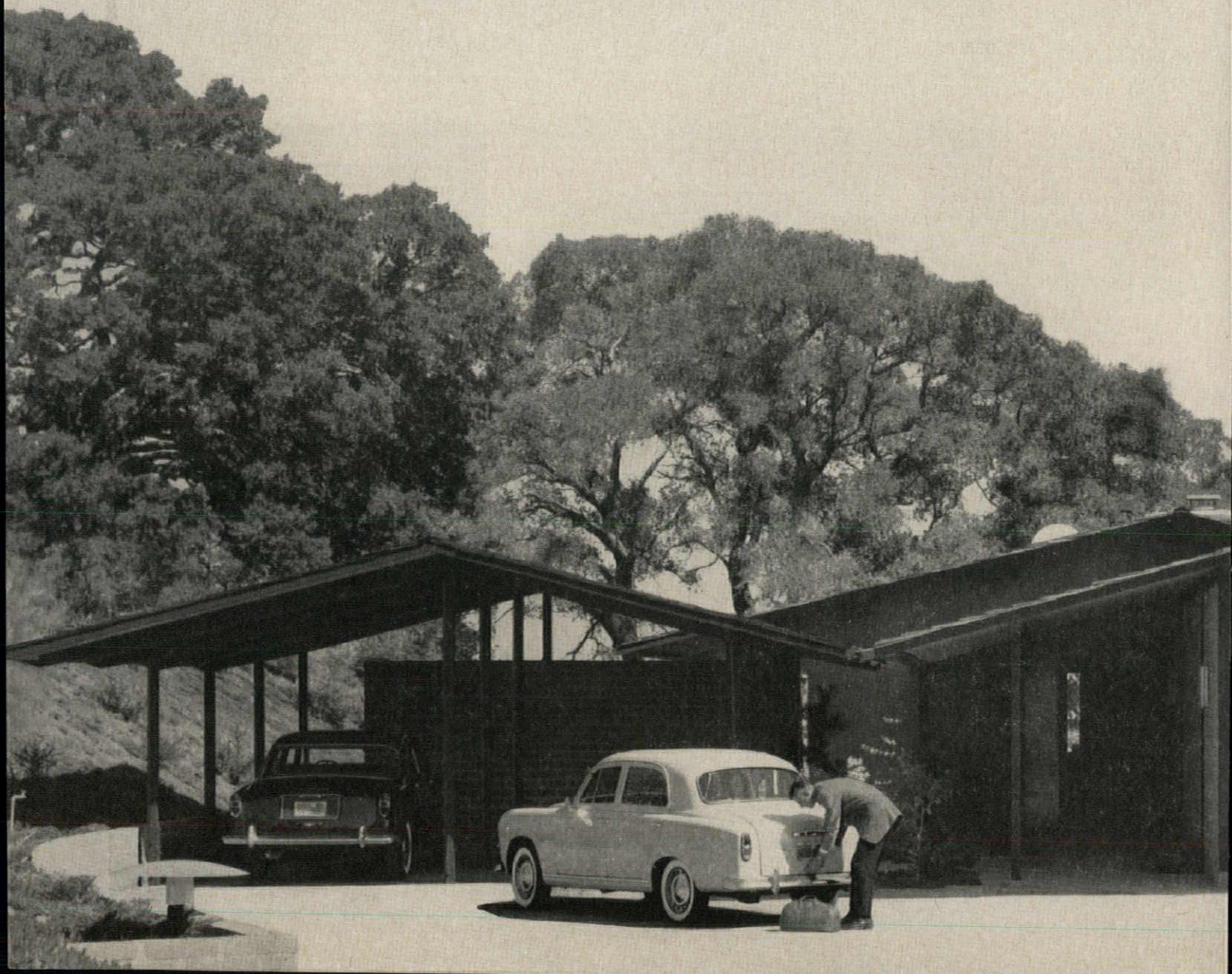
Your nearest Dow Corning office is the number one source for information and technical service on silicones.

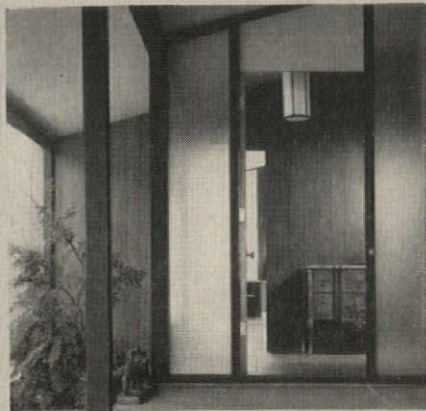


**Dow Corning CORPORATION**  
MIDLAND, MICHIGAN

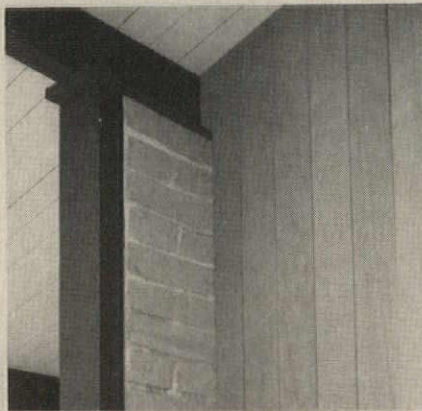
ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

*WHAT OTHER MATERIAL CAN BE USED*





Here at the entrance to this handsome home, it's readily apparent how important a contribution redwood makes to the casual, natural beauty so characteristic of the well-designed contemporary home. Note, too, the pleasing harmony between wood, planting, translucent glass and tile.



Saw-textured redwood is particularly effective when used in combination with adobe and other natural materials. When not stained or painted, a water-repellent preservative is recommended to reduce the tendency of the wood to darken.



Because Certified Kiln Dried redwood is easy to work, holds its shape and finishes so beautifully, it is often specified for the fine millwork required in such decorative design elements as this sliding grille.

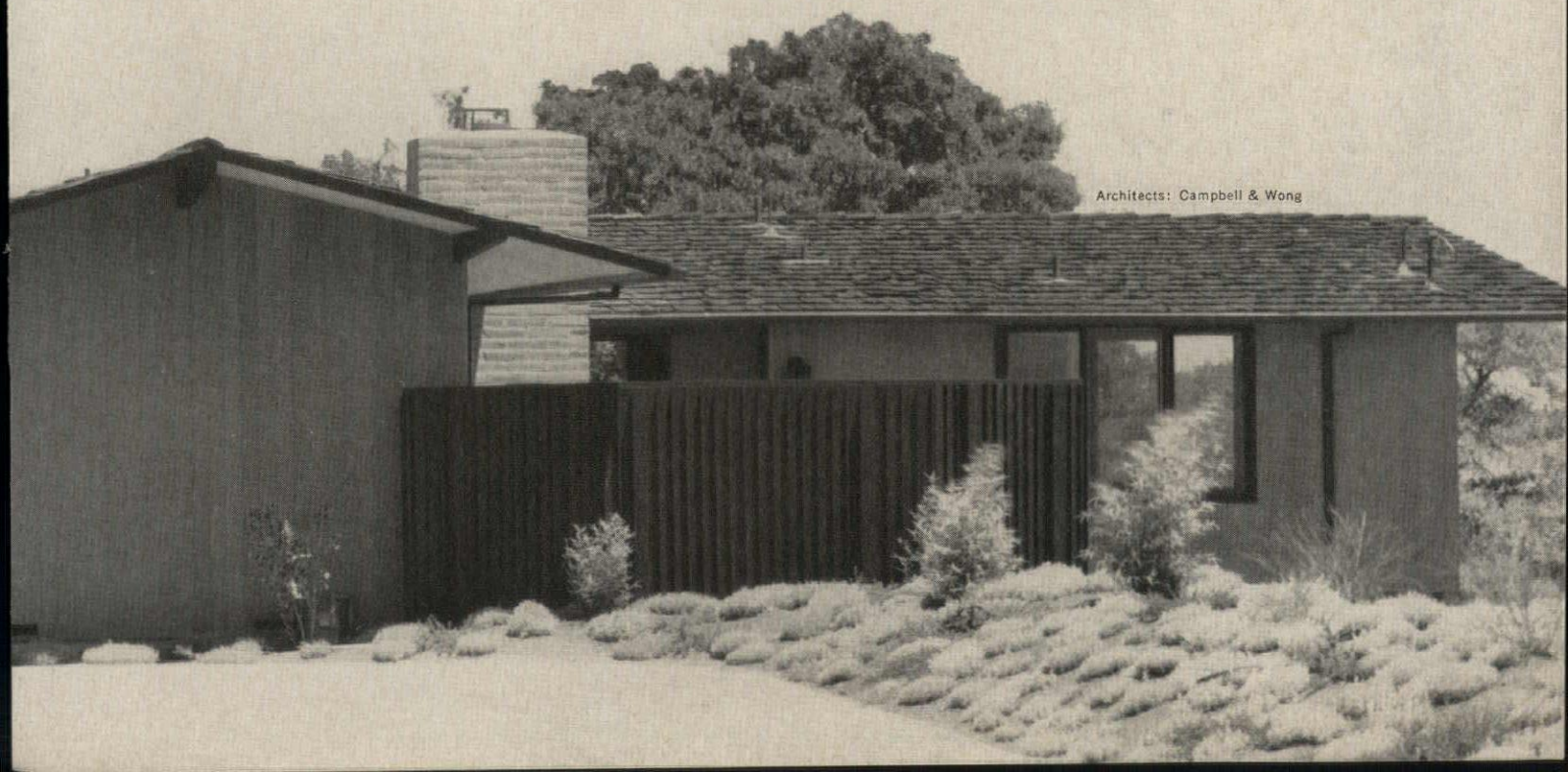
## SO EFFECTIVELY SO MANY WAYS?

From simple patio planter to the finest of interior paneling, from siding to decorative millwork, there's a grade and type of redwood to meet the most exacting specifications. What's more, the warm, natural beauty of Certified Kiln Dried redwood, with its wide range of grains, textures and color variations, has an almost universal appeal to both the architect and home owner. No wonder this exceptionally versatile wood is used so extensively in so many distinguished homes from coast to coast.



*All the wonderful warmth of wood is best expressed in redwood.*

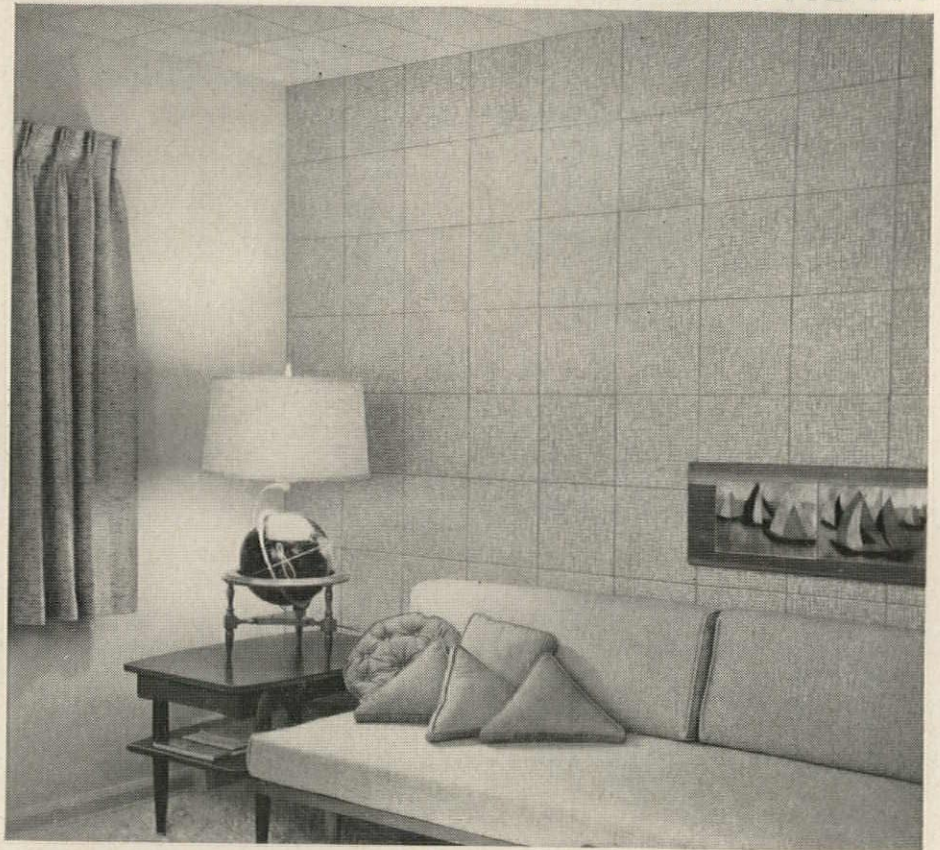
CALIFORNIA REDWOOD ASSOCIATION • 576 SACRAMENTO STREET • SAN FRANCISCO • CERTIFIED KILN DRIED REDWOOD



Architects: Campbell & Wong

IN RESIDENTIAL OR COMMERCIAL INSTALLATIONS . . .

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## ...WITH **Curon**® WALL COVERING

Only CURON\* wall covering offers you so many selling advantages . . . offers your customers distinctive decor, a new kind of sound-conditioning, thermal insulation plus easy installation, easy maintenance.



**WHAT IS CURON?** An amazing new 1/4" multicellular material. Fine-grained, soft-to-the-touch texture. Flexible. Light weight. Fire retardant.

**DECORATES SMARTLY,** CURON wall covering comes in about 20 different colors. In 10" squares, 10" x 20" rectangles, in rolls, in 9' x 50" silk-screened decorator panels. Combine, design for unusual decorating effects.



**ABSORBS NOISE AT WALL LEVEL** Because you can apply CURON to walls (as well as ceilings), you absorb noise before it builds up. It's the only sound-conditioning material that gives a smart decorator look.

**ANOTHER ADVANTAGE . . . INSULATES** Because of its 1/4" depth, CURON wall covering insulates superbly. It helps keep out cold in winter, cuts heating bills . . . vice versa in summer. Won't pack, is unaffected by moisture.



**WALLS THAT STAY SMART**—CURON wall covering keeps new looking indefinitely. Non-static surfaces repel dirt, dust. Spots and stains come off easily with detergent. Needs no painting. Damaged areas are easy to replace.

**EASY TO INSTALL**—Light weight flexibility makes CURON wall covering easy to handle. Goes over any flat or smooth surface . . . plaster-board, plaster, wood, even cinder block and cement (with proper sizing). Goes around curves, corners. Applies with wallpaper paste. Eliminates special mounting fixtures, furring strips, expensive adhesive.



**HOW AND WHERE TO USE CURON EFFECTIVELY**—CURON wall covering belongs in every home, office, apartment. It allows new freedom in design and decoration. Ideal for bedrooms, family and hi-fi rooms . . . office machine areas, reception, conference and consultation rooms . . . hallways, corridors. Brings modern look to redecorated, remodelled installations.

# Curon®

## WALL-CEILING COVERING

\*CURON is the registered trademark of the Curtiss-Wright Corporation for its multicellular material.

For more facts see your CURON dealer today. Or write: Curon Division Section RH-360, Curtiss-Wright Corporation, 1271 Avenue of the Americas, New York 20, N. Y.

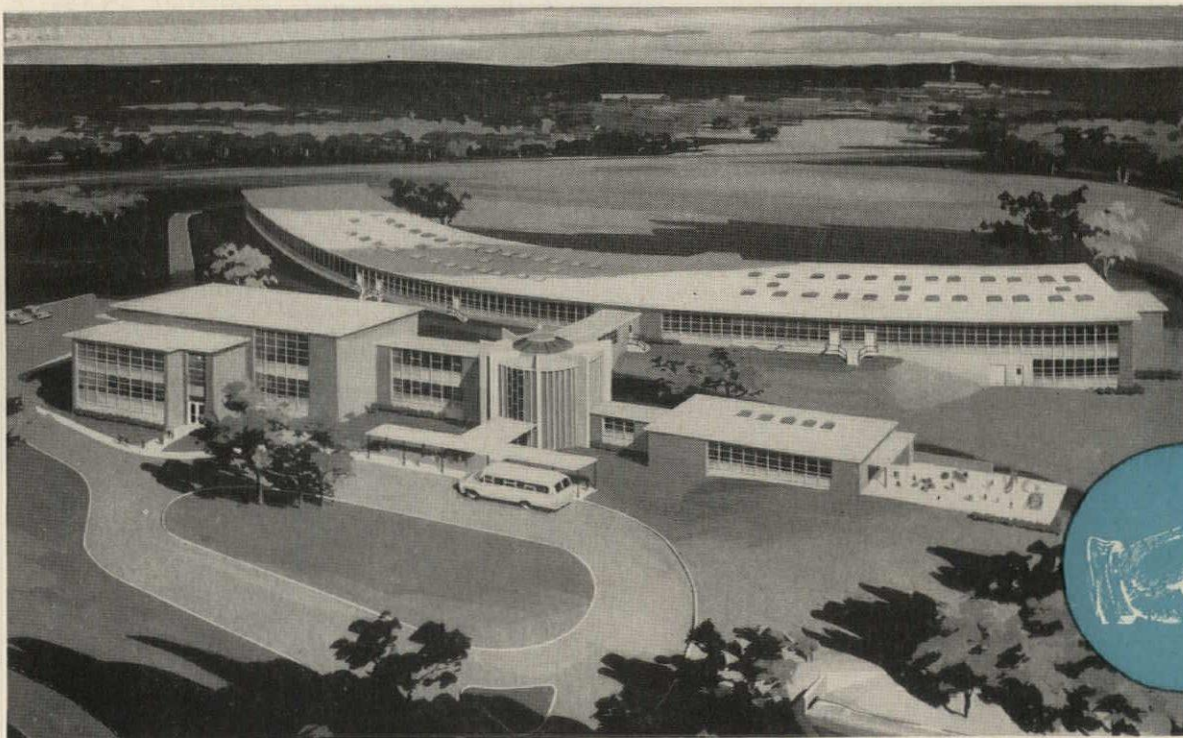


# 411<sup>th</sup> SCHOOL

**selects herman nelson**  
**“now or later”**  
**air conditioning**

## **LIDA LEE TALL ELEMENTARY SCHOOL**

(Laboratory School) Towson State Teachers College, Towson, Maryland; Architects & Mechanical Engineers: Finney, Dodson, Smeallie, Orrick & Associates, Baltimore; Structural Engineers: J. L. Faisant & Associates, Baltimore; General Contractor: Anchor Construction Company, Baltimore; Mechanical Contractor: George H. Schuman Company, Baltimore.



(turn page for cost data)

**NEW *kernel-cool* III offers**  
**OPTIONAL COLOR,**  
**OPTIONAL FUNCTION,**  
**OPTIONAL AIR CONDITIONING**

**and Nelson flexibility brings**  
**the cost within any school budget**

Herman Nelson — *the company that made air conditioning economically practical for schools by providing for it on an optional, "now or later" basis* — now offers brand new unit ventilator styling with optional color and optional function, too!

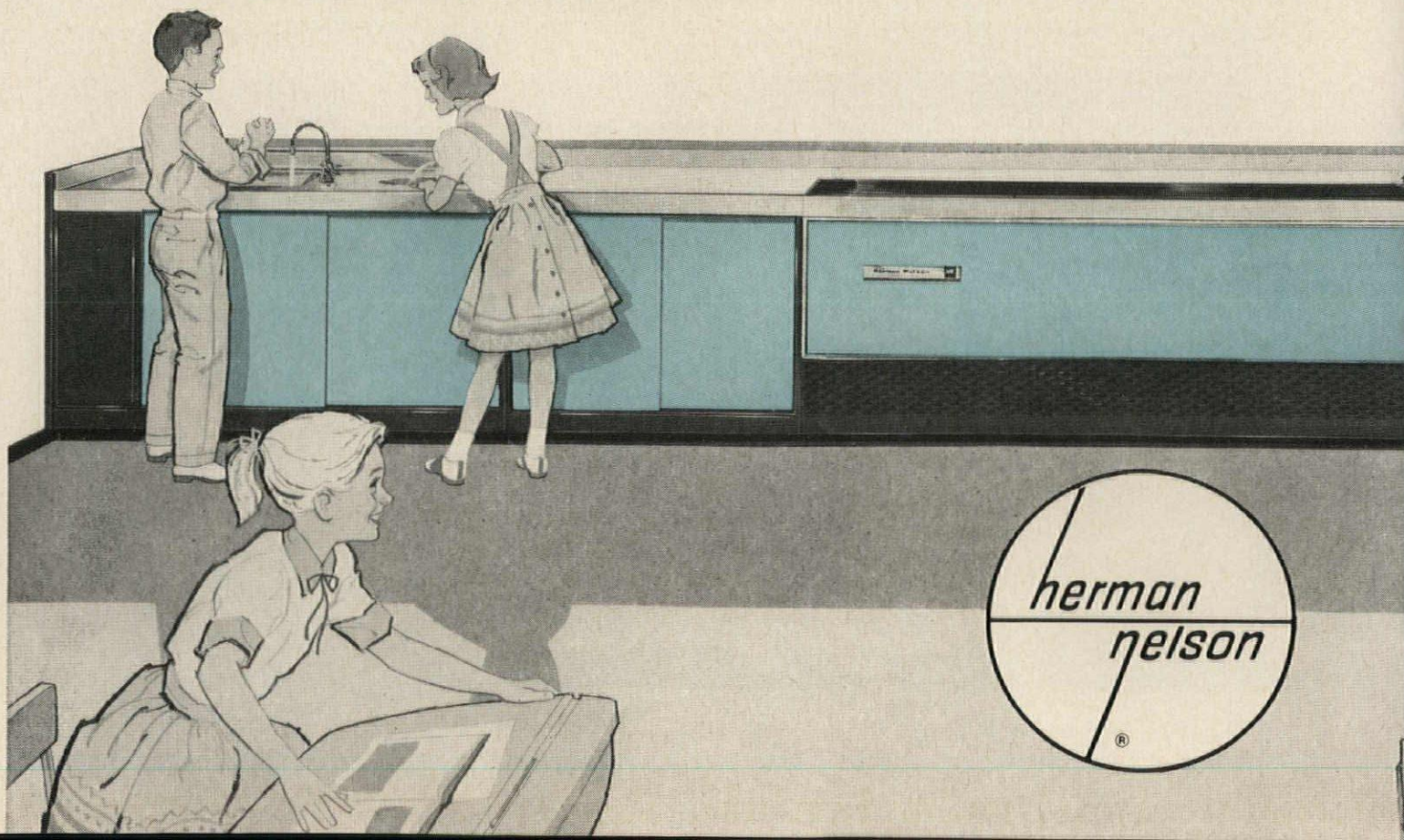
**OPTIONAL COLOR!** Your choice of unit ventilator equipment in six new decorator colors: Flame, Green, Blue, Salmon, Yellow and Neutral Gray.

**OPTIONAL FUNCTION!** Your unit ventilator accessory equipment can contain (1) sink and

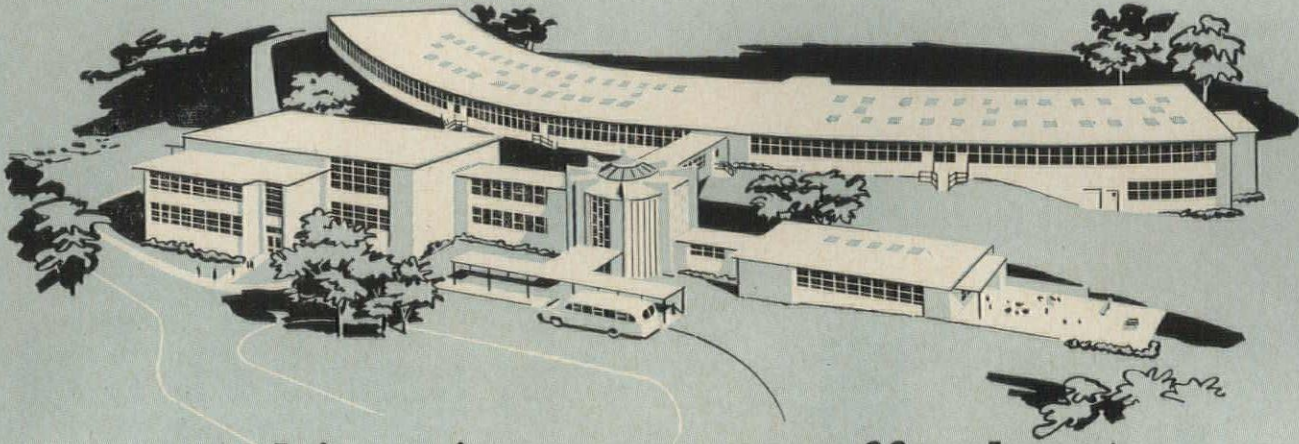
bubbler unit, (2) sliding-door cabinets, (3) open cabinets, (4) magazine racks, (5) cubicle cabinets, and (6) pull-out cabinets on casters.

*And exclusive Herman Nelson options (optional accessories, optional air conditioning) make it easy to tailor your system to fit your school budget.*

This new-color, new-function styling is available on *all* Nelson unit ventilator equipment — whether the equipment provides for air conditioning or for heating, ventilating and natural cooling only.



## COST DATA: LIDA LEE TALL ELEMENTARY SCHOOL



at this price, can you afford not  
to provide for air conditioning?

The total heating & ventilating cost (including provision for future air conditioning) for Lida Lee Tall school was \$1.64 per square foot. This cost is in the same range as that for schools in the area that *did not* provide for air conditioning!

And when the school *does* air condition, it can do so simply by adding a packaged liquid chiller in the boiler room at an estimated cost of just 55c per

square foot — about  $\frac{1}{3}$  the cost of actually installing even the lowest-cost air conditioning system.

Now, 411 SCHOOLS have taken advantage of Herman Nelson's "now or later" air conditioning idea. They installed HerNel-COOL units at little or no extra cost, can air condition later at a great saving. At this price, can you afford *not* to provide for air conditioning?



### Mail coupon for **FREE** herman nelson **FACT KIT** on school air conditioning

Includes information on (1) how air conditioning affects the learning environment, (2) the cost of school air conditioning (including rule-of-thumb estimates you can use in your own planning), and, (3) the equipment for school air conditioning.

herman  nelson

SCHOOL AIR SYSTEMS DIVISION OF  
**AAF** American Air Filter  
COMPANY, INC., LOUISVILLE, KENTUCKY

School Air Systems Division, Dept. 259  
American Air Filter Co., Inc.  
215 Central Avenue, Louisville, Kentucky

- FACT KIT on school air conditioning.
- Booklet: Architectural air conditioned school designs.
- Booklet: The case for air conditioned schools.

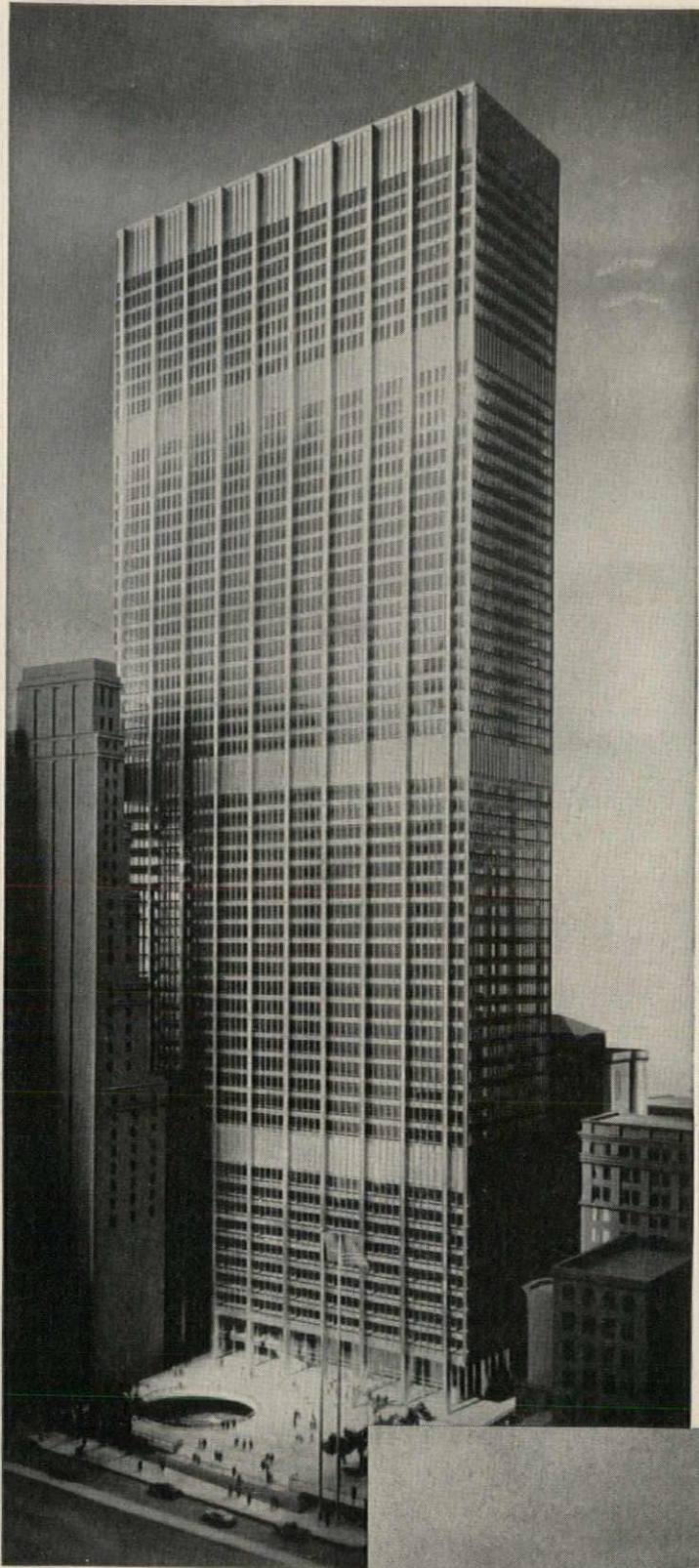
NAME \_\_\_\_\_

TITLE \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_





Chase Manhattan Building, to be completed in New York City in 1960. Architects: Skidmore, Owings & Merrill. General Contractors: Turner Construction Co. Structural Engineers: Weiskopf & Pickworth. Authorized SPRAYED "LIMPET" ASBESTOS applicator. E. B. Carley & Co., Inc.

## SPRAYED "LIMPET" ASBESTOS will protect new Chase Manhattan Building from fire

**4-hour UL fire-retardancy rating for steel  
floors in largest sprayed-insulation application**

For the startling Chase Manhattan project, now rising in lower Manhattan, nothing but the best would do. Therefore . . .

Every square foot of Robertson cellular-steel floor area (and there will be 60 stories) will receive a half-inch minimum coating of SPRAYED "LIMPET" ASBESTOS on the underside. This application, the largest sprayed-fireproofing job in history, will provide up to four hours' buckling-resistance to the steel floors in the event of fire.

Recent Underwriters' Laboratories tests on steel floors, beams, and other structural members indicate fire-protection up to five hours provided by various thicknesses of SPRAYED "LIMPET" ASBESTOS. Results of these tests are available for your examination.

**WHAT IS SPRAYED "LIMPET" ASBESTOS?** It's 100% pure asbestos fibers in an inorganic binder. It won't burn, rot, or corrode. It can be painted over with ten coats of paint without losing its thermal, acoustical, and other insulating properties. It follows the contours of the surface it covers, without hiding decorative details.

Learn more about the advantages of SPRAYED "LIMPET" ASBESTOS for modern fire-protection at low installed cost. Write today for complete information.



Applied in one operation, SPRAYED "LIMPET" ASBESTOS combines in mid-air with water from special spray gun.



**KEASBEY & MATTISON**

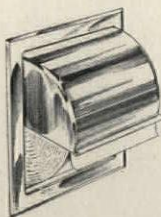
COMPANY • AMBLER • PENNSYLVANIA

A  
 CAREFUL  
*Selection*  
 OF  
**HALL-MACK®**  
 BATHROOM  
 ACCESSORIES



*adds the Touch that means so much!*

Concealed Toilet Paper Holder. Revolving hood protects, covers paper, lifts at the touch of a finger.



Relaxation Unit luxuriously practical—recessed for toilet paper, cigarettes, ashtray, magazines.

Concealed Lavatory Unit. Revolving door hides soap, tumblers and brushes.



In HALL-MACK's *complete* selection of bathroom accessories, you'll find many unique, practical ideas such as those shown here. Pioneered by HALL-MACK to meet specific needs, they're designed to provide extra convenience and beauty . . . to add the touch of luxury that means so much.

Blending easily with any decor and styled for every budget, these quality, gleaming accessories spell customer satisfaction. The bath you design, sell, or install today — in modest abode or palatial setting — will always have the best when you specify HALL-MACK Accessories.

**HALL-MACK COMPANY** Division of **TEXTRON INC.**  
 1380 W. Washington Blvd., Los Angeles 7, California

AR-360

Please send your FREE color booklet of new bathroom ideas.

Name \_\_\_\_\_

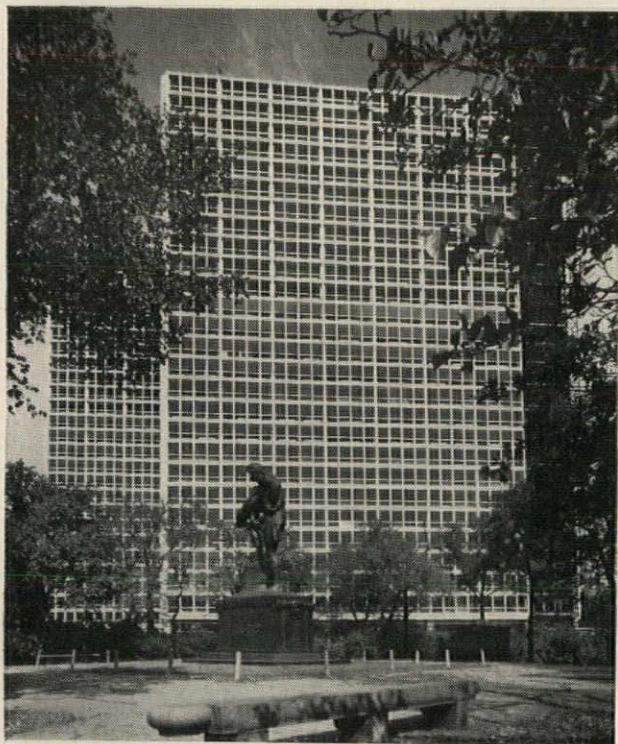
(PLEASE PRINT)

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Sold by leading plumbing, tile and hardware dealers everywhere

**Drainage and Vent Lines** in New York City's famous Seagram Building are galvanized steel pipe . . . durable and reliable steel pipe that will last the lifetime of the building and more with minimum service or maintenance.



**Rigid Steel Conduit** safely and efficiently handles the electric power requirements of the Commonwealth Promenade Apartments in Chicago. Zinc coated steel conduit is used underground and in concrete, black enamel at grade level and above.



# In the nation's buildings steel pipe does many jobs more efficiently, more easily, and at less cost . . . .

Accepted without question is the efficient and reliable performance of *steel pipe* in the nation's commercial, industrial and residential structures. And with reasons.

Design-wise—*steel pipe* fills many functions well, long and efficiently. Engineering-wise—it has the inherent strength and dimensional stability to withstand the toughest service over continued periods, and it is easy to form and join. Cost-wise—no

other metal tubular product offers more for less . . . ready availability, low initial cost, low installed cost and low per-year service cost.

These are only some of the reasons why *steel pipe* is the most widely specified pipe in the world for vent and drainage lines, heating and cooling, snow and ice melting, refrigeration and ice-making, fire protection systems, electrical conduit and structural uses, and water, steam, air and gas lines.



**Sprinkler System and Stand-Pipe Fire Lines** in Travelers Insurance Boston building are durable steel pipe. Savings in initial and installation costs were considerable; insurance premiums were less with steel pipe fire protection systems on guard throughout the structure.

## STEEL PIPE IS FIRST CHOICE

- Low cost with durability
- Strength unexcelled for safety
- Formable—bends readily
- Weldable—easily, strongly
- Threads smoothly, cleanly
- Sound joints, welded or coupled
- Grades, finishes for all purposes
- Available everywhere from stock

Insist on



Steel Pipe

## COMMITTEE ON STEEL PIPE RESEARCH

150 East Forty-Second Street, New York 17, N.Y.



8287-DB



Donley incinerator parts and plans were specified for this successful incinerator now serving this 72-suite apartment building.

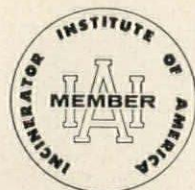
## HEY LADY...

### WHAT ABOUT THE GARBAGE?

... and yesterday's newspapers? ... and all the other rubbish the family produces daily? Quite a problem not only in apartments, but in every building you design ... unless proper provision is made for refuse disposal.

Using the Donley Automatic Safety Burner to provide small fires at frequent pre-determined intervals, refuse can be disposed of at its source with minimum heat, smoke, fly-ash and odor. Donley parts and field-tested designs provide control of essential operating features and assure successful incineration.

Donley Brothers can help you solve your special incinerator problem. Write for further information or see our catalog in Sweet's.



THE **Donley** BROTHERS COMPANY

13972 Miles Avenue Cleveland 5, Ohio

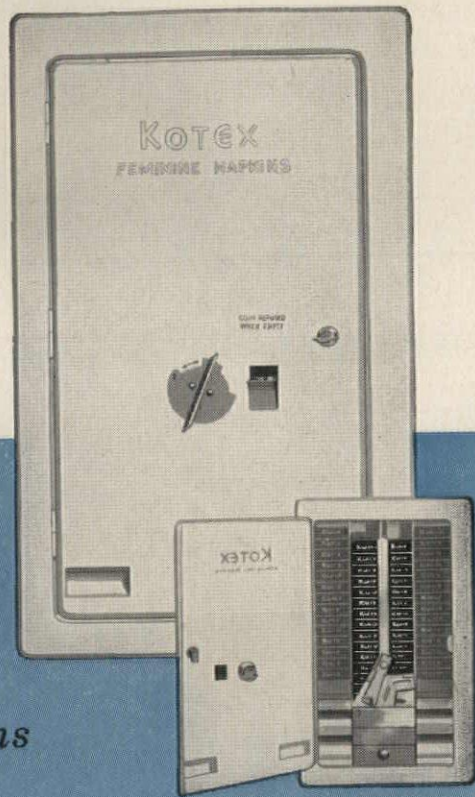




*The ultimate in built-in convenience...*

## RECESSED VENDORS

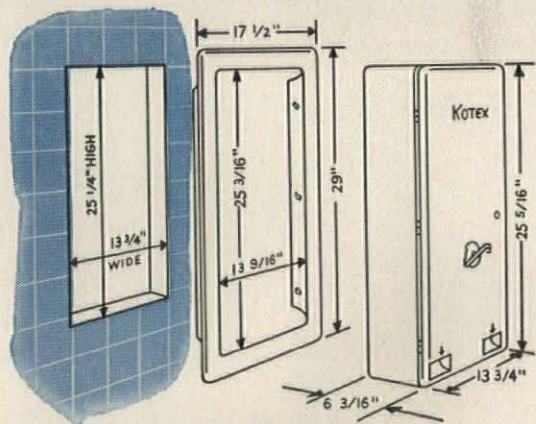
for **KOTEX** feminine napkins



**T**O KEEP PACE with the latest architectural designs, Kimberly-Clark has styled a brand new recessed dispenser for Kotex feminine napkins for rest room use in schools, offices, stores; industrial and public buildings. This unobtrusive, built-in vendor holds 63 individually boxed napkins. 33 vend from a single loading, 30 are held in storage.

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.

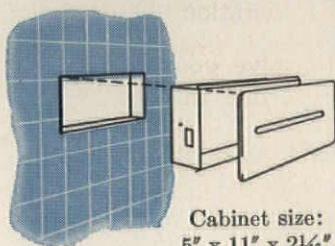
Available in durable white enamel, satin chrome, gleaming polished chrome and stainless steel. Matching frame for recessed installation. (Other vendors that can be surface mounted are also available.)



## 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-30, Neenah, Wisconsin.



KOTEX and KLEENEX are trademarks of KIMBERLY-CLARK CORPORATION

**KIMBERLY-CLARK CORPORATION** NEENAH, WISCONSIN



These fluorescent lamps may look alike...

## but only the Westinghouse Lamp has six

Despite similar appearance and ratings, these fluorescent lamps are *not* the same. One is a better lamp—and a better buy—because it's the only fluorescent lamp with all 6 advances described below. That lamp is made by Westinghouse. It costs you no more than any other leading brand—but it will give you years of trouble-free, efficient lighting.

**1. MORE EFFICIENT PHOSPHORS**—A special Westinghouse process selects Ultralume™ phosphor particles of a

size proven to give more efficient lighting.

**2. BRIGHTER END TO END**—Lead wires are plated with super-hard Chrome Vanadium to make sure Westinghouse tubes *stay* bright, end to end.

**3. BUILT-IN "SHOCK ABSORBERS"**—Specially designed Westinghouse anodes act as buffers to cushion the terrific shock of electron bombardment and improve lamp life.

**4. "RAINCOATS" FOR RELIABLE STARTING**—Silicone "raincoats"



## important advances that make it a better buy!

disperse moisture which can collect on exterior surfaces and prevent lamps from starting.

**5. MIXED GASES**—Westinghouse uses a precise mixture of certain rare gases, under exact pressure, to improve the light output.

**6. TRIPLE-COILED ELECTRODES**—To protect electrodes from the sudden electron bombardment when the lamp is first turned on. Emission material is quickly heated, fully protected.

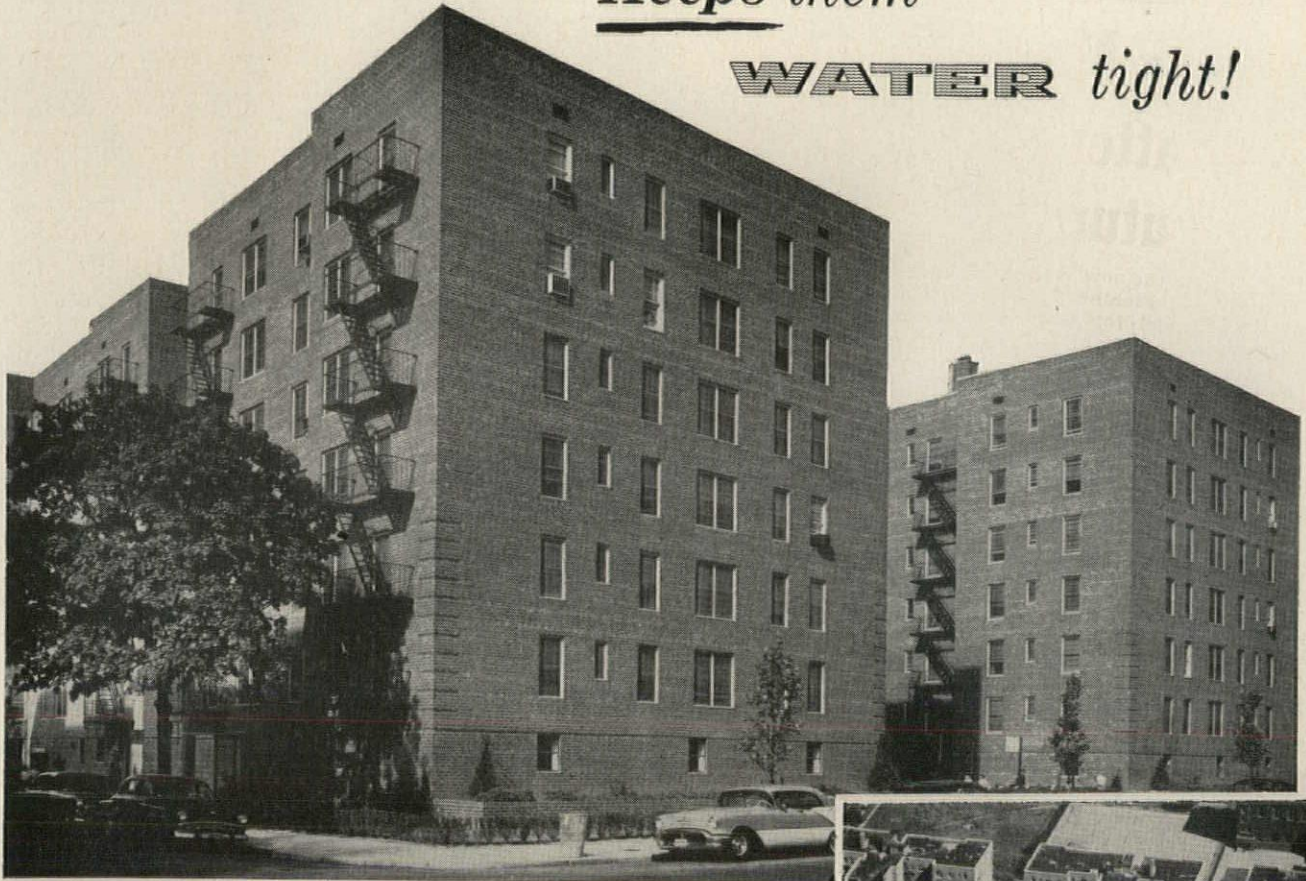
Regardless of the type or wattage of fluorescent lamps you buy, you will get better value, more light for your money, and longer, trouble-free service if you specify and insist on Westinghouse fluorescent lamps. Westinghouse makes a complete line, from tiny 4-watt lamps for instrument lighting to the giant 96-inch Super-Hi™ Lamps for store, street, and factory lighting. Contact your authorized Westinghouse lamp agent or nearest Westinghouse sales office.

**YOU CAN BE SURE...IF IT'S** **Westinghouse**  
WESTINGHOUSE LAMP DIVISION, Westinghouse Electric Corporation, Bloomfield, N. J.

**HORN** **HYDRATITE**<sup>®</sup>

*Keeps them*

**WATER** *tight!*



ARCHITECTS: Seelig & Finkelstein

***Specify*** "built-in" water repellency

with A. C. Horn's Hydratite—an integral water repellent admixture for concrete and mortar that really provides long range protection for masonry work.

Hydratite's effectiveness as an integral water repellent is due to its action as a concrete and mortar plasticizer that also minimizes initial shrinkage. The easy working of Hydratite treated concrete and mortar mixes, plus its increased ability to resist shrinkage, makes for tighter concrete and masonry work.

And tighter concrete and masonry work, of course, is the real foundation for long lasting protection against water penetration.

For further information on this and other Horn products write for bulletin AR-7167.



Nicknamed "Hydratite City" by Tomasello Masons, Inc., Contractors, the above South Ridge Apartment House Project in Jackson Heights, New York was built with Horn's Hydratite in all mortar joints. Mr. Tomasello said, "Our experience over the years has shown that Hydratite treated mortar and concrete will efficiently perform its function for the life of the building."



**A. C. Horn Companies**

Subsidiaries & Divisions

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750 Third Avenue, New York 17, N. Y. Plants in Long Island City • Chicago • Houston

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Sales Offices and Warehouses throughout the United States and Canada



# LARGEST POWER-OPERATED GYM SEAT INSTALLATION IN THE COUNTRY!

## Seating May Set Pattern For Future

Seating in the new Rock Island High School Fieldhouse may become a model for buildings of this type throughout the nation.

The main sections of bleachers, which can be opened and closed simply by pressing a button, are the largest installation of this type to be installed in any building in the United States.

The manufacturer of the bleachers, Medart Seating Co., St. Louis, has been using the Rock Island installation to show customers. The Rock Island installation may be advertised in trade journals to show the use of retractable seating in a building of its size.

Located along the east and west walls of the fieldhouse, the main sections of bleachers range from 70 to 75 feet wide. These sections on both the main playing floor and balconies may be opened and closed in a matter of minutes from a central control point. The bleachers are moved by electric motors.

Never before have retractable bleachers been used in such large sections, according to Benj. A. Horn, architect.

### Seat 6,110 Persons

The bleachers to seat 6,110 persons were installed at a cost of about \$90,000. This type of seating was purchased to give the maximum use of floor space for physical education classes.

Risers on the new bleachers are treated with a pigmented varnish to make their color lighter to blend with the attractive light colors predominating the fieldhouse. This pigmented varnish will prevent the bleachers from turning dark in years to come.

This is also the first time that this type of bleachers has been treated with the pigmented varnish, Horn said.

The installation of this type of seating in the new fieldhouse is an indication of the farsightedness of the Rock Island Board of Education, Horn commented.



ROCK ISLAND  
HIGH SCHOOL FIELDHOUSE  
Rock Island, Ill.  
Benj. A. Horn, Architect  
Rock Island, Ill.

Whatever seating capacity is required...

## POWER-OPERATION makes sense in gym seats!

**Open in seconds** . . . at the turn of a key! No muscle power, no noise, no binding, no damage to seats, walls, floors.

**Close in seconds** . . . just as smoothly, quietly, safely as opening operation.



Medart Power-Operated Gym Seats require no floor tracks, no extra wall reinforcements, no special construction provisions. Only regular 110-v. or 220-v. electric source is needed.

Cost? Just a fraction more than manually-operated seats—and this is soon recovered through lower maintenance and service expense. *Write for catalog.*

# MEDART

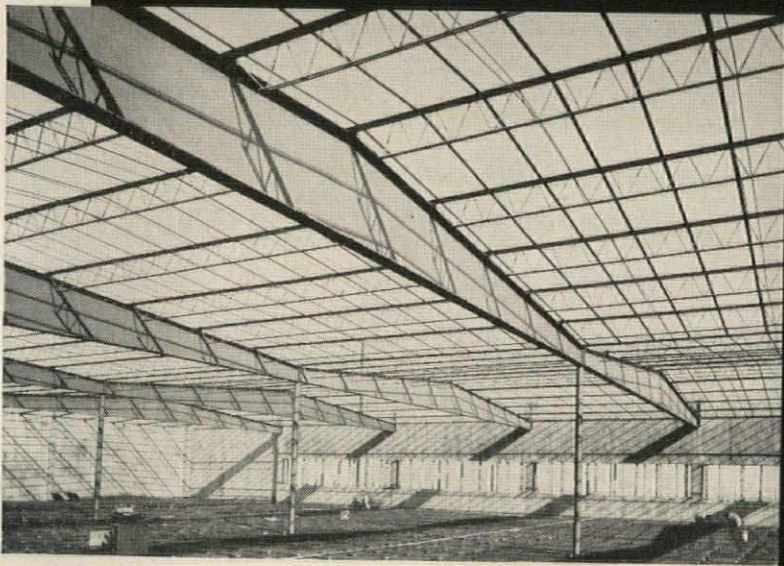
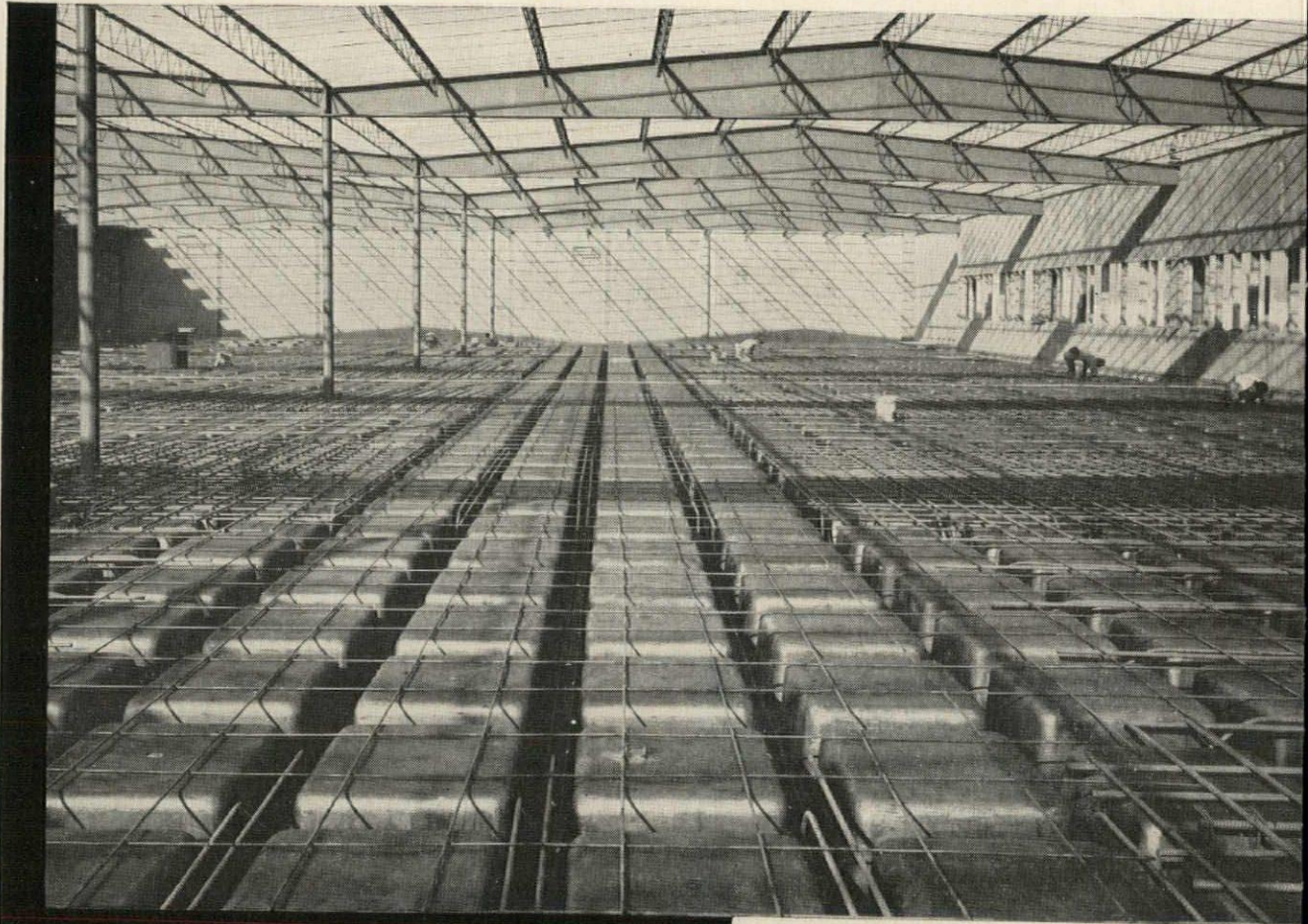
## TELESCOPIC GYM SEATS



**SPECIFY the best, then INSIST on it!**

Reprinted from  
Rock Island Argus  
Rock Island, Illinois  
September 16, 1959

FRED MEDART PRODUCTS, INCORPORATED • 3540 DE KALB STREET • ST. LOUIS 18, MO.



Expansive? Yes! Expensive? No!—Wide open spaces were achieved economically with no loss of rigidity . . . through the use of Ceco Steeldome construction . . . in Engineering Building No. 5 of Autonetics, a division of North American Aviation, Inc.

Architects & Engineers: Bechtel Corporation  
General Contractor: Lindgren & Swinerton

Ceco quality-approved Steel Joists were used as purlins to support the roof of Building No. 5. Joists were erected quickly, providing fire-resistant, non-shrinking, vermin-proof construction.

Illustrated here is the use of Ceco Steel Joist purlins in another Autonetics building—Autonavigator Production Building No. 4—to provide light but sturdy non-combustible roof framing.



**AGREED:** Two-way concrete joist construction provides wide, rigid spans

**BUT QUESTION:** How can this construction be economically achieved?

**ANSWER:** With **CECO STEELDOME SERVICE**

**PROOF:** If experience means anything, the acceptance of Ceko Steeldome service by architects, engineers, contractors and owners proves this: YOU CAN BEST DESIGN WIDE SPANS ECONOMICALLY WITH CECO'S TWO-WAY WAF-FLE CONCRETE JOIST CONSTRUCTION. Building professionals accord Ceko unquestioned leadership in this field. Add Ceko's work in pioneering jet-air removal of Steeldomes for exposed concrete ceilings—and again you see Ceko in the lead. With Ceko Steeldome service you get these advantages:

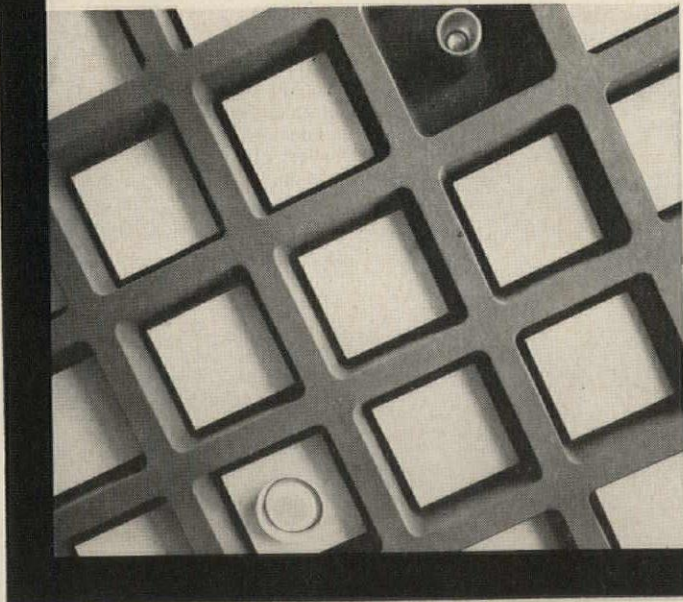
- 1—Skillful workmanship in forming economical wide spans in monolithic concrete.
- 2—Workmanlike placement of Centering and Steeldomes. Dependable on-time delivery of fabricated reinforcing material.
- 3—Elimination of projecting beams without sacrificing rigidity, thus reducing story heights and facilitating installation of ducts and other mechanical equipment.
- 4—Surprisingly handsome ceilings of exposed concrete.

Backed by experience, we can say—nothing in the market tops Ceko Steeldome service. Project after project offers proof . . . so next time draw on Ceko's "library of experience" for better buildings of concrete joist construction. Ceko Steel Products Corporation. Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois.

**IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE...**

Steelforms / Concrete Reinforcing / Steel Joists / Metal Roof Deck  
Windows, Screens, Doors / Cecoframe Buildings / Metal Lath

**TOTAL MANUFACTURING FOR THE BUILDING INDUSTRY  
FROM RAW TO FINISHED PRODUCTS**



Straight-up view of two-way concrete joist construction formed with Steeldomes. In this unretouched picture, the exposed concrete has been painted and the voids treated with acoustical tile. Voids also provide a new convenience for the placement of lighting fixtures, ventilators and intercom equipment.



# Wayne County General Hospital and Health Center

ELOISE, MICHIGAN

**Michigan's Newest,  
Most Modern Hospital  
and Health Center**



Smith, Hinchman & Grylls Associates, Inc.  
Architects and Engineers

Bryant & DeWiler Co.  
General Contractors

Lorne Plumbing & Heating Company  
Plumbing-Heating-Air Conditioning

## **AEROFIN INSTALLED**

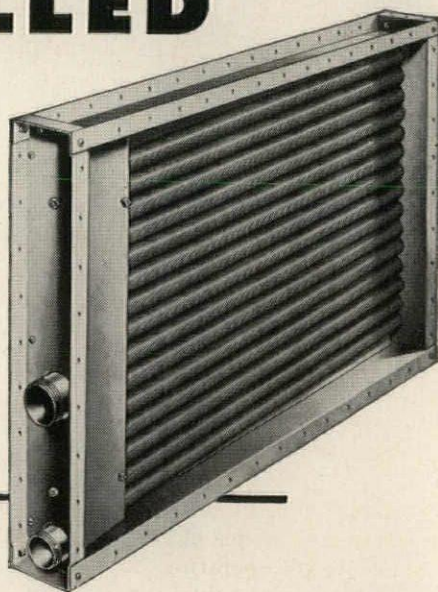
Modern smooth-fin design of AeroFin coils permits ample heat-exchange capacity in limited space — permits the use of high air velocities without turbulence or excessive resistance.

AeroFin performance data are laboratory and field proved. You can safely specify AeroFin coils at full published ratings.

### ***AEROFIN CORPORATION***

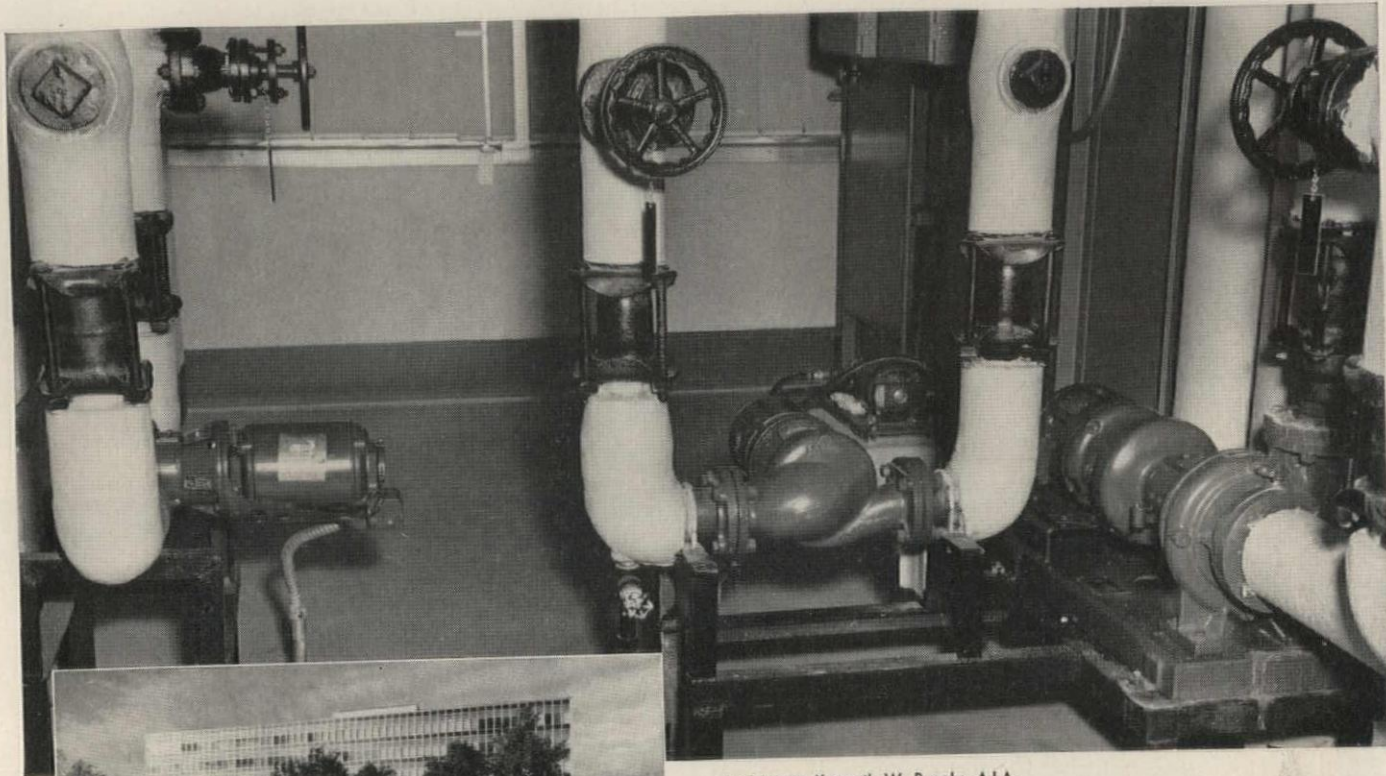
101 Greenway Ave., Syracuse 3, N. Y.

*AeroFin is sold only by manufacturers of fan system apparatus.  
List on request.*



**ENGINEERING OFFICES IN PRINCIPAL CITIES**





*Washington Water Power Building, Spokane, Wash., and one of the pumping stations.*

Architects: Kenneth W. Brooks, A.I.A.  
 Bruce M. Walker, A.I.A.  
 Mechanical Engineer: Wood & Landerholm  
 J. Donald Kroeker & Associates—Consultant  
 Mechanical Contractors: Warren, Little & Lund, Inc.

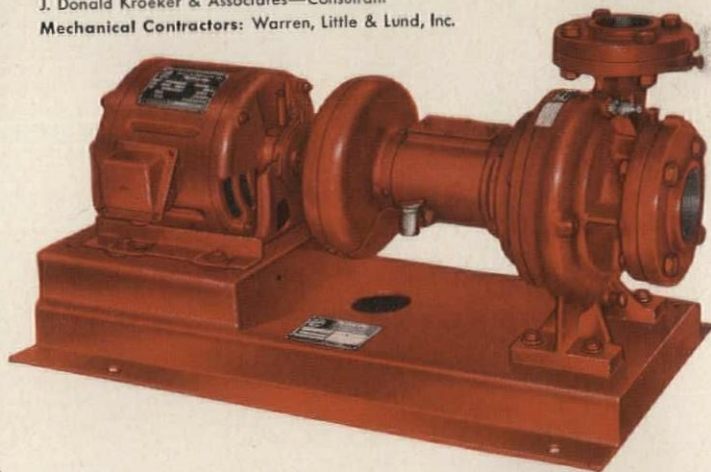
## WORLD'S THIRD LARGEST HEAT PUMP INSTALLATION EQUIPPED WITH **B&G® PUMPS**

In this modern building, the third largest heat pump installation in the world provides 815 tons of refrigeration and 9,000,000 BTU for heating. The heat pump draws 1600 GPM from a deep well with the water being discharged to the river in winter and used for irrigation in the summer.

The heating and cooling system is a dual duct, high velocity system, with a separate zone and pumping station on each floor. Five B&G Universal pumps and 21 B&G Boosters provide the necessary circulating equipment.

The system employs the Primary and Secondary Method of Pumping developed by B&G engineers. This method materially reduces pump horsepower required and provides close temperature control, more comfort, lower operating and installation costs.

Send for free booklet on B&G System of Primary and Secondary Pumping.



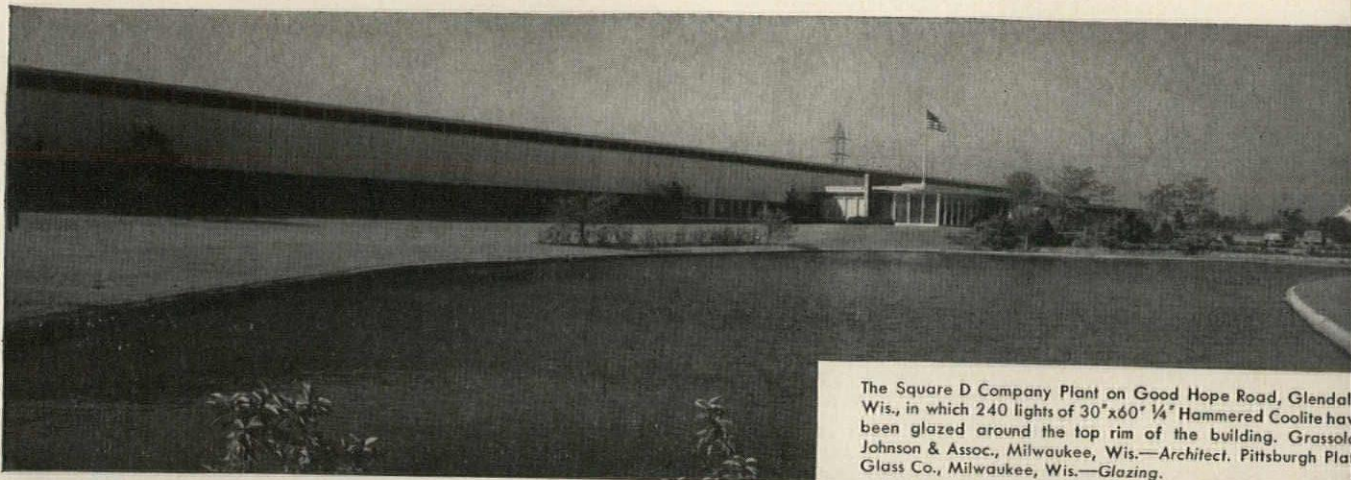
B&G Universal and Booster Pumps are specially designed and built for systems using water for heating and cooling. They are distinguished by quiet, vibrationless operation and long failure-proof operation. They can be installed without flexible connectors or noise dampeners of any kind.



**BELL & GOSSETT**  
 COMPANY

Dept. GC-32, Morton Grove, Ill.

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

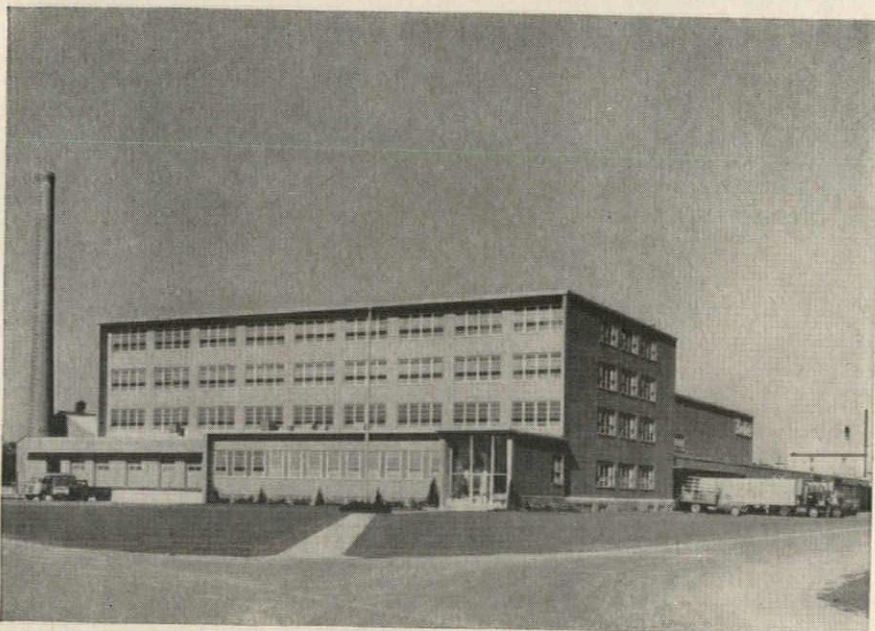


The Square D Company Plant on Good Hope Road, Glendale, Wis., in which 240 lights of 30" x 60" 1/4" Hammered Coolite have been glazed around the top rim of the building. Grassold Johnson & Assoc., Milwaukee, Wis.—Architect. Pittsburgh Plate Glass Co., Milwaukee, Wis.—Glazing.

# MISSISSIPPI GLASS . . .



Speer Carbon Company, Niagara Falls, N. Y. Laboratory glazed with 1/8" Luxlite Coolite, Glare Reduced One Side. Pilot house glazed with 1/4" Luxlite Coolite Wire Glass. Otto Preis, New York, N. Y.—Architect. Walter J. Johnson, Niagara Falls, N. Y.—Contractor. United Glass Company, Buffalo, N. Y.—Glazing Contractor.



Borden Foods Company, Plymouth, Wis. South, east, and west elevations glazed with 1/8" Mississippi Luxlite Coolite, Heat Absorbing Glass. Cowell & Robinson, New York, N. Y.—Architects-Engineers. McDonough Construction Company of Georgia—Contractors.



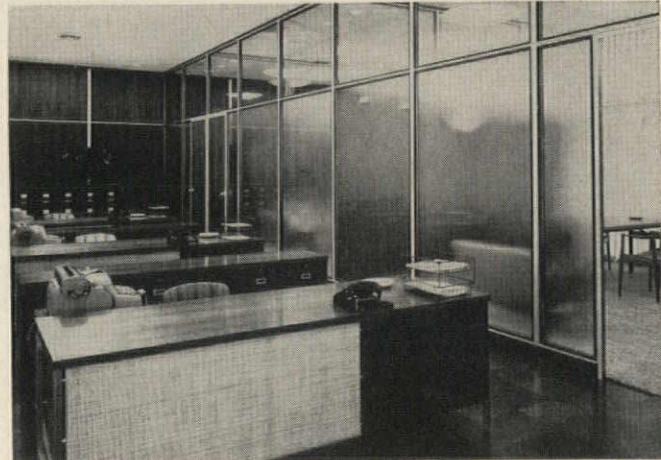
WORLD'S LARGEST



B. M. Electric Typewriter Plant, Lexington, Kentucky, where 1,000 sq. ft. of 1/4" Luxlite Coolite, Glare Reduced, is installed. Hardyce & Hamby, Associates—Architecture and Engineering. Albane Construction Company—General Contractor. Pittsburgh Plate Glass Company, Lexington, Kentucky—Glass and Glazing.

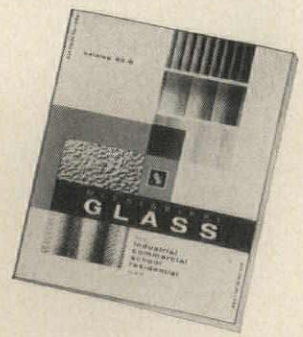
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pace setter in building progress, Mississippi glass helps achieve the ultimate in natural lighting . . . promotes truly functional architecture adapted to today's needs . . . offers a new dramatic texture that enhances the appearance of any structure. That's why today's leading architects are taking fullest advantage of translucent glass. Their outstanding buildings enjoy more and better daylighting per glazing dollar because translucent glass diffuses daylight deep into interiors to achieve even, comfortable, over-all illumination at low cost, and translucent glass helps create a feeling of spaciousness and comfort with resultant efficiencies and improved morale. For utility, beauty, and variety unmatched by any other glazing medium, specify Mississippi glass. Available in an exciting selection of patterns, wired and unwired, at better distributors everywhere.



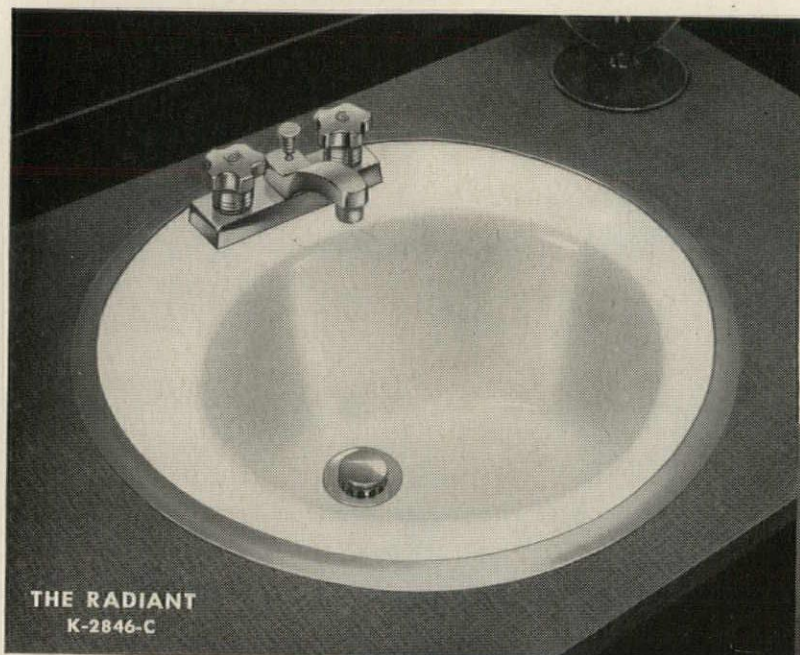
Partitions of 7/32" Mississippi Factrolite Glass in Mutual Insurance Company of Hartford. Interior by Associated Designers for Interiors, Inc.

Write for new 1960 catalog. Address Department 7.

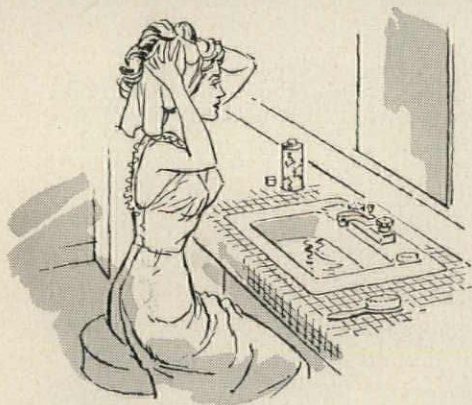


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## *Enameled iron lavatories of Kohler quality and design*

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The compact Radiant, of graceful, circular form is especially popular for modernizing where a distinctive fixture is desired for a bathroom, or washroom.

Its 18-inch diameter can be accommodated in a counter of 21-inch width. The Tahoe, with roomy basin and integral soap dishes, is available in two sizes, 20 x 18" and 24 x 18". Both have concealed front overflows with chromium-plated ferrules. Made in Kohler white and colors.

The handsome chrome-plated Constellation fittings are all-brass construction, insuring maximum resistance to corrosion and wear.

KOHLER Co. Established 1873 KOHLER, WIS.

# KOHLER OF KOHLER

ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS  
ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS



**1** Cap one brick with Brixment mortar, about 1" thick—and one brick with ordinary cement-and-lime mortar. After the mortars have hardened, place both brick in a pan of shallow water.



**2** Keep about 1/2" of water in the pan for at least one week. Even if soluble salts are present in the brick or sand, you will soon be convinced that Brixment mortar helps prevent efflorescence.

# **BRIXMENT** mortar helps prevent **EFFLORESCENCE!**

Efflorescence is caused by the soluble salts which almost all masonry materials contain. If reached by water, these salts dissolve and are drawn to the surface of the wall.

The air-entraining and water-repelling agent in Brixment makes Brixment mortar almost impermeable. This helps prevent water from saturating the mortar and dissolving any small amount of salts which it may contain. It also helps prevent water from percolating down through the wall, dissolving salts which may be in the brick or the back-up, and carrying them to the surface.

Protection against efflorescence is only *one* of the characteristics in mortar necessary to produce top-quality masonry at lowest cost. Several others are listed below—and *no other mortar combines ALL these characteristics to such a high degree as Brixment mortar.*

It is this combination of advantages that makes Brixment superior to any mixture of portland cement and lime—and which also accounts for the fact that Brixment has been the leading masonry cement for over 40 years.

Louisville Cement Company, Louisville 2, Ky.

## **BRIXMENT MORTAR ALSO COMBINES THESE 8 OTHER ESSENTIAL CHARACTERISTICS**



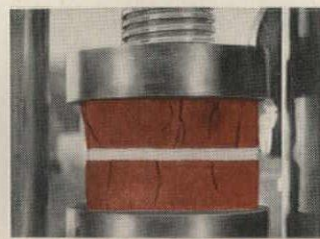
**PLASTICITY**



**WATER RETENTION**



**BOND**



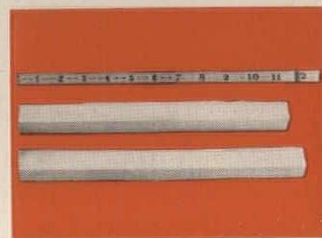
**STRENGTH**



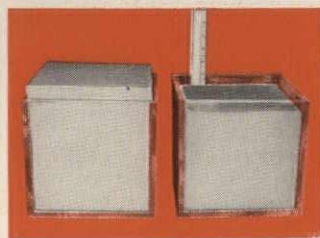
**DURABILITY**



**IMPERMEABILITY**

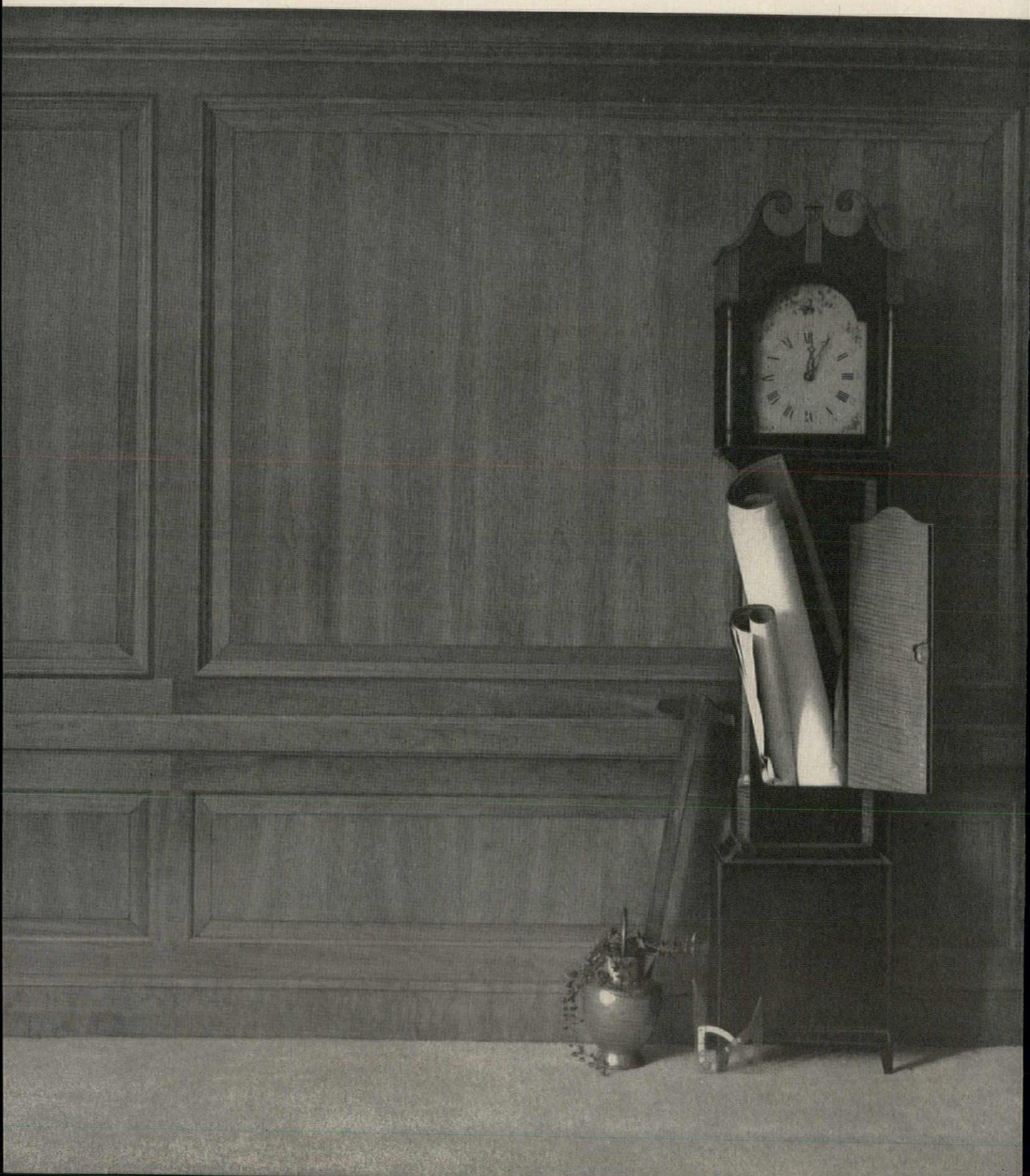


**SOUNDNESS**

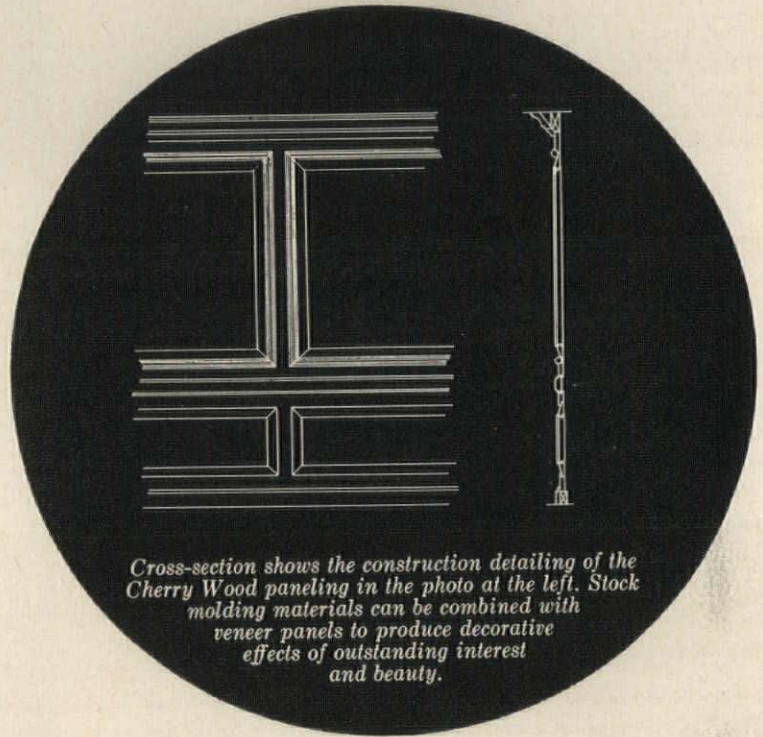


**YIELD**

# Timeless dimensions



# in wall paneling .....



*Cross-section shows the construction detailing of the Cherry Wood paneling in the photo at the left. Stock molding materials can be combined with veneer panels to produce decorative effects of outstanding interest and beauty.*

■ Centuries have put their stamp of approval on the mellow beauty of wood. Its fascination never grows old. Keeping it new are the constant advances in architectural concepts as well as the bold use of traditional motifs.

The imaginative installation in the photo at left certainly exemplifies a style of simple elegance in wall panel design. The deft hand of the wood artisan has been at work here, blending veneer panels and molding into a timeless expression of human craftsmanship. The result is a straightforward beauty of lines and planes in dimensional depth. Whether an architectural design is traditional or contemporary, the use of veneer paneling has a way of putting the busy man at ease in his work-day setting by virtue of its warmth and dignity.

The photo and cross-section detailing shown here depict only one style of divided paneling. Single panels of any desired size can be designed. The infinite possibilities for architectural ingenuity, taking full advantage of the charm of some of Nature's most beautiful woods in veneers by Stem, are easy to see. The most extensive portfolio of architectural veneers in the United States is on hand, ready for shipment. And this Stem selection offers endless inspiration for design ideas with the creative touch of wood. Stem veneers are the most masterful accomplishment of the veneering art. You are invited to let Stem help you achieve a masterpiece of interior artistry.

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Or, perhaps, we should ask, "Which do you provide for guests in your home?"

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You, as an architect, can provide your clients with the best, by including cotton towel service in the washroom facilities you design.

How? By specifying modern recessed cloth units like the one pictured (center, right) . . . or by providing proper wall space for any of a variety of modern, wall-mounted continuous cotton towel cabinets . . . ALL available to your clients through local Linen Suppliers.

*You do not obligate your client to any particular service. Why? Because this recessed unit will accept a wide variety of cabinets . . . both cloth and paper.*

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For complete information, write to Linen Supply Association on your letterhead. Send for this free Planning-for-Cloth Kit Illustrated, includes specifications for recessed unit and continuous cloth towel cabinets.

A. I. A. File No. 29-J



**Linen Supply** Association of America

and National Cotton Council • 22 West Monroe Street, Chicago, Ill.





## THE STORY BEHIND THIS SEAL

This is more than just the Seal of Approval of the Steel Joist Institute. It is the symbol of a 32-year-old dedication to the welfare and progress of an important segment of the design and construction industries.

### *What is the Steel Joist Institute?*

It is a voluntary association, organized in 1928, of open web steel joist manufacturers. Membership is available to any producer of open web steel joists who elects to manufacture joists in accordance with the standards and practices as adopted by the Institute.

### *What is its purpose?*

The Steel Joist Institute is a nonprofit organization made up of manufacturers actively engaged in the fabrication and distribution of open web steel joists. It was organized to place the industry on a sound engineering basis. Its objectives are to establish methods of design and construction for open web steel joists, to provide test and research data for public dissemination, to assist in the development of appropriate building code regulations, and to publish information relative to the proper

use of steel joists in the interest of safety and the public welfare.

### *What are its accomplishments?*

The Institute has made substantial practical contributions to the building construction industry. It has developed and published a comprehensive manual of standard specifications, load tables, and technical bulletins to assist the architect, engineer, and contractor; conducted research and testing of open web steel joists, bridging and cantilever members; initiated a thorough, effective quality verification program for "S" Series joists and a recommended Code of Standard Practice applicable to steel joists used for spans up to 96'.

*Inquiries concerning the Steel Joist Institute should be sent to the Managing Director, Steel Joist Institute.*

# STEEL JOIST INSTITUTE

Dupont Circle Building • Washington 6, D. C.

# THESE WALLS COST ONLY ...30% less than expected

**Structural neoprene gaskets support panels...  
eliminate need for metal frames**

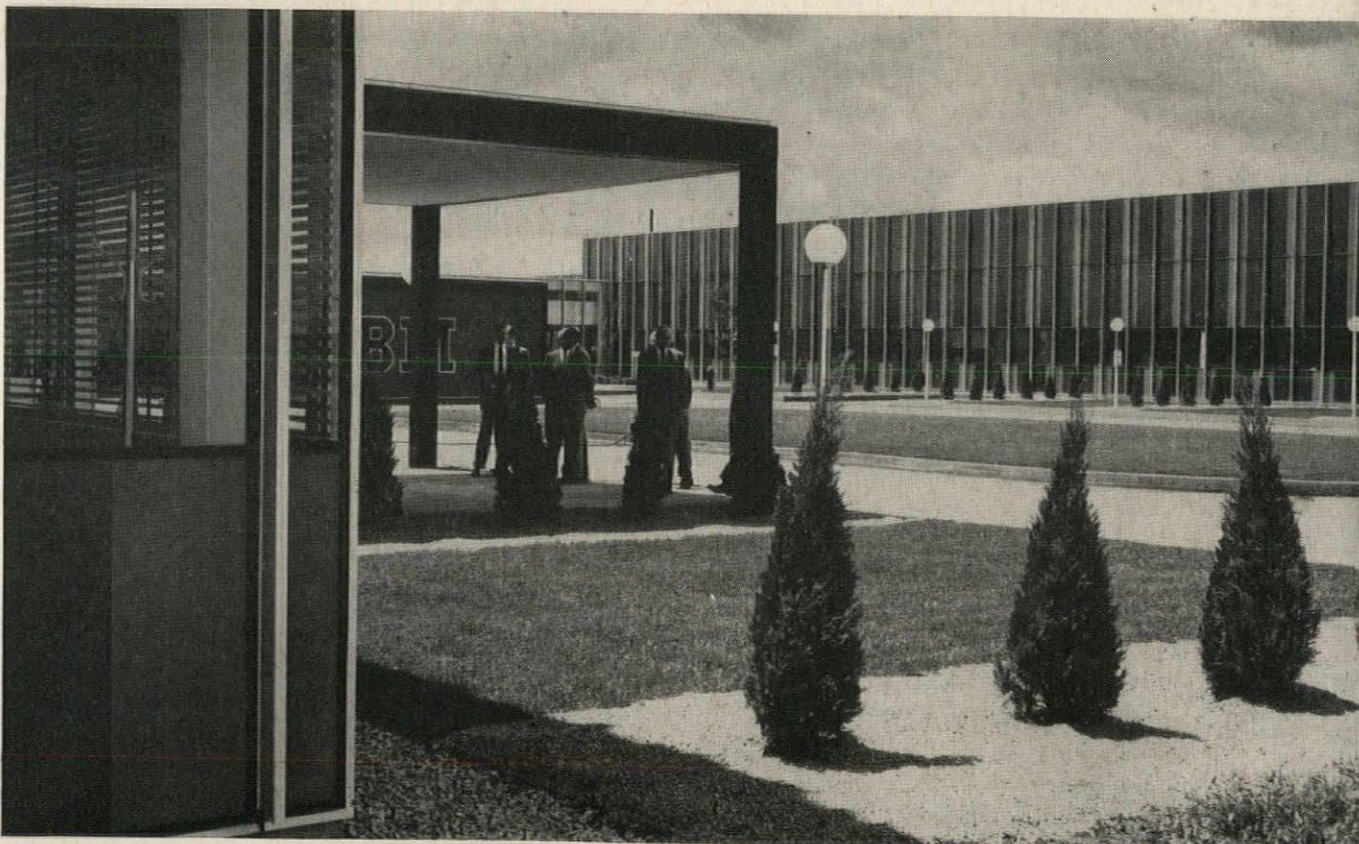
The IBM Building, Rochester, Minnesota, was originally planned with conventional wall construction, with walls to cost an estimated \$5.75 a sq. ft., installed. But Eero Saarinen & Associates developed a modular curtain wall system that cut this cost about 30%. The Saarinen design included a structural, self-locking neoprene sealing strip. This construction eliminated metal frames for structural support... simplified installation... and kept total installation cost down to a mere \$4 a sq. ft., including structural neoprene gasket, sill, coping, panels, glass and all other components.

Our booklet, "Neoprene Gaskets for Curtain Walls," gives further information. For your copy write: E. I. du Pont de Nemours & Co. (Inc.), Elastomer Chemicals Dept. AR-3, Wilmington 98, Delaware.

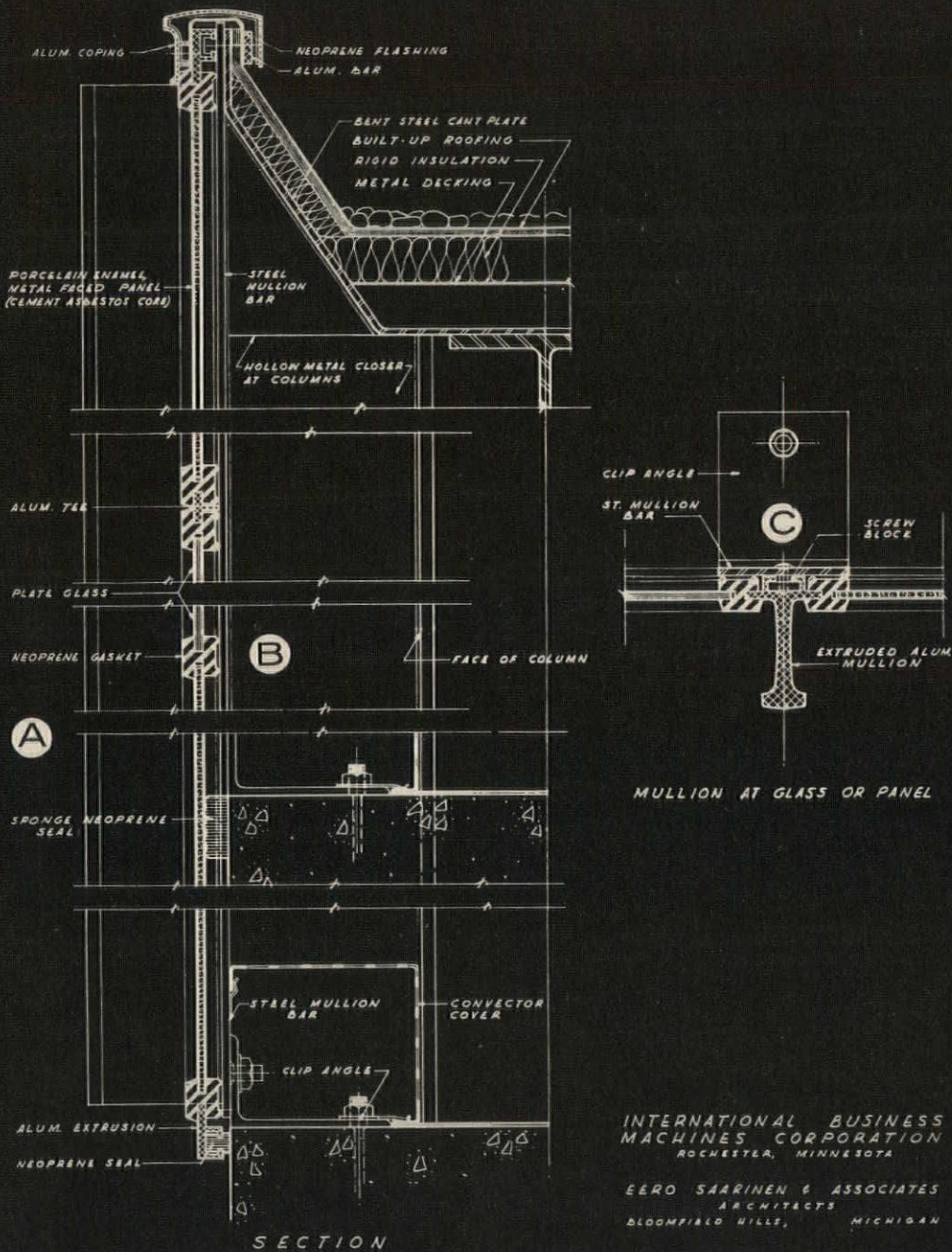
## QUICK FACTS ABOUT NEOPRENE

**RESILIENCE**—Neoprene accommodates horizontal and vertical expansion of glass or panels, as well as deflection and dimensional variations of glass or panels, maintains a weathertight seal. It has excellent resistance to compression set.

**WEATHER RESISTANCE**—In numerous outdoor applications, properly compounded neoprene has proved its ability to withstand sun, aging, ozone, airborne chemicals...to retain its resilience and strength for decades. It is flexible at extremely low temperatures... doesn't soften at high temperatures.



# \$4 A SQUARE FOOT



NEOPRENE GASKET BY INDUSTRIAL RUBBER GOODS COMPANY

## A Easy installation

Prefabricated neoprene gaskets snap in place easily, require no special skills, create no mess. Maintenance is nil.

## B No exterior frames

The prefabricated neoprene gaskets, with built-in locking strips, grip the glass or panel and prevent downward movement. Pressure of 10 lbs. per lineal foot eliminates the need for metal frames, even with modules running from sill to top of this two-story building.

## C Tight seal

Neoprene is resilient, adjusts to thermal expansion and contraction and to wind loads... remains weathertight and airtight.

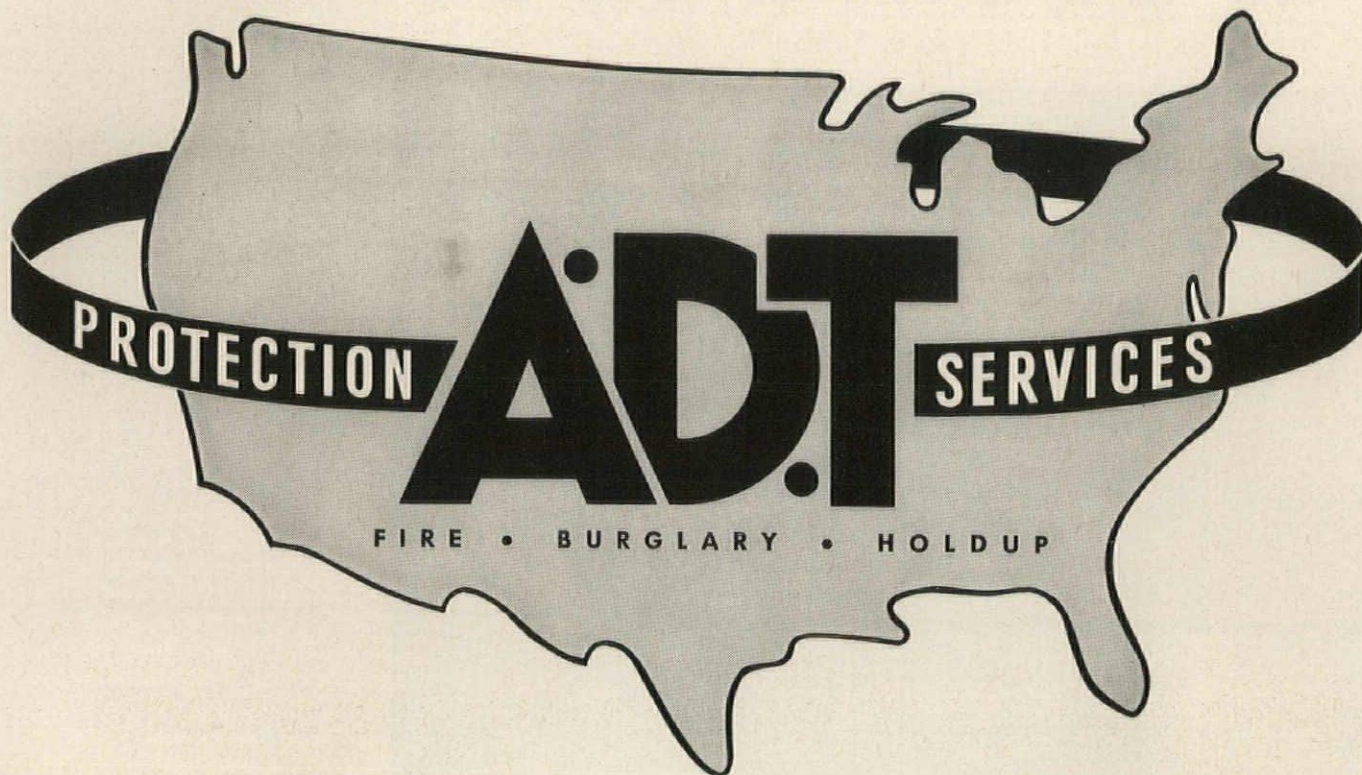
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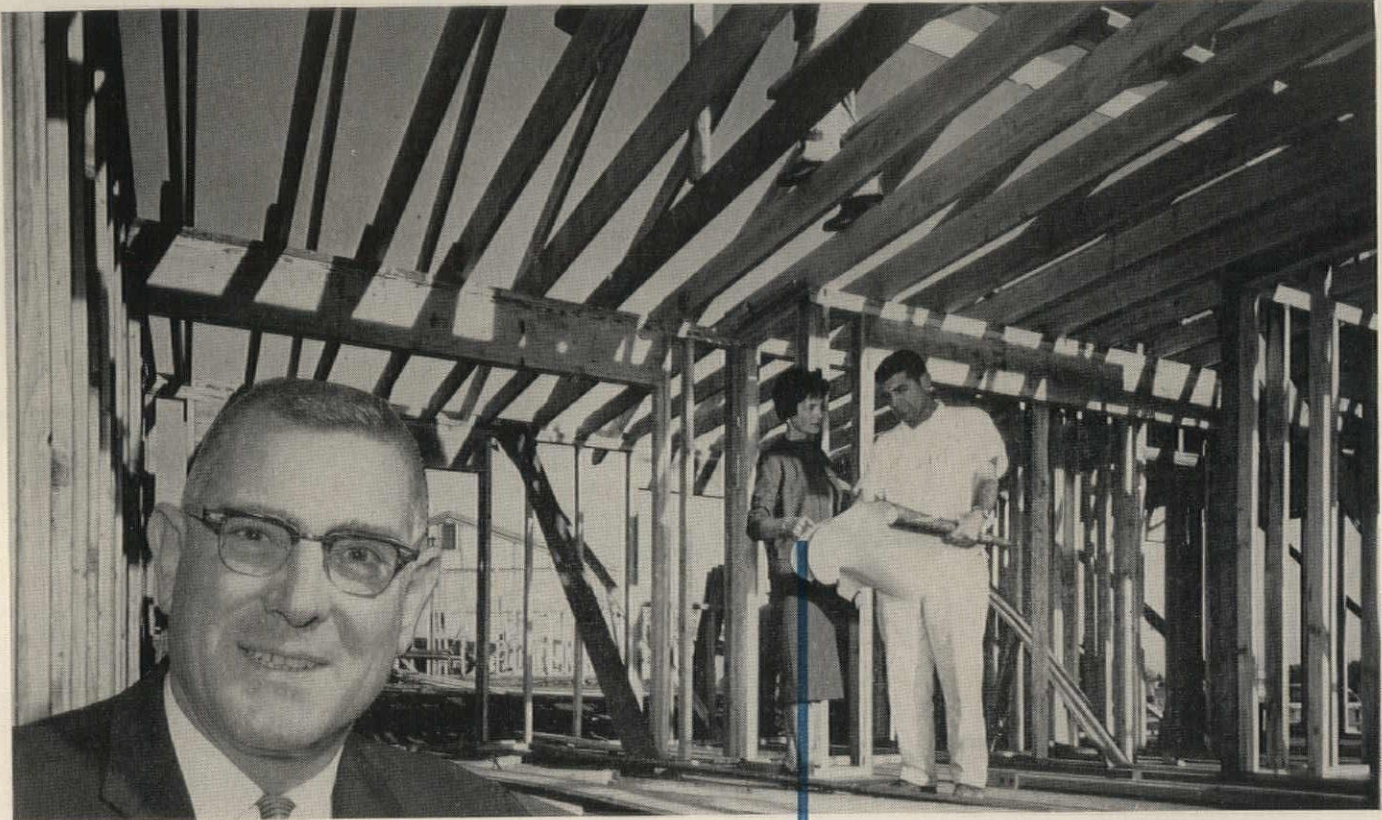
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# GRADE WISE IS PROFIT WISE...



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Like builder Larry Koch, you, too, can find important economies in materials costs... with no reduction of quality... by using the right grades of framing lumber. "Utility" grade West Coast dimension lumber and boards are profit builders for One and Two Living Units, when used in accordance with FHA standards. Equally important, you have the traditional advantages of quality when you build with West Coast lumber.

Use West Coast "Utility" grade lumber for: solid roof boards\*, sheathing\*, rafters\*, ceiling joists\*, floor joists\*, bridging\*, studs\* for single-story or top level of multi-story construction.

\* When used in accordance with FHA Minimum Property Standards for One and Two Living Units, FHA Bulletin No. 300.

## CHECK THESE USES for "Utility" grade West Coast Lumber

(in accordance with FHA Minimum Property Standards):

**RAFTERS FOR LIGHT ROOFING** (Roof slope over 3 in 12) (Weighing less than 4 lbs. per sq. ft. in place)

Douglas Fir Size	West Coast Hemlock Spacing	Maximum Span
2x6	16" o.c.	9'-8"
2x8	16" o.c.	14'-4"
2x10	16" o.c.	19'-8"

**FLAT ROOF JOISTS** supporting finished ceiling (Roof slope 3 in 12 or less)

2x6	16" o.c.	7'-8"
2x8	16" o.c.	11'-6"
2x10	16" o.c.	15'-8"
2x12	16" o.c.	18'-2"

**CEILING JOISTS** (no attic storage)

2x6	16" o.c.	11'-8"
2x8	16" o.c.	17'-6"

**FLOOR JOISTS**

		30 lb. live load*	40 lb. live load†
2x6	16" o.c.	7'-2"	6'-4"
2x8	16" o.c.	10'-8"	9'-6"
2x10	16" o.c.	14'-8"	13'-0"
2x12	16" o.c.	7'-0"	15'-4"

\*sleeping rooms only

†other than sleeping rooms

**BOARDS.** Ample strength and satisfactory coverage make "Utility" boards a primary material for sub-floors, wall sheathing and solid roof boarding in permanent construction. This grade is widely used for light concrete forms.

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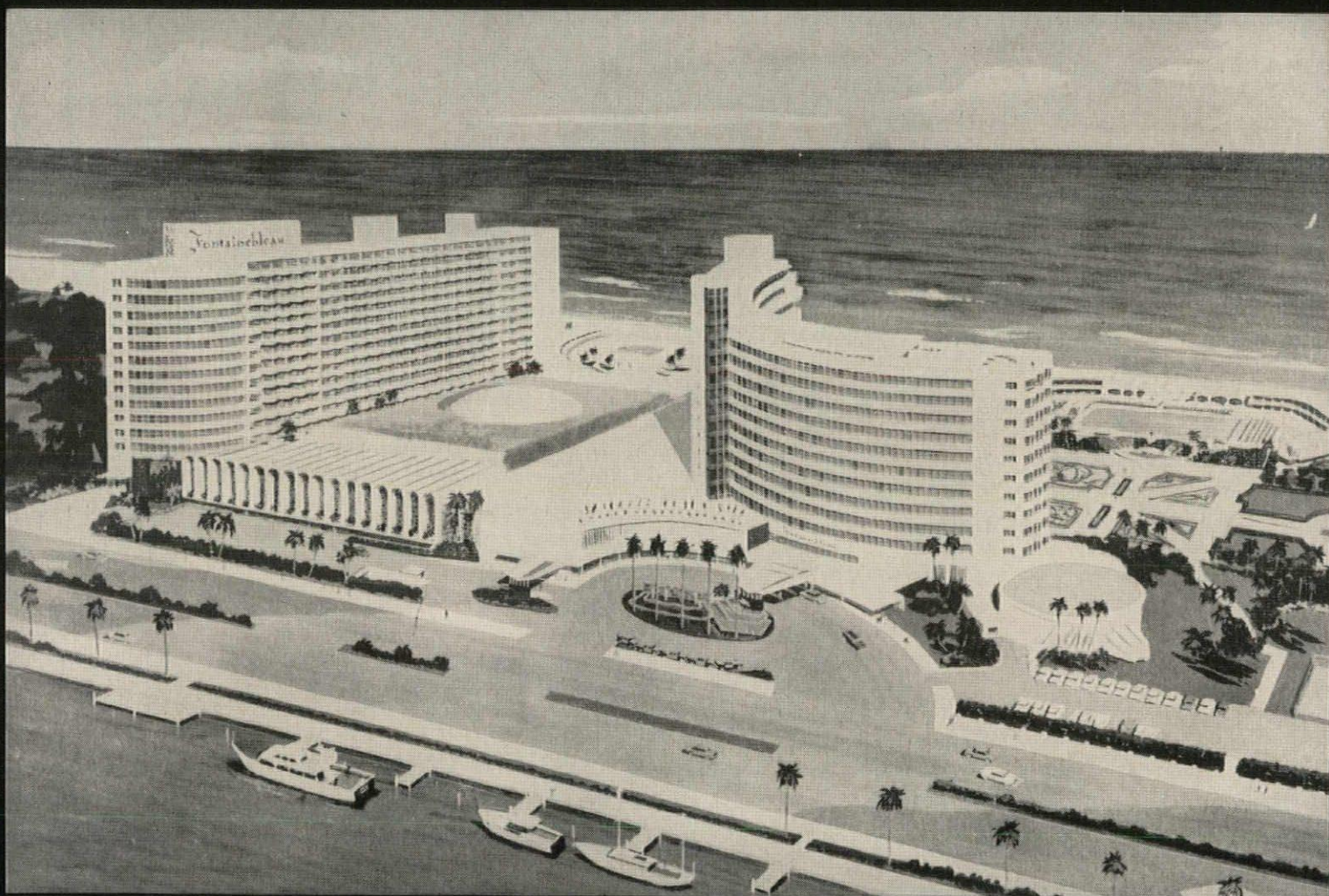


## GET THE FACTS

For detailed information about correct span tables for each dimension, write for your free copy of "WHERE TO USE 'UTILITY GRADE'" today!

# NEW ADDITION

## TO THE FABULOUS FONTAINEBLEAU



### **Addition to Fontainebleau Hotel, Miami Beach, Florida**

*Architect:* A. Herbert Mathes, Miami, Fla.

*General Contractor:* Taylor Construction Co., Miami, Fla.

*Masonry Contractor:* Kirkland Masonry Co., Hialeah, Fla.

### **FACTS ABOUT THE FONTAINEBLEAU ADDITION**

The proportions of the new addition to the Fontainebleau are immense. For example, a ball-room that is 200 x 140 feet, the largest in the world. A theater-banquet room that will seat 4,000 at a dinner. Set up for a performance, it will seat 6,000. A new building with 400 hotel rooms is going up right alongside. A little over three miles of Keywall is being used as a masonry reinforcement in the new addition.

*BUILT TO STAY YOUNG WITH*

# KEYWALL

**galvanized masonry reinforcement**

You can't be leaning over the shoulder of each mason all the time to make sure he uses the reinforcement right. Yet proper use of the reinforcement makes the difference between a building that stays young and one that ages fast. But what can you do?

Here's one man's answer. Masonry Contractor Hugh Kirkland says, "Lapping is the key to proper masonry reinforcement. Here's what I mean. Some masonry reinforcement is hard to lap. Too thick. By thick I mean an  $\frac{1}{8}$  inch in diameter. Lapped, that's a quarter inch. So, with a  $\frac{5}{8}$  inch mortar joint, you get little mortar around the wire. That means poor bond, poor embedment. So what happens? Most of the time reinforcement is butted, not lapped. That's even worse.

"We simply avoid the problem. We use Keywall. It comes in 200 foot rolls, not short lengths. So you very seldom have to lap it. And when you do, it's easy . . . easier than butting it. So of course, my men lap it. And when Keywall is lapped, there's still plenty of room for mortar.

"Keywall is a lot easier for my men to handle because it comes in rolls. It's easier to cut, too.

"But it's not only a matter of my men liking it. Keywall reduces shrinkage very effectively. And it's economical. What could be better than Keywall?"

## **KEYSTONE STEEL & WIRE COMPANY** Peoria 7, Illinois

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Just unroll it and you're ready to go. Joe Kuntz, Superintendent for the Masonry Contractor, Hugh Kirkland, shows how easy Keywall is to work with for the benefit of mason Fred Kinnaird. Keywall is made for wall thicknesses of 4", 6", 8", 10", and 12".



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you specify from the

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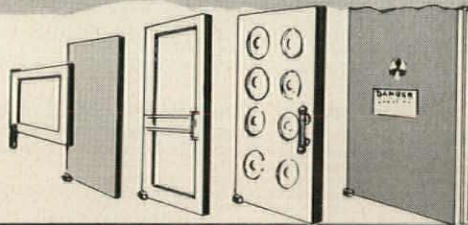


## DOOR CLOSER

styles and variations

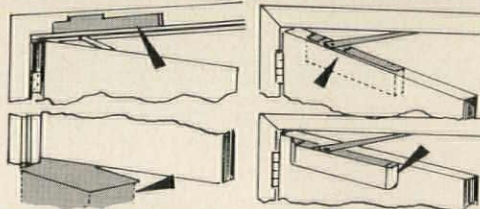
to meet every requirement and preference

**DOOR WEIGHT**  
requirements



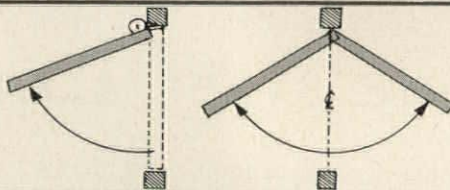
styles for doors, 12 lbs. to 1200 lbs. — light office rail gates to extra heavy lead-lined doors.

**CLOSER MOUNTING**  
requirements



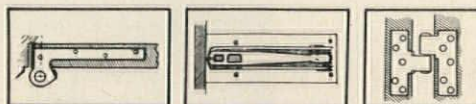
styles for mounting in the floor, in the jamb, in the door, on the door.

**DOOR ACTION**  
requirements



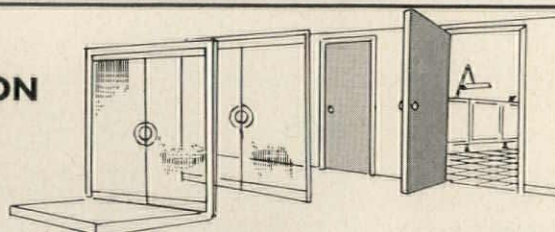
styles for single acting and double acting—both light and heavy doors.

**DOOR HANGING**  
preference



styles for offset hung doors, center hung doors and butt hung doors.

**DOOR LOCATION**  
requirements



styles for entrance, vestibule, corridor, all interior doors, toilet stall doors and office rail gates.

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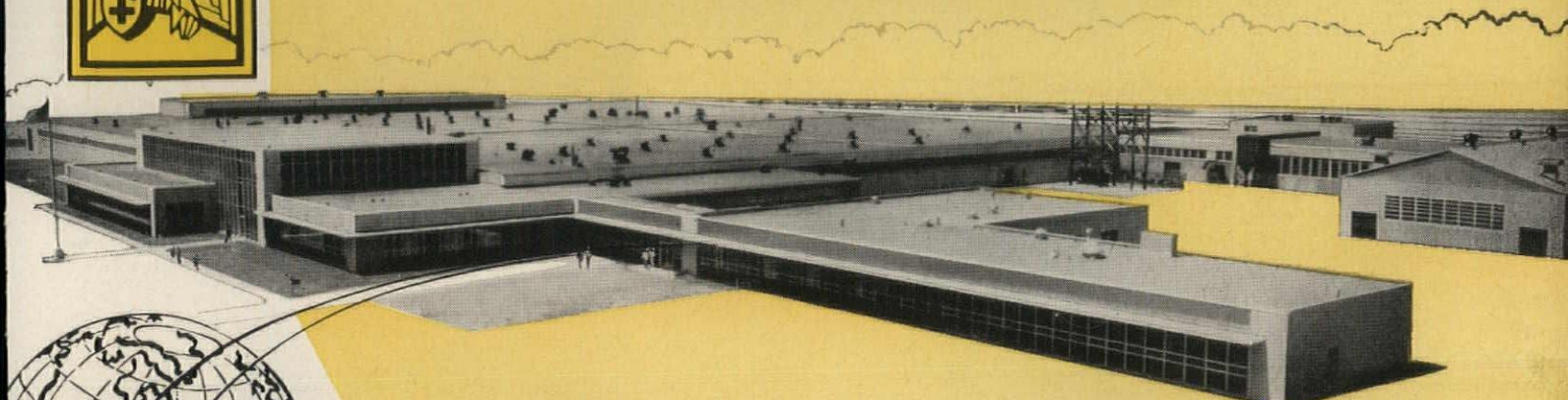
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To assure the most efficiently functioning technical departments in every hospital you design . . . draw upon the accumulated experience of the most discontented people in the world.

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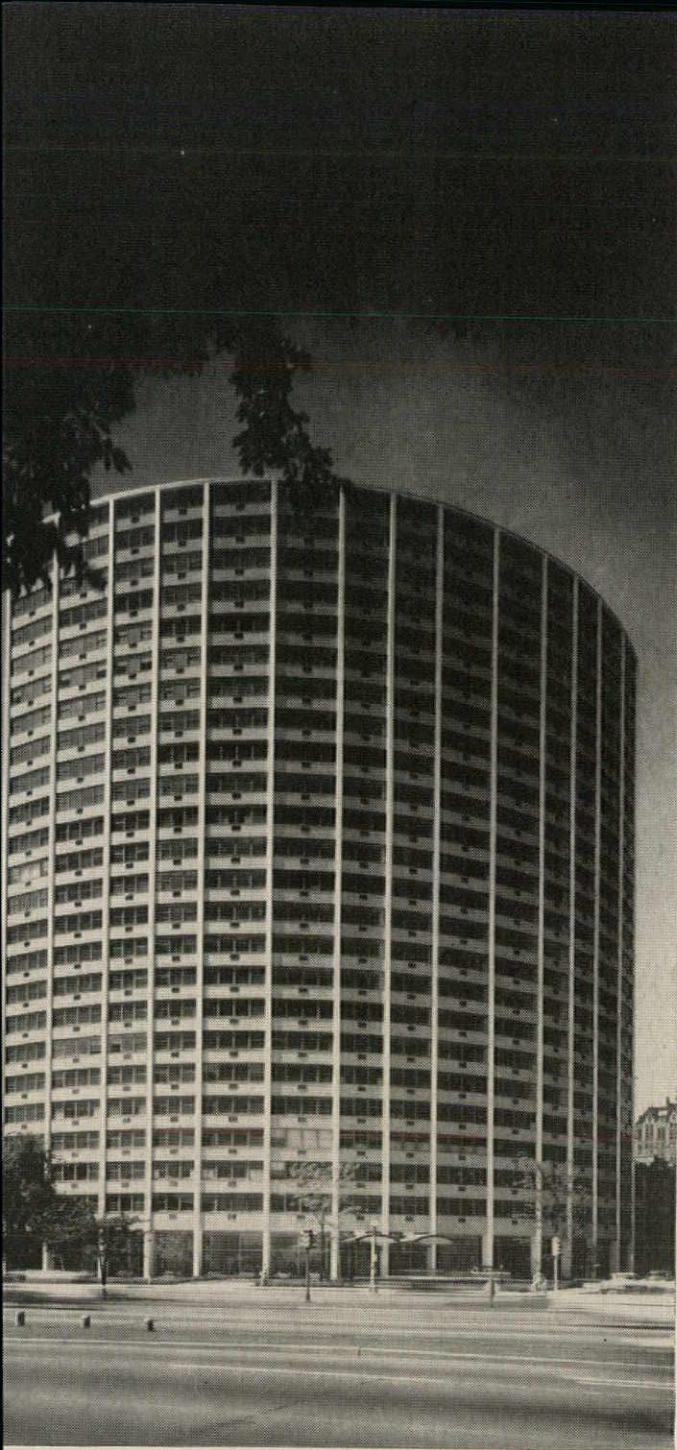
Please feel free to call upon our Technical Projects group for consultation or for the preparation of room plans, specifications and roughing-in drawings related to your specific project.

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Infant Formula Rooms, Operating Room Suites,  
Central Instrument Rooms, Utility Rooms.*



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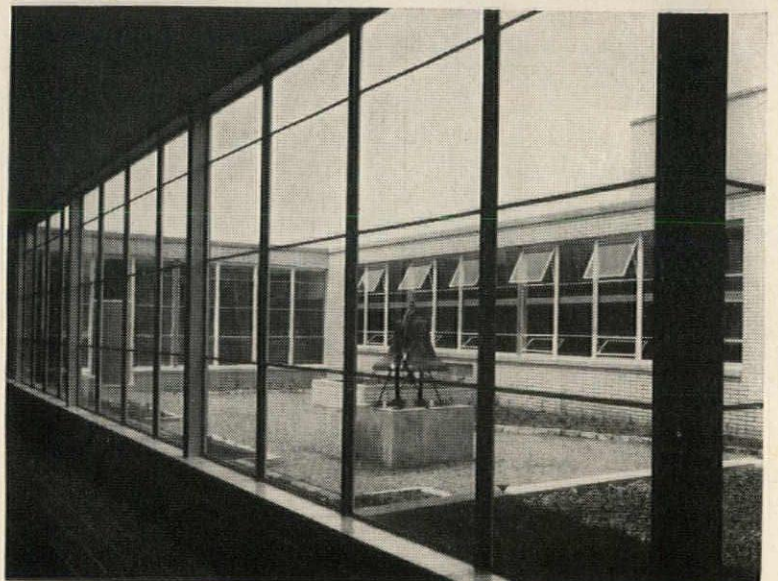
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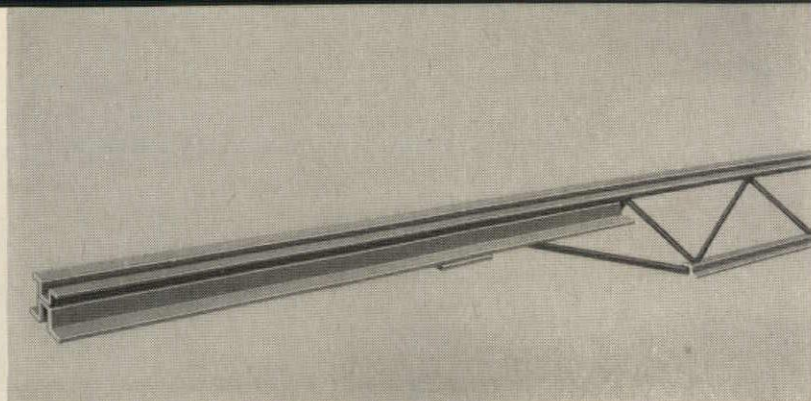


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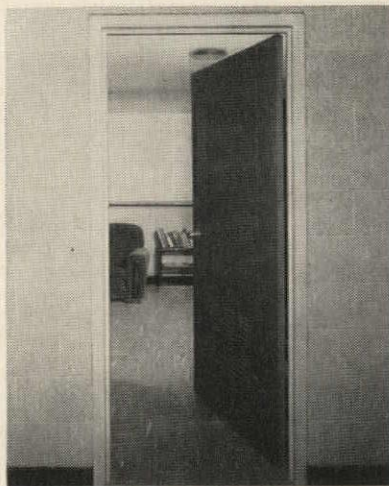


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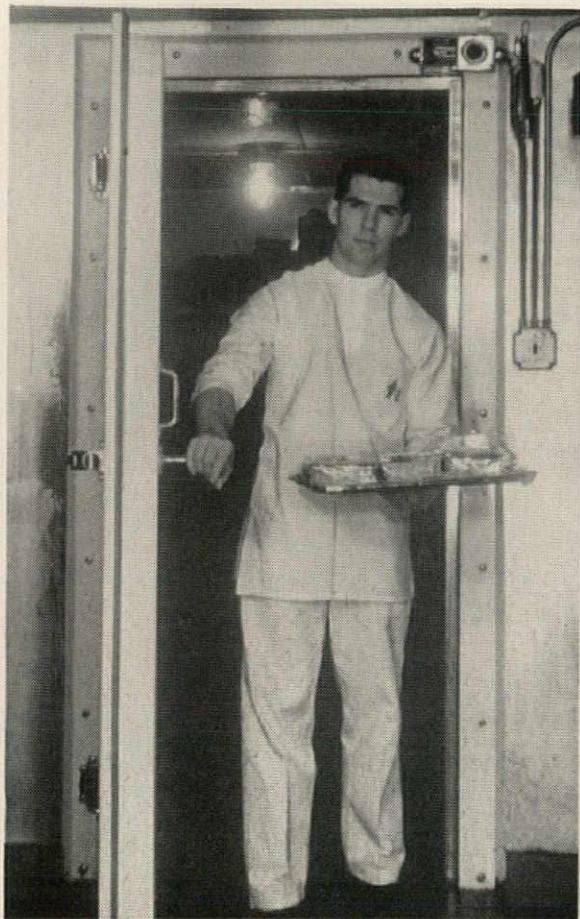
- Steel Windows                       "O-T" Steel Joist  
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Name \_\_\_\_\_ Title \_\_\_\_\_

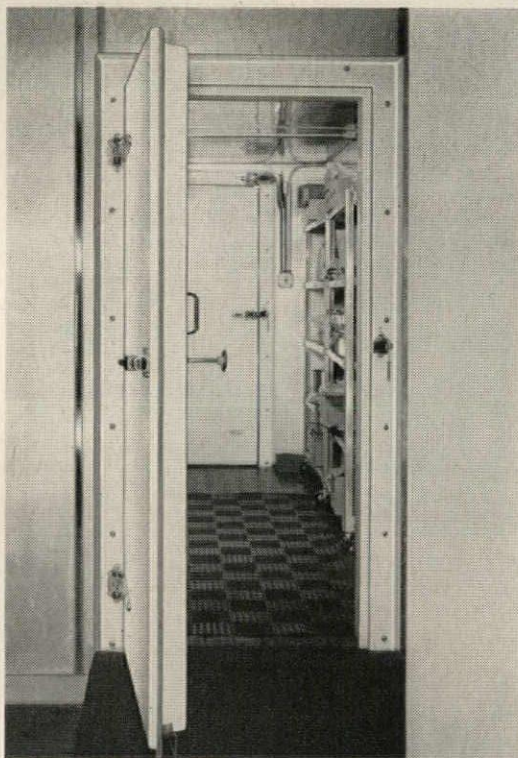
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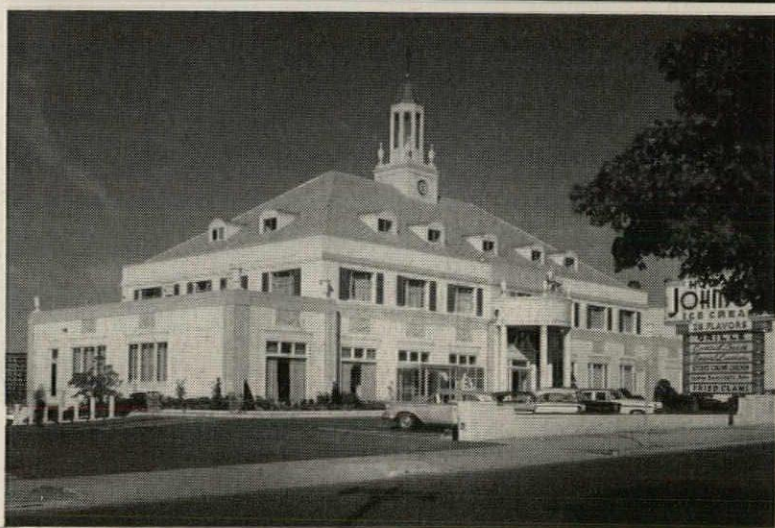
*LIGHTWEIGHT JAMOLITE doors open easily. Action photo shows tray-bearing busboy opening freezer door with one hand.*



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Doors provide attractive  
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# **JAMISON**

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*Scarcely Aware of it, Many of Today's Best Architects,  
By Default, are Sacrificing Excellence for Expedience*

## PLANS—A SUCCESS, BUILDING—A FAILURE

*by Benjamin B. Loring, President, Seaporcel Metals, Inc.\**

In the midst of an era of building construction that is at an all-time high, certain standards of architectural practice are at an all-time low.

Everywhere you look, architects are using the multitude of new materials to create designs that are fresh and crisp and bold and utilitarian as they have never been before. Design, at last, is no longer the afterthought, it is the first thought.

For architects, this development is a bonanza . . . and a booby-trap. The pressure created by the new materials is enormous. Today, creative architects must be familiar with materials that may not have existed five years ago. Wise architects ease this pressure. They take advantage of the extensive design consultation services offered by reputable manufacturers of these new materials.

But, so many more architects take the easy way out. They transfer the burden of knowing these new materials to the builders, the financiers and the contractors.

Thus, at the height of the building boom, these architects are getting short-changed every day of the week. Architects spend untold hours arriving at the precise specifications which will provide the most effective means to build within the design framework they have conceived.

The plans are then turned over to the builders, the financiers and the contractors. The specifications become a battleground for warring generals.

Builders stay up nights devising ways to get around the specifications. Financiers scheme to cut costs. Contractors appear to meet specifications without

actually doing so. The specifications are no longer standards of minimum acceptance, but are like the rules at school; to be broken, if possible, without getting caught.

### WHAT ARCHITECTS CAN DO

Forward-thinking architects can stop this rapid deterioration. They can pay more attention to follow-through . . . to making sure that what they specify is what they get.

And they can get help. Every reputable manufacturer offers help to architects in determining specifications. *But the architects, alone,* must be the ones to see that the specifications are met.

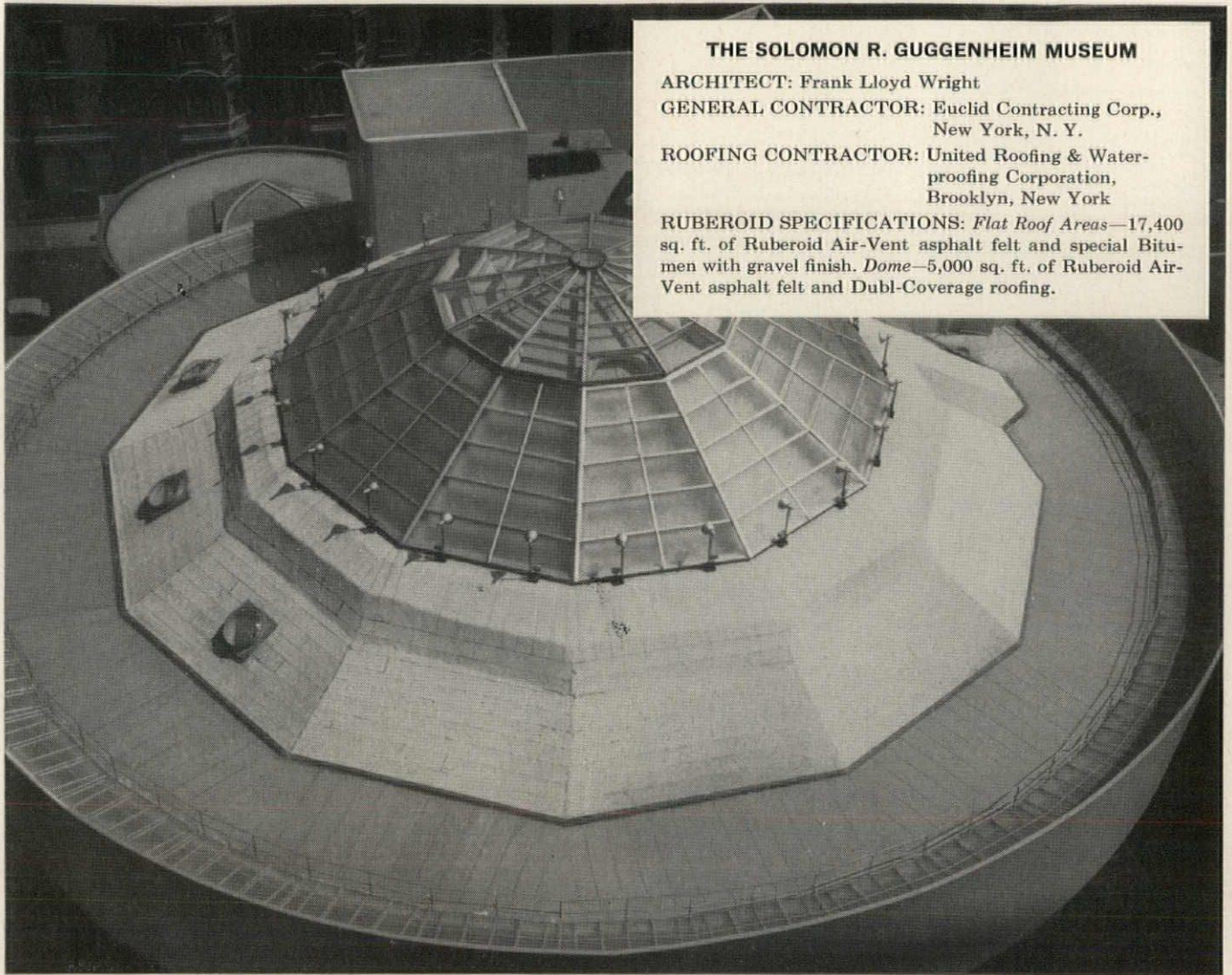
With such help, they do not have to compromise their standards because of unfamiliarity, understandable though it may be. They do not have to close one eye to their client's best future interest—for the sake of the present. In short, they do not have to question anyone else to see if their specifications have been met, to the letter and to the spirit . . . because they have seen to it themselves, by personal follow-through.

Architects should not abandon procurement as the responsibility of others. In days past, every conscientious architect insisted that his purchasing specifications be followed. He would not settle for one one-thousandth less.

Today's architects, if they choose, can do the same. In fact, they can be more forceful than ever. Architects can make sure that every product they have taken the pains to study . . . and to specify by name, is actually used. Their hours of deliberate, careful analysis can justify no other procedure.

Then, and only then, can architects know, without qualification, that their completed building will face the test of time and use and function as they have designed it to do . . . with the products they have specified . . . because the plans were a success and so, indeed, is the building.

\*Benjamin B. Loring is President of Seaporcel Metals, Inc., 28-20 Borden Avenue, Long Island City 1, New York, manufacturers of architectural porcelain products, laminated curtainwall panels since 1931, with licensees in 22 countries throughout the free world. He has prepared this series of paid public service advertisements in the interest of the architectural profession. He invites your comment. (Reprints of this editorial available upon request.)



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**ARCHITECT:** Frank Lloyd Wright  
**GENERAL CONTRACTOR:** Euclid Contracting Corp.,  
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**ROOFING CONTRACTOR:** United Roofing & Water-  
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**RUBEROID SPECIFICATIONS:** *Flat Roof Areas*—17,400  
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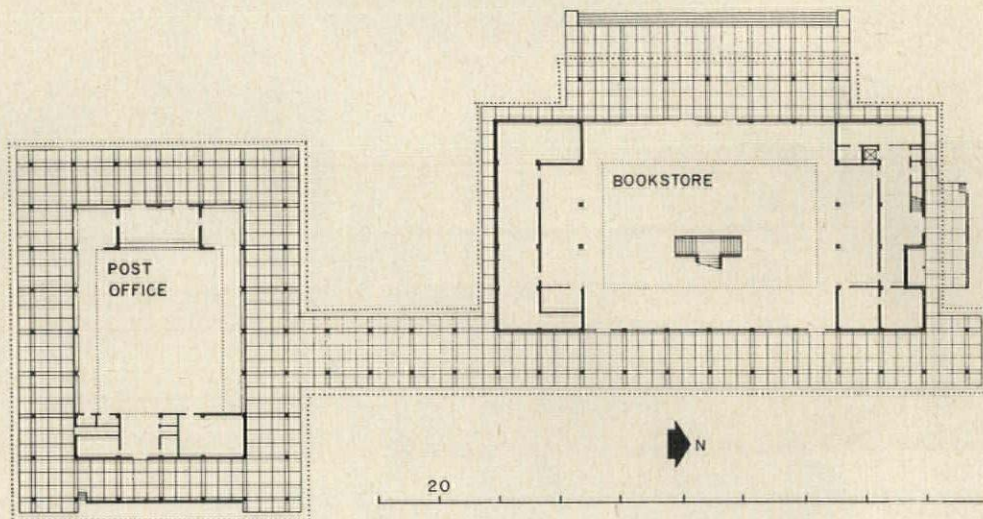
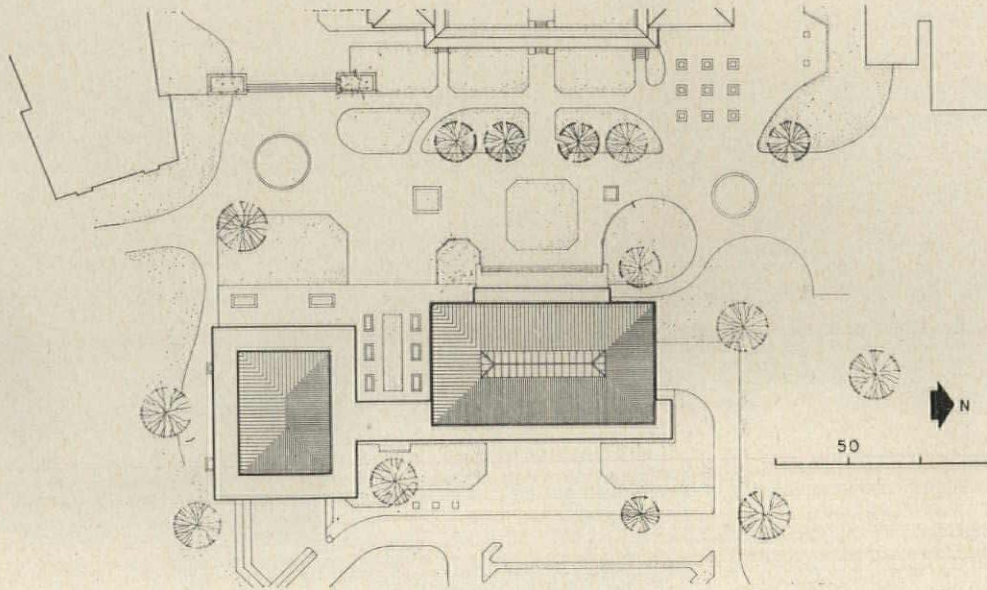
*Recent Work of*

## JOHN CARL WARNECKE

In the twelve years since he opened his own office in San Francisco, John Carl Warnecke has sharpened the focus of his design philosophy but he has not changed it: to develop an approach to architecture, not a style. To the current frenzy for more and more new forms, John Warnecke has turned a cool cheek, seeking instead a deliberate refinement of forms he has used and an evolution of new forms which will be responsive to the particular conditions of a building program. His office continues the tradition in the practice of architecture begun nearly fifty years ago by his father, Carl I. Warnecke, with whom he is a partner on certain jobs. His own firm recently expanded to include a number of associates.





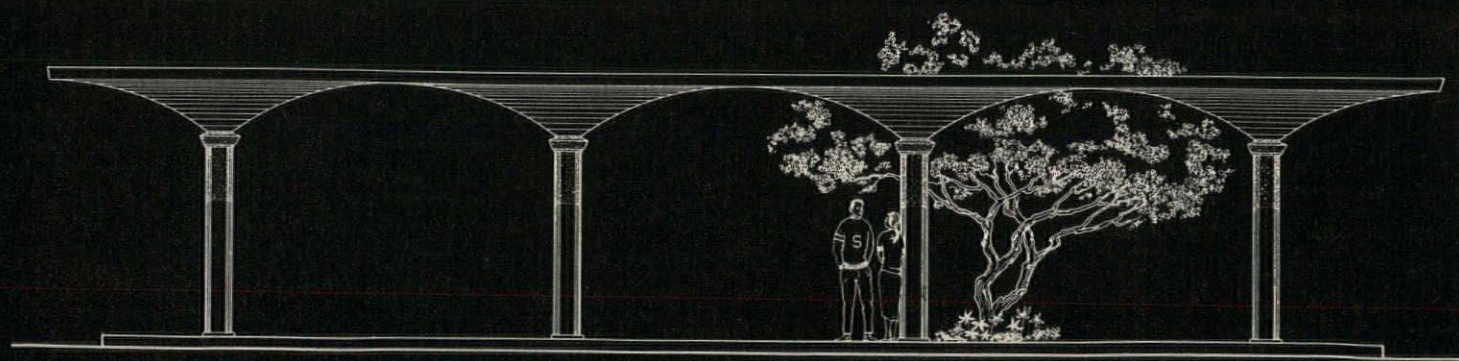


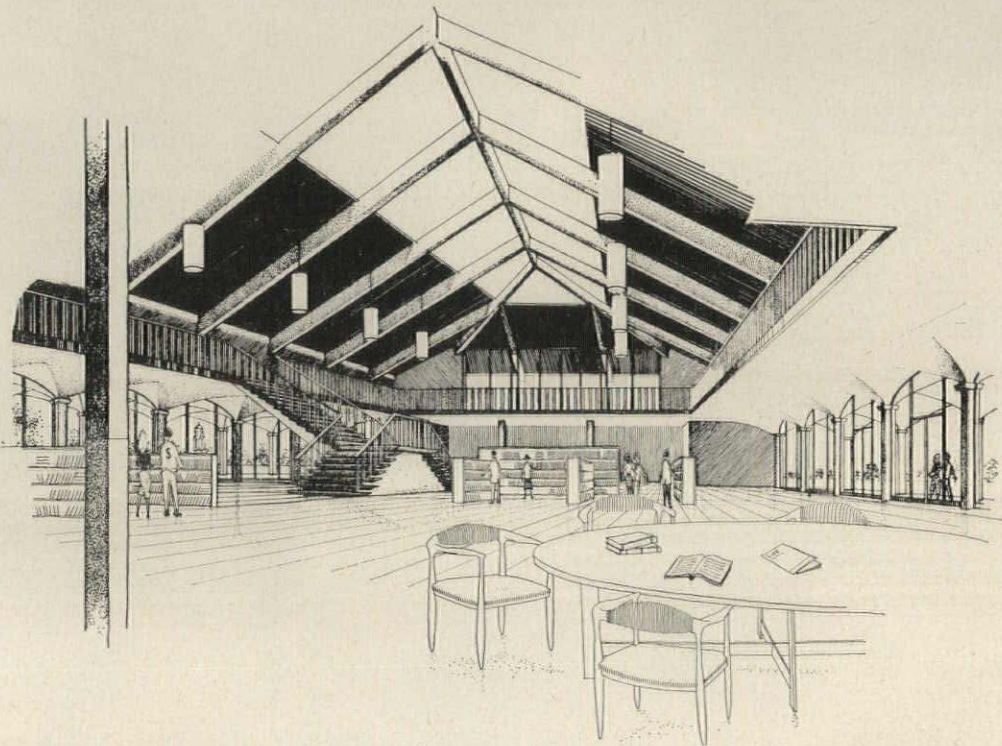
## POST OFFICE AND BOOKSTORE

*Stanford University, Palo Alto, Calif.*

In these new buildings for Stanford University, the design approach successfully combines a conscious recall of certain traditional elements of the earlier campus buildings and a strong expression of contemporary design, materials and construction methods. The long, flat-arched arcade, using the technical vocabulary of its own time, ties together visually the two new buildings and subtly allies them with the old. The red tile roofs, the tan color of the concrete's stucco finish and its slightly roughened surface are primarily a sensitive response to the overall context of the site, but they also satisfy the tradition of the Richardsonsque buildings on the campus (for which Shepley, Rutan & Coolidge were the architects). The new post office replaces one of these light tan, rusticated stone buildings. Strategically located at a point which students pass on the way between residence halls and academic buildings, the two new buildings open toward a landscaped pedestrian mall between them and the student union.

*John Carl Warnecke, Architect; Isadore Thompson, Structural Engineer; Kasin, Guttman and Malayan, Mechanical Engineers; Thomas D. Church, Landscape Architect; Howard J. White, General Contractor*





## POST OFFICE AND BOOKSTORE

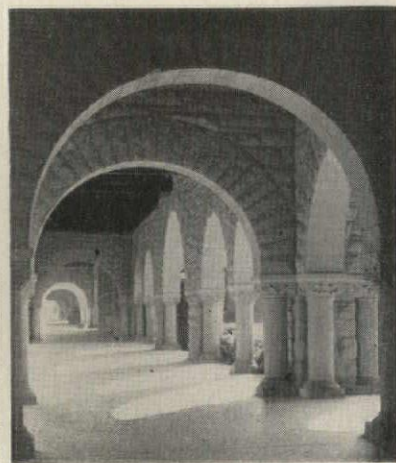
The arcade's distinctive vaulted forms visually link the bookstore and post office, and surround them with walks protected from rain. The columns are of concrete, poured in place; but the roof sections are precast and hoisted into place by crane: materials, method and design are in complete contrast to the pure masonry of the rusticated stone arcades around the "quads," built in the 1890's during the early days of the campus.

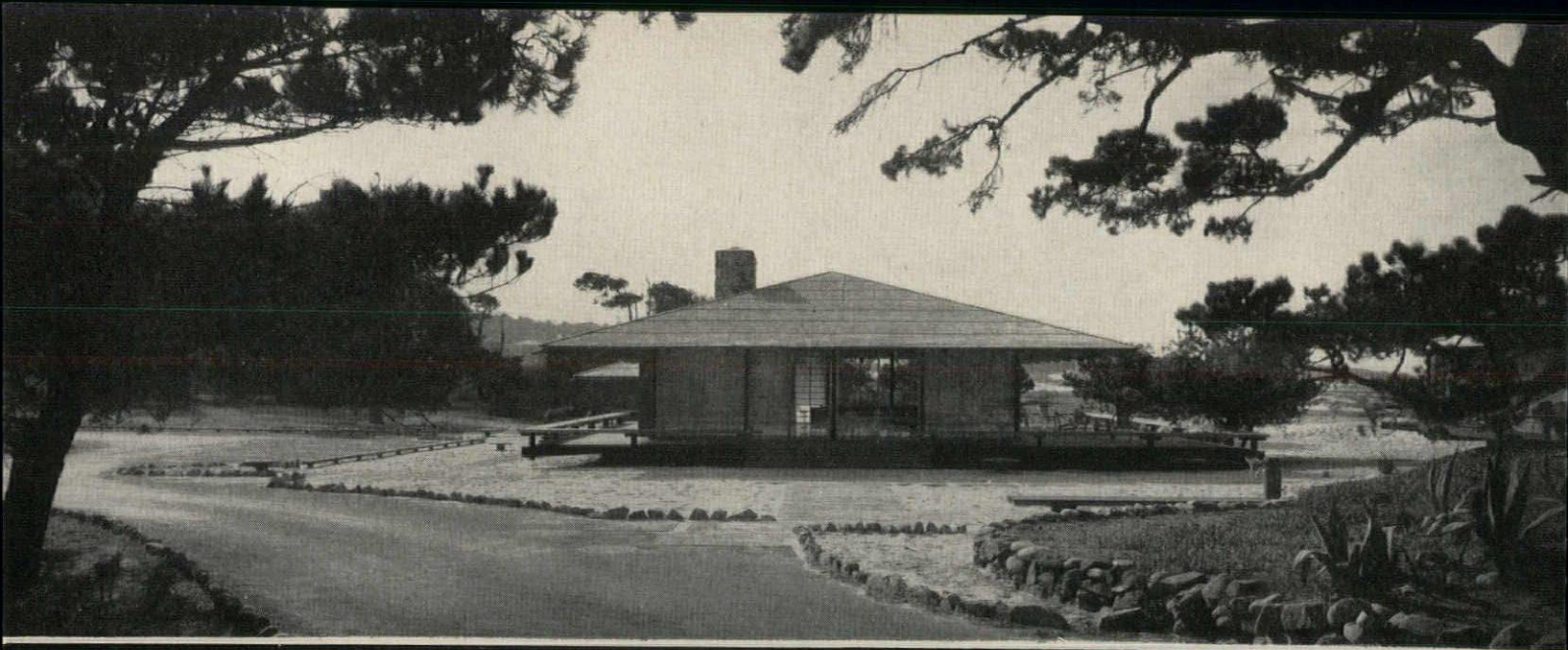
Precast concrete bents carry the structure of the bookstore building and free its interior of columns. The great skylight, running the length of the ridge on the hipped roof, floods this large open space with light and, since the building is used as both browsing library and sales room, the quality and quantity of light are important. On the mezzanine, reached by a central stairway which is the only interruption to the otherwise clear floor space, are retail sales and storage areas.

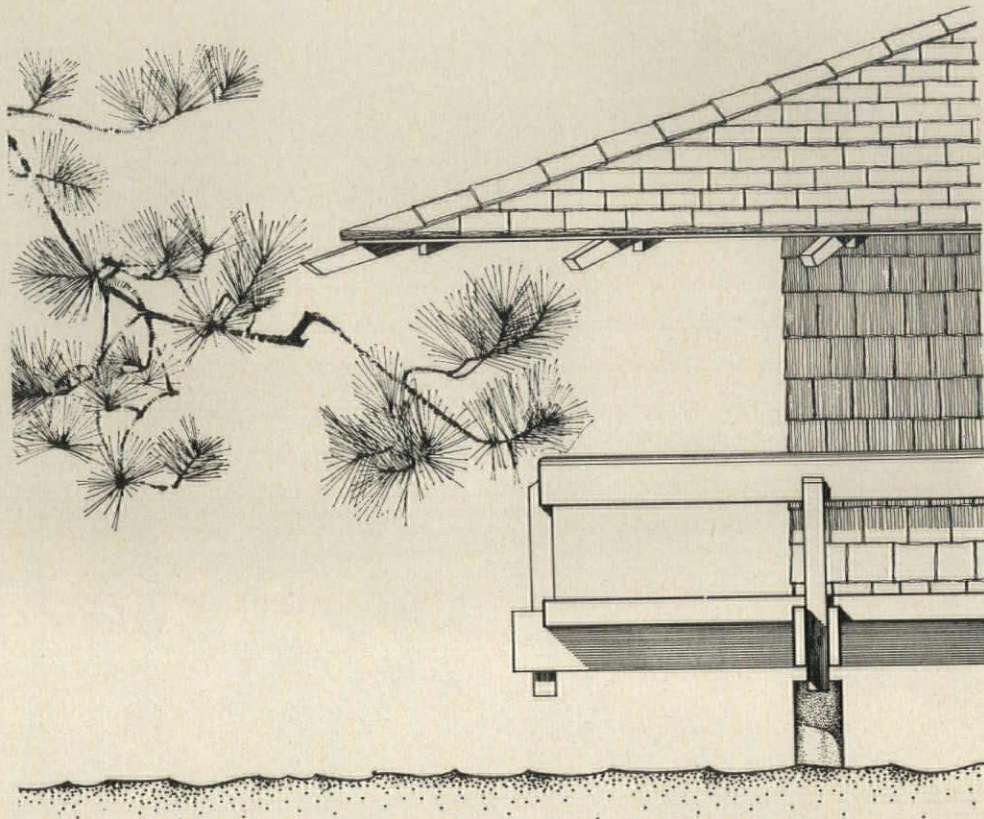
The post office is the smaller of the two buildings. By using the post office boxes as exterior filler walls—the boxes open from both the inside and the outside—all interior space is freed for postal work



Dandeleit







## ASILOMAR HOUSING

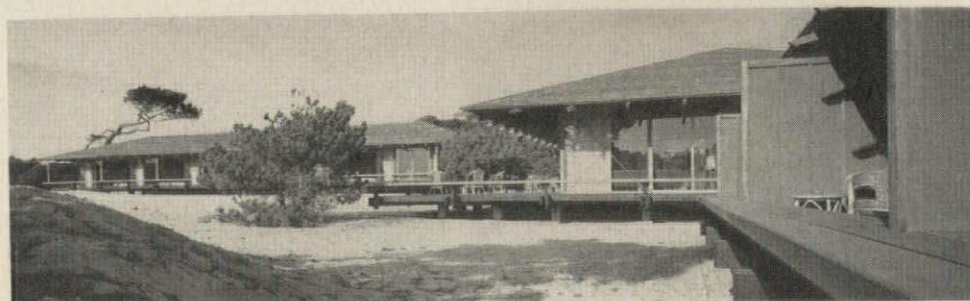
*Asilomar Beach State Park, Pacific Grove, Calif.*

Inherent in the design challenge of the new buildings at Asilomar—a 50-year-old conference grounds recently taken over as a unique addition to California's chain of state beaches and parks—is the need for a sympathetic perception of the environmental relationships of the site. Here, both natural and man-made relationships are influences. The natural setting has the serene beauty for which the Monterey Peninsula is noted; the existing 40-year-old buildings, designed with a strong affinity for the place by the pioneer woman architect, Julia Morgan, are still in use. The new buildings—two housing units, a lounge-conference room and corporation yard—are in rare harmony with both the site and these older buildings. Only in part is this harmony due to the materials used, although redwood interiors, hand-split cedar shingles, and the local stone recall Julia Morgan's buildings. The low lines, simple details and sensitive use of the site without disturbing sand or trees, give the buildings an unaffected serenity altogether appropriate.

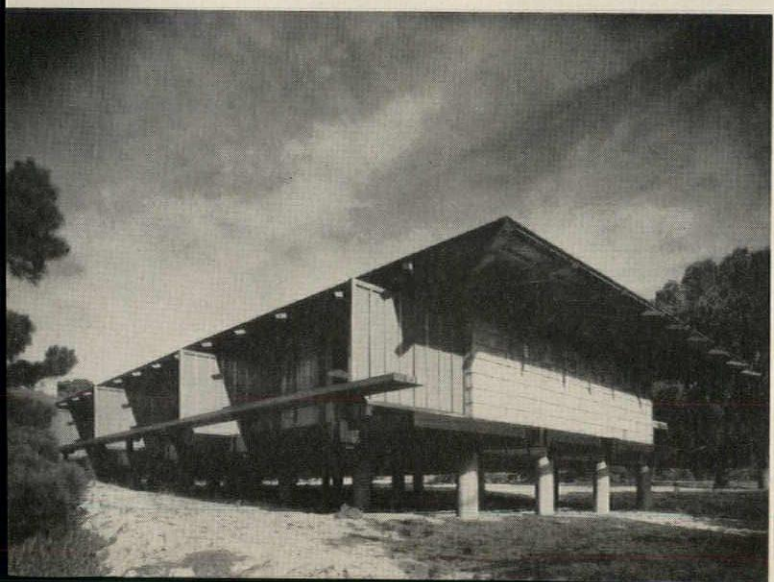
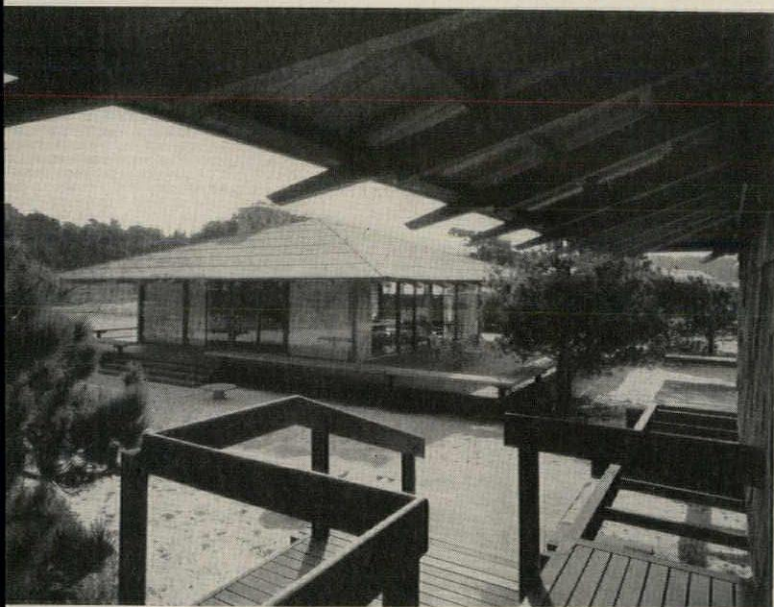
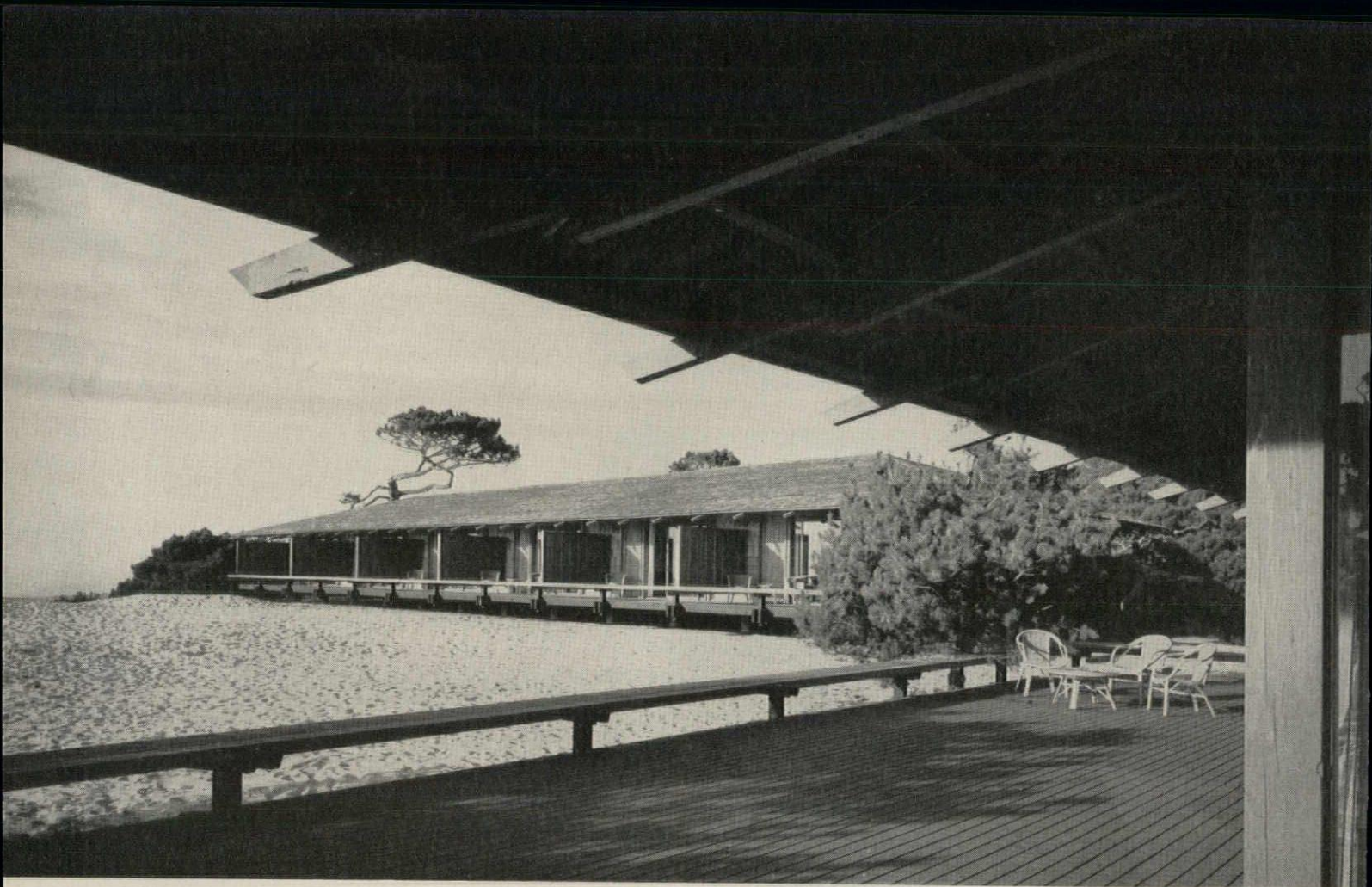
*John Carl Warnecke and Associates, Architects; William B. Gilbert & Associates, Structural Engineers; Comstock Associates, General Contractors*

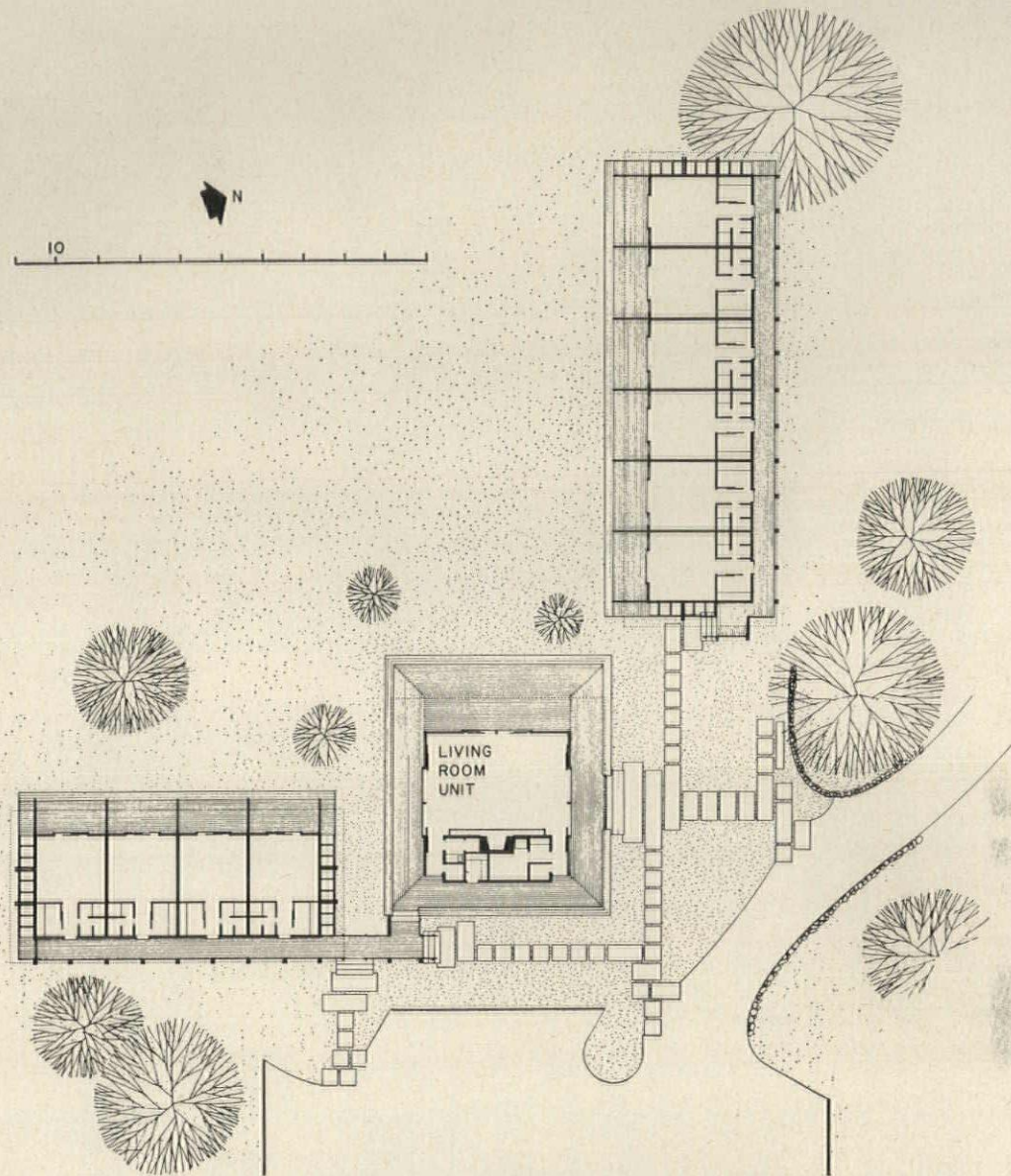
### PLOT PLAN

1. Existing buildings
2. New housing and living room
3. Corporation yard
4. Future buildings



*All photos by Roger Sturtevant*

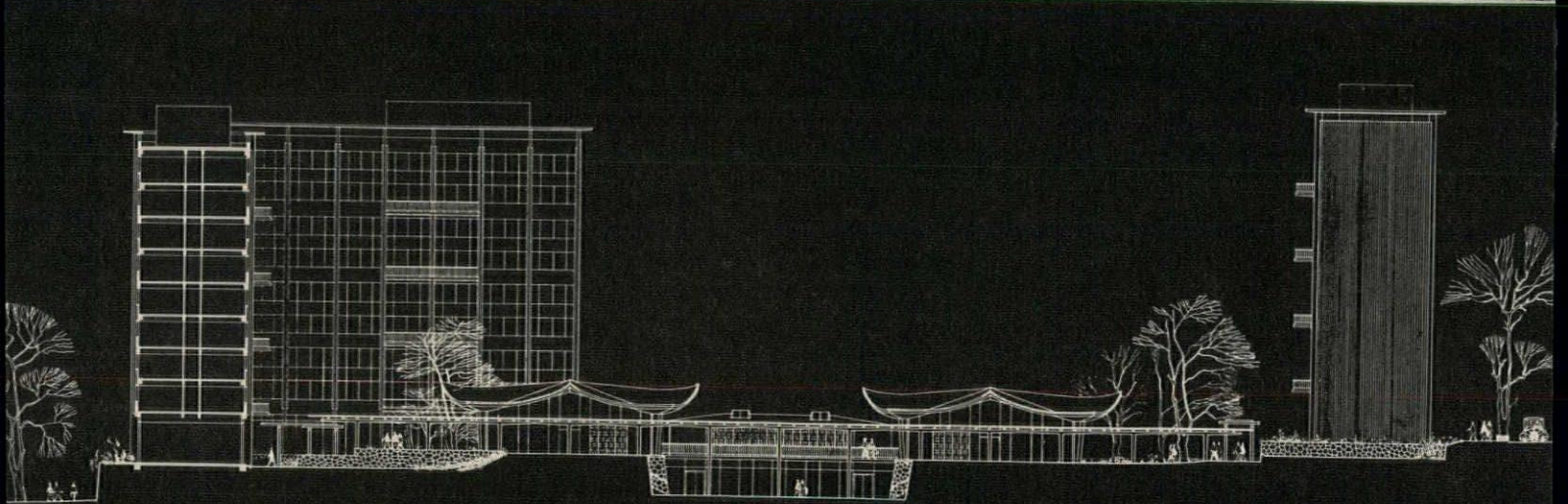




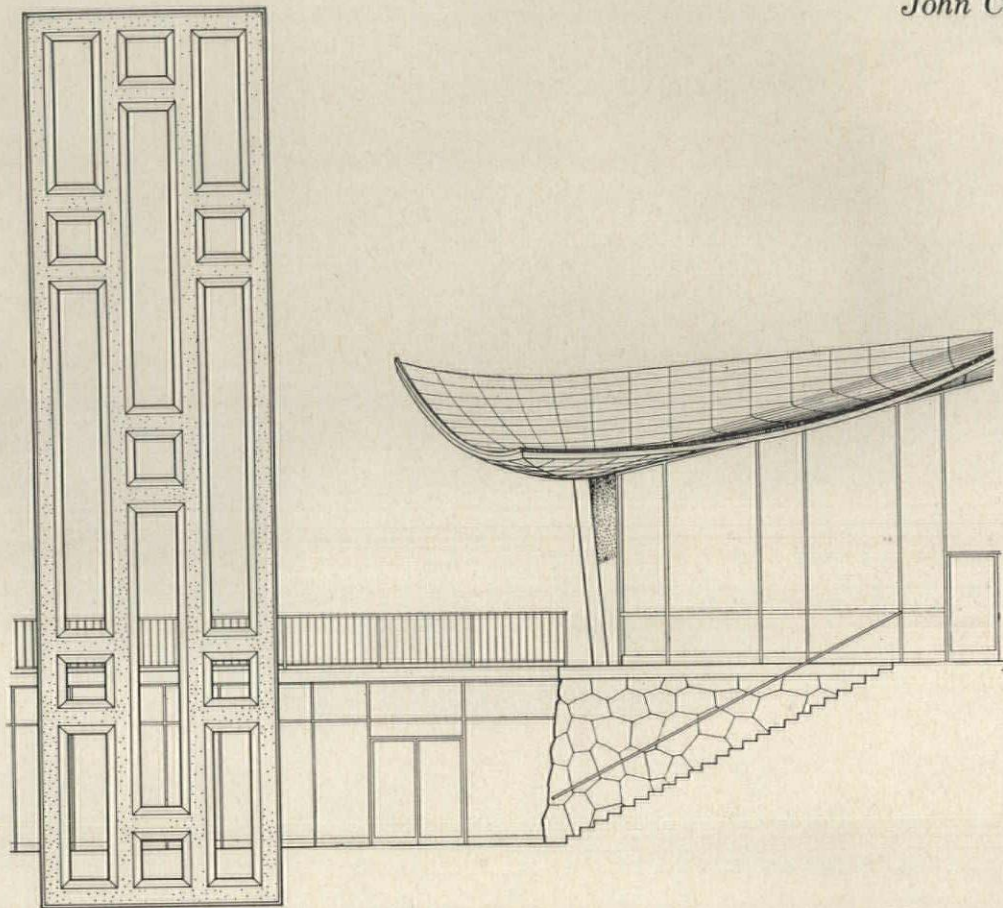
## ASILOMAR HOUSING

Eventually automobiles will use a perimeter road, leaving the main part of the site free for footpaths. Rooms in the housing units are similar to those in motels. Each holds four beds, and opens onto a private deck facing the ocean. The living room, in the angle between the housing units, functions also as conference room and is equipped with chalk boards, screen and kitchenette









## RESIDENCE HALLS

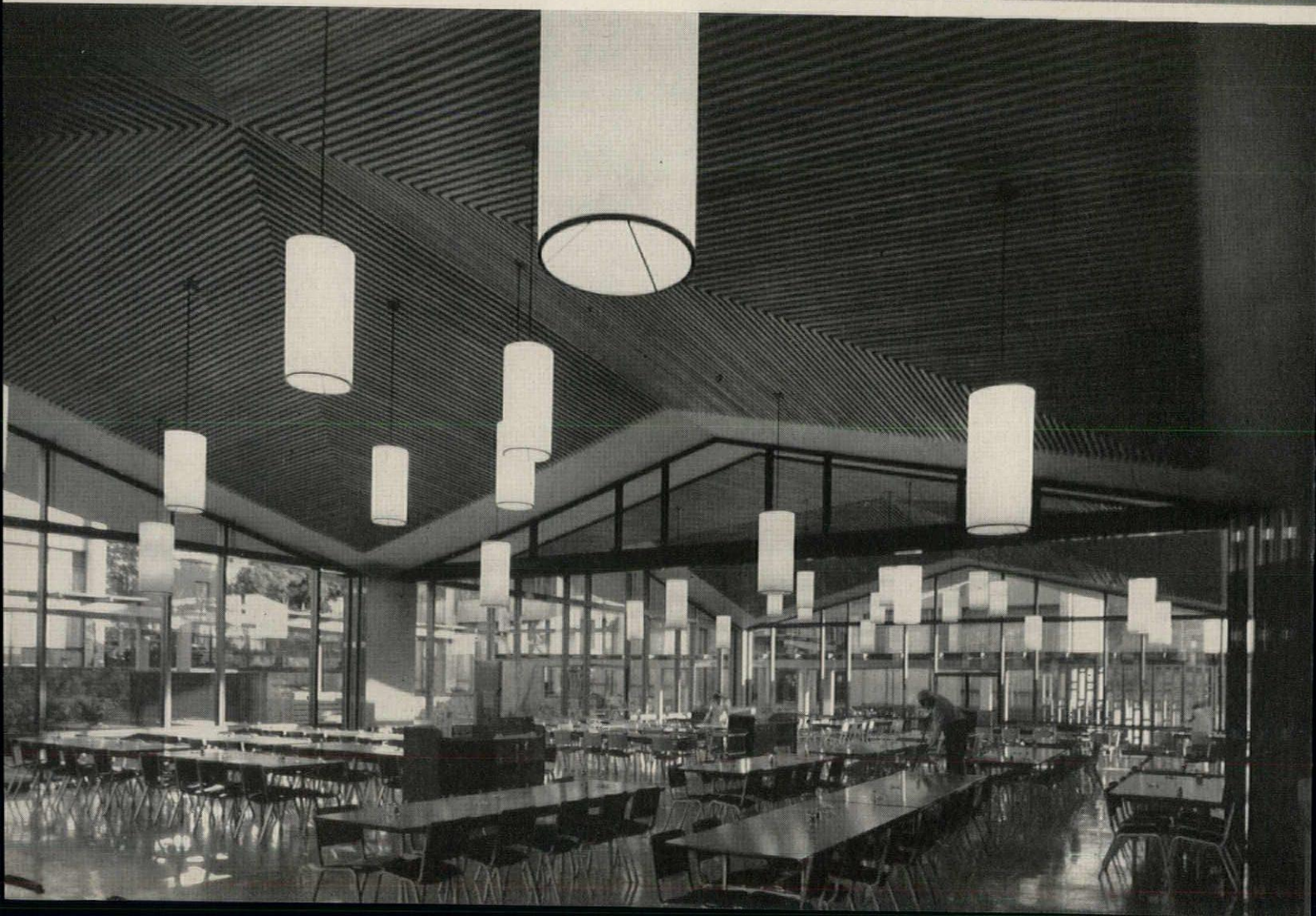
*University of California, Berkeley Campus*

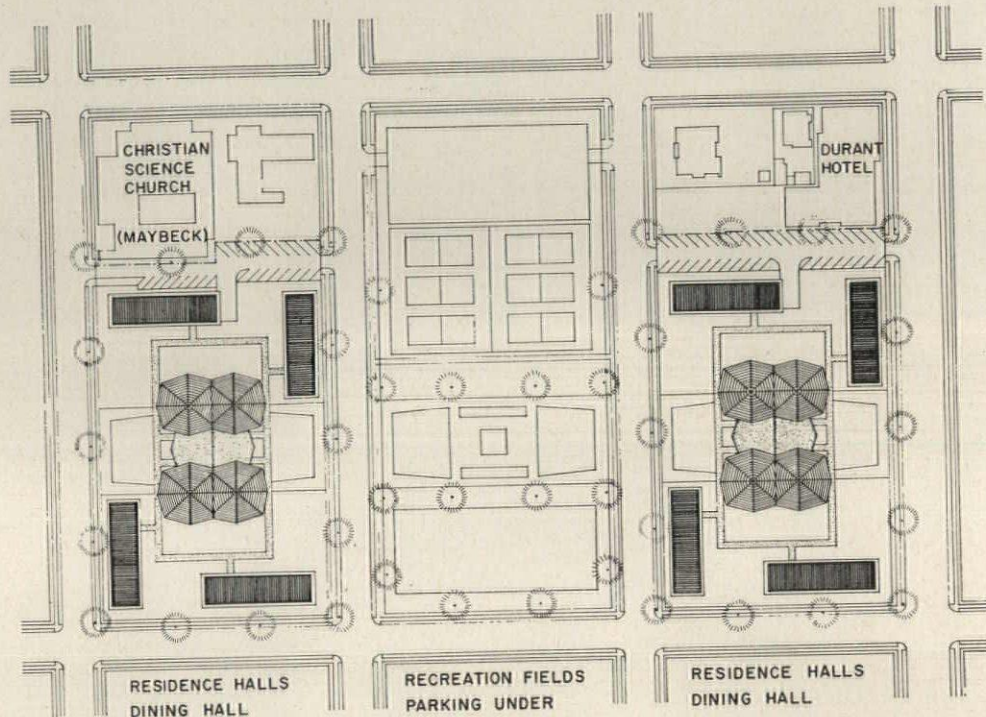
The tall buildings of the two new residence hall groups at the University of California house 1680 students; this explains, in part, their nine-story height in a two-story neighborhood. But this height, unusual in Berkeley, also makes possible the open central courts which, subdivided into smaller, more intimate courts, reflect some of the character of the surrounding residential district. The careful placing of the tall buildings on the perimeter of the site creates an environment of controlled space and gains the maximum openness for each site. The somewhat austere reinforced concrete structure of the halls is contrasted by the use of colored metal panels at the windows on the court sides of the buildings and on the street sides by the highly decorative cast stone grilles, 30 ft wide and eight-stories high, which screen the walls of utility rooms.

*Warnecke & Warnecke, Architects; Isadore Thompson, Structural Engineer; Dudley Deane & Associates, Mechanical Engineers; Lawrence Halprin, Landscape Architect; Knorr-Elliott & Associates, Interior Designers; Dinwiddie Construction Company, General Contractors*



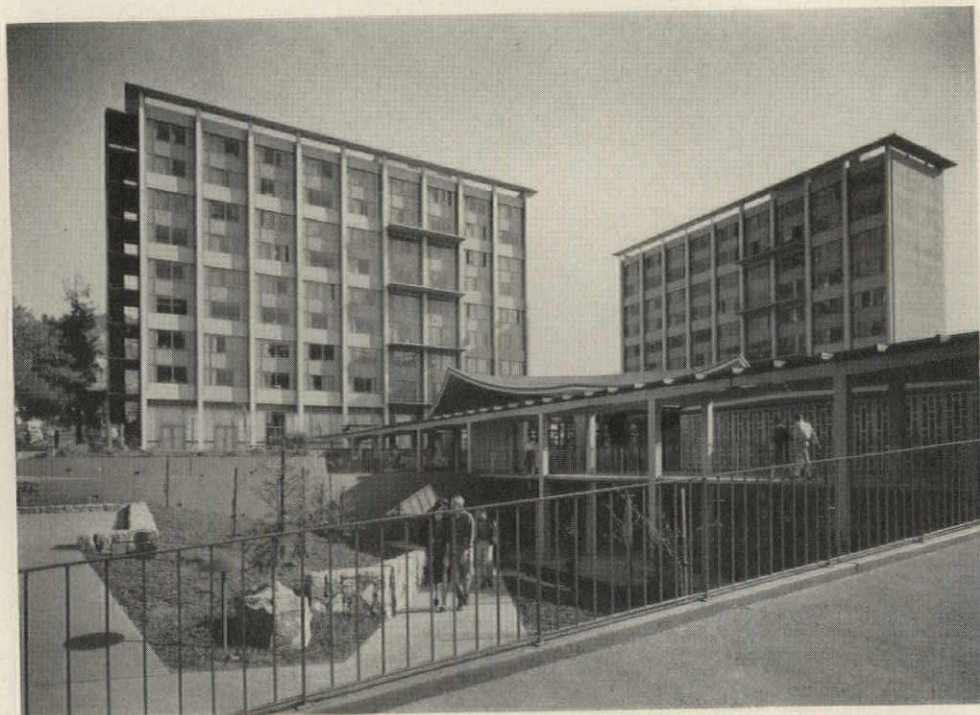
*Photo opposite page by Dandeleit, all others Roger Sturtevant*

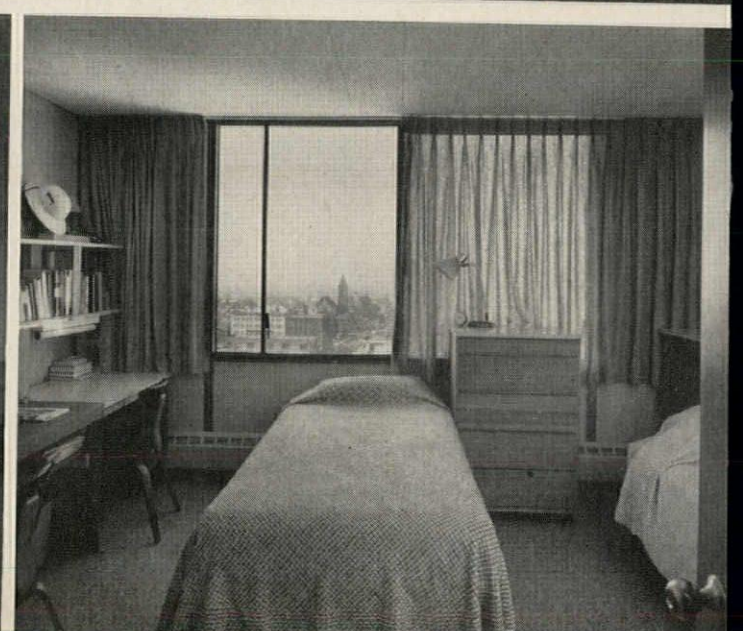
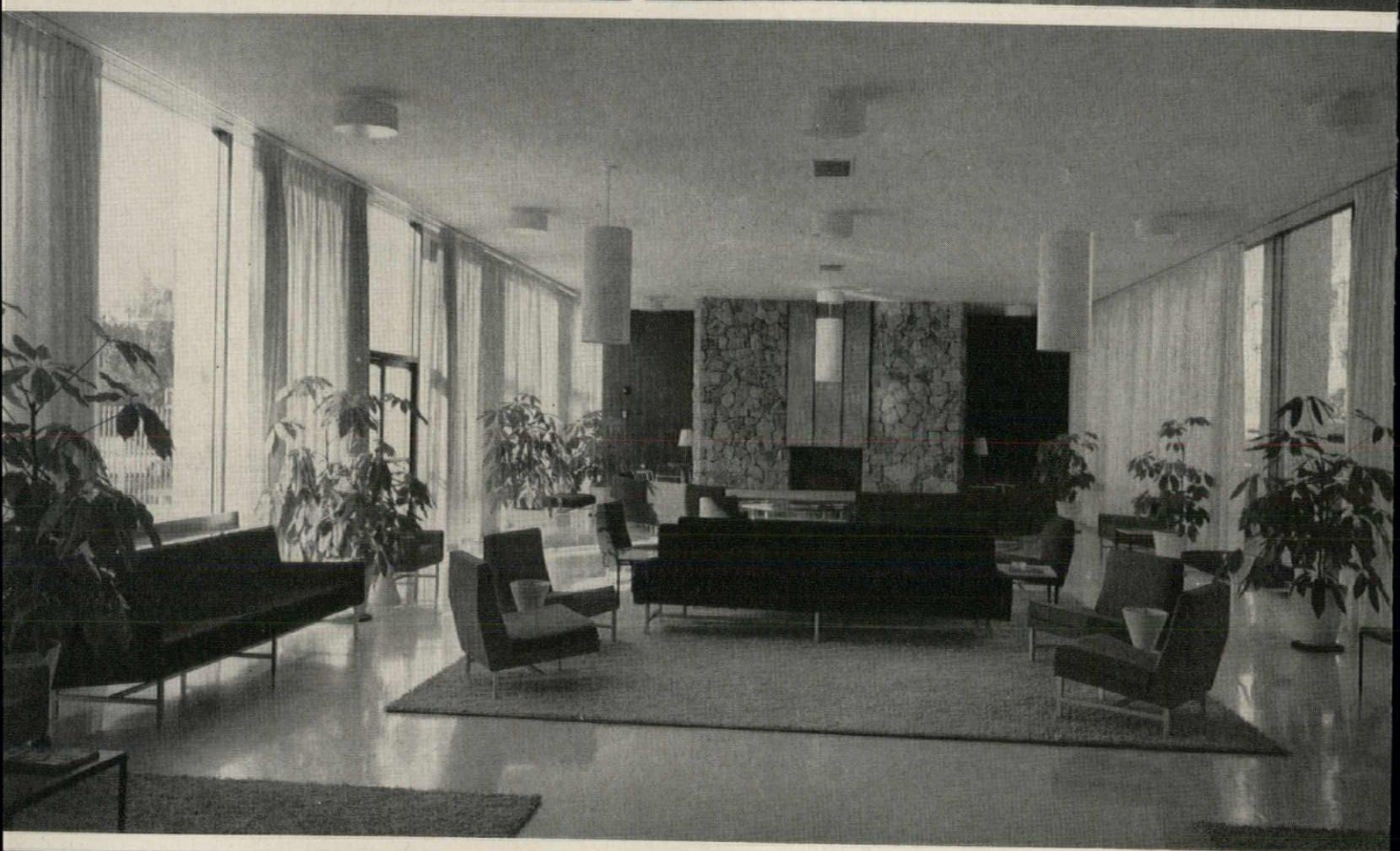


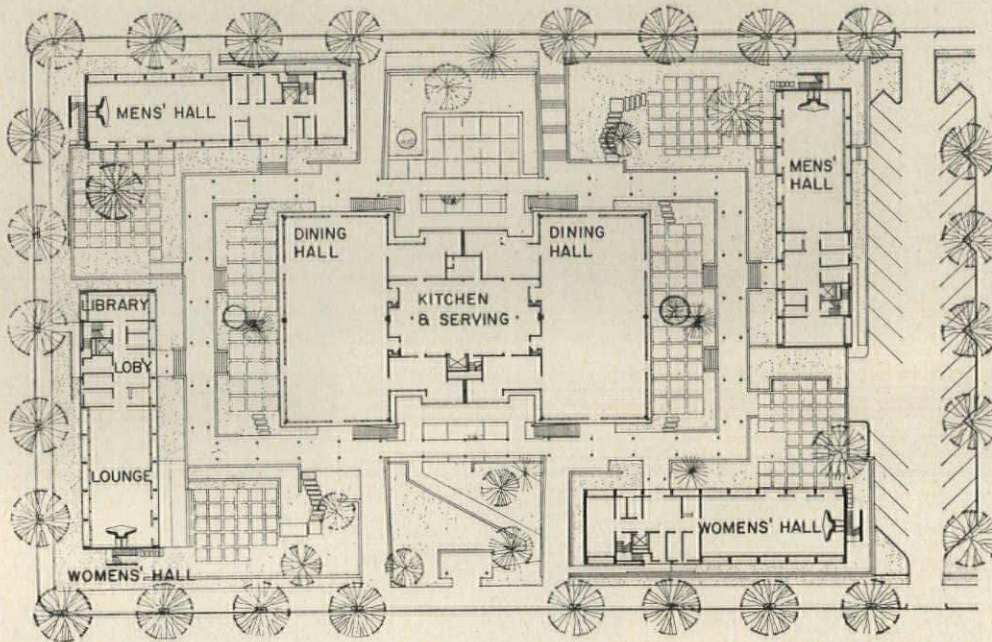


## RESIDENCE HALLS

Just as the residence halls reflect the scale of the University's buildings, so the pavilion-like dining halls with their informal, curving roofs respond to the character of the neighborhood. Each residence hall has its own dining room; arranged in pairs, these rooms can be used separately or together, as they are used at dinner when men and women students dine together. The central kitchen is on the same level as the dining rooms; below are the recreation room—with its own sunken court—and administration offices. Between the two blocks of buildings is a full block which is to be developed as a parking garage with playing fields on top



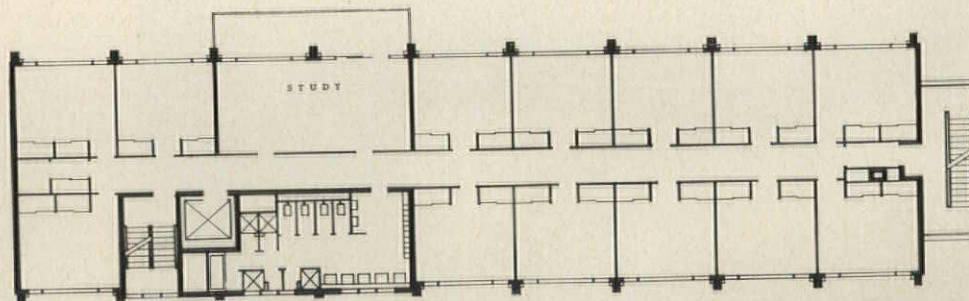




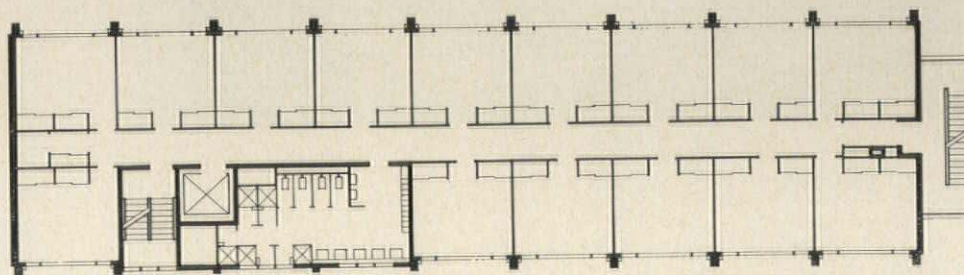
## RESIDENCE HALLS

Two of the halls in each block are for men, two are for women. In each building there are eight floors of double rooms, with a study room (facing page, bottom left) on every other floor. One elevator serves each building; an inside stair can be used between floors. The fire stair is outside and makes a strong design feature. Just inside the entrance to each building are lobby and desk (facing page, top right). The public rooms in each hall include a living room (facing page, center) which opens onto its own court; a library; and date rooms.

The design for these building groups won an invitational competition held by the University among seven architectural firms. During the early phase of this competition Warnecke and Warnecke held their own competition for design ideas among their staff members. The best ideas generated in this way were eventually synthesized into a single concept which was submitted in the University's competition

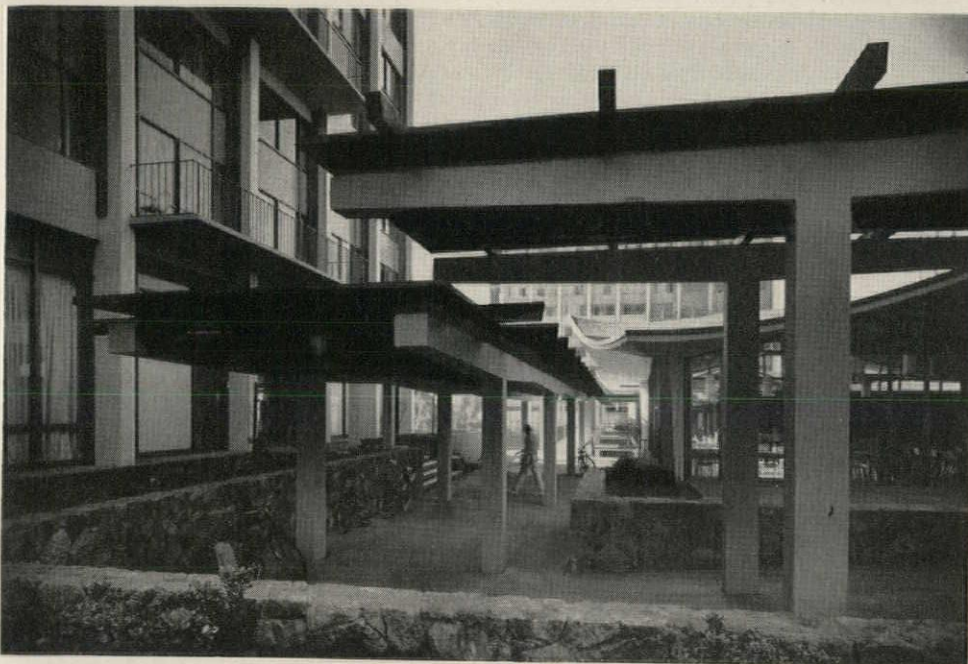
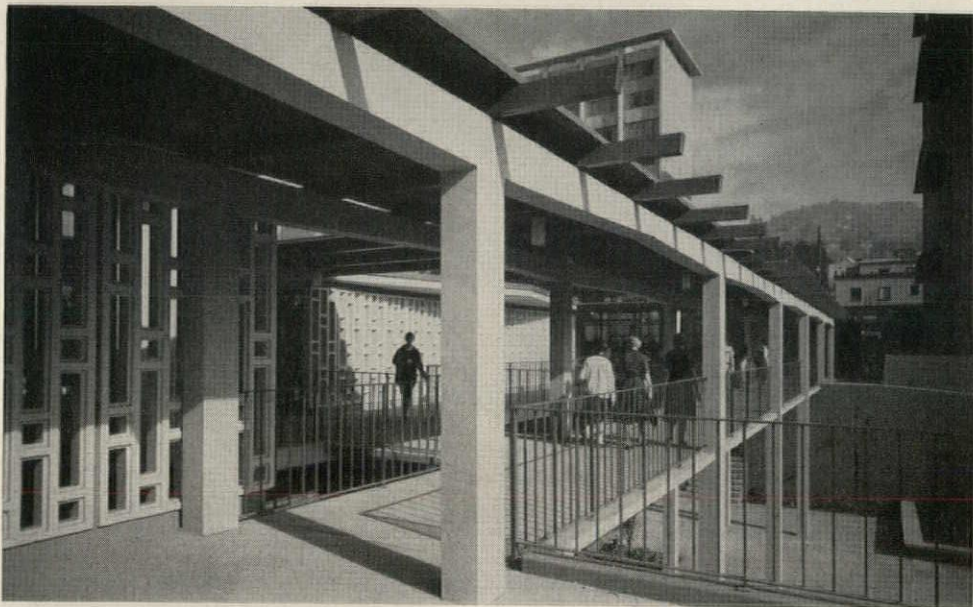
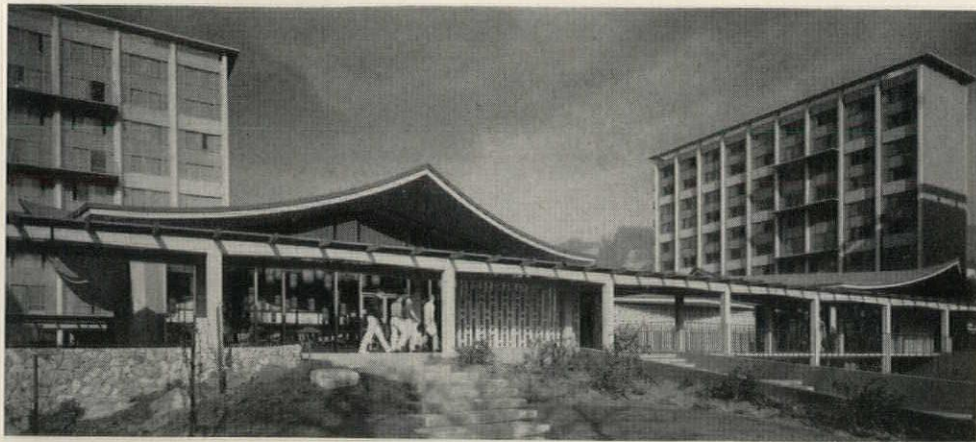


DORMITORY AND STUDY FLOOR



TYPICAL DORMITORY FLOOR

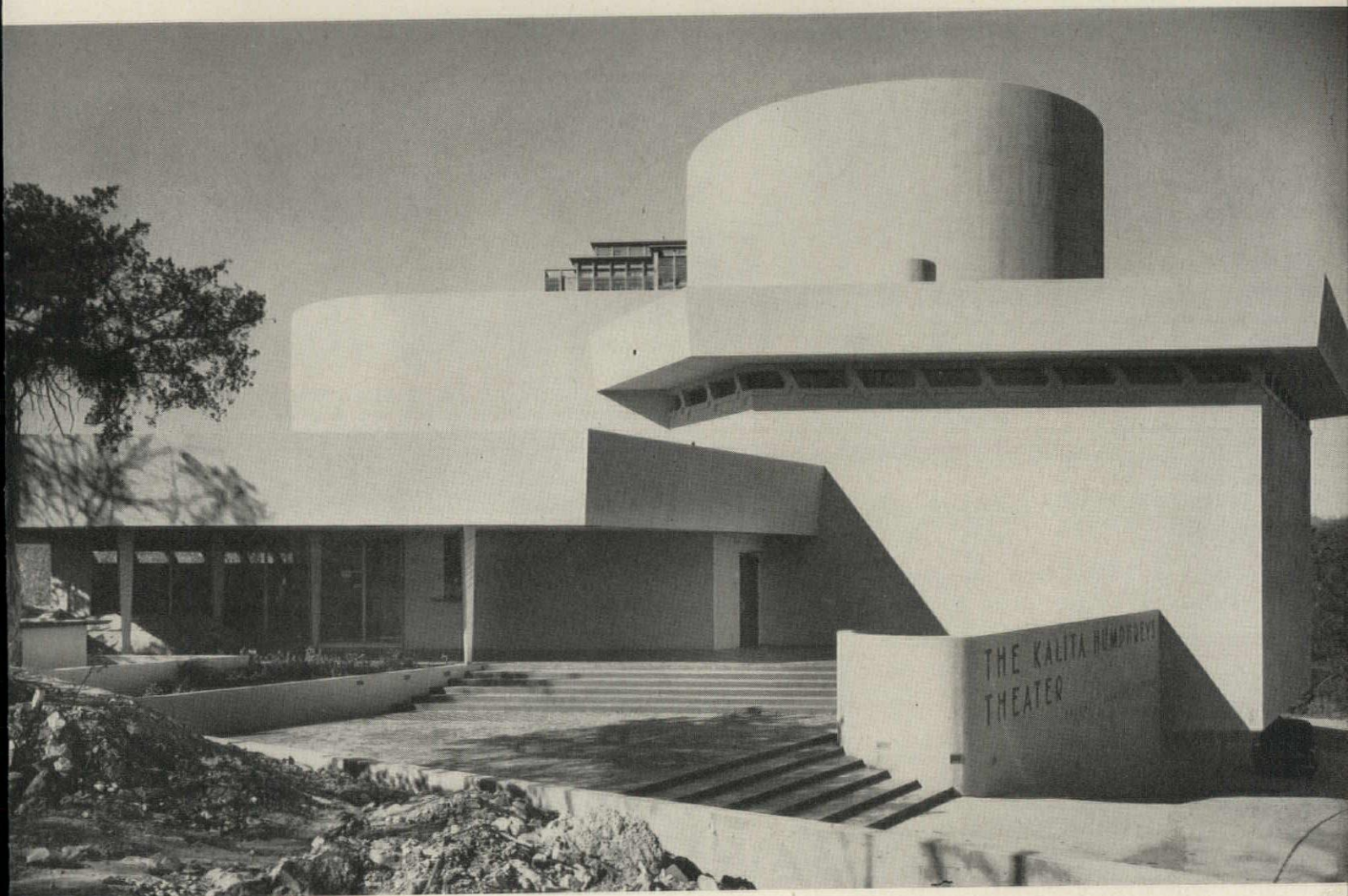




## RESIDENCE HALLS

Covered walkways connect all of the buildings and sometimes act as bridges across a sunken court, adding a three-dimensional quality to the site planning. The grille in front of the dining hall is of the same design as the large grille on the street side

*The following individuals in the Warnecke firm are to be credited, at his request, for their specific contributions in carrying out the work shown here: Carl Arras, Lun Chan, Robert Hart and Neill Smith, Associates; John Webb, James Hastings and Robert Efin*



# A THEATER BY WRIGHT

NAME: *Kalita Humphreys Theater of the Dallas Theater Center*

LOCATION: *Dallas, Texas*

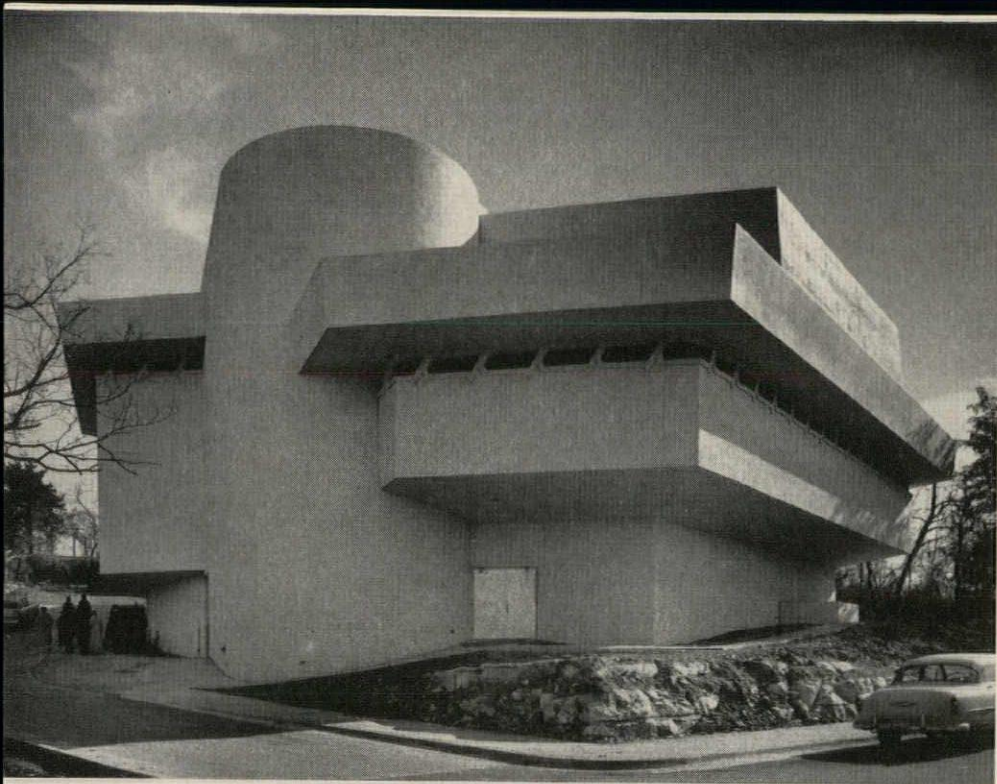
ARCHITECT: *Frank Lloyd Wright*

SUPERVISING ARCHITECT: *W. Kelly Oliver*

LIGHTING AND MECHANICAL CONSULTANT FOR STAGE: *George C. Izenour*

MECHANICAL ENGINEERS: *Herman Blum Engineers*

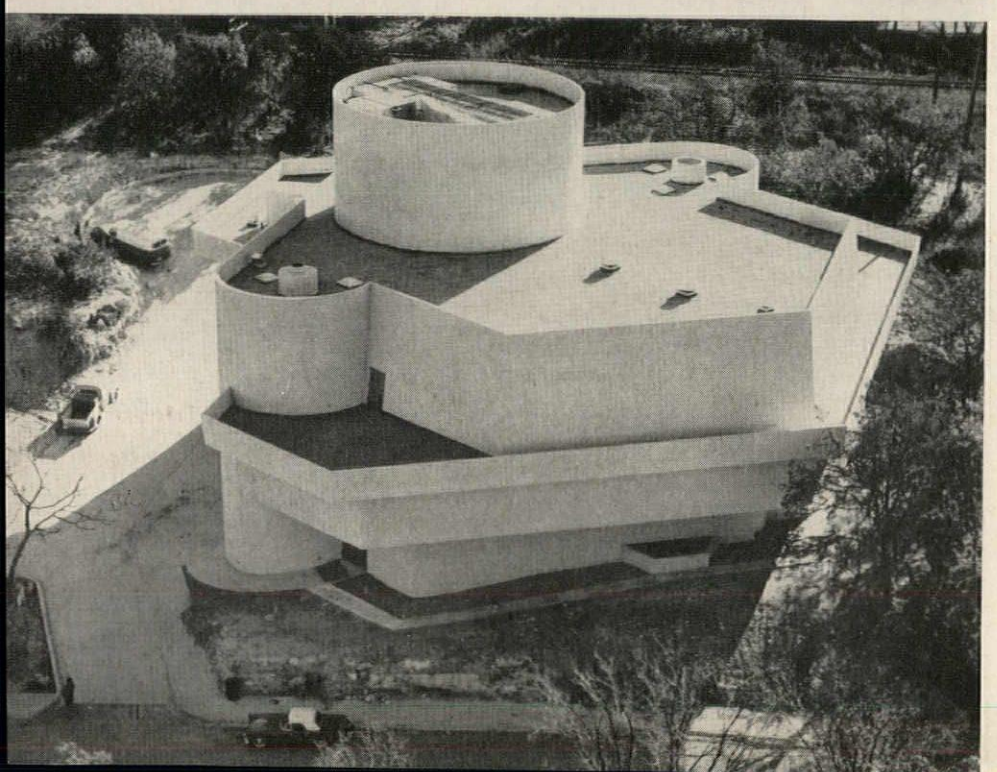
CONTRACTOR: *Henry C. Beck Co.*



Architectural experiment  
inspires mechanical experiment  
in the service of  
experimental theater



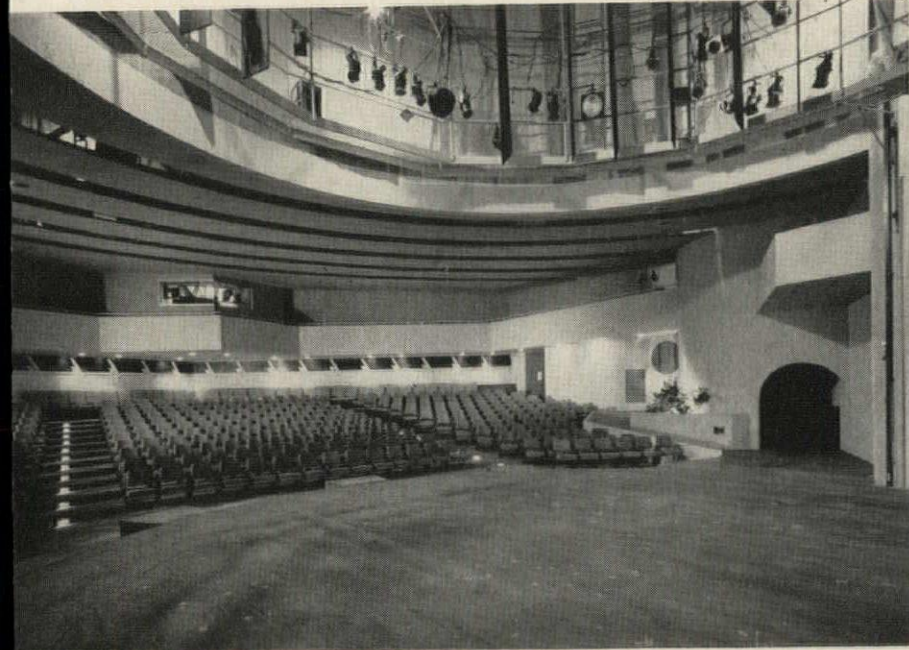
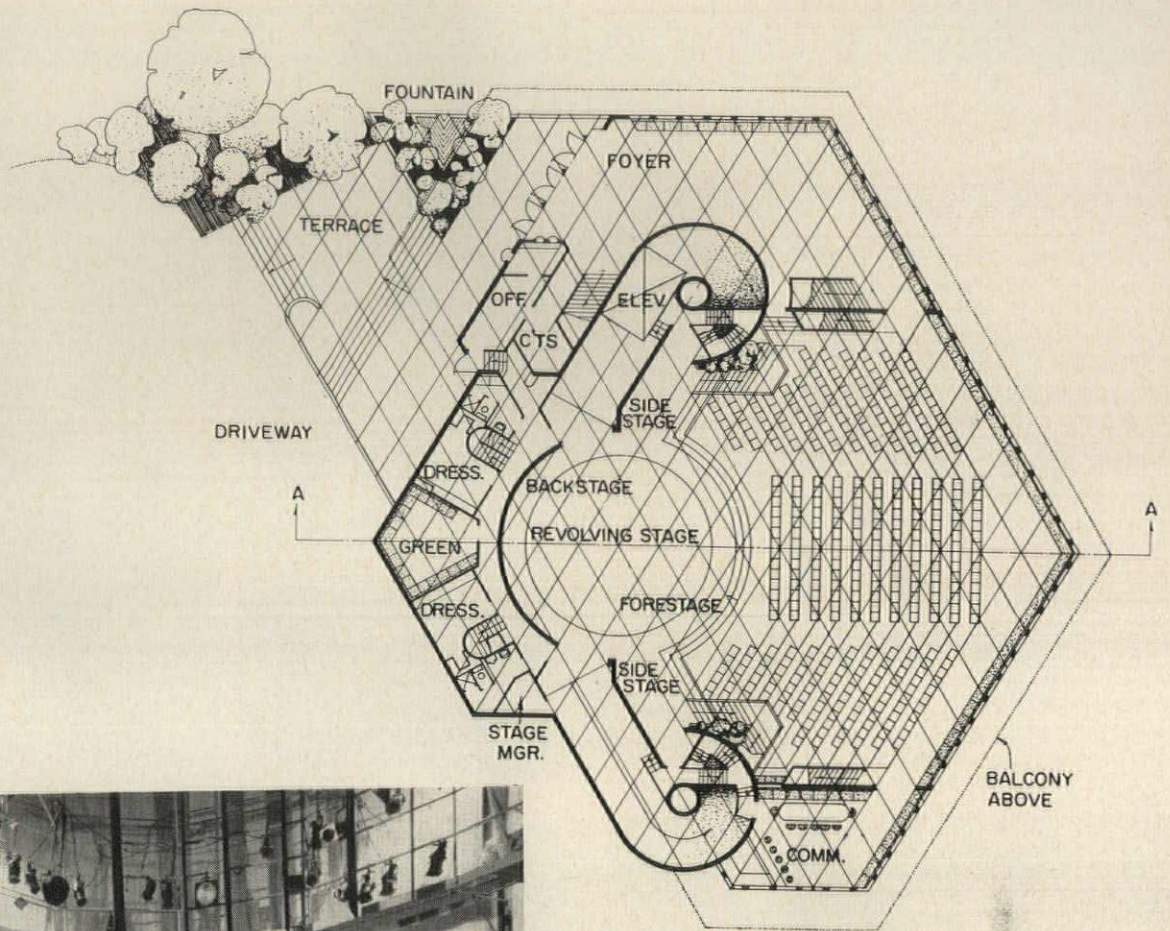
Frank Lloyd Wright never gave up what he considered a good idea, and the Dallas Theater Center is an outgrowth of two earlier experimental schemes. Around 1917 he planned a theater for Aline Barnsdall to be built in Los Angeles near her famous Hollyhock House at Olive Hill which he designed. The project fell through and he didn't get another chance at a major theater for many years until he developed a scheme for West Hartford, Connecticut, based on an earlier theater project for Broadacre City. It was never realized. A number of auditoriums have been included in his schemes. Both Taliesins have them, and several years before he died Wright erected a dance pavilion for his wife Olgivanna at the desert camp. The Olive Hill and Hartford theaters, however, can be considered prototypes of the new building in Dallas, the former in the fact that its basic concept provided for experimental theater and the latter in its use of a ramp system within a hexagon, as well as a circular revolving stage.



Of more importance to the design of the Dallas theater than these early models was a particular attitude strongly held by Wright. He believed in the dignity of manual labor, not only in the service of handcraft, but for its own sake. He was indifferent to mechanical contrivance, and did not want the form of his theater to be determined by the highly developed mechanics of modern theatrical production. In this design flats were to have been painted and stored in the basement workshop and lovingly toted by hand up one ramp, installed on the stage, and after the scene carried back down the opposite ramp to the basement. Unfortunately the turning radius in each ramp was determined by considerations of exterior mass and volume rather than function, and it became apparent that most pieces of scenery however gently carried by hand would be too long to round the bend. One of the ramps, therefore, is not used as such, and a mechanical lift has been installed across its width (see plan).

While a careful examination of the plan  
*text continued on page 165*

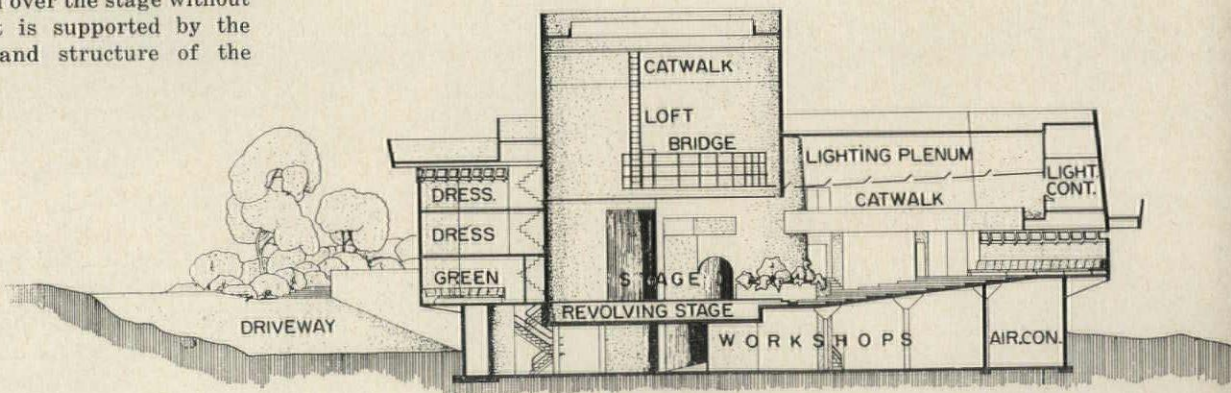




Messina Studios

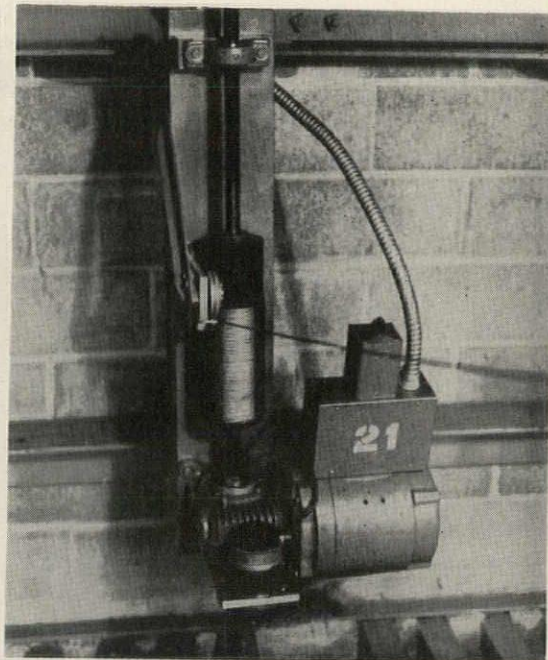
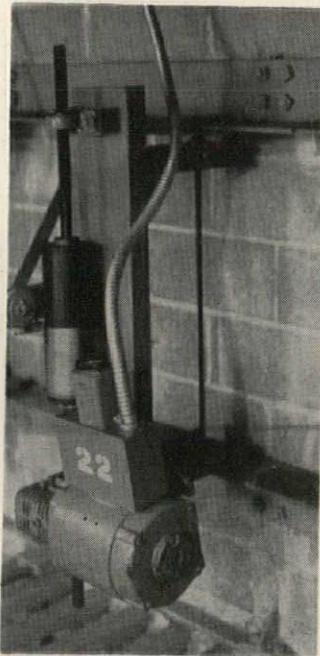
*Left:* view toward lighting booth on balcony. In the booth is located the electronic console with a pre-set memory developed by George C. Izenour which controls all stage lighting. Stage lights are positioned in the ceiling coves, in the steel mesh gridiron near the top of the loft, from the lower bridge 19 ft above the stage and from light slots in the floors of the balconies which overhang the side stages. Windows at the rear of the auditorium have been sealed off as a distracting light source. Vertical fins located within the projecting loft wall screen lights from audience

*Right:* a structure of many cantilevers, the most daring is the projection of the 8-in-thick drum which is suspended over the stage without columns underneath. It is supported by the corresponding weight and structure of the dressing room tower



SECTION A-A

*Below:* view toward fixed cyclorama. Stage is one foot from auditorium floor. *Right:* two views of the motor-driven winch designed by George C. Izenour. These are located in the gridiron 40 ft above the stage. Each winch holds 100 ft of 1/8-in. diameter steel cable and is capable of lifting 250 lb at the rate of 2 ft per second. The motors are designed so that each can be connected with as many as six other motors, thereby permitting the level raising of large pieces or synchronized moving of many pieces. Although the motors are permanently located, the point where the cable passes through the gridiron toward the stage floor can be quickly and easily changed, permitting great flexibility of operation



and section reveals other functional problems, it must be said that Wright has nonetheless made a significant contribution to theater design. He erected for Dallas the first building in America to function as an Elizabethan apron type theater. Apron type stages and theaters in the round have been erected in tents as well as in barns and other reconverted structures, but no contemporary theater building had yet been constructed to provide any arrangements other than those afforded by the proscenium type stage. Theaters constructed in the Western world since the end of the sixteenth century have been of the proscenium type and this means that for all this time the creation of theatrical illusion has been contained within a rectangular frame. While this arrangement is ideal for many types of performance, theater designers and directors are beginning to experiment with more flexible kinds of staging and welcome the added dimension given by the projecting stage. They feel that a more intimate relationship is established between actor and audience where the stage is partially surrounded by seats and closer to the auditorium floor. Wright's theater offers new possibilities to the creative theater director, but cannot be used for conventional staging.

At Dallas the 40-ft circular stage has a 32-ft revolving turntable. Wright's original idea was to bisect the revolving drum with a permanent screen dividing it into a fore-stage and a backstage. Sets would be carried up the ramp and changed behind the screen, the stage would revolve and a new scene appear. The diameter of the drum was too small, however, to allow it to be divided in half. The forestage would have been too shallow, the backstage too tiny to function as such. The dividing screen was never installed and the full depth of the stage is being used when needed. The revolving stage functions as scenery, not to change scenery.

When it became apparent that Wright's backstage didn't work, there was no where to go but up. Every good working theater has a fly galley, but Dallas required a special one for two reasons. With no backstage, most set changes have to be made from the flies. The system of raising and lowering flats had to be kept free from the circular wall or cyclorama at the rear of the stage because it is used as a screen for the projection of backgrounds and had to be kept clear of paraphernalia. Special winches were installed to raise and lower flats. These comprise a hanging system which is free of attachment to stage house walls as it does not require the traditional sandbag counterweights which must run in channels along these walls. The movement of flats

*text continued on page 166*

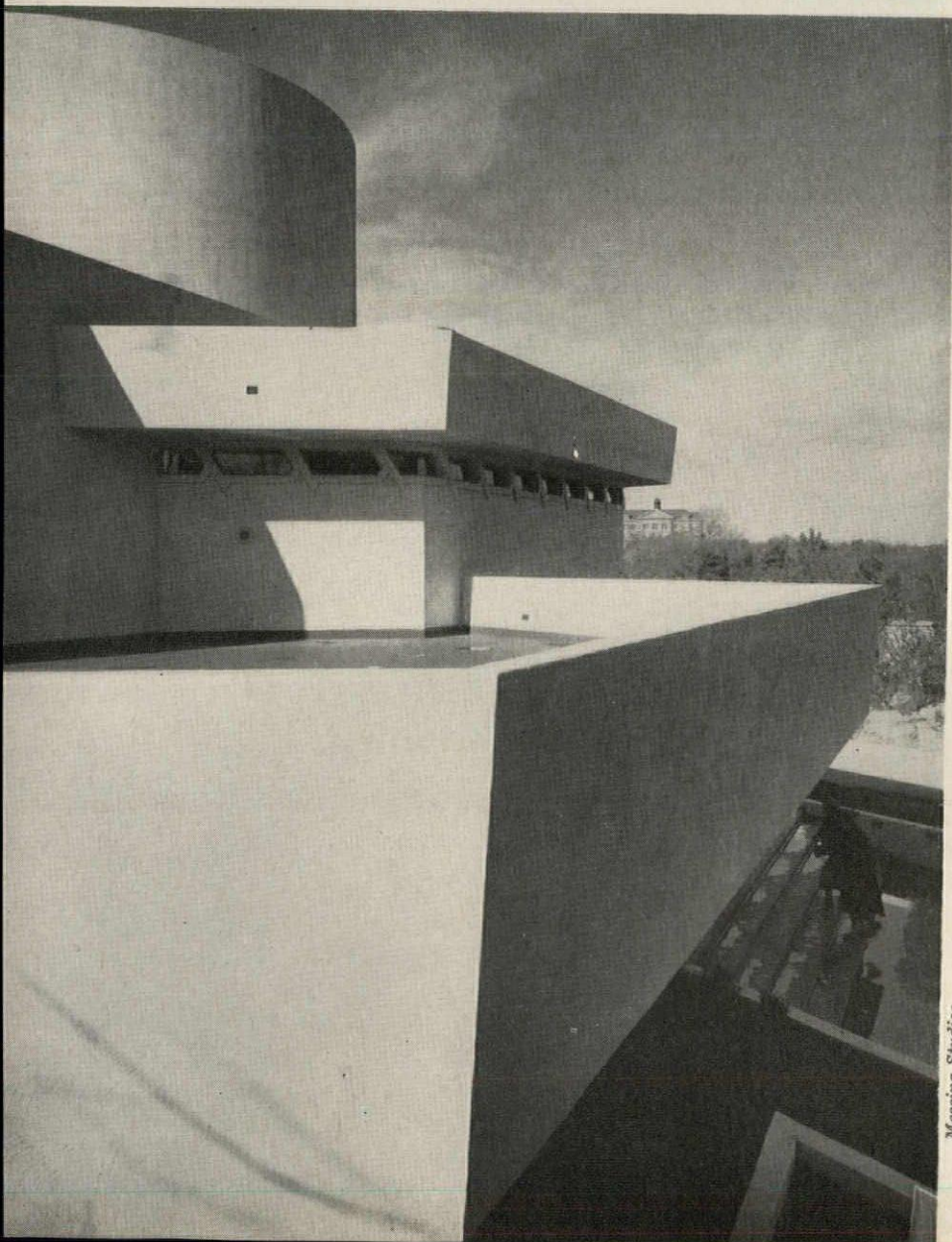
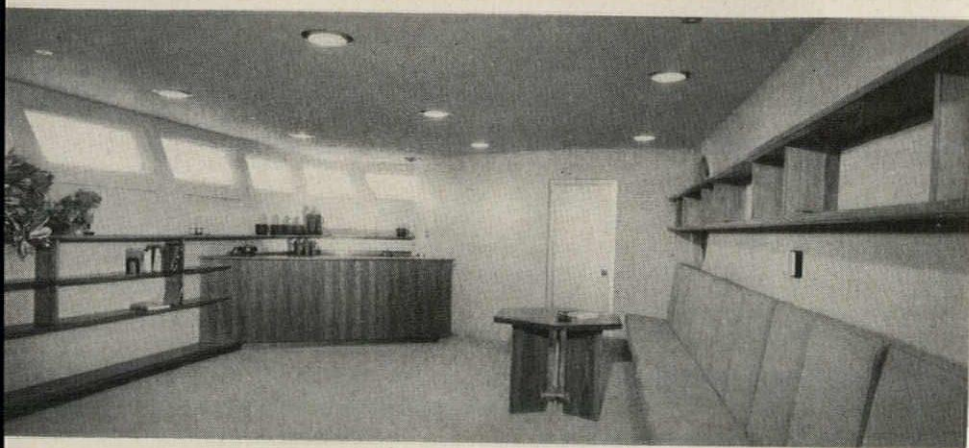
Portable console shown at bottom of photograph below is usually located in the stage manager's office beyond the cyclorama. All the operational controls for the winches are contained in this unit. The disc at the base of the panel is a control analogue of the turntable, geared to move exactly as the stage is moved; vertical slots have moving indicators which chart the position of the flats. With these analogues the operator "flies it blind." Powered by two 1½ horsepower motors, at its slowest speed the stage makes a complete revolution in 12 minutes, at its top speed in 25 seconds. Thirty plastic covered wheels underneath the outer edge serve as supports

*Messina Studios*





*Top: lobby. Middle: committee room adjacent to auditorium. Bottom: cantilevered terrace*



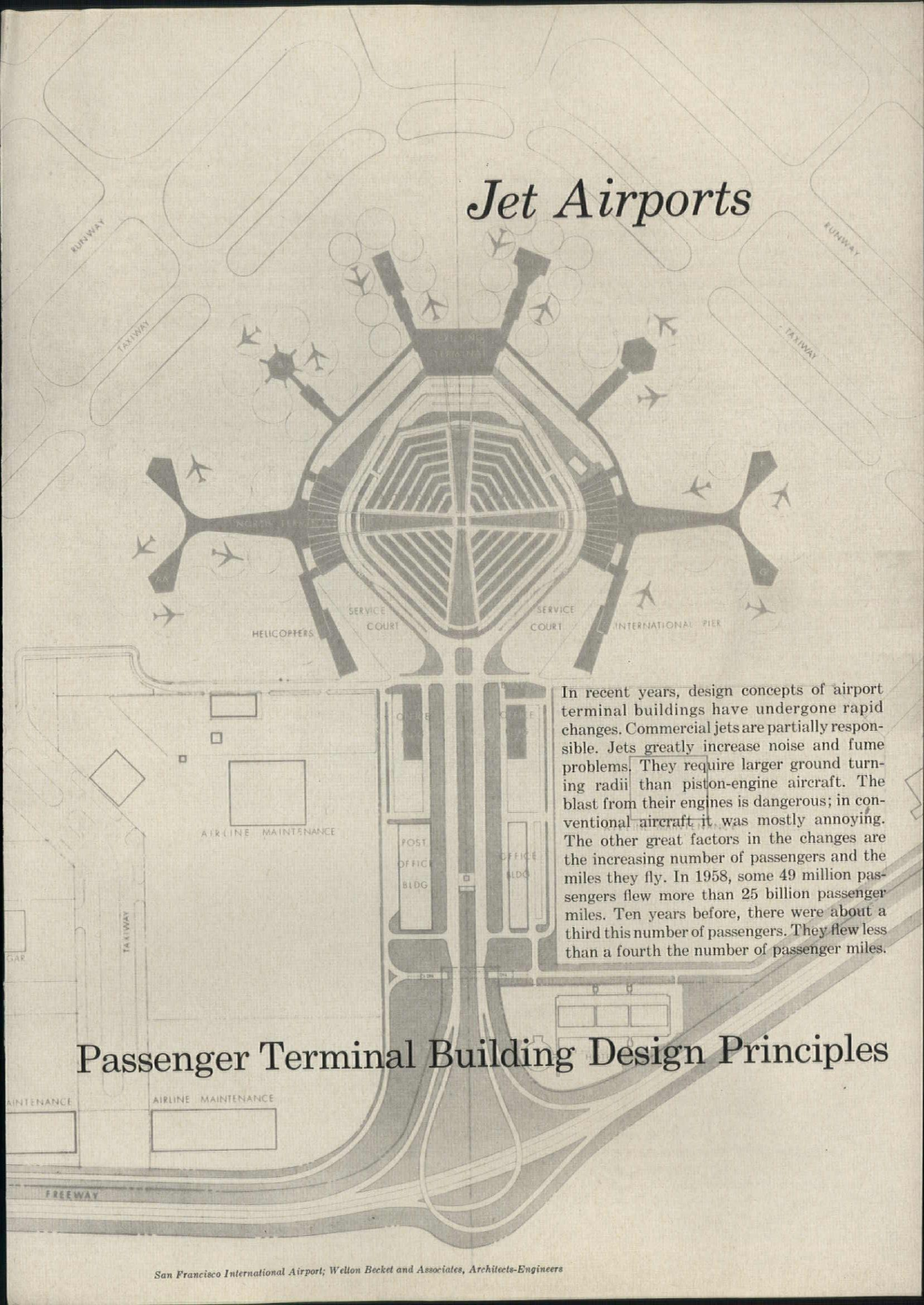
*Messina Studios*

is electronically controlled by a device developed by theater designer and engineer George C. Izenour who also developed the special winch. The mechanism can be preset to lower and raise scenery in any desired sequence or time span, and all preparation for staging may be set and ready while the performance goes on.

The narrow balcony or catwalk at the rear of the theater was originally intended to carry the stage lighting. A rule of thumb for the theater is that it should be possible to focus stage lights at a 45 degree angle. The rear balcony was too low to provide this angle (see section) so the indirect light coves which Wright had designed to light the auditorium were widened and made into front stage lighting positions. Additional lights have been installed on the inner surface of the fly galley. The lighting control booth is at the center of the balcony at the rear. It houses another console with a preset memory designed by Izenour, which electronically guides the sequence of lighting combinations.

The theater was constructed at a cost of approximately \$1,000,000.

# Jet Airports



In recent years, design concepts of airport terminal buildings have undergone rapid changes. Commercial jets are partially responsible. Jets greatly increase noise and fume problems. They require larger ground turning radii than piston-engine aircraft. The blast from their engines is dangerous; in conventional aircraft it was mostly annoying. The other great factors in the changes are the increasing number of passengers and the miles they fly. In 1958, some 49 million passengers flew more than 25 billion passenger miles. Ten years before, there were about a third this number of passengers. They flew less than a fourth the number of passenger miles.

## Passenger Terminal Building Design Principles

Some 75 airports in the United States are expected to build facilities for handling jets in the next fifteen years. Hundreds of additional airports will face this problem later, when smaller jet airliners become available. Add to these the thousands of smaller communities which, now or in the near future, must build or rebuild their airports. The net result is greatly increased activity in the airport field by architects and engineers in the years to come.

The present study is primarily concerned with the problems these professionals face in the design of terminal buildings for jet airports. With only a few exceptions, the same or similar problems exist in the design of *any* airport. For various reasons, this study must be limited in scope. Basic attention here is paid to the major problems involved in design for passengers and baggage. There are a number of other facets of airport terminal design of interest to the architect; among them are the handling of cargo and mail, layout of the aprons, provisions for aircraft servicing and maintenance, and requirements for special aircraft such as helicopters. Some of these subjects are auxiliary to the main purposes of this study; others are of sufficient interest and importance to deserve separate and complete treatment.

## GENERAL PRINCIPLES

In planning airport terminal buildings and aprons, it is most important to have early and continuous consultation with all airlines concerned. The airlines should provide an estimate of their traffic potential at the airport for the next ten years and guidance on traffic requirements for the period the buildings and other facilities are expected to be in service. The data should include:

- a. aircraft types and physical characteristics (wing span, turning circle, etc.)
- b. aircraft loads (passengers, cargo, and the capacities of the aircraft)
- c. the nature and relative proportions of traffic (International, Domestic, and combined) in the following categories: Originating, Terminating, Transit, and Transfer (interline)
- d. the movement rate, including peak movements
- e. route patterns to and from the airport

The airlines should also provide an estimate of their accommodation requirements and of the staff to be provided for.

The Master Plan of the buildings and aprons should show alteration and expansion possibilities for an increase in traffic during the expected life of the facilities. Basic planning principles are:

- a. minimum apron occupancy time
- b. minimum handling times for processing passengers, baggage, cargo, and mail
- c. the latest possible departing passenger reporting times
- d. maximum efficiency in aircrew routines consistent with airline operational requirements

The main purpose of the buildings should be to ensure *maximum operational efficiency*. Construction of the buildings should be such that the cost to airlines is kept as low as possible, commensurate with the attainment of maximum operational efficiency.

The physical layout of the passenger buildings and aprons should always be considered in relation to its effect on the passenger, providing him with effective serv-

ice and facilities. At the same time, attention must be paid to the location of other necessary accommodations (for baggage, cargo, and mail handling) so as to ensure maximum efficiency. The design and layout of buildings and aprons should permit flexible operations, and allow for changes in handling techniques, and seasonal and other variations in traffic loads. Buildings and aprons should be capable of progressive expansion to meet increasing traffic requirements without disproportionate additional costs. Expansion should be possible without interfering with the operation of existing buildings and aprons.

The effects of noise, blast, fumes and heat on personnel, passengers and visitors at the airport should be given careful consideration. The flow of passengers, baggage, cargo, and mail should be along a standard pattern, direct, clearly marked, and free from obstructions. Intersections of the lines of flow should be avoided.

Facilities should be based on the assumption that all passengers can be processed at the airport, regardless of other facilities located elsewhere in the community. Allocation of space within airport buildings, based on the airlines' accommodation requirements and the interrelationship of their offices with others, will permit expeditious handling and clearing of passengers, baggage, and cargo. In assessing apron layout requirements there are two basic questions: the size of the operational stands to be used and the number required.

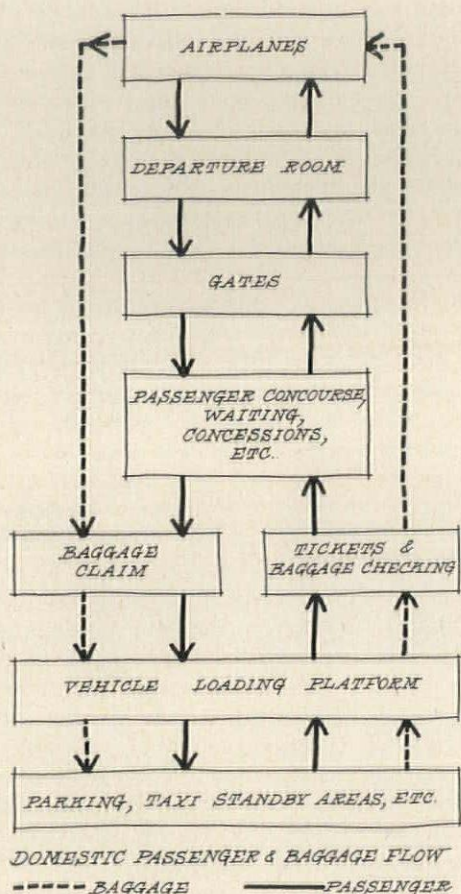
## PASSENGER AND BAGGAGE FLOW

The following broad principles govern the flow of passengers and their baggage.

Routings should be designed to provide an uninterrupted flow of departing, arriving, through, and connecting passengers and their baggage. All such routings should be logical, self-evident, as short as possible, unimpeded by any form of obstruction or cross-traffic, and require as few directional signs as possible. Design should be such as to permit a minimum number of contacts between the airlines and passengers. Facilities should be ample and strategically located to minimize passenger movement.

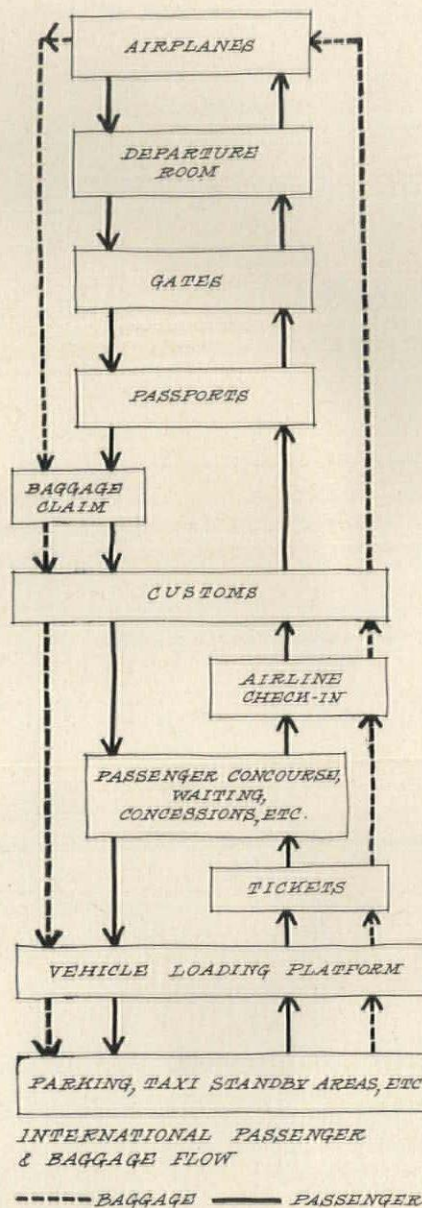
When it is necessary for passengers to change levels, escalators are considered desirable, in addition to stairs. Escalators and stairs for passengers with baggage should be of a width permitting use by passengers carrying two bags. Forty-eight inches has been found satisfactory at many locations for one-way traffic. Consideration must also be given to provision of elevators or other devices for passengers in wheel-chairs or with cardiac conditions or those who must be transported on stretchers. Separation of passengers from the public should be effected at the boarding control point. The public should be discouraged from entering concourses by use of appropriate signs. Concessions and other facilities available to the public should be so located that they do not interfere with or divert the passenger flow.

Adequate separation should be provided between the ground arrival-ticket-baggage checking area and the baggage-claim, ground-departure area. However, separate flow, for arriving and departing passengers, is only considered practical where the traffic volume is large. Provision should be made to process baggage which has been checked at an intown terminal directly to the outbound



DOMESTIC PASSENGER & BAGGAGE FLOW  
 ----- BAGGAGE      ————— PASSENGER

Above: General circulation of passengers and baggage for domestic flights is shown above. Right: For international travel, flow is similar, but added provisions are necessary for customs, passport operations, health checks, and the like. In airports designed for both types of traffic, domestic and international flow will involve some combination of the two types



INTERNATIONAL PASSENGER & BAGGAGE FLOW  
 ----- BAGGAGE      ————— PASSENGER

baggage room without interfering with passenger flow. Passenger and baggage (or other traffic) crossings at the same grade should be avoided. At high volume terminals, consideration should be given to the need of a connecting baggage area(s) for the sorting and transfer of both intraline and interline baggage. Doors in the line of passenger or baggage flow should be equipped with automatic opening and closing devices. Approaches to aircraft should be safe and operationally acceptable.

Normally, the concourses have the same number of levels as the main building. The following factors should be considered in determining whether single-, two- or multi-level buildings and concourses should be used:

- a. volume of traffic
- b. a large number of gates causes operations to be remote from the terminal building. This makes it desirable to bring airline workers closer to the gate locations.

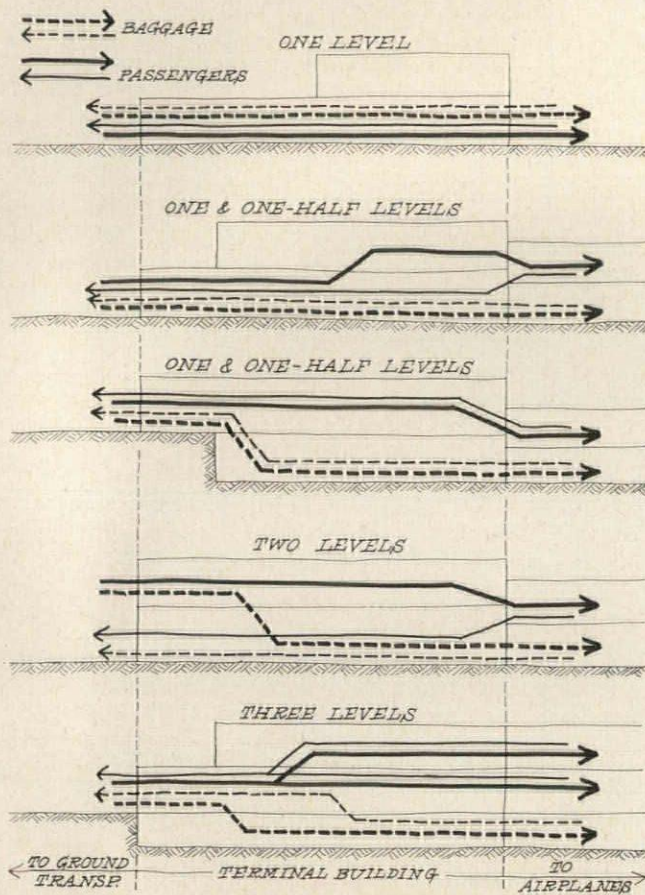
- c. larger than usual operations offices may often be more economical if incorporated in concourses.
- d. limited ramp space between concourses may make it impractical to place passenger corridors, departure rooms, and airline areas on a single level.

Two- or multi-level schemes often are practical if there is frequent operation of aircraft with large passenger capacities. They may also improve the flow of vehicular traffic, shorten travel distance, and avoid the crossing of passenger flow on the same grade.

#### PASSENGER TERMINAL BUILDING CONCEPTS

There are basically two types of terminal buildings constructed at airports: a. centralized terminal—all passenger and baggage processing is carried out in one building; and b. unit terminal—each airline processes its passengers in a separate building (several may share a building).

FLOW IN PASSENGER TERMINAL BUILDINGS



Typical methods of handling passenger and baggage circulation in airport terminal buildings are shown above. In general, for all of the schemes, it is considered best to separate enplaning passengers from their luggage at the earliest opportunity after they enter the building and to return luggage to deplaning passengers at the last possible moment before they exit

In practice, various combinations of these two concepts are used; for example, all international traffic may be handled in a centralized terminal while domestic traffic is processed in unit terminals. Local conditions dictate the solution best suited to a particular airport. Normally, the unit terminal concept will be practicable only where high traffic density exists.

The decision as to whether a terminal building should have one, one-and-a-half, two or three levels for the passenger and baggage flow process is influenced mainly by the size of the building required to handle the volume of traffic involved. The following should be borne in mind:

**One-level operation:** All operations relating to the processing of passengers and baggage take place at the apron level. Simplicity of layout is generally achieved, especially in the case of low frequency operations. Construction costs are normally lower than for other schemes. Gener-

ally, greater economy in operating costs and a higher degree of utilization of personnel are possible.

**One-and-a-half level operation:** It is possible to use a one-level operation on the land-side and a two-level on the air-side. This is called a "one-and-a-half" level scheme. On the land-side of the building, departing and arriving passengers use a common concourse. The scheme offers the air-side advantages stated below for two-level operation. However, departing passengers must proceed upstairs to the assembly area and arriving passengers downstairs to the baggage claim counters.

**Two-level operation:** Construction is normally relatively costly. With high frequency of operations, congestion in the passenger and flow process can be considerably reduced. Separation of functional aspects (e.g. inbound and outbound passengers and baggage) may be achieved. Maximum site utilization is possible, but extension and alteration possibilities are limited. An external two-level vehicle (bus or mobile lounge) operation may be used. In some respects, flow for passengers is more complicated. There is a distinct disadvantage in handling of transit and transfer passengers when the lower level is used for arrivals, and the upper for departures. It may be necessary to provide elevators, stairs, or escalators for the use of passengers, and conveyor belts or other devices for the conveyance of baggage. Generally, a two-level operation is economically justifiable only in large airports.

Utilization of the two levels can be achieved by using the lower level for the arriving passenger flow process and the upper level for the departing passenger flow process or by allocating the upper level for the entire passenger flow process, both arrivals and departures, and by using the lower level for airline functions.

**Three-level operation:** Advantages and disadvantages are similar to two-level scheme. Construction costs will ordinarily be even higher. Congestion and bottlenecks in the flow of passengers and baggage may be avoided. Crossings of the different flows are eliminated. Passenger walking distances may be held to a minimum with cross-over bridges between fingers. One level may be used for international passengers, another for domestic passengers and the ground level for baggage and service facilities.

**Concourses (Fingers):** Either a covered passageway for the passengers stretching from the terminal building to the gate position on the apron or a supplementary passenger assembly area, complete with rest rooms, telephones, service counters, seating accommodations, gate positions, and similar facilities. It is recommended that the passageway should have a minimum width of 15 ft for two-way traffic. The passenger handling level should be enclosed in order to provide protection from weather and aircraft blast and noise.

**Satellites:** In some locations, the provision of satellite terminals may prove desirable. These are located on the apron itself and are connected with the main terminal building by tunnels, fingers, buses, or mobile lounges. The satellite provides waiting room space in addition to that in the main terminal building. It is potentially capable of speeding up passenger flow by relieving congestion in the main terminal. In general, it must satisfy the same standard of passenger flow and supplementary facilities as for the main terminal building. The satellite concept is particularly useful for large airports, if transfer passengers making connections with another flight may do so without passing through the main terminal building.



## TICKETING AND BAGGAGE CHECKING

This area should be located near the entrance to the terminal building for passenger convenience, but far enough away to avoid crowding the entrance. This will enable passengers to complete any necessary check-in processes at the earliest opportunity. The preferred location is on the ground transportation arrival level to prevent the necessity of carrying bags to another level. Ticketing and baggage checking area should be functionally designed to satisfy needs based on peak passenger flow. Sufficient space should be provided in front of the counters to permit passenger queuing, necessary cross flow between positions, and circulation in the area. Design of ticket and baggage checking facilities should be coordinated with the airlines concerned.

Various media of communication are essential in this area and provision should be made for sufficient electrical equipment boxes and conduit. Some of the essential items are: telephone(s) at each counter position, public address system outlets, teleautograph, electronic devices, teletypes, pneumatic tubes, clocks, closed circuit TV, or others. Each airline has its own philosophy of operation and should have as much latitude as possible in determining configuration of its own functional equipment.

As the wall behind the counter is a focal point of interest, it should be kept clear of utilities such as fire hoses, electrical control panels, etc. In order to provide for the best functional use of the counter, the area should be kept free of columns. The design of the ticket counter should provide for future expansion. This might be accomplished through inclusion of training rooms, check-out rooms, storage rooms, display cases, etc., between airline ticket counter areas, so arranged that their functions can be displaced when additional counter space is required.

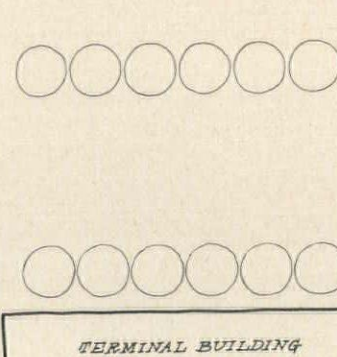
## MAIN PASSENGER CONCOURSE

Waiting areas with seating space should be provided for those passengers whose departure is not imminent, persons accompanying or meeting passengers, and others. The nature of traffic handled at a given airport will largely determine the location and size of the waiting areas. Airports with a high percentage of short-haul, "commuter" type traffic will not have the same needs for seating space as those with a higher percentage of long-haul, overseas or international travelers. Airports with a high volume of connecting passengers also have different seating requirements from those of terminating points. When considering seating space in the main lobby, account should also be taken of its relation to eating and drinking facilities, television and game rooms, and other convenience and diversionary facilities provided in the terminal building. Display of airline arrival and departure information in these areas, in addition to such displays in the ticketing and baggage areas, is highly desirable and should be considered if economic and practical factors permit.

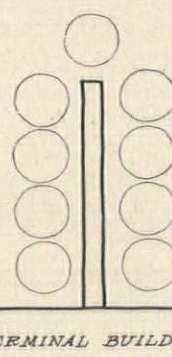
## WAITING AREAS

Terminal buildings should provide main concourses for free passenger movement from the main entrance to the ticket counters (if check-in is required) and to the gate or gate concourses. The directional flow should be apparent or indicated by signs. The concourse should be rela-

### OPEN APRON AIRCRAFT PARKING SYSTEM

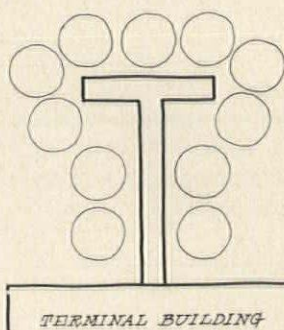


### SIMPLE LINEAR CONCOURSE

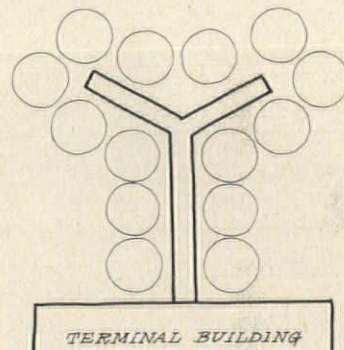


Above left: The simplest method of parking aircraft at the terminal building is the open apron system. Passengers walk across the apron to board the aircraft. System is impractical for all but smallest airports and unworkable for jets. Above right: Elementary linear finger is next logical step as traffic increases

### T-SHAPED CONCOURSE

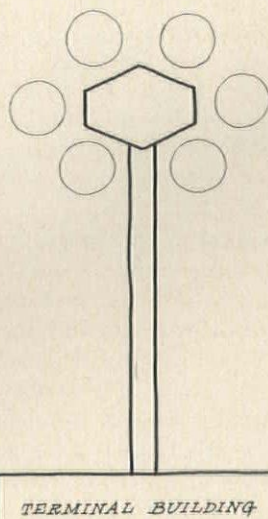


### Y-SHAPED CONCOURSE

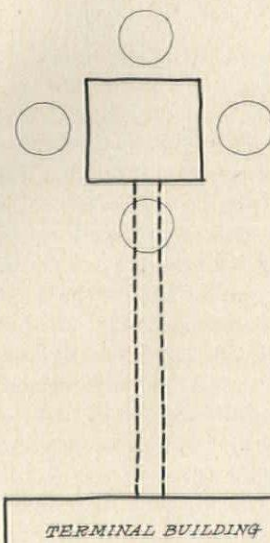


Above: A T- or Y-shaped concourse allows more aircraft to be handled and passenger walking distances to be appreciably reduced from those of the simple finger. Below: Satellites, reached by concourses or tunnels have similar advantages. A further development of this idea is the mobile lounge to be used at Dulles International Airport, Washington, D. C.

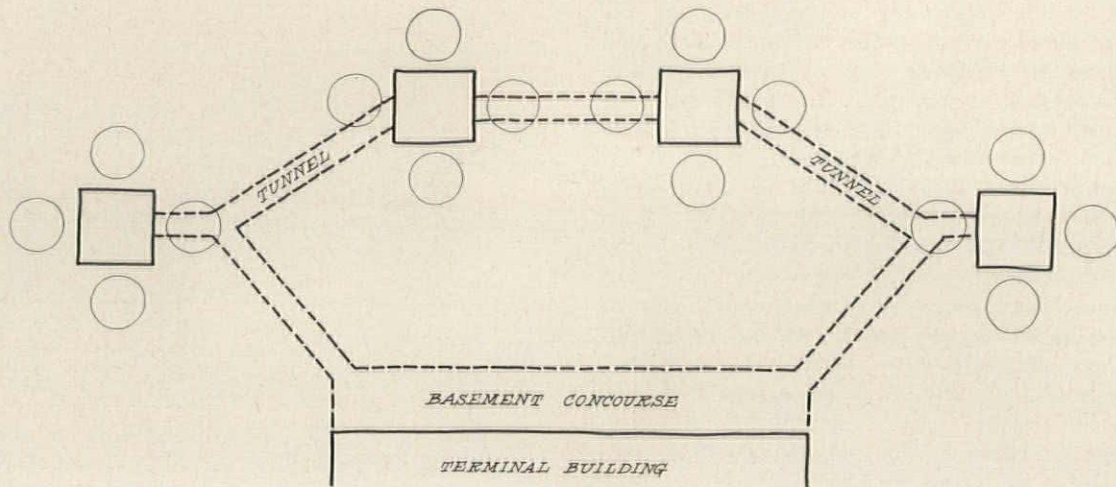
### SATELLITE AND CONCOURSE



### SATELLITE AND TUNNEL



SATELLITE SUB-TERMINALS WITH TUNNELS



Above: Satellite sub-terminals, connected to the main building and to each other by tunnels, free the apron from all passenger traffic. Thus the apron will be used for aircraft and operational vehicle traffic only

tively unobstructed to enable passengers to check in and board the airplanes in a minimum of time. Insurance vending machines or booths should be accessible in this area. Immediately adjacent to the main passenger concourse, waiting areas and concession areas are normally provided.

SPECIAL SERVICE ROOMS

The airlines and the airport management will specify their desires in design and location of special rooms. Among these are: passenger relations rooms (for handling passenger's complaints), public relations rooms, individual airlines clubs (for recognition of influential and important persons), invalid and children rooms (for care of invalid passengers and unaccompanied children during layovers, between flights, before departure of flights, and after flight arrival), and television room (for the public).

CONVENIENCE FACILITIES

Certain facilities should be provided for the safety, comfort, convenience and general care of passengers, the public, and building tenants. Some of these facilities are primarily for passengers. Others are for the public and building tenants in general. For example, insurance vending facilities are of primary importance to passengers while a gift shop is secondary.

*Public Address System:* An adequate public address system should be provided for the entire terminal area. By mutual agreement of the airlines and airport management, an automatic system with uniform announcements may be installed. Provision will then have to be made for an additional equipment room. In order to restrict the announcements made over the public address system to various areas of the building, the public address system may be divided into several sections to permit selective calling.

*Toilet and Lounge Facilities:* These should be adequate in size to handle transient traffic and strategically located throughout all areas, including concourses, so as to be readily available to outgoing, incoming and waiting passengers, visitors and building tenants. Facilities separate from those provided for passengers and the public should be included for tenants. Due consideration should be given to the surge of deplaning passengers in concourse areas. Construction materials used should be of a type that will minimize the possibility of marking or scratching them, be durable and easy to clean and maintain.

*Medical and First Aid:* Provision should be made for the examination and caring for of ill or injured persons, in an area convenient to those used by the public and personnel.

*Travelers Aid:* Particularly in large installations, space adjacent to the passenger service areas in the terminal building may be desired for this service. In a medium size terminal, this might be consolidated with a general information counter.

*Nursery:* This facility should be located adjacent to the women's lounge in the main portion of the terminal.

*General Information:* When the size or complexity of the terminal is such as to require oral answers to general questions, as differentiated from specific airline information, or oral direction of passengers and the public, a general information facility should be considered. This should be located in the main terminal area near the entrance.

*Police:* On occasion, it is necessary to call upon local police authorities for immediate assistance in controlling members of the public and passengers, for direction of traffic, and for protection of persons and property. When the frequency of such occurrences warrants it, an area should be available for stationing of police authorities.

*Clocks:* All public view clocks should be synchronized and operated on a "controlled" circuit to insure accuracy.

**Signs:** Directional signs, illuminated as required, should be adequate in number, suitable in size and position and unmistakable in content. These should conform with established industry specifications.

**Concessions:** Certain concessions are essential; others, while not essential, contribute to public and tenant convenience and airport operation income. The essential ones should be easily accessible from the passenger concourses. These might include: car rental agencies, employe snack-bar and cafeteria, insurance vending machines or booths, newsstand, parcel lockers, restaurant and supplementary eating facilities, taxicabs, telegraph (desk, phones, or both), and telephones. Others often provided are: bank, barber shop, camera shop, candy store, cocktail lounge, drug store, flower shop, gift shop, haberdashery, hotel, observation deck, shoe shine, showers and dressing rooms, valet, and women's wear.

### COMFORT AND SAFETY

A number of factors of this type are common to all types of terminal buildings and should be given careful consideration in the design of new buildings or when making alterations to existing ones.

**Sealing of Buildings:** For the comfort of the passengers and of the personnel working inside the terminal building at airports where there is a high frequency of operation with jet or prop-jet aircraft, it is recommended that structures be sealed (i.e. with fixed windows), particularly on the air-side. In this manner, protection is afforded from the effects of noise and fumes associated with these operations. The provision of such a feature introduces a requirement for air conditioning or filter ventilation throughout the sealed portion of the terminal building.

**Blast:** The blast levels likely to be experienced in operation must be taken into account in the construction of terminal buildings. Where the local climate makes possible the use of structures which are open, or partially open, protection against blast will be required. Protection against blast may be required for spectator areas if they are located close to the apron.

**Weather:** Whenever desirable and feasible, the design of the terminal building should provide for movement of passengers and their baggage under cover, to and from aircraft and vehicles.

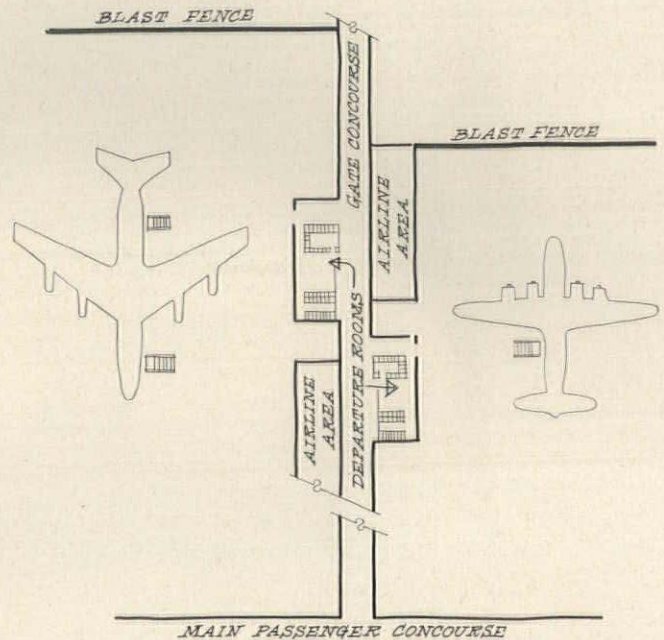
**Fire:** Precautionary measures against fire must be provided for in the design of the buildings in accordance with local regulations. It is recommended that fire-resistant materials be used in the buildings.

### REQUIREMENTS FOR GROUND VEHICLES

**Service Roads:** Adequate roadways should be provided within the airport for the use of service vehicles. Such roads should link the main terminal building, maintenance area, cargo building, and all ancillary operational buildings by the most direct routes possible. It is important that service vehicles should not have to use public roads in the course of their operations on their airport.

**Access and Parking:** In the design of an airport, adequate vehicle parking space should be provided as close as possible to the main terminal building. In order of their priority, these should include space for loading and

### SINGLE-LEVEL CONCOURSE



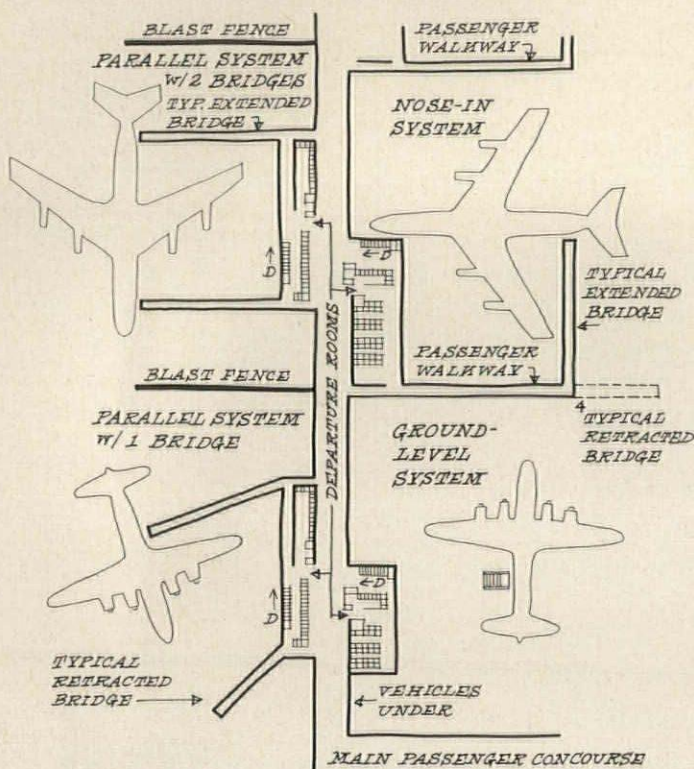
Above: A one-level linear concourse or finger is the simplest scheme currently being used. Airline operational and passenger areas may be combined on the same side of the concourse or placed on opposite sides as shown. For airports with limited traffic this scheme will often be the most practical and economical

unloading airline coaches or limousines, space for loading and unloading private cars, space for loading and unloading service and delivery vehicles, parking space on a regulated short-term basis for arriving and departing passengers (immediately adjacent to the terminal building), taxi, coach, and limousine standby parking spaces, rental car parking space, general car parking, covered accommodations for motor scooters and bicycles and spaces for staff cars, cargo vehicles, and the like.

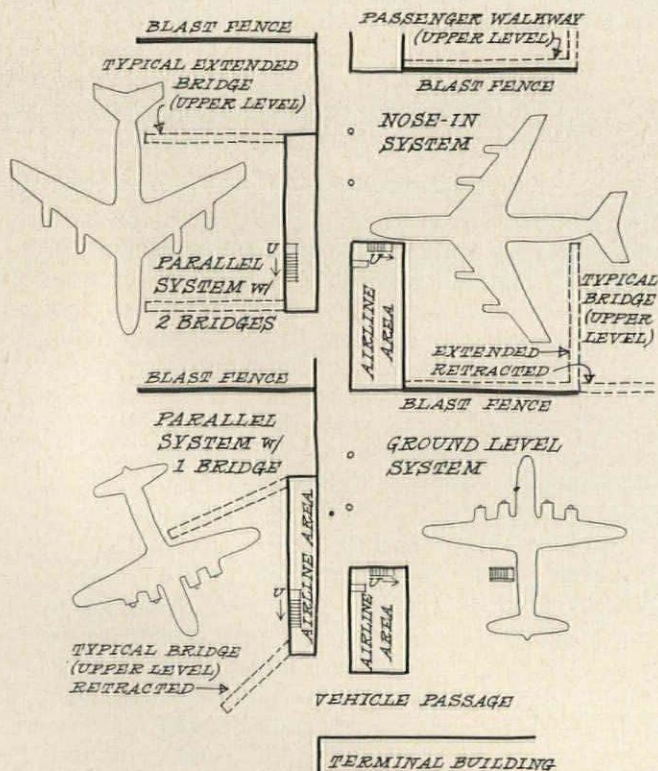
The following parking requirements should also be considered: airline official and staff car parking, airline coach and limousine parking (for those not immediately required), cargo vehicles parking spaces.

**Road access:** Considerations in planning road access to the main terminal and ancillary buildings: road design and layout should allow for future widening. There should be no public road access to runways and taxiways. Road layout should avoid conflict with runways and taxiways (otherwise roads should pass under the runway or taxiway by tunnel). It is desirable that the approach to the terminal building (land-slide) should be by a road system giving ample access to the building at a number of points. Adequate space for vehicles to pass other vehicles, moving or stationary, in front of the building, should be provided. Service roads should be of adequate width for the traffic type and potential and designed for two-way flow. All airport roads should be provided with adequate lighting (possible confusion with runway lighting by pilots must be avoided). All airport roads should have adequate signs.

TYPICAL TWO-LEVEL CONCOURSE



SECOND (PASSENGER) LEVEL



FIRST (OPERATIONS) LEVEL

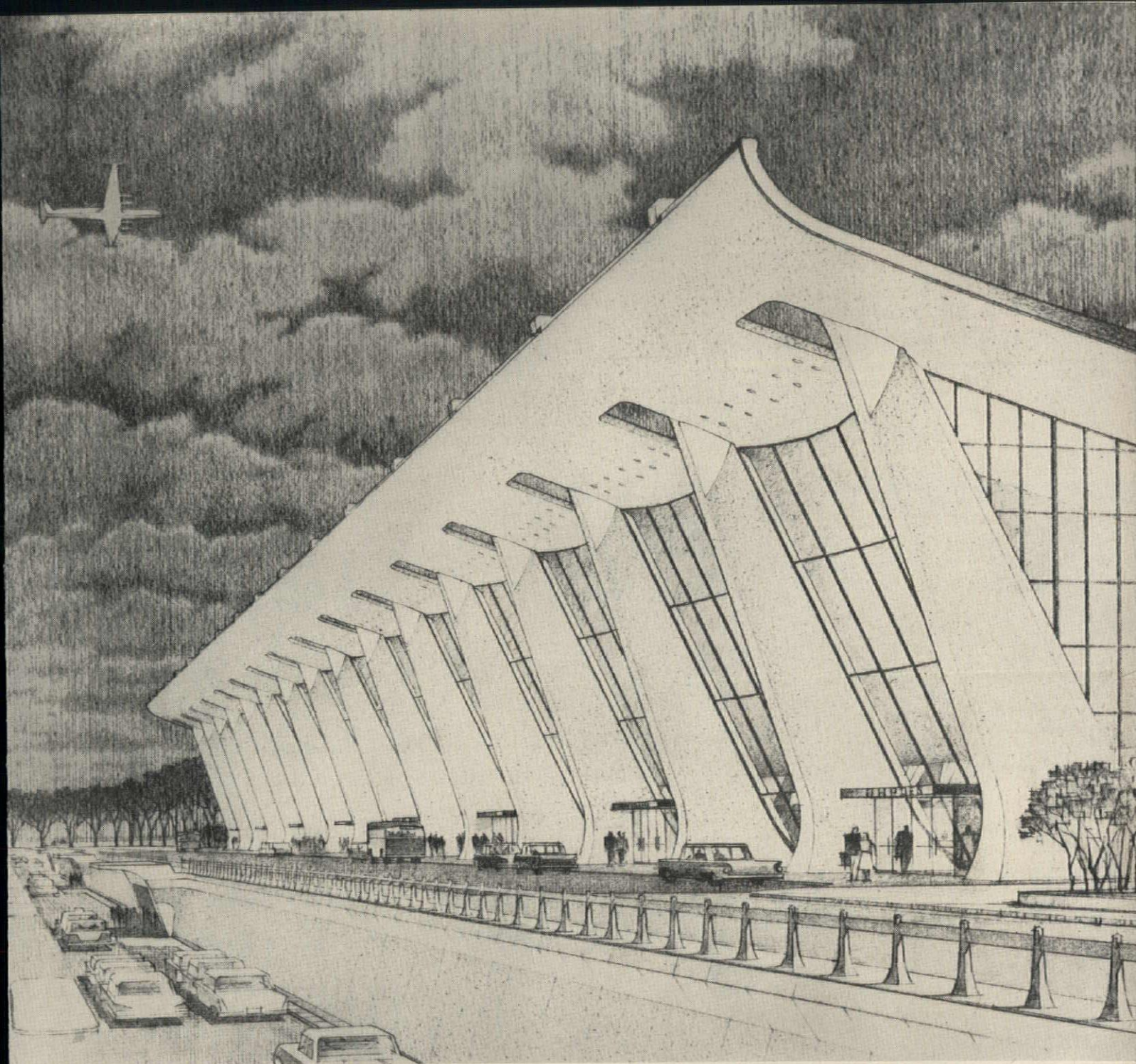
Another method of handling airline operations and passengers on the flight line is a two-level concourse similar to that shown. In this scheme, passenger walking distances will often be considerably reduced from those of the one-level concourse. Another advantage is the possibility of differentiation between those operations directly concerned with the passengers and the ones relating to baggage and servicing of the aircraft

CHECK LIST FOR PASSENGER TERMINAL PLANNING

Some basic considerations in the planning of passenger terminal buildings and related elements are as follows:

- I. *Location of Terminal Building*
  - A. Relation to runways, taxi-strips
  - B. Relation to other buildings on the airport
- II. *Auto and Truck Circulation*
  - A. Access roads to and from terminal
  - B. Parking areas—taxis, limousines, private cars, rental cars
  - C. Passenger vehicle loading and unloading
  - D. Mail, air cargo, and truck service road
- III. *Building Type*
  - A. Piers or concourses—Single-level, one-and-one-half level, two-level, multi-level
  - B. Open apron type with buses or mobile lounges
  - C. Individual satellite terminals
  - D. Provisions for expanding and flexibility
- IV. *Passenger Handling*
  - A. Passenger circulation flow
  - B. Ticket counter relationship to entrance
  - C. Ramps, stairways, escalators
  - D. Loading devices—bridges or mechanical
  - E. Passenger protection outside of terminal
- V. *Baggage Handling*
  - A. Baggage conveyors
  - B. Traffic flow
  - C. Baggage makeup area
  - D. Baggage claim area
- VI. *Building Interior*
  - A. Air line offices and ticket counters
  - B. Other offices, equipment rooms
  - C. Spectator concourse, writing rooms, rest rooms
  - D. Concessions, hotel rooms, etc.
  - E. Equipment and Systems—heating, ventilation, electrical, lighting, plumbing, antenna outlets, pneumatic tube systems, conveyors, public address system, signs, and closed circuit TV arrival and departure systems
- VII. *Apron*
  - A. Aircraft parking positions
  - B. Location with reference to runways, buildings
  - C. Facilities and utilities, e.g. fuel, power, communications, water, air conditioning, etc.
  - D. Lighting for aircraft parking positions
  - E. Provisions for expansion and flexibility
- VIII. *Cargo Handling*
  - A. Express
  - B. Mail—local and transfer
  - C. Air Freight
    1. Cargo building near passenger terminal
    2. Access for trucks and proper handling
- IX. *Maintenance and miscellaneous facilities*
  - A. Commissary, shop space, sewage disposal, bulk fuel storage plant, hydrant system or truck delivery, hangar facilities, etc.

The information contained in this study was developed from data furnished by the following organizations and individuals: Air Transport Association of America; International Air Transport Association; A. C. Furchgott, Jr., Chief Facilities Engineer, Eastern Air Lines, Inc.; U. S. Department of Commerce, Civil Aeronautics Administration; Federal Aviation Agency, Bureau of Facilities, Airports Division



# A NEW AIRPORT FOR JETS

NAME: *Dulles International Airport*

LOCATION: *Near Chantilly, Va., 23 miles west of Washington, D. C.*

CONSULTING ENGINEERS FOR DESIGN AND CONSTRUCTION: *Ammann and Whitney*

ARCHITECTS FOR MASTER PLANNING AND DESIGN OF BUILDINGS: *Eero Saarinen and Associates*

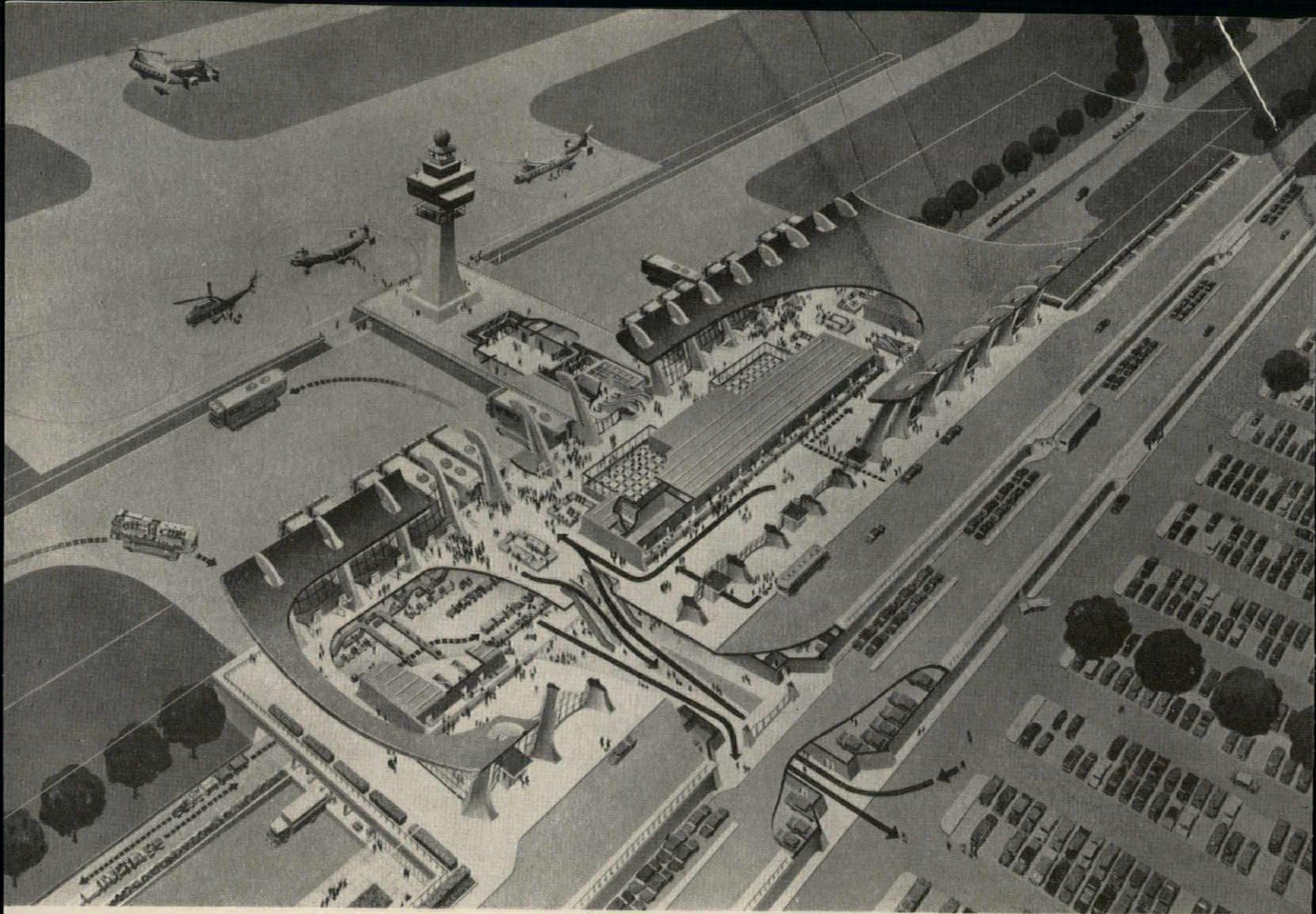
ASSOCIATED ARCHITECTURAL CONSULTANT: *Ellery Husted*

ASSOCIATED MECHANICAL ENGINEERS: *Burns and McDonnell*

TRAFFIC AND ECONOMIC FORECASTS FOR AIRPORT: *Landrum and Brown*

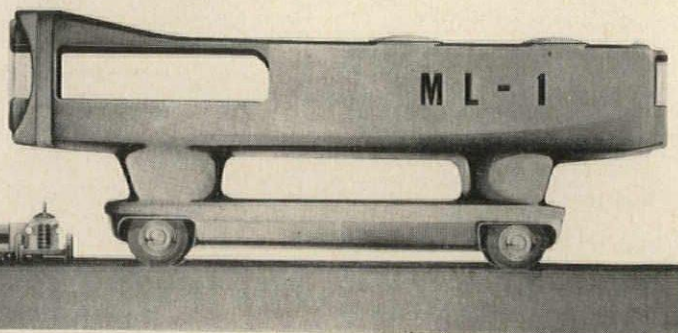
LIGHTING CONSULTANT: *Richard Kelly*

LANDSCAPE CONSULTANT: *Dan Kiley*

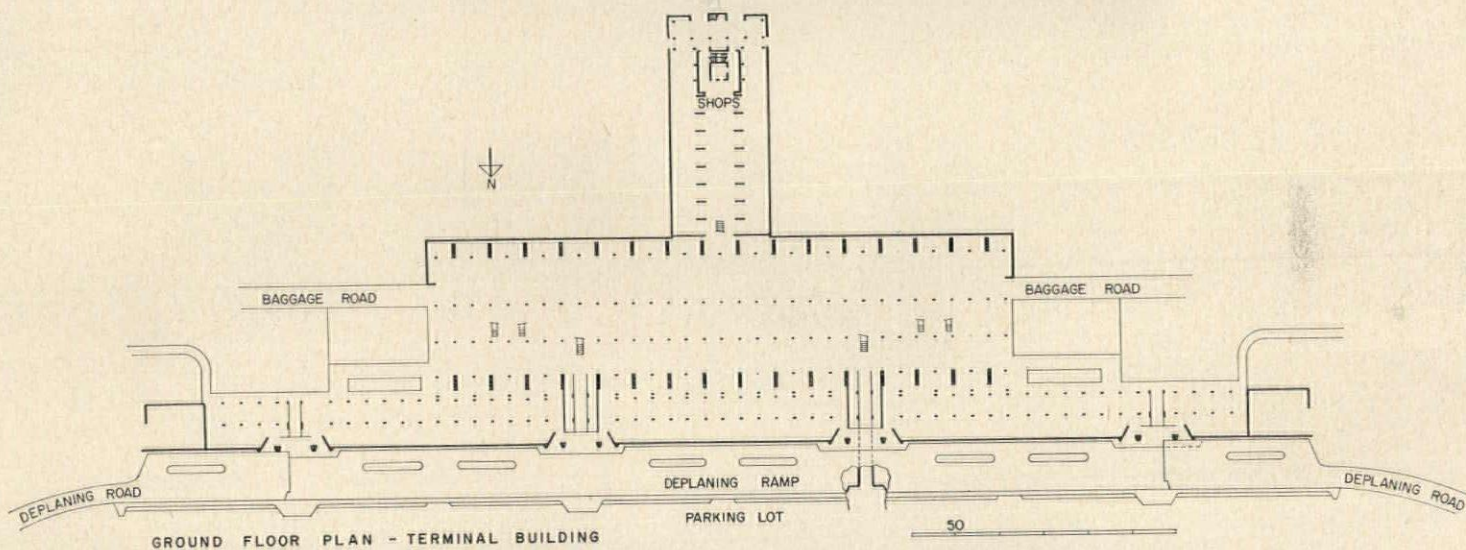
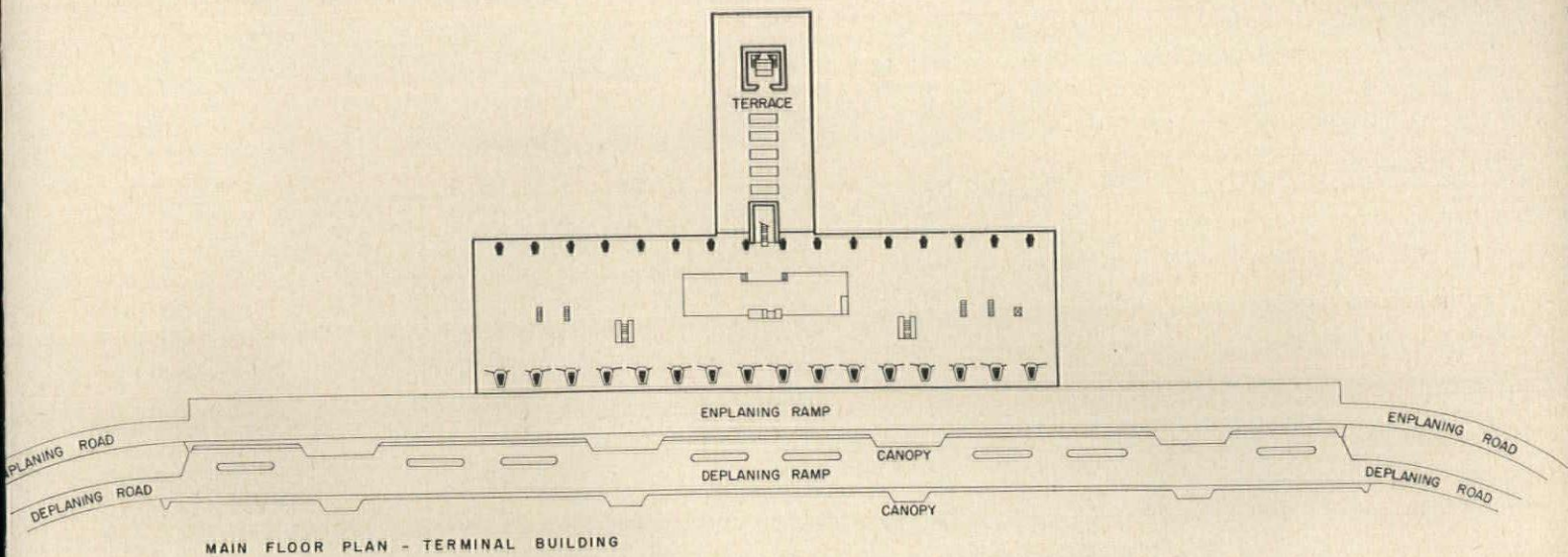


In the challenge of the jets  
is the chance of a new airport architecture.  
At Washington's new international airport,  
one of the first to be designed for jets,  
passengers will be transported from  
terminal to plane  
by means of a mobile lounge.

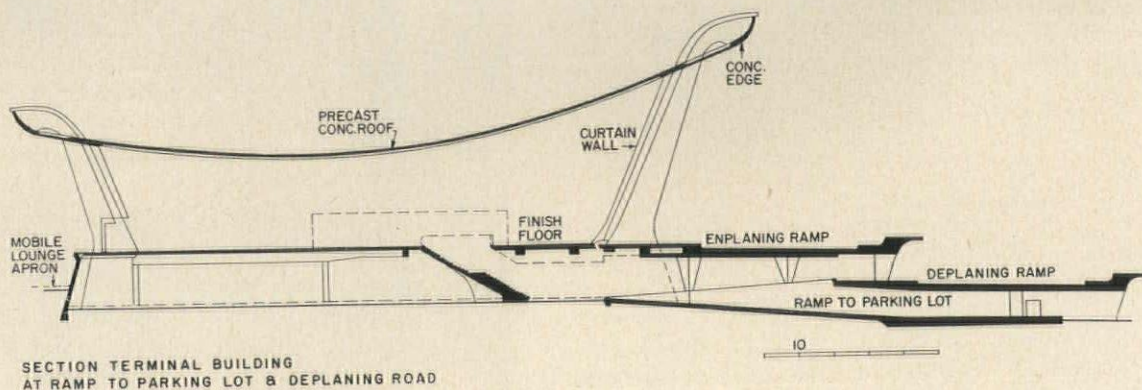
Airplane passengers, accustomed to being comfortably transported thousands of miles in a matter of hours, have to walk longer distances to get on and off the planes than most of them walk at any other time. Statistical research has given us an average passenger among the 48 million who enplaned during 1958. This footweary soul walked 650 ft from his parked car to the ticketing counter and from there another 950 ft to his airplane; about the equivalent of five brisk hikes across the length of a football field. Once on the plane every comfort was his, and all the more to be valued by contrast. It could be argued that some passengers like the long walk all weathers, and the steep climb into the plane. Let's through the sheds, and the dash across the field in not make adventure tame. The airlines, however, strive for maximum passenger comfort and convenience, a goal that becomes more elusive as more people fly and the number of planes multiplies, causing the number of gates to increase and making the connecting sheds ever longer. As the sheds or "fingers" grow they sprout the "sub-terminals" with ticketing facilities, lounges, toilets and concessions of their own. The horizontal creep continues. Jets in any case must be positioned at some distance from the main terminal because of their noise, blast and fumes.

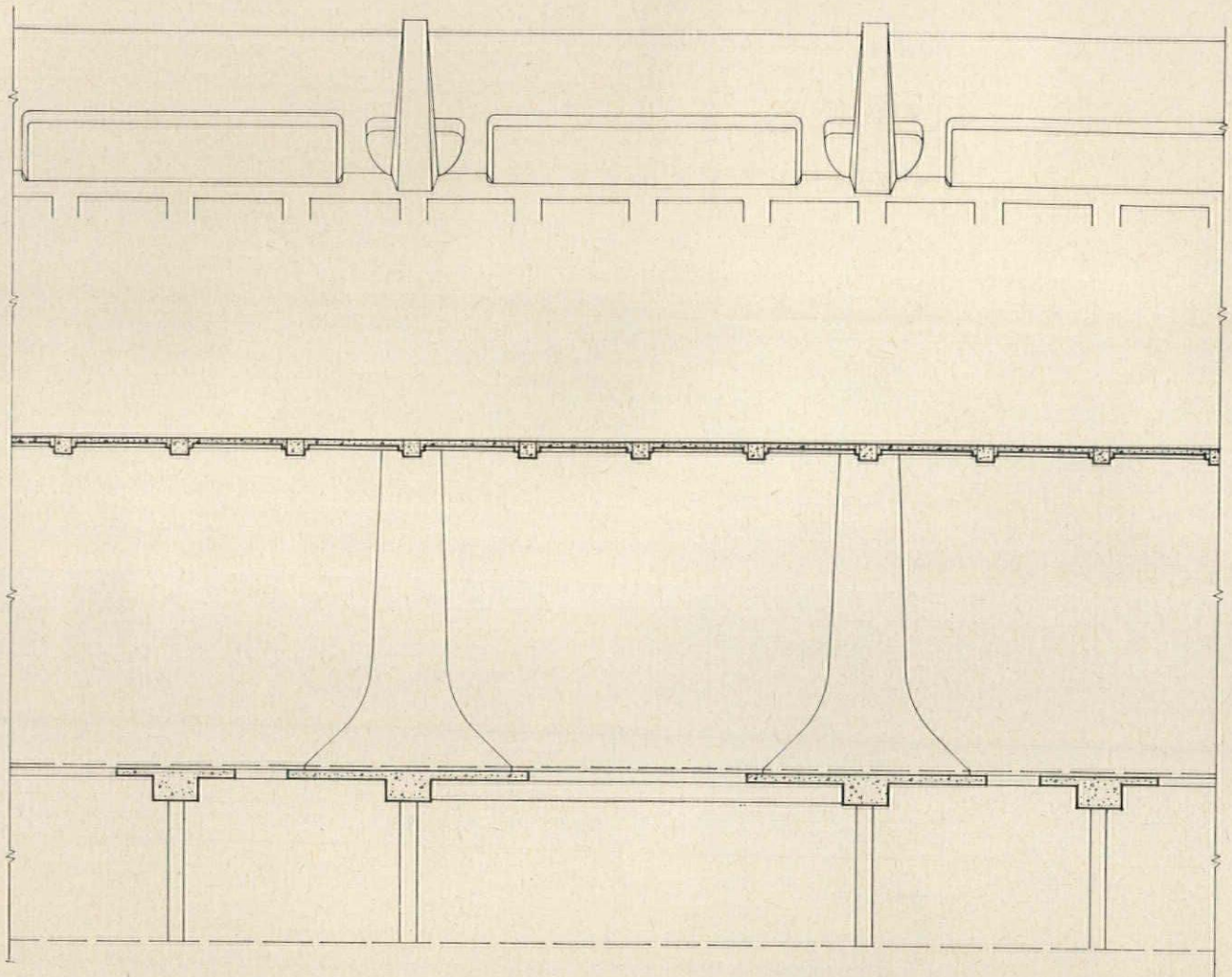


Preliminary study of mobile lounge now being developed for manufacture. It provides uninterrupted shelter to passengers from concourse interior to plane interior

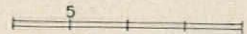


Design of terminal building is the work of Eero Saarinen. Mobile lounges transport passengers to planes parked on apron. Helicopters and small executive planes are loaded from short projecting arm extending to control tower. A two-level scheme, the main concourse with ticketing counters and access to mobile lounges is on the main floor and baggage circulation is on the ground floor

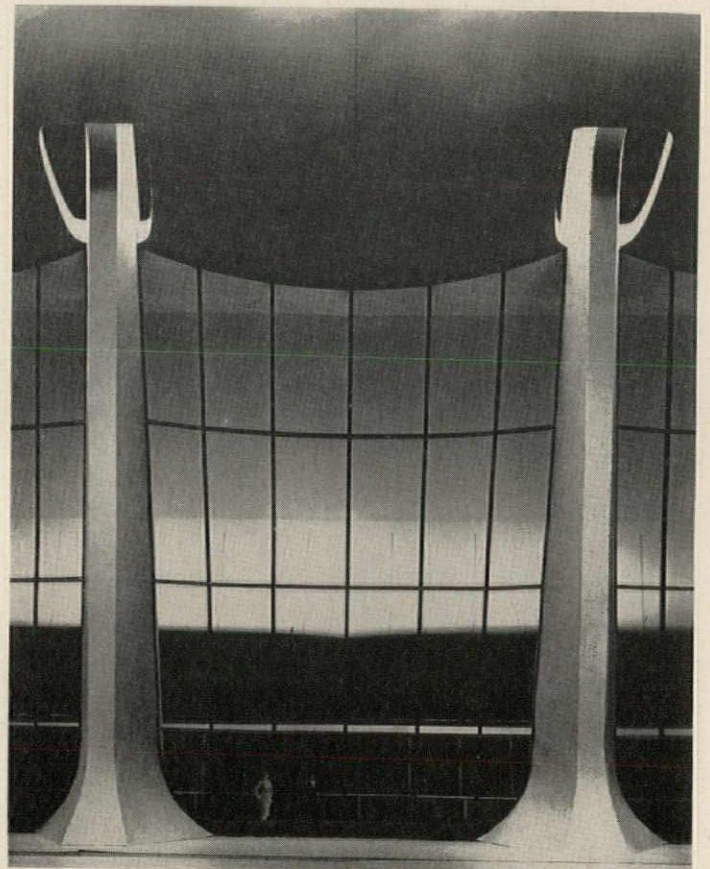




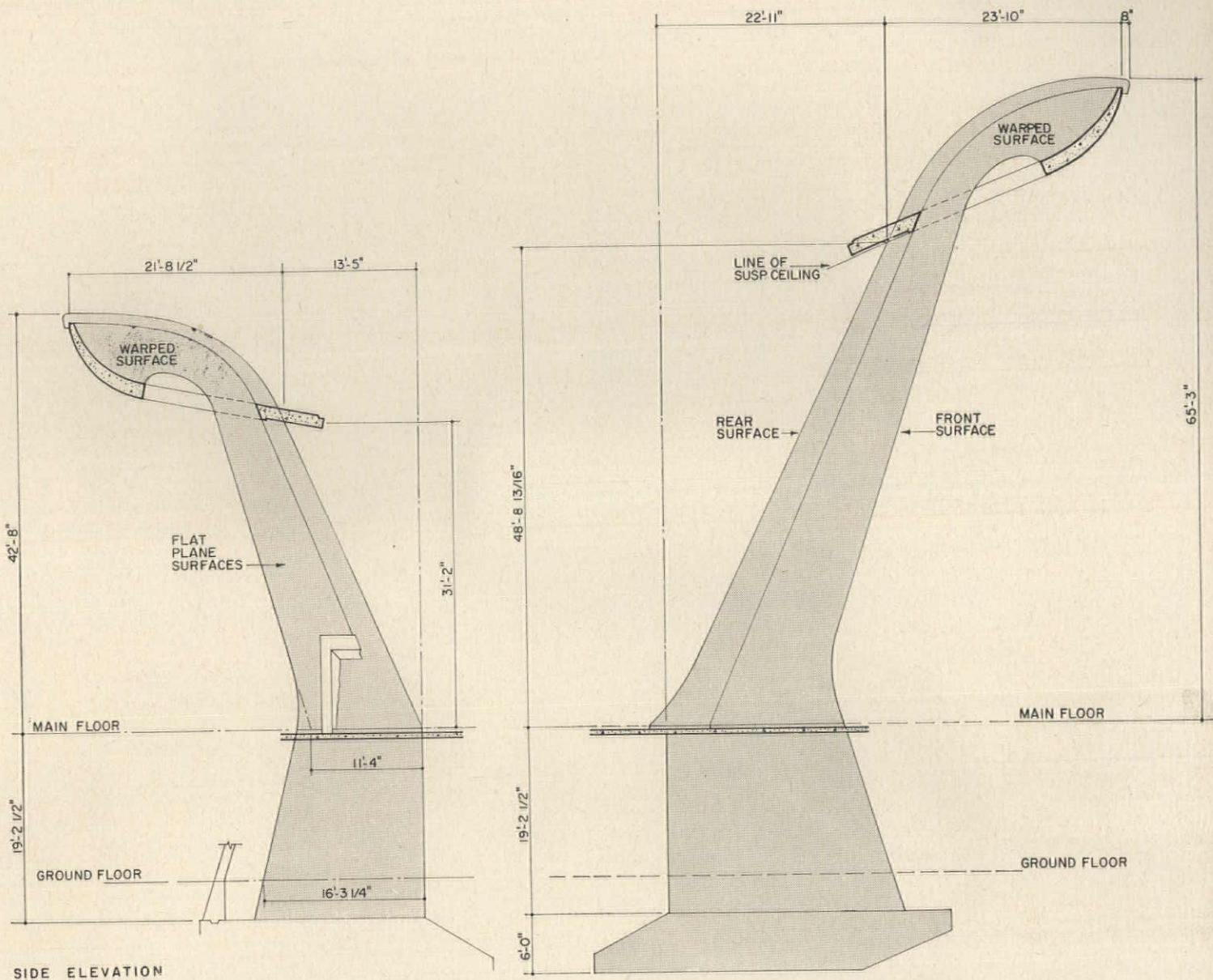
SECTION - TERMINAL BUILDING



The ground floor will be mainly concrete slab on grade. The main floor beams of reinforced concrete will span generous distances between columns widely spaced to clear the baggage handling facilities. The principal beams will be located in line with the main frames and be supplemented by intermediate beams at midpoints. A solid slab will span the beams. The catenary roof will be sheathed by a precast lightweight concrete roof deck spanning 10 ft between two pairs of 1-in. cables. At the intersection between the cables and the precast units will be a protective concrete casement poured around both cables into which steel projecting from the panels is embedded. Thus the precast units and the cables are made integral with each other. The cables carry the dead weight, the concrete casement prevents flutter. The pairs of cables will span the full width of the building between poured in place slabs which function as edge beams, transfer the cable reactions to the main piers and act as stiffeners. The concrete piers are sloped outward to counteract the pull of the cables. The spread at their base is purely sculptural







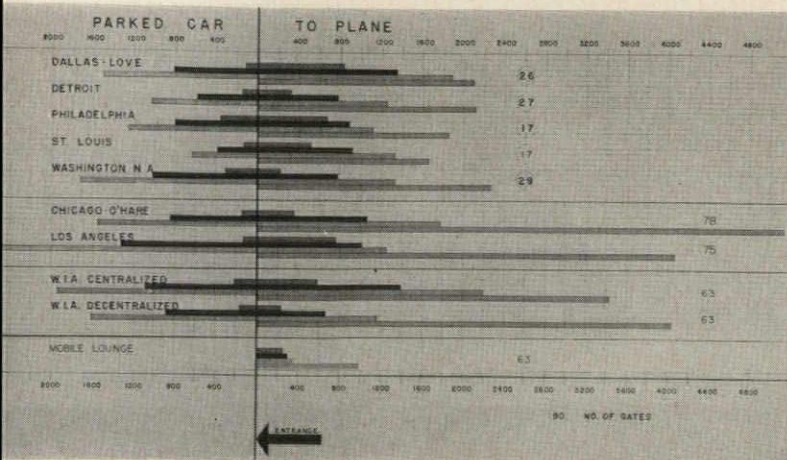
The planning group recognized from the beginning that impossible passenger walking distances and long and unmanageable finger structures posed the major problem. Intensive team research further reinforced this belief, established other areas where customary airport design practice didn't work, and led to a bold and imaginative solution.

The planners picked a group of airports for comparative study. Among them were the Washington National, Willow Run in Detroit, O'Hare in Chicago, Love Field in Dallas and Lambert Field in St. Louis. Research staffs measured the lengths of auto ramps and ticketing and baggage claim counters; they charted passenger volume per minute ratios at these counters, and developed time and motion studies of the entire enplaning and deplaning sequences. The former begins when the passenger arrives at the terminal building, the latter at the moment the plane touches down on the runway. Terminal apron occupancy time patterns for all scheduled flights of all airlines at Washington's present airport on a typical week day were measured in both good and bad weather to determine activity peaks. It was found that there is less congestion on a bad day than on a

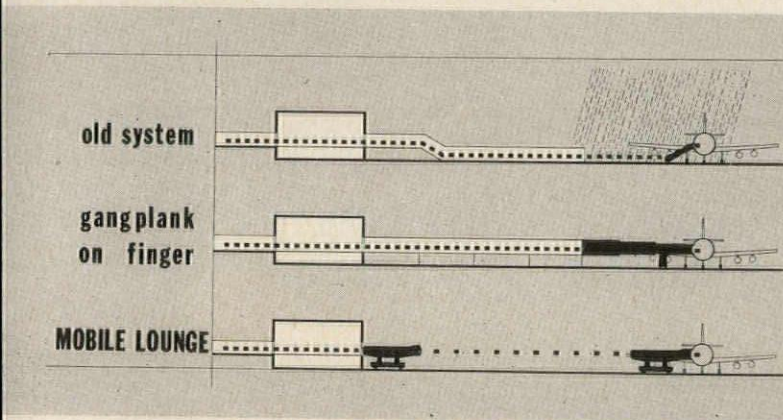
good day because activity peaks are spread out. On a good day planes are scheduled when people *want* to leave which is at certain definite reasonable hours. This analysis of peaks was important to the planners because quantities of operational facilities such as ticket counters are based on individual airline peaks, but quantities of passenger facilities are based on composite peaks.

A taxiing cost analysis was made of piston engine aircraft, executive planes and jets; comparative landing and take-off speeds were studied, and the comparative lengths of runway used in take-off and landing were charted. The final apron and runway scheme was partially determined by this data; wind conditions and expected air traffic patterns were among other factors which affected this part of the design.

The planners knew from their basic research that the Dulles International Airport, planned for ultimate saturation, would need 60 gates by 1975 and that already a decentralized sub-terminal scheme was necessary if conventional gate to plane loading were planned. At this point they broke with established practice and decided to make a clear separa-



Above: comparative passenger walking distance chart. Top line for each airport represents the shortest distance walked, the second line indicates the mean, the third the longest and the fourth an interchange



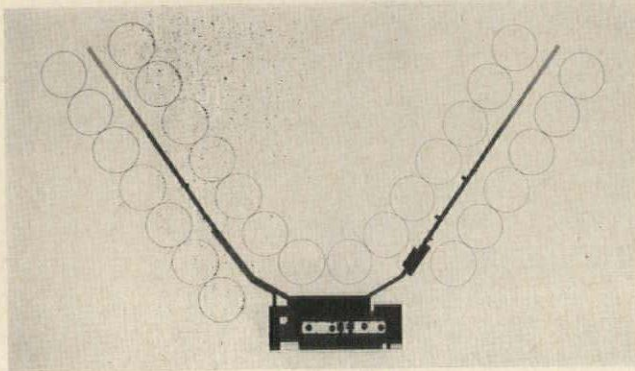
tion between the building and the airplane. The planes will be grouped around small structures called special service units or satellites located on the apron. Passengers will be transported directly to the planes. In London, Paris, Amsterdam and Frankfurt, conventional buses transport passengers from the terminal to distant planes. The architects for the Dulles airport have improved on this idea. In their basic concept the waiting room is no longer a part of the building; it is a mobile lounge. Designed to accommodate about 80 passengers, it will be 15 ft wide and 60 ft long. These lounges will line up on the field side of the terminal building and carry passengers to planes waiting either on the apron or in the hangars. In the European airports, passengers must climb in and out of an ordinary bus before boarding, but the mobile lounge provides continuous shelter from interior of the terminal to interior of the plane. There will be no steps. The lounge picks up its passengers at the level of the main terminal floor and when it reaches the plane, pneumatic units at the front of the lounge press against the airplane fuselage and form a sealed connection. The operator can adjust the unit for differences in plane doorway heights. Since it will load from either end like a

ferry, and can be driven from either end, the need to back up or turn around is eliminated. The mobile lounges will cost about \$100,000 apiece. Their total cost, however, is offset by a number of considerations, one of which is the fact that construction of the finger structures required by both centralized and decentralized terminal systems will not be necessary.

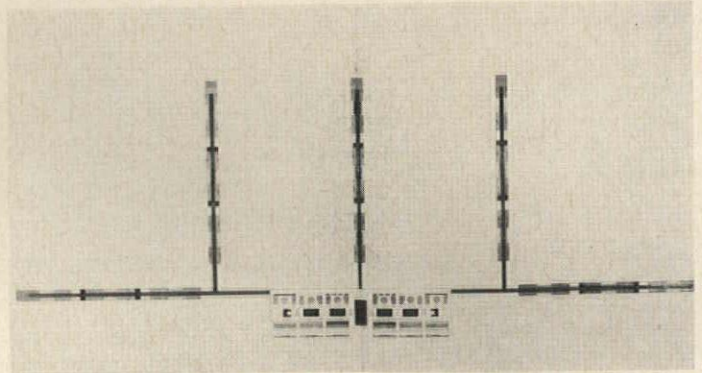
The mobile lounges will affect maintenance and operation costs. Their maneuverability will lessen the amount of taxiing, special positioning and pinpointing by planes. Research has shown that a considerable saving in time and fuel costs can be expected when planes no longer pull up to the conventional passenger gate. Among the many other advantages of the mobile lounge is one from which the Public Health Department benefits, for if communicable disease is found those exposed are already compartmentalized.

The individual airlines will not own their own lounges as this would result in expensive duplication. Since all airlines do not reach their peak use at the same time of day, a manageable number of lounges will be available in relation to their schedules.

The mobile lounge concept, by eliminating finger structures, allows the overall organization of the

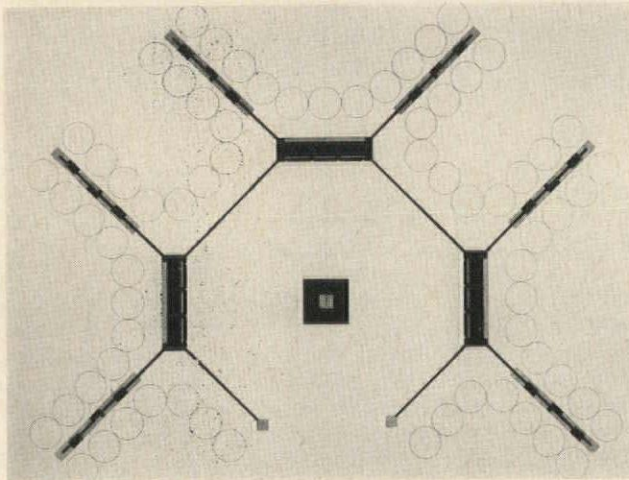


Willow Run, Detroit (finger loading system)

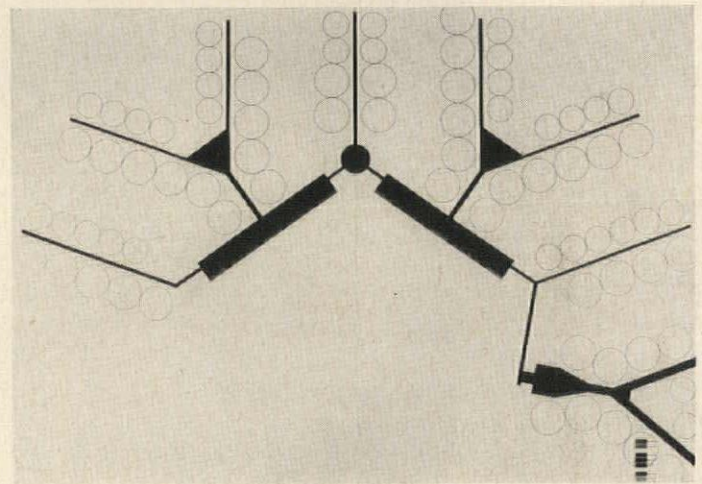


Dulles International Airport decentralized finger system study

Dulles International Airport decentralized finger system study



O'Hare, Chicago (finger loading system)

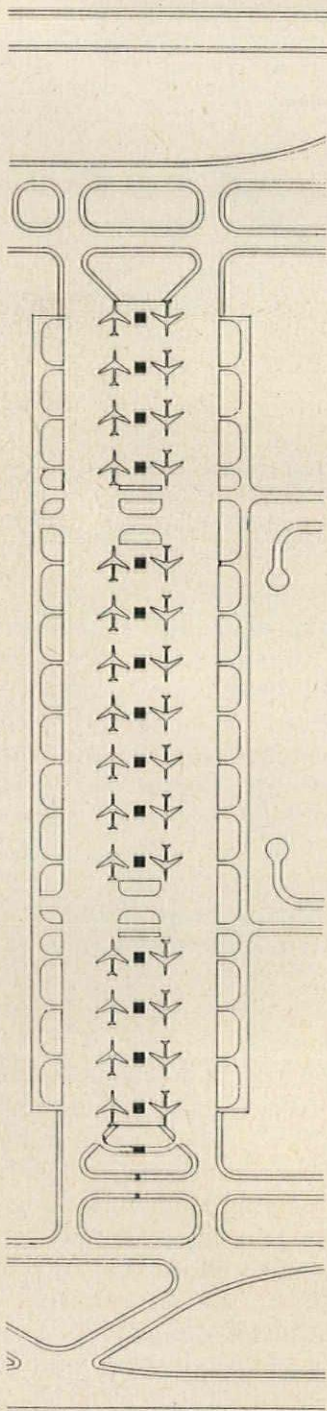
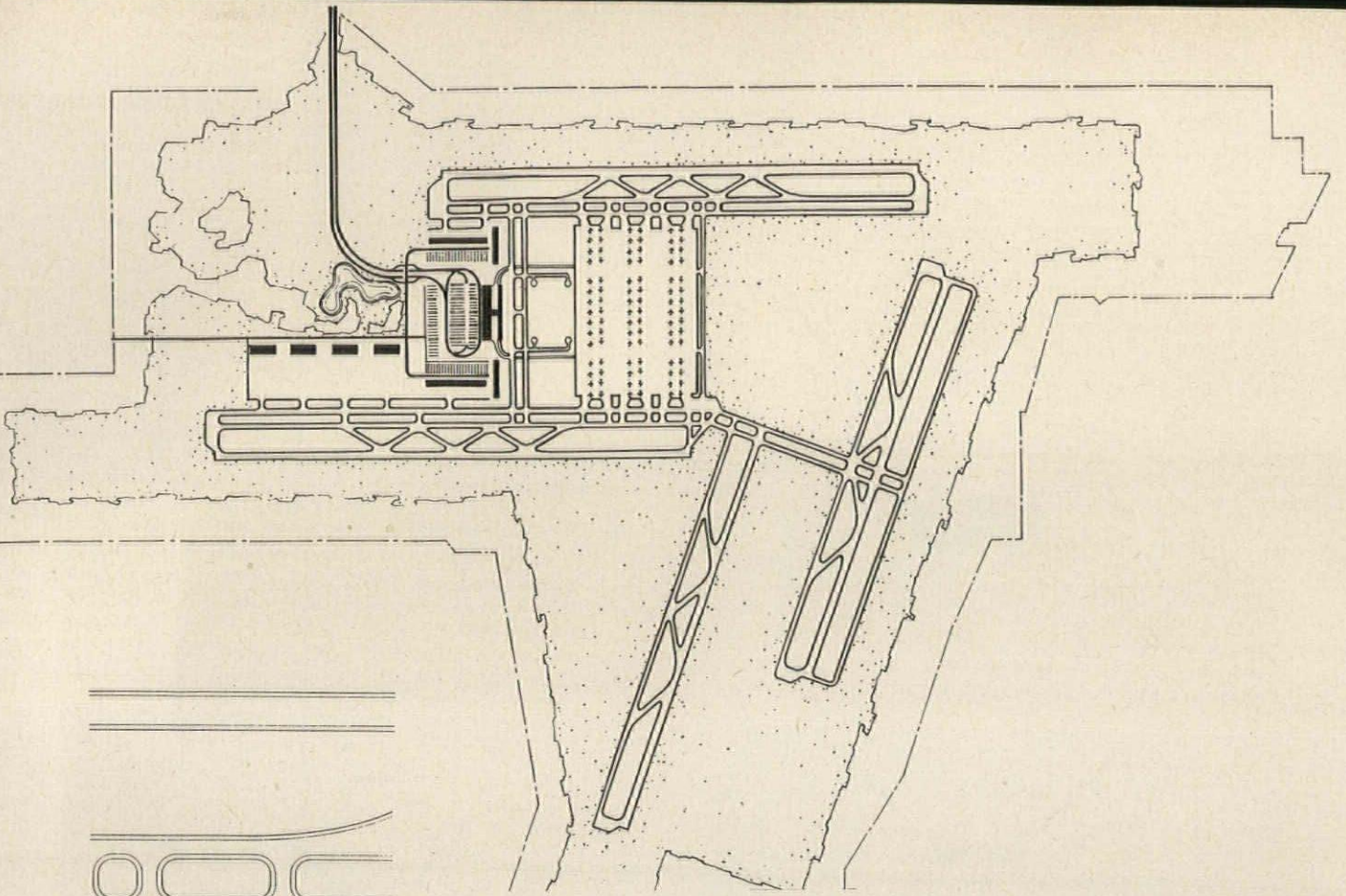


terminal building to be simple and direct. The structural system is based on 40-by-150-ft bays. It was found that the width requirements of two mobile lounges per bay was 40 ft. To handle all the passenger movement related to a corresponding 40 ft of ticket counter and auto ramp and to provide the necessary square footage for the baggage, concessions and amenities necessary to this basic provision required 150 ft in the opposite direction. Each 40-by-150-ft unit is the right size to handle everything it requires on both levels and is virtually self-contained. The terminal building, therefore, may be expanded in increments of 40 by 150 ft over the years. A great flexibility in phasing is possible. The present terminal has been planned to accommodate 24 mobile lounge positions. By 1975 there may be a need for 56 such positions which would mean the addition of 16 more bays.

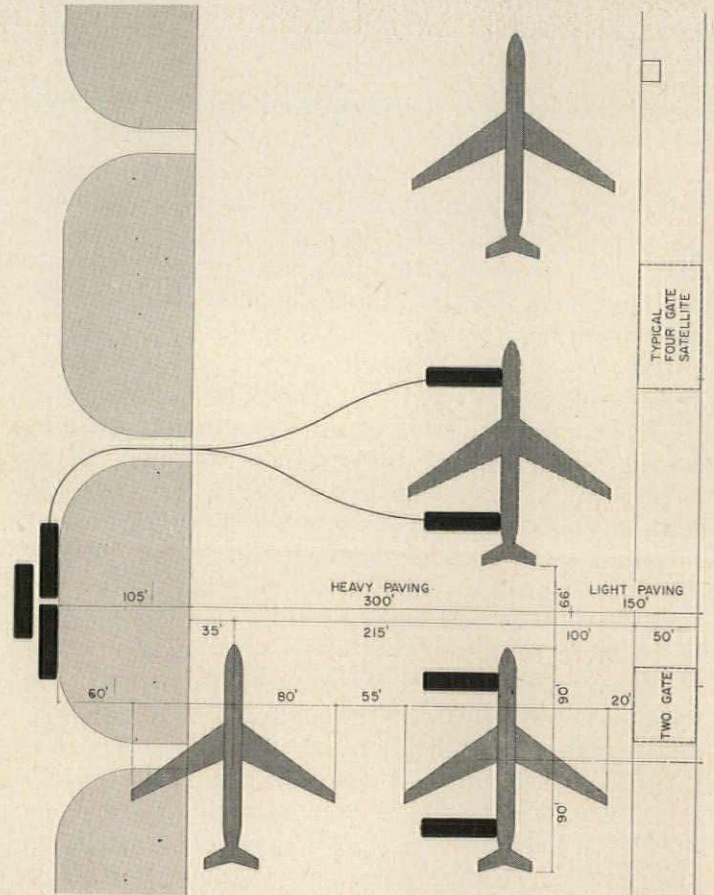
The architects wanted a great hall with a clear, uninterrupted interior. They argued that not only did this concept offer a hope of spatial grandeur, but it could create an ideal acoustical situation important in terminals where announcements are made through a loud speaker. A catenary roof was chosen and intensive comparative cost studies were made

to demonstrate its practicality in comparison to more conventional ways of enclosing an equivalent space. In this building the catenary roof makes a high façade articulated by an imposing colonnade. The effect will be monumental, even for Washington, but it is a monumentality inherent in the structural system, achieved without waste or sham. According to Saarinen, "We have tried to give the building a monumentality, not in the customary rigid form, but in a dynamic quality appropriate for the aircraft industry and as an entrance to this country for foreign visitors."

The terminal building is scheduled for completion in March 1961, and excavation will begin this month. Its estimated cost is \$9,000,000. \$62,500,000 has been made available for the airport to date. Actual work on the entire project began in September 1958 with clearing operations on the 9,600 acres of land. None of the standing timber is being removed within 1,000 ft from the airport boundaries as this entire area will be reforested so that in a few years a thick timber belt will screen surrounding areas from airport ground noise. Contracts have been let and construction begun on the three major runways and the apron.



*Above:* ultimate scheme. Field nearest terminal is heliport. Additional buildings may be hotels or other commercial structures as well as expanded airline operational facilities. *Left:* portion of apron to be built at present. Satellite structures will not be used by passengers, but will contain facilities for sanitary disposal of plane waste, cabin cleaning, inflight meal service, replacement of air conditioning units etc. In order to reduce clutter of ground equipment, fuel lines are underground with fueling hydrants at wing positions. *Below:* it takes two mobile lounges to carry all the passengers to a Boeing 707



## NEUTRA'S CRISP ELEGANCE FOR THE DESERT

OWNERS: *Mr. and Mrs. Maury Sorrells*

LOCATION: *Shoshone, California*

ARCHITECT: *Richard J. Neutra*

ENGINEER: *Eugene D. Birnbaum*

CONTRACTOR: *Robert A. Waymire*

This little white house, dramatically set against the near-black volcanic mountains of the desert landscape, neatly sums up many of the qualities we have come to associate with Neutra's residential work: a crisp elegance, a clarity of structure, and a sort of assured modesty played against fairly spectacular scenery.

The owner is the Supervisor of Inyo County, California, which is at the border of Nevada. Death Valley and Mount Whitney are close by; it is a region of few inhabitants. The house itself is surrounded by golf grounds. Neutra, as usual, makes the most of such views with roomy, glass-walled living areas; and at the same time there is provision for ample privacy in the bedroom areas, as well as a small walled-in patio to give a more intimate relief from the great scale of the natural surroundings.

*Julius Shulman*



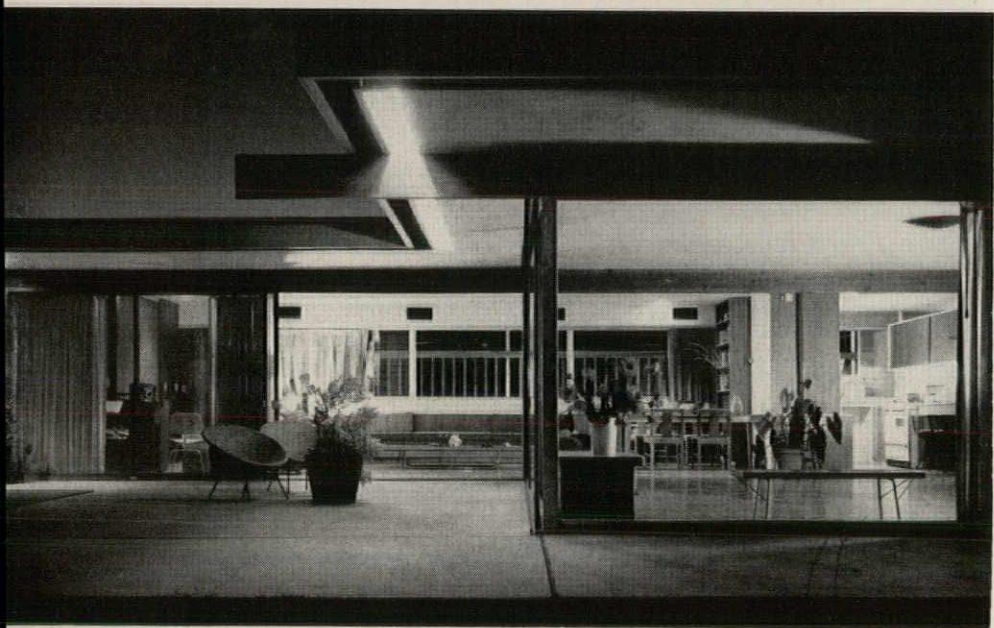


### *Sorrells House*

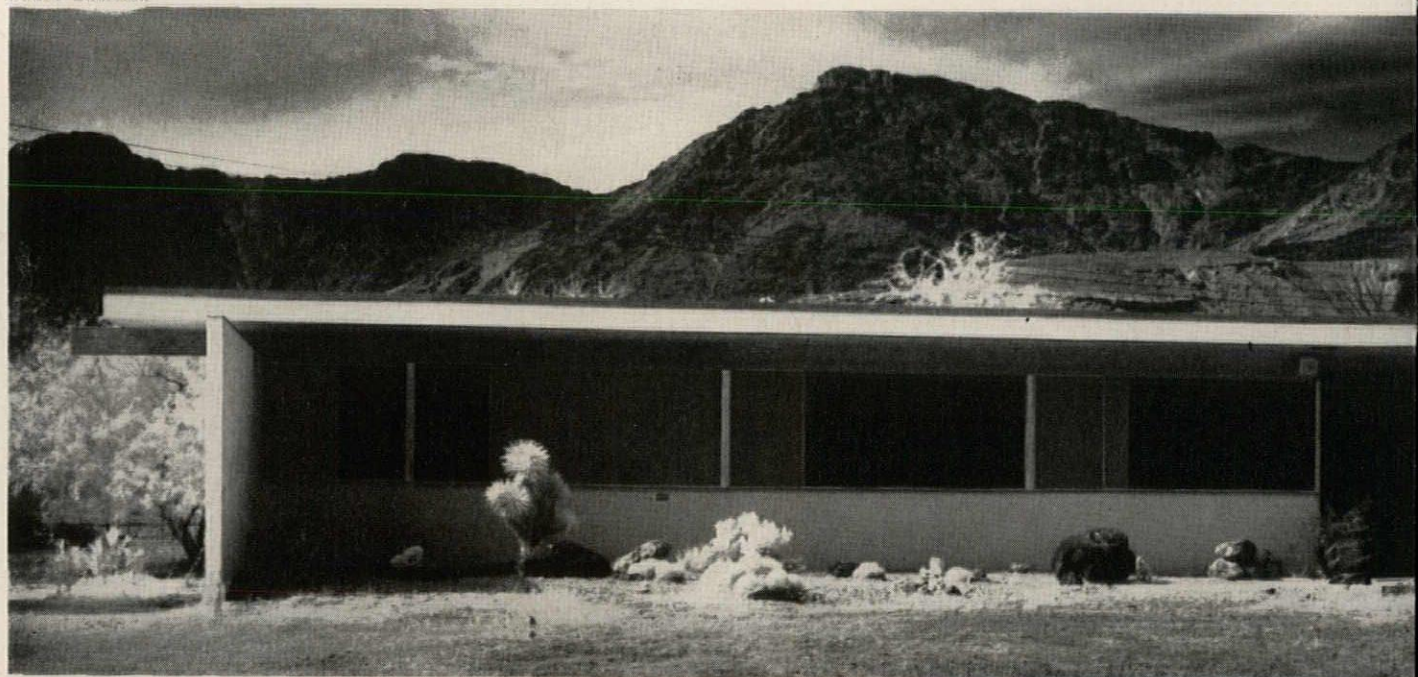
The plan of the house is an extremely workable one. Family and formal entrances branch on either side of the carport; the family entry passes by a wash room and "mud" area, while the formal one is via a wide veranda. The kitchen is well placed to control both entrances, as well as conveniently serve all indoor and outdoor living areas. The adjoining carport aids grocery delivery.

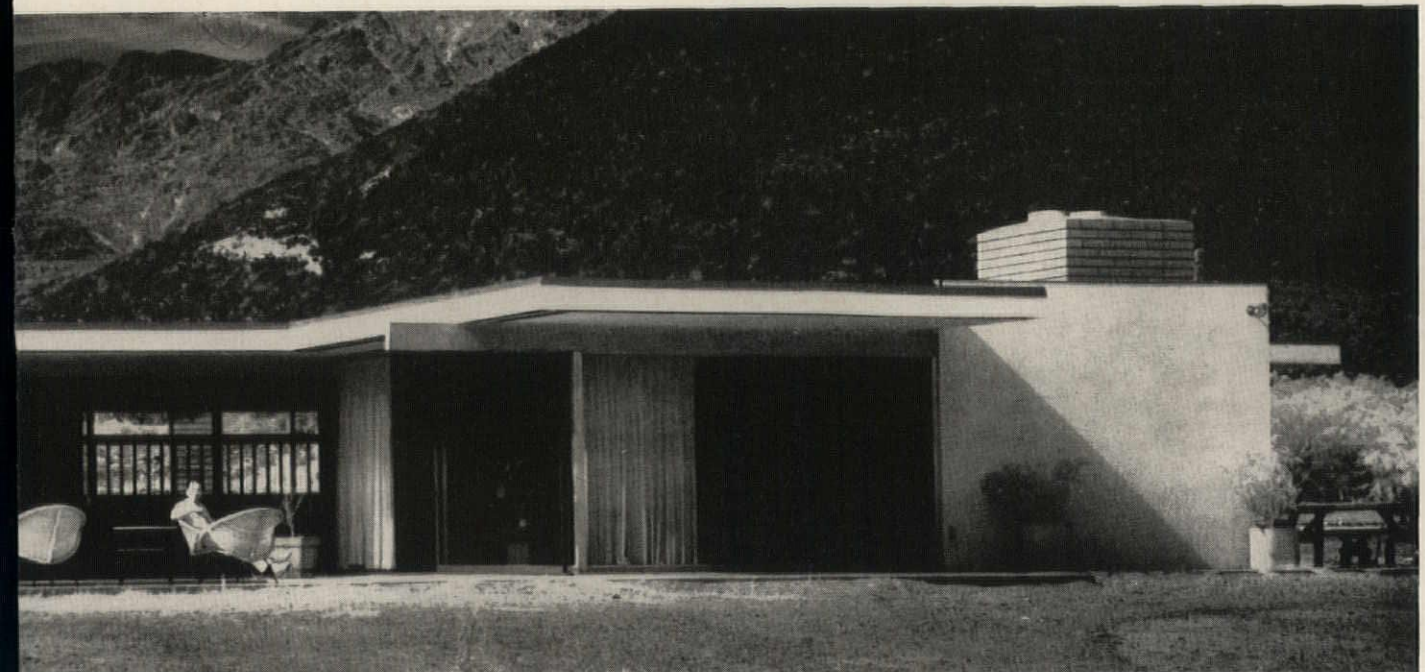
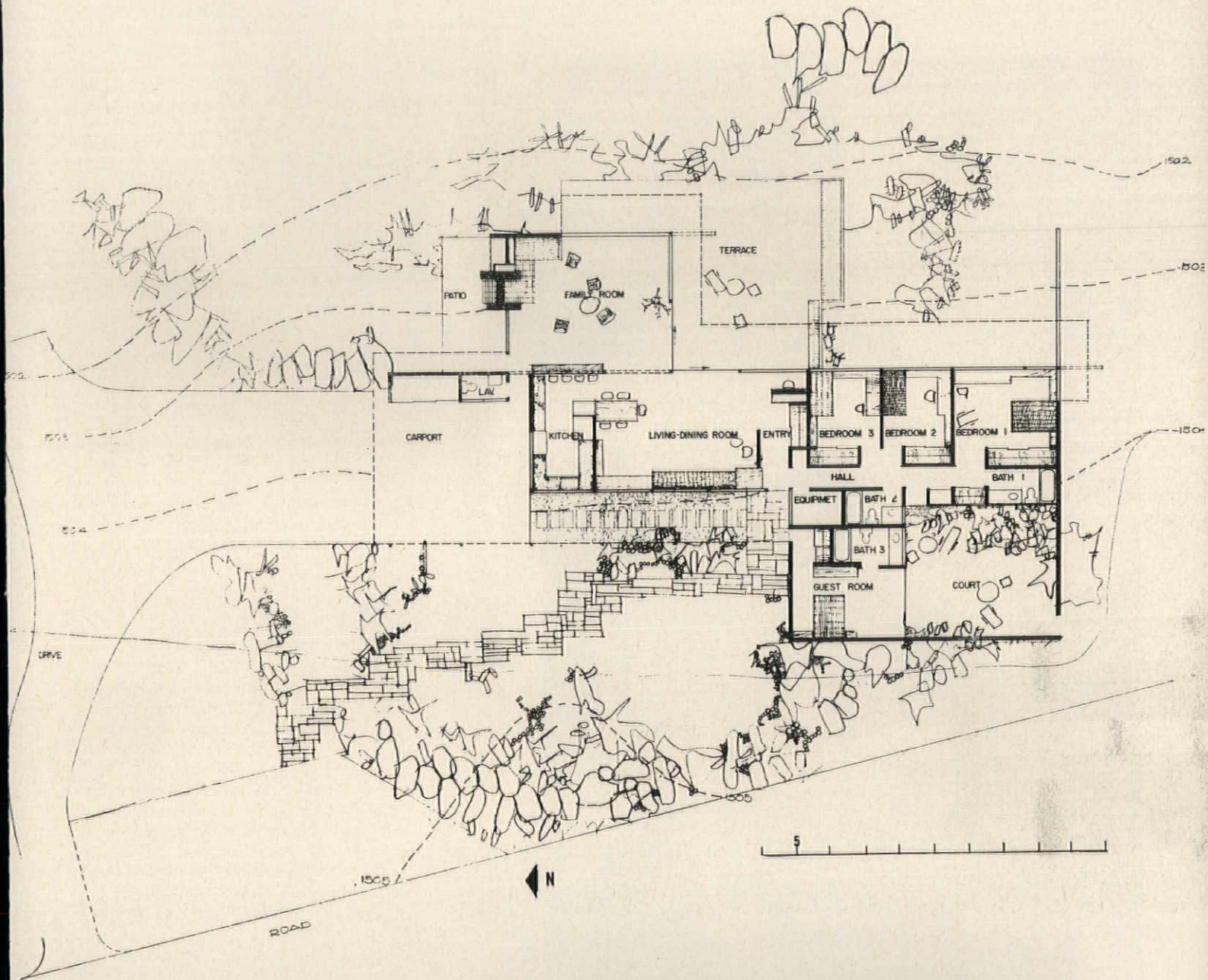
Sliding walls permit the family room, living-dining room and kitchen to be opened into a single area for entertaining, or closed-off as desired. The surrounding terraces expand the space of all. Sliding glass walls make the most of the climate and views.

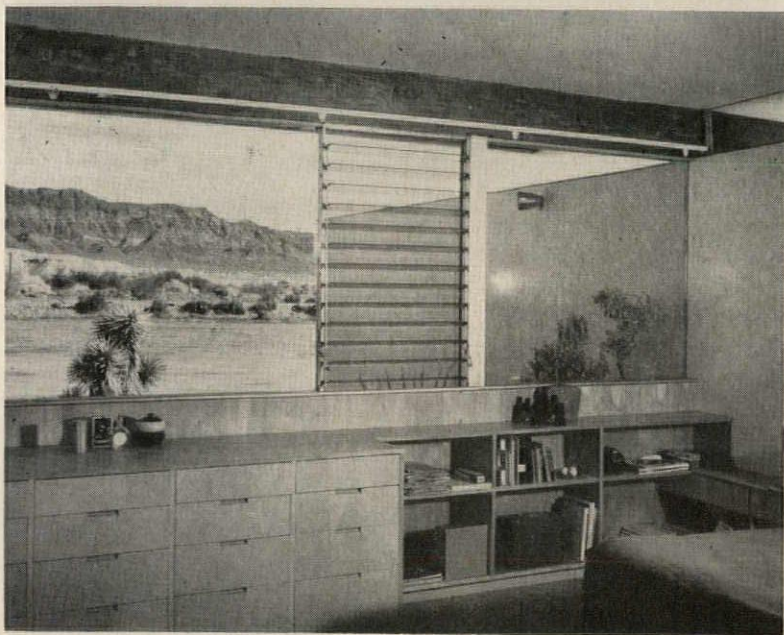
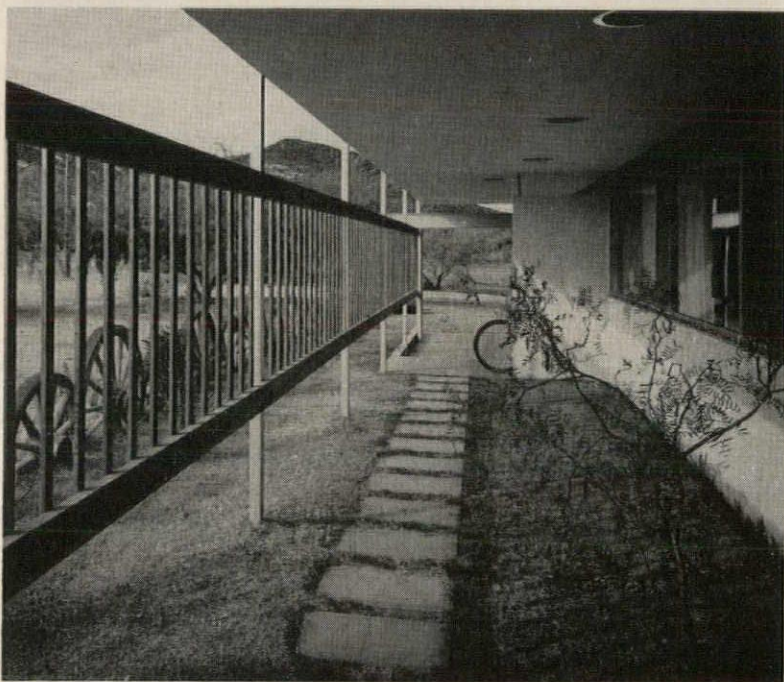
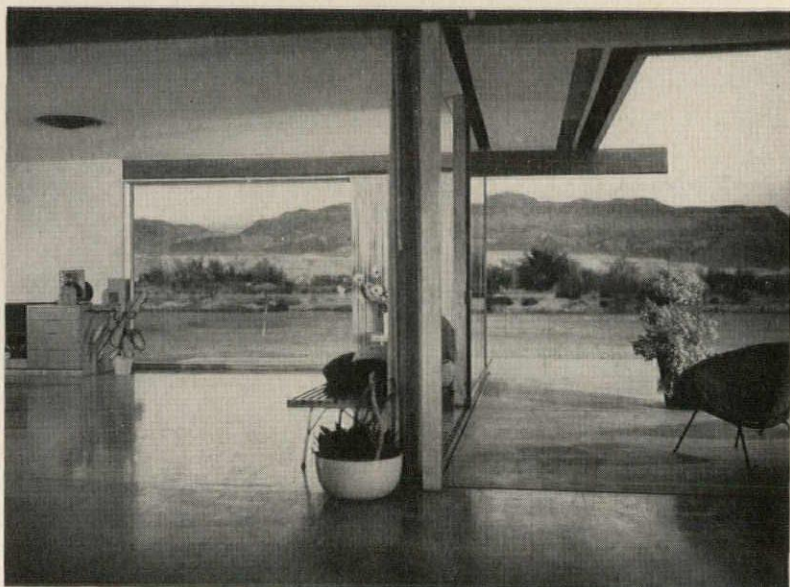
The bedroom wing for the parents, two children, and a guest, has direct access from the entry without crossing the living areas. The court off the guest room is also reached from the bedroom hall and doubles as a protected play area for the children.



*Julius Shulman*







Julius Shulman

### *Sorrells House*

The structure of the house is Neutra's typical, regular wood-post-and-beam frame—exposed and boldly expressed. The floors are concrete slab, surfaced with asphalt tile. Exterior walls are white-painted plaster. Interiors are plaster or plywood. Colors are quietly neutral, and contrast lights and darks for accent. Wide overhangs help offset the desert sun.

The entire aspect of the house is light, airy; artificial lighting is carefully planned to enhance the indoor-outdoor atmosphere of the house at night.

Photo at top shows family room and main terrace seen from the living area. Center photo is the entrance veranda. A corner of the master bedroom is at bottom



## DIGNITY AND COMFORT FOR CAROLINA

OWNERS: *Mr. & Mrs. Gregory Poole*

LOCATION: *Raleigh, North Carolina*

ASSOCIATED ARCHITECTS: *G. Milton Small  
(for Small & Boaz) and George Matsumoto*

ENGINEER: *Adolphus Mitchell*

CONTRACTOR: *Frank Walser*

LANDSCAPE ARCHITECT: *E. G. Thurlow*

All the relaxed comfort and spatial flow of a country club (the house incidentally adjoins one) are incorporated in the planning of this large and casually sophisticated residence. Almost the entire main floor, together with the lower level recreation room and terraces, form an enormous area for living and entertaining. There is plentiful use of contemporary planning devices, materials and equipment for easy use and upkeep—"the owners prefer entertaining and traveling to gardening." The house appears to be adequately run by one combination cook and housekeeper.

But above all, the house imparts a strong feeling of dignity and easy formality, typical of the region: the entrance court, the spacious entrance hall separating formal living and dining rooms, the profusion of screened and open porches, the stepped terraces—all blend with very careful proportioning and durable materials to give a luxuriously sensible house.

*Joseph W. Molitor*

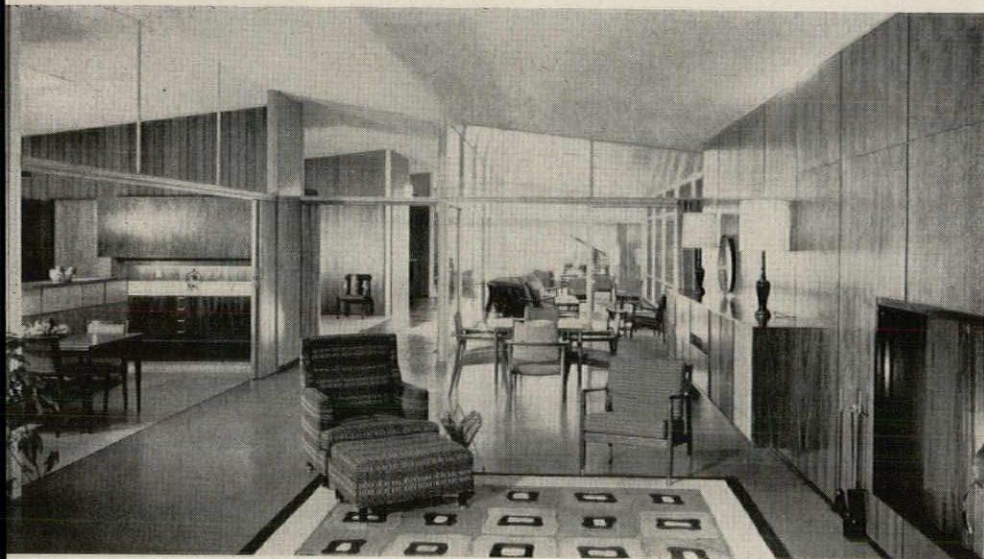




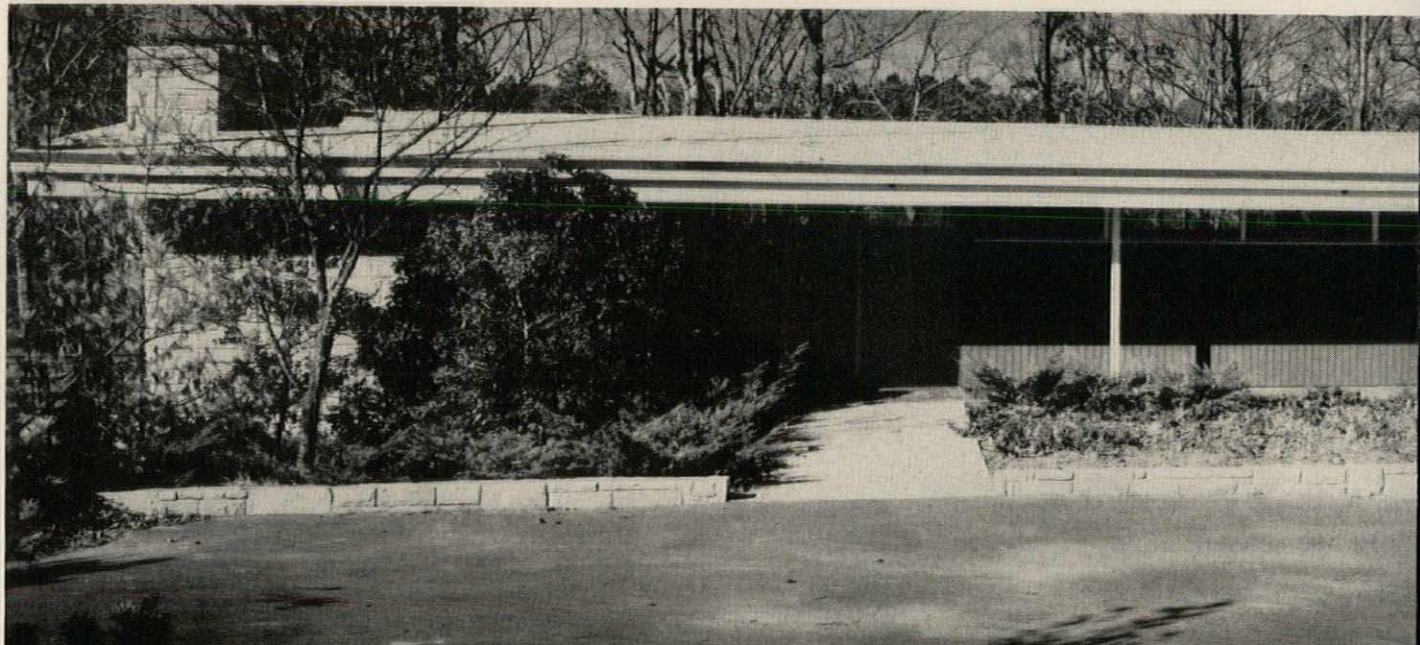
### *Poole House*

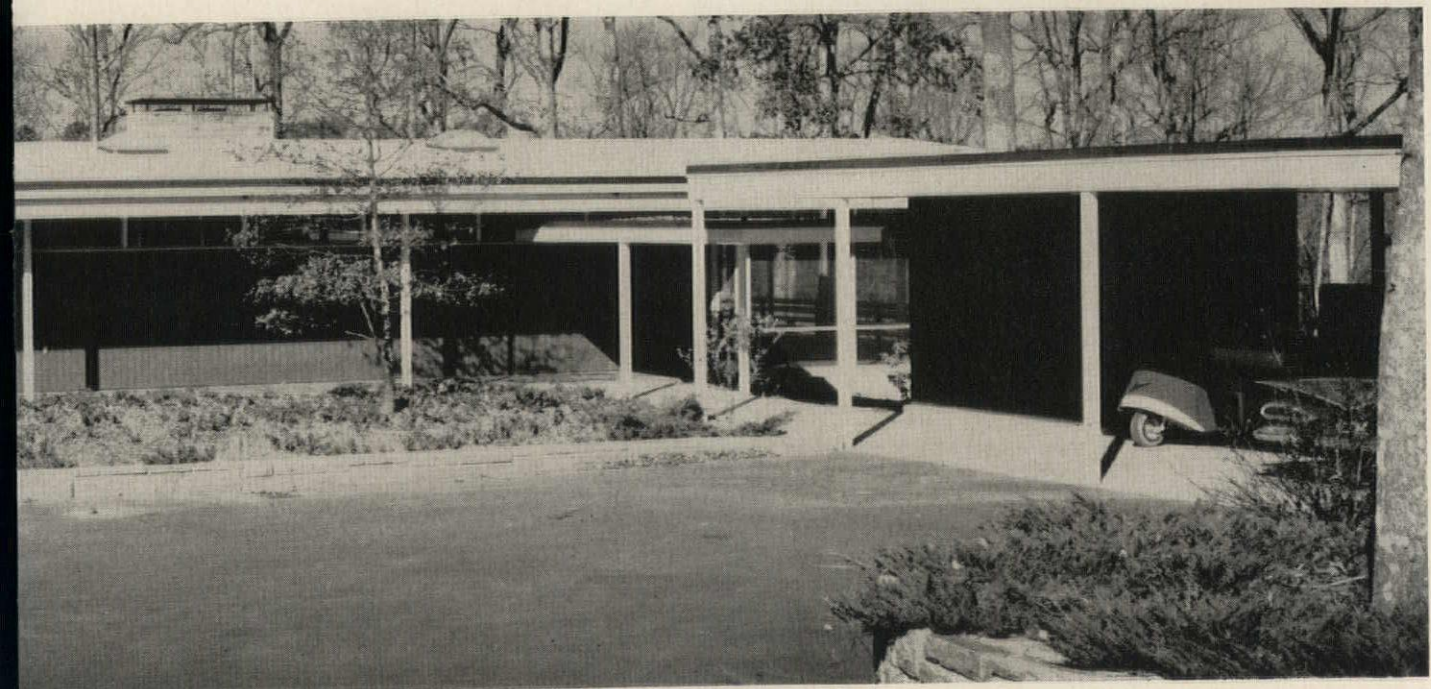
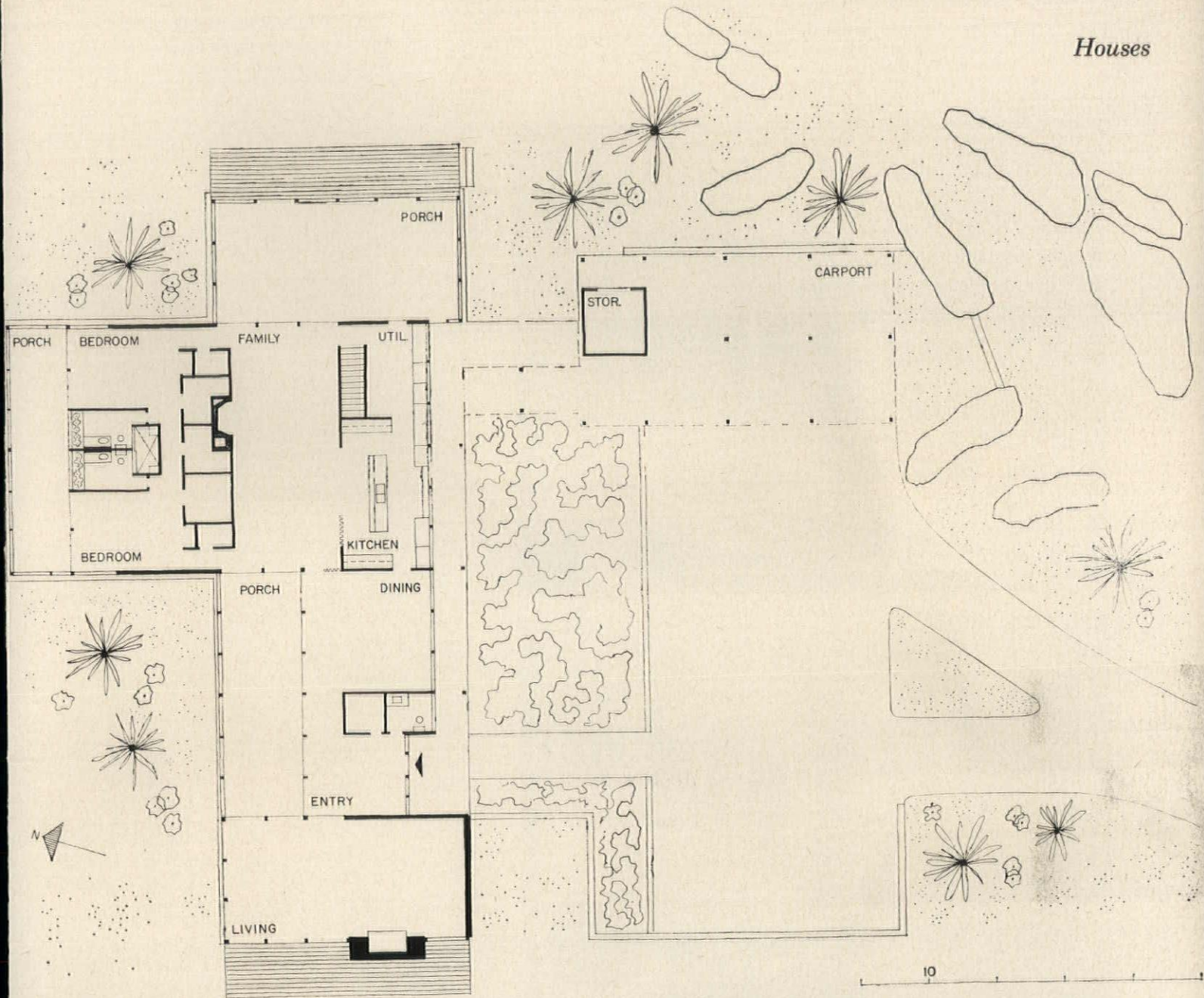
Sliding and folding partitions and doors play an important part in the functioning of the plan of this house. The Pooles have two children, both married and living away. The main level bedrooms, the family room, and the kitchen form a snug one-floor house when the parents are alone. Yet the entire sweep of living rooms and porches quickly converts into an open plan scheme (note photo from family room center left). The lower level contains recreation room, maid and guests' rooms, storage and utility.

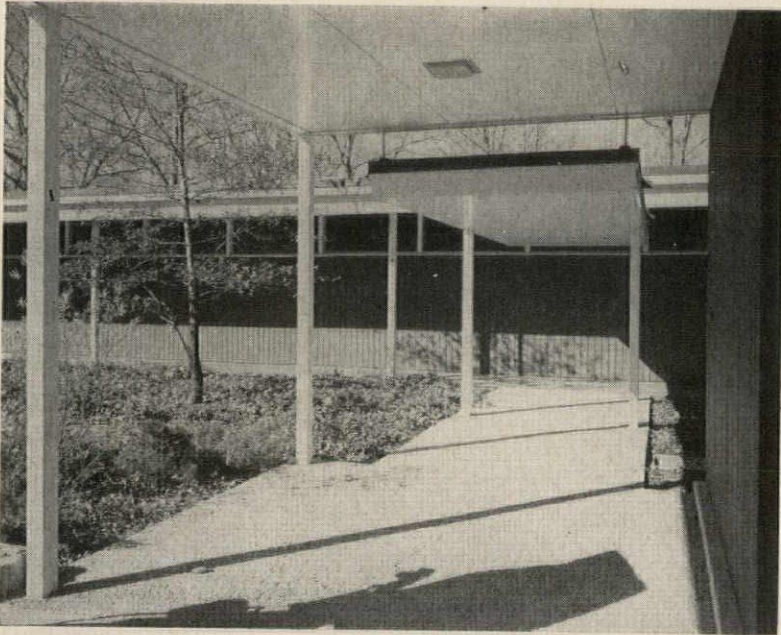
The lot overlooks a golf course, including a lake (the eleventh green is on an island) directly off the master bedroom wing. Both owners are devoted golfers. The property is extremely steep, with large and extensive areas of rock outcroppings between the house and the street which give a feeling of enclosure to the entrance and carport area (photo below)



*Joseph W. Molitor*







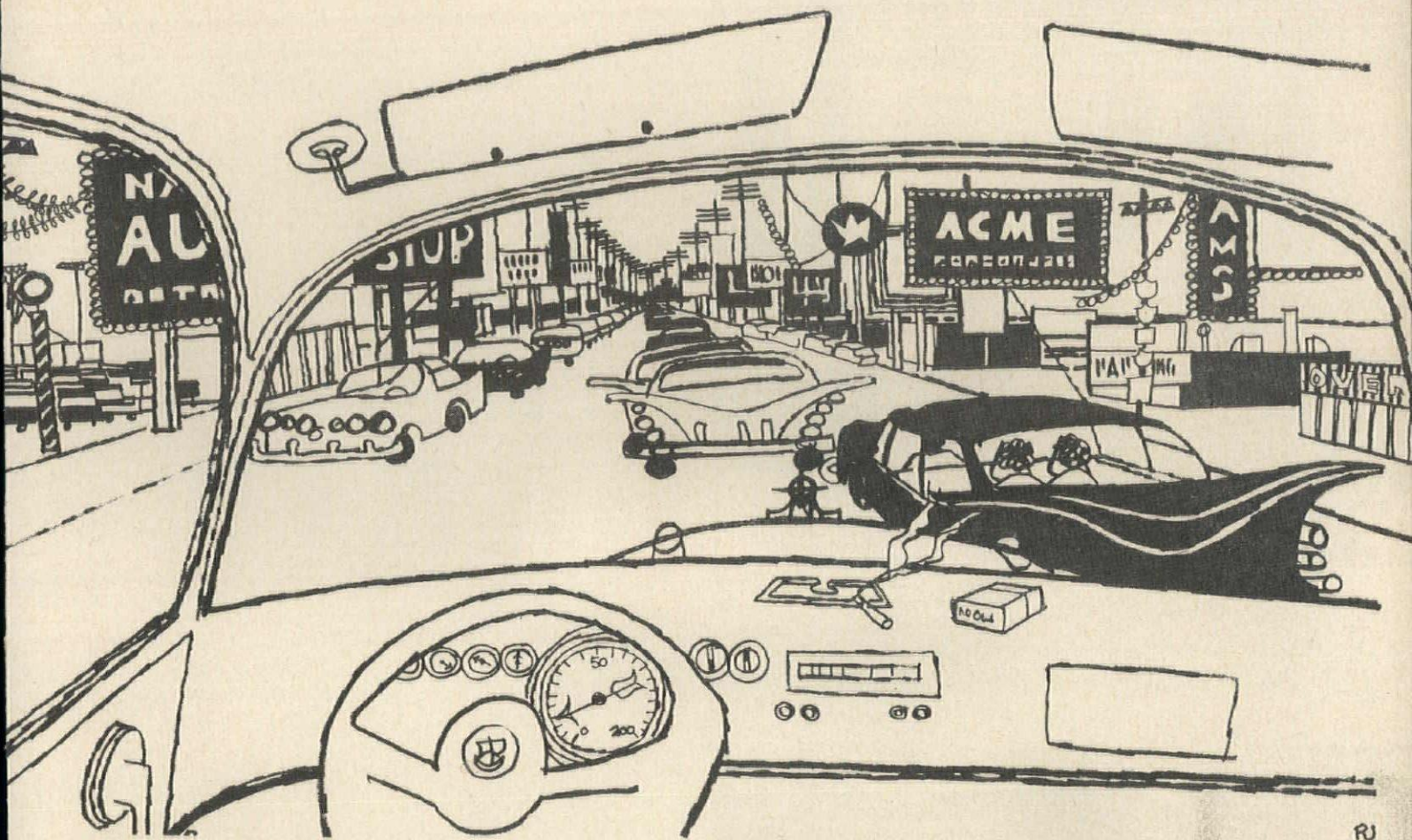
Joseph W. Moiktor

### *Poole House*

The construction of the house is generally wood frame, with steel columns and beams supporting wood joists. Exterior finishes are native stone masonry, vertical redwood siding, built-up roof with white marble chips, and flagstone-paved porches. Interior finishes are acoustic tile ceilings, wood paneled walls, walnut cabinet work, and floors of vinyl and ceramic tile, carpet and flagstone.

The house uses three heat pumps, separately zoned, for heating and cooling. Thermal insulation is glass wool. The electrical system uses low voltage wiring and dimmers.

The photo at top shows the covered walk linking the carport and house; at center is the dining room; and the kitchen, with serving counter into the family room, is at bottom



Drawing by Richard Jennings

## RETAILING AND THE AUTOMOBILE

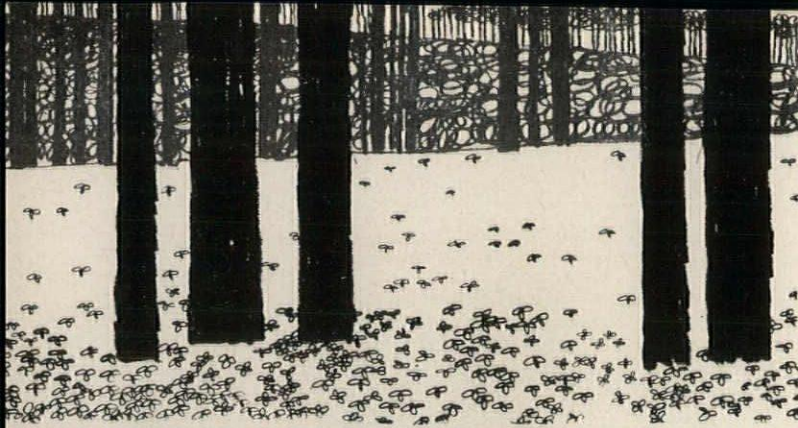
Trapped in a slow-moving, vehicular highway chain, or sitting bumper-to-bumper in the choking, angry snarl of Anycity traffic, we sometimes wish all those cars and trucks and busses would just go away. But, unlike the amiable snowman—who must one day melt away to nothing—the motor vehicle is here to stay. And if both business and pleasure are to benefit from it, the only course is to design (or redesign) *both* buildings and their settings—the city, the suburb, the countryside—so that pedestrians, vehicles, and public transport can each move freely and expeditiously without becoming entangled or spoiling the looks and pleasantness of things, or without disrupting the processes of government and business and living.

In this study we consider design for retailing; but especially in the light of its relationship to the automobile, the person on foot, and the environment in which it occurs. For retailing is no longer confined to the city or town market place as it used to be; thanks to the automobile, it takes place everywhere—in the city, in the suburbs, on the open highway.

Architectural design for retailing must therefore revolve about the situation of the building or buildings, and a studied examination and plan for the movement and accommodation of all kinds of traffic inside, outside, and around the building; and also in the neighborhood and community involved. A more general concern for the retailing environment can lead to—and in many cases has—a broadening of the architect's influence into such activities as urban redevelopment, neighborhood planning, regional planning, and so on.

With cities beginning to fight back in an effort to recapture some of the business lost to suburbia and regain their place as retailing centers, the downtown shopping center—a new building type—looms large as one to watch, and appears to offer all sorts of opportunities for architects and engineers. This is not to discount the suburban center, which will continue to have a rightful place in retailing's future and offer opportunities also; the point is that good design for each kind of retailing will create the special *parti* most appropriate for its particular situation.

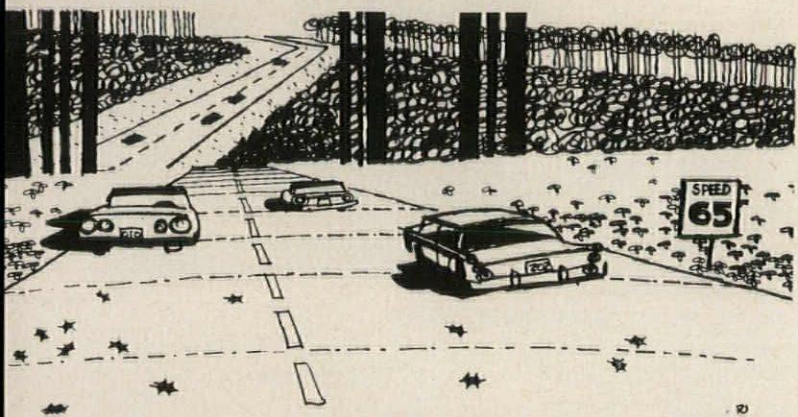
—JAMES S. HORNBECK



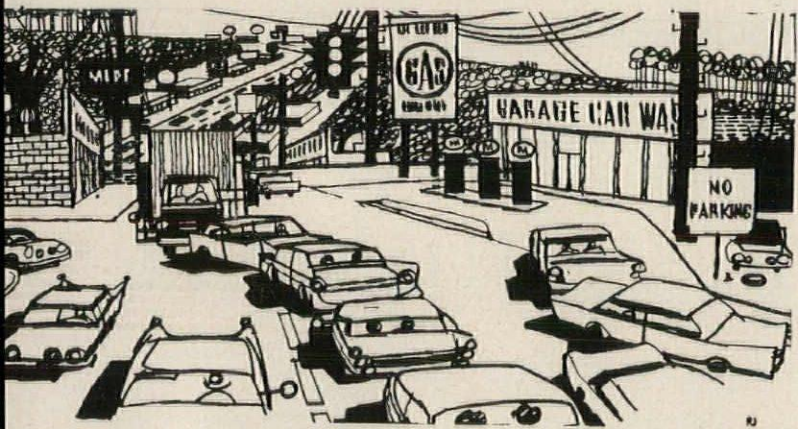
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The desecration of the countryside, and a possible way of redemption; a series by Richard Jennings:

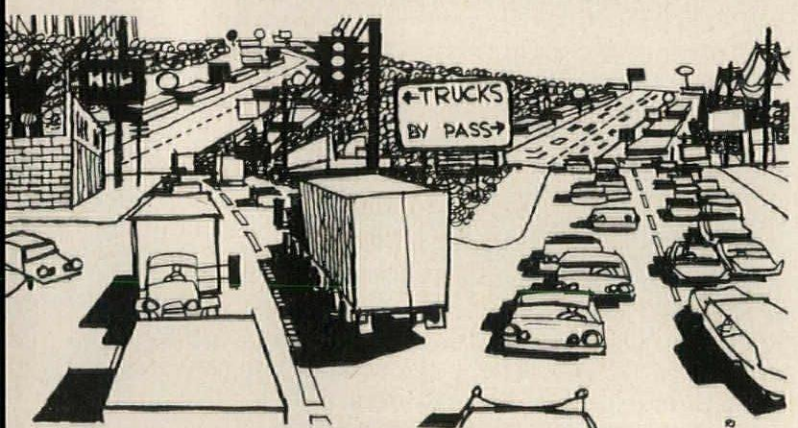
- 1—The Forest Primeval
- 2—The First Highway
- 3—Plus Highway Merchandising
- 4—Plus More Traffic; Today
- 5—A Way Out—Planned Retailing; 19—?



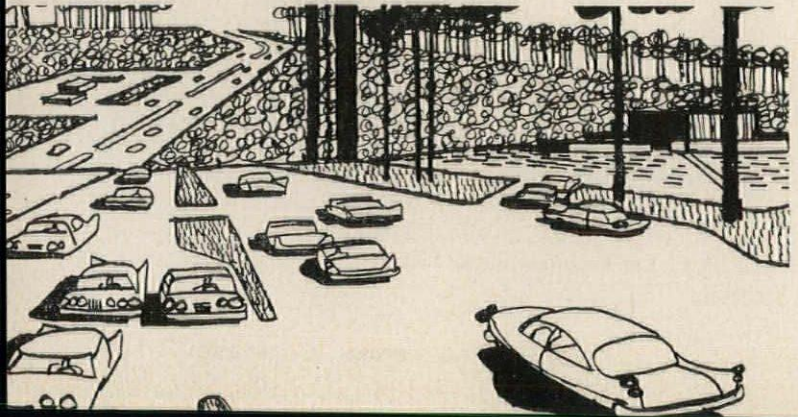
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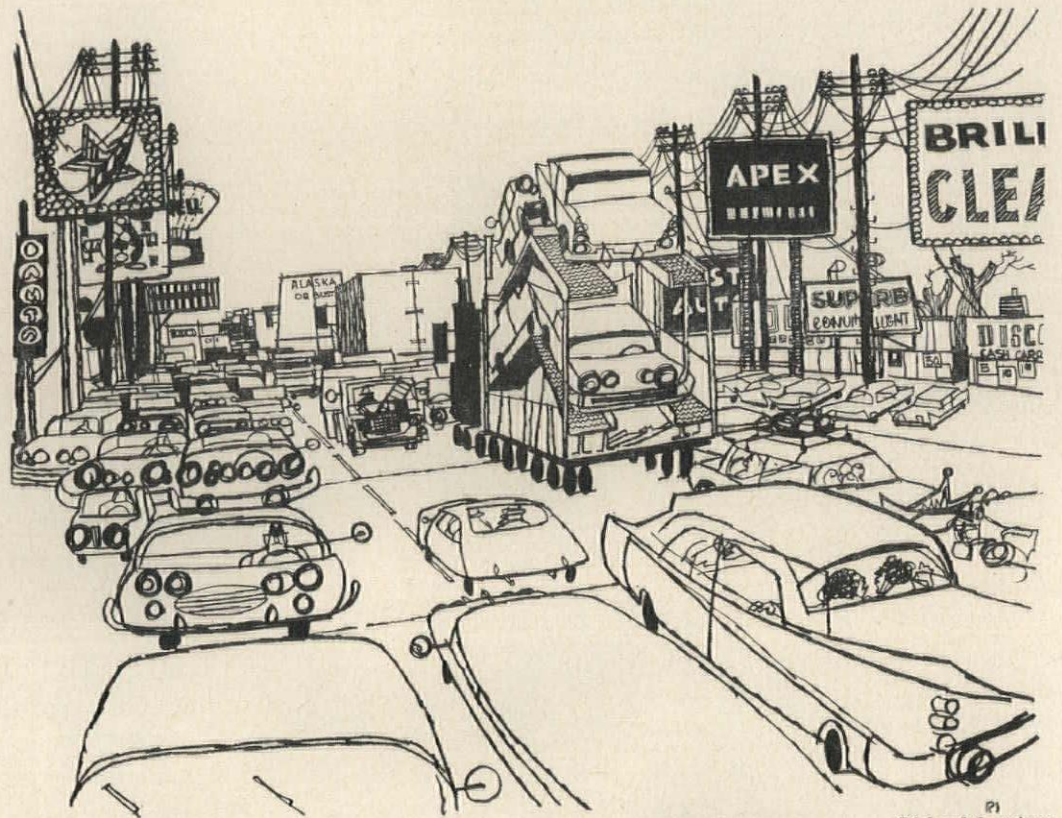


5

## RETAILING AND *A Romance Based Upon*

by Victor Gruen

In the past thirty years, retailing has been strongly influenced by the automobile; and as we find so often in history, romance played a part in the story. A love affair developed between the retailer and the automobile, creating a desire in the retailer to be as close as possible to the object of his affection. Although the first bloom of this romance has now faded, many retailers still have a lingering feeling that they would like to be close to the automobile. Let us briefly review the development of retailing and see how this affair began.



Richard Jennings

# THE AUTOMOBILE

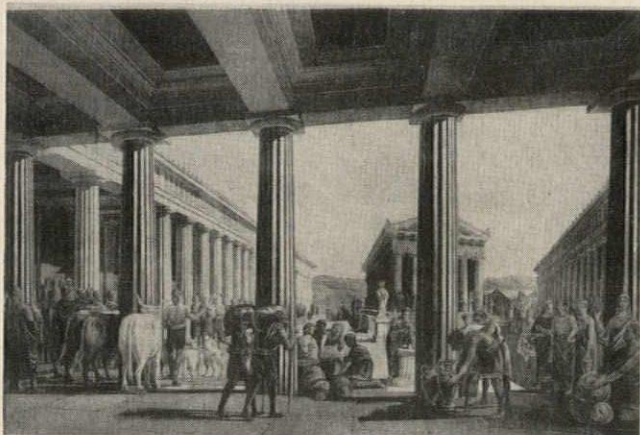
## *A Case of Mistaken Identity*

### *Prologue\**

Buying and selling is as old as mankind. Prehistoric man exchanged the deer he had slain for a necklace of shells; the modern housewife acquires a package of frozen food in exchange for money—the gratification of needs or desires motivated each transaction. Only the conditions under which each transpired have changed. A condition of great importance was the appearance of the middleman—the merchant—who turned this gratification into commerce. He carried the work produced by others from place to place; he established trade routes and trading posts; he started country stores and merchant states. Wherever he settled he became an integral, invigorating part of the life around him.

\*Although the main body of this article was written by Mr. Gruen especially for ARCHITECTURAL RECORD, the Prologue was condensed from a new book by Victor Gruen and Larry Smith, SHOPPING TOWNS U.S.A., just published by Reinhold Publishing Corp.

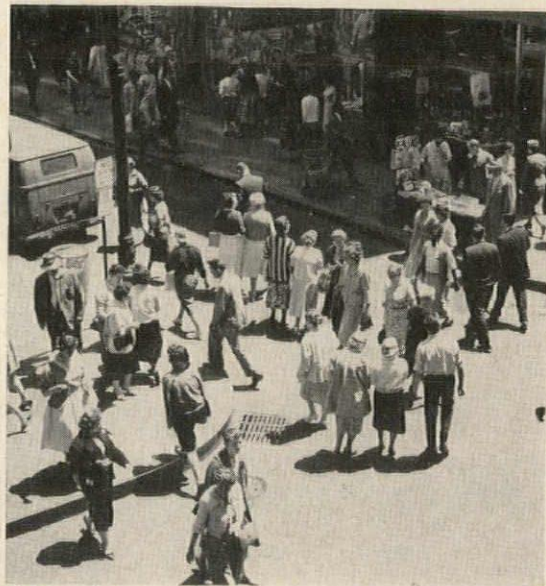
In ancient Greece, the merchant spread his wares beneath the colonnades of a building especially designated for his activity, the *Stoa*. The *Stoa* was no less important in the *Agora* (or city square) than the *Bouleuterion*, where politicians met, or the *Ecclesiasterion*, designed for public meetings. The temple was nearby, citizens in the square discussed topics of the day, transacted business, did their marketing. Buying and selling occurred where the philosophers, poets, and entertainers were arguing, reciting, performing their arts. Court trials were held here; banquets were spread. The *Agora* was the center of city life—and in this colorful, lively, dynamic environment commerce had its place. This integration of human activity was a universal pattern. Its existence was later guaranteed in ancient Rome, where wheeled traffic was banned from the city's forum when the vehicles threatened to crowd out humans.



The Bettmann Archive



Top, the Stoa, or open square, the Greek market place of classic times. Immediately above, a view of the market square in Leipzig, Germany, with vendors' stalls set up for business and with goods on display as in medieval times



Ewing Galloway

The problem of proper planning for pedestrian and automotive traffic; the confusion of a typical Main Street; the hazards—both by day and by night—of the shopping “strip,” with cars parked, cars moving, cars trying to park; the displeasing impersonality of parking by the acre. These are the problems all too familiar to everyone everywhere; problems that cry out for a sensible and a pleasing solution

In the medieval city, the market square was the city's center, not only geographically, but socially, commercially, religiously, and culturally. The City Hall and Guild Hall were there, as was the cathedral, with merchants' and craftsmen's stalls about it. The open area in the center became, in turn, the market place, the fairground, and the entertainment center for the citizenry.

Our own New England villages centered on the village green—a concept our forefathers brought with them from Europe. Such greens—a pleasant focus for community life—persisted well into the 19th century.

The industrial revolution radically changed the organization and character of cities, where factories were built and men were sought to work in them. The machine proved to have an insatiable appetite for manpower, and the city grew into a crazy quilt of packed humanity. The industrial slum became a

new pattern in many cities. Life in such cities became almost intolerable, and those who could afford it led the march to the suburbs. The march increased its tempo with the advent of interurban, elevated, and subway trains—became a rout when the automobile appeared.

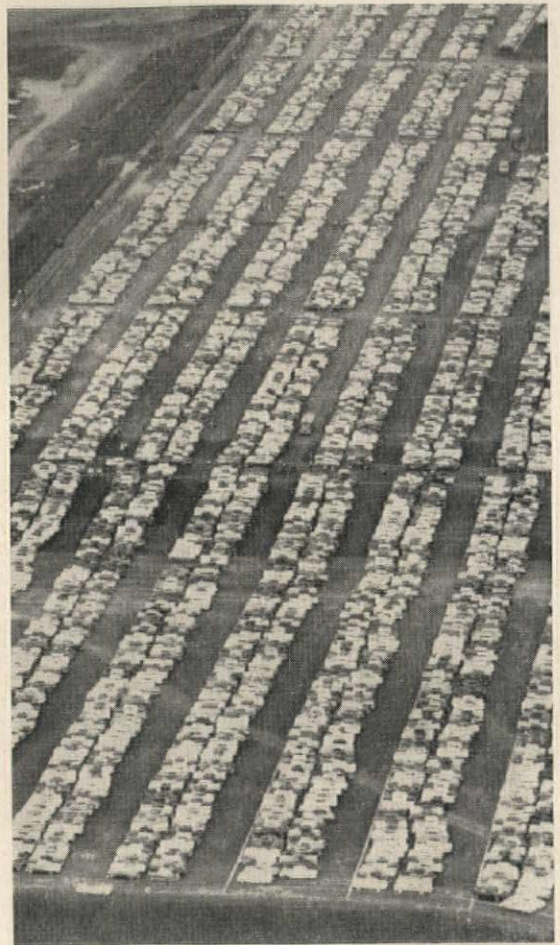
The automobile destroyed the last vestiges of community coherence. As long as tracks were the carriers of suburban dwellers, the new suburban communities had a central point—the railway station—to focus upon. As cities reached fingers out along the tentacles of railway lines, the shops, churches, and public buildings of the new towns sprang up about the station; and residential areas were controlled in their spread by walking distance. Such subcenters still exist in the Greater London Area.

When the automobile emerged as a means of private mass transportation, the final urban explosion took place. Automobiles provided complete freedom





Photos by Ewing Galloway



Wide World Photos

of movement, and made the individual completely independent of public transportation.

To accommodate the flood of people seeking to escape from the city and find peace and beauty in the country, house builders tore up the ground, cut down the trees, and callously removed every vestige of what people were after. Modern suburbia was born; a *milieu* in which there were neither the values of a rural community nor those of a well planned urban environment. But people must live somewhere, and suburbia grew. According to the United States Census Bureau, suburbs grew 29 times as fast as central cities between 1950 and 1959. The rate of population increase in those years was 1.5 per cent in cities; 44 per cent in suburban areas. In 1957 New York City held a special census in an attempt to obtain additional state assistance by proving increased population. To the dismay of city officials, it was found that the population of the five boroughs

had *decreased* 1.2 per cent; and this at a time when the population of the surrounding Greater Metropolitan Area was dramatically increasing!

Distances between residential and downtown areas increased rapidly, yet public transportation faced the threat of annihilation. The inroads automobile travel has made on public transportation is indicated in a study made by the Westchester County Association, which shows that despite a population increase of 15.5 per cent from 1949 to 1954, the number of railroad commuters decreased during the same period by 16.3 per cent.

Throughout the United States, suburban growth was so rapid and frenzied that the construction of roads, highways, and lines for drainage, sewerage, power, and gas lagged years behind—while any serious attempt at good planning for schools, shopping facilities, community centers, and churches was virtually nonexistent. Row upon row of identical houses



The Bettmann Archive



Living Gallows

Top, the octagonal Galleria of King Victor Emmanuel in Milan, Italy—an early and charming example of a covered mall for pedestrians. Immediately above, the old Cleveland Arcade, extending from Euclid to Superior Avenue, in Cleveland



R. Wenkam

set in an empty countryside proved to be less than the heaven their owners were seeking.

Since suburbia is having a marked effect upon our way of life, it is only natural that its influence should be felt in the marketing of goods. In the amorphous suburban environment, the merchant has had difficulty in finding a logical way to integrate his activities into the local scene. Stores were not provided with predetermined locations such as near the railway stations as in an earlier period—the customer no longer had a geographical focus; he and his car were everywhere. Under such conditions, the best retailing locations seemed centered on highways.

As an increasing number of highway stores appeared, more people parked along the curb and parking space became scarce. A new type of hitching post—the parking meter—made its appearance. But it cost money, and as the cost of curb parking tended to slow down sales, merchants responded and ar-

ranged for customer off-street parking; first in back of, and later in front of the stores.

Business grew, and so did traffic confusion. Highway congestion resulted—so serious in nature that motorists chose alternate, less crowded routes. When the alternate roads in turn attracted new stores and new congestion, superhighways were constructed to provide an unhindered traffic flow. Residential areas surrounding congested traffic arteries or situated near the stores or their services became undesirable; and the stores then found themselves in the center of a blighted residential section of reduced buying power. As customers were siphoned off from settled roads—partly by the appearance of blight and partly by the attraction of the freeways—a wild scramble for new locations started. Stores were built in freshly created suburban areas still further removed from downtown. Ironically enough, the merchants again encountered the same undesirable



Ewing Galloway

#### CONCERN FOR THE PEDESTRIAN

Above, the mall of the Cross County Shopping Center in Yonkers, N. Y., designed by architect Lathrop Douglass. Left, the mall of the Ala Moana Regional Shopping Center in Honolulu, Hawaii, designed by architects John Graham and Company.

Right, top, the access bridge serving the Gulfgate Shopping Center in Houston, Texas, designed by architects John Graham and Company. Immediately right, a bus stop and protected bus terminal and waiting room for the Southdale Shopping Center, Edina, Minnesota—near Minneapolis—designed by Victor Gruen Associates, architects. Both city and suburban busses serve the center



Infinity, Inc.



situation from which they were trying to escape. The need for farsighted, comprehensive planning became urgent and more widely understood at last.

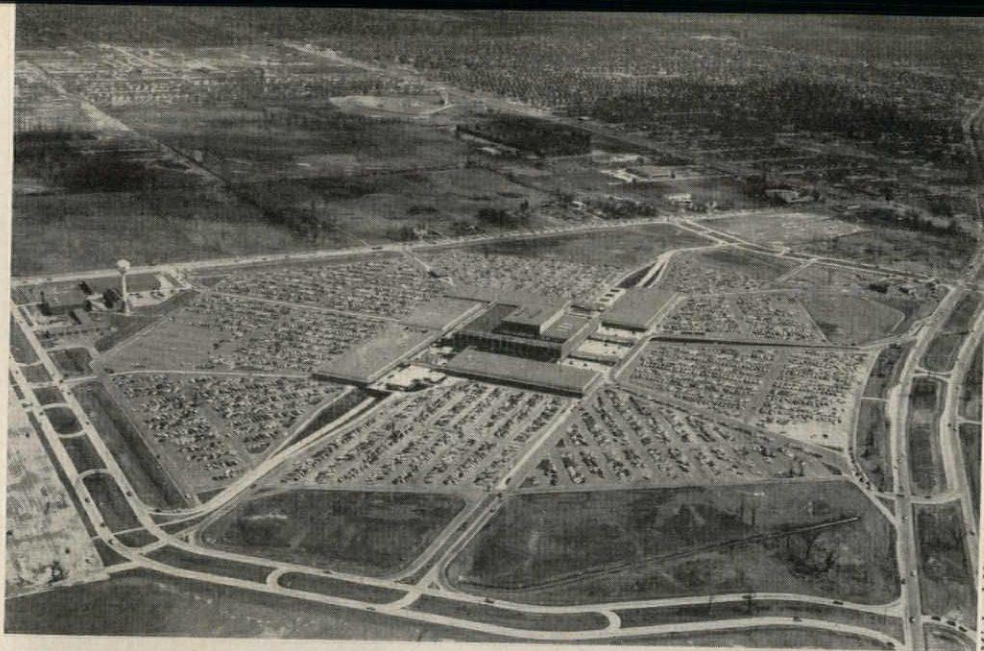
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When environmental planning is applied in designing new retailing facilities, the needs and desires of the shopper are involved. It is significant that the common name is *shopping center*, not *selling center*. This clearly indicates that the desires of the shopper take precedence over those of the retailer. An earlier term, *parking center*, failed to catch on.

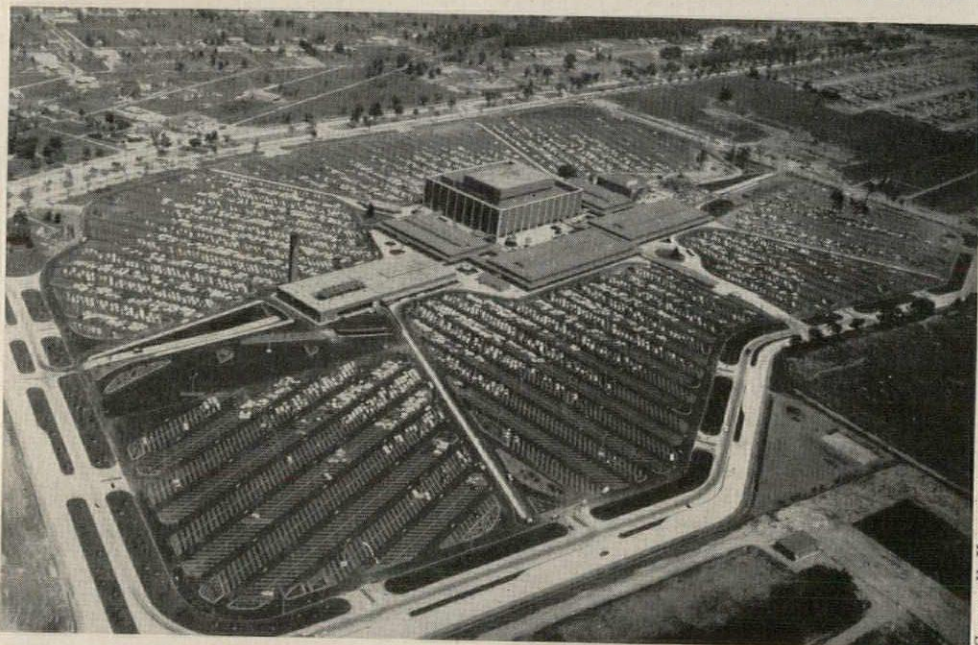
Suburban shoppers require a convenient, amply stocked shopping area served by plentiful free parking. These are the purely practical needs about which the shopping center was first conceived. However, good planning will provide additional attractions by meeting other needs. By offering facilities for social life, recreation, civic and educational func-

tions within a protected pedestrian environment, shopping centers can fill an existing void. In the shopping centers that fulfill this need of suburbanites for the amenities, we find that pedestrian areas are busy not only during normal shopping hours, but that people promenade, windowshop, relax in the garden courts, view exhibits, and patronize the restaurants on Sundays and holidays. All age groups are considered; auditoriums are booked to capacity; meeting rooms are busy; dance and music schools and skating rinks attract teenagers. The amusement centers are popular with children.

Such a concept results in an upgrading of the surrounding residential area and raises property values. When the shopping center becomes indeed a place which provides physical living requirements for suburbia, and simultaneously fulfills civic, cultural, social, and recreational needs, it will make a significant contribution to better living.



Michael Honos



George E. Kawamoto

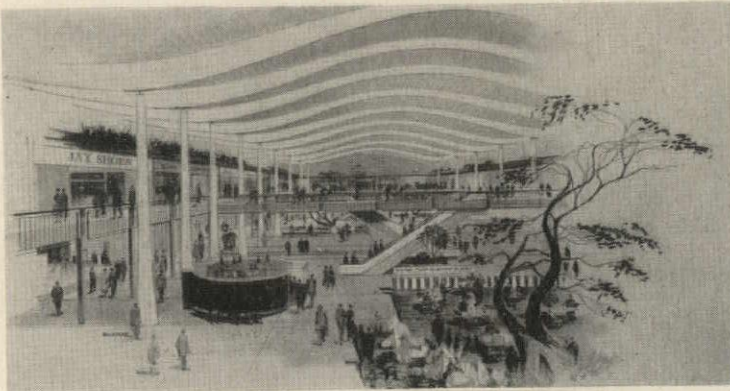


Gordon Summers

#### CLUSTER-TYPE REGIONAL CENTERS

These three examples by Victor Gruen Associates illustrate the cluster-type regional shopping center, which has become—by now—a well established expression which has been built in various parts of the country by developers and their architects. Its typical features include an outer-ring road, ample parking, underground service, a department store or two as a "main draw," plus mall and plaza areas devoted strictly to pedestrians.

Top—Northland, near Detroit; Center—Eastland, near Detroit; Bottom—Valley Fair, San Jose, California



The main shopping mall, Wildwood Shopping Center, West Allis, Wisconsin—a two-story volume enclosed by precast concrete units, designed by Victor Gruen Associates, Architects



THE COVERED MALL



The Galleria of King Umberto I, in Naples, Italy—a prototype

The Bettmann Archive



Photos by Infinity, Inc.

The air conditioned garden court and some typical shops at Southdale Center, Minneapolis—designed by Victor Gruen Associates. In this controlled atmosphere, the conventional store “front” ceases to exist; and only a security barrier and some means of identification remain as required elements in the design.

DISENCHANTMENT

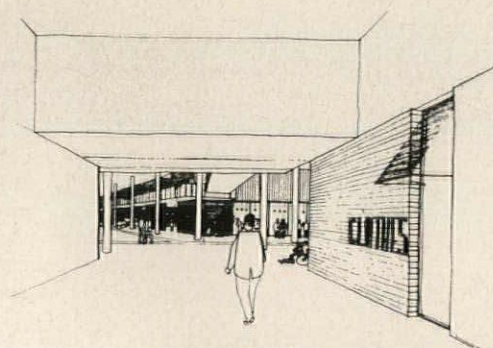
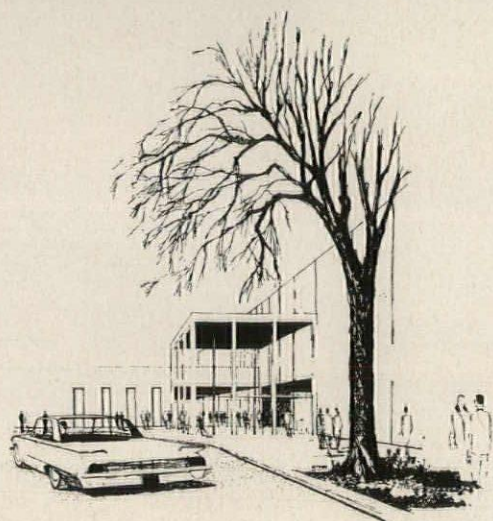
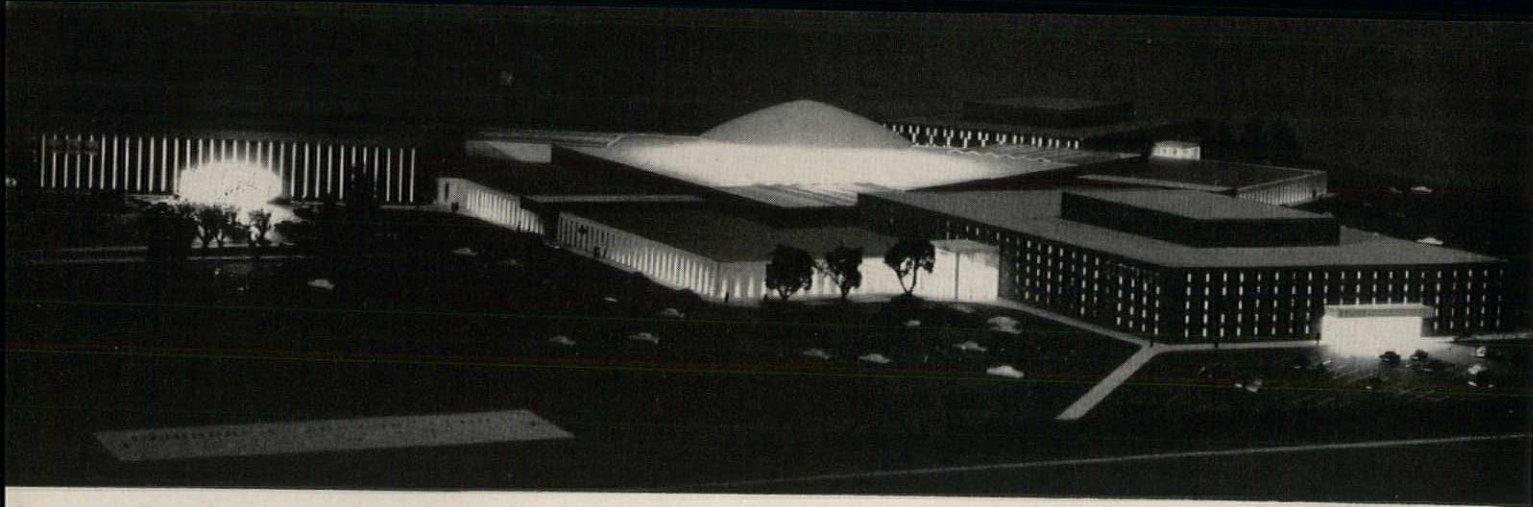
As the retailer-automobile honeymoon comes to an end, the retailer slowly realizes that his love has been misdirected. His true love belonged not to the automobile, but to the female customer in it. No automobile—not even the most elegant Cadillac—ever bought a thing. As the retailer transferred his attachment from the car to the lady, he drew the logical conclusions which were then expressed by changes in store design and center planning.

Early automobile-conscious stores featured carriage trade entrances, but it was soon evident that the chauffeur-driven car was *passé* and that parking space had to be provided for the lady shopper. At first, stores were strung along the highway; the housewife drove from store to store, parking near front entrances and shopping as she went. When

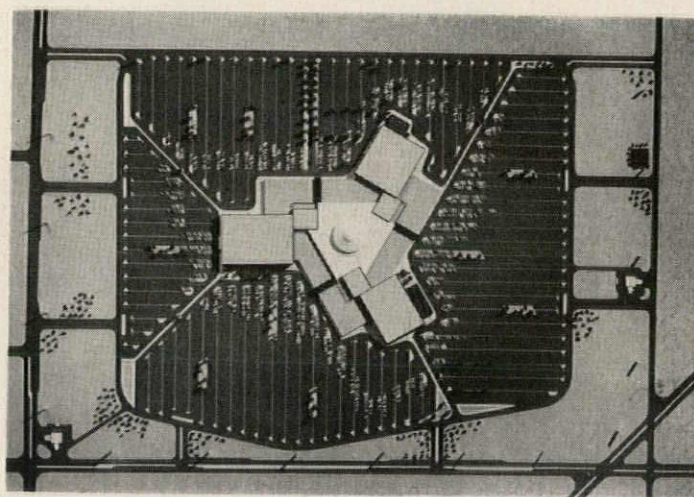
this became popular, parking space became scarce, and the highways became so congested that mobility for shopping—or for any other purpose—no longer existed.

Parking lots were next provided *behind* the stores. Shops and stores continued to present their “fronts” to the highway, but 90 per cent of their customers now came in by the back door—the same entrance through which garbage was removed and deliveries made.

The first planning step forward was taken when store buildings were moved back from the road and larger parking areas were provided in front. Now—for the first time—service facilities (at the back) and customer facilities (at the front) could be decisively separated.



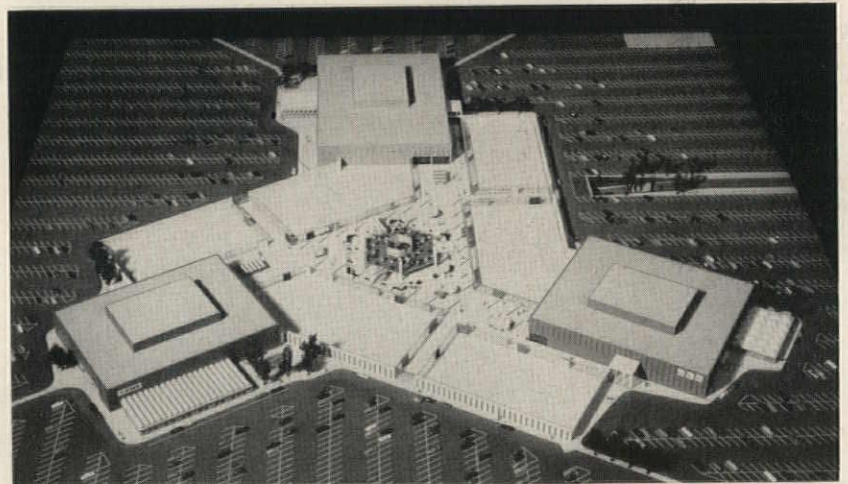
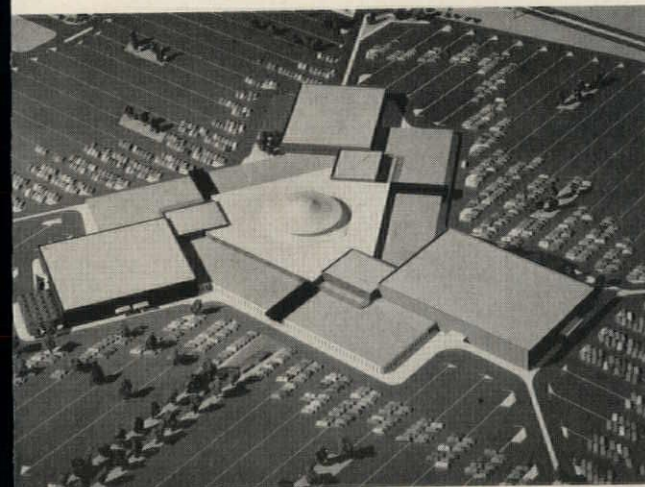
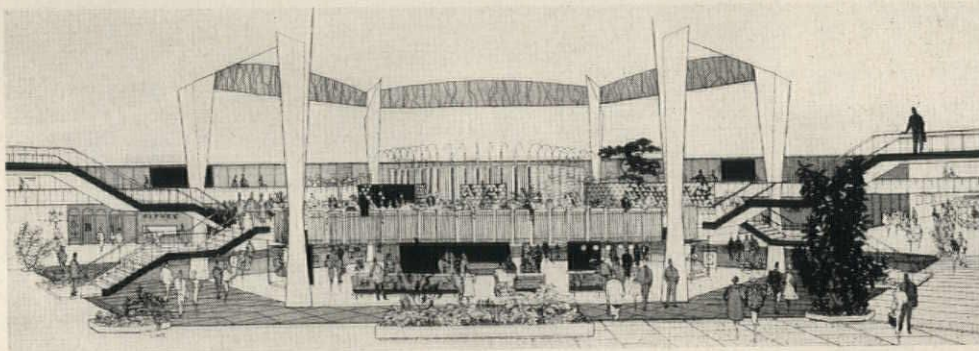
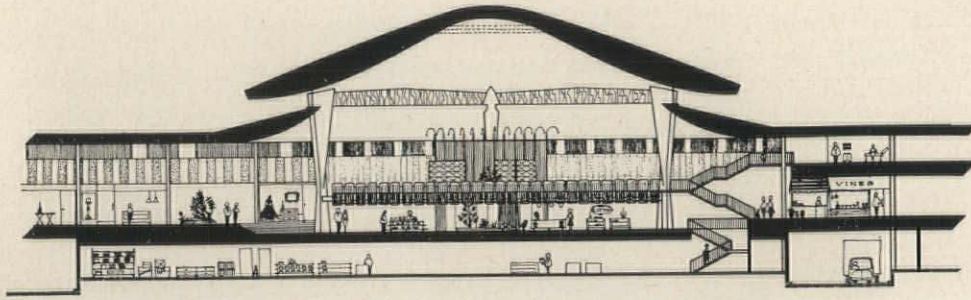
Randhurst designed to serve a market of 300-400,000, north and west of Chicago, this first-of-a-kind shopping center is being sponsored by three downtown department stores: Carson Pirie Scott, Wieboldt's, and The Fair. The triangular cluster type scheme—which is now under construction—revolves about a central, three-level galleria, enclosed by a clerestoried dome of concrete. Victor Gruen Associates, architects; Larry Smith and Company, economic consultants



As the automobile flood swelled, the depth of the parking lots had to be increased until it became impossible to construct shopping facilities within the narrow, 150- to 200-ft-deep strips which zoning laws usually allowed for retailing. Thus, special zoning for sites of considerable depth was worked out, and the first shopping centers were born.

Instead of one strip, two parallel strips of stores were built, and parking was arranged outside of both. The space between the strips was made into a pedestrian mall, of minimum width. The merchants, however, still feeling that their best interests were tied to the automobile (that romance again!) gave main emphasis to the store "fronts" facing the parking lots, expecting their customers to park in front of their store and march in by the

front door. The mall was underplayed, and considered principally as a short cut for the shopper who desired—after her primary purchase was made—to make secondary visits or purchases in other stores. The mall, long and narrow, featured only a token of "landscaping" in the form of some scraggly little plants, and was altogether empty and dreary. Usually there was a roadway directly adjoining the store groups, based on the idea that people would make short stops along the curb, and also window-shop by driving along the store fronts. This arrangement transferred the congestion and danger of the suburban highway to the roadway along the strips, and I know of at least one such shopping center where traffic signals finally had to be set up on the road between parking lots and stores so that one



could walk from his car to the stores without endangering his life.

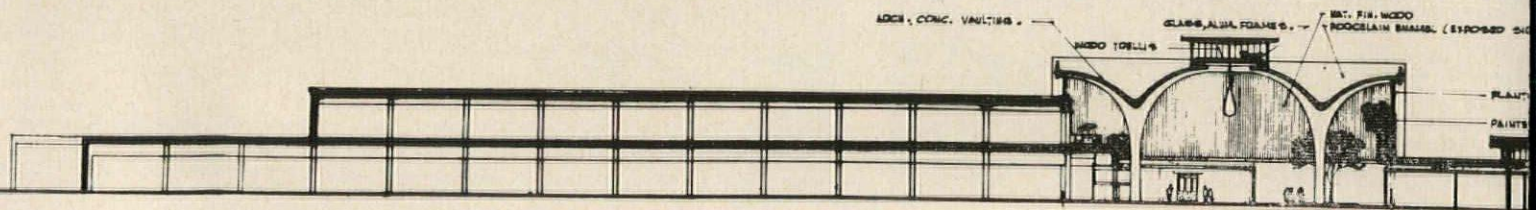
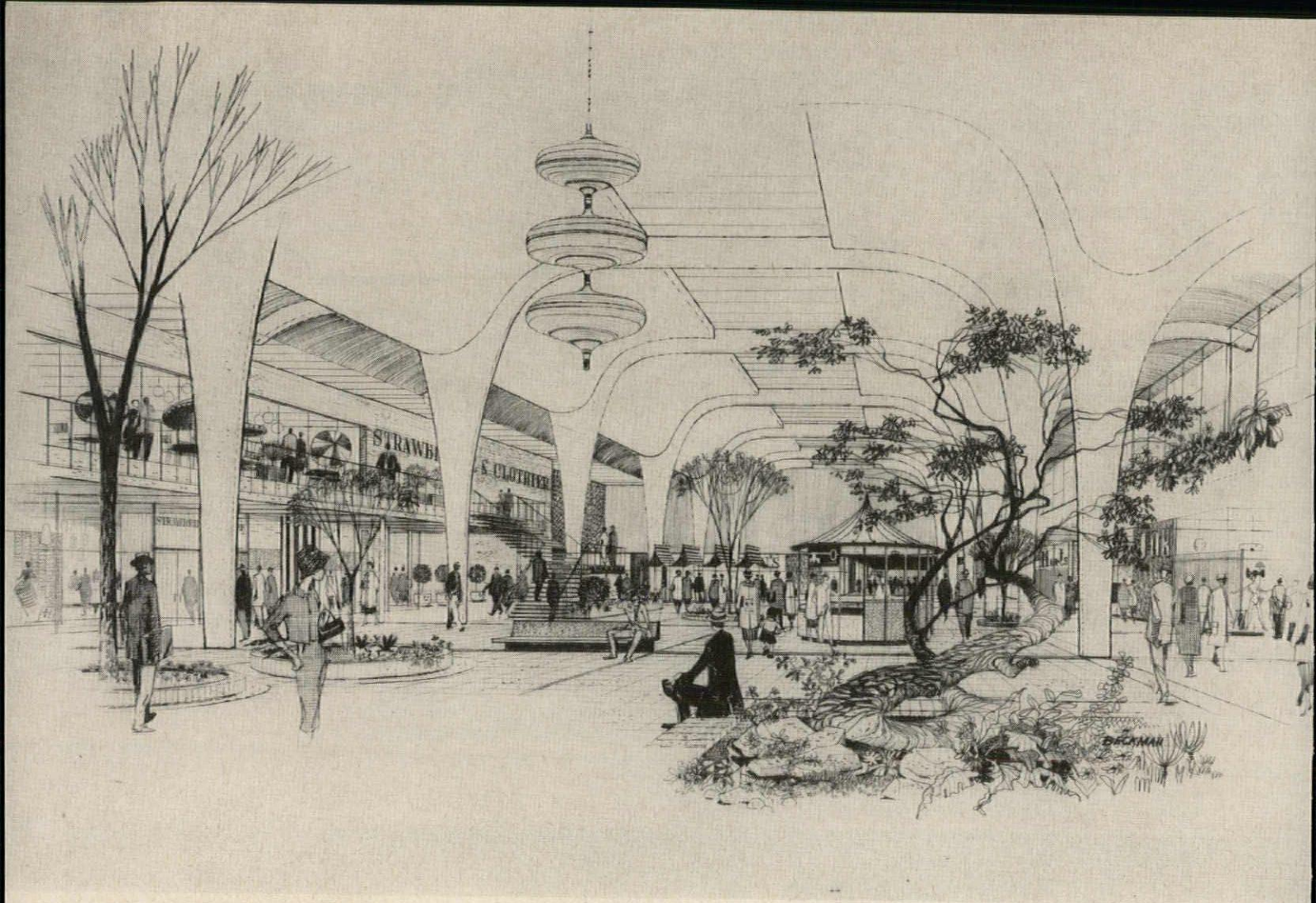
But as merchants, planners, and developers gained experience and wisdom, they realized that shopping activity can be most successfully and pleasantly carried out by people who are on foot and who can concentrate on shopping without being distracted by the dangers, inconveniences, and nervous tensions mechanized traffic brings. Separation of motorized and pedestrian areas became increasingly stringent; service traffic was sent underground.

The hypothesis that dozens of people could park in front of a specific store was abandoned; store entrances facing parking areas became less important; and pedestrian areas were made larger, wider, and more attractive. To an increasing degree, regional

shopping centers emulated the ideals of a truly urban crystallization point, and included within their boundaries office buildings, medical buildings, hotels, auditoriums, exhibit areas, theaters, social meeting places, clubs, and facilities for other cultural, recreational, and civic activities.

In addition, the size and shape and variety of pedestrian areas developed; the one narrow mall—reminiscent of Main Street—was replaced by more intricate systems of open, interconnected spaces of various sizes, proportions, and character. These are now called malls, courts, arcades, plazas, etc.

Thus, the well planned regional shopping center came to resemble more and more an historic urban center. And as such centers grew, so did the realization that public transportation could add meas-



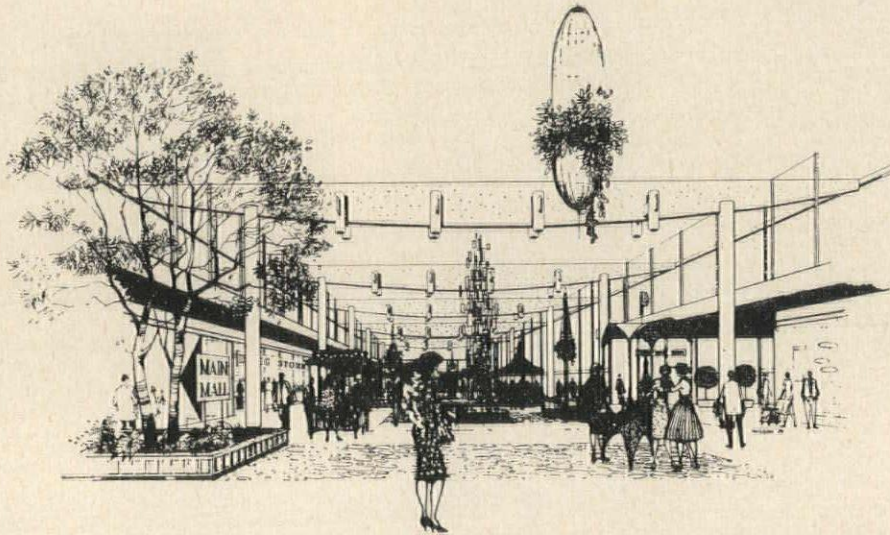
urably to their business; many centers (Northland, Old Orchard, Southdale, Roosevelt Field) have encouraged bus transportation through special roads, bus terminals with waiting rooms, etc.

Where climatic conditions were unfavorable, planners went further: pedestrian areas were enclosed, and by means of air conditioning, special lighting, acoustical control, etc., furnished a pleasant, year-around environment for shoppers. Again, an historic pattern was imitated: the colonnades, gallerias, and covered arcades of European cities found contemporary expression in the covered mall.

Thus, the best regional centers are incorporating the best qualities urban centers once had. They can

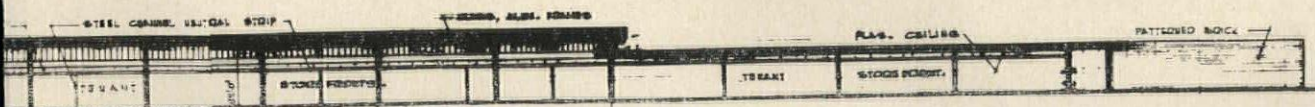
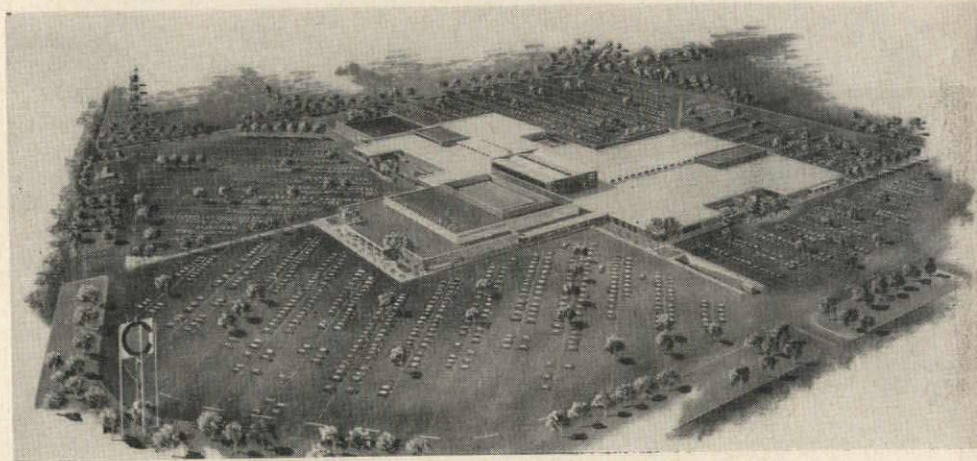
rightly be regarded as a serious threat to existing downtown centers, which today are lacking in the best urban characteristics, due to lack of foresighted planning. In 1954, I stated (in a *Harvard Business Review* article) that the evolution of the regional shopping center could have two potential effects on those concerned with downtown: first, that of a shock treatment that might stir city officials and business men into action; and second, that of serving as an experimental workshop in which ideas for downtown revitalization might be developed. I feel justified in those statements today. The shock has set in, and action—though in many cases hesitant and misdirected—is at last being taken (or at least it is being planned) in many of our cities.



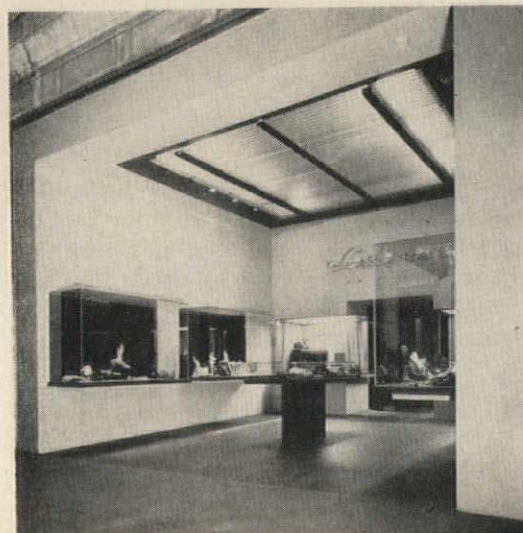


THE COVERED MALL

Directly across the Delaware River from Philadelphia and 4 miles east of Camden, New Jersey, the Cherry Hill Shopping Center will serve approximately 400,000 people. The design focuses on an enclosed, two-level, air conditioned garden street, shown at left. A typical arcade leading to the central area is shown above; a section through the entire building below. Shops are enclosed by sliding doors for maximum visual recognition. Victor Gruen Associates are architects for the development, jointly sponsored by Strawbridge and Clothier and Community Research & Development, Inc.



The Lederer de Paris shop on Fifth Avenue in New York, built in the early 30's, was an early classic in small shop design that set up new basic principles of styling for retailing still valid today. Morris Ketchum, architect; Victor Gruen, designer





*Ewing Galloway*



Left: The Lloyd Center, Portland, Ore., designed by John Graham & Co. Above: Rockefeller Plaza, New York, a well known early example of an urban shopping center

*John Todd Photo Service*



The new downtown pedestrian mall in Kalamazoo, Mich.; landscaping by Nicholas Kik

## THE URBAN SHOPPING CENTER



*The Bettmann Archive*  
View of the medieval (and contemporary) market square in downtown Leipzig, Germany

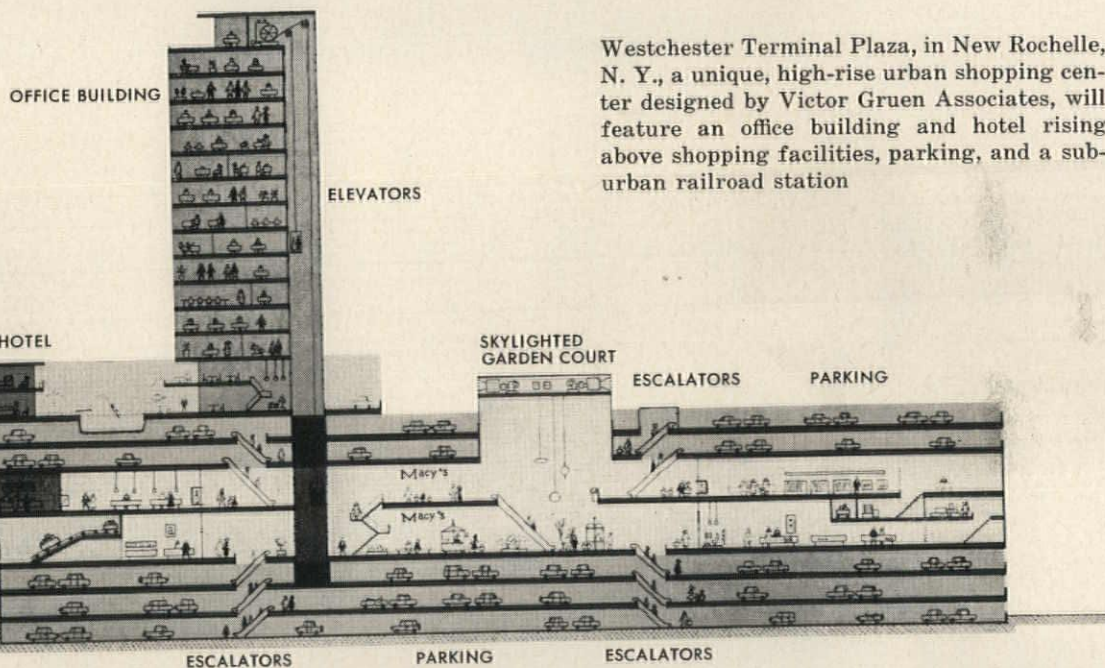
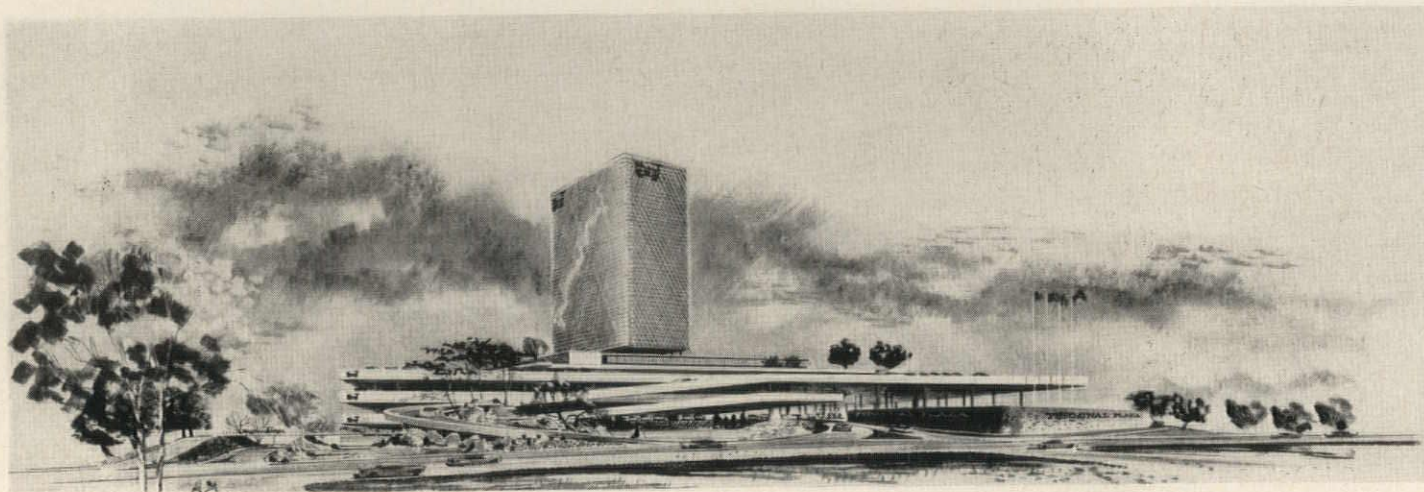
## URBAN SHOPPING CENTERS

A new kind of shopping center has appeared; the urban shopping center, in which the downtown area—father of all commercial centers—translates lessons learned from the suburban children into the downtown vernacular.

The Lloyd Center in Portland, Oregon, designed by John Graham, is an example. Located near the center of the metropolitan population, and only a few miles from the existing business center, it includes office buildings, hotels, institutional buildings, and other typical downtown elements. Service traffic is underground and vehicles are excluded from pedestrian areas, which are of various sizes and shapes. Since the Lloyd Center occupies expensive urban land, parking is in multi-level garages, and

public transportation facilities are also provided.

Our own office is working on two urban shopping centers. One, Midtown Plaza, is located in the heart of Rochester, New York. It will include two department stores and fifty smaller stores, plus what will be Rochester's largest hotel, a tall office building, auditorium, recreational facilities, etc., all arranged about a pedestrian area which was formerly a busy vehicular thoroughfare. Some of the structures are existing downtown buildings (a cinema, for example, will be connected to Midtown Plaza by an underground passage linking it to a three-level, 2000-car garage beneath the entire development), while others are new. From all levels of the garage, one can ascend by escalator to the pedestrian area,



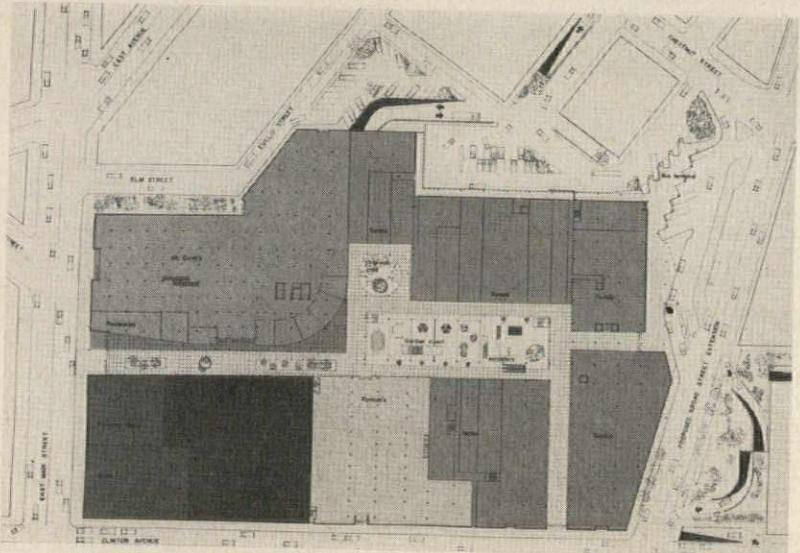
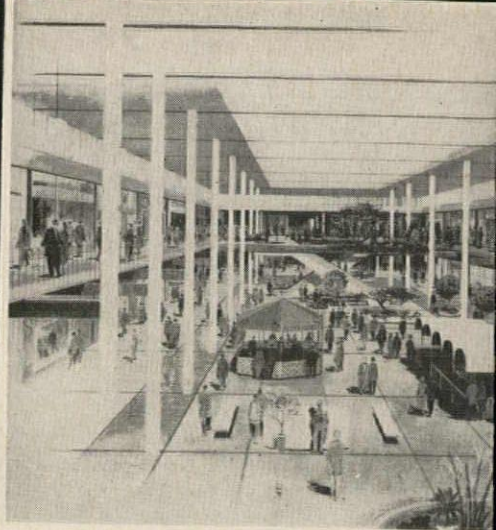
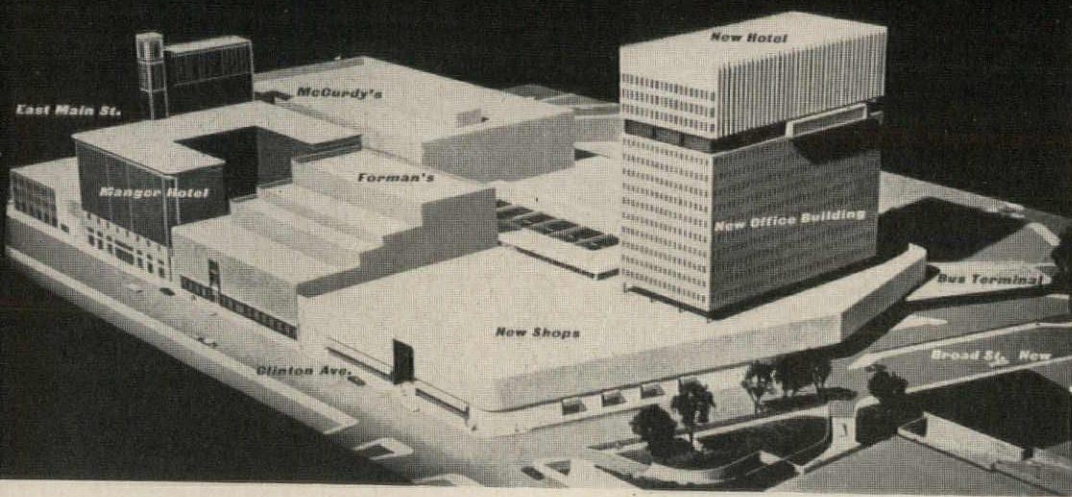
Westchester Terminal Plaza, in New Rochelle, N. Y., a unique, high-rise urban shopping center designed by Victor Gruen Associates, will feature an office building and hotel rising above shopping facilities, parking, and a suburban railroad station

which will be covered and air conditioned. Pedestrians may stroll in a space defined by variously shaped elements (the largest of which will rise two stories) which will appear as a garden court with planting, fountains, sculpture, benches, etc. A new bus terminal will serve out of town, suburban, and city lines. Additional bus stops will be provided at various perimeter points.

Another multi-purpose, urban shopping center now in the project stage is Westchester Terminal Plaza, in downtown New Rochelle, New York. It will be located only one-half mile from the present business center, and will be built directly adjoining the tracks of the New Haven Railroad. It will include a railroad terminal, ticket offices, etc., as well as a bus

terminal, multi-deck parking for 5000 cars, a theater, and auditorium, an office building, a hotel, and about 800,000 sq ft of retailing space. It will be a high-rise building with six parking levels, three merchandising levels, and a multi-story office building. Stores cannot be entered from surrounding streets; entrances from the parking decks will lead to the pedestrian areas.

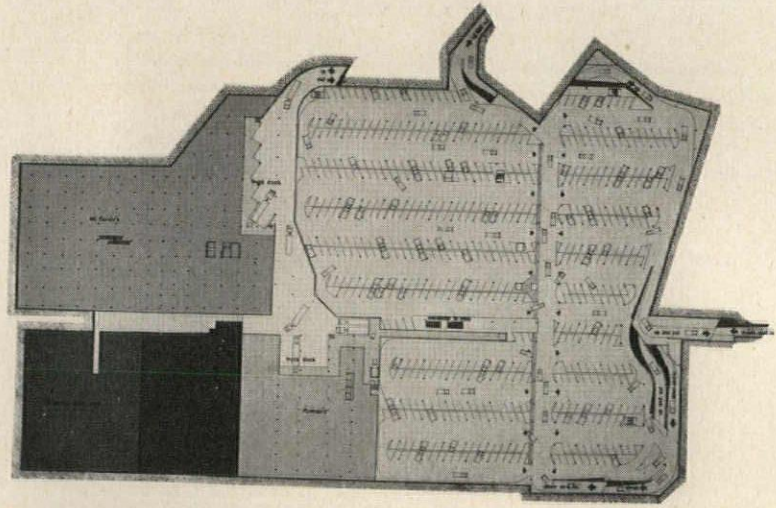
The foregoing three projects have one quality in common which accents the difference between an urban and a suburban shopping center; they occupy much less land. Westchester Terminal—if built on cheap suburban land—would cover about 100 acres. On urban land, however, it will occupy only 10 acres. Midtown Plaza will be built on 7 acres.



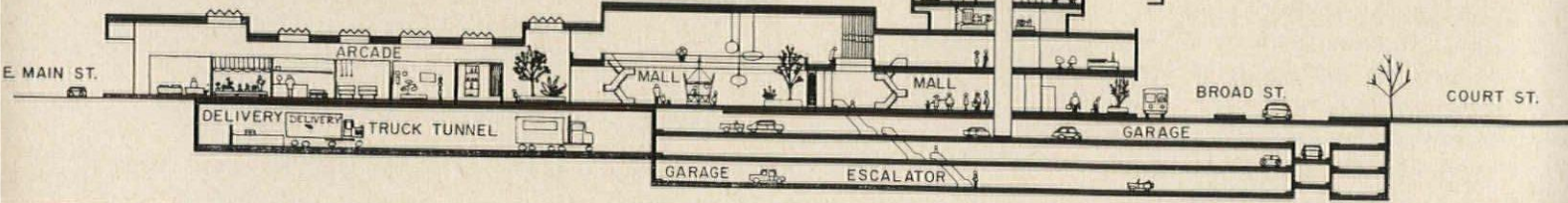
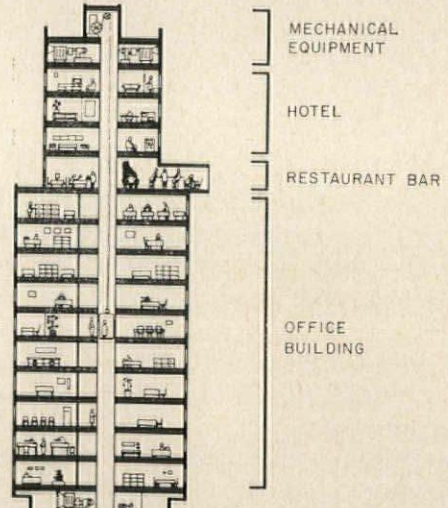
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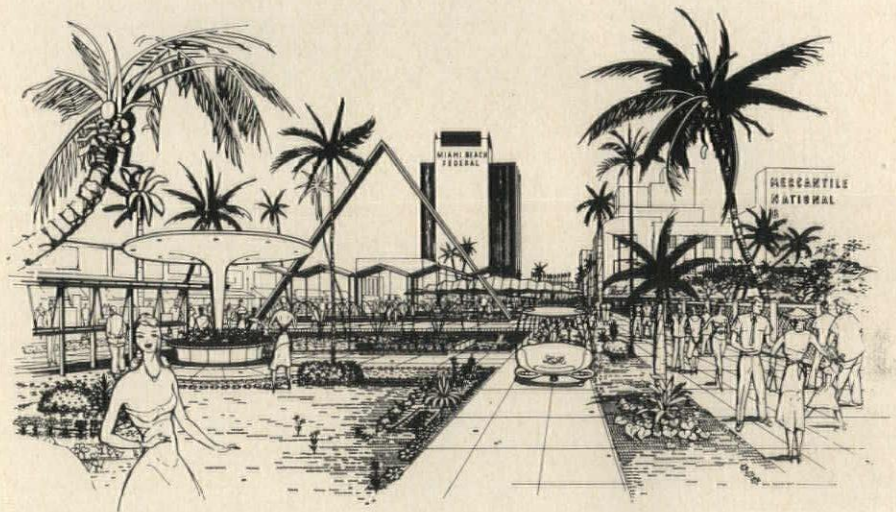
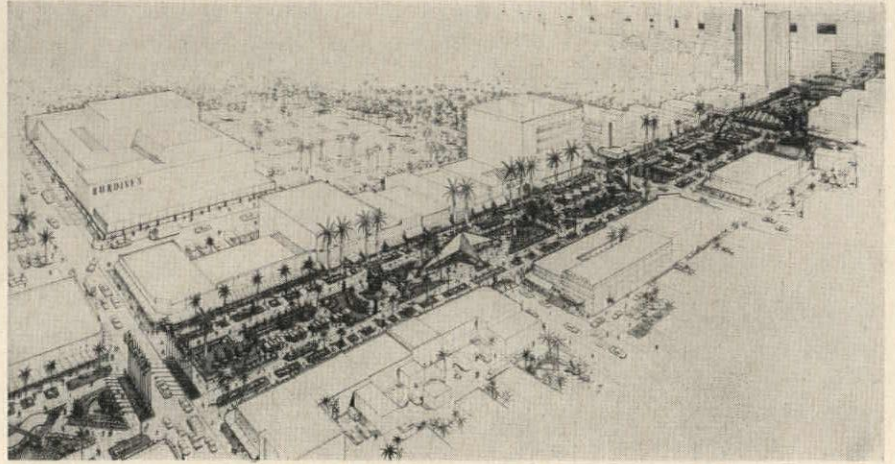
### THE URBAN SHOPPING CENTER

Midtown Plaza, a new urban shopping complex covering 10 acres in the heart of downtown Rochester, N. Y., is now under construction. It is being carried out under private sponsorship (2 department stores), and no public funds are involved. The maximum walking distance from any one tenant store to another is 560 ft; there will be surface parking for 6000 cars; underground parking for 2000. The section below shows the main elements in the project, which was designed by Victor Gruen Associates. Larry Smith & Co. were economic consultants



PARKING LEVEL





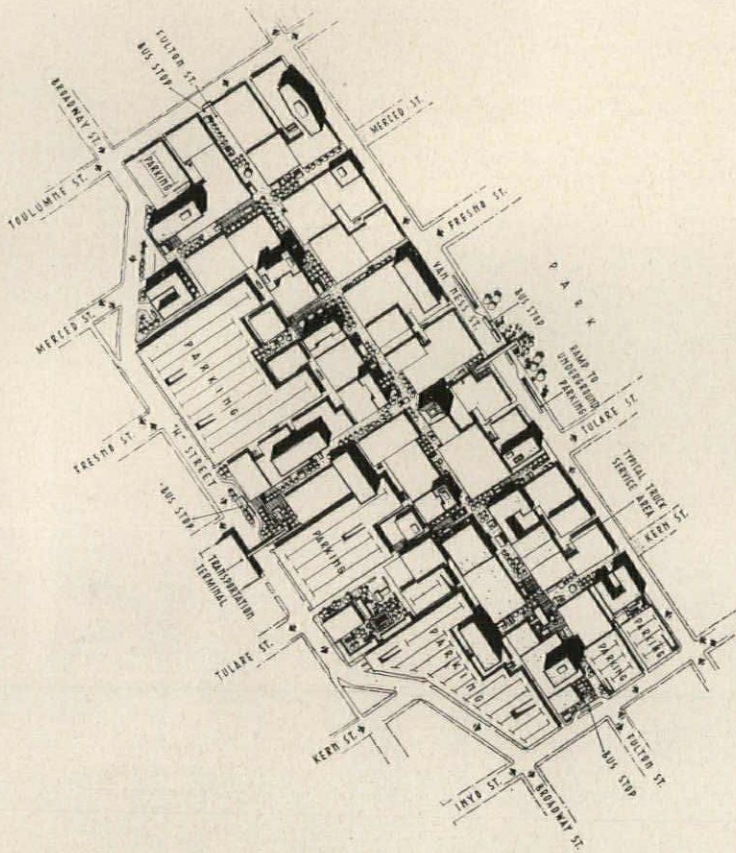
Palm-lined, 100-ft-wide Lincoln Road in Miami Beach will soon have its 12-block length converted into an attractively landscaped pedestrian mall, due to passage of a \$600,000 bond issue. The project, designed by architects Morris Lapidus, Kornblath, Harle & O'Mara, will be maintained by the city as a park

## DOWNTOWN REVITALIZATION

The core area of our cities has—in the large majority of cases—one inherent advantage suburban centers can never possess. It is located in the midst of an urban region about which the largest buyer's market centers. Despite the prophets of gloom, if full advantage of this potential is taken, downtown will become once more the most dynamic and economically sound retail, business, cultural, and administrative center of its region. But, downtown will have to do much more than it now does. One-way avenues, arterial highways, municipal parking, widening of streets, and downtown promotions of various types will not do the trick, and serve only as temporary expedients. The present rash of downtown malls serves only to demonstrate the desire of shoppers for a quieter, safer, more restful environ-

ment. But since most of the mall experiments are limited in scope and executed without regard for basic requirements (access, parking, services, etc.) they must be regarded as merely another promotion.

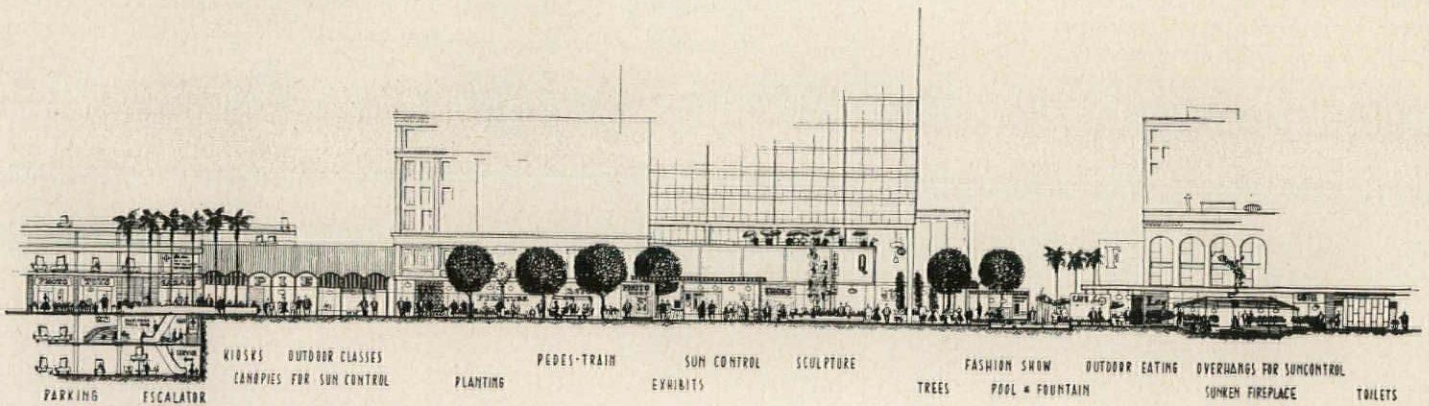
Downtown revitalization must be based on a clear over-all concept embracing all the qualities that make an urban environment both attractive and economically sound. Our plan of four years ago for downtown Fort Worth points in this direction. In developing it, we first delineated and defined the area which should be regarded as the core of the city. We tabulated present land uses and confronted this list with a tabulation of desirable land uses for the next twenty years. The comparison showed that the desired compactness could not be achieved at present because many low productivity land uses



### DOWNTOWN REVITALIZATION

On this page are shown the plan and typical section for the redesign of the inner zone of downtown Fresno, Cal., as designed by Victor Gruen Associates. Fresno is located midway between San Francisco and Los Angeles, and serves a four-county trade area of more than one million people.

The inner zone will include a retail area; office buildings; pedestrian areas; hotels, motels and apartments; a civic center; convention facilities; semi-public and recreational buildings. The redevelopment is being sponsored by the city, the city Redevelopment Agency, and a group of businessmen and property owners.

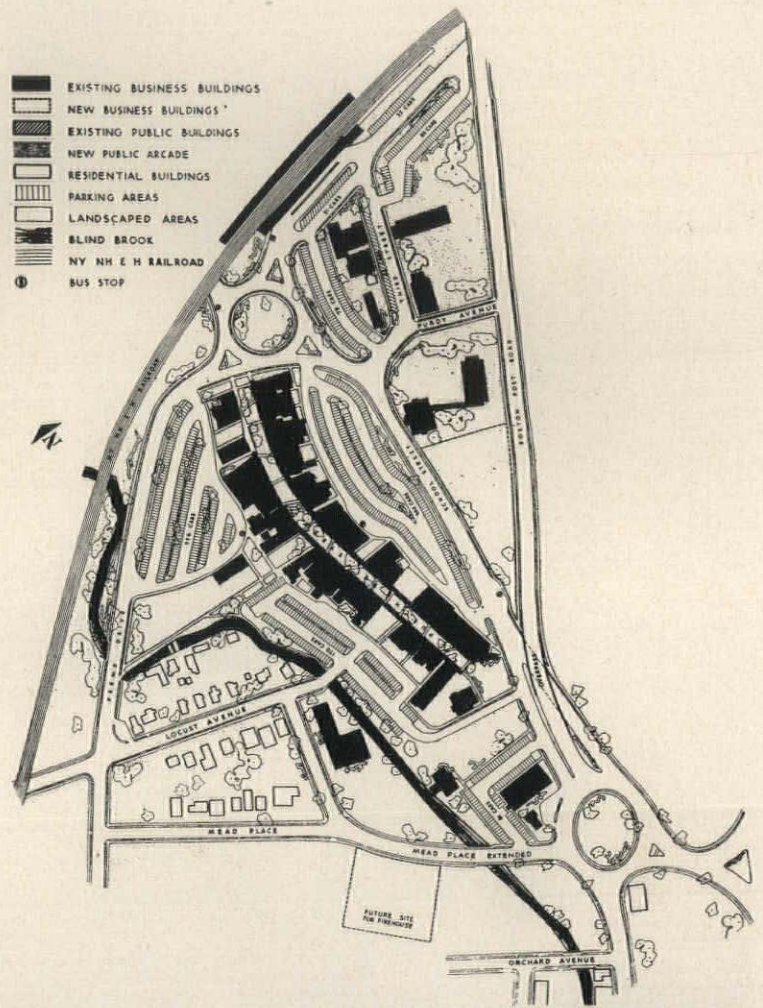


(storage, warehousing, manufacturing, and particularly the handling of moving or parked vehicles) interfered with the homogeneity essential to the functioning and practicability of a true urban center. Excluding all these non-compatible land uses, we then delineated a compact core area which would provide ample space for all compatible downtown uses and also those which could be expected to grow; plus generous open spaces, plazas, squares, and parks. This area was so compact it proved practical to make it a single pedestrian area, only slightly larger in size than several of the large regional shopping centers.

The plan called for an inner multi-lane loop road tightly circling the core area, into which highways from all directions would terminate. Adjoining this

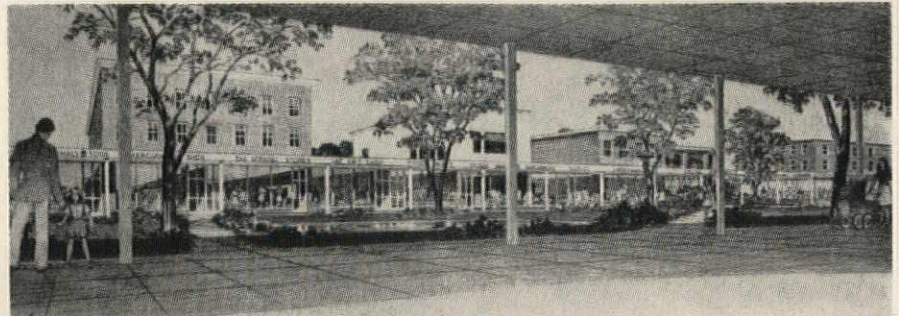
road, six multi-story parking garages were designed to provide 60,000 parking spaces. These rectangular garages will have their short sides on the loop road and their long sides reaching like fingers into the core area. Thus, no vehicular entrance will be more than two to two and one-half minutes walking distance from the central point of the pedestrian area. Special bus roads run along the sides of the garages; terminals are located near the center of the core area. Special arrangements were made for service and emergency traffic.

Monotony is avoided by variety in the shaping of open spaces. In certain areas we propose covered pedestrian spaces, especially where high density retailing occurs. The environment will be visually enhanced and made more convenient by colonnades



So far, 38 obsolescent buildings have been demolished to provide parking space for the redevelopment of downtown Rye, N. Y., a pioneer example (1946) of a well-planned, adequately serviced mall, by architects Ketchum, Giná & Sharp. The town in 1945 is shown at top left; the master plan—which is now being carried out (with minor changes)—is shown at top right.

Architect Morris Ketchum says, "The temporary mall idea is doomed to failure unless preliminary plans include proper provisions for perimeter traffic, automobile access, and adequate parking. You can't have all icing and no cake"



and other sidewalk shelters, covered crosswalks, landscaping, benches, fountains, sculpture, murals, exhibit areas, sidewalk cafes, etc.

The principles used in the Fort Worth plan have been followed more or less ably in master planning projects for about 50 cities.

If and when plans for city cores (now in various stages of preparation) are realized, urban shopping centers will rise to new importance. However, to think this will spell the end of suburban shopping centers is fallacious, for they will continue to play their specific role in meeting marketing and other needs, and to a lesser degree shopping-goods requirements. For the large cities, they will become satellite centers for shopping, cultural, social, and recreational needs.

The same planning principles apply to both urban and suburban centers, modified only by the fact that suburban land is cheaper and more easily available, and that mass transportation must play a larger part in the urban center, regardless of size or type. Most merchants fail to realize that the same principles apply to both, and downtown retailers—faced in most cities by an alarming drop in volume—think their salvation lies in more automobile traffic and more parking garages near their stores. They still fail to transfer their attachment from the automobile to the shopper, and are aided and abetted in their demand for more traffic by many traffic experts and city planners! Mr. Wiley, head of New York's traffic department, stated, "I have yet to see a city choked to death because of too much traffic. Cities

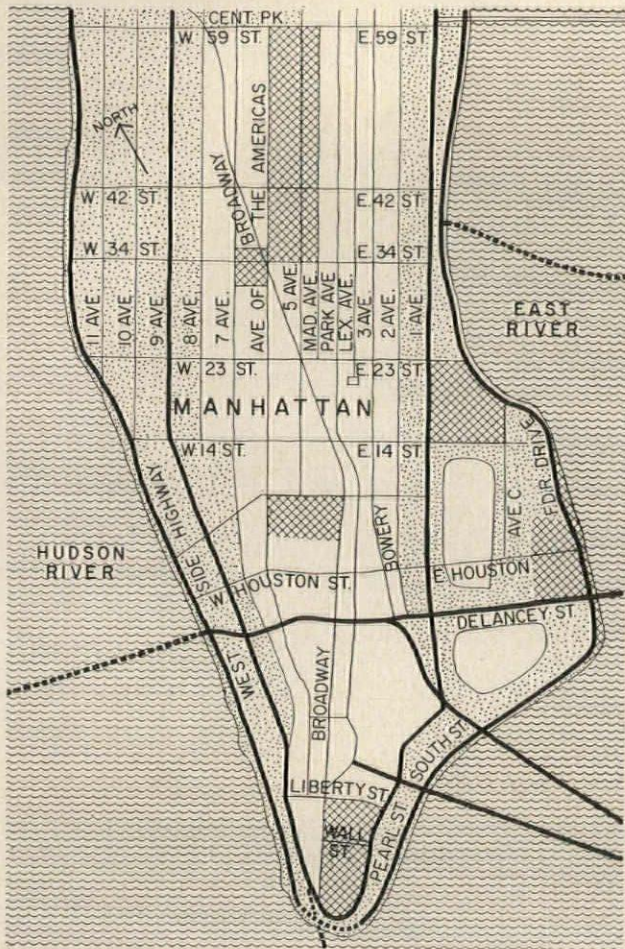
## HOW ABOUT ZONING FOR MANHATTAN TRAFFIC?

Victor Gruen says, "When asked if my approach to urban redevelopment could be applied to Manhattan, my answer (published in *The New York Times Magazine* on Sunday, January 10) proposes this basic idea:

"Zoning, which presently applies only to buildings, should be extended to cover the entire land mass of the city, including transportation. Areas not presently zoned (roads, parking lots, parking garages, etc.) occupy about one third of the total area in Manhattan, in the most urbanized of all cities.

"Zoning categories would then be set up for all areas, such as: zones for foot traffic only; for surface public transportation; for taxis only; for vehicular services (garages, etc.). Emergency vehicles could go anywhere; special arrangements might be made—if desirable—to permit service traffic in certain zones during carefully limited hours.

"If one applied such a scheme, then he could visualize an express traffic zone beyond the present one (West Side Highway and East River Drive) and located two or three blocks from each river. Accessory automobile zoning could then be spotted in the area between the two express zones and immediately adjoining the inner express loop, on a narrow strip. The remaining central area would then be zoned for public and semi-public transportation only (buses and taxis), with two exceptions: streets specifically semi-industrial (as the garment center) might be zoned for service traffic exclusively; and the highly qualified retail, office zoned for foot traffic only. Thus Fifth Avenue from 42nd to 59th Streets (together with certain side streets and Herald Square) could be converted into an attractive pedestrian island. Likewise, the Wall Street area and certain residential communities could be made strictly pedestrian oases"



- ▨ AREAS OPEN TO ALL TRAFFIC
- TAXIS AND TRUCKS ONLY
- ▩ PEDESTRIAN AREAS
- ══ EXPRESSWAYS FOR PRIVATE CARS AND TAXIS

expire because they don't have enough traffic, and we . . . say we serve as much traffic as we can."

Mr. Wiley's trouble is that he has hypnotized himself into believing that there is only one type of traffic—motor vehicles. And for this, he is willing to sacrifice public transportation, which today takes care of 80 per cent of all Manhattan-bound persons during rush hours; he is willing to cripple pedestrian traffic, and if pressed to the wall by the rising flood of cars, might want to sacrifice all the buildings in the city! He forgets—as most traffic engineers do—that traffic is a means of travel, not an end in itself. Our aim should be to move as many *people* and as much *merchandise* as possible, not to move as many *vehicles* as possible through streets flanked by buildings which are thus made unsuitable for human

activity. The sensible approach would utilize the most efficient carriers in such a way that they do not interfere with each other or with people on foot.

Thus, both in suburbia and downtown, we see the romance slowly ending; and find it being replaced by a more sensible and more lasting marriage based on convenience. Convenience for the automobile, in surroundings best fitted to its technological potentials—freeways and expressways where it can safely develop its speed; convenience and prosperity for the retailer, by giving him the true object of his affection—the shopper on foot, unharried by traffic—in an environment which is safe, pleasant, and also good to look at.





Wide World Photos

## ECONOMICS, PLANNING, AND PROSPECTS

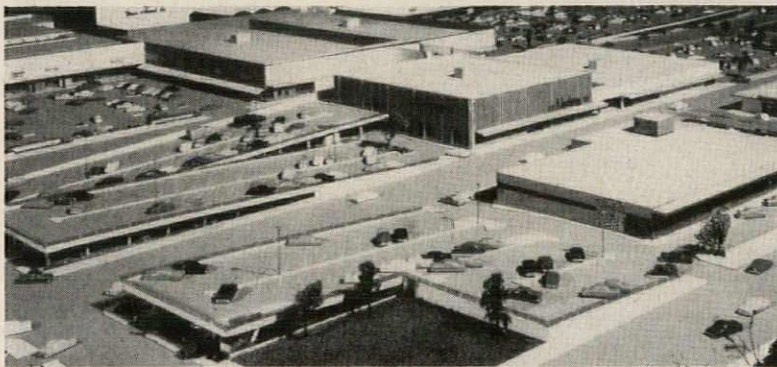
*Several  
Urban and Suburban  
Shopping Centers  
from the John Graham Office*

The Northgate Shopping Center, Seattle, Wash., above, was—according to John Graham—a pioneer regional center (opened in 1950), and became a prototype for many others that followed. The design features a well-developed pedestrian mall and underground deliveries and utilities

At one point during the discussion concerning the retailing centers shown on these four pages, John L. Follett, partner in the architectural firm, John Graham and Company, figuratively planted both feet on the ground and made these interesting observations: "It is an economic truism that in any shopping center operation, income must balance capital expenditures, i.e., cost of land, structures, utility systems, taxes, insurance, professional fees, brokerage fees, and the rising cost of money itself. This simple fact has been ignored by some developers, yet the rentals a retail tenant can pay are well established. The formulation of millions of leases has set up a recognized pattern for negotiation.

"The amenities architects can provide are regulated by the money the leases will produce. Downtown rentals—greater than suburban—can provide projects with greater amenity, but only if land costs and taxes are kept from skyrocketing. Urban renewal is a means of controlling or rationalizing the high land costs of downtown property; and is also a vehicle that will enable cities to rejuvenate themselves and compete forcefully with growing, prospering suburbia.

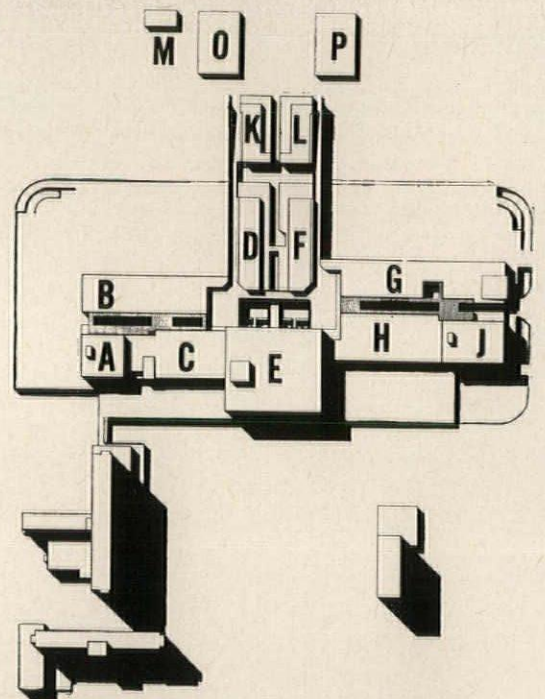
"Since the shopping centers of today will eventually become urban centers, the acres we now devote to automobile parking should be supplanted by multi-level structures, so that the land thus freed can be occupied by future buildings. Today's urban areas may develop as unplanned cities (even as most of those we live in) if we fail to recognize the problems our cities now face, and incorporate solutions for them into our design thinking."



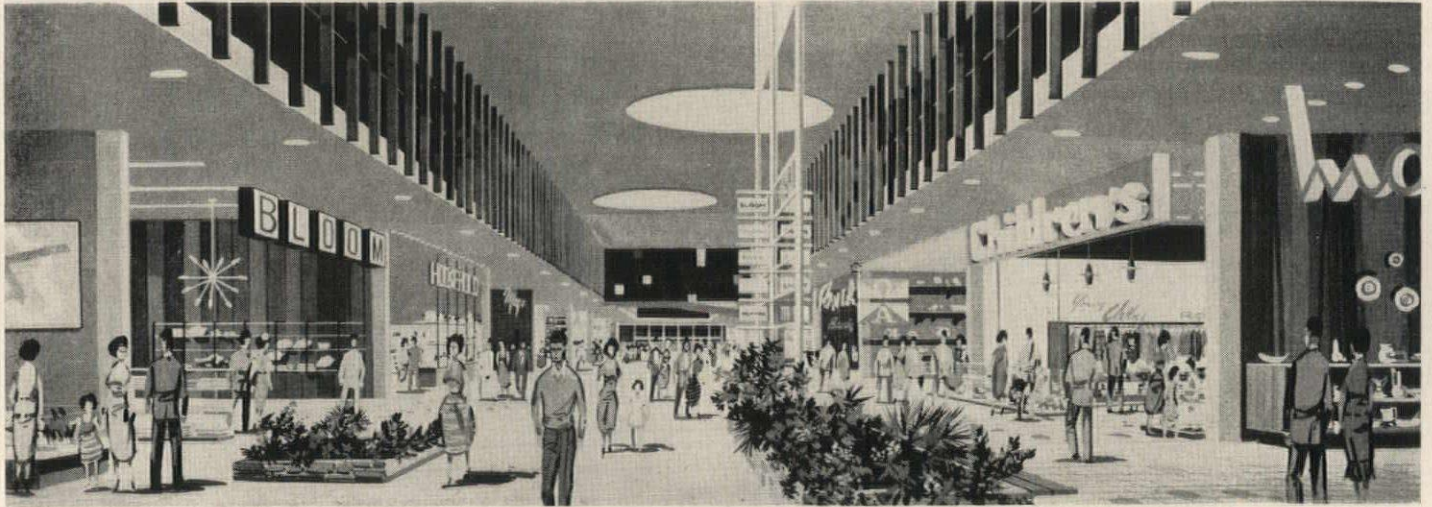
Model photos by Photo Art



The Lloyd Center, in Portland, Ore., built on 70 acres of expensive downtown land, provides 1,200,000 sq ft of building area and multi-deck, protected parking for 8000 cars. Architects John Graham & Co. designed the center as a complete urban complex which includes office buildings, hotels, institutional buildings—all set within a planned pedestrian park

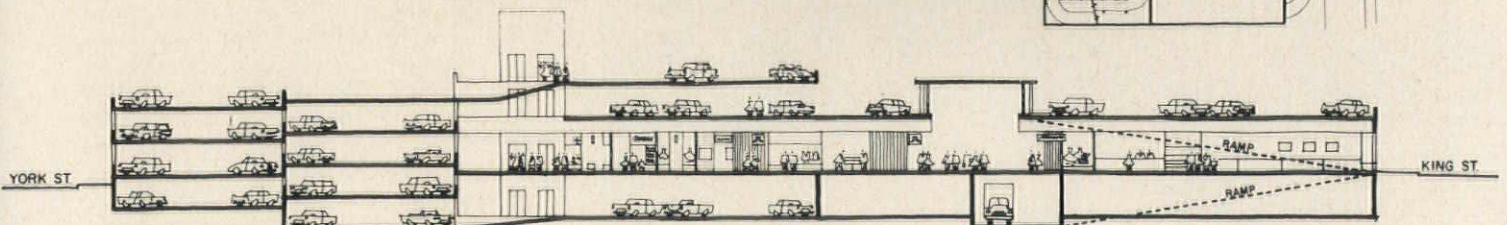
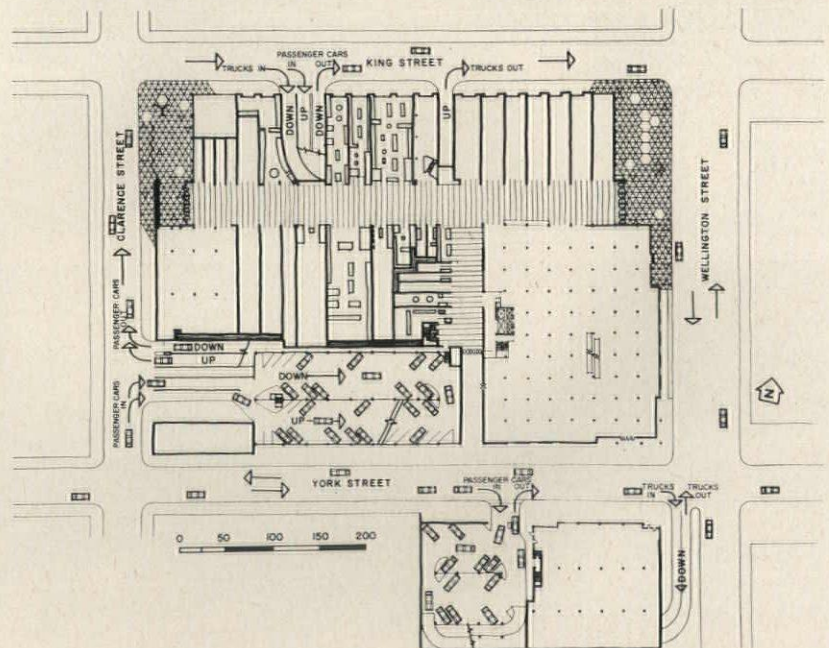


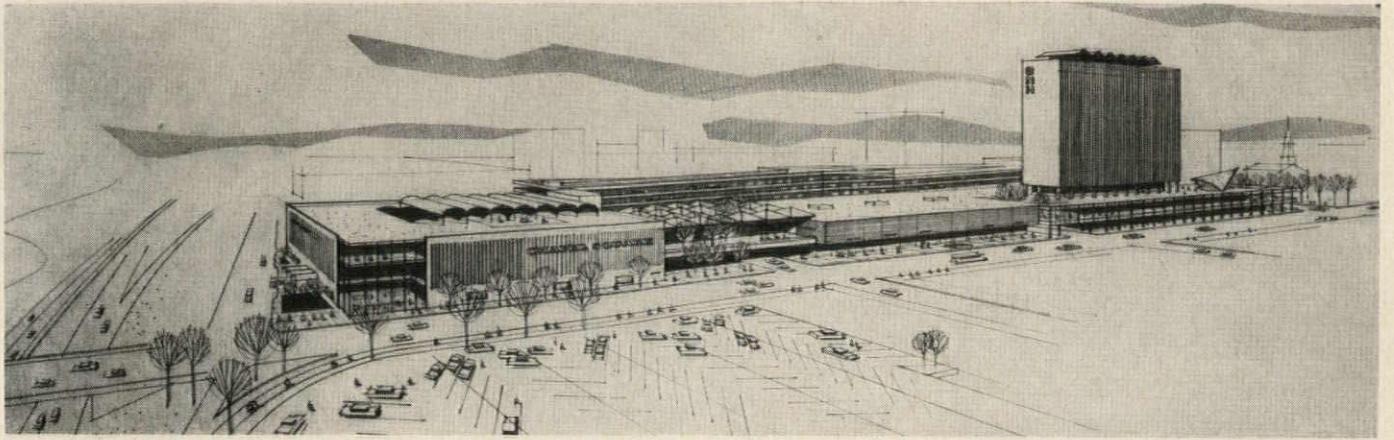
- |                     |                    |
|---------------------|--------------------|
| A. Women's Apparel  | H. Clothing Stores |
| B. Home Furnishings | J. Jr. Dept. Store |
| C. Restaurant       | K. Bank            |
| D. Home Furnishings | L. Hardware Store  |
| E. Department Store | M. Food Stores     |
| F. Specialty Shops  | N. Supermarket     |
| G. General Stores   | P. Supermarket     |



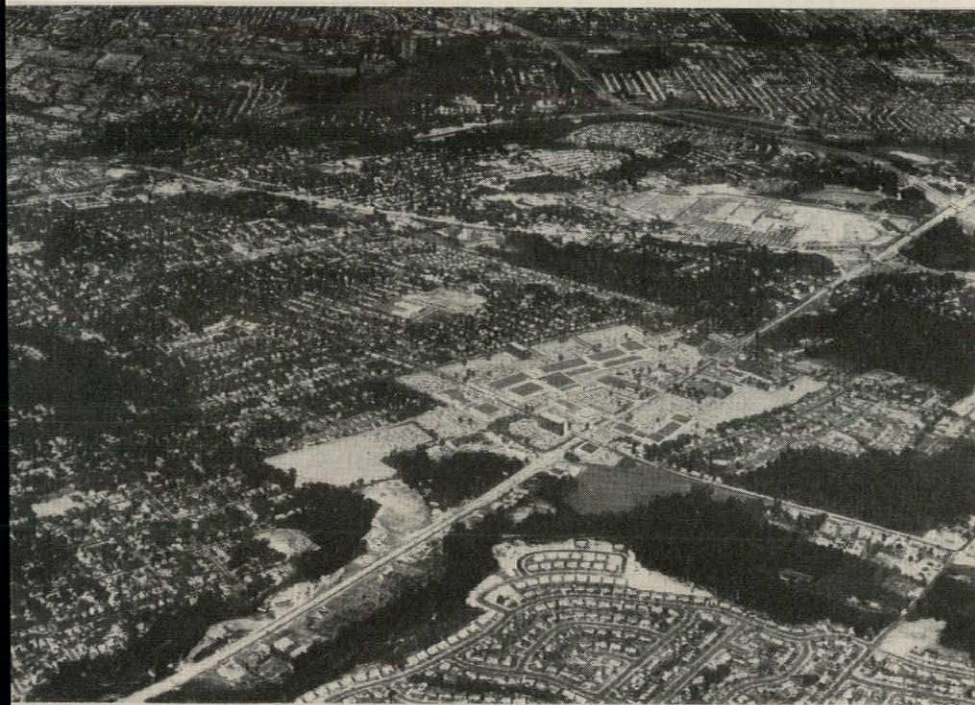
Wellington Square, in London, Ontario, points the way toward the ultimate downtown retail area. It encompasses a city block; has an enclosed, air conditioned pedestrian mall and multi-level parking below. All of the planning groups were called in during its development: traffic engineers, graphic designers, etc.

Although high land costs demanded a multi-level plan, the shopping-mall pedestrian traffic was not allowed to split into more than one level; the mall being a simple area at street level flanked by 36 shops and terminating in a department store. The mall is clerestory lighted, and the shops that line it open wide, both physically and visually, to the passing shopper





The Church Street Urban Renewal Project in New Haven, Conn., as designed by John Graham & Co., was sponsored by Roger Stevens Development Co., and will be under construction by spring, 1960. The high-rise element at right is a hotel-office building; at left is Malley's Department Store. A two-story link of specialty shops connects these main elements on two levels



Roger Dudley



Fairchild Aerial Surveys, Inc.

The two photos at left show the Bergen Mall Shopping Center—foreground and below—as designed by John Graham & Co., and the Garden State Plaza, designed by Abbott, Merk & Co. Here, within one-half mile, is an area embracing a population greater than that of Cleveland. As Follett points out in his comments, this sort of situation cries out for unified planning; these suburban centers of today will inevitably become the urban centers of tomorrow

# Architectural Engineering

## Thin Shells Growing Up

The thin shell has come to be a convenient form for spanning and enclosing space. Perhaps too much so. The engineering fitness of shells in relation to architectural application does not always get the attention it deserves. The two-part article by Gunhard-Æstius Oravas beginning this month makes clear the pitfalls lurking in shells when their physical behavior is not comprehended. Here, then, is one engineer stirring up the pot a bit. A chance for everybody to throw something in the pot, or pick morsels out of it, has been made possible through the recent formation of the International Association for Shell Structures in Madrid. Activities announced are a conference on "Precast Shells" this fall (Warsaw or Dresden) followed by others on "Experimental Research" (Delft, Holland) and "Approximate Methods of Calculation" (Brussels). A quarterly magazine will begin publication this year. President of I.A.S.S. is E. Torroja of Spain, and one of the two vice-presidents is A. L. Parme of the U. S. For information write to: Secretariat of the International Association for Shell Structures, Alfonso, XII, Madrid (7), Spain.

## The Compleat Engineer

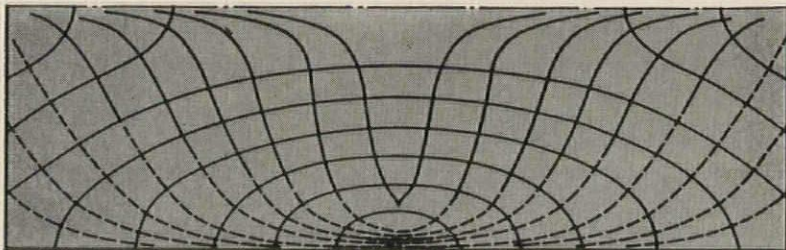
"Illuminating engineers are so obsessed by efficiency that they lose all sight of character in lighting. Occasionally, some man like Basset Jones, Jr. talks to them good sound sense, but he talks over their heads."—from an article in ARCHITECTURAL RECORD, October 1913. Basset, who died January 25 at the age of 82, knew whereof he spoke judging by his record: he designed the elevator system in the Empire State Building; directed the illumination for the 1939 New York World's Fair; supervised the stage lighting for the late Maude Adams in "Peter Pan"; was known as an economic theorist; on Nantucket, developed a strain of black Japanese pine resistant to salt water spray, and conducted experiments in breeding shellfish; in 1923 financed Charles Birdseye in his quick-freezing process for fish, the forerunner of modern-day frozen foods. Jones shared Frank Lloyd Wright's distaste for cities, and concluded that one way to make it impossible for people to live in them was to put up many very tall buildings, and this could only be done if the art of elevator design kept pace with building design. In experimenting with elevators he got them moving so fast that elevator operators couldn't stop within three or four floors of their destination, so he designed the first push-button controlled elevator. At the New York World's Fair he championed the idea that buildings should glow from within rather than having light thrown at them by floodlights. Jones didn't believe that buildings should look the same at night as in daytime; he preferred them vague, poetic and misty. Basset Jones was a partner in Meyer, Strong & Jones, Consulting Engineers.

## Ur Not Apt to Forget

On the one hand, the clay masonry industry hopes that research will keep it in the running in the steady march toward mechanization of building. On the other hand, it would not like architects to forget that brick has a "physical timelessness and durability almost beyond belief." As a gentle reminder of this fact, the Structural Clay Products Institute, on the occasion of its 25th anniversary, presented a 5000-year-old brick from the ancient Mesopotamian city of Ur to the American Institute of Architects to be reposed in the A.I.A.'s august gallery at The Octagon in Washington. The ruler at Ur in 3000 B.C., King Shulgi, must have recognized the permanence of brick because he imprinted it with his royal stamp which read, "The divine Shulgi, mighty man, King of Ur, King of Sumer and Akkad." What better way to be remembered to posterity?

## This Month's AE Section

*THIN SHELLS*: Engineering Fitness and Architectural Form, p. 216.  
A Design Tool for Determining *ACOUSTICAL PRIVACY REQUIREMENTS*, p. 222  
*TECHNICAL ROUNDUP*, p. 225. *PRODUCT REPORTS*, p. 227. *LITERATURE*, p. 228.  
*TIME-SAVER STANDARDS*, Residential Heating and Air Conditioning, pp. 231, 233, 235.



# Thin Shells: Engineering Fitness and Architectural Form

by *Gunhard-AEsius Oravas*  
Assistant Professor Engineering Mechanics,  
McMaster University  
Hamilton, Ontario

Part 1 of 2

Engineers, perhaps unfortunately, can make virtually anything "stand up," but unless the architect evolves his initial concept for a thin shell with a solid and almost intuitive understanding of what thin shells can and cannot do, the finished structure may be heavy, awkward and clumsy, mirroring its distress at having been pressed into a stylistic mold without regard for its intrinsic patterns of behavior.

The efficiency of thin shells stems principally from their ability to transmit applied loads by membrane stresses. To the extent that these membrane stresses are replaced by bending stresses, to that extent the shell's efficiency is reduced. In a properly designed shell, the transverse bending moments near its boundaries can be considered merely a disturbance to the predominant state of membrane stress. If, however, a shell is conceived without regard for their deleterious effects and without an understanding of how to minimize them, the bending moments themselves may

become the predominant stresses within the shell while the desirable membrane stresses become in effect only a disturbance. In such a case, a thin shell is scarcely more efficient than a slab or a beam.

This situation can be avoided by careful manipulation of the geometrical contour of the shell to minimize its inherent boundary disturbance and by equally careful attention to the nature of the boundary supports. Otherwise, as detailed in the following review of thin shell behavior, the architect's quest for openness (and hence lack of support) along the boundaries of a thin shell roof may lead not to the airy, floating form desired, but to a shell that is less delicate and less efficient than it might otherwise have been.

## A Review of the Structural Behavior of Thin Shells

A thin shell can be described as a structure whose two lateral dimensions (sides) are very large in comparisons with its third dimension,

Though it has long been a common technique in architectural criticism, the approach used here—the exposition of general concepts through an examination of specific buildings—has rarely been applied to discussions of broad engineering principles. In this article, nevertheless, it seems peculiarly appropriate, since the author's aim is not to present technical information ("engineering talk," as he puts it), but to advance a point of view that may prove helpful to both architects and engineers in evaluating proposed thin shell designs.

Oravas does not suggest that the architect need acquire the engineer's knowledge of thin shell structures. But he firmly maintains that at least a qualitative understanding of their structural behavior is imperative if the architect hopes to see more than an incidental resemblance between his soaring vision and its final realization.

Accordingly, this provocative discussion focuses attention on the critical importance of boundary disturbances in thin shells, not by a theoretical analysis but by examining actual shell structures in the light of their boundary behavior. In this issue, Oravas deals with cylindrical shells—closed, open and segmental. Next month he will conclude his discussion with an examination of doubly-curved shells of positive, negative and compound curvature, and a brief look at folded plates.

thickness. In general, it possesses curvatures in two directions normal to each other at any point on the shell surface, as shown in Figure 1. Mathematically, the curvature is equal to the reciprocal of the radius:

$$\text{curvature} = \frac{1}{\text{radius}}$$

Thus a flat plate is obviously a special degenerate case of a thin shell whose radii have been made to approach infinity.

The purpose of any structure is to transfer the loads it carries to the supports, the efficiency with which this can be accomplished depending entirely upon the type of structure, its properties, and the nature of its supports. The thin shell strives to transfer all its surface loads in such a way that it has to mobilize the minimum amount of its intrinsic "strength"; that is, by stresses that cause the least possible deformation.

In the case of a thin shell whose geometrical configuration possesses spatial curvatures, the types of internal stresses that tend to deform

it least are the "membrane" stresses which act in its surface. As can be seen from Figure 1, these tangential stresses possess vertical components capable of transferring the surface loads to the supports.

In the case of flat plates (Figure 2), because of the absence of curvature, such membrane forces cannot develop vertical components to transfer loads. Since a flat plate structure can therefore derive no benefit from them, the membrane stresses do not develop at all. However, since the applied loads *have* to be transferred to the supports, a new set of internal forces—the transverse shear forces acting normal to the surface of the plate—has to emerge. Unfortunately, the transverse shear forces cannot alone maintain equilibrium in the plate, and so must be accompanied by transverse bending and twisting moments if they are to exist at all.

It is well known that any thin structure deforms appreciably when subjected to transverse bending moments. The reason for this behavior is that the magnitudes of the transverse moments are functions of the thickness of the structure, which in the case of plates and shells is rather small. Since the magnitudes of the load-transferring transverse shear forces in turn depend on the magnitude of the inherently small bending and twisting moments, it seems obvious that transverse bending is a very inefficient way for thin shells to support their loads.

For instance, a sheet of cardboard can be stressed in its own plane with considerable uniform load without any appreciable deformation, yet laterally it is unable to support any uniform load to speak of. However, when the same cardboard is given an initial curvature, it can support considerable lateral loads without undergoing large deformations. Obviously the curved configuration permits the thin cardboard to develop membrane stresses which can carry the surface loads to the supports with a minimum of effort.

If the loading supported by the thin shell is reasonably uniform and the deformations that result from the membrane stresses are permitted to develop freely, then the shell strives to transfer all its surface loads by the membrane stresses alone. However, the spreading deformations emanating from the membrane stresses in the thin shell can seldom

run unhampered over the shell's total surface. As a rule, the region where the membrane deformations are unable to satisfy the actual final configuration of the thin shell is in the neighborhood of its boundaries. Thus in this region transverse forces and moments have to appear in order to establish an edge configuration that is compatible with the nature of the shell's support.

In the neighborhood of the boundaries, transverse bending dominates, but fortunately, in the case of most shells, this transverse bending zone is limited to a rather narrow strip around the shell's edge. If this zone constitutes a small fraction of the total surface area, then the transverse bending effect can be considered to be a mere "disturbance" of the dominating membrane state of stress within the shell.

It is commonly found that the most critical stress conditions prevailing within the skin of thin shell structures are brought about by such boundary disturbances rather than by the membrane stresses themselves. In considering the stability of thin shells, the membrane stresses do play an important part, but under ordinary circumstances, the buckling phenomenon is seldom the determining factor in the proportioning of a thin shell structure.

The primary objective of the designer, from a purely structural point of view, should be the quest for a thin shell whose configuration and edge supports would tend to reduce the boundary disturbance of the shell to the bare minimum. Such a purely structural solution rarely, however, meets the functional requirements of the best architectural solution, so that a satisfactory balance must always be struck between the two alternatives: the best architectural design and the best structural design.

### Closed Cylindrical Shells

Silos, bins and reservoirs are often constructed as thin cylindrical shell structures stiffened by transverse diaphragms. Such shells are quite efficient in supporting axial and lateral loads, and, as a rule, have rather narrow boundary disturbance zones. If they are subjected to internal pressure, then the predominating membrane stresses within the skin of the shell are tensile. Obviously, in the case of a reinforced concrete shell, this should be avoided. However, if such a shell is subjected to external pressure, the membrane stresses are predominantly compressive and concrete becomes a highly suitable construction material.

If the closed concrete cylindrical

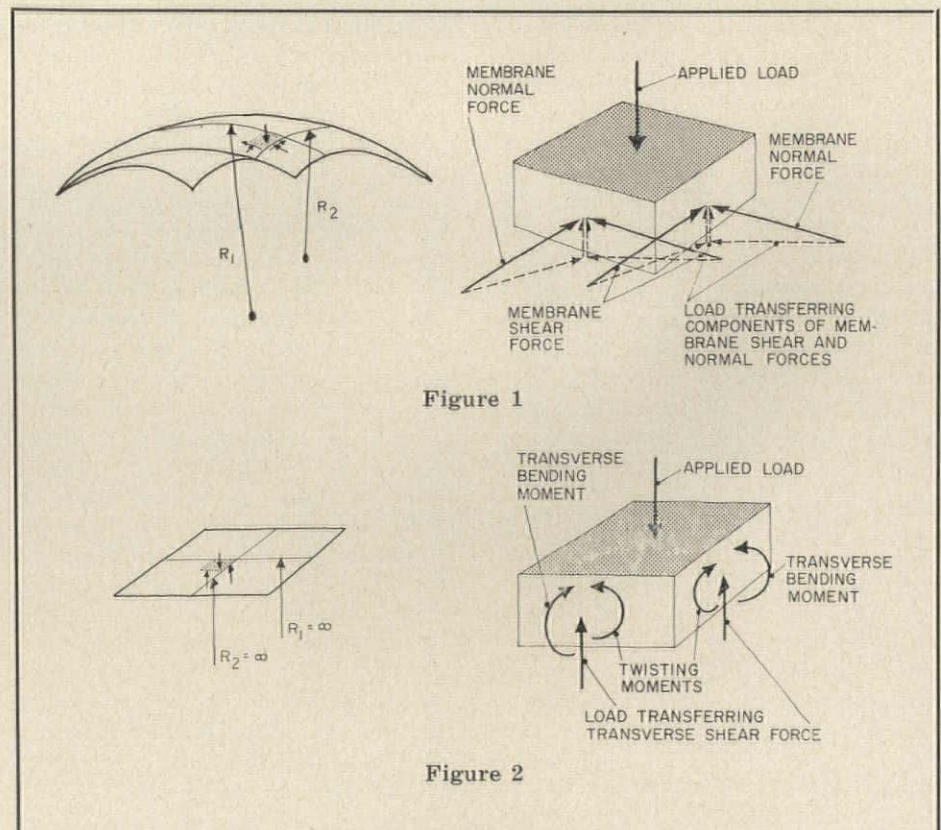
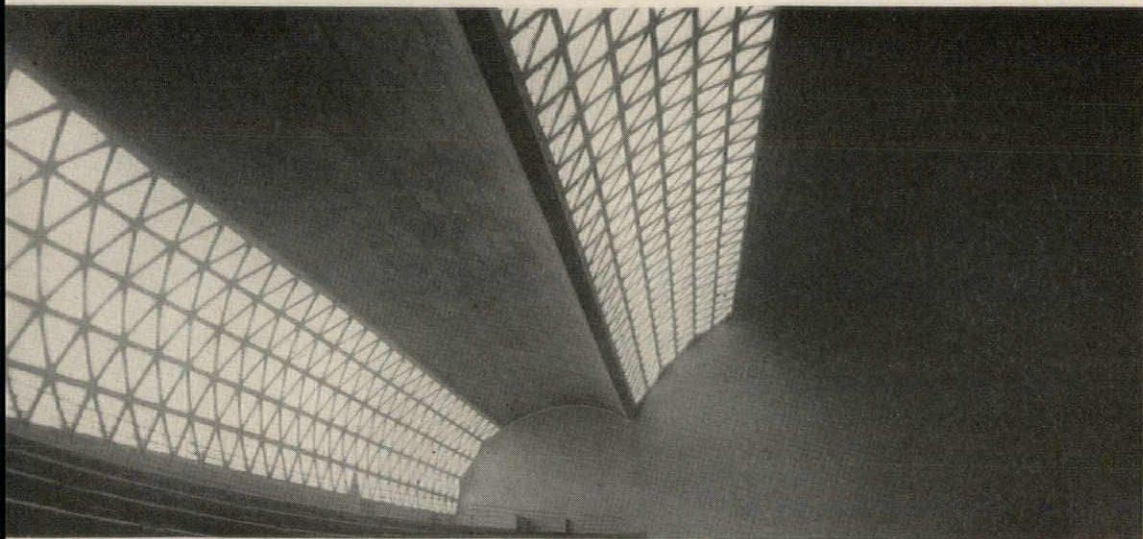


Figure 1

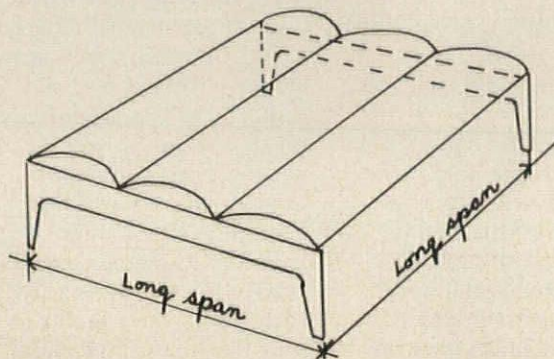
Figure 2



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3



5

shell is subjected simultaneously to external and internal pressure, then the membrane stresses are compressive as long as the external pressure exerted on the shell is greater than the internal pressure. If the tank is subjected to internal pressure of a limited maximum intensity brought about by its contents, then the desired external pressure can be introduced by prestressing in order to maintain a resultant compressive stress in the skin of the shell.

Then the only tensile stress condition appears in the boundary zone, which is of limited width around the shell's edge. The depth of this zone is a function of the shell's thickness and radius. In general, the boundary zone disturbance can be diminished by reducing the thickness of the shell. At least in principle, there are no fundamental difficulties connected with the proper design of prestressed closed cylindrical shells.

#### Open Cylindrical Shells

Because of the early work of the

German engineers, Dr. Ulrich Finsterwalder and Dr. Franz Dischinger, who made it the object of their pioneering efforts to predict thin shell behavior by theoretical analysis, the cylindrical barrel shell occupies a unique place in the annals of thin shell design. In spite of their historical importance, however, there is little to be recommended in the use of such shells, since the desired membrane state of stress as a rule does not dominate in them, and may not even exist at all. As a matter of fact, the membrane state of stress rather can be considered a disturbance of their prevalent state of transverse bending. Such behavior contradicts the fundamental aim of thin shell design, which is to find configurations that tend to minimize the transverse bending phenomenon.

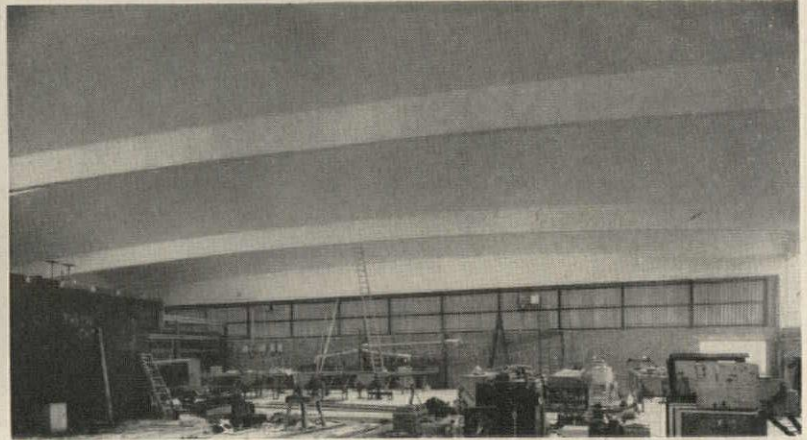
Among the cylindrical barrel shells, there is a special type called the short barrel shell which is shown in Figure 3. This type of structure hardly deserves to be called a shell because of its almost linear struc-

tural behavior; i.e. it acts very nearly like an arch. The structural behavior of the short barrel arch is very crude when compared to that of a pure shell and its clumsy appearance testifies to its generally inefficient performance. Time and time again this form of thin shell is used for enclosing large areas, even though its appearance should give enough reason to search for new shell forms that can perform their structural functions more gracefully.

One such form was a contribution by Spain's Dr. Eduardo Torroja, who designed the delicate and highly ingenious intersecting twin barrel shell roof shown in Figure 4. Even though the boundary disturbance in this shell was as prominent as in all shells of cylindrical barrel type, its stunning originality and pioneering audacity seem to fully justify its adoption in this instance.

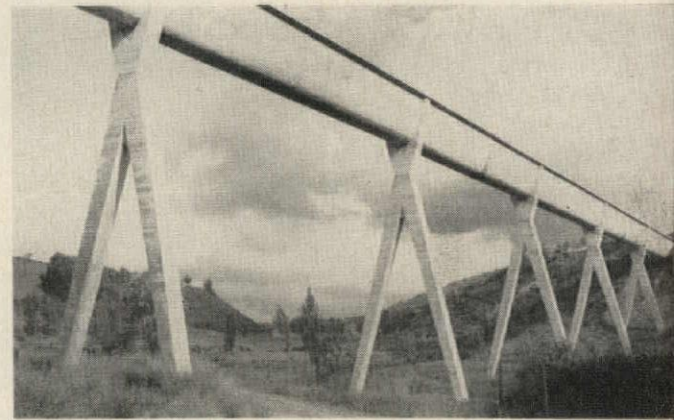
In striking contrast is the shell structure shown in Figure 5. Here, barrel shells, capable of covering long spans, are supported at their





6

7



3. Alabama State Coliseum, Montgomery, Ala.; Sherlock, Smith & Adams, Architects; Ammann & Whitney, Consulting Engineers. 4. Fronton Recoletos, Madrid; S. Zuazo, Architect; Eduardo Torroja, Engineer. 6. Fropax Ltd. factory, Kings Lynn, England; H. G. Cousins, Consulting Engineer; Holst & Co. Ltd., Contractors. 7. Aqueduct, Allos, Spain; Eduardo Torroja, Engineer. 8. Exhibition Hall, Munich; Baudir, Zametzer, Baurat, Rosenthal, Architects; Dyckerhoff & Widmann, Structural Engineers. 9. Railroad platform roof, Koblenz, Germany; Dyckerhoff & Widmann, Structural Engineers

ends on a girder. This girder has been assigned the task of transferring shell reactions of considerable magnitude by transverse bending over the girder's long span to its supports. Obviously, since the girder has been forced to perform its load transferring function in the most disadvantageous manner, it had to assume monstrous proportions in order to be capable of the task.

Even the advent of prestressing could not exonerate the disarranged structural logic involved in this type of construction, which betrays an all-too-common lack of understanding of the boundary supporting problem of the thin shell.

As can be deduced from the foregoing discussion, the cylindrical shell in general does not represent the best features of thin shell behavior because of the widespread transverse bending that propagates from its boundaries and because of the rather large diagonal tensile stress resultants that appear in barrel shells of certain proportions. The latter phe-

nomenon is a particular nuisance when the shells are constructed of reinforced concrete, which is the current practice in the building industry.

In an attempt to diminish these adverse effects of cylindrical shell behavior, the straight generator could be made to assume the shape of a shallow segment of a curve, thus producing a shell of double curvature as shown in Figure 6. The longitudinal curvature of the shell is helpful in reducing the boundary disturbance zone propagated from the long edge. Roughly speaking, the more the longitudinal generator is made to curve, the shorter is the reach of the boundary disturbance that propagates from the long edge of the shell. Thus it is evident that by introducing an appropriate longitudinal curvature into the geometry of the barrel shell its transverse bending zone can be reduced at will. Theoretical methods for the analysis of such shells have been developed by the Russian engineer Ambart-

sumyan and German engineer Windels, thus making these shells available to architectural application.

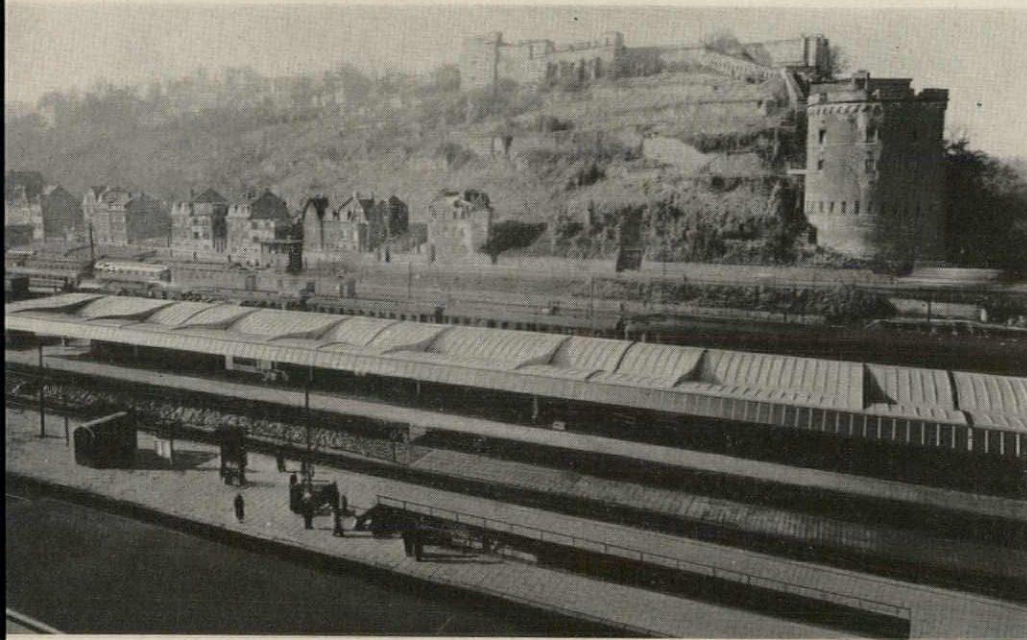
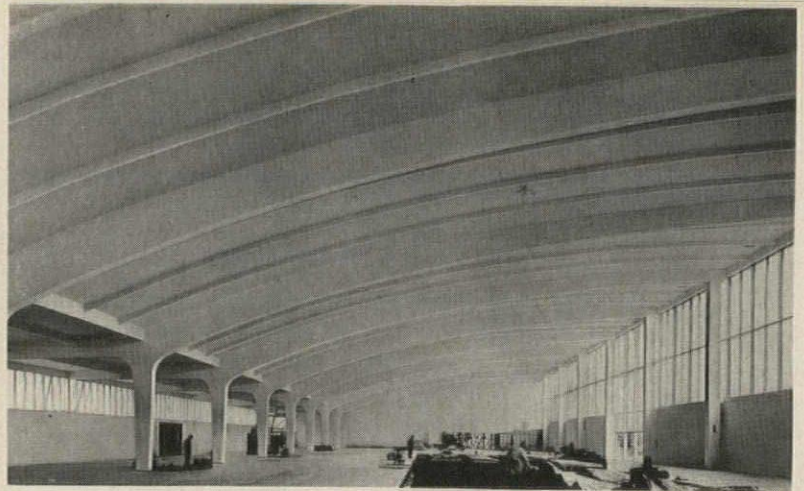
The immense popularity of cylindrical concrete barrel shells stems largely from the fact that they permit relatively inexpensive formwork to be manufactured out of straight pieces of lumber. Many designers justify the use of the barrel shell as a space spanner only because it behaves somewhat more efficiently than a slab or a beam structure and because of the additional economy in its formwork. However, this argument seems to be a rather weak justification for adopting a shell configuration that possesses poor properties of structural behavior.

Many great shell pioneers, notably Dr. Torroja and Dr. Finsterwalder, after scoring their initial successes in conventional reinforced concrete shells, set out to search for means of overcoming this disadvantage. They found a relatively satisfactory answer in prestressing. Dr. Torroja, for example, used longitu-

Muller-Grah, Munich



8



Weiland, Koblenz



9

dinal and transverse prestressing for the esthetically striking aqueduct shown in Figure 7 in an attempt to eliminate longitudinal and transverse tensile stresses in the concrete shell. Figures 8 and 9 show cylindrical barrel shell structures which were designed by Dr. Finsterwalder using prestressing in a variety of novel ways in order to overcome the undesirable tensile stress present in the shells. It is instructive to note that the firm Dyckerhoff & Widmann K. G., which carried out Dr. Finsterwalder's pioneering work in thin shells, has constructed only prestressed cylindrical barrel shells since the war.

In conclusion, the following points can be raised in connection with cylindrical barrel shells:

1) The use of cylindrical concrete barrel shells is *fully* justified only when prestressing is applied.

2) The use of short barrel shells should not be encouraged because their structural behavior is a travesty on pure shell action.

3) While conventional cylindrical shells are somewhat cheaper than, for instance, shells of double curvature or prestressed shells, it is the writer's opinion that, if the initial cost is of cardinal importance a conventional framing system should be adopted instead of a barrel shell.

#### Segmental Cylindrical Shells

An early type of a composite octagonal thin shell cupola is shown in Figure 10. Dr. Dischinger, who pioneered the theoretical analysis of such shells, named them multi-edged cupolas (in German: *vieleckkupeln*). There are innumerable other such compound shell configurations which can be constructed by combining cylindrical shell segments into a cupola, but these cupolas all have one characteristic in common: their structural behavior as a thin shell is extremely delinquent. As a rule, there is no membrane state of stress existing within the skin of the cylindrical shell segments and heavy transverse bending dominates.

This adverse condition exists in all structures where cylindrical shell segments are employed. It was pointed out earlier that the thin cylindrical barrel shell behaves rather uneconomically as space spanner when compared to the pure shell action. This already poor structural behavior of the cylindrical barrel shell deteriorates considerably more if the barrel shell is sliced up into segments that have to carry loads as components of a compounded cupola.

Such shells have, in fact, rapidly lost their popularity and have recently been used only in connection with precasting methods. The most that can be said in their defense is that their structural behavior is somewhat superior to that of folded plates, were the plates to be used in their place. On the other hand, it is doubtful whether the slight advantage in structural efficiency of the segmental barrel shell over folded plates is sufficient to offset the higher cost of its formwork.

A particularly exciting shell con-

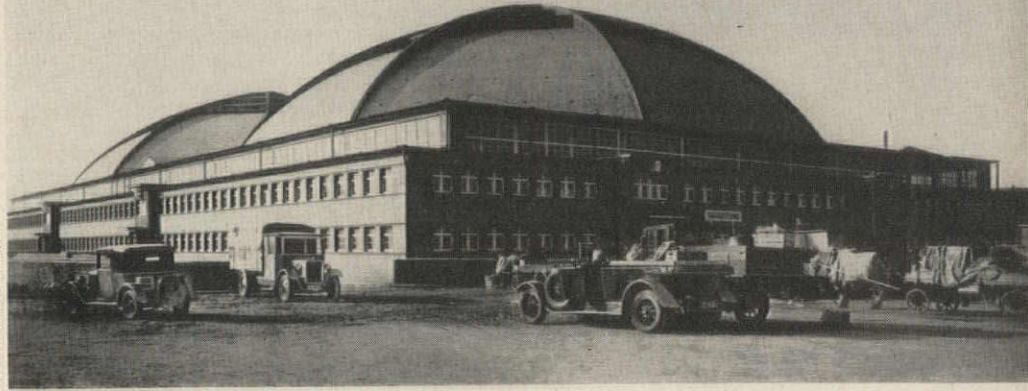
figuration is obtained when two identical cylindrical barrel shells are made to intersect at right angles and the interior portions of the shells removed, as in the monumental project shown in Figure 11. There are so many controversial features incorporated in this structure that it is instructive to scrutinize it in some detail.

As was pointed out in the foregoing discussion, segmental cylindrical shells simply *do not* behave economically, especially if they have been assigned to enclose long spans. The segmental barrel shells transmit considerable loads to their boundaries to be absorbed by the boundary members in order to maintain the structure in equilibrium. If the boundary members are also to support long spans, then they are likely to be heavy in comparison with the thickness of the shell. Unfortunately the expansion or contraction of such heavy members due to ambient thermal changes lags behind that of the flimsy shell structure, bringing about additional boundary disturbances which very often are of the most critical nature. Hence it is evident that a reduction in the unsupported length of the edge member is accompanied by a diminution in its size, which in turn brings with it the desirable relaxation of the dangerous boundary disturbance in the thin shell. This phenomenon is not limited to the shell under discussion but is valid for all types of thin shells.

Had the designers of this project modified somewhat the relative proportions of the cross barrel thin shell and relaxed somewhat the stringent outside boundary conditions by permitting a few intermediate edge member supports within the window frames, then the shell structure would have lost most of its bulk in the boundary arches and its appearance would have been improved to a large degree.

In contrast to this barrel shell example, it is instructive to study the geometrically analogous, and beautifully executed shell structure in Figure 12. Even though the scales and geographical locations of the two thin shells do not correspond, the shell in Figure 12 demonstrates one possible solution that could have been considered in facing the roofing problem posed by the airport structure.

H. Walter, Leipzig



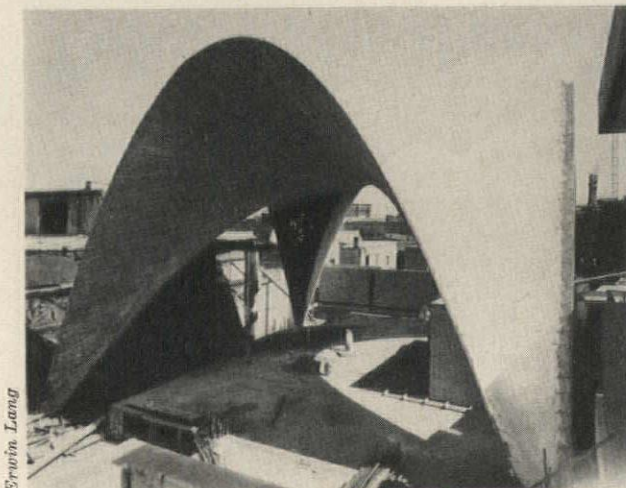
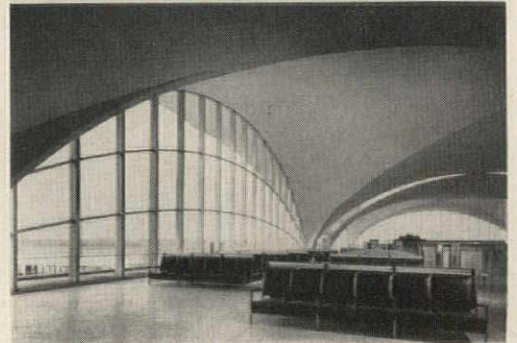
10

Hedrich-Blessing



11

10. Market Hall, Leipzig, Germany; H. Ritter, Architect; Dyckerhoff & Widmann, Structural Engineers.  
11. Airport Terminal Building, St. Louis, Mo.; Hellmuth, Yamasaki & Leinweber, Architects; Wm. C. E. Becker, Structural Engineer; Roberts & Schaefer Co., consultants for shell. 12. Church of San Antonia de las Huertas, Mexico; Felix Candela.



Erwin Lang

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## A Design Tool for Determining ACOUSTICAL PRIVACY REQUIREMENTS

*Of all the components that comprise noise, one of the most annoying is speech from a neighboring room. At the same time, providing adequate speech privacy (see "Acoustical Privacy," AR, June 1959) can be more difficult than controlling reverberation or reducing the general hum of noise. An easy-to-use method has been developed by Bolt Beranek and Newman, Consultants in Acoustics, for determining, first, the degree of speech privacy required for typical situations, and, second, the building components that will give the necessary sound isolation. The "Speech Privacy Design Analyzer" was developed under the sponsorship of Owens-Corning Fiberglas Corporation, and with the collaboration of several other manufacturers. It will be issued soon by O-CF to architects and others interested in speech privacy.*

People are becoming more critical of their indoor environment: they want better control of heat, light and sound. Oddly enough, as buildings have incorporated air conditioning, better lighting and new building materials, the problem of providing a satisfactory acoustical environment has become more difficult. For example, when office buildings had massive walls, heavy partitions, high ceilings and crude central heating and ventilation (by present-day standards), occupants were not bothered by the conversations of their neighbors. Now in the days of suspended ceilings, perimeter air conditioning, movable partitions and lightweight construction, there are many paths for the sounds of voices to travel from one office to another and become a source of distraction, annoyance and even embarrassment.

There's nothing wrong with these new techniques and materials. The point is that the designer cannot consider the functions of these components separately, but must be aware of how they affect each other. This is certainly true in the matter of acoustical privacy. The type of partition, the type of ceiling construction, the type of air distribution equipment and ductwork—all help to determine whether you can hear your neighbor, and he you.

There are three factors to be considered in providing a comfortable acoustical environment in office buildings, hotels and motels, hospitals, dormitories and apartment buildings. First, there is the control of sound

reverberation (not too boomy, not too dead); second, the control of annoying noise (equipment, traffic, foot-falls); and third, the provision for speech privacy. In many cases, this third factor—the one we are concerned with here—is the most important one.

Acoustical privacy was discussed at length in the June 1959 issue by William Ranger Farrell of Bolt Beranek and Newman, Inc. Acoustical privacy was said to mean really "speech privacy" because when people say that they have no privacy or that they have a terribly noisy office, they most often mean that they can understand what their neighbor is saying.

Three years ago, criteria for allowable noise from traffic, ventilation systems, business machines, etc., were developed by Leo L. Beranek of Bolt Beranek and Newman, Inc. These noise criteria were based on surveys among a large number of office workers, checked by past field experience and a laboratory test using artificially produced noise.

These early studies were aimed at determining the maximum noise level at which office personnel felt they could do their work without loss of performance.

The direction of subjective testing now is toward isolating the various factors that make up a noisy environment.

The first factor to be isolated is speech intelligibility. A two-year investigation by W. R. Farrell and B. G. Watters of Bolt Beranek and New-

man, Inc., sponsored by Owens-Corning Fiberglas Corp., has determined to what extent speech sounds from the next office can be understood before an average listener feels he does not have acoustical privacy. This information plus field test data on transmission losses of partitions, suspended ceilings, doors and interconnecting air passages form the basis of a design tool called the "Privacy Design Analyzer." It can be used by architects to determine how much sound isolation is required for a given situation and which sound isolating components will provide the needed isolation.

The scope of the speech privacy analyzer is broad enough to encompass most of the day-to-day privacy situations such as private offices, conference rooms, and rooms in college dormitories. It is not intended for very large rooms, exceptionally quiet or noisy rooms or for halls with amplifying systems. By limiting the scope of the analyzer, it was possible to avoid complicated terminology. Surprisingly, the word decibel never appears.

Physically, the analyzer consists of one sheet for estimating the privacy requirement for a particular room and a second sheet which translates the privacy requirement into a privacy rating for each of the building components involved.

The speech privacy analyzer grew out of laboratory experiments on the reactions of people to intruding speech. To relate this information to building components, it was necessary to draw heavily on acoustical theory, including the behavior of sound in rooms and the transmission of sound through structures. Reinforcing the laboratory and theoretical studies are a list of actual complaint situations which have been interpreted with the analyzer.

*Item 1* on the Estimating Sheet is the floor area of the room in which the speech sounds originate. The room size is important because in a small room, sound will be reflected

more frequently from walls and other boundaries and will result in a "build-up" of sound intensity. In a large room the sound will tend to spread out and the intensity will be less.

The scope of the analyzer encompasses rooms with floor areas from about 50 sq ft to about 1600 sq ft. As may be seen from the scale in Item 1, this range in room size reflects a 15 unit variation in the Speech Privacy Requirement.

Regardless of the size of the room, it is assumed that both the talker and the occupant of the adjacent room are located at least 2 or 3 ft away from the partition which separates them. This is especially important if the partition has an interconnecting door or air grill.

Item 2 describes how people will talk in the source room. In most private offices, hotel rooms, hospital rooms, and the like, people will speak in a conversational tone of voice. In board rooms and conference rooms it is common for people to raise their voices in order to be heard throughout the room.

In more exceptional cases, a loud voice may be used. An example is a psychiatrist's office where a patient may sometimes become excited and raise his voice. Another example is a noisy business machine room where the operators speak in loud voices.

The term loud voice refers to the highest speech effort which can be sustained without strain. Even higher speech levels are possible. A shout is a quite unusual level and falls outside the scope of the analyzer.

Item 3 deals with the kind of privacy required. In some cases it is important that conversations be truly confidential. Most executives need true privacy for at least part of their work. Doctors, lawyers and psychiatrists certainly require confidential privacy.

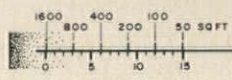
In many other instances, all that is needed is freedom from distraction. When the people involved are working together and do not need to discuss private matters, normal privacy will suffice.

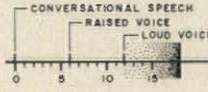
At the other extreme are those rare cases where absolute secrecy is necessary. The analyzer, however, is intended for the usual situation where occupants of adjoining rooms are concerned with their own work and problems.

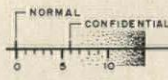
Item 4 gives the level of the steady background noise which will be pres-

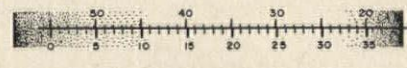
## PRIVACY REQUIREMENT ESTIMATING SHEET

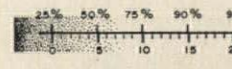
JOB \_\_\_\_\_ FROM RM \_\_\_\_\_  
 FLOOR \_\_\_\_\_ TO RM \_\_\_\_\_  
 DATE \_\_\_\_\_ DESIGNER \_\_\_\_\_

1 SOURCE ROOM FLOOR AREA 

2 SOURCE ROOM SPEECH USE 

3 PRIVACY REQUIREMENT 

4 ADJACENT ROOM BACKGROUND NOISE  
 TRAFFIC - LARGE CITY  SUBURBAN  RURAL   
 DIFFUSER - \_\_\_\_\_ CFM \_\_\_\_\_ SP \_\_\_\_\_  


5 PROBABILITY OF SATISFACTION 

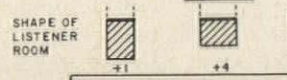
TOTAL =

SPEECH PRIVACY REQUIREMENT

NOTE: RED DOTTED AREA OF SCALES INDICATE UNUSUAL DESIGN PROBLEMS. SEE INSTRUCTION BOOK.

**FIBERGLAS**

## COMPONENT SELECTION SHEET

	POSSIBLE COMPONENTS	RATING
<b>1 CEILING</b> PRIVACY REQUIREMENT <input type="text"/> +4 <input type="text"/> MINIMUM PRIVACY RATING <input type="text"/>		
<b>2 PARTITION</b> PRIVACY REQUIREMENT <input type="text"/> SHAPE OF LISTENER ROOM  MINIMUM PRIVACY RATING <input type="text"/>		
<b>3 DOORS, CORRIDORS</b> PRIVACY REQUIREMENT <input type="text"/> LISTENER ROOM FLOOR AREA: 1600 800 400 200 100 50 SQ FT -8 -5 -2 +1 +4 +7 MINIMUM PRIVACY RATING <input type="text"/>		
<b>4 INTERCONNECTING AIR PASSAGES</b> PRIVACY REQUIREMENT <input type="text"/> LISTENER ROOM FLOOR AREA PER SQ FT OF AIR PASSAGE: 1600 800 400 200 100 50 -8 -5 -2 +1 +4 +7 MINIMUM PRIVACY RATING <input type="text"/>		

ent in the adjacent room. Because of the wide range of noise levels which may be encountered, there is a possible variation of about 30 units in the Speech Privacy Requirement as the background varies from "very quiet" to "noisy." The quietest of these situations might be a non-air conditioned building in a rural location. The noisiest might be an office in the heart of a busy city where the air conditioning system has been designed for maximum economy, with little regard to noise annoyance.

The background noise for *Item 4* is assumed to be caused by a combination of traffic noise and air distribution noise. (Other noise sources which can be counted on for steady, continuous masking are outside the scope of the analyzer; data for them are not included but must be specially calculated.)

The noise rating of *Item 4* will be found on a Noise Rating Sheet (not shown in the article). The noise ratings listed represent a mixture of traffic noise and air diffuser noise which can be expected in the particular building location and for the chosen operating conditions of the diffuser.

The numerical noise rating, listed for each operating condition of the diffuser, is preceded by the letter N, H, L or M. These letters describe the tonal character of the combined traffic-diffuser noise. An "N" noise has a normal tonal character, "H" has more pronounced high frequency components, "L" has predominant low frequencies, and "M" is rich in the middle frequencies. All of these characteristics are commonly encountered and accepted.

The letter which accompanies the noise rating is written in the box to the right of *Item 4* and carried along throughout the remainder of the privacy calculations.

Although the very highest order of acoustic environment would be ideal, the fact is that buildings must be built to a budget. *Item 5* may be thought of as showing the significance of the compromise that almost always must be made between quality and cost.

Because no two people are exactly alike, the meaning of speech privacy is not easy to tie down. A condition which is perfectly satisfactory for one occupant may be most annoying to another. The statistics of people's desire for privacy are given as the

percentile figures in *Item 5*. For example, if "90%" is checked in *Item 5* and if the resulting speech privacy requirement is just matched by the privacy rating of the building components, on the average nine persons out of ten will be satisfied.

#### Example

Assume your problem is the design of a group of small (10- by 10-ft) executive offices for a downtown office building, and you want to select the building components that will give the requisite speech privacy.

First step is to determine the values for the five items on the *Privacy Requirement Estimating Sheet*. These are written in the boxes at the right of the sheet, and the numbers are totaled to give the Speech Privacy Requirement.

This Privacy Requirement is listed in the appropriate boxes on the *Component Selection Sheet*. The Privacy Requirement then is adjusted for room shape and size to give a Minimum Privacy Rating. For each of the four components—ceiling, partition, doors and corridors, and interconnecting air passages—the privacy analyzer provides a stack of rating cards with four numbers, prefixed by the letters N, H, M and L. The designer then refers to the Minimum Privacy Ratings on the *Component Selection Sheet* and selects the components that satisfy the sound isolation requirements. He can then weigh the alternates against other requirements such as appearance and cost.

This is how the sheets would be filled out:

*Item 1: Source Room Floor Area.* Opposite 100 sq ft on the scale is the number 12 which is written in the box.

*Item 2: Source Room Speech Use.* Since it is likely conversational speech will be used, the number here is zero.

*Item 3: Privacy Requirement.* The nature of the work requires confidential privacy which gives a number of six.

*Item 4: Adjacent Room Background Noise.* A rating sheet is provided with the analyzer which combines values for noise from traffic (low-frequencies) with noise from the air conditioning diffuser (medium to high frequencies). In this case assume that the rating is H 30 (H meaning the combined noise has a high frequency tonal character). Opposite 30 on the scale is the num-

ber 25; therefore, H 25 is written in the box.

*Item 5: Probability of Satisfaction.* Because these are high quality offices, 99% probability is chosen. Opposite 99% is the number 21.

The total of the five numbers is 64, and since the character of the background noise in the listening room is high frequency, the letter "H" is written in front of 64. This number is a measure of the overall difficulty of the sound isolation problem. The remainder of the acoustic design is the selection of building components which in combination will meet or exceed this requirement.

Going now to the *Component Selection Sheet*, the number H 64 is entered in the boxes labeled Privacy Requirement.

*Item 1: Ceiling.* The number 4 is added to the Privacy Requirement to give the ceiling Minimum Privacy Rating; in this case it is H 68.

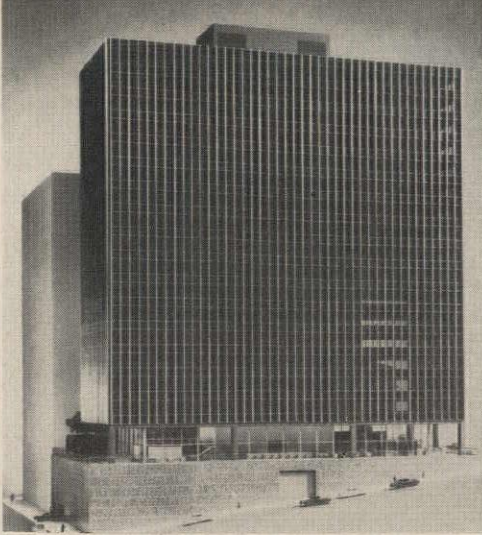
*Item 2: Partition.* An adjustment must be made for the relative size of the common wall and of the listening room floor area. If the floor area is about equal to the common wall area, then the adjustment is plus four and the Minimum Partition Privacy Rating is H 68.

*Item 3: Doors and Corridors.* A similar correction is made for the relative area of the door opening into the listening room and the floor area of the listening room. Since the floor area is 100 sq ft, the adjustment is plus four and the Minimum Privacy Requirement for the door is also H 68.

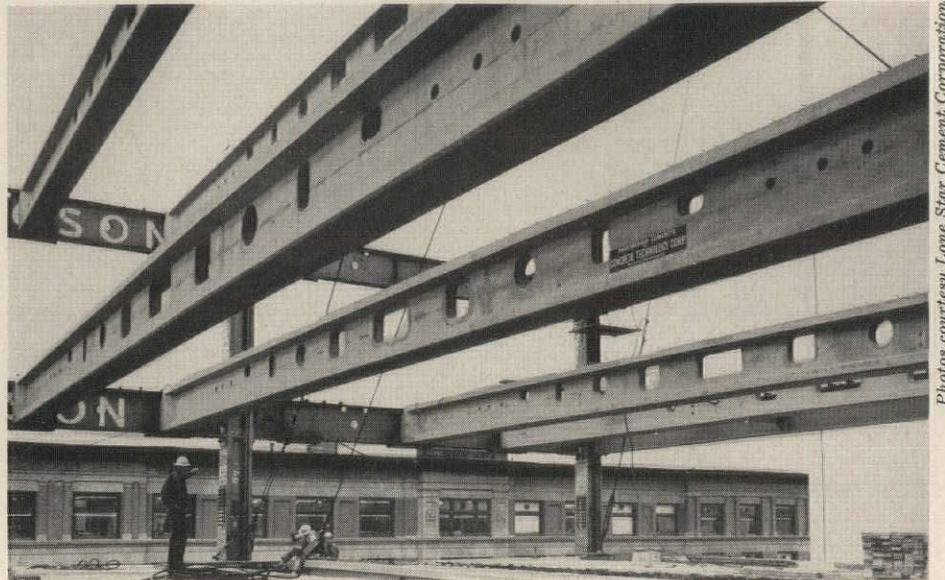
*Item 4: Interconnecting Air Passages.* The neck area of the air diffuser in this example will be taken as  $\frac{1}{2}$  sq ft, so there are 200 sq ft of floor area per sq ft of air passage. The adjustment again is plus four, and the Minimum Privacy Rating is H 68.

Any of the components in the speech privacy rating cards which exceed or equal the minimum ratings have satisfactory sound isolation properties.

In some instances it will prove convenient to use components which have ratings which exceed the minimum. If as many as three of the components have ratings which exceed the minimum by at least 10 units, then the fourth component can have a rating four units lower than indicated on the component selection sheet.



**THE NORTON BUILDING**  
Seattle, Washington  
*Architects: Bindon & Wright; Skidmore, Owings & Merrill, Associated. Consultants: Anderson, Birkeland & Anderson, Structure; T. Y. Lin, Prestressing. General Contractor: Howard S. Wright Construction Co.*



Photos courtesy Lone Star Cement Corporation

## Punctured Prestressed Beams Frame West Coast Skyscraper

Precast concrete's rapid development from a new and relatively untried import to a standard and highly useful tool of the building trade is confirmed once again in Seattle's newest skyscraper. At 21 stories, the Norton Building is one of the tallest prestressed concrete structures yet built. More important, its designers took full advantage of the precasting technique to achieve maximum interior ceiling heights within a minimum building height. The modified I-beams for each floor were cast with about

fifteen apertures of various sizes and shapes incorporated in the webs so that the ducts and utilities could pass through rather than under the structural framework.

The use of prestressing was dictated largely by the desire to span the 210-by-70-ft floors without interior columns and without out-size framing members. On each floor there are fourteen beams that span the 70-ft bays, supported only by the steel perimeter frame.

Each beam was pretensioned by two

dozen  $\frac{3}{8}$ -in. strands in the bottom flange, and post-tensioned by two draped tendons. Although they were designed for 30-ton loading, they were tested as high as 135 tons with only a 9-in. temporary deflection.

The reduction in beam size made possible by the prestressing, plus the use of lightweight haydite concrete for the floor slabs, cut the total weight of the building by some 20 per cent—a particularly important factor in view of Seattle's subsurface soil conditions.

## Heavy Beams Cold-Bent to Form Arches

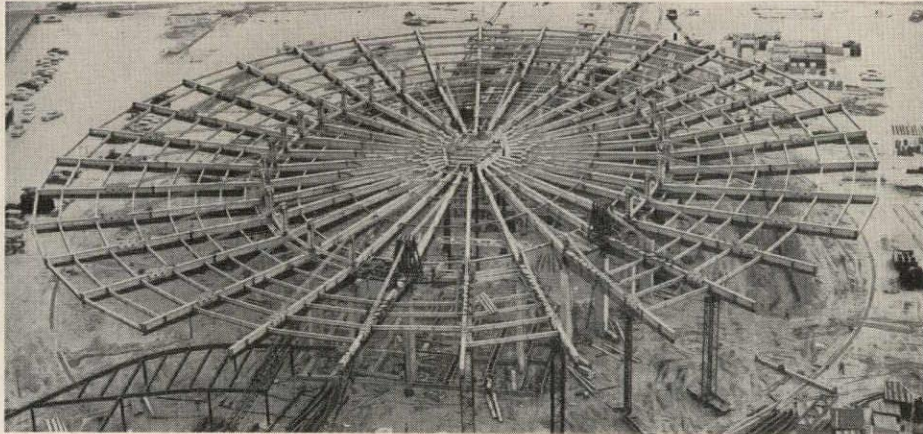


The largest structural sections ever bent cold to any significant radius support the roof of the reconstructed Palm House at Chicago's Garfield Park Conservatory. Since the old Palm House had been a city landmark since 1907, the Park District engineers decided to maintain its general appearance, but to replace the open trusses that formed the original arches with heavy wide flange beams whose relatively smooth and unbroken surfaces would offer fewer starting points for rust and would be far easier to maintain.

Their specifications called for production of the arches by splitting straight beams into tees, bending the tees to the required radius, and welding them together again. Alternately, the arches could be fabricated

*continued on page 226*

Pan American World Airways System



## Airport Terminal Canopy Designed for Minimum Weight, Maximum Sound Absorption

By far the most celebrated feature of the Pan American World Airways terminal now under construction at New York International Airport is a four-acre roof shaped like an elliptical wagon wheel, complete with 32 spokes that cantilever some 114 ft beyond a supporting ring of heavy piers midway between the hub and the outer rim. The spokes themselves are prestressed welded steel girders.

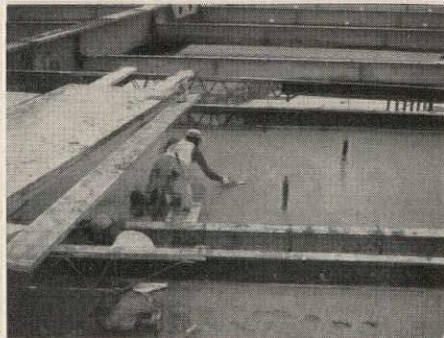
As might be expected, the construction of the canopy portion of this roof, which will shelter arriving and departing jet liners, posed problems over and above the structural framing. The slabs between the radial girders, for example, had to meet two rigid requirements: minimum weight, and maximum sound absorp-

tion with some decorative potential.

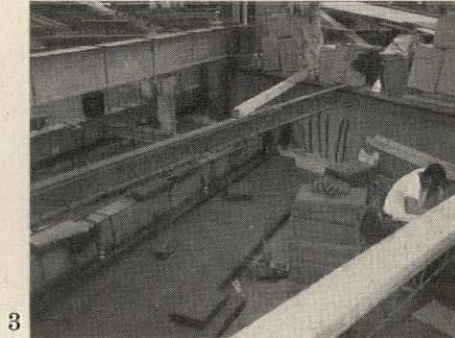
The first was met by using lightweight concrete (1) reinforced with welded wire fabric (2) for the 4-in. slabs. Because of its allowable tensile stress of 24,000 psi, as compared to the 20,000 permitted for reinforcing bars, the use of fabric reduced the weight of reinforcement by about 20 per cent.

The weight of the roof was further reduced in meeting the second condition by installing acoustical cellular glass insulation (3) in 3-in. blocks as the ceiling material. Since the blocks weigh only 2 psf but are highly effective in reducing sound levels, and are attractive when painted, their use contributed to the fulfillment of both major requirements.

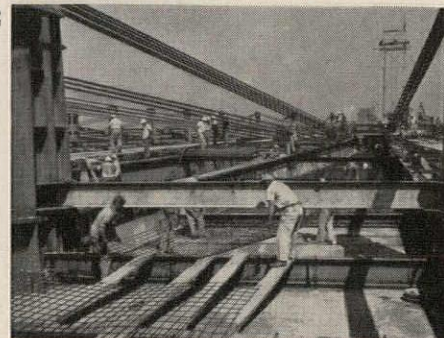
Welded Wire Reinforcement Institute



1



3



2

### PASSENGER TERMINAL New York International Airport

Owner: *Pan American World Airways, Inc.*

Architects & Engineers: *Tippett-Abbott-McCarthy-Stratton*

Associate Architects: *Ives, Turano and Gardner*

General Contractor: *Turner Construction Company*

## Heavy Beams Cold-Bent

*continued from page 225*

from built-up sections equivalent to 21WF62 beams.

Instead of following either of these methods, however, the steel subcontractor, Johnston Iron Works, obtained permission to investigate bending of whole beams. It was found that, while hot bending involved an extended delivery time and was in any case of questionable accuracy, the beams could be cold bent accurately, in reasonable time and at a reasonable price, by the Commercial Shearing & Stamping Company.

As finally erected, the arches were formed of two halves welded together at the crown. Each half was made up of a single beam cold bent to the desired radius. The cold-bending method proved to be extremely accurate and, according to Johnston, about 60 per cent cheaper than the alternate method of slitting, bending and re-joining. Some opening-up of the curve occurred during transit and storage, but this was easily corrected by localized heating and quenching.

## Expanded Bibliography On Uses of Solar Energy

True to its stated aim of "gathering, compiling and disseminating information relating to solar energy," the Association for Applied Solar Energy last fall published its second bibliography on solar energy utilization. In 1955, when the first edition of *Applied Solar Energy Research* was brought out, the field was still in its infancy. Its subsequent expansion in quantity and variety of research is reflected by the heftiness of the current volume, which organizes a vast reservoir of data drawn from many sources—periodical articles, reports from scientific institutions and government agencies, patents, and even typed memoranda. Abstracts of these data are organized for easy reference under broad subject headings that include solar radiation and solar radiation effects; the use of solar energy as heat for low and high temperature conversion; and the use of solar energy as light. The 275-page bibliography is published by the Association for Applied Solar Energy, 3424 North Central Ave., Phoenix, Arizona.



## Automatic Traffic Controls for Parking Ramps

One of the newer developments in housing for the "insolent chariot" is a computing system that automatically keeps track of the vehicular traffic within a parking ramp. It consists essentially of strategically located traffic detectors, computing equipment that registers the information picked up by the detectors, and "traffic counters" that record the number of available spaces on each level or in the entire ramp and may also operate signals to direct drivers to the nearest parking space.

Since 1956, three such systems, of varying degrees of refinement, have been installed in Rochester, New York's municipal parking ramps. The first two ramps used as detection devices conventional pressure-sensitive treadles which require straight and confined traffic flow. The third, opened last spring, uses photoelectric beams which give an accurate count regardless of the position of a vehicle in the roadway.

The new photoelectric detectors accurately register multi-lane traffic, and one type incorporates directional characteristics so that it fails to register if a vehicle passes through the detection zone and then backs out

again. If pedestrian traffic is likely, as is the case on the lower levels of a ramp, two photoelectric beams can be used, spaced 4 ft apart. A car cuts the beams simultaneously and registers; a pedestrian, who cuts them one at a time, is not counted.

Depending on its design, a given ramp may require any or all of these detection devices in various locations. Similarly, depending on the proposed number of attendants, a system may use the traffic counters only to record available parking spaces or it may also use them to operate a central annunciator panel and directional signals on each parking level. The relatively elaborate system installed in Rochester's newest ramp, for example, makes it possible to operate an eight-level garage with no more manpower than would otherwise be required to service five levels. In all of the Rochester ramps, parking meters have been used in each stall to eliminate the need for a cashier and checker at the exit, thus allowing vehicles to exit at a higher rate. Traffic flow into the street has been clocked at an average of ten cars per minute during peak periods. *Rampark, Inc., 75 College Ave., Rochester 7, N. Y.*



## High Velocity, High Temperature Heating for Residences

The new *Jet-Heet* warm-air system, which was introduced last month after a 13-year testing period that included installations at the South Pole, offers a new approach to home heating and cooling. It differs from conventional systems in several respects, but the most prominent are the delivery of high temperature, high velocity air through small flexible ducts, and the use of aspirating registers to eliminate the need for a return air system.

The furnace itself uses a simple injection burner in a pressurized combustion chamber, and a high velocity heat exchanger that delivers air at 350F, 400 cfm, and 1.25 in. bonnet pressure. Hot flue gasses are carried off by forced draft so that stack temperatures are kept down to about 400F. This makes it possible to use a 3-in. vent pipe in place of a chimney, and eliminates the standby losses nor-

mally caused by natural draft.

Since the supply air is delivered at a relatively high temperature and velocity, a smaller amount of air is required, and conventional sheet metal ducts can be replaced by 2-in. inside diameter flexible tubing installed like BX cable through the stud spaces. According to the manufacturer, two men can install a complete system—oil tank, furnace, ducts and registers—in only eight hours. (The same ducting can be used for air conditioning.)

The use of flexible tubing rather than sheet metal also helps to cut down on the noises generally carried through the duct system. Special silencers cope with the noise problems connected with the delivery of high velocity air.

During the development of the *Jet-Heet* system, it was found that more uniform room temperatures could be

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more products on page 238

**Translucent Building Panels**

(A.I.A. 17-A) Describes complete line of *Sanpan* translucent panels, window walls, and curtain wall systems, with detail drawings of all panel types and accessory framing sections. 8 pp. *Panel Structures, Inc.*, 45 Greenwood Ave., East Orange, N. J.\*

**Wood Window Details**

(A.I.A. 19-E-1) File folder contains traceable detail drawings on double hung windows and window wall openings, plus suggested specifications. *Architectural Woodwork Institute*, 332 S. Michigan Ave., Chicago 4, Ill.

**Fir Plywood Components**

Gives a run-down on the special characteristics, applications and advantages of such fabricated fir plywood components as box beams, curved panels, stressed skin panels and trusses. 10 pp. *Douglas Fir Plywood Assn.*, 1119 A St., Tacoma 2, Wash.\*

**Stock Hand Railing Components**

(A.I.A. 14-D-4) Detail drawings and complete specifications cover aluminum, bronze, stainless steel and plastic components for the fabrication and assembly of non-ferrous hand railings. Bulletin 911, 24 pp. *Julius Blum & Co., Inc.*, Carlstadt, N. J.

**Coefficients for Design**

. . . of *Cylindrical Concrete Shell Roofs* extends and supplements Tables 2A and 2B (coefficients of internal forces caused by line loads) of ASCE Manual No. 31, "Design of Cylindrical Concrete Shell Roofs." 89 pp. *Portland Cement Assn.*, 33 W. Grand Ave., Chicago 10, Ill.\*

**Vinyl Wrinkle Finishes**

Coatings Technical Release No. 40 describes the use of vinyl plastisols, organosols and solution coatings in preparing vinyl wrinkle finishes. 5 pp. *Union Carbide Plastics Co., Div. of Union Carbide Corp.*, New York, N. Y.

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Includes detailed information on sixteen basic types of *Calcore* porcelain enamel curtain wall panels, with full-color installation photos. 8 pp. *Architectural Div., Caloric Appliance Corp.*, Topton, Pa.\*

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Describes complete line of control devices, with features, wiring diagrams, dimensions and application information for each. GEC-1260D, 72 pp. *General Purpose Control Dept.*, *General Electric Co.*, Schenectady 5, N. Y.

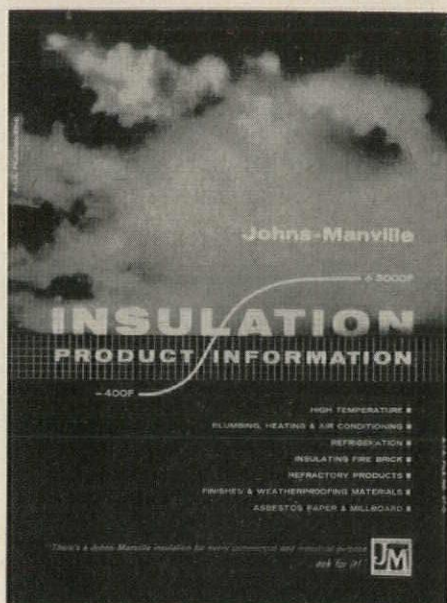
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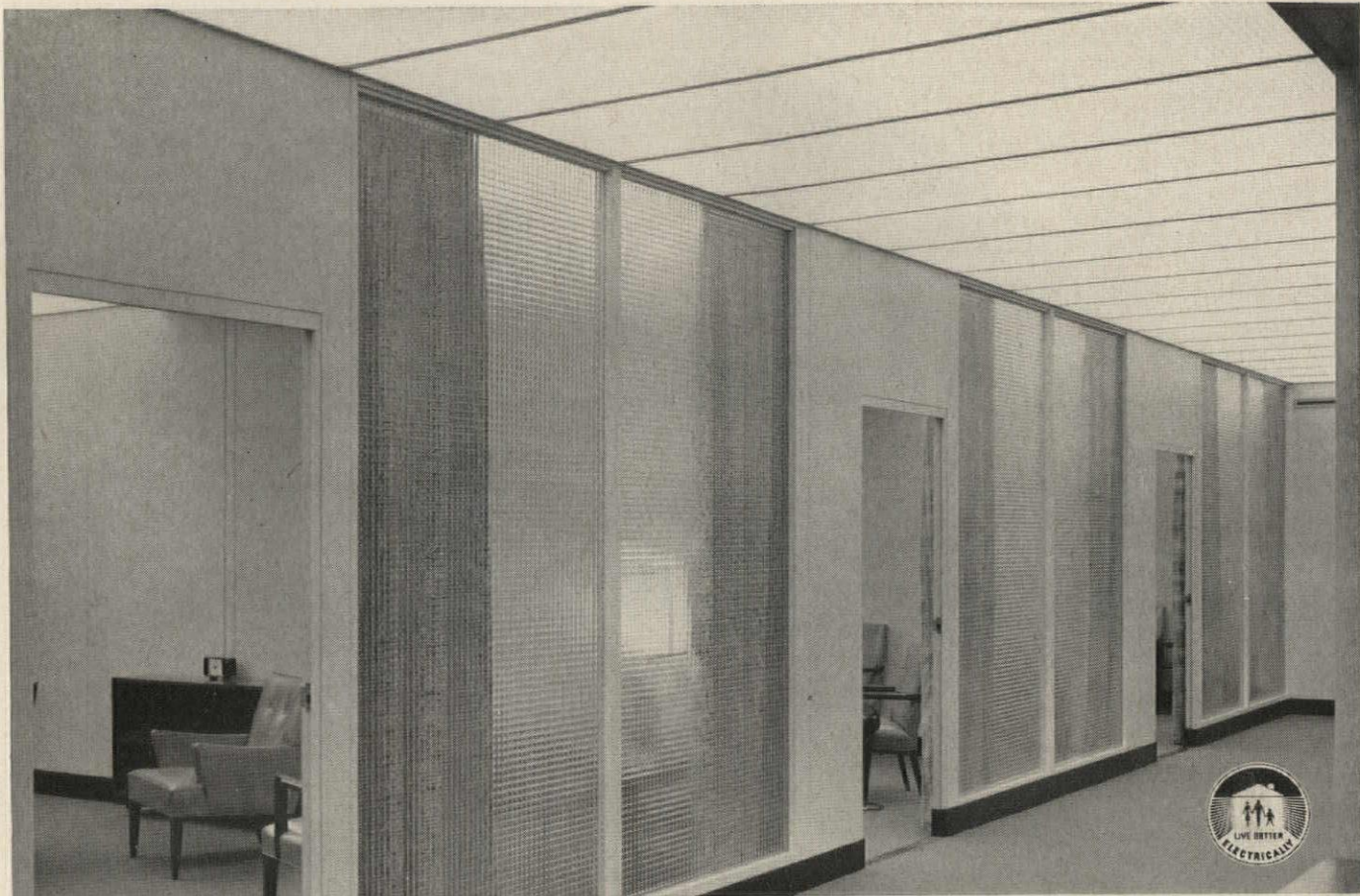
**Water Reduction Bulletin**

Technical Paper No. 1 discusses the effect that a reduction of water in concrete mixes by chemical admixture has on such properties as strength, workability, permeability, bond and abrasion resistance. 8 pp. *Dewey and Almy Chemical Div.*, W. R. Grace & Co., Cambridge 40, Mass.\*

\*Additional product information in *Sweet's Architectural File* more literature on page 282



**INSULATION PRODUCT INFORMATION** (A.I.A. 37-D) describes thermal insulations for all types of commercial and industrial requirements, in applications ranging from -400 to 3000 degrees F. The catalog contains six complete sections, each devoted to a special group of thermal insulations: industrial and high temperature; plumbing, heating and air conditioning; refrigeration; insulating firebrick and refractories; finishes and weatherproofing materials; and miscellaneous insulations. Information on each product consists of an application photo, description, available forms or types, advantages to users, and detailed specification data, including compliance with government specifications and ASTM standards. Catalog IN-244A, 54 pp. *Johns-Manville Sales Corp.*, 22 East 40th St., New York 16, N. Y.



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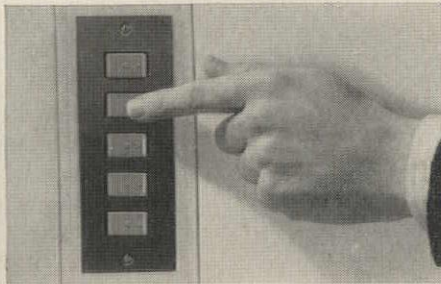
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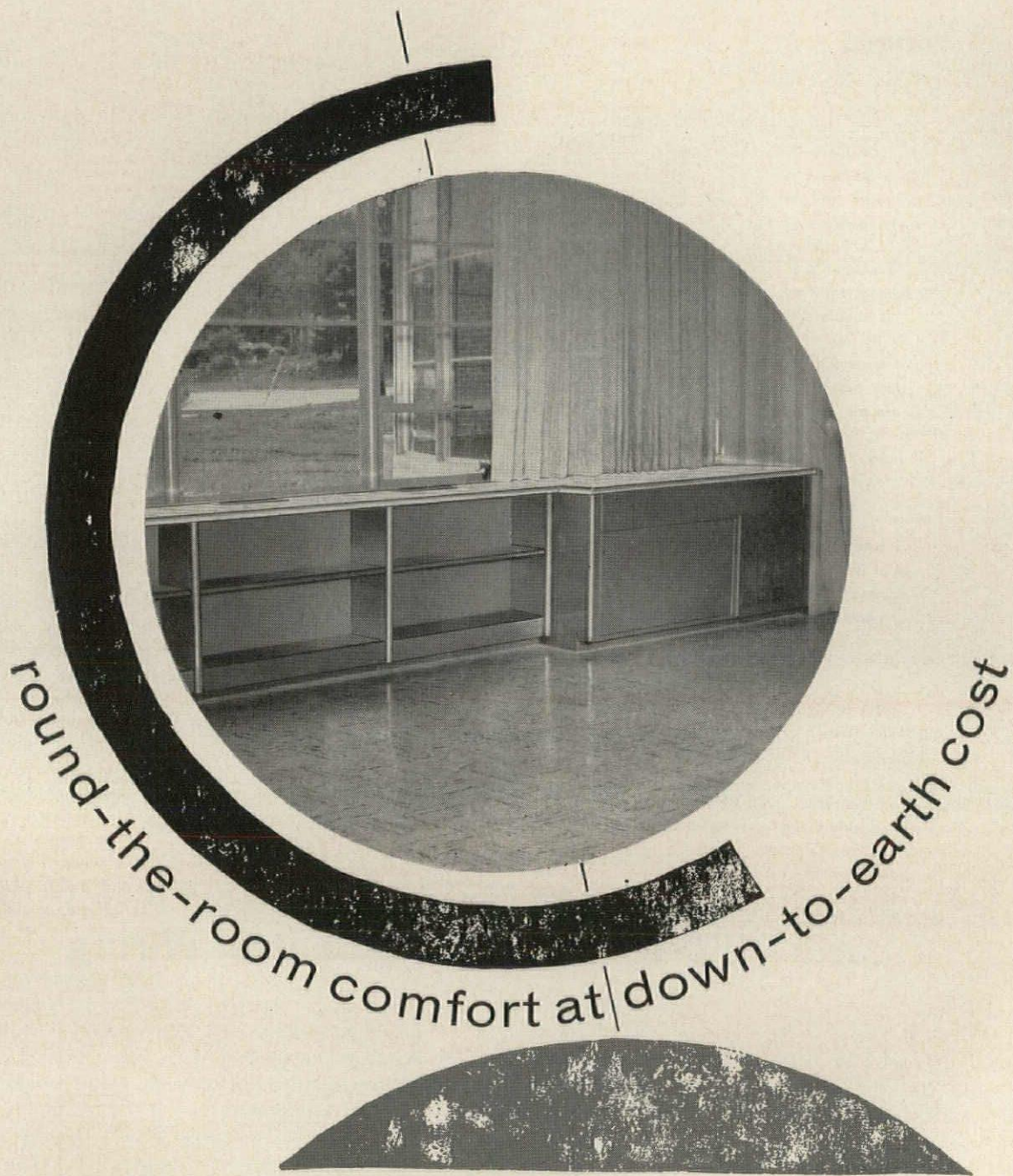
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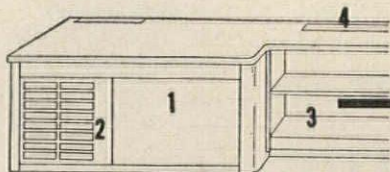
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**RESIDENTIAL HEATING AND AIR CONDITIONING: 1—Furnaces**

by S. Konzo, Professor of Mechanical Engineering, University of Illinois;

E. J. Brown, Research Associate in Mechanical Engineering, University of Illinois

Generally a warm-air system is one which circulates warm air; hence, it could include anything from a blast coil heated by steam to a parlor stove. More strictly, however, a warm-air system is defined as one containing a direct-fired furnace over which air is circulated. When the air circulation is by natural gravity the system is referred to as a *gravity warm-air system*, a type which has been superseded by the *forced warm-air system* in which the air circulation is by means of a fan. Positive circulation by the blower (centrifugal fan)

permits the use of relatively small ducts, means for filtering the air, and provisions for supplying tempered outdoor air, if desired. The forced warm-air system is characterized by its adaptability to a wide variety of building types, its rapid response to changing weather demands, and its possible combination with summer cooling.

The forced warm-air system consists of a furnace, a burner with necessary automatic controls, a blower, a supply-air distribution duct system, supply outlets, and a return-air duct system.

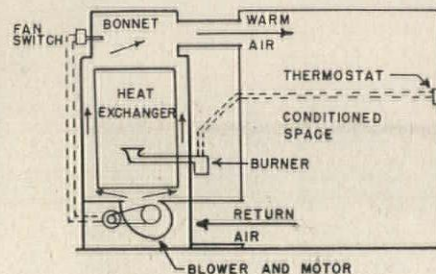


Figure 1. Basic furnace arrangement

**Furnaces and Basic Control**

A number of possible arrangements of control equipment have been tried, but the basic arrangement is that illustrated in Fig. 1. The furnace, which is sold in "packaged" form in smaller sizes, consists of a burner (oil, gas, or electric), a heat exchanger (usually steel), a jacket (or casing), a blower, a filter, and automatic controls. An automatic humidifier is often included.

The sequence of operation is extremely simple, and most effective if the control settings are properly made in accordance with so-called "Comfort Air Circulation" principles, advocated by the National Warm Air Heating and Air Conditioning Association. Essentially the operating sequence

of a warm-air system is as follows:

- a) When the room temperature drops, the room thermostat demands heat and closes the burner switch.
- b) The generation of heat within the heat exchanger results in a rapid rise in bonnet-air temperature, since the blower is not operating.
- c) When the temperature of the bonnet air reaches the setting of the fan switch (such as 110 F) the blower begins operation.
- d) The delivery of heated air through the duct system to the room results in a gradual increase in room-air temperature. When the room-air temperature reaches the desired value set on the thermostat the burner is shut down.

- e) The blower continues to operate until the bonnet-air temperature is reduced to some low value (such as 80 F), at which time the blower is shut down.
- f) The cycle is repeated. The successful operation of the system requires that the fan-switch settings be so arranged that the blower starts operating whenever the bonnet-air temperature reaches a value of the order of 110 F.

Furnaces are classified according to the direction in which air flows through them. For example, in the upflow furnace, generally used in houses with basements, the air flow is upward through the furnace (Figs. 2a and 2b). The upflow furnace may be either of the *low-boy type* (Fig. 2a)

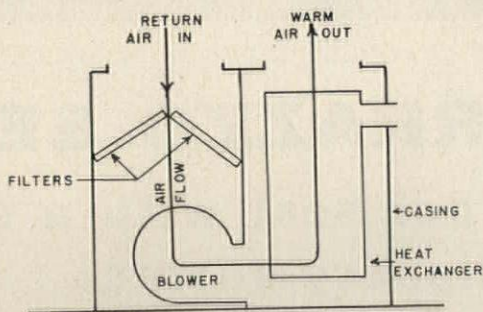


Figure 2a. Low-boy furnace has blower adjacent to heat exchanger

Figure 2b. High-boy furnace has blower below heat exchanger

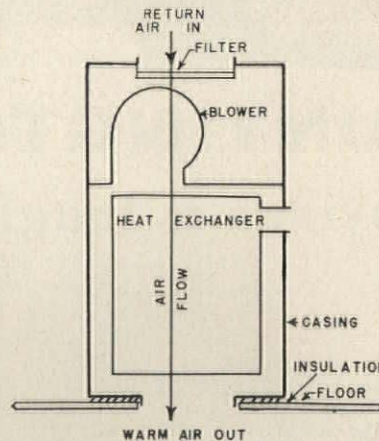
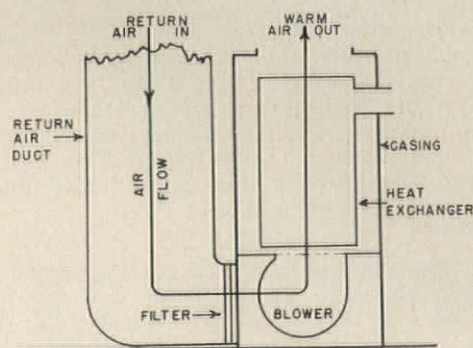
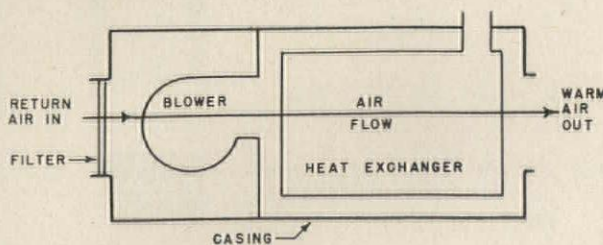


Figure 3. Counter-flow furnace is used over crawl spaces and concrete slabs

Figure 4. Horizontal furnace can be located in an attic or in a crawl space





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**RESIDENTIAL HEATING AND AIR CONDITIONING: 2—Outlets, Distribution Systems**

by S. Konzo, Professor of Mechanical Engineering, University of Illinois;  
E. J. Brown, Research Associate in Mechanical Engineering, University of Illinois

with the blower located adjacent to the heat exchanger, or of the *high-boy* type (Fig. 2b) with the blower located below the heat exchanger. Both types require approximately the same floor area when the return-air ducts are included.

In the *counter-flow furnace* (Fig. 3) the air flows downwards opposite to the direction of flow of the flue gases. The blower is mounted above the heat exchanger. This type of furnace is commonly used for houses built over a crawl space or on a concrete slab floor, and the furnace is often located in a closet or utility room.

The *horizontal furnace* (Fig. 4) can be suspended from floor joists in a crawl space or mounted on top of ceiling joists in an attic space. The air flow is horizontal over the heat exchanger.

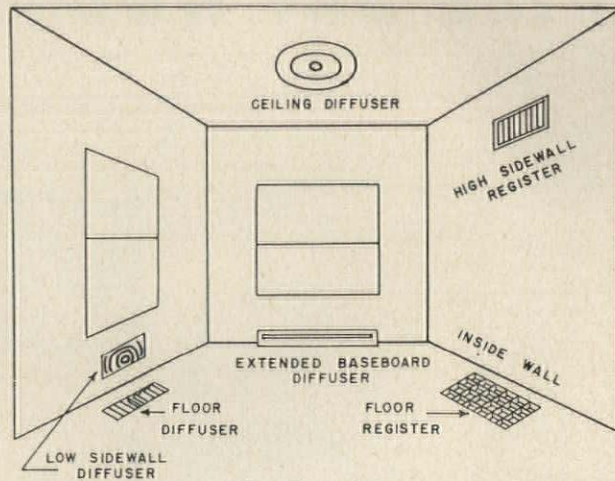


Figure 5. Various types of supply outlets

**Supply Outlets:**

**Types, Locations, and Applications**

A *supply outlet* is an opening through which air is delivered into a conditioned space. Outlets are grouped under the broad classification of *registers* and *diffusers*. Although the difference between registers and diffusers is not sharply defined, a *register* is commonly considered as an outlet which discharges the air in a confined jet. On the other hand, a *diffuser* is an outlet which discharges the air in a spreading jet. Registers and diffusers may be placed at a number of locations (Fig. 5), including

the floor, baseboard, low sidewall, high sidewall, and ceiling.

For heating purposes the preferred location of supply outlets is in the floor, at the baseboard, or low sidewall of the *outside wall* and preferably under windows. The next preferred locations are diffusers located low on an *inside wall*, or registers high on the same wall. The ceiling location is the least desirable from the standpoint of heating.

On the other hand, for cooling purposes, the high sidewall register on an *inside wall* or the ceiling diffuser provide the best air

distribution. There is no one outlet location which will provide the best air distribution both summer and winter, so a compromise location is demanded. The floor, baseboard, and low sidewall locations at the exposed wall provide good conditions for winter and acceptable conditions for summer, if adequate air velocity is maintained at the outlet face and the air is directed upwards towards the ceiling. The ceiling location (and high sidewall outlets) do provide good conditions for summer, but do not compare in winter with diffusers or registers located low in the outside wall.

**Air Distribution Systems**

One of the most satisfactory air-distribution systems for a residence is designated as the *perimeter* system, in which the conditioned air is introduced vertically into the living space through supply outlets located in or near the outside wall. For a house built over a basement or crawl space, these perimeter outlets may be served by the *extended plenum duct system* (Fig. 6). The same extended plenum can also serve to supply inside wall outlets.

The return-air duct system is usually short and direct; in small homes the return system frequently consists of a single return-air grille, so located that a short duct may serve to carry the air back to the furnace. In larger houses, a return-air inlet should be provided in each room. Rooms not provided with individual return-air inlets should have a grille in or above the door or have the door undercut by 3/4 in. to 1 in. to allow for the return of air from the room.

A method for the admission of outdoor

air to the duct system is also shown in Fig. 6. The outdoor air is admitted through the return-air duct and tempered before entering the supply-air duct system.

In the summer the forced-air system may be operated without heat, to circulate air within the house. At night, cool outside air may be admitted through the fresh-air intake and circulated throughout the house.

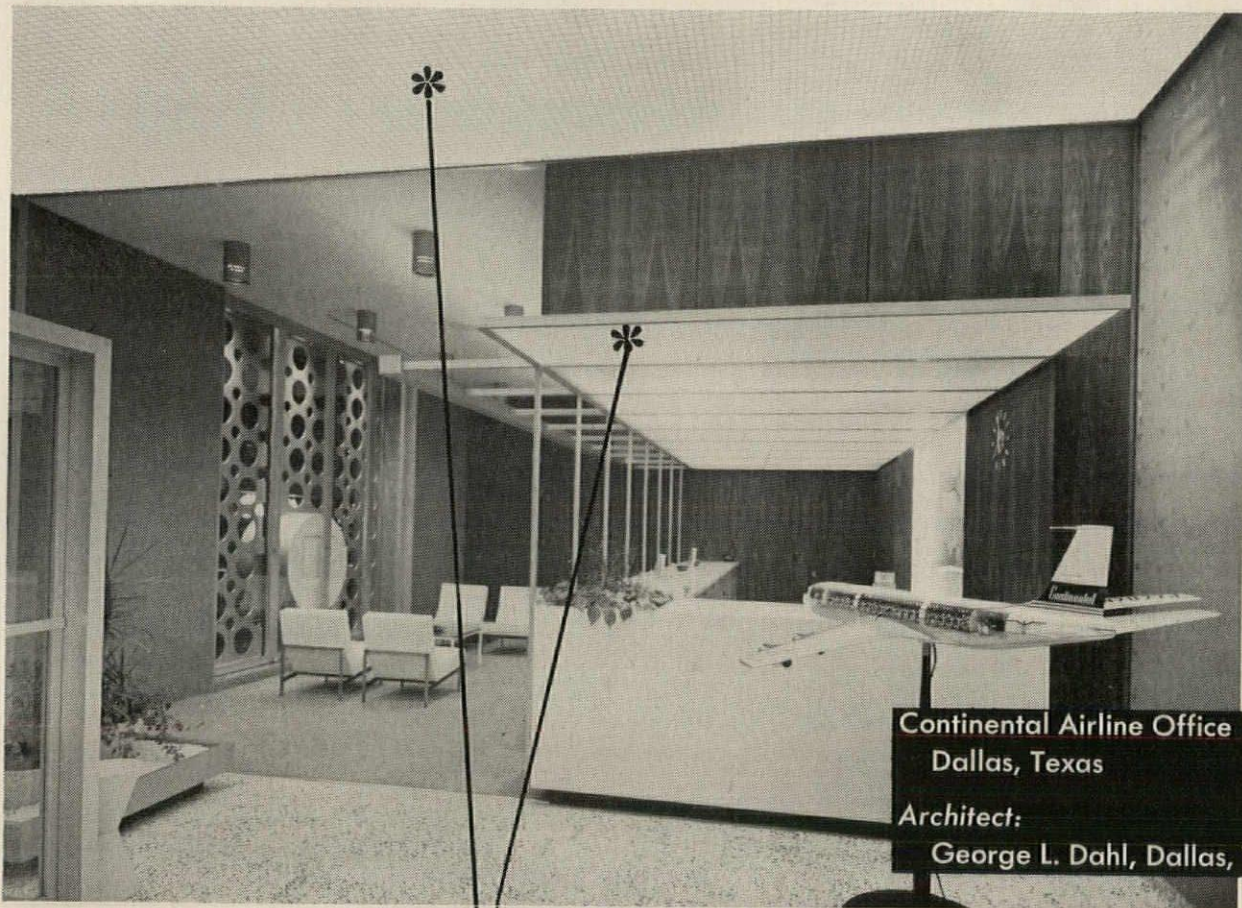
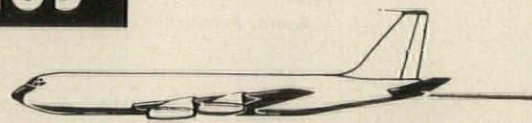
The house built upon a *concrete floor slab* came into prominence after World War II and introduced many difficulties from the standpoint of heating. Extensive research has indicated that this type of house can be effectively heated with warm air if the perimeter duct is embedded in the slab. The heated ducts in the floor serve not only to take care of the heat loss through the edge of the floor slab, but also serve to maintain comfortable temperatures at the floor surface. Heat is introduced indirectly into the room through the warm slab and directly into the living space through the warm air discharged through registers near the perimeter. The *perimeter-loop* duct sys-

tem (Fig. 7) is more effective than the simpler *perimeter-radial* duct system (Fig. 8).

Details of slab construction for the embedded duct systems, as recommended by the National Warm Air Heating and Air Conditioning Association, are given in Fig. 9. The *edge insulation*, which is mandatory, decreases the heat loss from the edge of the slab to the ground and to the outdoor air. The vapor barrier, usually specified below the embedded duct, prevents the migration of moisture from the ground into the duct system. Ducts may be formed of lightweight metal, impregnated paper tubes, or vitrified clay pipe. In any case they should be round and covered on all sides by concrete at least 2 in. thick. Ducts must be tied down or weighted to keep them from floating when the concrete is poured over them. Edge insulation must be of the rigid type and not subject to deterioration in the presence of moisture. Glass fiber, foamed plastic, or foamed glass boards are satisfactory. In northern climates, the in-

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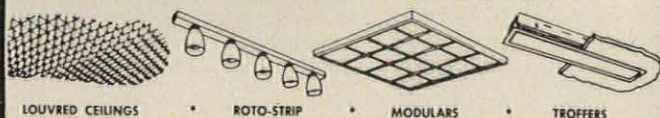
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**RESIDENTIAL HEATING AND AIR CONDITIONING: 3—Distribution Systems**

by S. Konzo, Professor of Mechanical Engineering, University of Illinois;  
E. J. Brown, Research Associate in Mechanical Engineering, University of Illinois

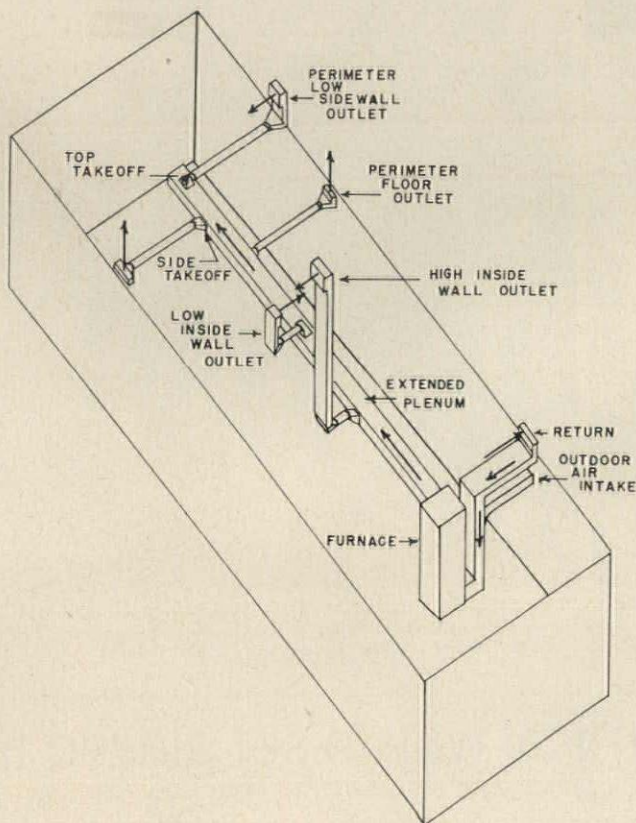


Figure 6. Extended plenum distribution system

sulation should be at least 2 in. thick.

The house built over a crawl space has also come into common use since World War II. For this type of construction, the *perimeter-radial* system is particularly well adapted, as it is also to a house with full basement. For the house built over a crawl space, in which no basement space is available, the *counter-flow* type of furnace is usually located in a utility (or furnace) room on the first floor, and the warm air is discharged downwards from the furnace into the plenum chamber below the furnace. The radial system may utilize low sidewall and baseboard outlets, as well as floor outlets.

The return-air system shown in Fig. 7 consists of a grille and a short stub duct connected to the side of the return-air plenum. This simple system has the disadvantage of permitting noise from the blower to issue directly into the adjacent room. Quiet blower units must be selected and sound insulating material used on the inside of the return duct and return-air plenum. In Fig. 8 another simple return-air duct system is shown in which the return-air grille is located in the ceiling. This arrangement reduces the transmission of blower noise to the

room and is preferred to the simpler arrangement of Fig. 7.

Any ductwork which is located in a closed crawl space or basement is usually not insulated, since any heat loss from the duct serves to warm the floor of the living space above. However, any supply duct or return-air duct which passes through a ventilated crawl space or an attic space must be heavily insulated, since the space can become cold and any heat loss from the duct is lost and not available for heating the house. Supply ducts require insulation of 2-in. thickness and return-air ducts require 1-in.-thick insulation. If such ducts are to be used for summer cooling, the insulation must be carefully covered with a vapor barrier to prevent the passage of water vapor through the insulation and the formation of condensation on the cool duct surfaces.

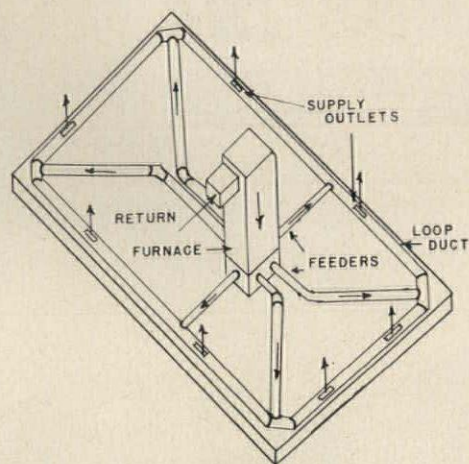


Figure 7. Perimeter-loop distribution system

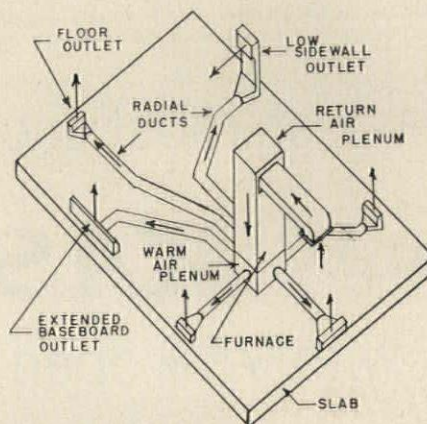


Figure 8. Perimeter-radial distribution system

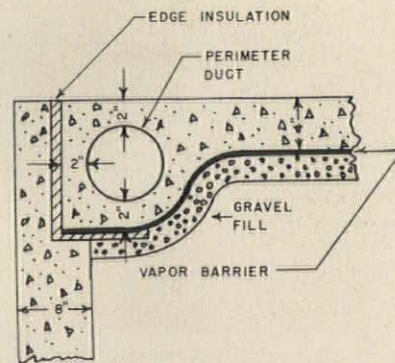
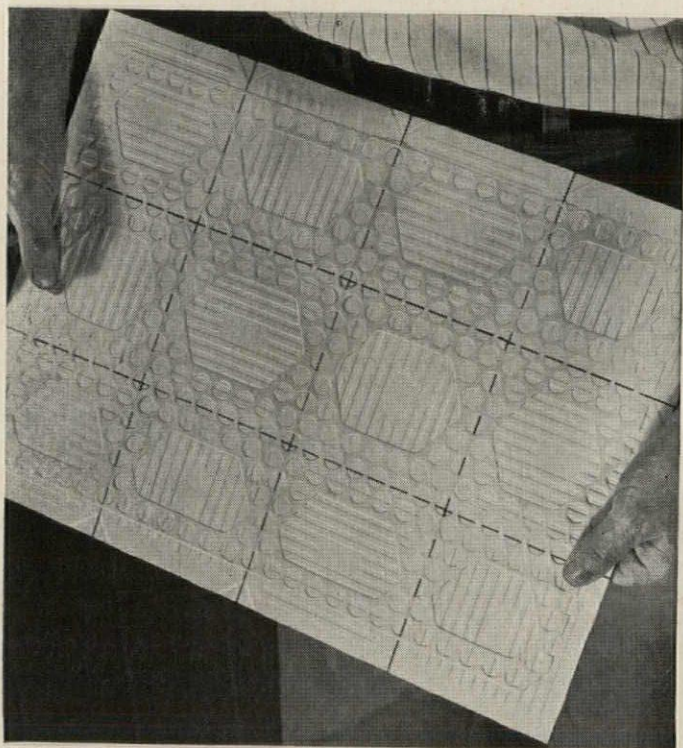


Figure 9. Slab construction for embedded duct systems



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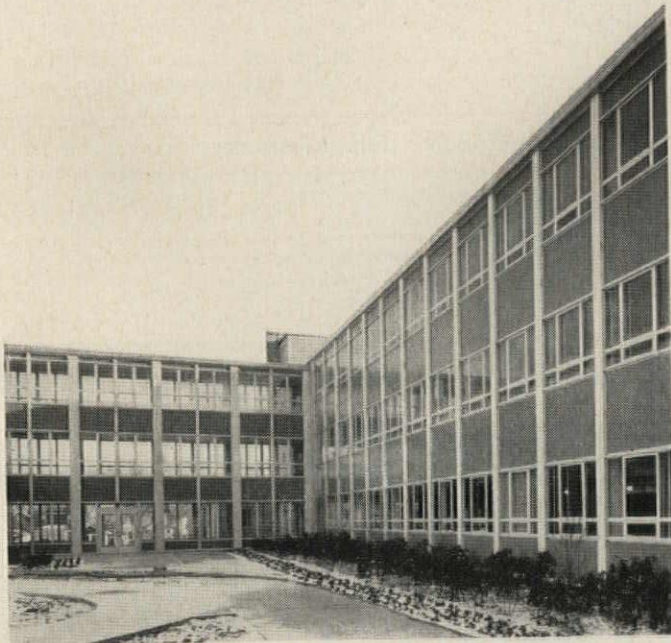
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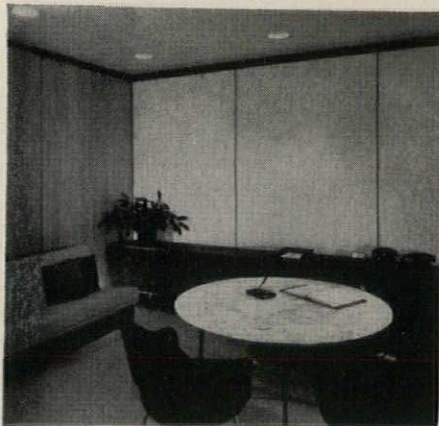
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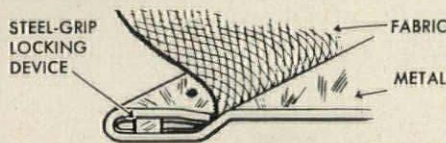
The new *Delineator* wall system is said to give architects advantages formerly available only in custom systems, at costs that reflect mass production economies. It is characterized by a recessed feature trim that gives precise delineation of the wall units. The panels, which come in 2 to 5 ft widths on a 4-in. module can be finished with a wide variety of wall-covering materials—natural woods, silks, grass cloths and vinyls, and can be readily combined with glass. Despite the slimness of the 2¼-in.-thick panels, the system provides a high degree of sound control. New connection methods and perimeter sealing techniques minimize the possibility of sound leaks. *E. F. Hauserman Co., 7516 Grant Ave., Cleveland 5, Ohio*



**Versatile Woven Plastic Fabric**

The *Fabricane* group of woven plastic fabrics combines the durability and pliability of plastic with the appearance of natural cane. Dust and flame resistant, and easily cleaned, they require no processing either before or after installation. Because they minimize sound distortion, the fabrics were originally used in high fidelity and stereo installations. However they can also be used as wall coverings, on cabinet and screen panels, as theater and church back-

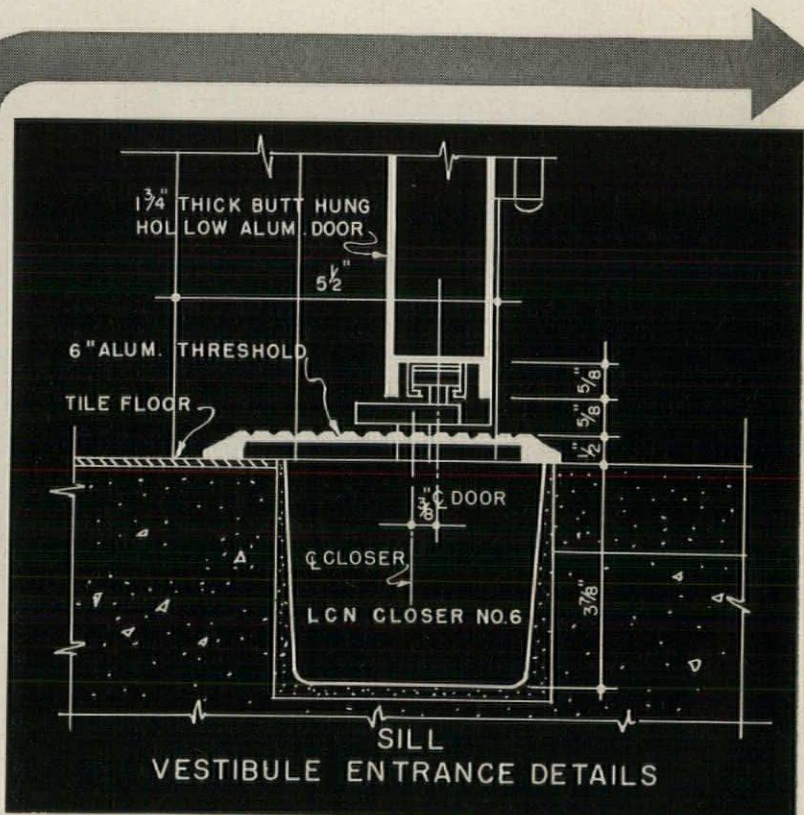
drops, and for soft or stiff upholstery. *Fabrics Coordinator, Dept. C, Wendell Plastic Fabrics Corp., 1220 Broadway, New York 1, N. Y.*



**Pull-Proof Fabric Duct Connectors**  
To prevent the pull between fabric and metal on flexible duct connectors

from ripping the fabric, Elgen has developed a virtually fool-proof locking method for its *Silent Duct* connectors. Called *Steel-Grip*, it consists of pre-attaching metal edges to fabric being locked into position in the metal to material to metal construction of the connectors. The edges of metal sections are also machine punched for extra gripping action. *Elgen Mfg. Corp., 32-49 Gale Ave., Long Island City, N. Y.*

more products on page 240



**CONSTRUCTION DETAILS**

for LCN Floor Type Door Closer, Shown on Opposite Page  
*The LCN Series 2-4-6 Closer's Main Points:*

1. Full rack-and-pinion, two-speed control of the door
2. Mechanism concealed; lever arm disappears under door
3. Door hung on regular butts, its weight carried independently of closer
4. Closer easily adjusted or serviced without taking door down
5. Installed with or without threshold; may be flush with threshold or with floor
6. Used with wood or metal doors and frames

*Complete Catalog on Request—No Obligation  
or See Sweet's 1960, Sec. 18e/La*

**LCN CLOSERS, INC., PRINCETON, ILLINOIS**

Canada: Lift Lock Hardware Industries, Ltd., Peterborough, Ontario

# MODERN DOOR CONTROL BY *LCN*

CLOSERS CONCEALED IN FLOOR

GENERAL OFFICE BUILDING:

MARATHON, A DIVISION OF AMERICAN CAN COMPANY

NEENAH, WISCONSIN

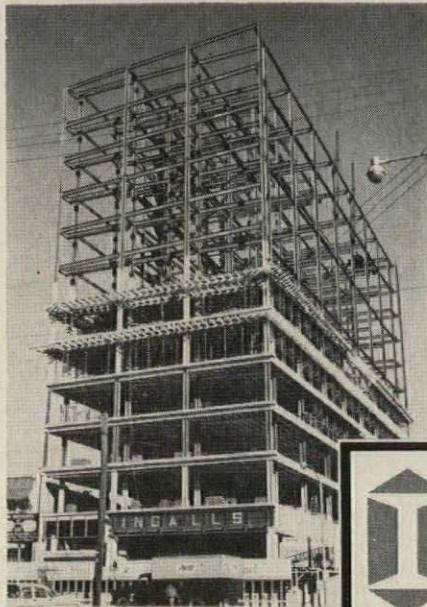
LCN CLOSERS, INC., PRINCETON, ILLINOIS

*Construction Details on Opposite Page*

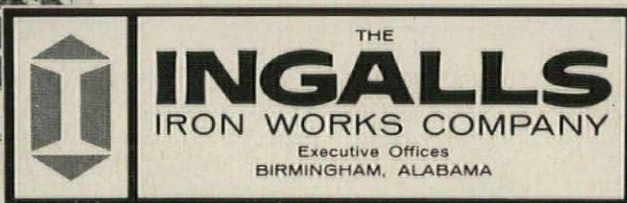


Perkins & Will  
Architects Engineers

## atlanta banks on structural steel by...

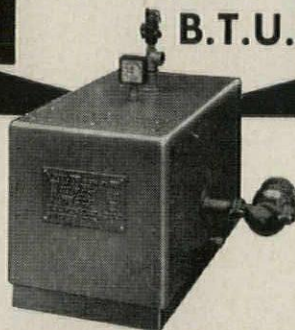


A soaring population of over a million . . . a soaring skyline of modern office buildings. That's Atlanta today. And typical of this dynamic trend is First National Bank's new branch office structure shown here. Over 1,300 tons of structural steel . . . fabricated and



**ELECTRIC  
HOT WATER  
HEAT**

**TO  
2,000,000  
B.T.U.**



- 40,948 B.T.U. to 2,000,000 B.T.U. Output.
- All units meet the requirements of the ASME Boiler and Pressure Vessel Code.

### PRECISION *Electric* HOT WATER HEATING BOILER

- **Complete unit ready for installation** with circulating hot water system and water chiller for year-round air-conditioning.
- **Conversion easily accomplished** where other type fuels now used. Suited for homes, churches, apartments, hotels, motels, hospitals, commercial buildings, swimming pools, snow melting and domestic hot water. Temperature Range 60 to 250 degrees.
- **Every unit tested and inspected.**

Write for color brochure and prices.



**PRECISION parts corporation**

400-AR North 1st. Street  
Nashville 7, Tennessee

No ducts! No noise! No chimney! No odors! No flame!

## Product Reports

### Slick, Dust-Rejecting Coating

A water-like fluid based on colloidal silica possesses the unique and useful property of filling the microscopic pores in a painted surface, making it so slick that dust and dirt cannot cling to it. Within 15 minutes after a 1 to 14 solution of the Soil Retardant Concentrate with water has been applied to a clean interior or exterior surface, the hard, transparent, dirt-rejecting coating is formed. Only one thin coat is required. The soil retardant finish does not affect the weathering of coatings, and succeeding coats of paint can be applied over it when necessary. *Finishes Div., E. I. du Pont de Nemours & Co., Wilmington, Del.*

### Crack and Corrosion Proof Terrazzo

*Corocrete* terrazzo flooring is recommended for installations where attractive appearance must be combined with high strength and resistance to corrosive chemicals, as in laboratories, industrial plants, sanitary facilities, and commercial and institutional kitchens. Available in a wide variety of colors, the material consists of silica or marble chips blended with liquid and hardener. It is applied with standard cement finishing tools, and given the final terrazzo finish by grinding. *The Ceilcote Co., 4832 Ridge Rd., Cleveland 9, Ohio*

### Lightweight Glass Drainline

A new lightweight glass drainline system for disposal of chemical wastes features simple, one-piece couplings for making quick permanent compression joints. The coupling consists of a stainless steel shell, a rubber sleeve, and a liner of du Pont's *Teflon 100-X*. The joint is made by

# INGALLS

erected by Ingalls . . . . frame its distinctive design. When you plan with steel, you make a sound investment. Savings, strength, and security are your dividends . . . . year after year after year. And when you call in Ingalls, you can bank on skill and experience in building that investment. Plan with steel—and Ingalls—on your next job.

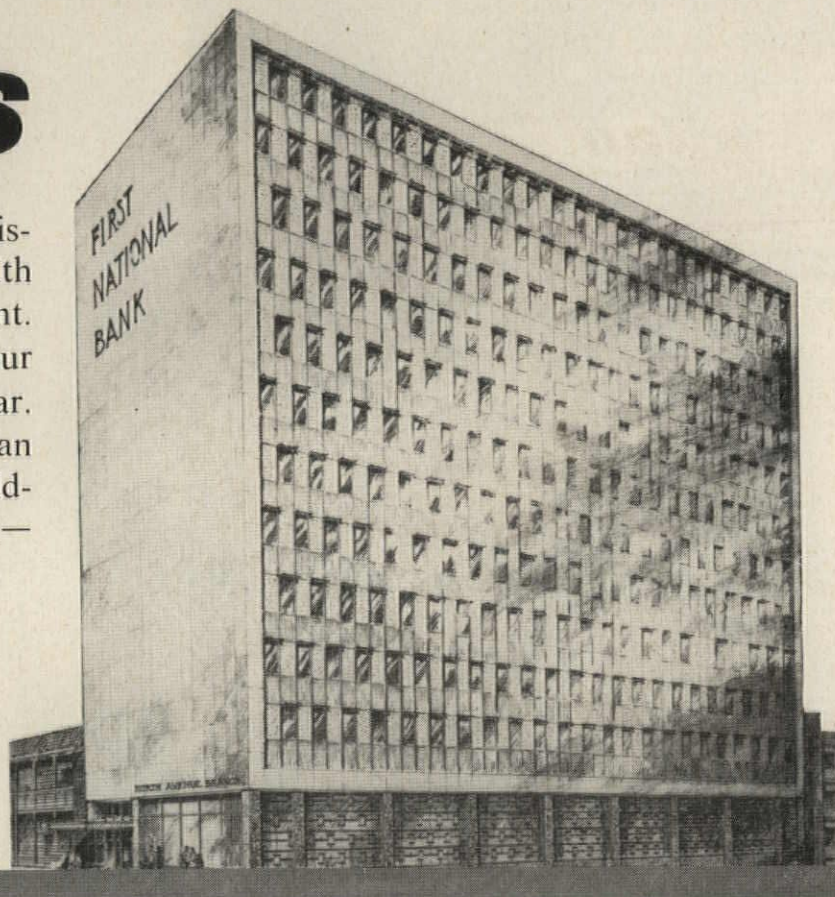
**Architect:** Francis P. Smith

**Engineer:** Robert G. Lose

**Builders:** Daniel Construction Co.

**Steel Fabrication:** The Ingalls Iron Works

**Steel Erection:** The Ingalls Steel Construction Co.



simply stabbing both ends of the glass pipe into the coupling and turning a single nut. Made of a hard, low expansion borosilicate glass that is affected only by massive quantities of hydrofluoric acid and hot alkalis, the piping and fittings can be mounted vertically or horizontally, in or above the ground. *Corning Glass Works, Corning, N. Y.*

## Bactericidal Concrete Floor

The development of a new type of concrete floor that kills bacteria and fungus is expected to reduce food plant maintenance and repair expenses and to help hospitals control infection. A strong, insoluble bactericidal agent incorporated in the mix is said to retain full effectiveness for the life of the floor. In food plants, the agent kills bacteria from spilled ingredients before they can form floor-devouring acids. In hospitals, it destroys disease-carrying organisms before patients can be infected. *Kalman Floor Co., 110 East 42nd St., New York 17, N. Y.*

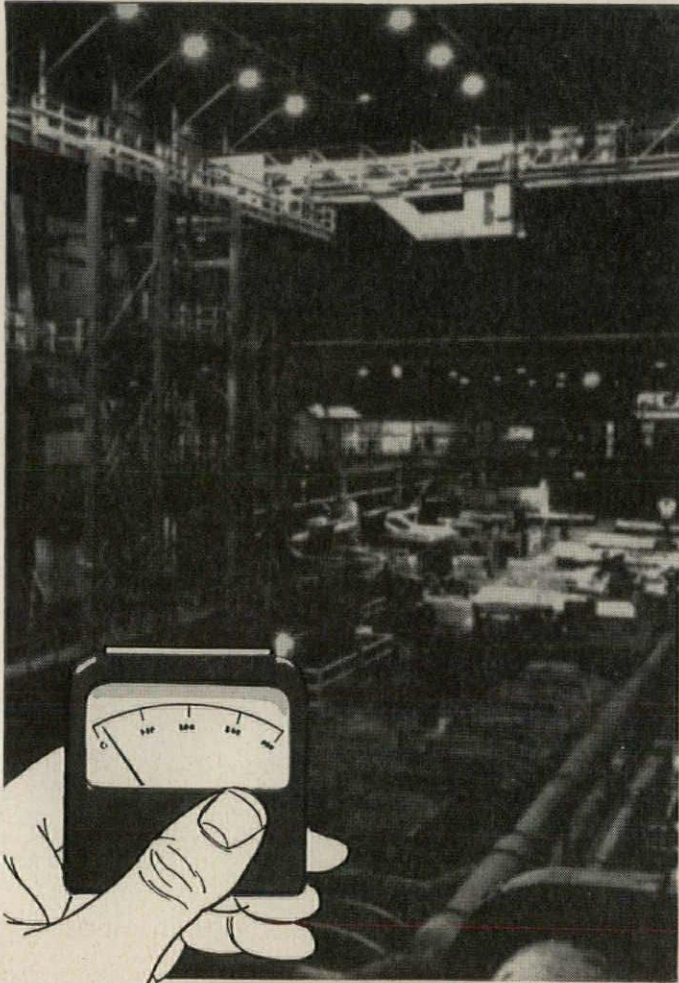
## Heavy-Duty Floor Finish

*Labrocrete No. 10*, a new extra-heavy duty floor finishing material, is produced especially for industrial plants, mills, foundries, factories, warehouses, and other installations where an economical, rugged flooring is required. According to its manufacturer, the concrete finish offers low original cost with maximum wear resistance; is easy to install and maintain; will not dust or rust; is non-corrosive and chemically inert; and has low absorption. It may be wet ground for a monolithic terrazzo-type floor, and is also available with non-slip or other specified aggregates, and in color. *Pre-Mix Corp., 4537 Mayfield Rd., Cleveland 21, Ohio* more products on page 246



A new fabric woven in America with an exotic Oriental look. Fabricane is one of a collection of woven synthetic and natural fiber materials designed for architectural uses. Information and samples on request to Dept. B.

**WENDELL PLASTIC FABRICS CORPORATION**  
1220 Broadway, New York 1, New York • Mills: Blacksburg, South Carolina



**Dull, dreary lighting** cuts down worker efficiency, causes eye strain, makes many work tasks hazardous.



**Improved lighting** pays off in higher output and greater accuracy, comfort and safety for workers.

## Abolite lifts the lighting level

In the picture on the right, those Abolite fixtures provide a high level of comfortable, glareless light throughout this high bay building. 18% of the light is directed upward through Abolite's open top, washes out the deep shadows, gives lamps a soft background. 35° shielding of lamp practically eliminates glare.

Open-top design also gives Abolite high bay units a self-cleaning action. Air circulates through the fixture, sweeps reflecting surface clean.

Choose from several Abolite upright units for high bay lighting: 18" and 24" Alzak aluminum fixtures for 400 and 1000 watt mercury lamps; and 14" and 18" fixtures for 300-500 watt incandescent lamps (ideal for gymnasium lighting). For full information, write *Abolite Lighting Division, The Jones Metal Products Company, West Lafayette, Ohio.*

*Abolite Cat. No. HMFAU-2400  
Alzak aluminum upright  
fixtures with 400 watt white  
reflector Mercury lamps.*



**ABOLITE**  
*Lighting*

THE JONES METAL PRODUCTS COMPANY

West Lafayette, Ohio



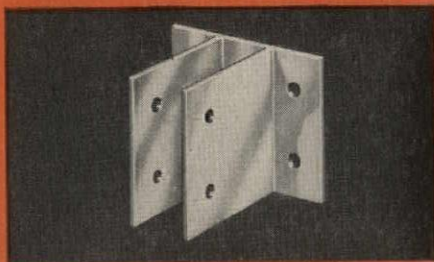
*the proved  
porcelain*



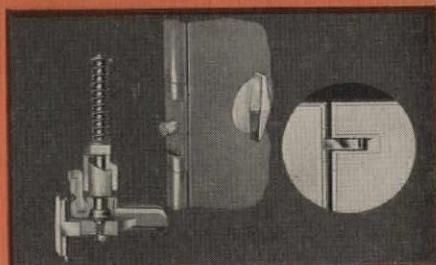
## PORCENA

for schools, public buildings, deluxe installations

You can be confident of beauty, of long-run economy, when you select Sanymetal Porcena porcelain enamel on steel as the material for toilet compartments. In 24 years of experience, and thousands of Porcena installations, there has not been *one* failure due to material or design. The secret of this record lies in the quality porcelain, the strong hardware, and the correct handling and assembly technique which Sanymetal uses. For an example of results, ask us about the case of one large school system, where vandalism or deterioration causes the replacement of toilet compartment panels (of another material) at the rate of one per calendar day, but where a Sanymetal PORCENA installation has stood up, year after year, without damage.



Sanymetal uses extra strong hardware especially designed for porcelain, such as these brackets designed to properly carry the weight of large panels and prevent sagging.



DELUXE, Porcena installations should have hardware that is beautiful as well as strong. Flush design of Sanymetal hinges, hinge brackets, latches, etc., gives you the clean, attractive appearance you want.



THE NAME PLATE  
IDENTIFIES EVERY  
SANYMETAL INSTALLATION

*Sanymetal*<sup>®</sup>

PRODUCTS COMPANY, INC.

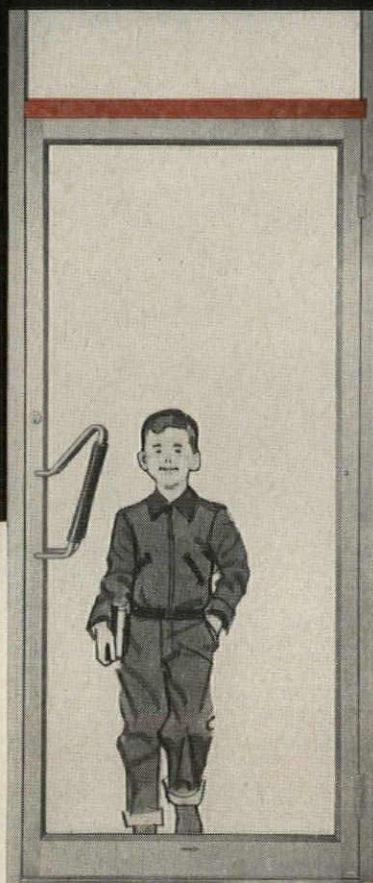
1689 Urbana Road, Cleveland 12, Ohio

Representatives in principal cities

In Canada: Westeel Products, Ltd., Montreal, Toronto, Winnipeg



**The Style Leader 125** is designed for shops where atmosphere is important, such as jewelry stores, clothing stores and specialty shops, or for banks or stores desiring a prestige appearance.

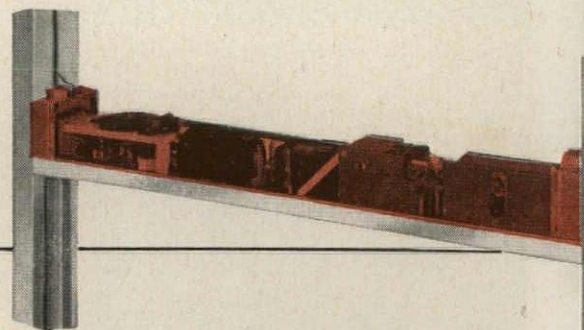


**The Narrow Stile 188** is used in stores or buildings which have a normal to heavy flow of traffic.



**The Extra Duty 350** is for use in stores or buildings which have an extra heavy flow of abusive traffic such as supermarkets and schools.

*Keys to the slim appearance  
and low installed cost of  
Kawneer Entrances...  
manual or automatic*



**Kawneer Automatic Operator**... the new idea in automatic operators. Nothing buried in the floor, nothing hanging over the door. The Kawneer Automatic Operator is completely concealed in the 4½" transom bar, wired to the mat through the frame. Available with all Kawneer entrance packages.

# new! KAWNEER DUTY-RATED ENTRANCE PACKAGES

with "tuned-to-the-traffic" design

These new Kawneer entrance packages are built to meet specific entrance needs. They combine the economy of fabrication with custom design flexibility. You choose from

- ... five different doors
- ... twenty push-pull hardware combinations
- ... five (or more) closers
- ... eight frame and entrance wall glazing systems

All components arrive in one package shipment, eliminating catch-as-catch-can deliveries and scheduling problems.

For complete information, tear out this corner and hand it to your nice secretary.

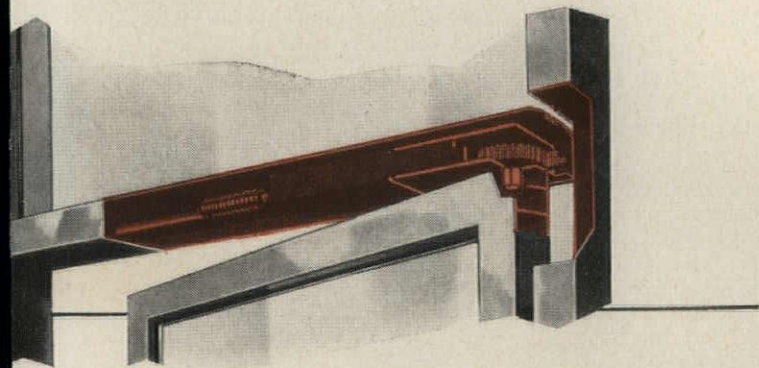
(Nice secretary: write for "The Second New Idea In Entrances", Dept. AR-30, Kawneer Company, 1105 N. Front Street, Niles, Michigan.)



The **Wide Stile 500** is for buildings where traffic is both heavy and highly abusive, or where a feeling of massiveness and solidity is desirable, such as banks.

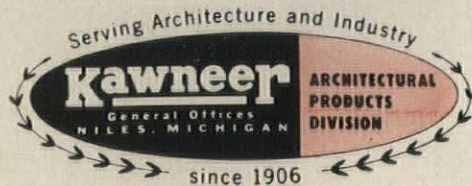


The **Stainless Steel 200** has been developed for those applications in which the design and decor of the building or store makes its use preferable.



#### Kawneer Concealed Overhead Closer

... It introduced the new sheer look in entrances—with low installed cost! No holes to dig, no cement case to set, no complex adjustments to make; this closer is completely concealed in the 1 1/4" transom bar. Available with all Kawneer entrance packages.

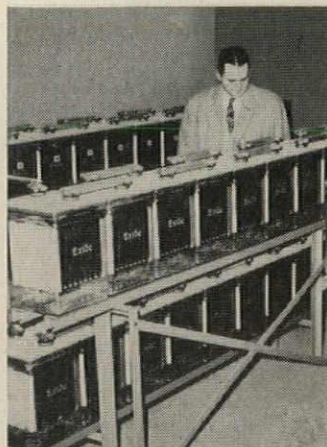




## When lights go out



## The Exide Emergency Lighting System takes over



**Emergency power source**  
Powerful Exide Batteries can handle lighting loads for entire buildings. Long service life—up to 25 years is common.

This emergency system prevents losses from panic, injury, damage and theft.

Sudden darkness from power failure can bring heavy losses. You need Exide Emergency Lighting Systems to provide the necessary illumination at such a time.

It is wise to plan for this fail-safe source of light when the building is designed. Exide supplies systems to suit structures of any kind and size—theaters, schools, hospitals, stores, factories and public buildings. Plan for long-range economy with the built-in protection of Exide Emergency Lighting Systems. Get all the facts—write Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 20, Pa.

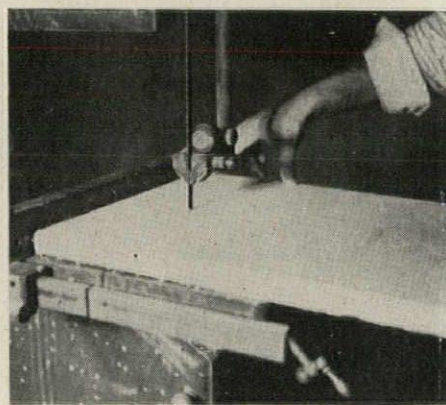
# Exide®

The Electric Storage Battery Company

## Product Reports

### Long-Lasting, Leakproof Ballast

The *Dri-Lok*, a solid fill ballast with case, core and coil permanently bonded into a single unit, is termed "the most significant development in ballast design since the introduction of fluorescent lighting." According to the manufacturer, the product eliminates all possibility of compound leakage. It contains a stable thermosetting material (75 per cent silica sand, 25 per cent "secret ingredients") that will not react or combine chemically with any other material in the ballast, and cannot soften or liquefy under any operating conditions. The voidless filling and bonding of the ballast eliminates the danger of parts working loose and shorting, and, coupled with the extreme heat conductivity of the thermosetting material, results in cooler operation, thus extending ballast life. The "locked-in" design of the *Dri-Lok* also reduces ballast hum. *Jefferson Electric Co., Bellwood, Ill.*

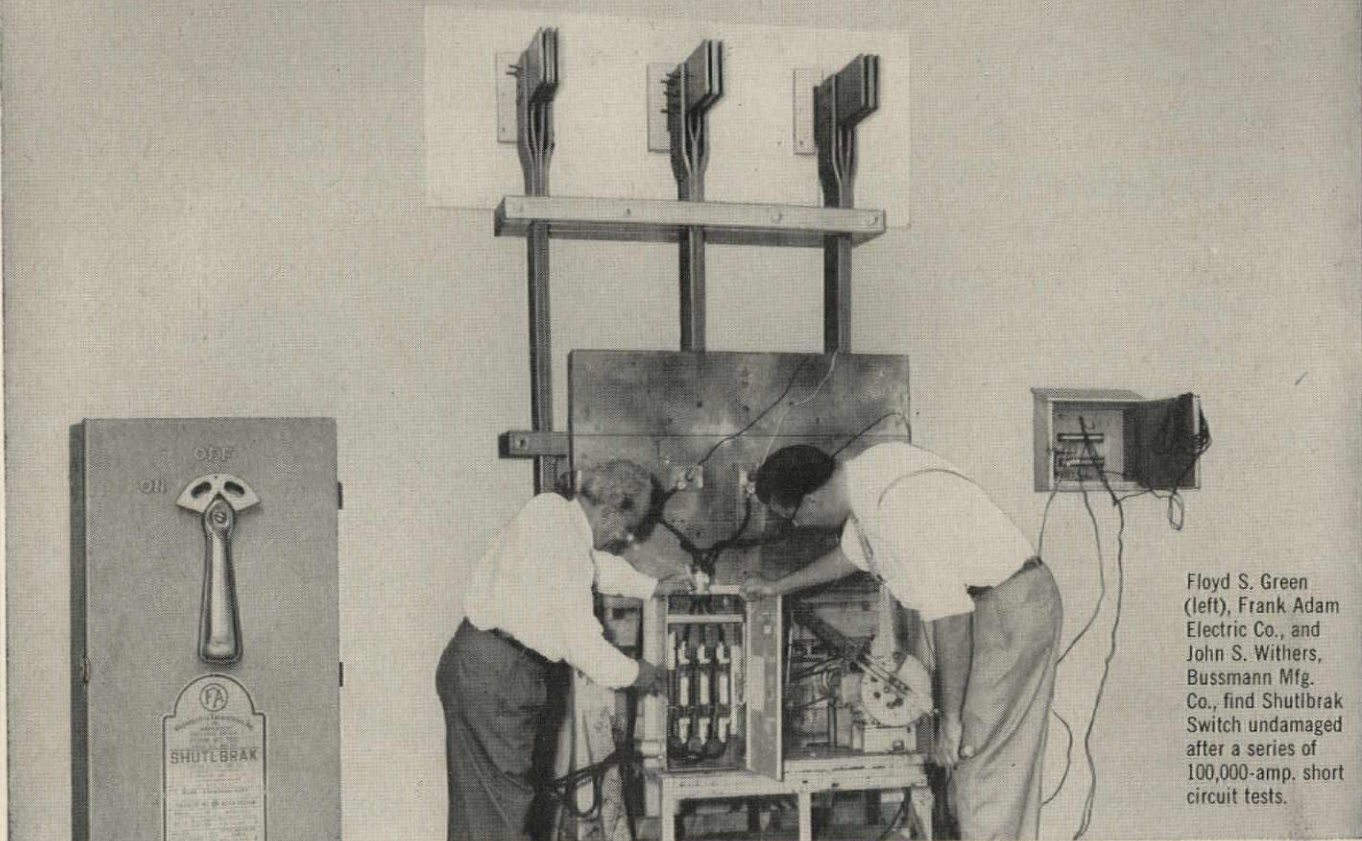


### Inorganic Construction Board

*Unarcoboard*, an inorganic, incombustible board for structural and insulation use in the construction industry, is said to be ideal for use as an exposed wall surface where insulation and sound-deadening properties are required. Available in sheets up to 4 by 8 ft in size, the white board can be worked like wood and installed just as rapidly and economically. Finishing is not required for smooth-sealed surfaces, but, if desired, the board can be laminated, covered by veneers, or painted with alkali-resistant paint. It comes in thicknesses from 1 to 3 in. *Union Asbestos & Rubber Co., Fibrous Products Div., 1111 W. Perry St., Bloomington, Ill.*

more products on page 253

**UNDAMAGED AFTER BEING "CLOSED"  
ON 100,000-AMPERE SHORT CIRCUIT!**



Floyd S. Green (left), Frank Adam Electric Co., and John S. Withers, Bussmann Mfg. Co., find Shutlbrak Switch undamaged after a series of 100,000-amp. short circuit tests.

# FRANK ADAM SHUTLBRAK SWITCHES

(SHUTTLE BREAK)

**TYPICAL TESTS MADE WITH  
FA 3-POLE  
SHUTLBRAK SWITCHES**

Switch Capacity	Fuse Type
100-amp. 250-v. Same switch	KTN Limitron LPN Low Peak
200-amp. 250-v. Same switch	KTN Limitron LPN Low Peak
100-amp. 600-v. Same switch	KTS Limitron LPS Low Peak
200-amp. 600-v. Same switch	KTS Limitron LPS Low Peak
400-amp. 250-v.	LPN Low Peak
600-amp. 250-v.	LPN Low Peak

In recent tests at Bussmann Manufacturing Company's test station, Frank Adam Shutlbrak Switches, equipped with Bussmann high interrupting type fuses, went through a series of tests with switches "closed" on a 100,000-amp. short circuit. **NOT A SINGLE BREAKDOWN OCCURRED!**

Here's a powerful demonstration of the safety and dependability insured by Frank Adam's famous Shutlbrak mechanism. FA Safety Switches give positive protection to both men and equipment against every hazard that might be caused by the tremendous overloads and shorts that can occur in any distribution and feeder circuit.

It costs no more for the extra *vital margin of safety* provided by Frank Adam Switches. Specify this better equipment. A new brochure is just off the press—write for yours!

**FRANK ADAM ELECTRIC COMPANY**  
P. O. BOX 357, MAIN P. O. • ST. LOUIS 66, MO.

busduct • panelboards • switchboards • service equipment • safety switches • load centers • Qulkheter

See our catalog in SWEET'S.





SHERATON

SHERATON-PORTLAND  
HOTEL ACHIEVES  
BOTH LUXURY  
AND ECONOMY  
WITH PORCELAIN  
ENAMEL  
PANELS

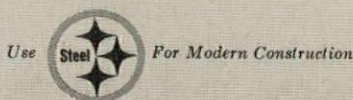
To create an overall theme of elegance and beauty for this completely modern hotel, architects Perry, Shaw, Hepburn & Dean specified porcelain enamel steel panels. The supplier chose Inland enameling iron for its uniform flatness and excellent enameling characteristics. Finished panels were delivered to the site set in metal frames. They were extremely easy to install and provided 15,000 square feet of refreshingly colorful design.

Porcelain enameled panels are simple to

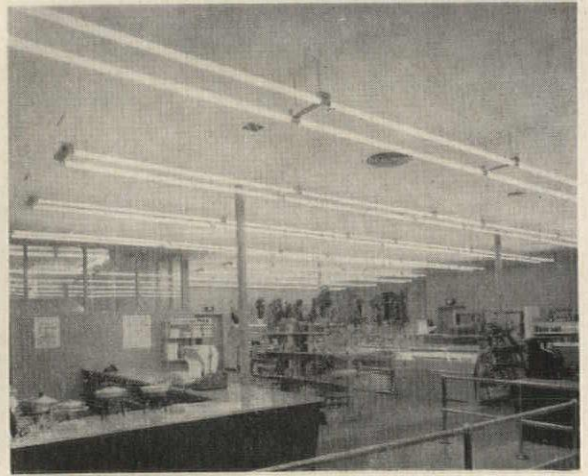
clean, acid-resistant, weather-resistant and colorfast. They completely eliminate later refinishing costs generally required with ordinary painted panels — make present and future maintenance of this attractive hotel extremely economical.

For complete information on the economy and efficiency of curtainwall construction, call or write the curtainwall manufacturer nearest you, the Porcelain Enamel Institute, or Inland Steel Company.

Montag, Inc., manufacturers of the porcelain enameled panels used, selected 16 gage, stretcher-leveled enameling quality steel supplied by Inland Steel Company—had no trouble meeting architect's specifications for color (grey), size and flatness.



# MARTLITE



SCIENTIFIC POULTRY FARMS, INC.  
FRANKLIN SQUARE, L. I., N. Y.  
ABRAHAM LANDOW ARCHITECT

## raises sales by raising lighting level

**Martlite Lighting Systems** increase sales in stores because they produce a large proportion of diffused light. They are economical to install and to operate, and little if any maintenance is required to keep them in top operating condition.

The fixtures have simplicity in design and are spaced away from the ceiling as a background for achieving a balanced brightness effect. They can be dressed up by the addition of plastic panels and louvers.

Martlite Fixtures are economical, sturdy and flexible.

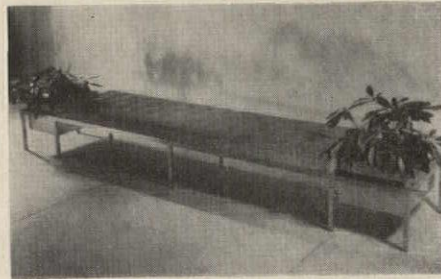
**There is an Ainsworth Fixture for every need. Send for more information.**

# Ainsworth

LIGHTING, INC.

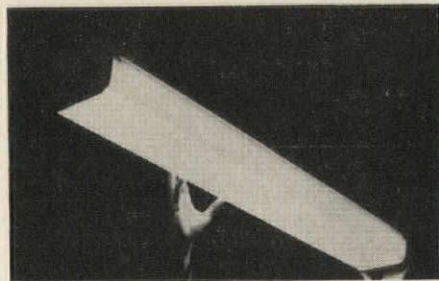
38-10 29th Street, Long Island City 1, N. Y.

## Product Reports



### Furniture for Public Areas

The bronze-framed planter bench shown above is typical of a full line of pieces designed by architect William Armbruster to meet the special furniture requirements of such public areas as lobbies, lounges, and waiting rooms. Other items in the line include platform seating units, benches, tables, chairs and planters, all designed to match the scale of large interior spaces and the maintenance conditions of public seating. *Edgewood Furniture Co., Inc., 334 East 75th St., New York 21, N. Y.*

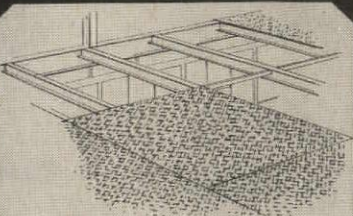


### Prismatic Plastic Diffusers

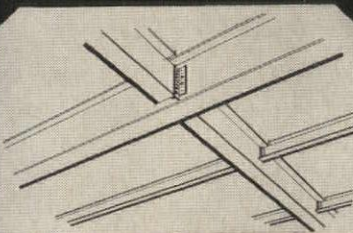
Two new extruded plastic diffusers for fluorescent fixtures are said to provide increased intensity of light on work areas, high fixture efficiency and excellent 45 degree cut-off, as well as low surface brightness. The *Directo-Lite* wrap-around diffusers are made of clear styrene with prismatic striations on both the bottom and sides. The prismatic design on the sides refracts emitted light upward to the ceiling, while the bottom lens directs light down onto work areas. The *Tu-Tone* diffusers (above) are similar, except that the one-piece units are made with white translucent side walls and a clear prismatic bottom. The latter confines emitted light to a 45 degree cone below the fixture, while the translucent sides present a low-brightness surface that completely hides the lamps. *Sheffield Plastics, Inc., Sheffield, Mass.*

more products on page 262

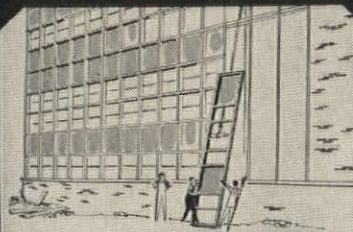
### other Inland construction products



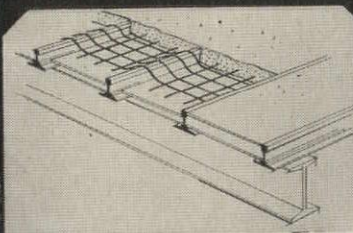
**4-WAY SAFETY PLATE** has come into general use as an integral, prefabricated part of the supporting structure, providing durable floors and added strength.



**WIDE FLANGE BEAMS** are the answer wherever more strength with less weight, longer spans with more open floor area, is the goal. Sizes from 8' to 24'.



**INLAND ENAMELING IRON** is ideally suited to curtain-wall and enameled panel systems, providing strength, beauty and unlimited design possibilities.



**INLAND SUB-PURLINS** are especially designed to provide a lighter, more efficient member for shorter-span roofs. They come cut-to-length and mill painted.

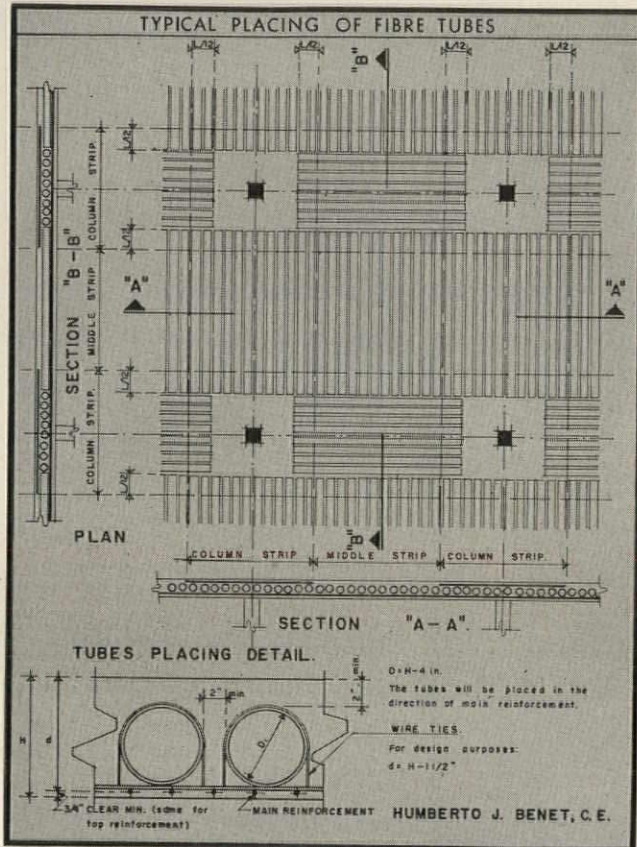


**INLAND STEEL CO.**

30 West Monroe Street  
Chicago 3, Illinois

# VOIDS

permit wider use  
of flat plate concrete slabs



Form voids with  
labor-saving, money-saving

**SONOCO**

**SONOVOID**

**FIBRE TUBES**

The many advantages of flat plate concrete slabs can be applied with greater design flexibility when such slabs are voided . . . (1) to displace low-working concrete and reduce slab weight; (2) to reduce reinforcing steel requirements; and (3) to permit a thicker slab with more rigidity and less deflection.

Sonoco SONOVOID Fibre Tubes are specifically designed to form voids in concrete floor and roof slabs, lift slabs, bridge decks, and precast piles. Low in cost and easy to handle and place, they save both contractors and owners time, labor, materials, and money.

## 7 GOOD REASONS For Using VOIDED Flat Plate Concrete Slabs

1. Voids create lighter weight slabs—with savings in concrete and reinforcing steel. And, this reduced dead load permits a considerable saving in foundations and structural members, particularly in multi-story buildings.
2. Smooth slab soffit underside allows direct application of plaster, paint, tile, and eliminates need for dropped ceiling.
3. Voids flat plate slabs reduce cubage of structure, with accompanying savings in walls, stairways, elevators, pipes, ducts, wiring, splays, facing, and supports.
4. Flush beams, as well as the voids through the slab, simplify installation of electrical, plumbing, and heating services.
5. The greater thickness of voided flat slabs, along with the dead air spaces within the slab, provide improved accoustical and thermal insulation qualities.
6. Voids slabs have less deflection—with greater ease of cantilevering.
7. Voids flat plate slabs offer greater design flexibility—permit spans of over 20 feet, provide better utilization of space and greater freedom in locating partitions—and LOWER OVERALL COSTS!



See our Catalog in Sweet's  
For complete information and prices, write

**SONOCO**  
Construction Products

SONOCO PRODUCTS COMPANY

Order Sonovoid Fibre Tubes in sizes from 2.25" to 36.9" O.D. in standard 18' lengths or as required. Can be sawed to size on the job—end closures available.



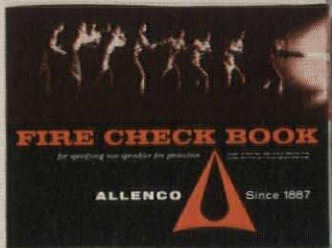
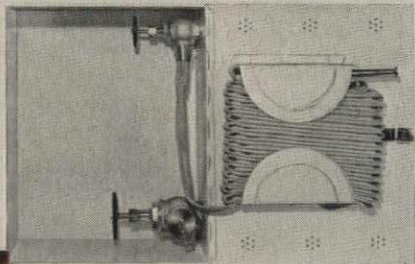
pretty  
neat!  
smallest,  
most  
compact

# FIRE HOSE CABINET!

It's the ALLENCO semi-automatic trimless "Hozegard" cabinet that not only matches good modern design but also permits flush mounting. The door is all that's visible! No trim to deal with. An exclusive, foul-proof hose rack is on the inside of the door which swings out 180° for instant and easy hose withdrawal. Hose *can't snag*, is always ready for instant action. U. L. Listed when hose clip is included. Available in sizes to include extinguisher and/or auxiliary 2½" angle-valve. Illustrated is Unit 7169. It has 22½% smaller visible area than other trimless cabinets containing the same equipment. Body is 20 gauge, door is 12 gauge, hinge is continuous semi-concealed, sight glass is 16" x 7½", handle is chrome plated. Overall dimensions: 26" by 27" by 8".

Specify **ALLENCO** by name

**WRITE** for your free copy of the ALLENCO "Fire Check Book", Speeds specification writing. Shows basic requirements for standpipe system, Hose stations, Extinguishers, Exterior centers. An invaluable guide.



**W. D. ALLEN MANUFACTURING CO.**

650 South 25th Avenue • Bellwood, Illinois

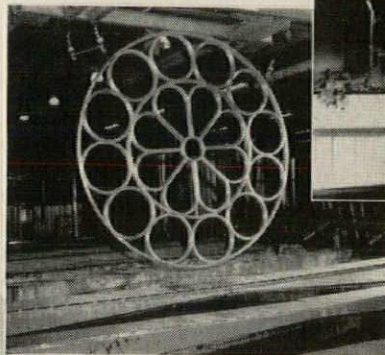
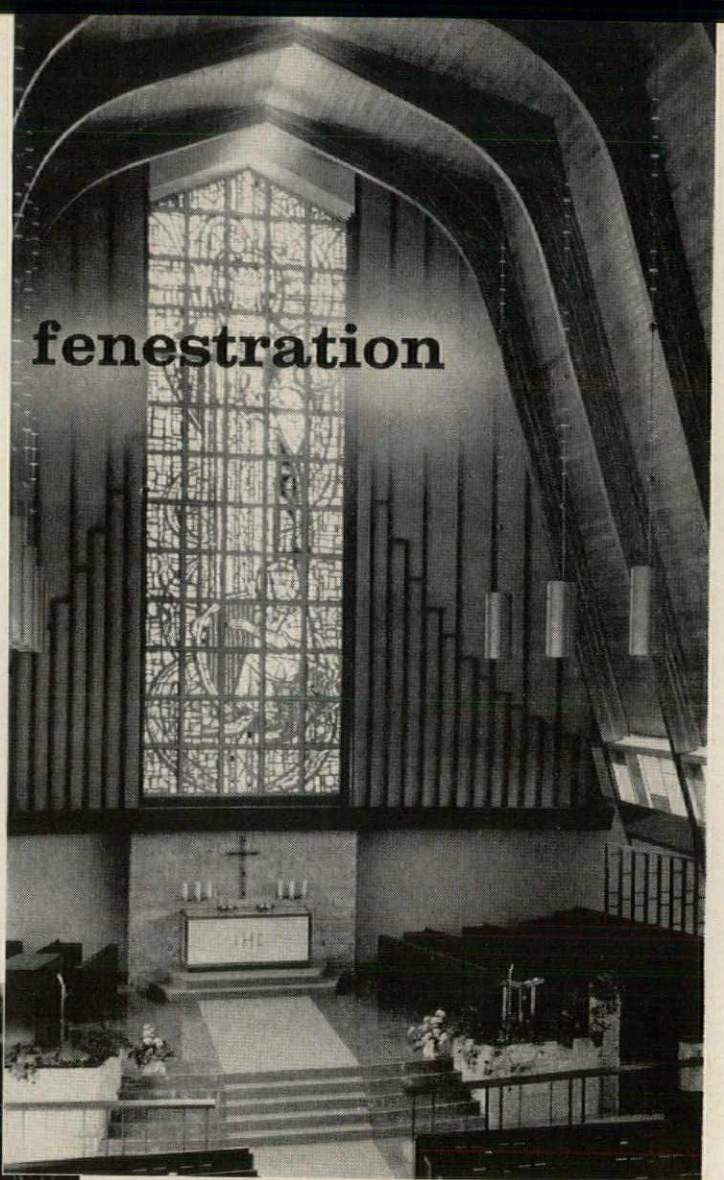
New York Office and Warehouse • 66 Reade Street, New York City 7

# aluminum church fenestration

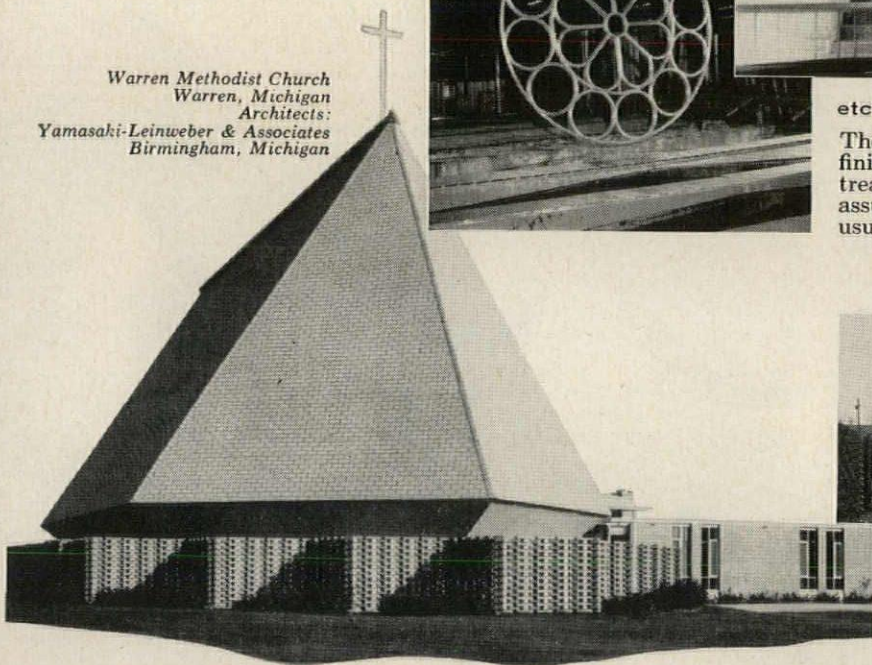
to fly the flight  
of architect's fancy

Even as medieval gothic architecture was symbolic of praying hands pointed to heaven . . . present day church structures often reflect soaring concepts among imaginative, contemporary architects. As specialists in engineered windows, the MARMET staff (and plant facilities) are well prepared to custom fabricate quality aluminum fenestration for the most daring modern or the most delicate, Gothic traditional.

*First Methodist Church  
Rochester, Minn.  
Architect:  
Bergstedt & Hirsch  
St. Paul, Minnesota*

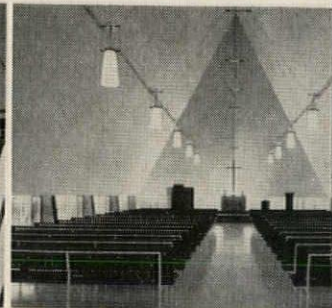
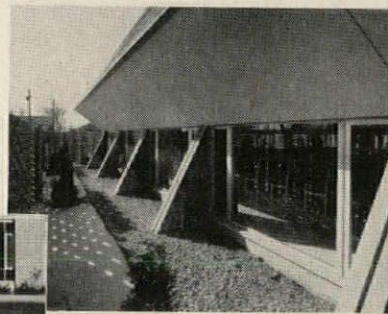


*Warren Methodist Church  
Warren, Michigan  
Architects:  
Yamasaki-Leinweber & Associates  
Birmingham, Michigan*



etched finish "stays new" indefinitely

The gleaming luster of MARMET's alumilited finish "stays new" indefinitely. A special dip treatment removes all surface impurities . . . assures even weathering, freedom from the usual maintenance problems.



## the man from MARMET

When any unusual site conditions require special technical assistance, the MARMET field engineer is available on 24 hour call to expedite job progress. If you need technical help or information in addition to that supplied by your local MARMET representative . . . write or phone for complete details on this service.



For additional information on the complete line of MARMET products—consult Sweet's Catalog File No. 17a or write to MARMET for catalogs Mar. 60-wc and 60-d.

Beautiful in their very simplicity, MARMET Series 100-160 Church windows in contemporary, gothic and rose window sash . . . add satin finished permanence to both the modest church building and more imposing edifices.

Constructed with the closest attention to details . . . MARMET windows are made of the finest extruded aluminum alloy . . . all electrically welded for hairline miters. The series 100-160 provides for double glazing, and accommodates up to 3/8" leaded glass. A smooth finished snap-on glazing bead eliminates screws and simplifies a later change to stained glass.



CORPORATION

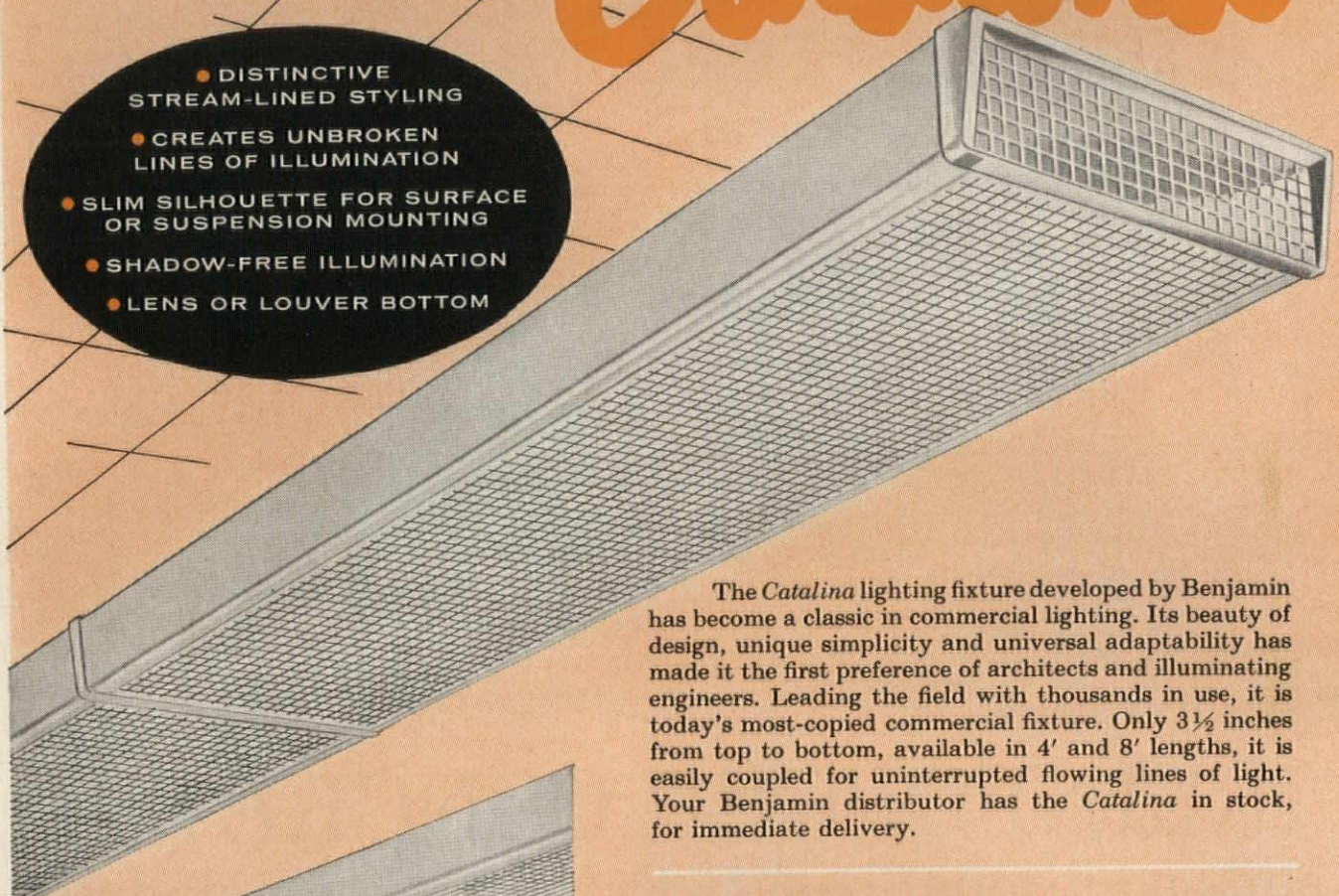
300-R Bellis Street, Wausau, Wis.

YOU GET THE  
ORIGINAL  
NOT A COPY  
WHEN YOU  
SPECIFY...

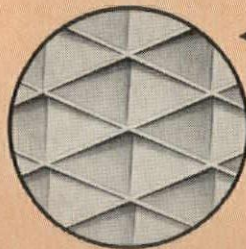
THE CLASSIC

# Catalina

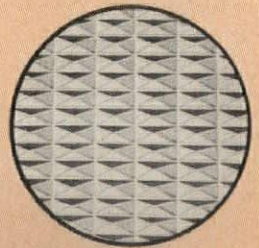
- DISTINCTIVE  
STREAM-LINED STYLING
- CREATES UNBROKEN  
LINES OF ILLUMINATION
- SLIM SILHOUETTE FOR SURFACE  
OR SUSPENSION MOUNTING
- SHADOW-FREE ILLUMINATION
- LENS OR LOUVER BOTTOM



The *Catalina* lighting fixture developed by Benjamin has become a classic in commercial lighting. Its beauty of design, unique simplicity and universal adaptability has made it the first preference of architects and illuminating engineers. Leading the field with thousands in use, it is today's most-copied commercial fixture. Only 3½ inches from top to bottom, available in 4' and 8' lengths, it is easily coupled for uninterrupted flowing lines of light. Your Benjamin distributor has the *Catalina* in stock, for immediate delivery.



◀ **SPARKLING PLASTIC LOUVERS**  
Benjamin's own one-piece polystyrene 45° x 45° louver with ½ inch cube.



▶ **GLISTERING L-120 LENS**  
Benjamin's exclusive polystyrene L-120 lens combining low-brightness with prismatic light diffusion.



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DIVISION Des Plaines, Ill.

**THOMAS INDUSTRIES INC.**

BENJAMIN • MOE LIGHT • STAR LIGHT • ENCHANTE • SAN MARINO



**WRITE TODAY** for complete information—ask for Bulletin C: Benjamin Division, Thomas Industries, 207 E. Broadway, Louisville 2, Ky. AR-3B



# REINFORCED CONCRETE

adds additional beauty to Milwaukee's skyline

Another outstanding example of reinforced concrete design flexibility is the new Milwaukee Municipal Building and Garage, housing the city's Health Department and Public Works. In the construction of this modern building, the architects were able to take advantage of the variations in street grades to provide two parking levels below the first floor offices.

For buildings large or small, reinforced concrete provides maximum design freedom to meet the unusual or specialized demands of terrain and occupancy. Before you build, investigate this more flexible method of construction and enjoy the added advantages of speed and economy.

City of Milwaukee Municipal Building and Garage  
Milwaukee, Wisconsin

Architects: Eschweiler & Eschweiler, Milwaukee

General Contractor: Siesel Construction Company, Milwaukee



Concrete Reinforcing Steel  
Institute

38 South Dearborn Street

Chicago 3, Illinois



## on aldrin

Today, more and more builders and architects are specifying aldrin for termite control in new construction. Here's why:

Aldrin is now listed in the minimum property standards of the F.H.A. for termite control on all types of new construction—slab—

basement—crawl space. This means complete projects can be treated safely, and without interrupting normal construction work.

Aldrin is alkali-stable, even when lime, cement and other building materials are present in the soil.

And, aldrin is economical. Small

amounts go a long way, give effective protection for many years.



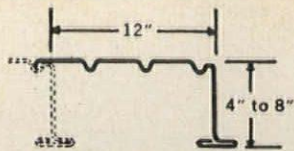
See your local Pest Control Operator for complete information on aldrin for termite control in new construction. Why not see him today. Or write to:

**SHELL CHEMICAL COMPANY**

AGRICULTURAL CHEMICALS DIVISION  
110 West 51 Street, New York 20, New York

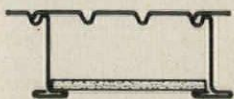
ATLANTA • NEW ORLEANS • ST. LOUIS • SAN FRANCISCO



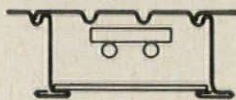


**T-STEEL** — New! Galvanized. For clear spans to 32'0". Adaptable to acoustical and flush, luminous treatments. Provides superior diaphragm to resist seismic and wind loads.

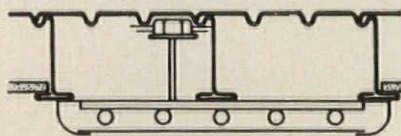
**Ceiling Treatments with T-Steel Deck**



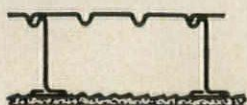
Standard Tile or Board



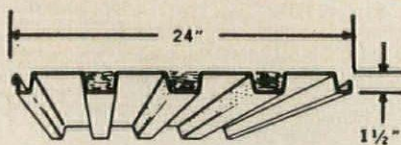
Light Diffuser



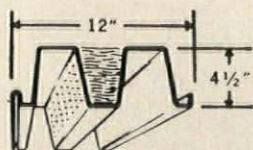
Surface-mounted Fixture



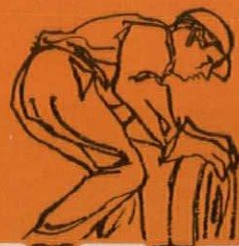
Lath-and-Plaster Fireproofing



**TYPE B ACOUSTIDECK** — For purlin spacings to 10'. Uses minimum of 1" rigid insulation board.



**TYPE C ACOUSTIDECK** — For purlin spacings to 24'. Uses minimum of 1 1/2" rigid insulation board.



**ACOUSTIDECK**



**INLAND** coordinated roof

*Complete structural systems permit a range of ceiling, lighting, and acoustical treatments within budget limitations*

**Acoustideck** serves as a combination steel roof deck and acoustical ceiling having a Noise Reduction Coefficient of .70. It is especially practical over gymnasiums and other areas where it is important to have acoustical treatment not easily damaged.

Panels are erected fast in any weather that a man can work. Since the panels are Bond-erized, then covered with a baked-enamel prime finish, field-painting costs can be cut in half because only one finish coat is required normally. The fluted underside is left exposed as an attractive ceiling.



T-STEEL  
ROOF DECK

systems save school building dollars

**New T-Steel Roof Deck** allows you design freedom in covering classrooms of 26' to 32' spans. You can specify various types of acoustical tile — provide a flush, luminous ceiling — or leave the underside of T-Steel exposed and paint it.

T-Steel deck provides a superior diaphragm to resist seismic and wind thrusts — proved by full-scale shear tests conducted by independent engineering firms.

Write for catalogs 240, 241 and 246 — or see Sweet's sections 2c/Inl and 11a/In for full information on Acoustideck and T-Steel. Inland Steel Products Company has a force of trained sales engineers capable of giving you the benefit of diversified experience on specific problems. Write or call your nearest Inland office.

member of the



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**INLAND STEEL  
PRODUCTS COMPANY**

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Milwaukee 1, Wisconsin

EP-6

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your  
foot  
to  
wash  
your  
hands**



● A touch on the Bradley Foot-Control and you have a clean spray of tempered water for the best wash-up you've ever experienced! No soiled hot and cold faucets to touch. No dirty bowl because the Bradley rinses itself clean when it's used.

Yes, this is the Ultimate in washing pleasure, convenience, speed, sanitation and in modern good looks.

Bradleys are available in six beautiful colors, in any combination of these colors,

and in stainless steel. Bradleys are ideal for today's schools, institutions,

office buildings, plants and are

already in use in many of the finest!

**BRADLEY WASHFOUNTAIN CO.**

2227 West Michigan St.

Milwaukee 1, Wis.

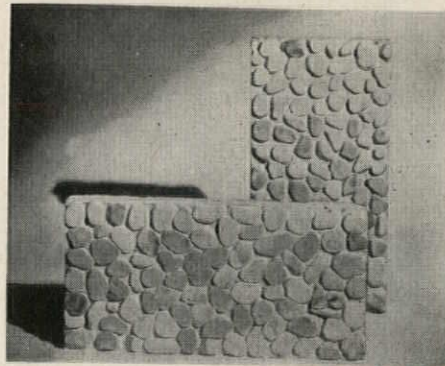


Write for  
colorful new  
Bradley Bulletin  
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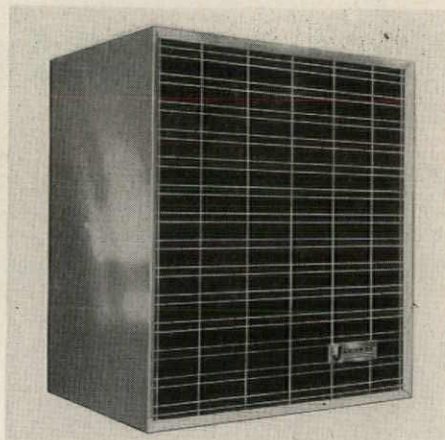
**BRADLEY**  
*washfountains*

## Product Reports



### Precast Marble Tile

*Cobblecast*, a new series of Venezia precast marble for walls and exterior flooring, features large rounded marble chips set in relief to create a three-dimensional appearance on surfaces where a rugged texture is desired. The standard 8-by-16-in. units are approximately 1 in. thick and come in white, buff, salmon, dark green and black. *Buildesign Corp.*, 41 East 42nd St., New York 28, N. Y.



### Streamlined Unit Heaters

A new line of gas-fired unit heaters, the 67 series, has been restyled for greater compatibility with surrounding decor. The heaters also feature quiet air delivery which makes them suitable for applications where conventional units might be too noisy. Controls are completely automatic, factory assembled and wired, and though concealed from view, readily accessible for servicing. A limit control prevents excessive unit temperatures, while a thermopilot shuts off all gas in event of pilot failure. The eleven models in the 67 series have a Btuh input range of 30,000 to 250,000. *Janitrol Heating and Air Conditioning Div.*, 400 Dublin Ave., Columbus 16, Ohio

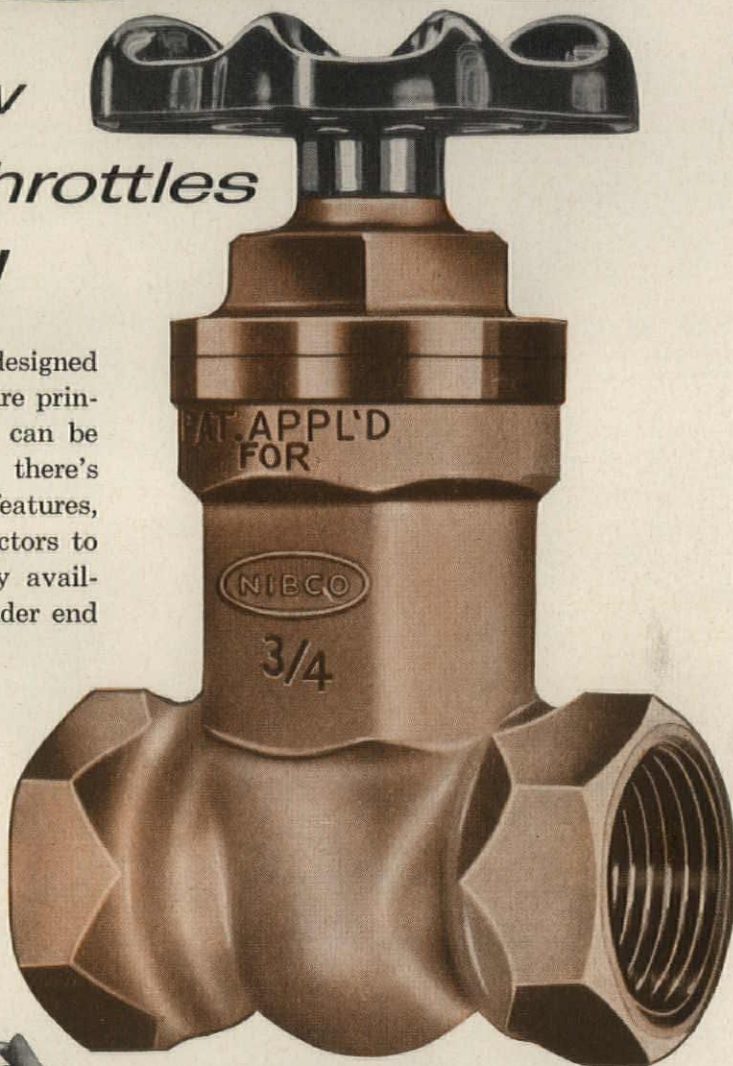
more products on page 266



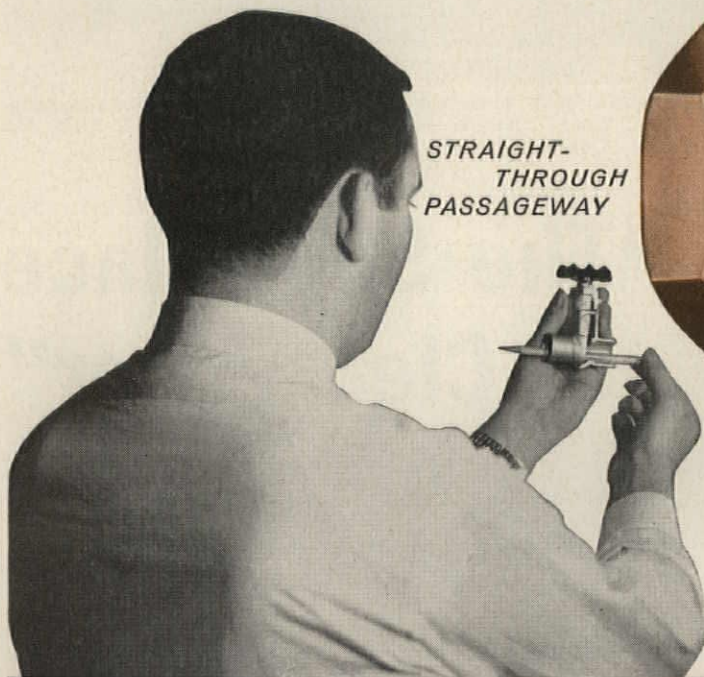
# HUSKY

*...new full-flow  
gate valve that throttles  
like a globe!*

You've never seen a valve like this newly designed HUSKY conical gate. New shape, new closure principle that provides unrestricted flow, but can be throttled from shut to wide open. And, there's practically no wear out. These new HUSKY features, together with its low price, permit contractors to greatly upgrade all installations. Presently available at wholesalers in 1/2" and 3/4" sizes (solder end or threaded).



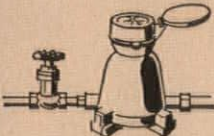
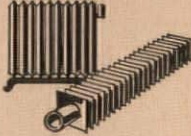

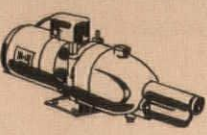
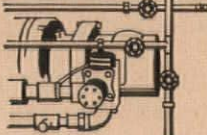
STRAIGHT-  
THROUGH  
PASSAGEWAY



## FEATURES

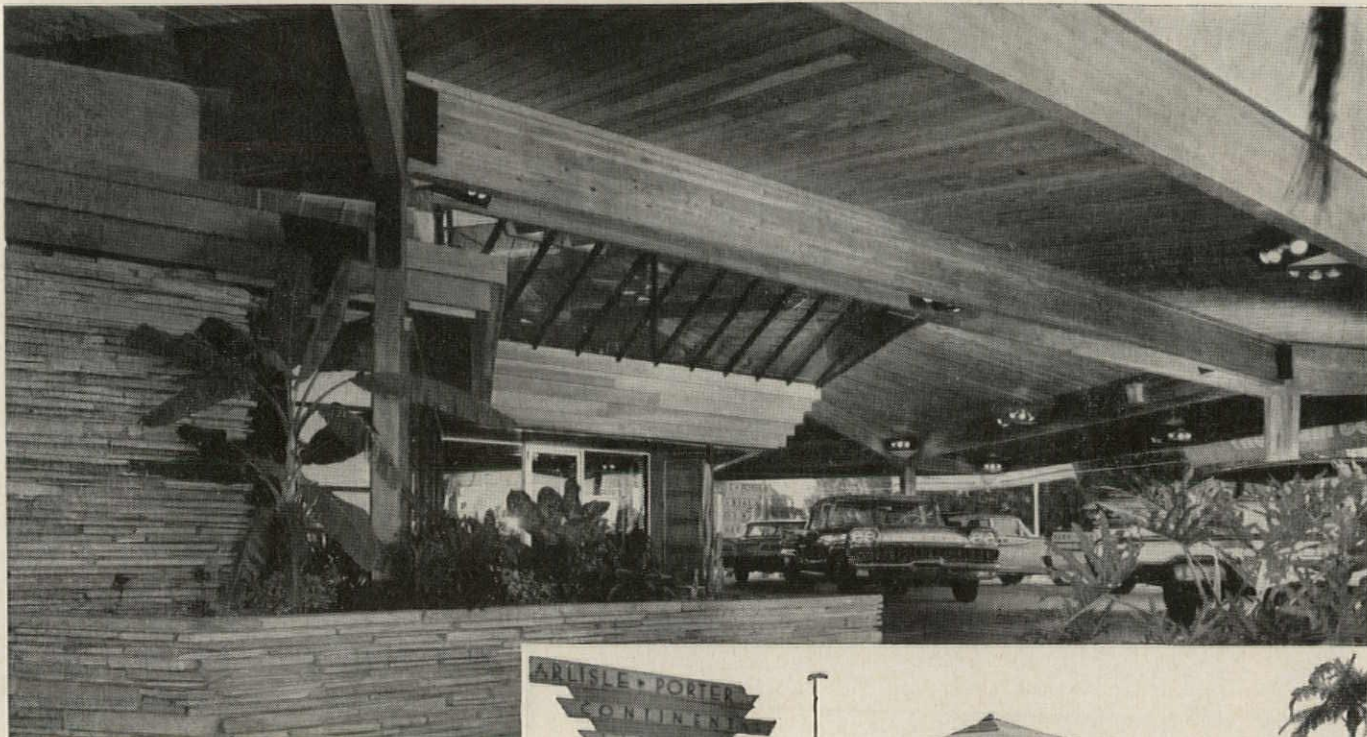
- Hexagonal Body • Concave Seat
- Buna-N Gate • W. O. G.
- Non-Rising Stem • Full Flow
- Throttle Control • Aluminum Handwheel • Fingertip Closure
- Only Seven Parts



<b>UNIVERSAL USAGE!</b>	 Water & Gas Meters	 Radiators	 <b>HUSKY BRASS VALVES</b>
	 Water Pumps	 Air Lines	



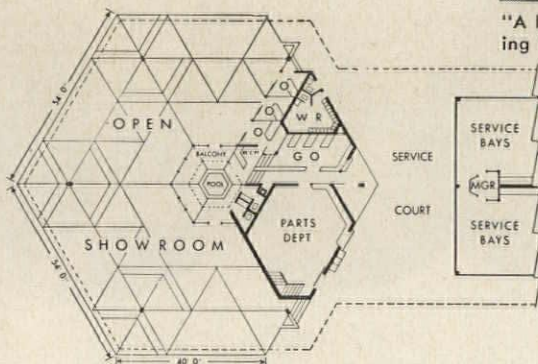
NIBCO INC., Dept. K-2103  
Elkhart, Indiana



Wood says welcome. An interior view of Carlisle-Porter's new showroom and service building. Construction features Rilco laminated wood hip beams,  $5\frac{1}{4}$ " x 26' x 39'1" to 52'8" long, plus columns, purlins, fasciae and Rilco Western Red Cedar deck.



"A landmark in this area," says H. H. Carlisle of his firm's recently constructed Rilco building in Clearwater, Fla. Architect: John Randall McDonald, AIA, Indian Rocks Beach, Fla.



## "The Showplace of Clearwater"

"And the most dramatic business building on the West Coast of Florida," adds H. H. Carlisle, of Carlisle-Porter, progressive Continental, Lincoln and Mercury dealer in Clearwater, Fla.

"We are more than pleased," he continues, "with the Rilco laminated wood construction. It has greater beauty than we could visualize . . . the utility is tops . . . and as a setting for our fine cars it permits us to show them off to the very best advantage. We have visitors every day who express amazement at the beauty and utility of this building."

Strong words, but typical of those from the many satisfied owners of buildings constructed with Rilco laminated wood.

Laminated wood arches gracefully span large areas, often eliminate supporting columns and posts. Initial low cost and labor saving maintenance of wood assures satisfaction for budget minded buyers. Fashioned from sturdy Douglas fir, Rilco wood members are bonded by glues stronger than the wood itself. All members are shipped custom constructed to your exact specifications.

In addition, Rilco laminated wood offers complete freedom of design — lends itself to most types of construction. Write for complete information.

Ask for Rilco's free, fully illustrated commercial construction catalog.

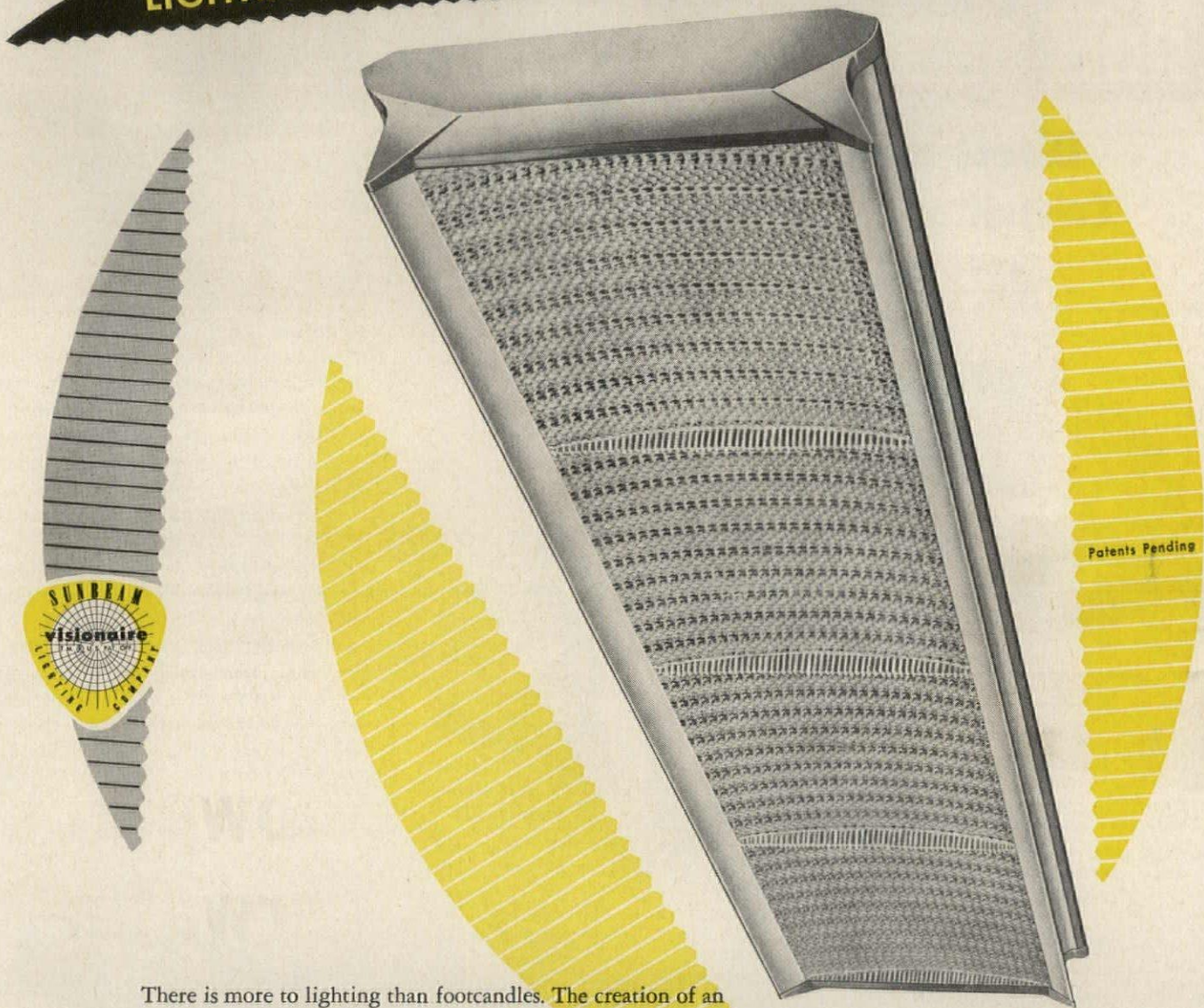


**RILCO**  
works wonders with wood

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W 818 FIRST NATIONAL BANK BUILDING  
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# SCULPTURAMA LIGHTING FOR A FRIENDLY ATMOSPHERE



There is more to lighting than footcandles. The creation of an aesthetic environment and a friendly atmosphere are equally essential to most if not all human tasks. To this end Sunbeam Lighting Company dedicates a new and beautiful Sculpturama® series (QRH7502). The all-curved styling of this 2-lamp unit is combined with the inwardly curved Holophane Prismalume\* acrylic lens panel.

This blend of gentle curves results in excellent low brightness control both from the illuminated metal sides and the prismatically sharp Prismalume\*. No visible "hardware" mars the clean, sculptured look of this unit. Now, you can have lighting fixtures which will supply both footcandles and friendly styling to your interiors. An added bonus comes your way in the form of comfortable, low brightness illumination.



## SUNBEAM LIGHTING COMPANY

777 East 14th Place, Los Angeles 21, California  
3840 Georgia Street, Gary, Indiana

For more details ask for bulletin A84G.

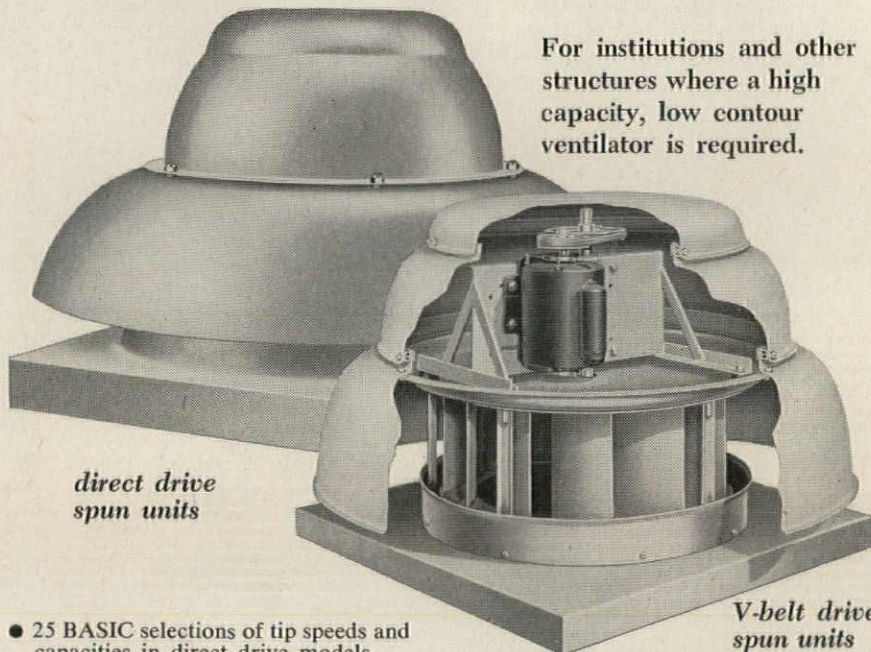
\* © Holophane Co., Inc.

# Burt

# NEW

*Spun Aluminum*

## Direct and V-Belt Drive Centriflow Fan Ventilators



*direct drive  
spun units*

*V-belt drive  
spun units*

- 25 BASIC selections of tip speeds and capacities in direct drive models.
- 64 BASIC selections of tip speeds and capacities in V-belt drive models.
- CAPACITIES from 65 to 27,648 CFM.
- HORSEPOWER ratings from 1/60 to 7½.
- SIZES from 6" through 48" wheel diameters.
- STATIC PRESSURE range from 0" through 1" W.G. (Higher static pressures on application).
- LOW PROFILE heavy gauge spun aluminum housings.
- NON-OVERLOADING backward curved, non-sparking aluminum fan wheels.
- ADJUSTABLE SHEAVES on V-belt units to change capacities at anytime.
- DAMPERS available in drop-in sleeve type, automatic back-draft or motor operated.
- BURT DESIGNED for minimum noise levels.
- AMCA CERTIFIED capacity ratings for units of 16" wheel diameter and larger.



*Send for FREE Data Book!*

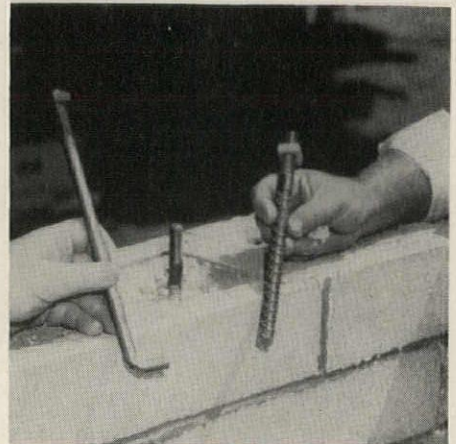
Write for Burt Data Book SPV-101-H.  
It supplies quick data on Burt's  
complete line of modern Roof Ventilators.

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

# The Burt Manufacturing Company

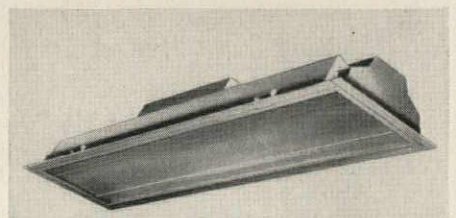
48 E. South St. AKRON 11, OHIO  
MEMBER AIR MOVING & CONDITIONING ASSOCIATION, INC.

## Product Reports



### Headless Anchor Bolt

A new anchor bolt design for fastening wood ledgers and sills to concrete and unit masonry combines greater strength with ease and economy of manufacture and installation. Called the *Di-Lok* anchor bolt, it eliminates the bend, or head, at the base of the conventional anchor bolt so that sills can be set immediately after the foundations are poured, and the bolts hand-placed in the concrete through pre-drilled holes in the sills. The bolt's holding power derives not from a bend, but from a surface pattern similar to that of standard reinforcing rods. *Columbia-Geneva Steel Div., U. S. Steel Corp., 523 W. Sixth St., Los Angeles 14, Calif.*



### Combination Light and Air Diffuser

A recessed air diffuser incorporating an enclosed light troffer unit provides engineered air distribution through slots along both sides of the light fixture. It can be had in 1-by-4- or 2-by-4-ft sizes with a top air connection as shown or with a right angle connector for a horizontal air inlet. In either case, discharge air is completely separated from ballasts, fluorescent tubes and reflecting surfaces. The 5-in. expanding cone damper that controls air volume is accessible by unlatching the bottom of the diffuser. *Barber-Colman Co., 1300 Rock St., Rockford, Ill.*

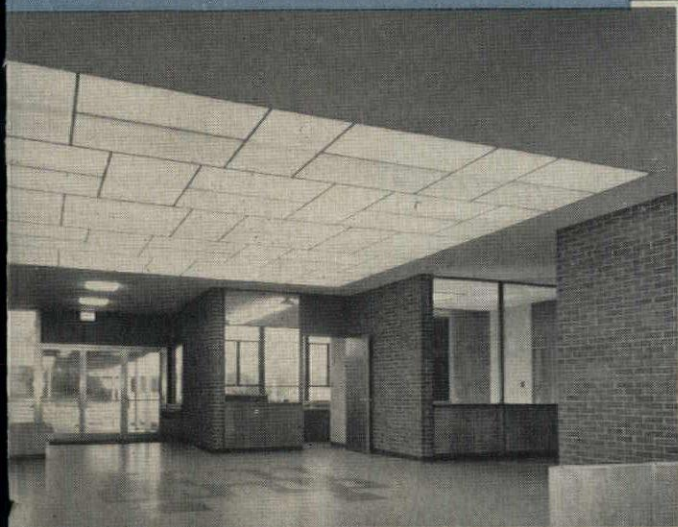
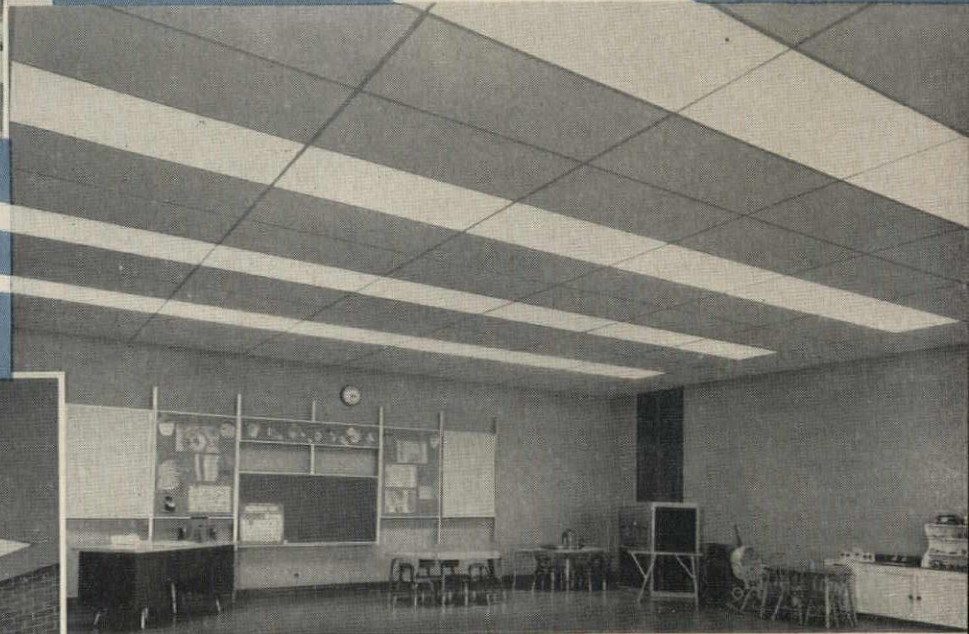
*more products on page 274*

middlefork school, northfield, illinois  
feature american plastic louvers...  
*for better light shielding and seeing comfort*

they provide the finest in luminous shielding  
qualities of soft glare free illumination,  
with minimum of maintenance . . .



ARCHITECT: Albert R. Martin  
Wilmette, Illinois  
CONTRACTOR: Oman & Giden  
Northfield, Illinois  
ELECTRICAL: Erland's Elec. Contractors  
Skokie, Illinois



Now! AMERICAN LOUVER offers 3 shielding  
medias—42°—45° and the all new 55° louver,  
for higher lighting efficiency and uncluttered  
appearance—they will meet your most rigid  
lighting requirements for individual fixtures,  
modules or complete louvered ceilings.

**It pays to specify American louvers**

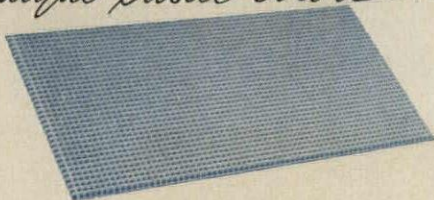
- PERMANENT COLOR STABILITY
- HIGH IMPACT FOR GREATER STRENGTH
- EASY TO HANDLE—LIGHT WEIGHT
- PATENTED INTERLOCKING LOUVERS
- ASSURE PERFECT ALIGNMENT
- LOW COST UPKEEP—EASY TO CLEAN
- AVAILABLE IN COMBINATION OF SIZES
- LOUVERS MAY BE CUT TO SPECIFICATIONS

Exclusive Process by AMERICAN LOUVER COMPANY

U. S. A. Patent No. 2,566,817  
Canadian No. 484,346

U. S. A. Patent No. 2,607,455  
Canadian No. 497,047

*Available in 5 permanent  
beautiful pastel colors . . . .*



American Plastic Louvers are available in pastel  
colors, molded-in for permanent beauty. They pro-  
vide the architect and designer unlimited possi-  
bilities with the use of colors in combinations of  
White . . . Blue . . . Green . . . Pink . . . Yellow  
and Low Brightness Grey.

Engineers are available in your area to help with  
your lighting problems or write American Louver  
Company direct.

**american louver company**

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# DEVOE PAINTS

*decorate  
the palace that  
replaced "the barn"*

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Moisant International Airport, Kenner, La. Architects: Goldstein, Parham & Labouisse and Herbert A. Benson—George J. Riehl, New Orleans, La. Painting Contractor: Bailey, Lewis and Williams, Atlanta, Ga.



**20,000,000 cubic feet  
in New York's new 60-story  
Chase Manhattan Bank  
will be air-conditioned  
and heated with the help of  
some 1,500 tons  
of Bethlehem Steel Pipe**

Beth-Co-Weld to 4-in., nom., and  
Electric Resistance-Weld to 16-in. OD

*Architect: Skidmore, Owings & Merrill.  
General Contractor: Turner Construction Co.  
Mechanical Contractors: Raisler Corp. and Kerby Saunders, Inc.—A joint venture.  
Pipe Jobber: Chas. F. Guyon, Inc.  
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BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.  
*Export Distributor: Bethlehem Steel Export Corporation*



**BETHLEHEM STEEL**

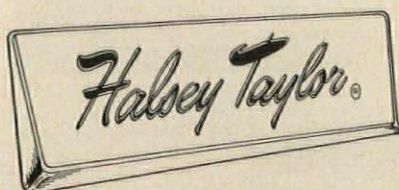




Photo courtesy of Mel Warshaw, Inc., Miami (creators of Jay Originals and Trend-Setter fashions)

**FASHION NOTE FOR 1960** — Advanced styling is an art, demanding the very epitome of creative genius. It's an incentive to feminine shoppers. And in like manner it influences industrial buyers . . . even in the selection of drinking-water equipment, such as these two trend-setting models by Halsey Taylor. In fact, if it's Taylor-made, it's the most modern in its field.

The Halsey W. Taylor Co., Warren, O.



ASK FOR LATEST CATALOG, OR SEE SWEET'S OR THE YELLOW PAGES



this is the new  
**WALL MOUNT \***

It's a Halsey Taylor first! Mounts on the wall, off the floor. Compact, easy to keep clean, with no corners or crevices to catch the dirt.

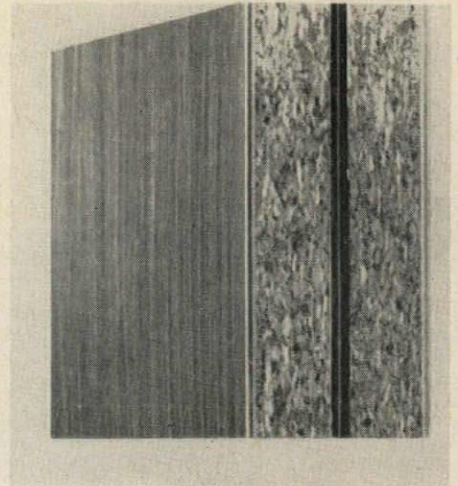
\*Patent Pending



new wall-mounted  
**COFFEE BAR**

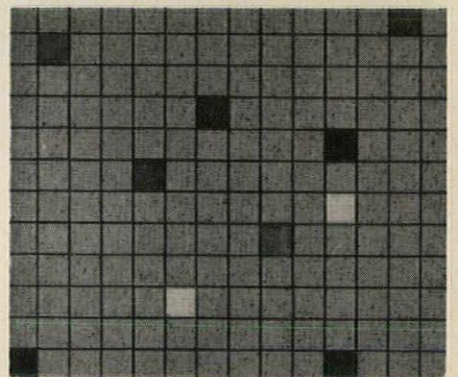
Gives instantaneous hot water for serving up to sixty 8-oz. cups of hot coffee. Goose-neck type dispenser with a push-down lever. No exposed fittings.

## Product Reports



### Acoustical Plywood Door

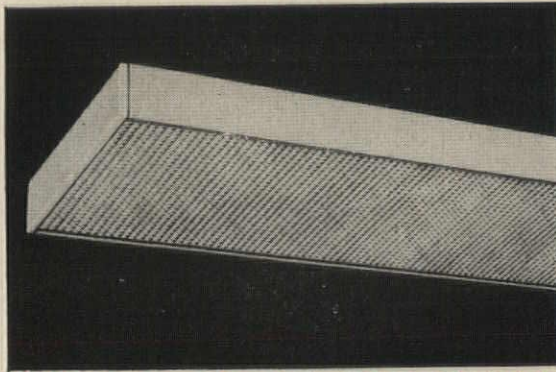
According to its manufacturer, the *Weldwood* Acoustical Door combines reasonable price with certified sound control performance. Its construction is shown above: an outer skin; an inner skin of *Novoply*, a three-ply board of resin-impregnated, laminated wood chips and flakes which has excellent sound reduction properties in its own right; damping material; and a small air space. The doors are hung in the conventional way, and may be faced with a wide variety of domestic or imported veneers. *United States Plywood Corp., Door Div., 55 West 44th St., New York 36, N. Y.*



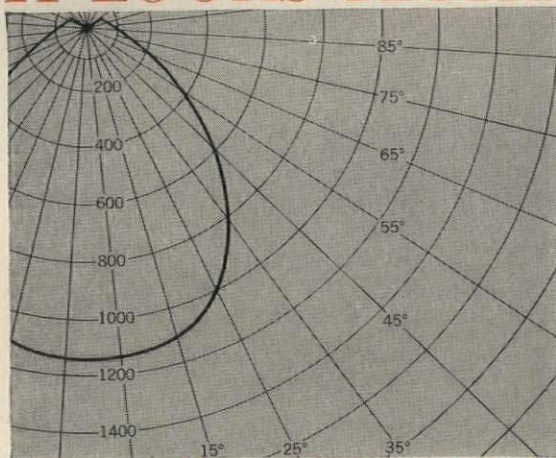
### Pre-Patterned Ceramic Tile

The latest addition to the *Vico* line of ceramic tiles is a cushion-edged tile that comes in 2-ft-sq sheets of 1-in. or 3/4-in. squares prearranged in a selection of six "Buckshot" blends and three Buckshot spatters (above). The squares are said to be extremely easy to apply, impervious to moisture and liquids, non-marring, easy-cleaning, and highly wear-resistant. *Amsterdam Corp., 285 Madison Ave., New York 17, N. Y.*

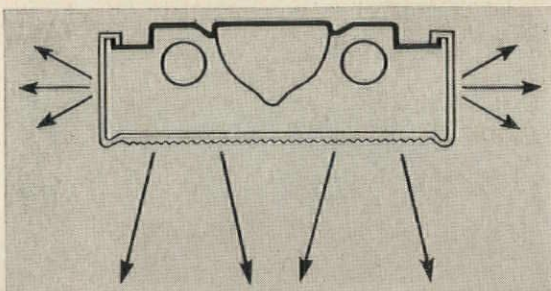




IT LOOKS RIGHT



IT LIGHTS RIGHT

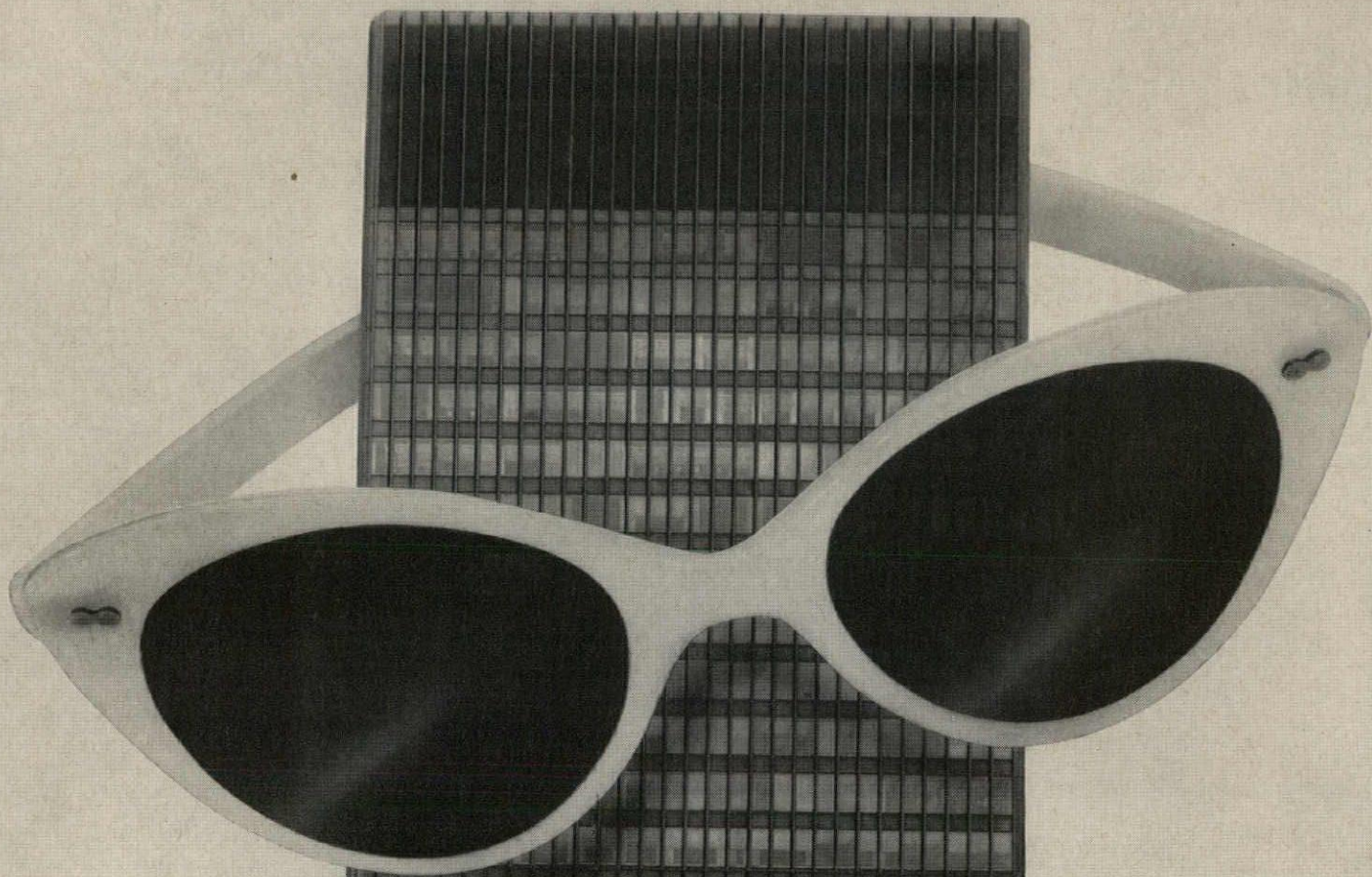


IT'S MADE RIGHT  
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Lightolier's new Primalux fixture is only  $3\frac{7}{8}$ " deep, so it hugs the ceiling with a built-in look. **It Looks Right.** It spreads the light evenly in the  $0^{\circ}$ - $45^{\circ}$  zone and also reduces brightness in the direct glare  $45^{\circ}$ - $90^{\circ}$  zone. **It Lights Right.** The diffuser is made from Koppers light-stabilized EVENGLO® polystyrene, a plastic that comes in a wide range of colors, can be extruded into a variety of shapes, and is tough enough to cope with a heavy-handed maintenance man. **It's Made Right.** For more information on EVENGLO polystyrene, or for a list of manufacturers using EVENGLO in fluorescent fixtures, write to Koppers Company, Inc., Plastics Division, Dept. AR-30, Pittsburgh 19, Pennsylvania. Offices in Principal Cities • In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario

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## Famous Park Avenue beauty enjoys Flexalum light control

Regard the Seagram Building. What glamour it adds to Park Avenue! How shapely! How well-groomed! For its 3,676 windows, the architects naturally chose Flexalum Twi-Nighter venetians. What's more, Hunter Douglas engineered two custom features so that haphazard slat-tilts and blind heights wouldn't interrupt the symmetry of the building's facade. A special 3-stop action keeps the blinds fully raised, fully lowered, or set at one happy medium, while the unique tilt mechanism

fixes slats at a 45-degree angle. No other window covering is so ideal for buildings with curtain-wall construction.

Naturally, Hunter Douglas is concerned with the people *inside*, as well as sight-seers *outside*. Flexalum venetians give real light control, let in soft, diffused light, or make rooms dark and strictly private. As for maintenance problems, there aren't any. Only Flexalum venetians are designed as an integrated whole, so they don't suffer from malfunctions that often afflict blinds

whose parts have been garnered from several sources. Flexalum venetians won't rust, chip, crack or peel. And they're guaranteed for 5 years. See our latest specs in *Sweet's Architectural File 19d/Br* or write to: Dept. AF-10, Bridgeport Brass Co., Hunter Douglas Division, Bridgeport, Conn.

*Flexalum*<sup>®</sup>  
TWI-NIGHTER<sup>®</sup> VENETIANS



*... to the nth degree!*

Where perimeter heat is indicated, *Nesbitt Sill-line Radiation* is your prescription. The five Sill-line accessories shown here illustrate but one way this product has been designed to provide a better solution to most installation conditions. There are many others: the five enclosure styles; the six decorator colors; the one-piece back panel that permits mullion-to-mullion application on panel walls. All point up the versatility of *Nesbitt Sill-line Radiation*. For the full story, send for publication 30.

MEMBER



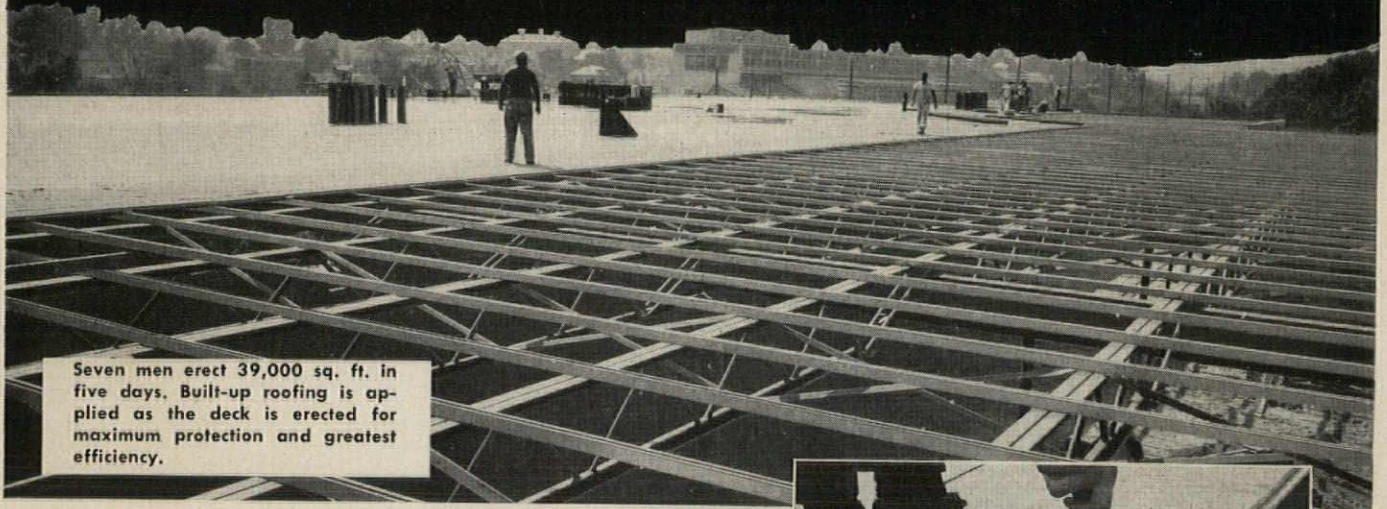
Sill-line Radiation is made and sold by  
John J. Nesbitt, Inc., Philadelphia 36, Pa.

**Nesbitt**

**SILL-LINE**

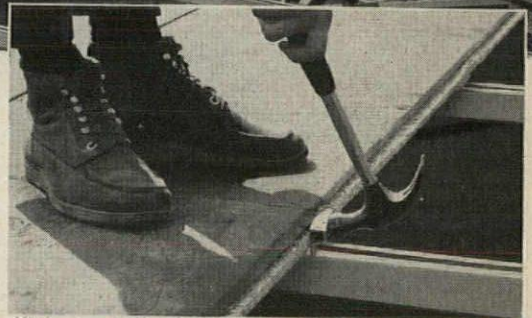
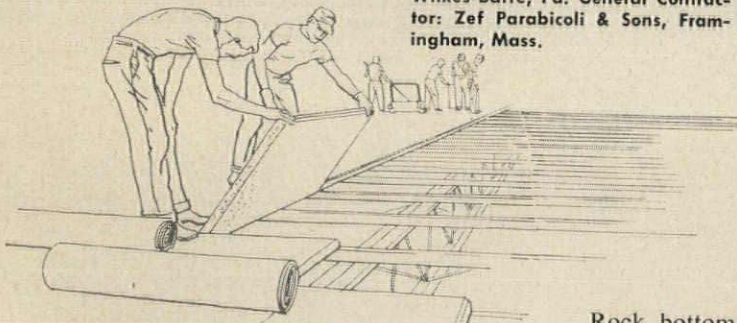
*The world's most beautiful perimeter radiation*

# "HIGHER QUALITY ROOF DECK WITH 2¢ to 19¢ psf SAVINGS"



Seven men erect 39,000 sq. ft. in five days. Built-up roofing is applied as the deck is erected for maximum protection and greatest efficiency.

Architects: Lacy, Atherton & Davis, Wilkes-Barre, Pa. General Contractor: Zef Parabolici & Sons, Framingham, Mass.



High speed clips lock in sub purlin slot and fit tightly over tongue of Tectum plank. Fast erection methods cut costs, save time.

## TECTUM ROOF PLANK DESIGN DATA FOR BOX SECTION SUB-PURLINS

### Three Span Load Table

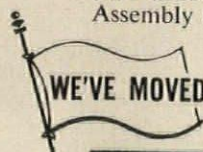
Total Loads P.S.F.	Spacing O.C.	16 Ga.	Spans 18 Ga.	20 Ga.
30	32"	9'-9"	8'-7"	7'-1"
	36"	9'-2"	8'-2"	6'-8"
	42"	8'-6"	7'-7"	6'-2"
	48"	7'-11"	7'-0"	5'-9"
35	32"	9'-0"	8'-0"	6'-6"
	36"	8'-6"	7'-7"	6'-2"
	42"	7'-10"	6'-11"	5'-8"
	48"	7'-4"	6'-6"	5'-4"
40	32"	8'-5"	7'-6"	6'-1"
	36"	7'-8"	6'-10"	5'-7"
	42"	7'-4"	6'-6"	5'-4"
	48"	6'-10"	6'-1"	4'-11"
45	32"	7'-11"	7'-0"	5'-9"
	36"	7'-6"	6'-8"	5'-5"
	42"	6'-11"	6'-2"	5'-0"
	48"	6'-6"	5'-9"	4'-8"
50	32"	7'-7"	6'-8"	5'-6"
	36"	7'-1"	6'-4"	5'-1"
	42"	6'-7"	5'-10"	4'-10"
	48"	6'-2"	5'-6"	4'-6"
55	32"	7'-2"	6'-4"	5'-2"
	36"	6'-9"	6'-0"	4'-11"
	42"	6'-3"	5'-7"	4'-6"
	48"	5'-10"	5'-2"	4'-2"

Rock bottom construction costs using high quality Tectum® roof deck materials was reported by R. E. Robertson of New England Cooperatives, Inc., Framingham, Mass. Bids were received for steel, gypsum and Tectum roof decks and the Tectum specification offered greater benefits at costs ranging from 2¢ to 19¢ psf less. One bid included an unpainted formboard for the interior ceiling surface, and another \$2,000 in painting costs was saved using Tectum.

Tectum form plank was used for the second floor office area slab, leaving the Tectum in-place after the concrete cured as an attractive acoustical ceiling for the first floor area.

Tectum roof deck planks are insulative, acoustical, structural and relatively light weight. Tectum normally does not require painting, is termite and rot resistant, has an attractive textured surface with a natural off-white coloring. Economical spans lessen the weight factor of supporting steel. Box section sub-purlins provide continuous beam strength, are welded in place over supporting joists.

Send today for complete information on this new, high quality roof deck system. Ask for Tectum Box Section Roof Deck Assembly Catalog and the Tectum Form Plank Catalog.



**TECTUM CORPORATION**  
General Offices

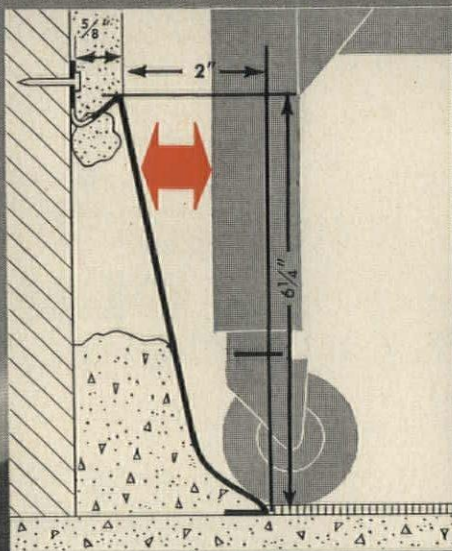
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Now you can specify Milcor Metal Base as a standard item available through building supply dealers. You can provide the advantages of steel at an installed cost competitive with costs of bases made of other materials. All styles of Milcor Metal Base — and all other items in the nation's most complete metal lath line — are described in the Milcor catalog in Sweet's Architectural File, section 12a/In. If you would like a personal copy, write for catalog 202.



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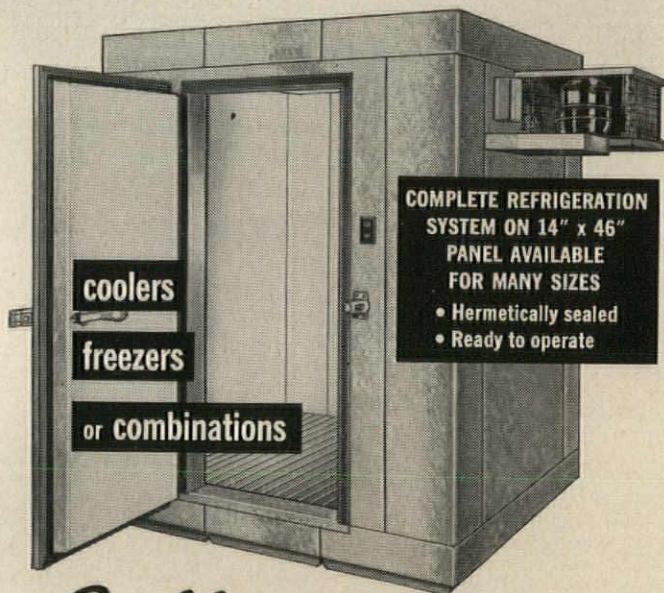
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## Bally walk-ins

Aluminum or steel sectional construction

Sanitary! Strong! Efficient! You can assemble any size cooler, freezer or combination in any shape from standard sections. Add sections to increase size as your requirements grow. Easy to disassemble for relocation.

ARCHITECTS: see 8 pages of engineering data in Sect. 26/A of Sweet's Catalog.

**Bally Case and Cooler, Inc., Bally, Pa.**

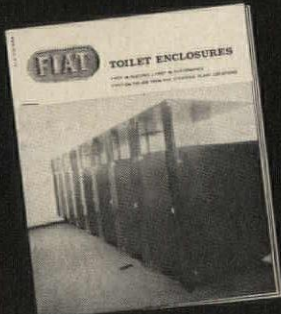
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**STRENGTH**  
 where it counts...  
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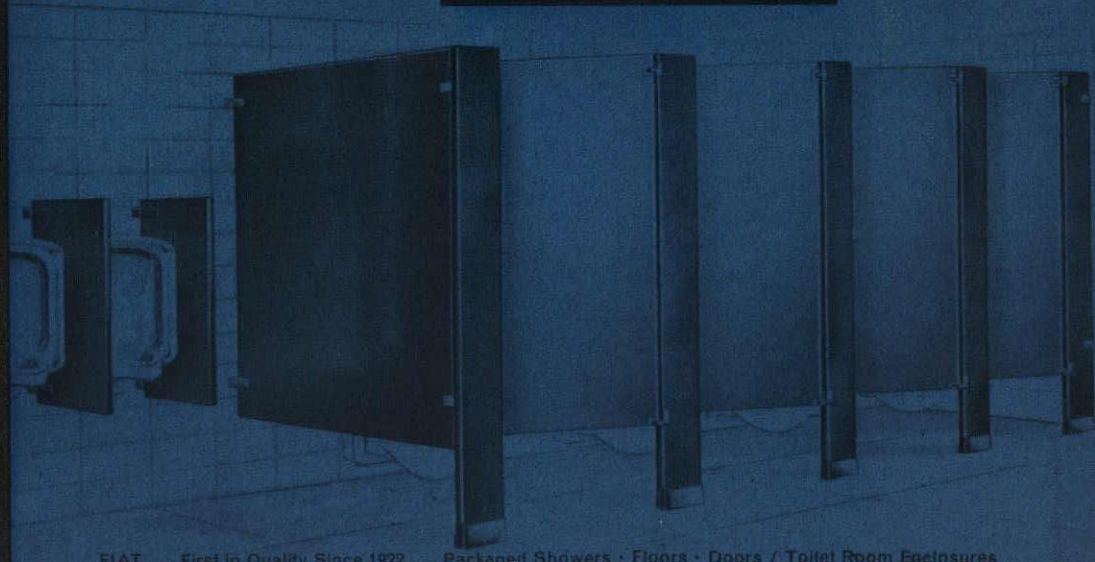
Get away from coatings and plating, and you have the solid-metal strength and durability that's needed in toilet compartment hardware.

That's why Fiat *LIFE-LINE* Harmonized Hardware is solid-to-the-surface selected alloy... aluminum above the floor, stainless steel for floor shoes... all in a harmonizing satin finish that blends with any decor.

It's top quality, furnished without exception for every Fiat Enclosure installation because it's been tested and proved best for the purpose.



Send for new Brochure: "Fiat Toilet Enclosures" to get the facts about the FIAT line, as well as architectural details and specifications.



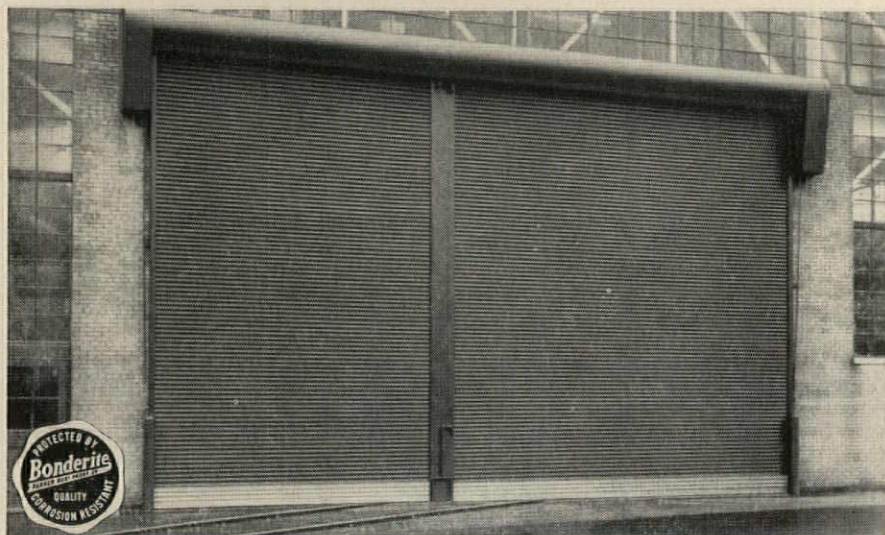
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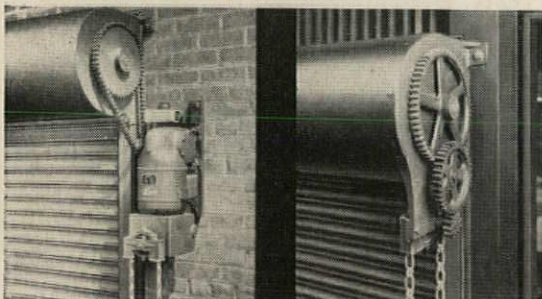


Door requirements differ . . . for commercial or industrial reasons, for in-plant railroad entry or truck-loading areas and from simple service doors to attractively functional institutional entrances. The range is wide. Yet, Mahon supplies Rolling Doors to suit your specific needs . . . standard or Underwriters' labeled . . . for new or old openings.

Mahon doors are rugged and precision assembled for easy operation—economically installed. Their fast, counter-balanced, vertical roll-up action saves expensive space and makes it completely usable. All-metal (either galvanized steel, stainless steel, aluminum or bronze) construction insure longer life, lower maintenance.

Whether you're building, modifying or replacing—investigate Mahon Rolling Doors . . . the doors and the advantages last.

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# M A H O N

Versatility at Work—Mahon Doors as installed for Fitzsimons Mfg. Co., Detroit. Here, a Railroad and Truck Door are combined into a dual-purpose unit. How: a movable mullion . . . application-engineered by Mahon . . . permits easy access through either or both doors.

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- Aluminum or Steel Curtain Wall (in natural or colored metals)
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### CONSTRUCTION SERVICES

- Structural Steel—Fabrication and Erection
- Steel Fabrication—Weldments

Write for Rolling Door descriptive literature.  
Also in Sweet's Files.

## Office Literature

continued on page 228

### Fire Alarm Systems

Describes and illustrates components and accessory equipment of Standard fire alarm systems for industrial, institutional and public buildings, including *March Time*, master coded and box coded systems. Typical specifications for all systems are also included. Publication No. 246, 36 pp. *Standard Electric Time Co., Springfield, Mass.*

### Mechanical Joining of Aluminum

Covers recommended procedures for joining aluminum parts with nails and pins, metal stitching, mechanically formed joints, and architectural fasteners. 32 pp. *Dept. PRD-28, Reynolds Metals Co., Richmond, Va.\**

### Current Designs in Lighting

(A.I.A. 31-F-2) Contains installation information, lighting curves and other technical data on Kirlin built-in lighting fixtures. A "Rapid Estimate Chart" for determining the approximate lighting intensity from a proposed lighting layout is also included. 104 pp. *Kirlin Co., 3435 E. Jefferson Ave., Detroit 7, Mich.*

### Rust-Oleum Architectural Handbook

(A.I.A. 25-B-241) Includes complete specifications for coating structural steel, steel water tanks, production components, galvanized iron, and other rustable metal surfaces. Also included are reference tables, special technical data sections, information on special coating systems, and actual color chips of the various coatings. Form No. 259-A, 30 pp. *Rust-Oleum Corp., 2799 Oakton St., Evanston, Ill.\**

### Exciting New Creations

. . . in *Recessed Lighting* features, in addition to basic recessed housings and trims, such new units as pendant and surface ellipses, pendant spheres, wall and ceiling brackets, spotlights, and downlights. 24 pp. *Catalog Dept., Halo Lighting Products, Inc., 3232 W. Chicago Ave., Chicago 51, Ill.*

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

more literature on page 292



No.15 • Mars Outstanding Design Series



**NO COLUMNS!** In an unorthodox application of stress principles to multi-story construction, Architect Seymour Rutkin of New York has eliminated encumbering columns, achieved maximum space flexibility.

His office building of the future is supported by a concrete arch, and unified by circularly wrapped high tension steel cables which also hold the circular concrete floor slabs in compression. At areas of joining both floor slabs and arch are thickened and reinforced in generally three directions to resist moments and rotation about areas of arch support. Concrete is used in compression and steel in tension, as completely as possible. The cylinder in the center of the building is non-structural, acting as a mechanical core for elevators, plumbing, etc.

This ingenious departure from precedent is another example of the contribution today's designers are making. In translating their pace-setting ideas from concept to reality they require the best of drafting tools.

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Mars Products are available at better engineering and drafting material suppliers.

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*for the man  
who's going places ...*

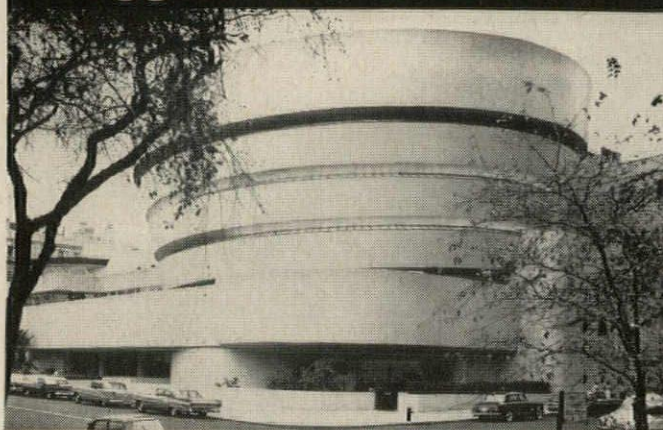


*the pencil that's as good as it looks*

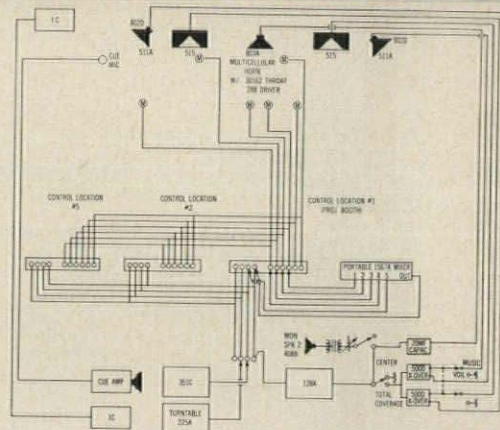
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ALTEC sound systems, like all ALTEC products, are designed for dependable service under all conditions, for long life, and for ease of installation and service. A force of hundreds of ALTEC engineer-consultant-contractors is ready to serve you with more than 100 different ALTEC commercial

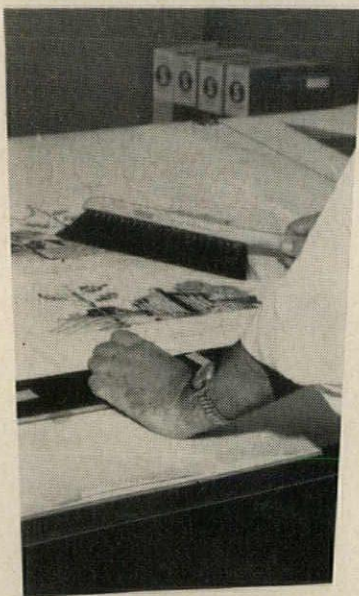
sound components and/or systems designed to your specifications. Before you specify commercial sound equipment, you'll want to talk to your nearest ALTEC contractor. For his address look in the yellow pages of your telephone directory or write to ALTEC at the address below.

See Altec's product listing in Sweet's Catalog Industrial Architectural File (34/AL), 1960 Edition.

\* Sound Systems, Inc., Long Island City 1, N. Y.



**ALTEC LANSING CORPORATION**, Dept. AR-11D  
1515 S. Manchester Avenue, Anaheim, Calif.  
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Do yourself and your client a favor by specifying NIXALITE, the permanent bird barrier and control.



For full details, write:

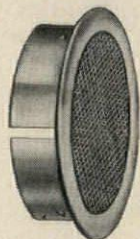
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Architects: Skidmore, Owings & Merrill  
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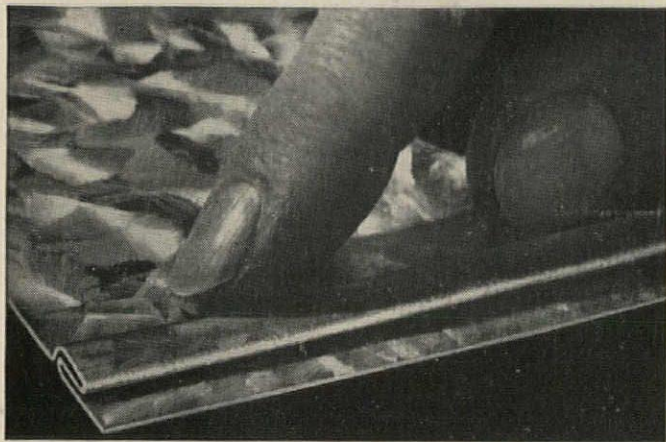
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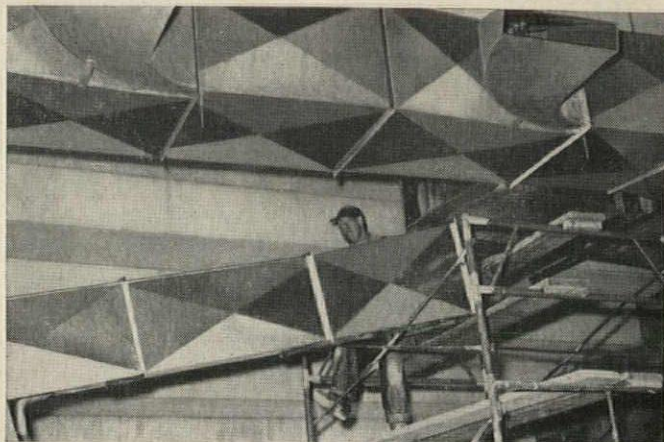


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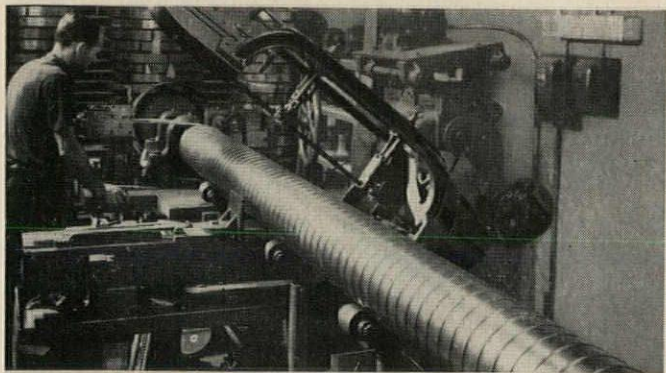
**MUCH LESS SUSCEPTIBLE** to local surface damage in handling and working. Will not break or flake.



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ARCHITECTS: BELLI & BELLI, CHICAGO

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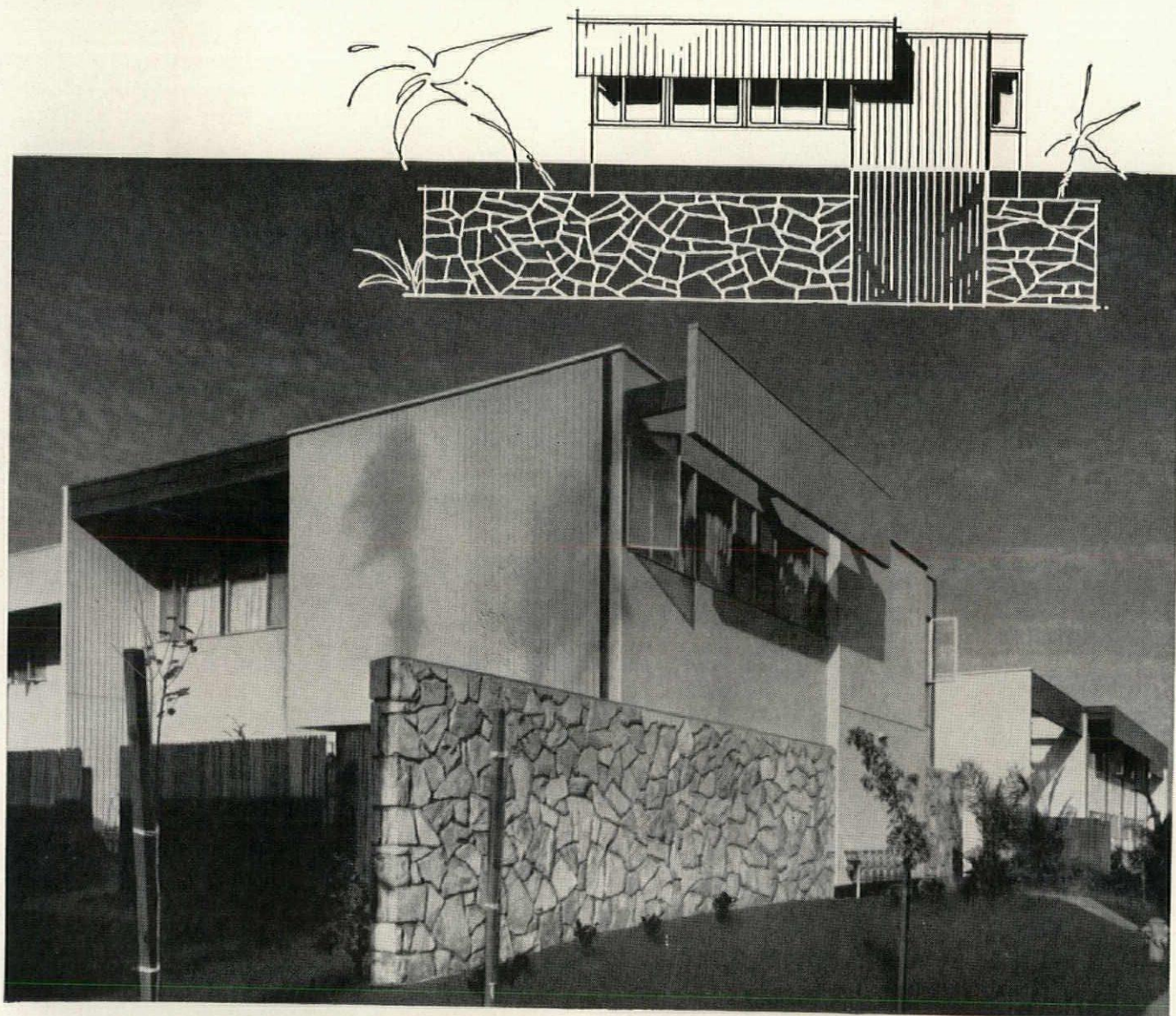


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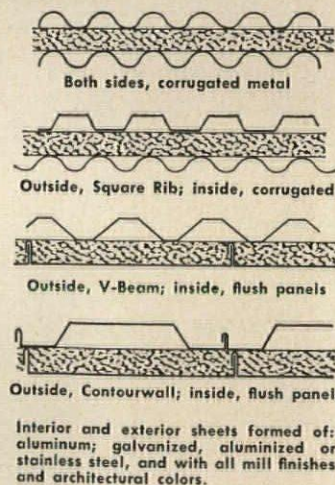


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## Office Literature

### Colored Glass Block

Four-page folder details, with selection, installation and dimensional data, new colored glass blocks in Shade Aqua and Shade Green. *Owens-Illinois, Toledo 1, Ohio.\**

### Gerber Plumbing Fixtures

Describes and gives dimensional and installation data on complete line of brass, vitreous china, and steel enamel ware. Catalog G-9, 96 pp. *Gerber Plumbing Fixtures Corp., 232 N. Clark St., Chicago 1, Ill.*

### Heifetz Lighting Fixtures

Contains photographs, drawings and specifications on Heifetz "Design Gallery" lighting fixtures. Catalog A, 64 pp. *Heifetz Co., Clinton, Conn.*

### Lupton Curtain Wall

Illustrates and gives details, design data and specifications on the *Lupton* line of architectural curtain walls. 24 pp. *Michael Flynn Mfg. Co., 700 E. Godfrey Ave., Philadelphia 24, Pa.*

### Gas-Fired Storage Water Heaters

Describes features, design and operation, and storage and recovery capacity of the Model 230 scale-free storage water heater. Specifications are also included. Bulletin 4, 20 pp. *Patterson-Kelley Co., Inc., East Stroudsburg, Pa.*

### Air Diffusion Plus

Describes and illustrates features of ADP air diffusers, and gives engineering and ordering data. 12 pp. *Air Distribution Products, Los Angeles 48, Calif.*

### Science Furniture for Schools

... and *Colleges*, by James Flaherty, lists and depicts a full line of educational science furniture and equipment, including steel and wood laboratory tables, cabinets, fume hoods, and specialized furniture. Selector guides for such items as table top material for various requirements, electrical and plumbing details, and combinations of service fixtures are also featured. *Educational Div., Laboratory Furniture, Old Country Rd., Mineola, Long Island, N. Y.*

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

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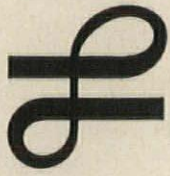
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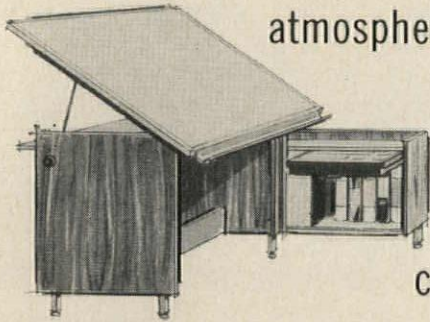
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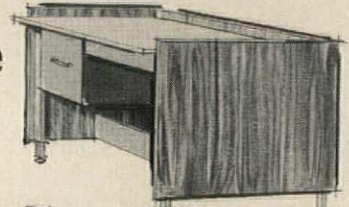
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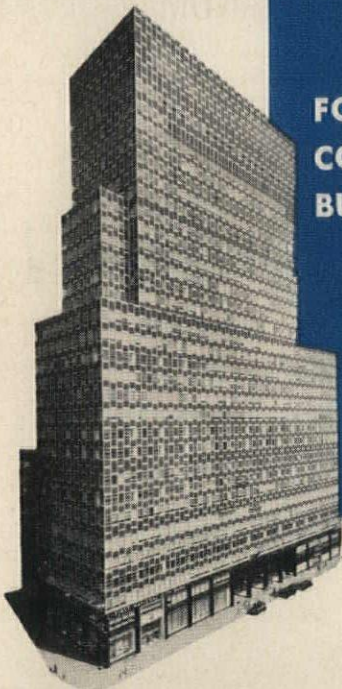
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# Long Beach Memorial Hospital

Architects Associated  
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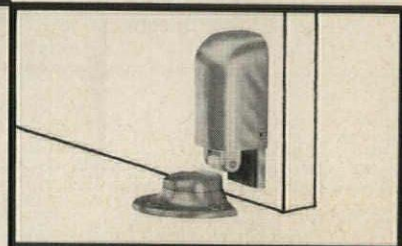
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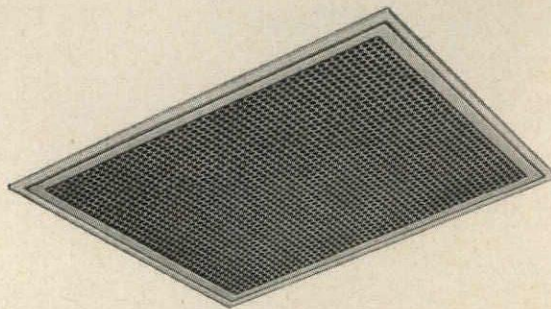
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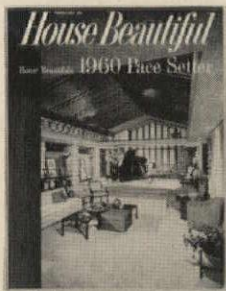
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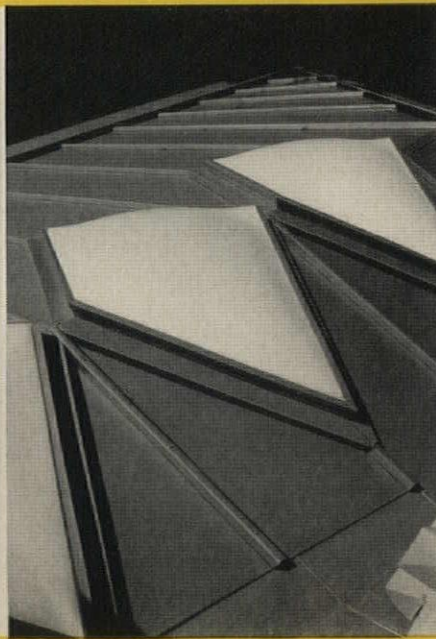
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On the Calendar

March

- 6-9 Fifth National Electrical Industries Show, sponsored by Eastern Electrical Wholesalers Association—The Coliseum, New York
- 7-11 National Convention (first of three in 1960), American Society of Civil Engineers—New Orleans
- 13-14 29th Annual Convention, Na-

tional Housing Conference—Statler-Hilton Hotel, Washington

- 14-17 56th Annual Convention, American Concrete Institute—Commodore Hotel, New York
- 21-23 First National Electric House Heating Exposition, sponsored by Electric House Heating Equipment Section, National Electrical Manufacturers Association—Sherman Hotel, Chicago

30ff 46th Annual Convention, Michigan Society of Architects; through April 1—Sheraton-Cadillac Hotel, Detroit

April

- 4-8 1960 Nuclear Congress and Exhibit—The Coliseum, New York
- 5-7 Spring Conferences, Building Research Institute—Statler-Hilton Hotel, New York
- 18-19 Joint Conference on Automatic Techniques, sponsored by American Society of Mechanical Engineers and Society for the Advancement of Management—Sheraton Hotel, Cleveland
- 18-23 92nd Annual Convention, American Institute of Architects—Mark Hopkins Hotel, San Francisco
- 19-21 Church Design and Building Conference and Exposition—Morrison Hotel, Chicago
- 25-27 Annual Convention, Construction Specifications Institute—Rickey's Studio Inn, Palo Alto, Calif.
- 25-29 41st Annual Convention and Welding Exposition, American Welding Society—Biltmore Hotel and Great Western Exhibit Center, Los Angeles

May

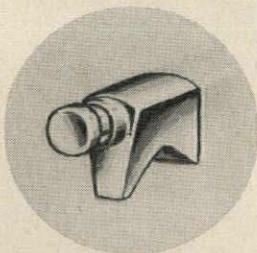
- 1-3 Chicago Electrical Industry Trade Show and Exposition—Lake Front Exposition Hall, Chicago
- 1-4 Annual Meeting, Air-Conditioning and Refrigeration Institute—The Homestead, Hot Springs, Va.
- 9-12 Second Instrument-Automation Conference and Exhibit of 1960, sponsored by Instrument Society of America—Civic Auditorium and Brooks Hall, San Francisco
- 11-16 World Design Conference in Japan (followed by tours, 18-20); theme, "Our Century: The Total Image"—Tokyo
- 12-14 South Atlantic A.I.A. Regional Conference—Winston-Salem, N. C.
- 15-20 29th Annual National Conference, American Institute of Decorators—Beverly Hilton Hotel, Beverly Hills, Calif.

continued on page 306

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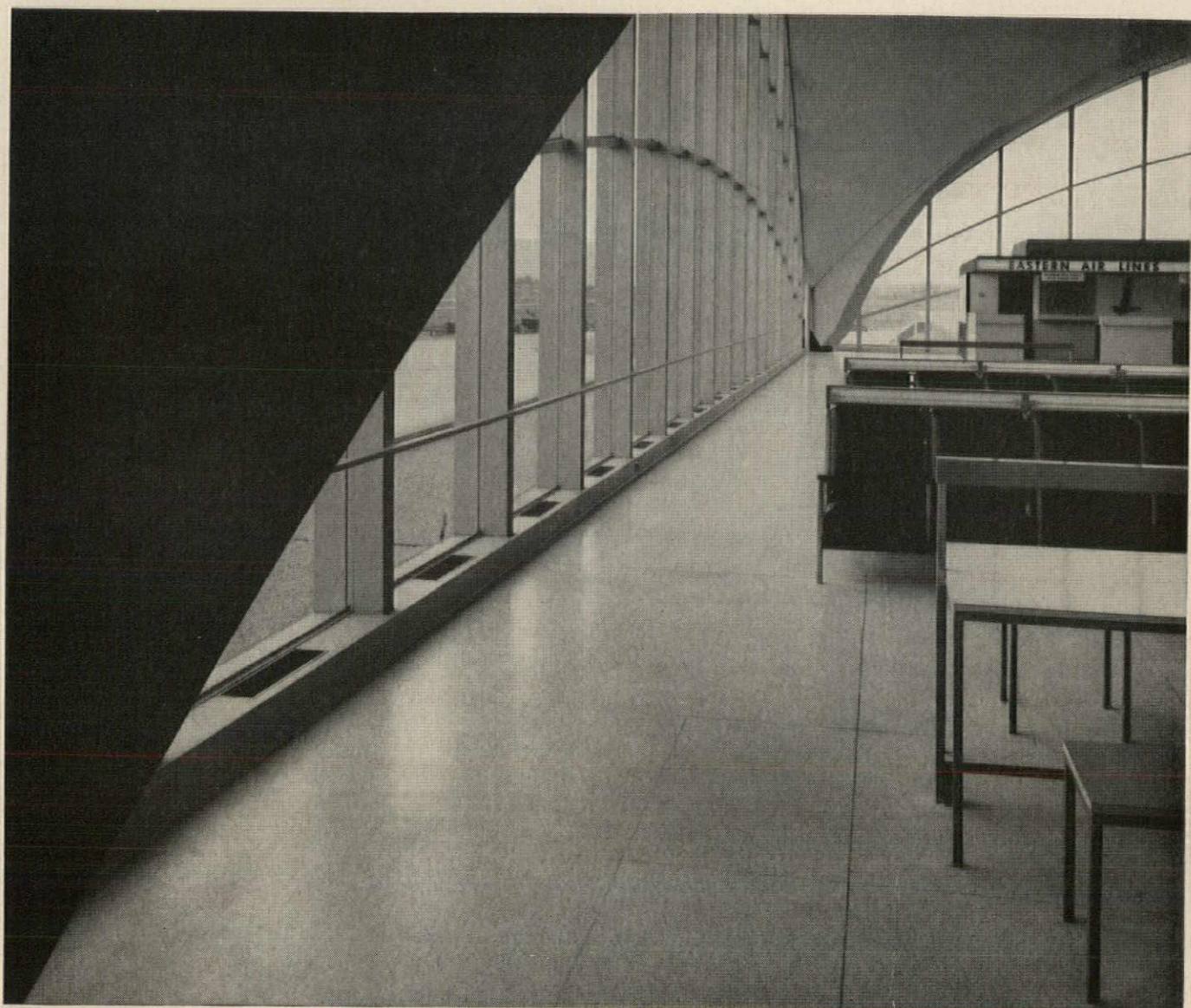


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Economical maintenance is assured with Terrazzo floors, which need only wet cleaning. Refinishing and buffing are eliminated. Minimum savings of 20c per sq. ft. per year in cleaning time can be

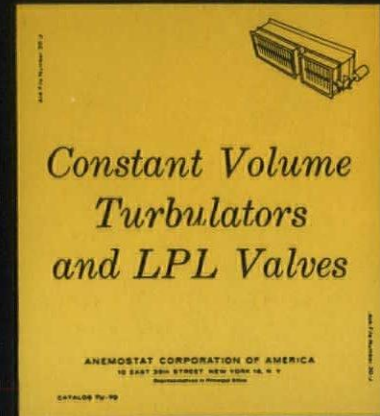
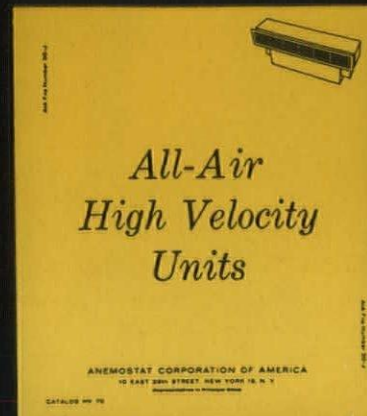
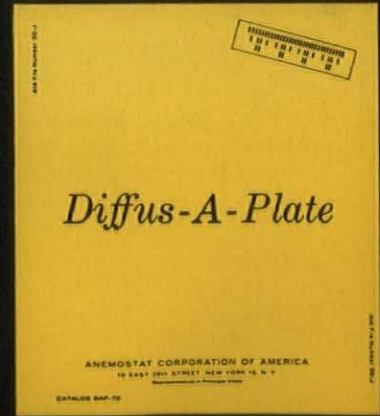
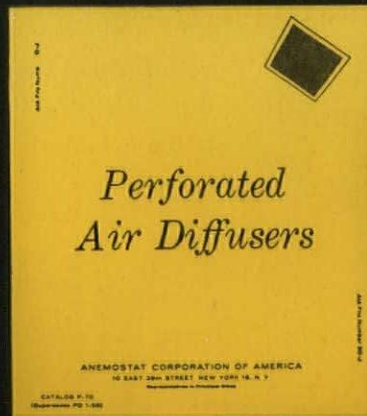
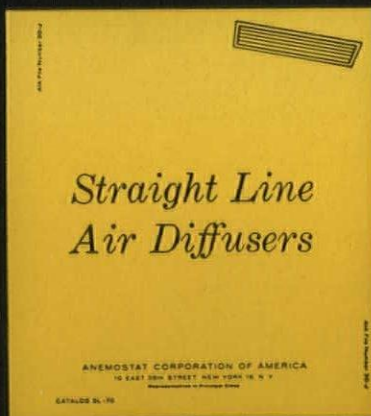
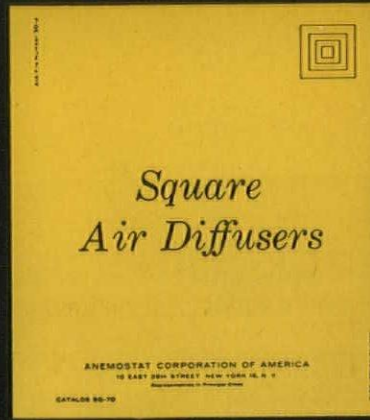
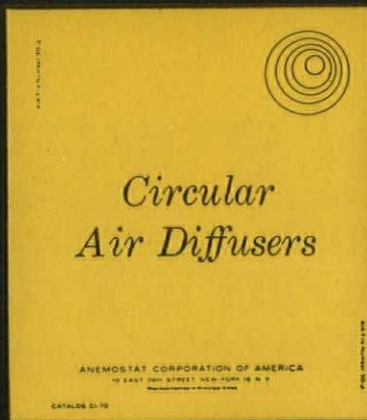
expected. Terrazzo is easy to walk on. It has more frictional resistance than Underwriters Laboratories' minimum coefficient of .50.

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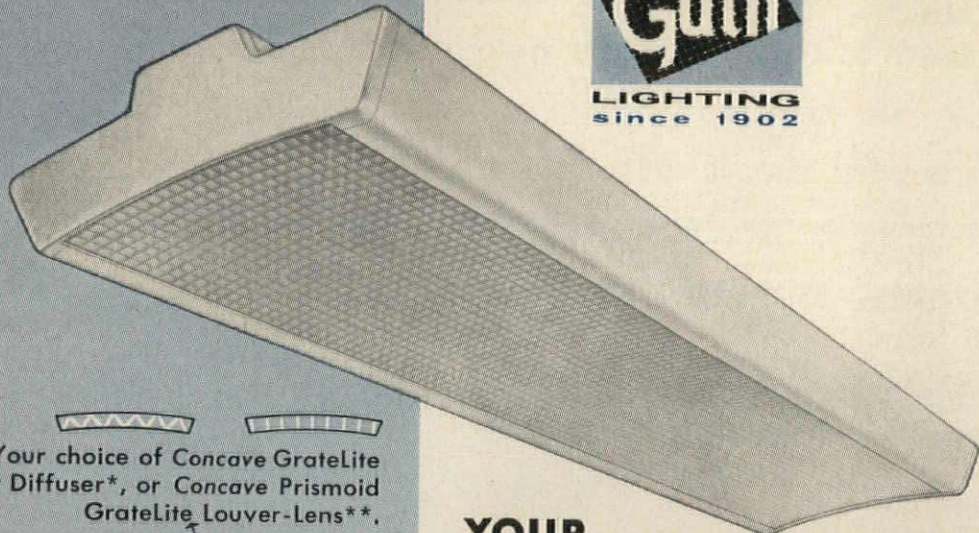
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AC 1577

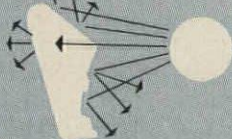




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since 1902

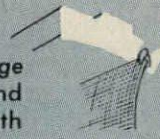


Your choice of *Concave GrateLite Louver Diffuser\**, or *Concave Prismoid GrateLite Louver-Lens\*\**.

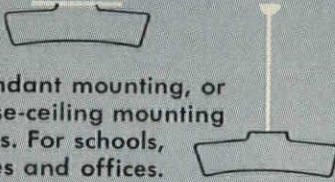


One-piece plastic side wings are tubular for added strength, lower side brightness, plus "reflector" efficiency. Ends are capped to simplify maintenance.

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Available in 2, 3, or 4 light units ... in the same fixture width. 4' or 8' lengths.

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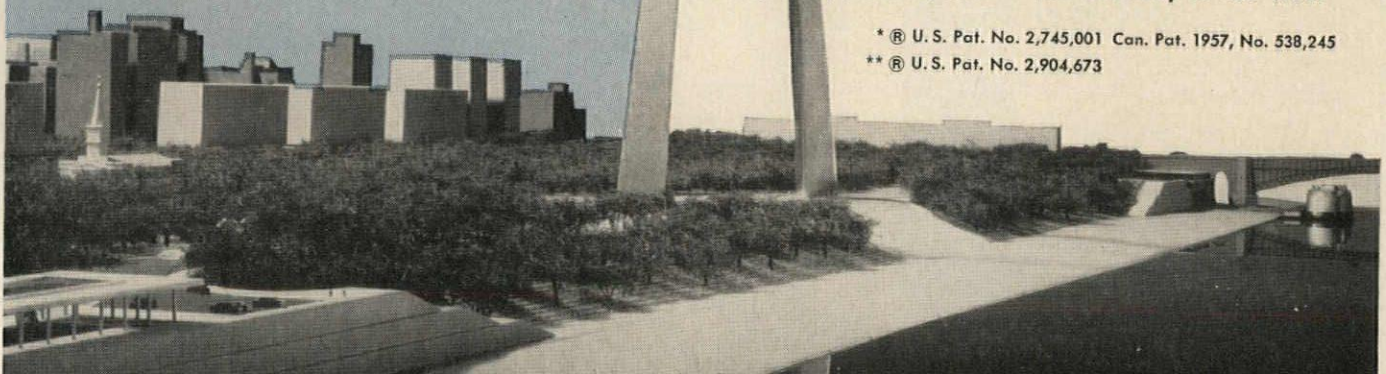
**THE EDWIN F. GUTH CO.**

2615 WASHINGTON BLVD., BOX 7079, ST. LOUIS 77, MO.

Development, St. Louis, Mo. — "The Gateway to the West"

\* ® U. S. Pat. No. 2,745,001 Can. Pat. 1957, No. 538,245

\*\* ® U. S. Pat. No. 2,904,673





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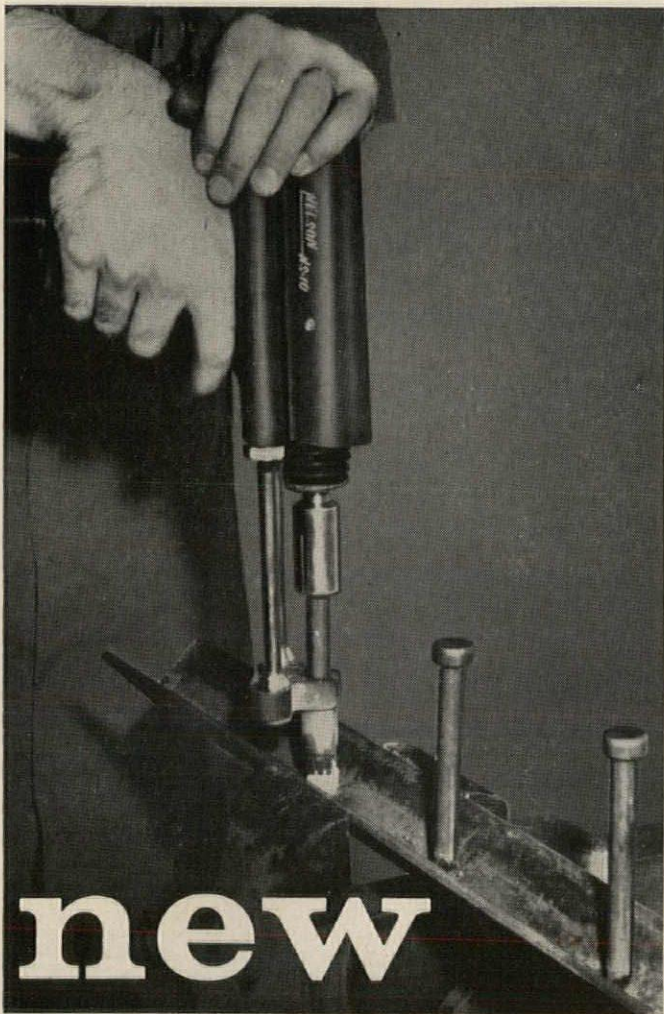


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- Made of certified steel—job quality assured.

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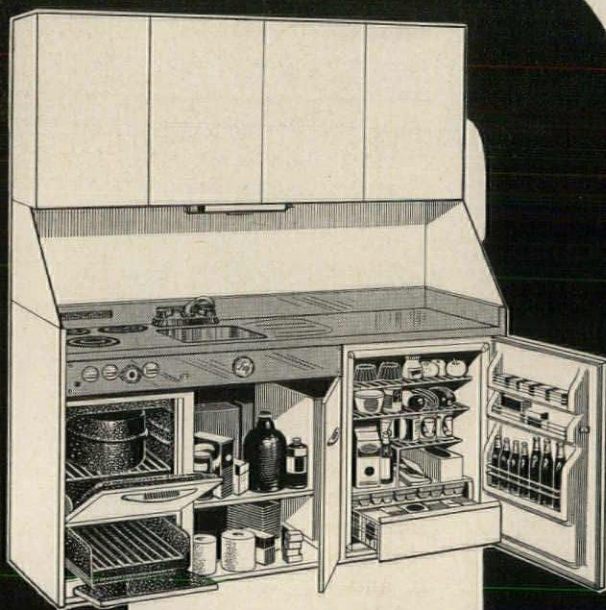
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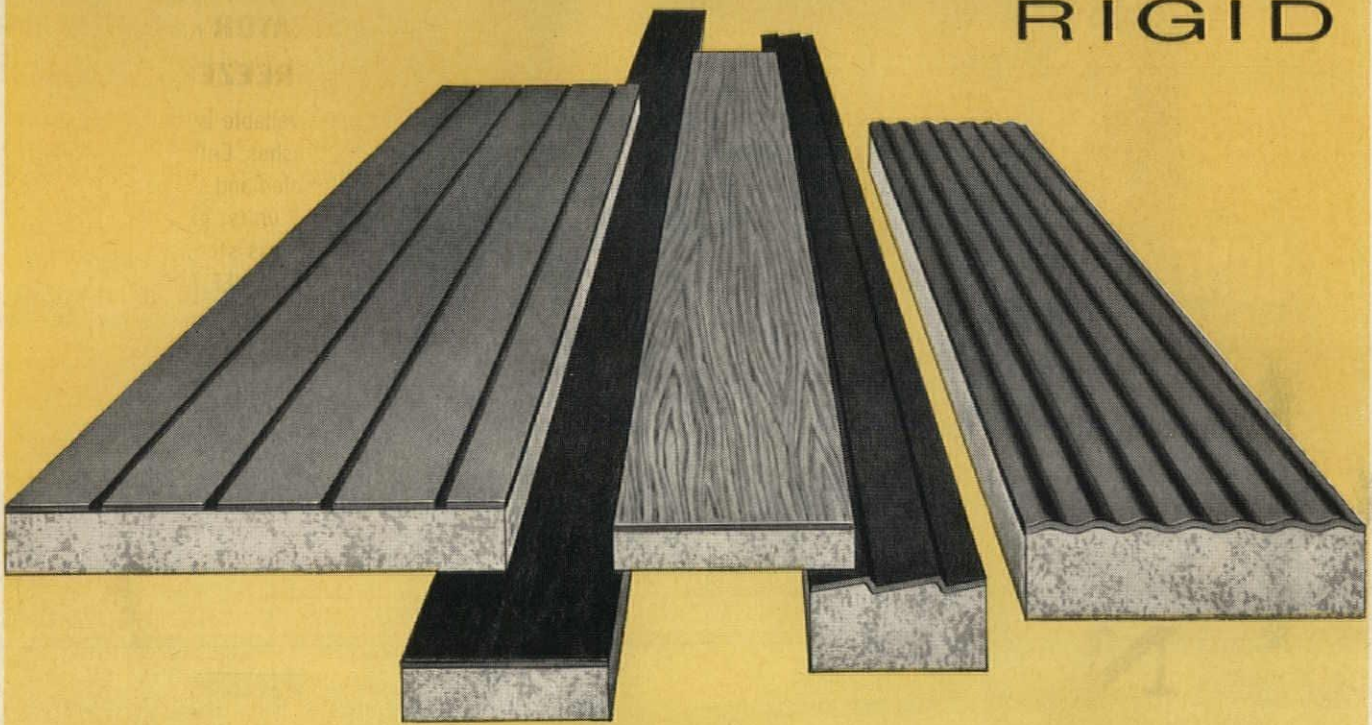
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**COMPLETE KITCHEN UNIT**

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tion, roof deck or a load-bearing wall of tremendous strength-weight characteristics . . . offers complete latitude in design at a reasonable cost.

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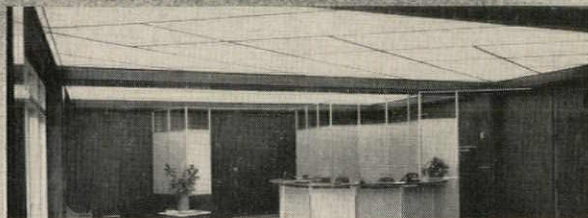


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Soundsheet Translucent Acoustical Element provides balanced sound absorption plus superior light diffusion in **one** medium. The use of Soundsheet shielding, in a ceiling system of your choice, offers new economies and interesting, fresh architectural interior concepts. Available translucent or opaque in flat or corrugated sheets, or in 2' x 2' tension or edge-framed modular panels.

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## The Record Reports

16-20 Annual Meeting, National Fire Protection Association—Montreal

28ff 25th World Planning and Housing Conference; through June 3—San Juan, Puerto Rico

### Office Notes

#### Offices Opened

Gunnar Birkerts and Frank Straub announce a new partnership, Birkerts & Straub, Architects, at 287 E. Maple Rd., Birmingham, Mich.

Stuart B. Mockford, A.I.A., and Joseph H. Rudd, A.I.A., announce a new partnership, Mockford & Rudd, Architects, at 723 Washington St., Oregon City, Ore.

Joe B. Roberts has opened an office for the practice of architecture at 3113 Sherwood Lane, Wichita Falls, Texas.

#### Firm Changes

Harland Bartholomew and Associates announces that Joseph W. Guyton has joined the traffic engineering staff. Address: 317 N. 11th St., St. Louis 1.

Kenneth Brunner announces his affiliation with Russell T. Connors in a partnership known as Brunner & Connors, Consultants, Civil and Structural Engineers. Address: 8839 E. 2nd St., Downey, Calif.

Victor W. Buhr announces the admittance of Thomas S. George, Jr., A.I.A., and William B. Miles, Jr., to the partnership of George, Miles & Buhr, for the general practice of architecture and engineering. Address: 106 W. Main St., Salisbury, Md.

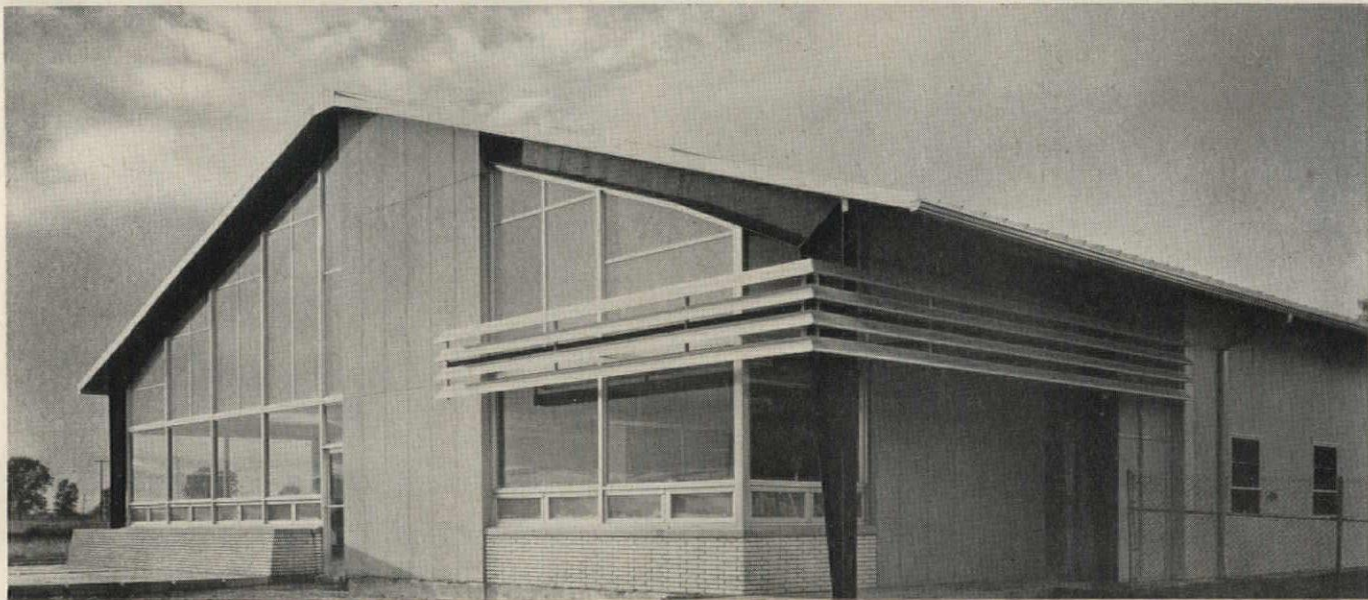
Carroll, Grisdale & Van Alen, Architects, announces that their firm has been selected to continue the practice of Borie & Smith, Architects. C. Louis Borie and Arthur T. Smith are available for consultation. Address: 6 Penn Center Plaza, Philadelphia 3.

Deeter & Ritchey, Architects, is the name of the firm formed by the merger of the individual practices of Russell O. Deeter and Dahlen K. Ritchey. Address: 3 Gateway Center, Pittsburgh 22.

John R. Diehl, A.I.A., and Francis R. Stein, A.I.A., announce the formation of a partnership, Diehl & Stein,  
*continued on page 314*



# IDEAS



Service Building, All Saints Cemetery of the Catholic Archdiocese of Chicago.

Special architect for this project: R. E. Johnson, Evergreen Park, Illinois

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**T**HE INCREASINGLY POPULAR Casement Bow Window complements the rich heritage of a Colonial past. Once carefully hand fashioned by dedicated early craftsmen, the Casement Bow is now faithfully executed by the Andersen Corporation for the 60's . . . the new era of elegance.

**Simplifies detailing, installation!** Offered in standard detail, the Andersen Casement Bow Window speeds both detailing and installation. Completely pre-assembled, including

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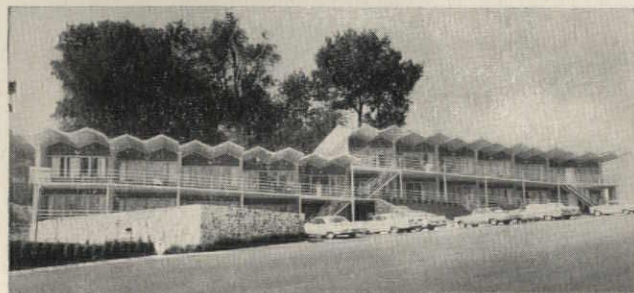
# Bow Windows

For complete information on Andersen Windows see your Sweet's File, phone your lumber and millwork dealer, or write for Detail Catalog or Tracing Detail File to: Andersen Corporation, Bayport, Minnesota.

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**Contemporary design? Yes!** Excellent detailing, clean functional lines—Andersen WINDOWALLS make important contributions to contemporary architecture. You have a choice of 7 basic units, 30 different types, 685 cataloged sizes. Shown: Motel, St. Clair, Michigan. Architect: George D. Lytle.

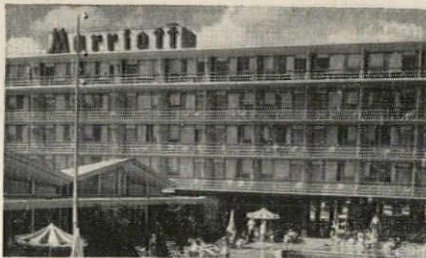
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**PLASTER-WELD**

**permanently  
bonds new plaster  
to concrete . . .  
for as little as  
2¢ per square foot.**



**DUPONT PLAZA CENTER, MIAMI, FLORIDA**

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With Plaster-Weld you can permanently bond gypsum, lime putty, acoustical plaster and cements to themselves . . . or directly to any sound surface . . . even glass. Applied with brush, roller or spray gun. No costly surface preparation. You cover Plaster-Weld with new material as soon as touch dry (about an hour). In case of Marriott Motor Hotel, billed as "World's Largest Motel," Plaster-Weld was sprayed on smooth concrete ceilings to bond lime putty plaster finish. Archt.: Joseph G. Morgan, Washington; Genrl. Contr.: Charles H. Tomkins Co., Inc., Washington; Plstg. Contr.: Novinger Company, Inc., Brentwood, Maryland.

**A Plaster-Weld bond is ageless . . . never lets go!** Plaster-Weld is approved by New York City Board of Standards & Appeals, and protected under U.S. Patent No. 2,760,885. For technical data, and job proof, see Sweet's or write us direct. Address Box 5756C, Larsen Products Corp., Bethesda, Maryland.

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*The Record Reports*

Architects, to succeed John Diehl Associates, Architects. Address: 40 Witherspoon St., Princeton, N. J.

Fred S. Dubin Associates, Consulting Engineers, announces the promotion of James R. Quinlan to an associate.

Graham, Anderson, Probst & White, architectural and engineering firm, announces the appointment of Rear Admiral William O. Gallery, USN (ret.), as assistant to the president, Marvin G. Probst. Address: 80 E. Jackson Blvd., Chicago 4.

David B. Liberman, A.I.A., announces that A. Jackson Davis, A.I.A., is now an associate. Address: 605 Walnut St., Knoxville 2, Tenn.

Lundeen & Hilfinger, Architects & Engineers, announces the elevation to partnership of C. Eugene Asbury. Address: Corn Belt Bank Bldg., Bloomington, Ill.

The R. T. Patterson Company, Inc., Engineers and Constructors, announces a larger staff and new offices. Mr. Patterson, the principal, formerly was president of Patterson-Emerison-Comstock, Inc. Address: 350 Grant Bldg., Pittsburgh 19.

Samborn, Steketee & Associates, Otis & Evans, Consulting Engineers and Architects, announces that Carl Thaller has been named an associate. Address: 1214 Cherry St., Toledo.

Perry Coke Smith, Benjamin Lane Smith, and Charles Haines announce that the following are associates with Voorhees Walker Smith Smith & Haines: Benjamin Bailyn, John Loughnane, John Pine Delavan, Robert S. Lundberg, Leander Economidis, Allen Nathanson. Address: 101 Park Ave., New York 17.

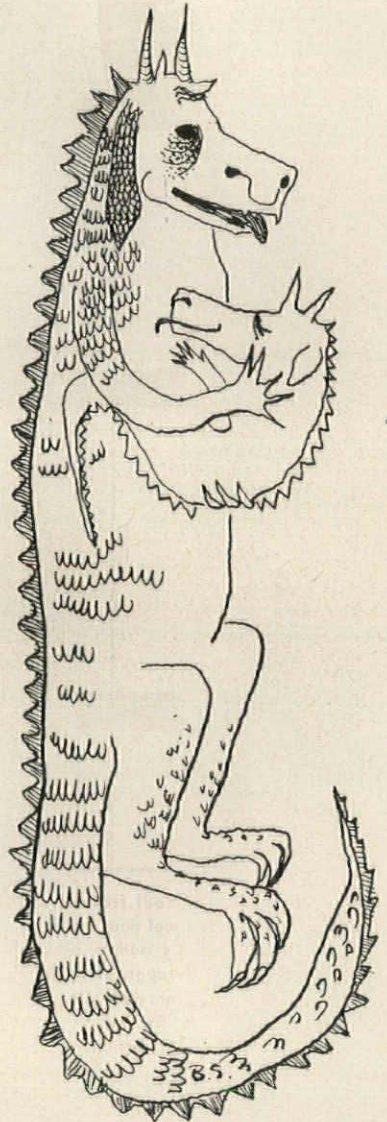
Wimberly & Cook Architects, Ltd., is now the name of the firm formerly known as Wimberly & Cook, A.I.A. The firm has incorporated, and George V. Whisenand, who was associate, has become a partner. The officers are: Howard L. Cook, president; George J. Wimberly, vice president; Mr. Whisenand, secretary-treasurer. Address: 315 Royal Hawaiian Ave., Honolulu.

*New Address*

Fred S. Dubin Associates, Consulting Engineers (home office), 635 Farmington Ave., Hartford 5, Conn.  
*more news on page 322*

**Balfour**  
rolling doors

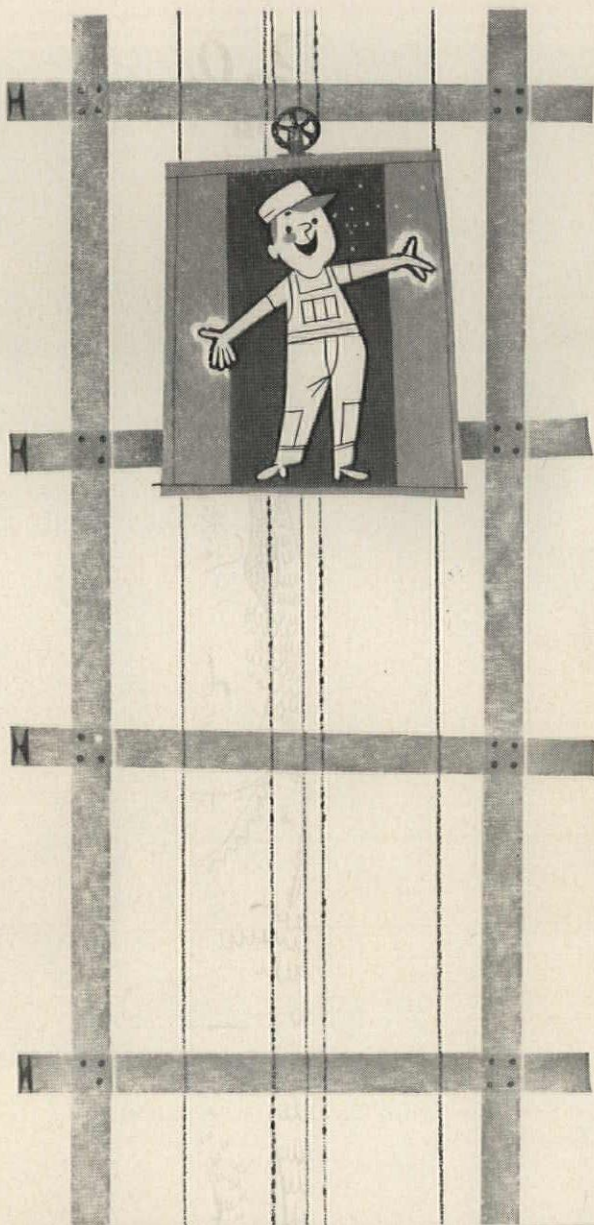
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**3. For concrete floors and heavy electrical loads:** G-E single-level BIG DUCT boasts an 8½ square-inch cross sectional area to accommodate heavy power wiring and multi-conductor communications cables. Can be used in 3-inch minimum concrete fills.

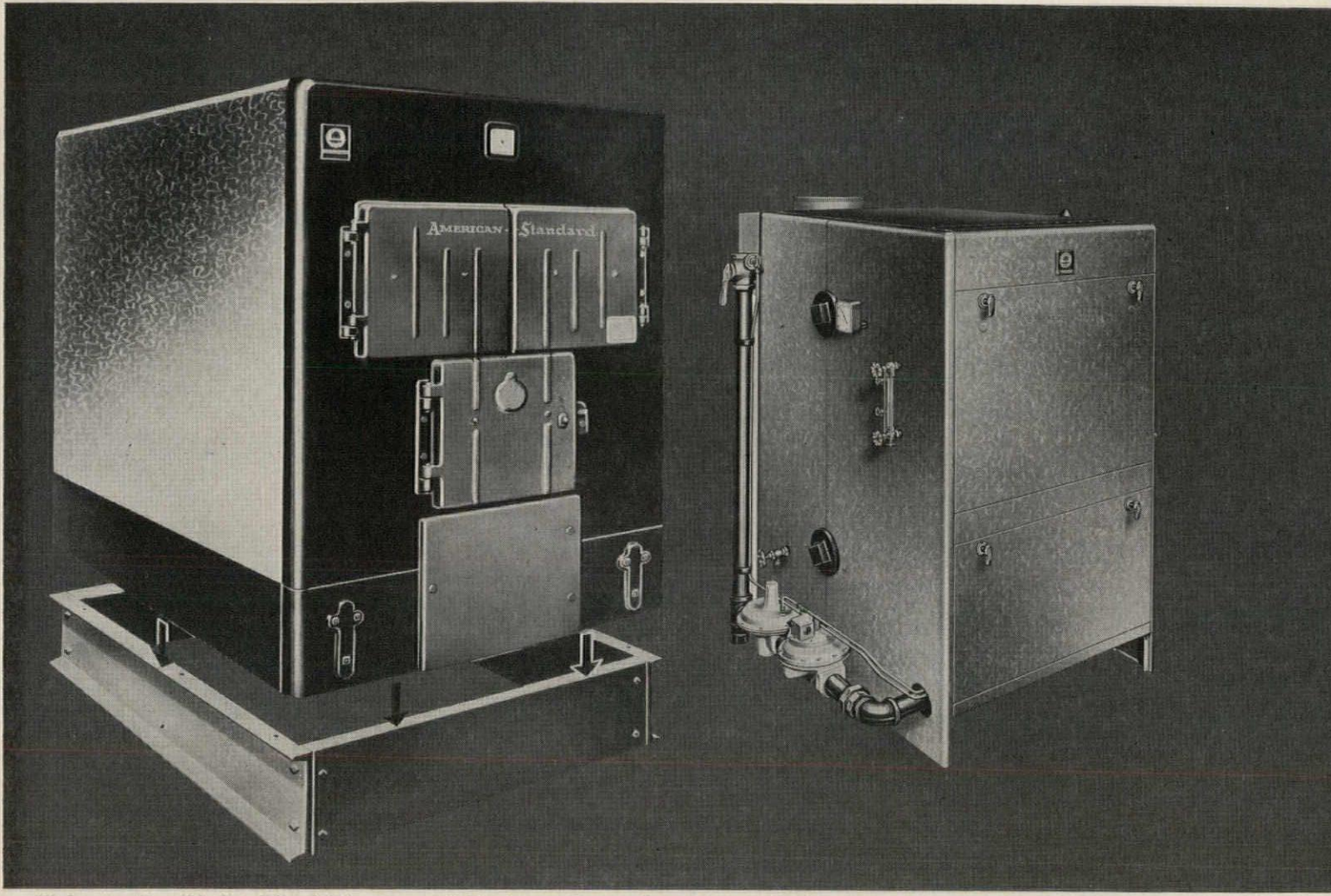
**4. For concrete floors and maximum flexibility:** G.E.'s two-level duct system permits multi-location feeding without awkward conduit home runs. Feed through the lower level with distribution through the top level. The ideal solution to difficult feeding problems when 3½ inches of fill are available.

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Conduit Products Department, Section CU90-371  
Bridgeport 2, Connecticut

Please send me the bulletins checked below:

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 Cellular-steel floor wiring system.  
 I have enclosed a description of my underfloor wiring problem. What do you suggest?

Name \_\_\_\_\_ Title \_\_\_\_\_  
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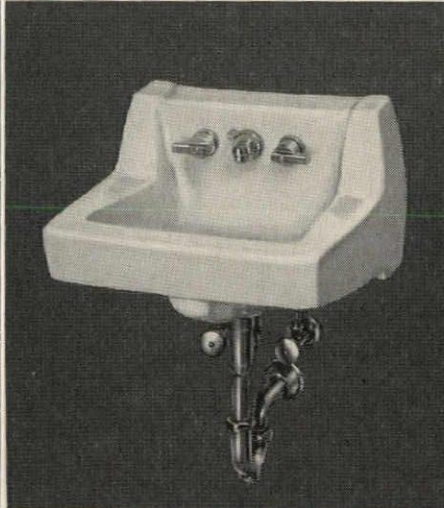


**High-capacity oil boiler:** The A-7 is also available for coal. Unique new design of internal circulation gives fast, smooth steaming. Optional pedestal base eliminates expense of special base or pit. Forge Red and black steel jacket. Easily installed in batteries.

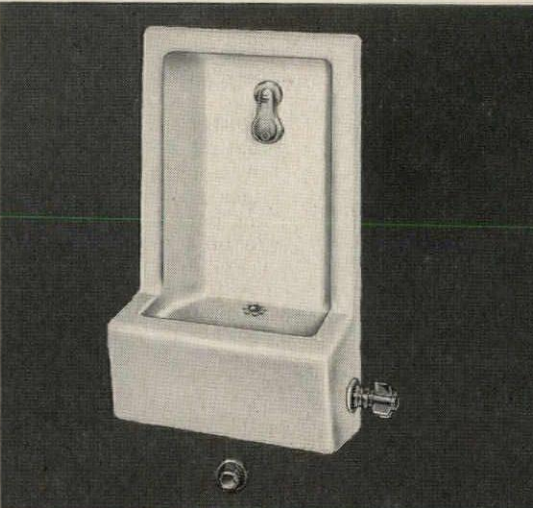
**Compact gas-fired boiler:** The G-6 requires minimum headroom—just 65", even for the largest capacity model. Enclosed in a Forge Red steel jacket, G-6 presents a clean appearance. It is ideal for installation in batteries and approved by the A.G.A. for all gases.



**Combination drinking fountain-receptor:** Ideal for laboratories, home-economics rooms, lower grades. Ledgeworth provides anti-squirt bubbler and self-closing glass filler. Latter has gooseneck with stream regulator. Acid-resisting enamel on cast iron.



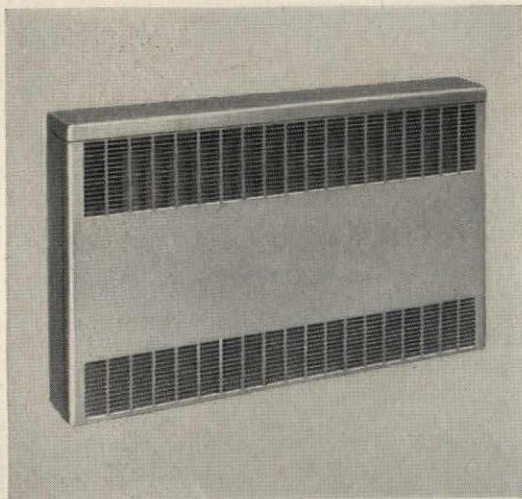
**Extra-sturdy lavatory:** The Firmledge is built to withstand wear and tear of school washrooms. Integral china bracket provides extra support to hold unexpected weights, eliminates extra supports. Made of vitreous china.



**Cuspidor:** The Seredor for locker rooms and gymnasiums has a sanitary flushing water spreader, self-closing valve and handy cleanout extension below. Easy-cleaning vitreous china.

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meets the needs of both students and school boards



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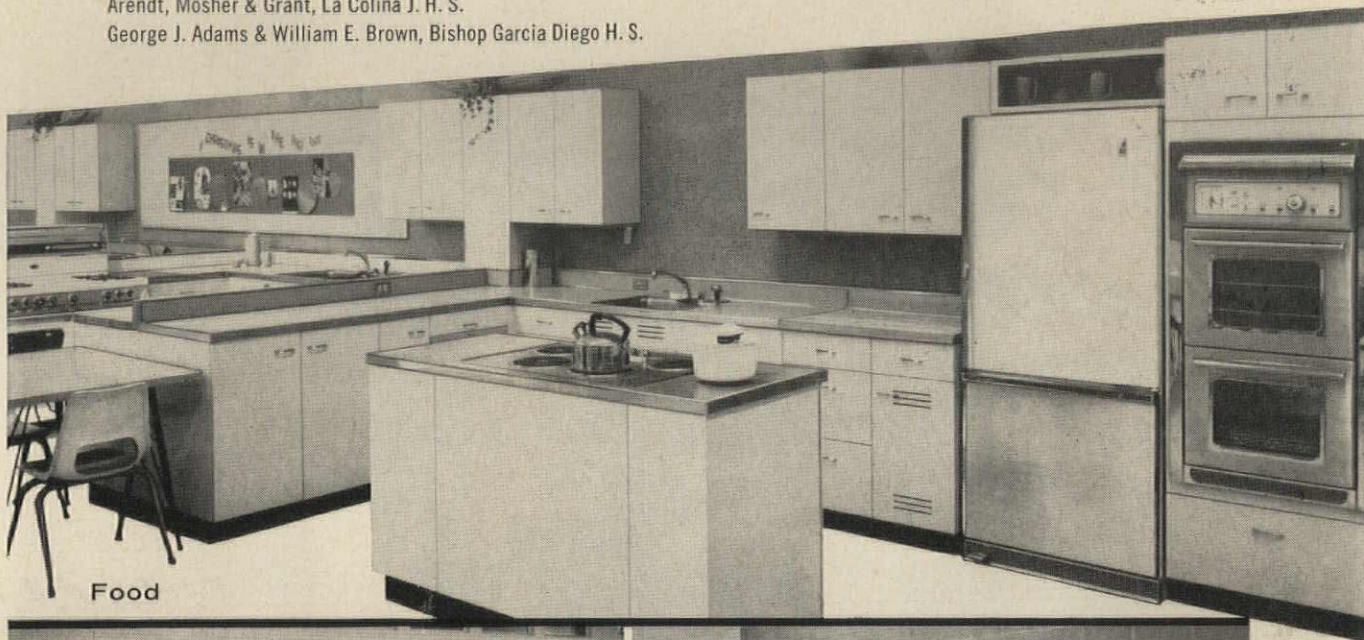


# Custom school installations by *St. Charles*

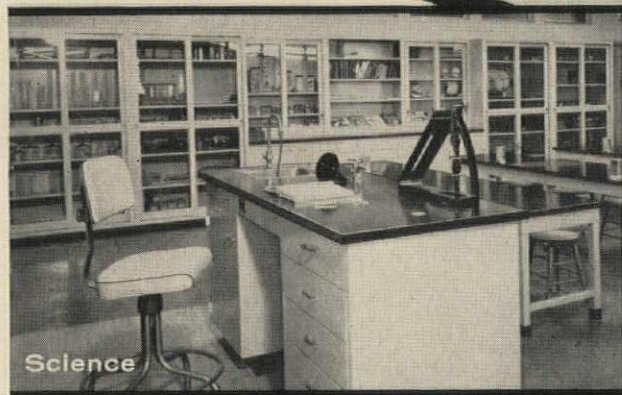
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Food



Science



Arts and Crafts



Clothing



Clothing

The beauty of these installations reflects the built-in St. Charles quality that means long-range economy, even under extremely hard usage. And St. Charles' custom-flexibility provides vital design-freedom... permitting each installation to meet each individual teaching requirement.

Write for free catalog: "St. Charles Custom School Storage Furniture." Available at request on your letterhead. St. Charles Manufacturing Company, Dept. ARS-3, St. Charles, Illinois



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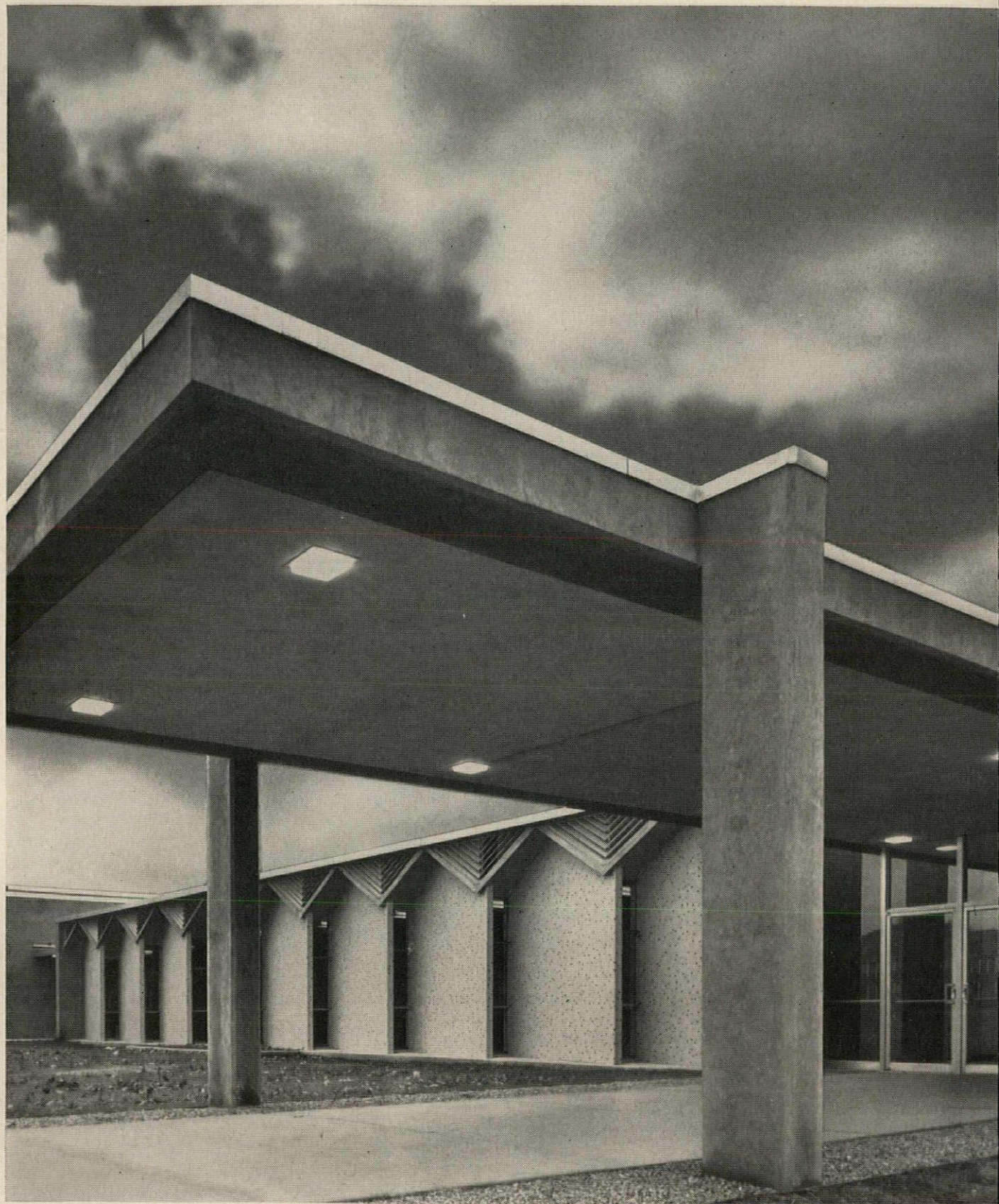
Custom School Storage Furniture



School Storage Furniture for Food, Clothing, Science Labs • Arts & Crafts • Elementary Classrooms



**BUILDING PRODUCTS**



*Memorial Student Union Building, Southern Connecticut State College. Architect: Carl R. Blanchard, Jr., A.I.A., New Haven, Connecticut.*

# STYROFOAM<sup>®</sup>

delivers permanently low "K" factor,  
lower costs for Connecticut college building

Thermal conductivity—"K" factor—was a major point of choice of Styrofoam† to insulate the Memorial Student Union Building at Southern Connecticut State College. The building—which will house dormitories, apartments, cold storage areas, dining rooms, and activities rooms—required permanent insulation.

The application required an insulation with low moisture absorption, a low thermal conductivity factor, and one that would act as its own moisture barrier. Styrofoam was specified as the sole insulation material in the building—for all exterior cavity walls, for the foundation perimeter, and for interior low temperature rooms.

For cost savings were also an important benefit from using Styrofoam. For example, one use of Styrofoam was in the exterior wall which was designed as a plenum chamber. Inside this 10" plenum cavity, the interior face of the exterior wall was insulated with Styrofoam applied by means of water base adhesive.

The use of Styrofoam helped save construction costs by eliminating the need for battens, i.e., nailing of 2 x 2's over the insulation, as would be required with other insulation materials.

Because of its unique water and water-vapor barrier properties that bar moisture and won't absorb water, Styrofoam provides permanent, low-cost insulation efficiency for comfort and low temperature space. And its light weight makes installation fast and easy. For more information, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Dept. 1701N3.

## Other Dow building products

**SCORBORD\***—(Pat. applied for) Superior rigid insulation for foundation perimeters, slab floors. Exclusive pre-scored feature speeds installation.

**ROOFMATE\***—Lightweight rigid insulation for built-up roofs serves as its own moisture barrier. Reduces blistering, resultant leaks.

**POLYFILM\***—High quality polyethylene film for temporary enclosure or moisture barrier under slab or insulation.

**SARALOY\* 400**—elastic sheet flashing conforms to surface contours. Bonds to any construction material. Won't crack. <sup>®</sup>TRADEMARK

†Dow's registered trademark for its expanded Polystyrene



Both walk-in refrigerators are insulated with Styrofoam.



Main dining room, showing exposed concrete roof structure.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

See the "DOW HOUR of GREAT MYSTERIES" on NBC-TV

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...it doesn't leave tracks

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## The Record Reports



### Triangular Design Chosen For London Office Block

One of London's tallest new buildings will be this triangular office block, now under construction. Stone, Toms & Partners are the architects, with Bylander & Waddell as consulting engineers. The 28-story building, 300 ft high, is to occupy the site of the Empress Hall of the Earls Court Exhibition. Estimated cost of the new block is about \$6 million. It will have 350,000 sq ft of rental floor space and will house 3500 workers.

Glenn Sarjeant, partner in Stone, Toms responsible for the building, says he chose the triangular design because it gives maximum floor space and maximum natural light, because it facilitates the provision of 18-ft-sq rooms now popular in England, because it helps overcome wind resistance with great stability, and because it harmonizes with a nearby exhibition hall.

The reinforced concrete structure has 14 internal columns; external columns, on 24-ft centers, are sheathed in white vitreous enamel. End walls are finished in white artificial stone. Spandrels are blue vitreous enamel, probably on aluminum. The central service core has 12 elevators; there are also service cores at each corner of the triangle. The top floor is recessed to form an observation terrace, with a projecting canopy over it.

more news on page 330

## INFRA-RED HEATING FOR RETAIL STORES



### Gas-Fired Overhead Panelbloc Combines Economy of Operation With "Heat Zone" Flexibility

Food stores need lots of heat at doors and checkout counters, but want minimum heat at meat, produce and fresh-frozen sections. PANELBLOC can automatically maintain different temperatures in various parts of the same store! PANELBLOC "Heats Like the Sun." No fans, no motors, no noise. Easy to install — no electrical connections needed.

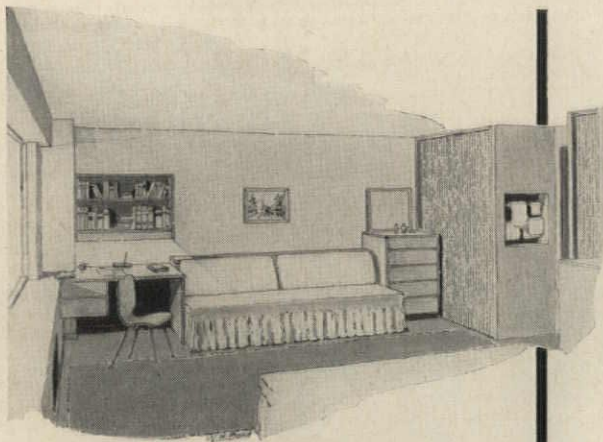
PANELBLOC users can utilize low-cost package units for cooling, eliminating costly duct work.

Write for information and Case Histories on Store Heating today.



**PANELBLOC DIVISION**

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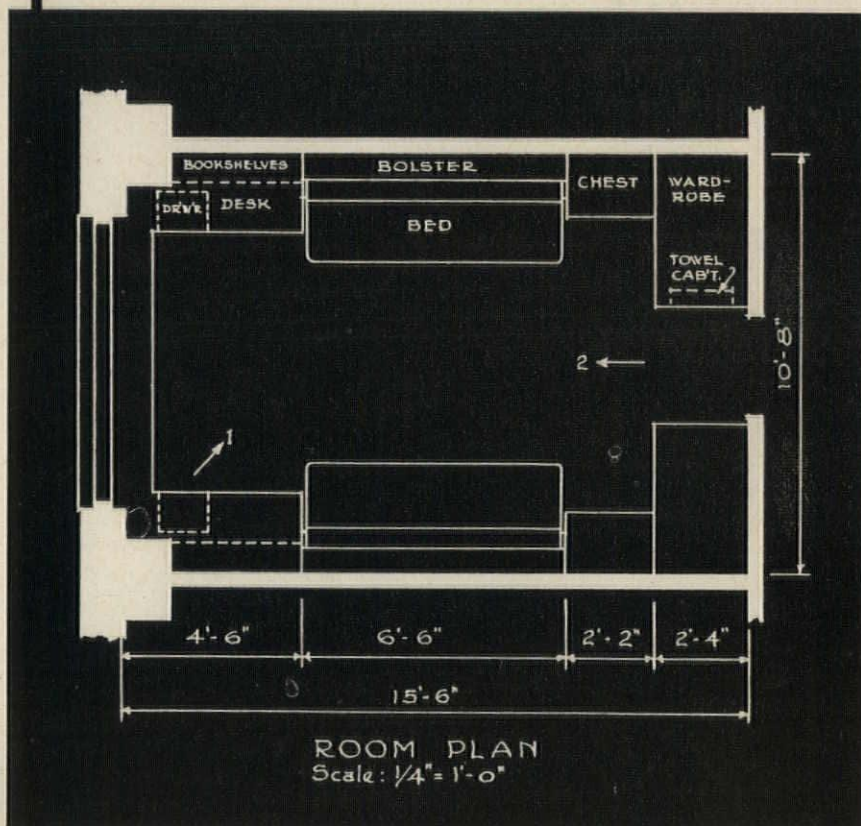


more spaciousness  
in less space  
becomes a reality  
when you plan the dormitory  
*"from the furniture up"*

Getting more spaciousness into the limited space allotted to dormitory or residence hall quarters starts with recognizing the furniture as a basic planning element. By pursuing this concept the architect finds the way opened to him for creating the arrangements that add substantially to the social, personal, study and aesthetic values of dormitory residence.

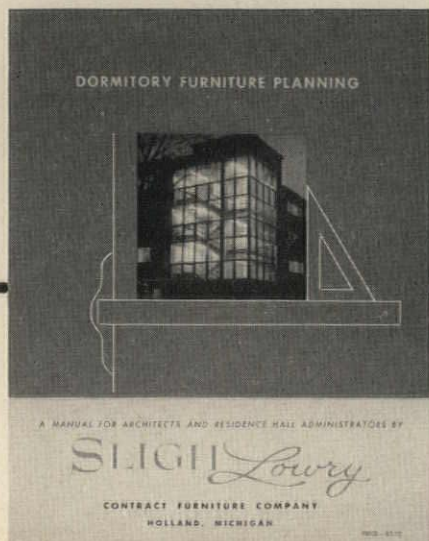
Planning "from the furniture up" disregards the arbitrariness of stock furniture designs which oppressively clutter up the space. It is the practical way of gaining greater accommodations while at the same time materially reducing initial cost and maintenance expense. It permits fuller scope in achieving functional utilization of the furniture in suite-for-four or room-for-two arrangements.

Sligh-Lowry has been most helpful to architects and administrators in this new approach to planning "from the furniture up." You will find the comprehensive Manual on this subject highly beneficial.



#### HOW TO PLAN "FROM THE FURNITURE UP"

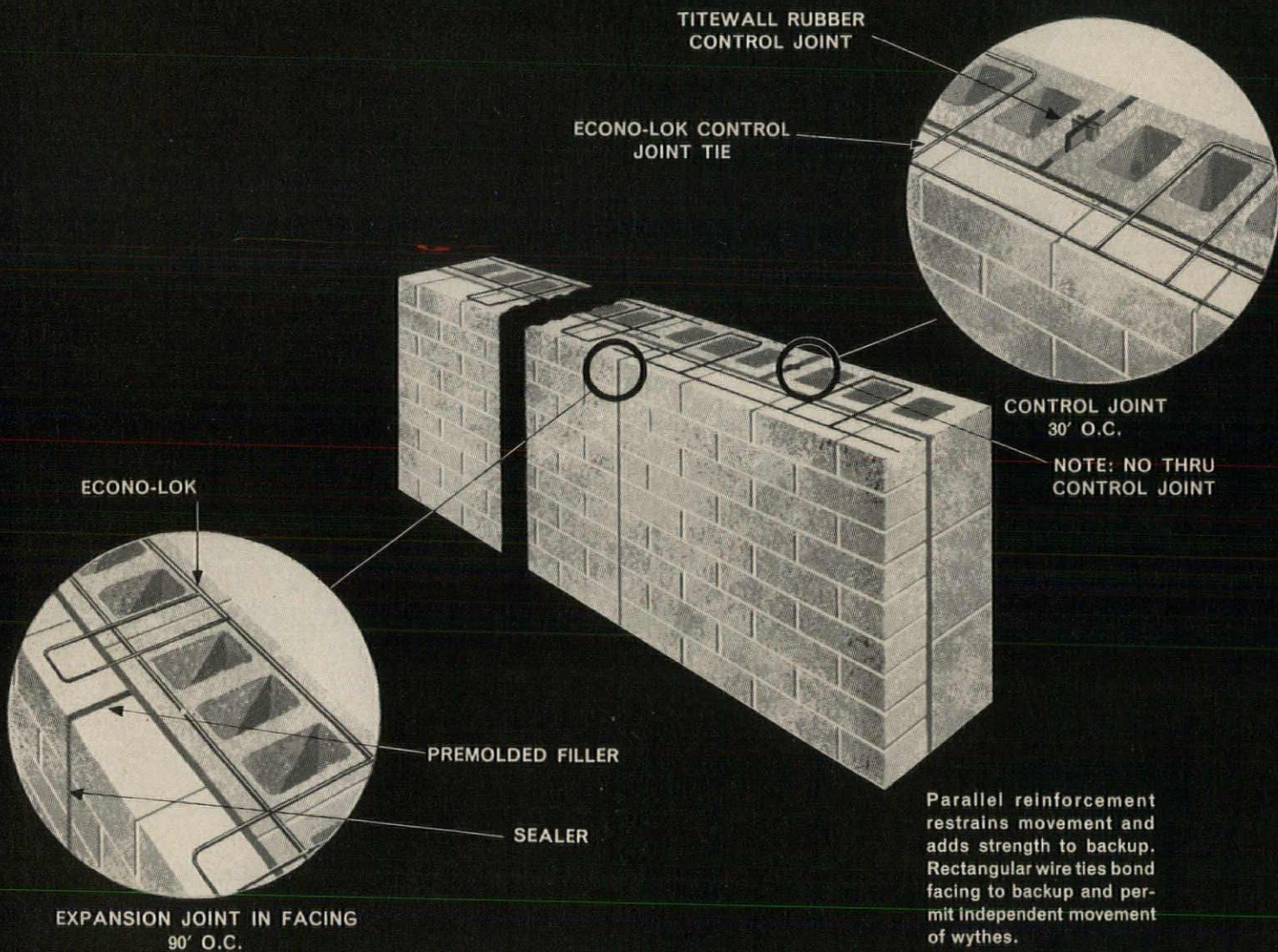
DORMITORY FURNITURE PLANNING, A Manual for Architects and Residence Hall Administrators, provides a detailed guide for planning dormitory rooms and suites "from the furniture up." Separate sections cover minimum furniture requirements in general and the special considerations that affect them; recommended design and construction features; the relative advantages of wood and metal furniture, built-in and freestanding; and suggested specifications for factory-built wood furniture. Of special interest is a collection of perspectives, plans and details of typical room layouts. 40 pp. \$3.



**SLIGH** *Lowry*  
**CONTRACT FURNITURE COMPANY**  
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EXPANDING HORIZONS IN MODERN MASONRY DESIGN

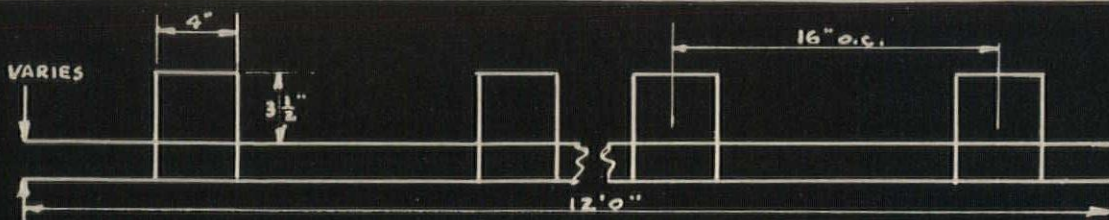
# flexibility and strength with



■ The exposed side and the interior side of faced masonry walls are subject to differing stress under varying atmospheric conditions. These stresses continue throughout the life of the building and will—if not relieved—eventually cause fatigue failure.

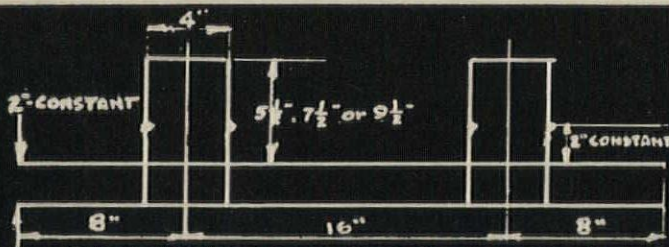
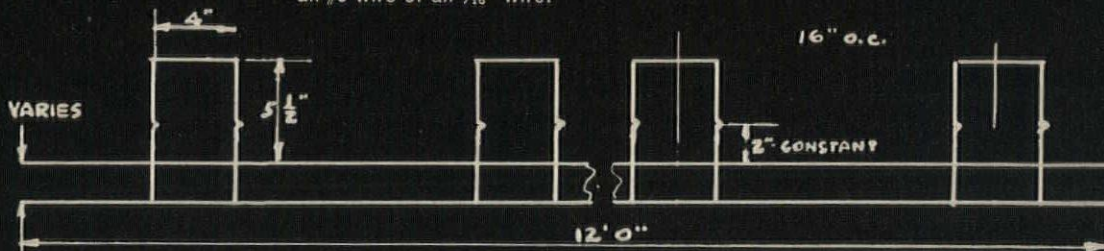
These normal stresses can be virtually eliminated through the use of ECONO-LOK reinforcing ties and the proper spacing of control or expansion joints.

# CONO-LOK<sup>®</sup> reinforcing ties only



## ECONO-LOK FOR COMPOSITE MASONRY WALLS

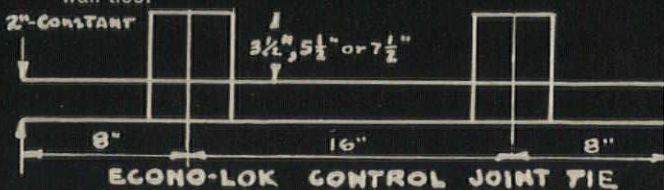
Width of parallel reinforcing wires varies with thickness of backup. 9 rectangular ties per 12' length. Available in all #9 wire or all  $\frac{3}{16}$ " wire.



## ECONO CAVITY-LOK CONTROL JOINT TIE

### ECONO-CAVITY-LOK<sup>®</sup> FOR CAVITY WALLS

Width of parallel reinforcing wires varies with thickness of backup. 9 rectangular ties per 12' length. Available only in all  $\frac{3}{16}$ " wire as per code. Requirements for cavity wall ties.



## AVAILABLE FINISHES

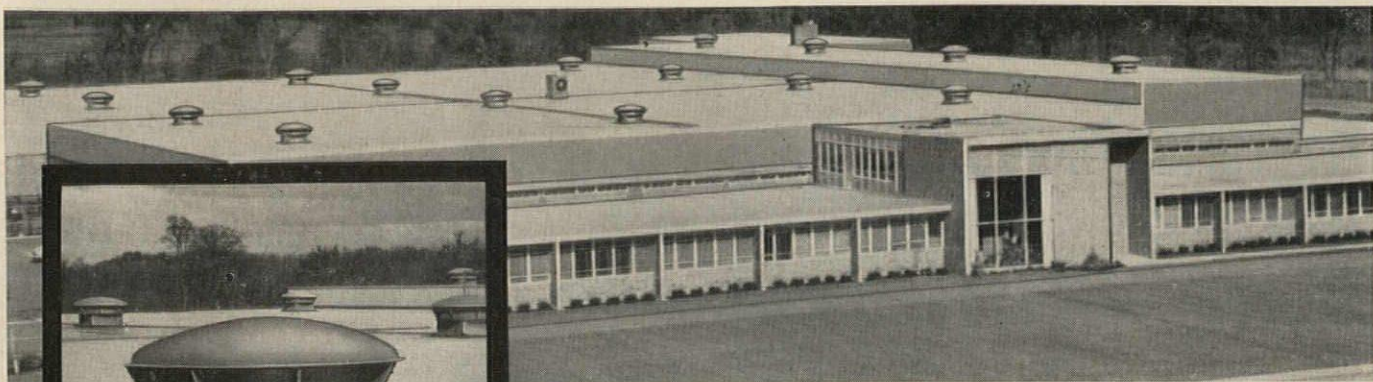
1. All brite basic wire.
2. Brite basic side rods & galvanized rectangular ties.
3. All mill galvanized wire.
4. Hot Dip galvanized after fabrication.



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 Mechanical Contractor: John E. Green Plumbing and Heating Co., Inc. Sheet Metal Contractors: Carlson Bros. Co.

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While the roof of this contemporary building demonstrates the low, attractive contour so much desired in a roof fan, it's the engineering under the hood that explains why the Allen "I-Line" is being specified by architects and engineers again and again.

For Allen has achieved a low silhouette along with high operating efficiency, low noise level, rigid construction, easy installation and easy accessibility for lubrication, cleaning and inspection. Direct drive or belt drive, supply or exhaust units.



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Roof ventilators for every commercial and industrial need • Representatives in principal cities

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BEAUTY AND PROTECTION WITH

**CERESIT DUST-ON COLORTOP**

The Complete Concrete Topping Finish

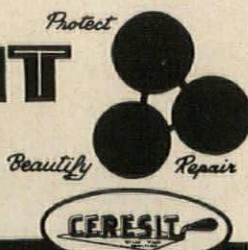
You can add value and increase customer satisfaction with Dust-On ColorTop. Ceresit combines flint aggregates with Portland cement and the purest, non-fading, mineral oxide colors. Ceresit ColorTop becomes part of the concrete giving Deep Down color and protection that lasts as long as the slab itself. Dust-On ColorTop requires no complicated measuring, weighing, or mixing. Just float 50 lbs. on 100 sq. ft. and finish with a steel trowel.

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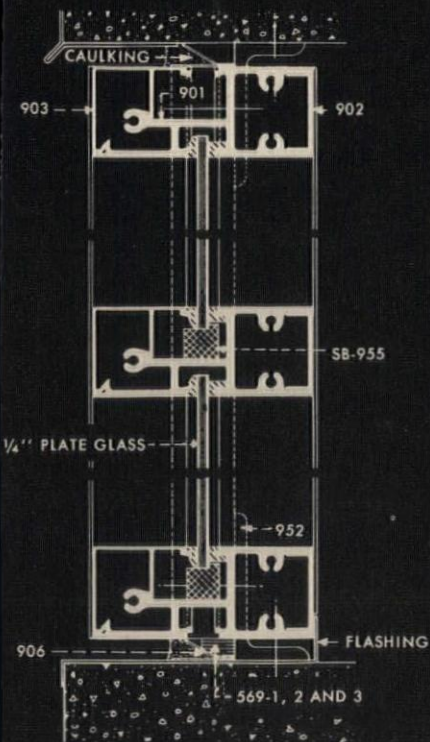
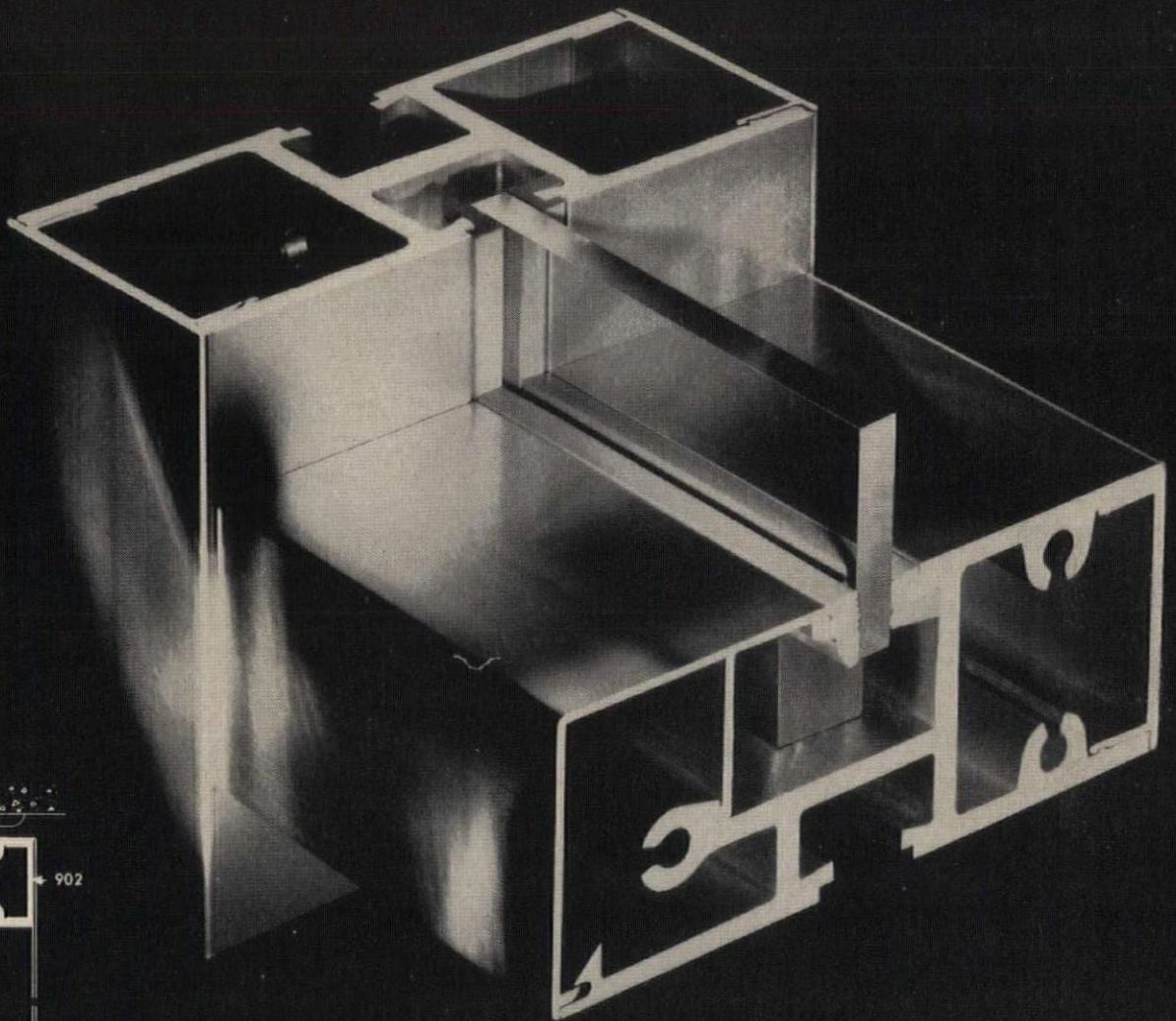
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 ...YOUR OWN PATTERNS IN**

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# THE NEW PITTCO® "900" SERIES



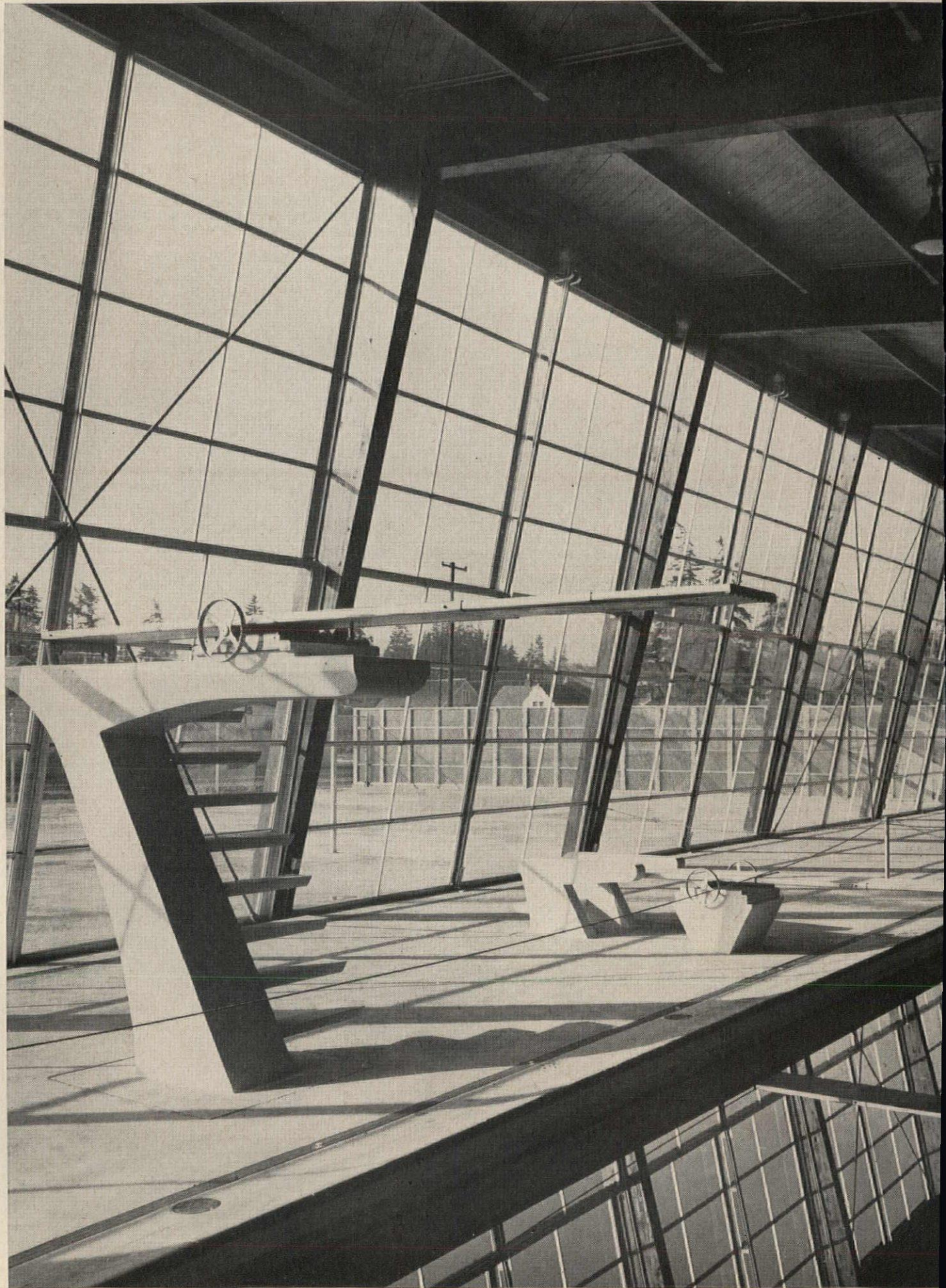
You can frame windows and glass-clad walls completely with the related components of the new PITTCO "900" series. It is provided with a drainage system. All members are aluminum; all fastenings are concealed; all glass is held in neoprene strips and recessed to increase daylight opening. And the clean beauty of every line is strikingly apparent. For details, consult your PITTCO Metal Representative.



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**PITTSBURGH PLATE GLASS COMPANY**

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# "OVERHEAD DOOR" opens a new door to climate control

*Overhead doors adapt any building to weather, temperature changes*

The "OVERHEAD DOOR" offers you new ideas in climate control. Through unique, imaginative applications you can now design structures that literally adapt to changing seasons, changing temperatures.

The new idea is the movable wall—banks of "OVERHEAD DOORS" that make the whole wall open, close quickly, silently. To a basically outdoor structure, they let you add indoor protection. To a basically indoor structure, they let you add measured amounts of sun and fresh air.

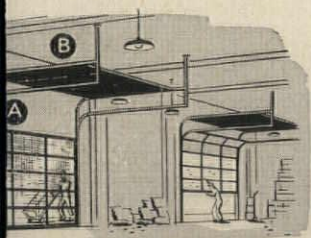
The dramatic swimming pool shown at left is an example. Oregon architect Gordon Trapp utilized banks of glass-paned aluminum "OVERHEAD DOORS" bringing climate control to this indoor-outdoor swimming pool. They open the pool to warm, fair weather,

tightly close it to cold, foul weather—flood it with light all year 'round.

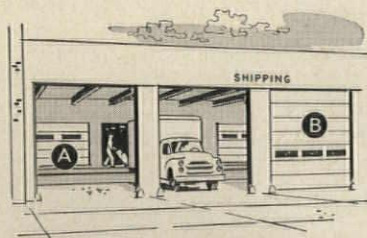
Many other new ideas in climate control have been developed and tested by Overhead Door Corporation engineers—ideas that are a result of this company's 39 years of experience in the garage door field. Some of these ideas may be of value to you.

Get detailed information from your local distributor (see "OVERHEAD DOOR" in the white pages) for an application you may now be planning, or write to Overhead Door Corporation, *General Office*: Hartford City, Indiana—*Manufacturing Distributors*: Cortland, N.Y.; Hillside, N.J.; Lewistown, Pa.; Nashua, N.H.—*Manufacturing Divisions*: Dallas, Tex.; Portland, Ore.—*In Canada*: Oakville, Ontario.

*Solve many climate control problems—*



**Swimming pool doors**—Protection from winter weather, screened ventilation for summer comfort are both provided with a double-track "OVERHEAD DOOR." This element actually holds two doors—one with screen panels (A), one with wood glass panels (B).



**Weather-lock**—Double rows of doors protect shipping areas. An inside row (A) of "OVERHEAD DOORS" is opened after the outer doors (B) have been closed. Trucks or railroad cars are loaded in a protected area, without excessive loss of heated or cooled air.



**Movable store front**—Stores and markets also utilize movable walls for climate control to stimulate customer traffic. "OVERHEAD DOORS" open the whole store front—attract customers with a store-wide display. At night and in bad weather, doors secure tightly.



*the original upward-acting sectional door, made only by*

## OVERHEAD DOOR CORPORATION



An important new concept in building construction! Shlagro's new Vertical Member longspan joist is the first to provide a diagonal-free ceiling thru-way! The result: easier installation and maintenance of ducts, piping, wiring, sprinkler systems—all utilities. Future utility additions and emergency repairs are made without disturbing ceiling area. Meets all structural requirements for materials, strength, safety, design and stress—surpasses the older diagonal-type longspan joists in economy, appearance, and usable utility space. Write today for Shlagro Catalog 375.



another PRODUCT by the PIONEERS of SQUARE columns!

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title \_\_\_\_\_

Please attach to your professional letterhead and mail to:  
**SHLAGRO STEEL PRODUCTS CORP.**  
SOMERVILLE, MASS.

## The Record Reports

### Education Notes

This summer, for the fifth year, the Atomic Energy Commission and the American Society of Engineering Education will again jointly offer special training in nuclear energy to engineering and science teachers and to instructors in technical institutes. The program will equip them for teaching and for setting up curricular and research programs in nuclear energy. Two study groups are offered to engineering teachers: the Basic or Beginning Institutes, and the Advanced Institutes; a Basic or Beginning Institute is also offered to technical institute teachers. Inquiries should be made to Professor W. Leighton Collins, Secretary, American Society for Engineering Education, University of Illinois, Urbana, Ill.

The Massachusetts Institute of Technology announces the establishment of the Wasserman Graduate Student Fellowship, "to support study in the general area of plastics and their potentialities in the building industry." The donor of the fellowship, which carries an annual stipend of \$3500, is Max Wasserman, president of the Wasco Chemical Company. Details are available from Dr. Albert G. H. Dietz, Professor of Building Engineering, Room 5-209, M.I.T., Cambridge 39, Mass.

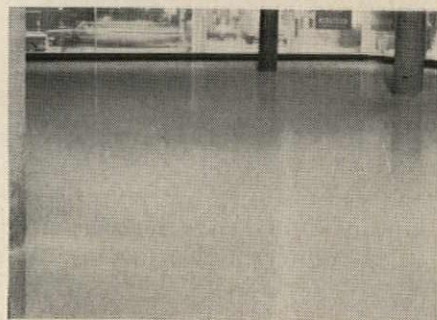
The University of Pittsburgh has established, with the beginning of the current academic year, a graduate program in Urban Renewal and Redevelopment. The course leads to a master's degree. Information is available from the Graduate School of Public and International Affairs, University of Pittsburgh, Pittsburgh, 13, Pa.

The Ohio State University, at Columbus, announces that it has reorganized its engineering curriculum. Students now will complete basic engineering and general academic requirements in a two-year Pre-Engineering Division, and in their last three years will move into the Professional Division for work in their major studies. The Professional Division will be open to students transferring from other disciplines, and from other colleges.

## TRETOL DEKOTE CONCRETE FLOOR TREATMENT

### 1 APPLICATION:

**CURES  
HARDENS  
SEALS  
DUSTPROOFS**



Apply DEKOTE to freshly troweled concrete floors by spraying, brushing, or by roller, and you get a floor that looks better, is stronger, will last longer and be easier to maintain.

DEKOTE, as a curing agent, retains 95% of the moisture in concrete to assure positive, complete hydration for maximum strength and hardness. It effectively seals concrete surfaces against most acids, oils, greases, and other foreign materials. Objectionable dusting, usually found in untreated concrete is eliminated.

Paints and tile adhesives may be applied to DEKOTE-treated floors without removing the DEKOTE membrane.

DEKOTE is a clear, fast-drying material that imparts a smooth, natural lustre to concrete that makes it easy to maintain and clean.

For complete information and specifications on this new concrete floor treatment, write for DEKOTE T 130 Catalog Sheet.



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Products for Concrete and Masonry

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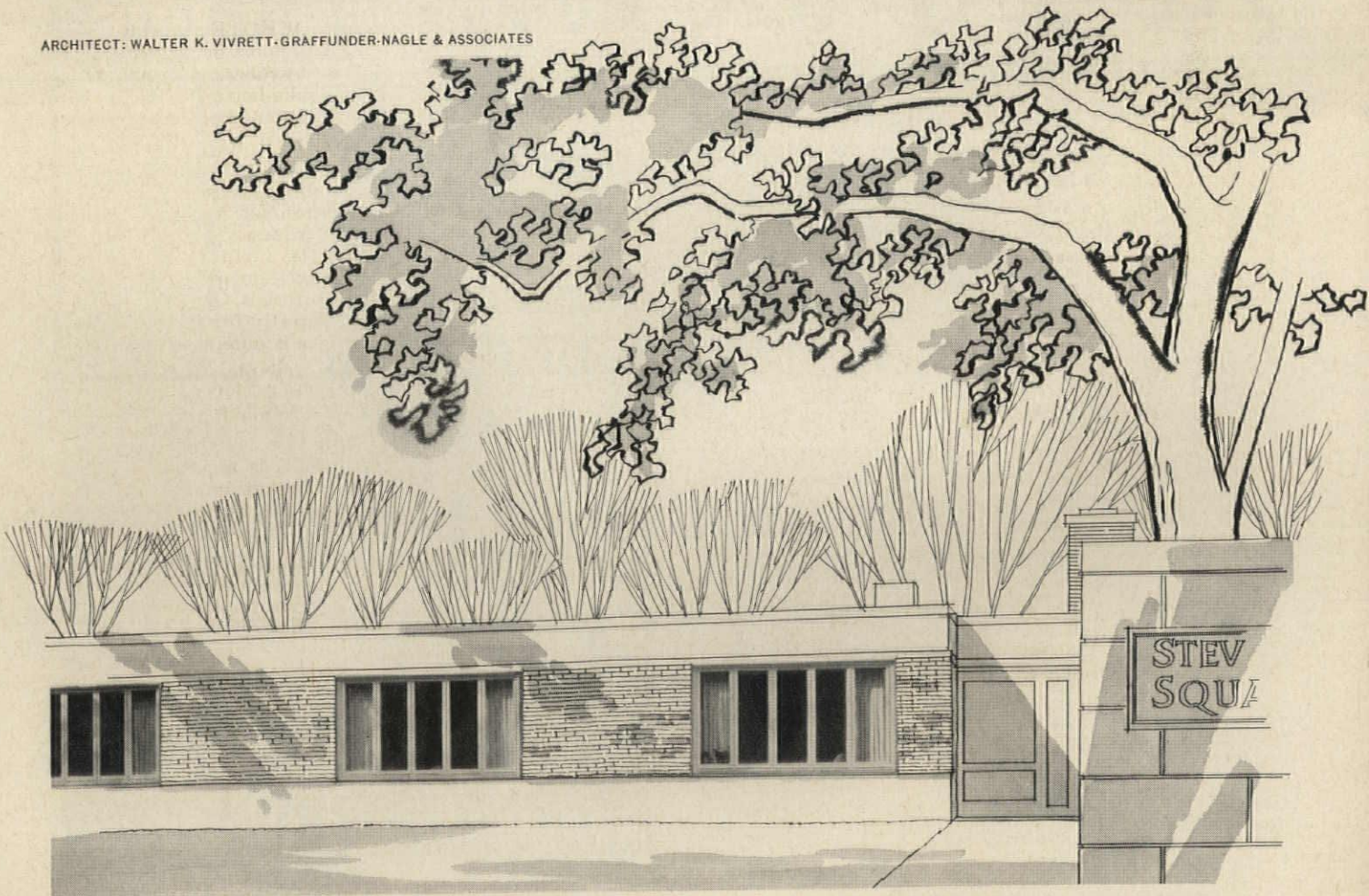
## wood casement windows

serve as important design feature in home for retired

Groups of five No. 24N PELLA CASEMENT WINDOWS provide a functional design element that complements the long, horizontal lines of this single-story unit. Over 200 PELLA CASEMENTS were used on this entire job. PELLA offers you 60 *standard* sizes with well-proportioned sash and mullions that combine into hundreds of custom-like arrangements. Traditional effects can be achieved with PELLA removable muntins that snap in and out for

easy cleaning. To assure low maintenance cost, PELLA CASEMENTS offer self-storing ROLSCREENS and storm sash. Insulating glass also available. Compare...then specify versatile PELLA WOOD CASEMENT WINDOWS on your next project. Full specifications in SWEET's catalog. Or consult the classified section of your telephone directory for name of our nearest U.S. or Canadian PELLA distributor. ROLSCREEN COMPANY, PELLA, IOWA.

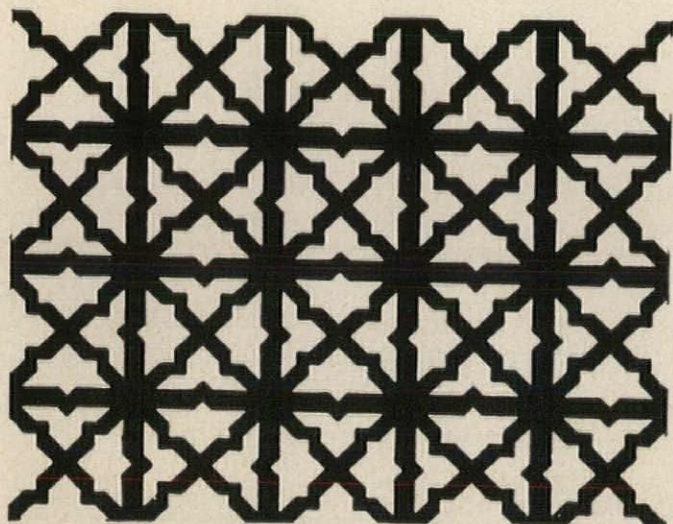
ARCHITECT: WALTER K. VIVRETT-GRAFFUNDER-NAGLE & ASSOCIATES



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architectural grilles  
more than 100 other patterns  
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Of the more than 100 designs in Hendrick Architectural Grilles, many are obtainable only from Hendrick. All combine the functional and the decorative with low installation costs — lower than for most architectural materials. All are of the highest quality: they always lie flat . . . never bend or warp . . . provide plenty of open space for passage of air.

All Hendrick Grilles are available in a wide range of dimensions, with varying numbers and sizes of perforations. The Hendrick Catalog contains full information on every design. Write for it today — and see how Hendrick Grilles can help make *your* design shine!

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## RUBBER and VINYL SEALS

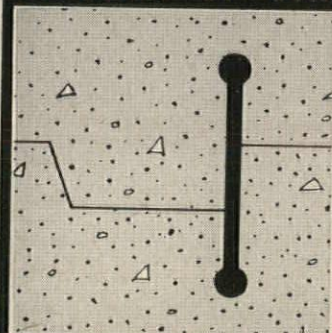
### FOR MASONRY JOINTS

Water Seals for cast-in-place construction joints between concrete footings and walls, walls and floor slab, wall section and wall section, and floor slab and floor slab.

Sealing Gaskets for use between sill and coping stones, brick and stone wall panels, masonry wall panels and structural steel members.

Sealing strips for control joints in block constructed walls . . . watertight seals with an inherent, permanent liveliness for use in Michigan and Besser Control Joints.

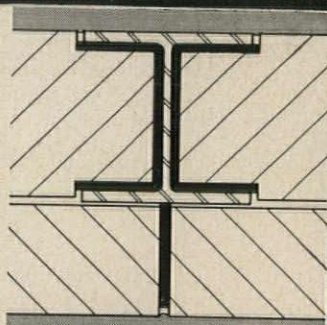
### RUBBER or VINYL WATERSTOPS



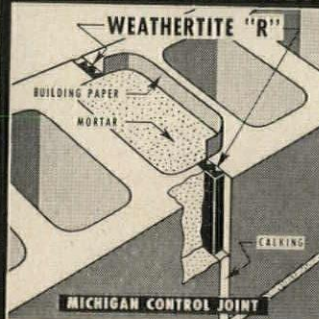
Williams Waterstops are made from Natural Rubber Stock and designed for maximum effectiveness in any type of cast-in-place construction joint. They will bend around corners, and will not crack or tear from shear action. Tensile Test: 3990 lbs., Elongation Test: 650%. Available in rolls up to 80 feet in length. Field splicing is simple. Williams Waterstops can also be furnished in Vinyl or Neoprene for industrial uses where resistance to oil and other injurious wastes is desirable.

### EVERLASTIC MASONRY GASKETS

Everlastic Masonry Gaskets are a readily compressible, nonabsorbent Elastomer impervious to water and inert to heat, cold and acids. In masonry joints they permit linear expansion in summer heat, and seal joints against moisture which causes frost damage in winter. Everlastic Gaskets are furnished die-cut to specifications and coated with pressure sensitive adhesive . . . they should be used between sill and coping stones, brick or stone wall panels, and masonry and structural steel members.



### WEATHERTITE for CONTROL JOINTS



Weatherite is a specially shaped, nonporous, expanded Polyvinyl Chloride strip which provides multiple, continuous contact surfaces when compressed, and thereby produces the positive pressure contact essential for an effective watertight seal in standard control joints in block constructed walls. Weatherite is available in two types to meet all requirements. Type "R" is made especially for use in Michigan Control Joints; Type "RB" is made especially for use in Besser Control Joints.

See Sweet's Files, or Write for Information.

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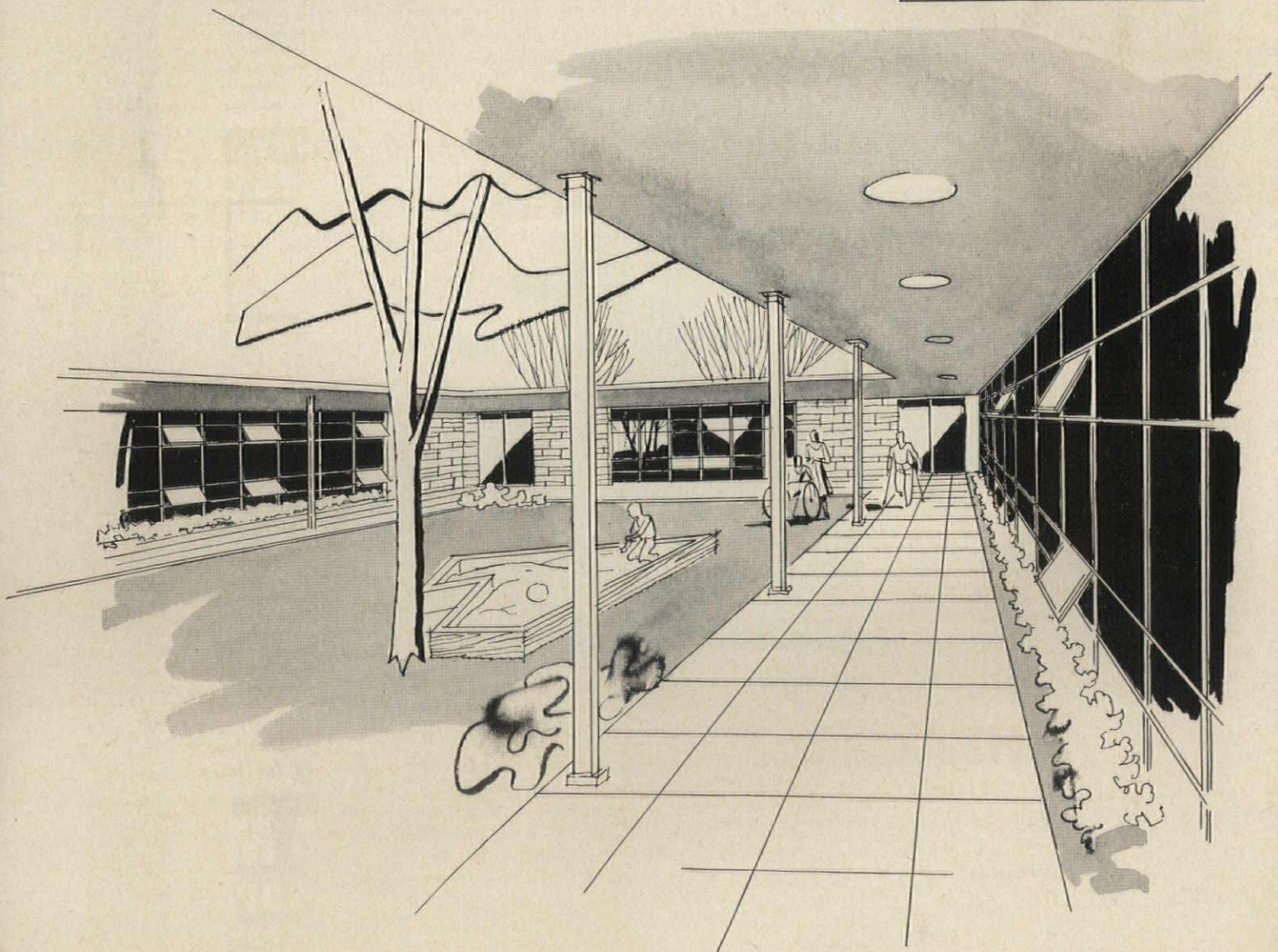
# Children's convalescent hospital makes efficient use of Pella windows



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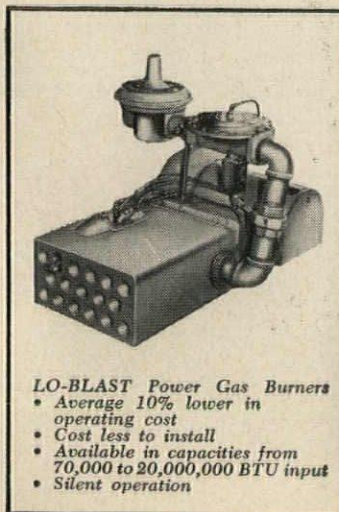
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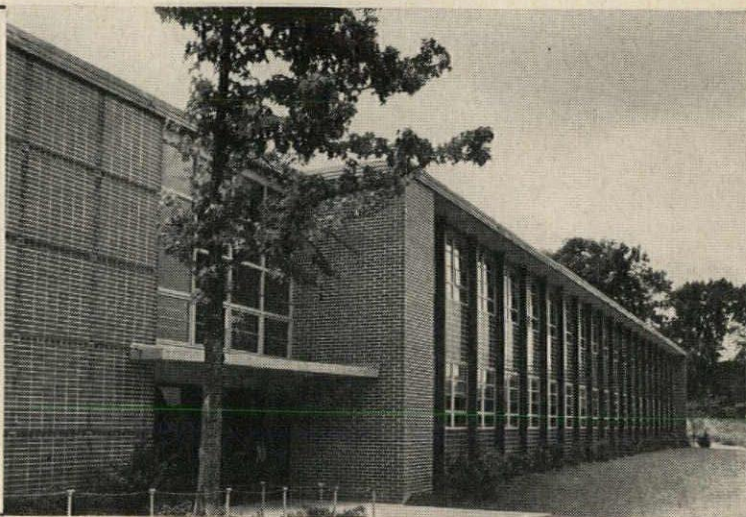
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Gas heating can give your schools safe, economical service. For specific information, take advantage of the consulting services provided by your Gas company, as well as Mid-Continent. They have trained heating specialists who have been working with architects, engineers and school boards for years. If you want further information, check with your local Gas company's heating specialist, or write to Mid-Continent Metal Products Co., 1960 N. Clybourn Avenue, Chicago 14, Illinois. *American Gas Association.*

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"With the style of architecture we want here in Birmingham, we find that it's more sensible to have small boilers in each building rather than try to build a central plant and pipe the heat to each building," states Mr. Fred J. Kelley, business manager of the City Board of Education. "In many of these new installations, we have specified Lo-Blast Power Gas burners because of their good record here in Birmingham for safe, consistent performance, plus low-cost installation and operation."

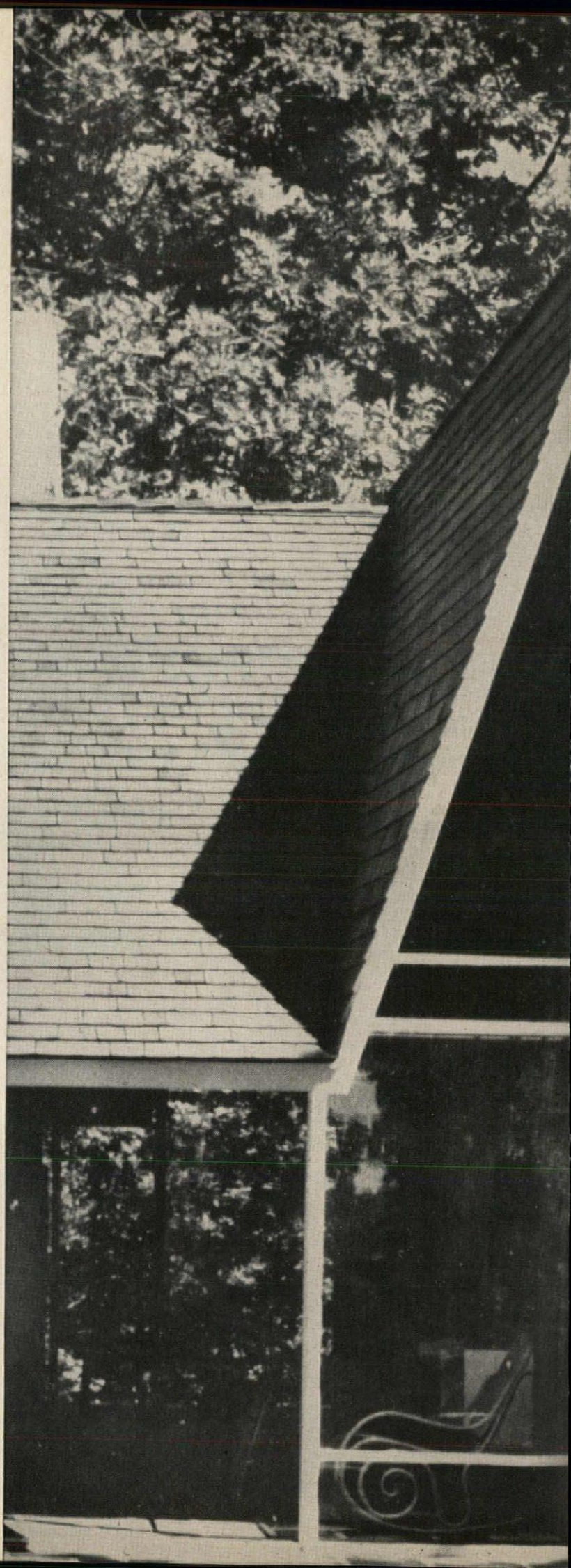




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Architects and engineers have hailed "Record Houses" annuals as handy references, trend indicators, valuable aids for selling clients, and an *inspiration!*

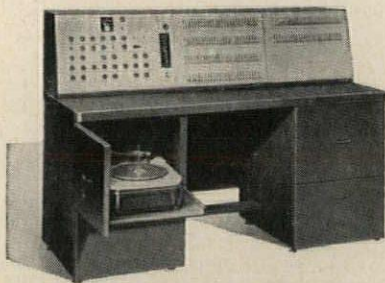
"Record Houses of 1960" will be all of these and more—a *delight to read* for everyone interested in design for better family living.

Architectural Record subscribers will receive "Record Houses of 1960" in addition to the regular May issue. The house building and buying public will buy it, complete with advertised product information, in bookstores coast to coast.

# RECORD HOUSES OF 1960 ARCHITECTURAL RECORD



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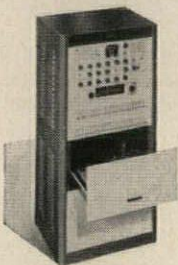


SPECIFY

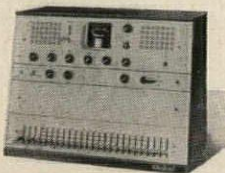


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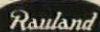
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## Required Reading

continued from page 68

### Viollet-le-Duc . . .

would be well advised to hunt for one of the older editions or, better yet, secure the original French text with the illustrations unmarred by folding or stitching.

The Bucknall translation is reasonably accurate, if often ungainly and unidiomatic. However, the present publisher has done a modest service in merely republishing the text of the great French medievalist, whose writings, especially these *Discourses*, form a significant cornerstone of modern (not just contemporary) architectural philosophy. Yet the absence of notes, commentary, or even a new introduction is deplorable. Lacking such necessary material, the excellent essay by Sir John Summerson, "Viollet-le-Duc and the Rational Point of View," in his collection, *Heavenly Mansions*, remains the most useful general introduction to the subject.

—JOHN M. JACOBUS, JR.

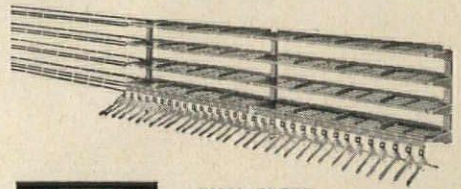
### Photographic Grand Tour

THE THRONES OF EARTH AND HEAVEN. Photographs and notes on the plates by Roloff Beny. Texts by Freya Stark, Jean Cocteau, Bernard Berenson, Rose Macaulay, Stephen Spender. Foreword by Herbert Read. Harry N. Abrams, Inc., 6 W. 57th St., New York 19. 182 pp., illus. \$17.50.

Though this is a book of pictures of buildings, architects should be warned that buildings here are useful only as photographer's models, and as evocations of all that was noble in ancient, classic, and Renaissance cultures. Roloff Beny, a painter from Medicine Hat, Alberta, has made a grand tour of the Mediterranean, his itinerary including such exotic ports-of-call as Palmyra, Baalbek, Memphis, Cyrene, Leptis Magna, Syracuse, and Knossos. Both photographs and notes concentrate on the poetry of Mediterranean buildings and ruins, and the book will never replace *A History of Architecture on the Comparative Method*. It must be said that "superb" is not too strong a word for the photographs, as technique or as evocation; the book itself is handsomely designed and well printed.

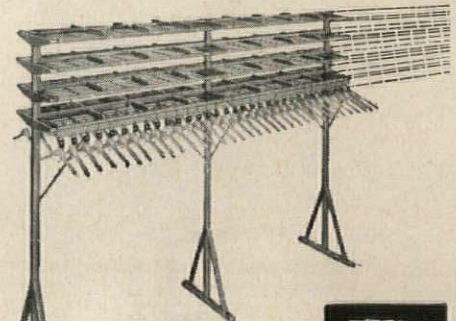
—GRACE M. ANDERSON

## Checker COAT and HAT RACKS



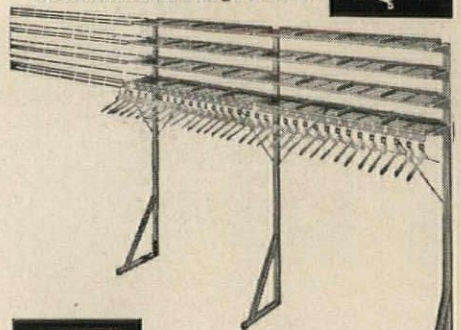
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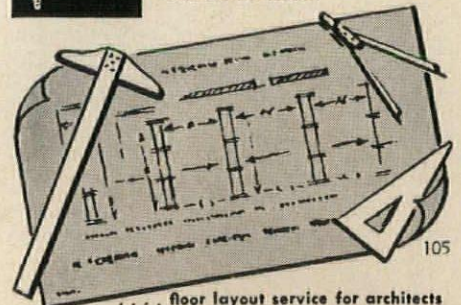
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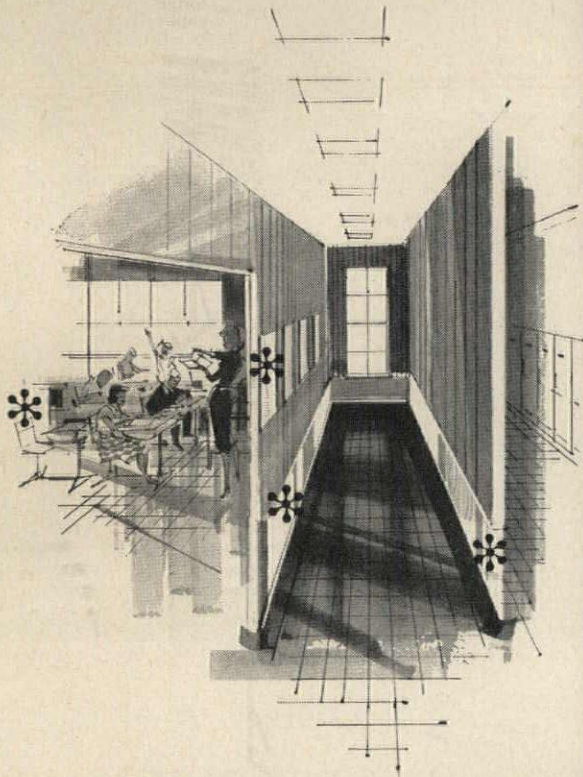
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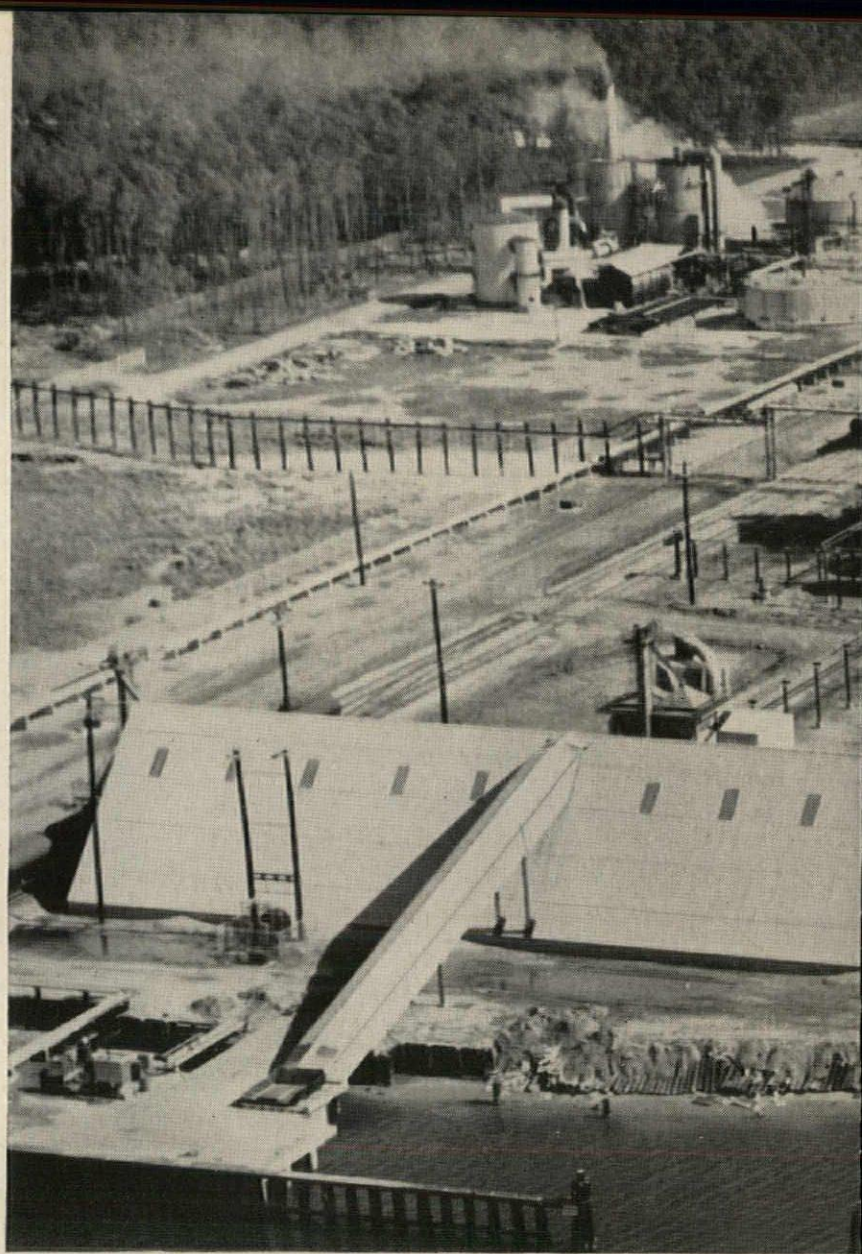
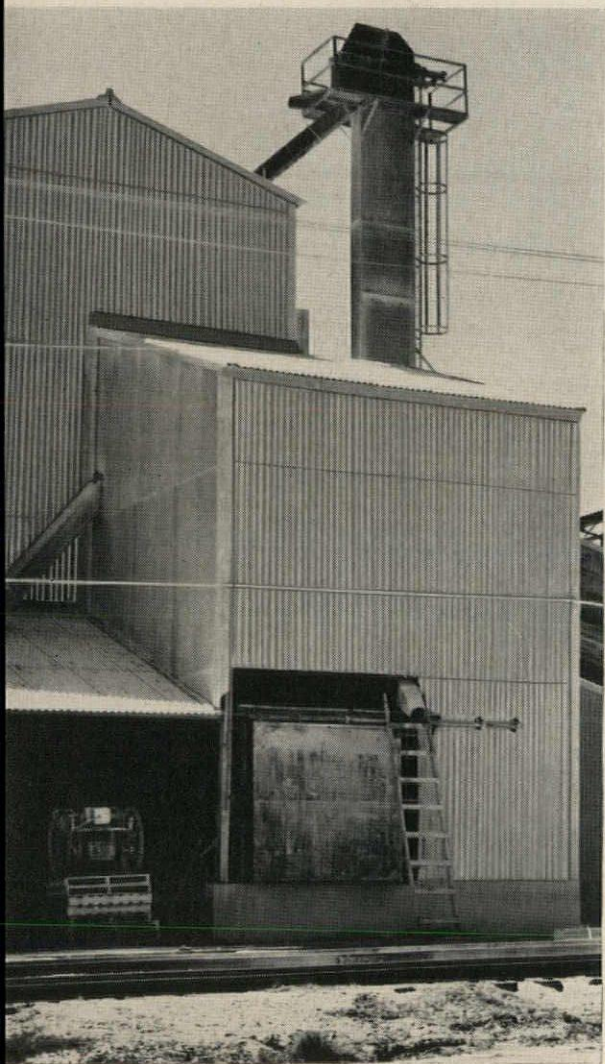
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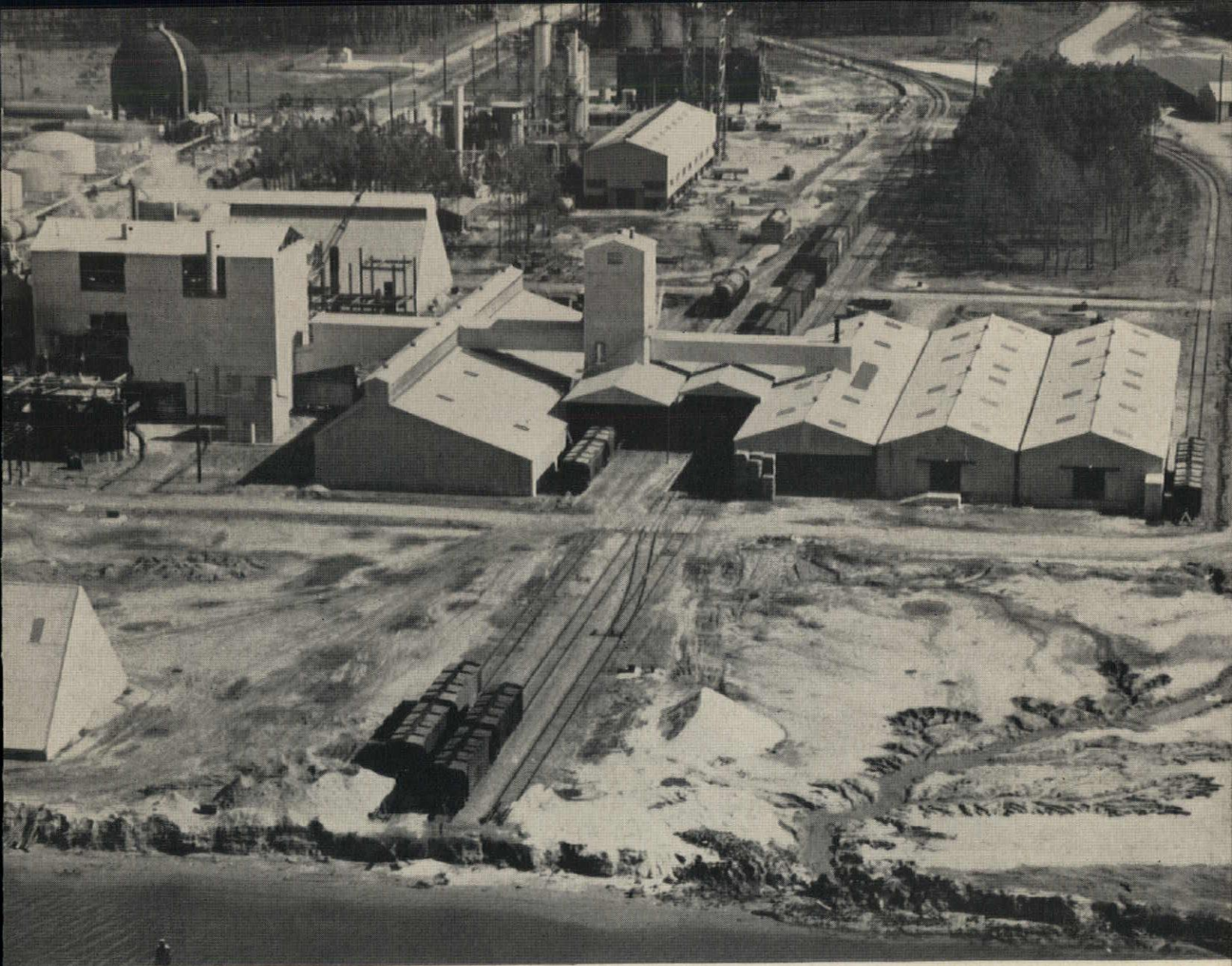




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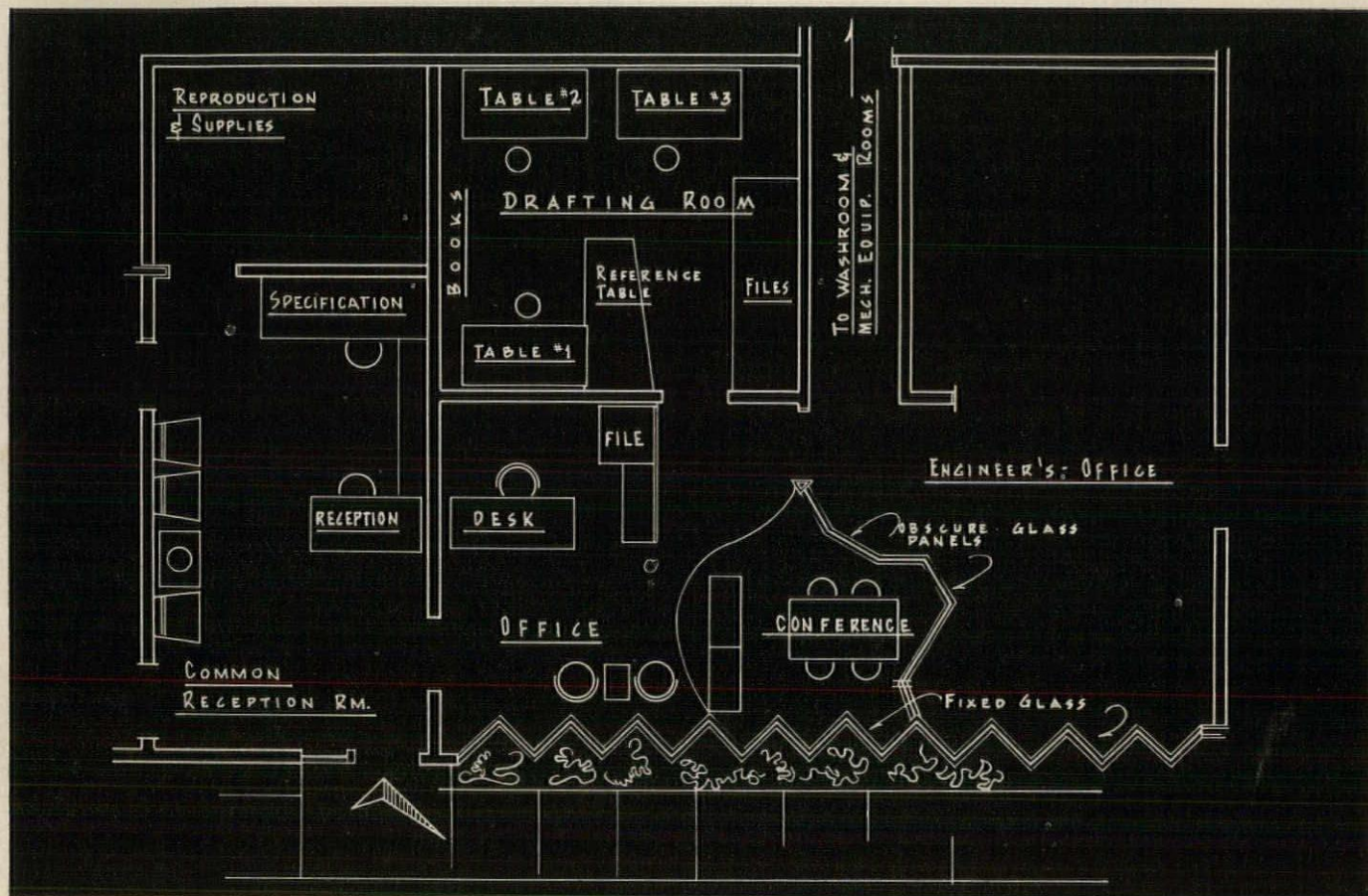
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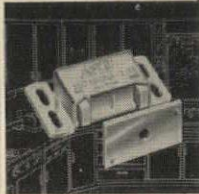
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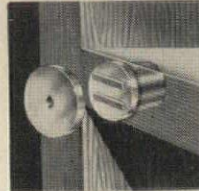
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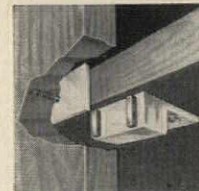
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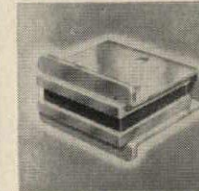
1002 Magnetic catch with plastic case, lifetime, self-aligning magnet. Mounts in a variety of ways.



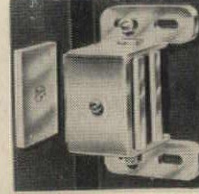
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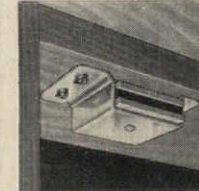
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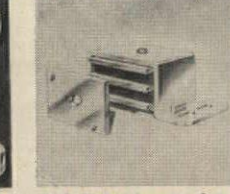
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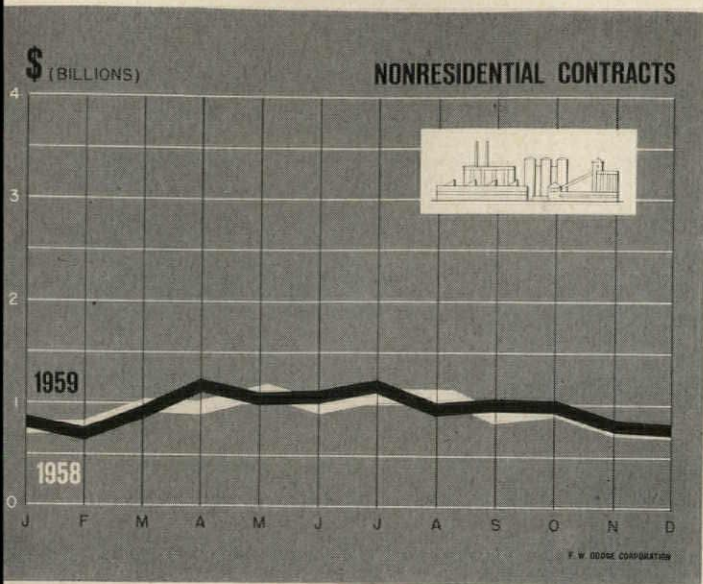


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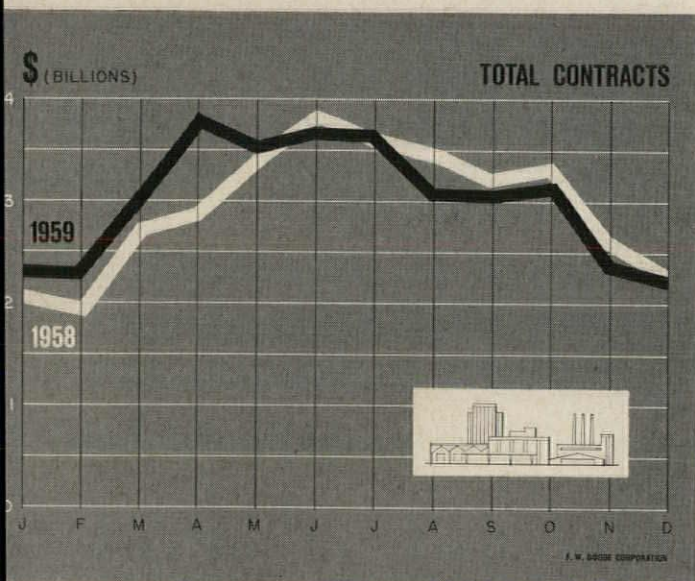
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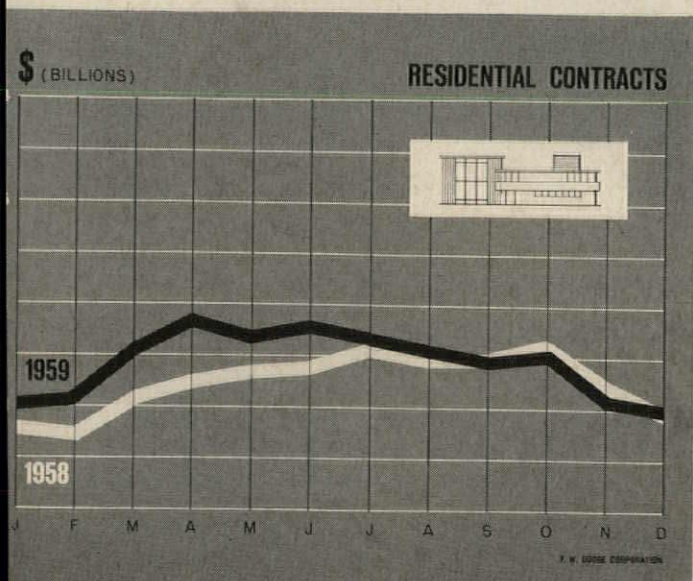
# Current Trends in Construction



A SLIGHT DELAY of some six hours in the arrival of an airplane a few Sundays ago provided an unparalleled opportunity for the 25-cent tour of New York's Idlewild Airport. This establishment is rapidly becoming a sort of permanent World's Fair, but the feature that comes to mind at the moment is the customs layout in the International Arrivals Building. If there are any readers of the RECORD who haven't already been there, customs is located in two bays on the ground floor, with glassed-in balconies for greeters and sight-seers. Arriving baggage comes through compartments in the rear of the building. Wire carts are provided for the baggage, and incoming passengers wheel them to some 34 check-out counters, complete with conveyor belts. Efficiency is the watchword, and we clocked some of the passengers in less than five minutes. The whole thing has the air of a gigantic supermarket. And, come to think of it, what better device could be designed for the immediate indoctrination of newcomers into the ways of the United States?



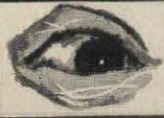
THIS LEADS us to shopping centers, this month's building type. There are no really comprehensive statistics on shopping centers, partly because they are a little difficult to define for statistical purposes. Store building in general has been having quite a boom. The Dodge contract figures for stores totaled \$1,949,000,000 for 1959, a new record, and 23 per cent above the 1958 total. Prospects are that 1960 will produce an even higher total. To some degree at least, this will be a reflection of the tremendous upsurge in home-building last year, which opened up new areas for store development. It will also reflect the fact that we have about three and a half million more people than we had a year ago.



NOT ALL shopping centers are howling successes, although most of them certainly have done well. In cases where they have not lived up to their sponsors' hopes, a variety of causes may have been at work. One theory, which is offered here from the viewpoint of the shopper, is that some have paradoxically underestimated the importance of the automobile. The suburban housewife's car is as much a part of her way of life as the cowboy's horse was of his. Many a shopper will drive a few feet from store to store, in preference to walking. In some shopping centers, it is quite a hike from car to store. A shopper who has made some purchases, and who wants to visit another store nearby, is faced with the choice of carting the packages, or trudging to the car and back again. The so-called "highway commercial" development, where separate stores have their own individual parking lots in front of their doors, is a recognition of just this fact. In the case of very large new shopping centers, subdivision into smaller sub-centers, with in-front-of-the-door parking, would seem to be worth considering.

GEORGE CLINE SMITH

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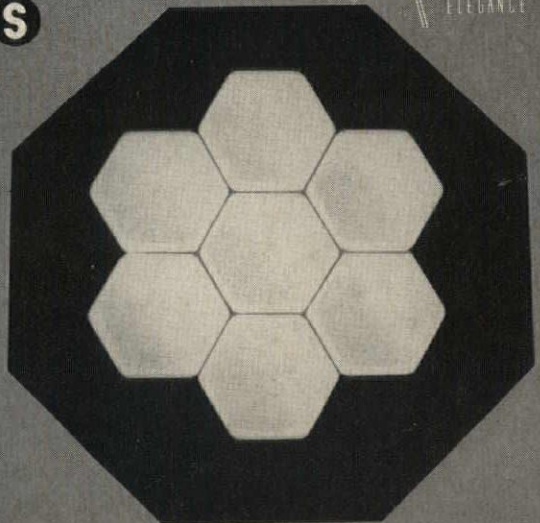
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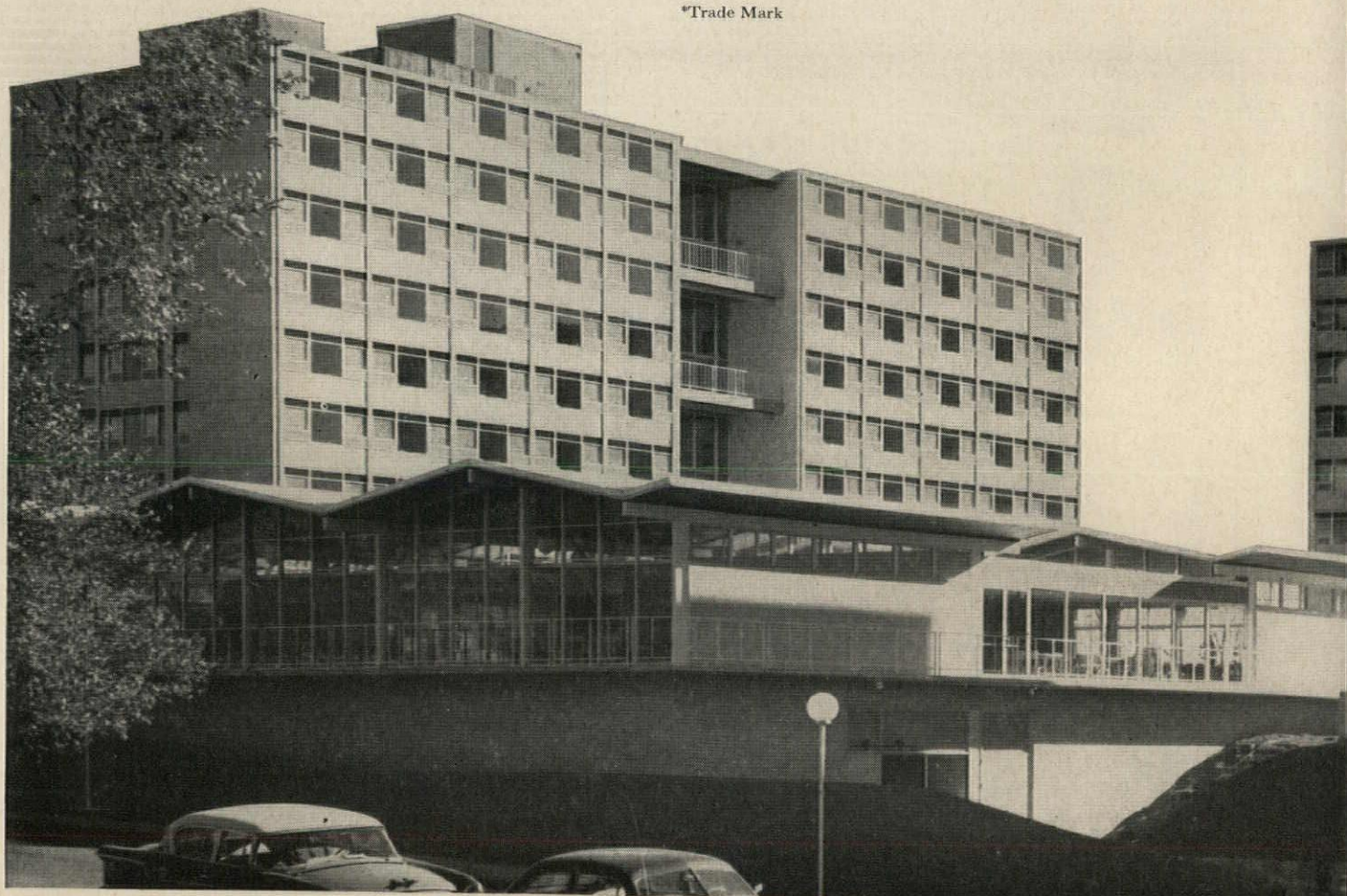
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**METAL WINDOWS • CURTAIN WALLS  
MICHAEL FLYNN MANUFACTURING CO.**

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Architect: Hellmuth, Obata and Kassabaum, St. Louis, Mo. Contractor: D. C. Bass & Sons Construction Co., Bass Bldg., Enid, Okla.



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A complete line of Electric and Manual Folding Partitions

## Torjesen



3 Electric Folding Partitions.  
Clinton Place H.S., Newark, N. J.  
Architect: Kelly & Gruzen

\* **AUTOMATIC ELECTRIC PARTITIONS**

\* **MANUAL PARTITIONS**

- (a) Top Hung — Center Pivot — All Hinged
- (b) Top Hung — Center Pivot — Pair or Individually Operated
- (c) Top Hung — Edge Pivot — Pair Operated
- (d) Bottom Bearing — Edge Pivot — Pair Operated
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\* **HIDDEN PARTITIONS**

- No Floor Track • No Exposed Hardware
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now available at the same price as Duck or Vinyl

### Torjesen "WALL-A-WAY" Folding Partitions with **TOROPLY**

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Architects: Smith and Parent, Kalamazoo / Contractor: Ray Stevens Company, Kalamazoo

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