ARCHITECTURAL RECORD

January 1962 **1**

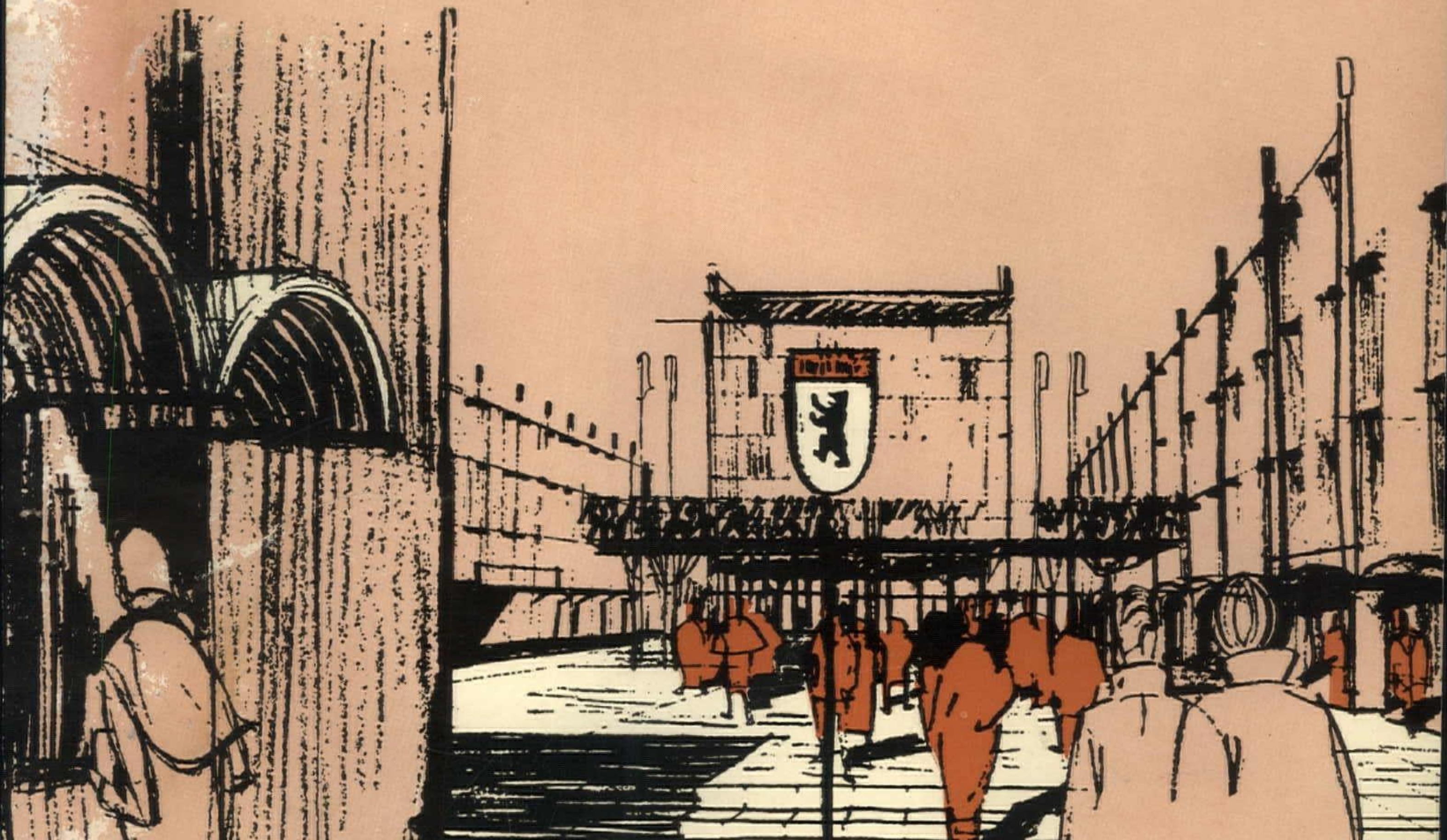
Building Types Study: Apartments

Social Science Center on Brandeis Campus

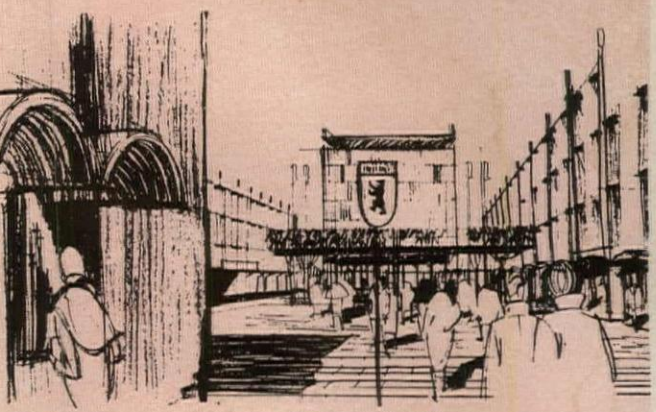
Two Industrial Buildings by Yamasaki

Nuclear Attack and Industrial Survival

Full Contents on Pages 4 & 5



University of Maryland Cafeteria, College Park, Md. Walls: Scored Design SD-4 in 380 Cr. Fawn and [illegible] Cr. Mocha. Architect: Johannes & Murray. Tile Contractor: Franklin Marble and [illegible] Co. Plate 457.



Cover:

Gehag Redevelopment, West Berlin. Architects: The Architects Collaborative International, Ltd. Drawing by Richard Stauffer

ARCHITECTURAL RECORD January 1962 Vol. 131, No. 1. Published monthly, except May 1962, when semi-monthly, by F. W. Dodge Corporation, a McGraw-Hill Company.

Executive, editorial, circulation and advertising offices: 119 West 40th Street, New York 18, N. Y. Western Editorial Office: 2877 Shasta Road, Berkeley 8, Calif. Office of Publication, 10 Ferry Street, Concord, N. H.; second-class mail postage paid at Concord, N. H.

Subscription rate for individuals in the field served $5.50 per year in U. S., U. S. Possessions and Canada; single copies $2.00, except Mid-May 1962 issue $2.95. Further details on page 6. Postmaster: Please send Form 3579 to Circulation Manager, ARCHITECTURAL RECORD, 119 West 40th Street, New York 18, N. Y. (National Edition)

ARCHITECTURAL

Features

RECORD

CONTENTS
January 1962

Building Types Study 302: Apartments

Coming in the Record

NEW WORK BY VICTOR LUNDY

A talented young architect perhaps best known for his churches with dramatic laminated wood structures has widened the spectrum in his latest group of projects. The February feature will include a ski resort and a country club as well as churches: and brick, concrete and stone as well as wood. Some very special drawings in this one.

ARCHITECTURE FOR AN ARENA THEATER

Harry Weese's most intriguing project to date has just been completed in Washington, D.C.—Arena Stage, a theater designed specifically for arena staging and embodying a number of important technical innovations in theater design. Here also the theater becomes Architecture—no routine achievement.

SCHOOL DESIGN AND "GYMNASIUMS"

Next month's Building Types Study on Schools will have a special feature on gymnasiums—actually a roundup on several kinds of facilities currently being designed to serve school athletic (and frequently also other) purposes. The feature will include an article on "combination gyms" by educational consultant Dr. N. L. Englehardt, Jr.

ARCHITECTURAL RECORD (combined with AMERICAN ARCHITECT and ARCHITECTURE), title ® reg. in U. S. Patent Office, Quotations on bulk reprints of articles available on request. Indexed in Reader's Guide to Periodical Literature, Art Index, Industrial Arts Index and Engineering Index.

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

SUBSCRIPTIONS: Available only by paid subscription. Publisher reserves the right to refuse non-qualified subscriptions. Subscriptions to Architectural Record solicited only from architects and engineers. Position, firm connection, and type of firm must be indicated on subscription orders forwarded to Circulation manager, Architectural Record, 119 West 40th Street, New York 18, N. Y. Subscription prices: U. S., U. S. Possessions and Canada: $5.50 per year; other Western Hemisphere countries, to those who by title are architects and engineers, $9.00 per year. Single copy price except Mid-May 1962 issue $2.00; Mid-May 1962 issue $2.95. Beyond Western Hemisphere, to those who by title are architects and engineers, $9.00 per year for 12 monthly issues not including Mid-May 1962 issue. Subscriptions from all others outside U. S., U. S. Possessions and Canada for 12 monthly issues, not including Mid-May issue, $24.00 per year.

CHANGE OF ADDRESS: Subscribers are requested to furnish promptly both old and new address, sending, if possible, stencil impression from magazine wrapper; new postal zone number, if any, should be included. Allow one month for change.

UNCONDITIONAL GUARANTEE: The publisher, upon written request, agrees to refund the part of the subscription price applying to the remaining unfilled portion of the subscription if service is unsatisfactory.

OTHER F. W. DODGE SERVICES: Dodge Reports—Dodge Construction Statistics—Sweet's Catalog Services—Dodge Mailing Service—Home Planners' Digest—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.

Audit Bureau of Circulations

Associated Business Publications

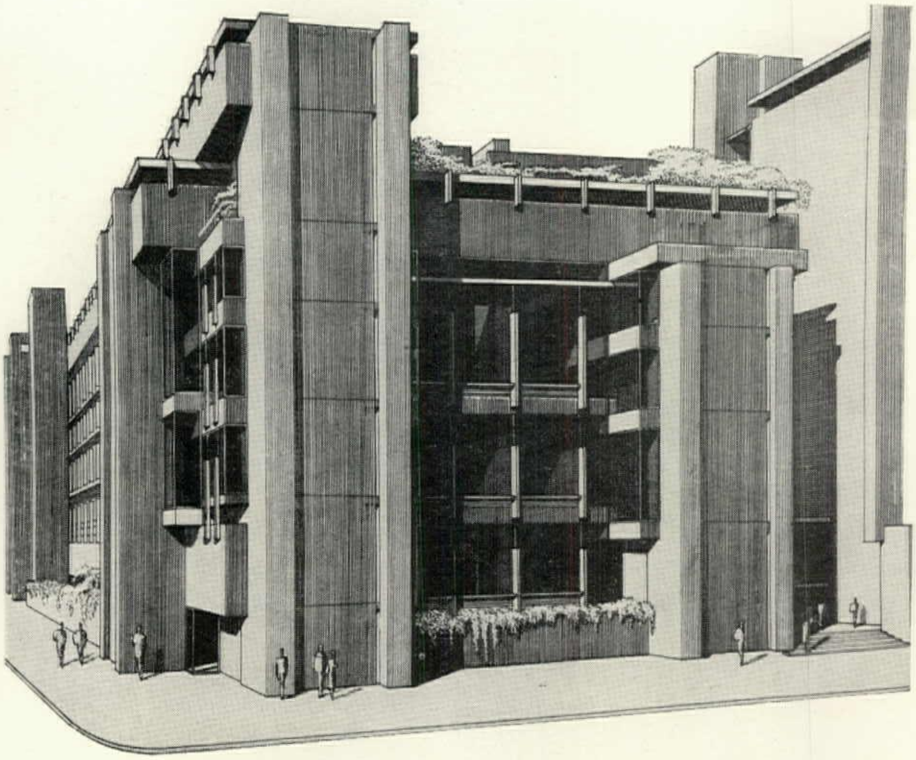
TRUE THERMAL BREAKS
. . . Both frame and vent are manufactured with true, integral thermal breaks . . . no "through" metal. Thermal breaks provide insulation and eliminate condensation.

DUAL GLAZING
. . . Two panes of glass enclose 2" air space, providing greater insulation against heat gain, heat loss and noise.

BUILT-IN VENETIAN BLIND
. . . Between the two panes of glass where it offers most effective solar barrier . . . remains relatively dirt free . . . all controls inside room . . . blind is completely hidden from sight in raised position.

HORIZONTAL PIVOTING
. . . for ventilation if desired and for cleaning **all** glass surfaces from inside, installs from inside, too.

LOW-COST
Initial cost comparable to other high-quality commercial windows . . . substantial savings in construction, maintenance and requirements for heating and cooling equipment.



Shown at the left is the architect's drawing of the exterior of the Yale University School of Art and Architecture. With its completion, Yale will have a complete Center for Fine Arts, which will include the Fine Arts Gallery, the History of Art Department, the Art and Architecture Library and the School.

YALE'S NEW ART AND ARCHITECTURE BUILDING

Groundbreaking ceremonies were held in December at Yale University for the new $4 million Art and Architecture Building designed by Paul Rudolph, professor of Architecture and head of the Department of Architecture at Yale. Occupancy is expected by February, 1963. When completed the building, seven stories above ground and two floors below, will house all the departments of the School of Art and Architecture now located in several buildings in the immediate area—architecture, city planning, painting and sculpture and graphic design. Also to be included will be an art-architecture library with space for 75,000 books and reading space for 150 persons.

Mr. Rudolph said the new structure, which will provide 105,000 sq ft of space, will be of reinforced concrete, with a special aggregate exposed on both inside and outside surfaces. In exterior appearance, the building will be only about 40 per cent glass, and will have the feeling of the older buildings at Yale in that it will have an irregular roof and a series of towers. A special feature will be a large jury room in the center of the first floor, designed to stimulate communication through works between various school disciplines.

Contractor will be the George B. H. Macomber Company, of Boston and New Haven.

Building will have exterior panels of cast-in-place concrete aggregate cast in sieve-like forms so that the water comes out through the openings between vertical members and brings the aggregate to the surface. Panels are hosed down after hardening. The wish is to expose the aggregate without sandblasting or bushhammering

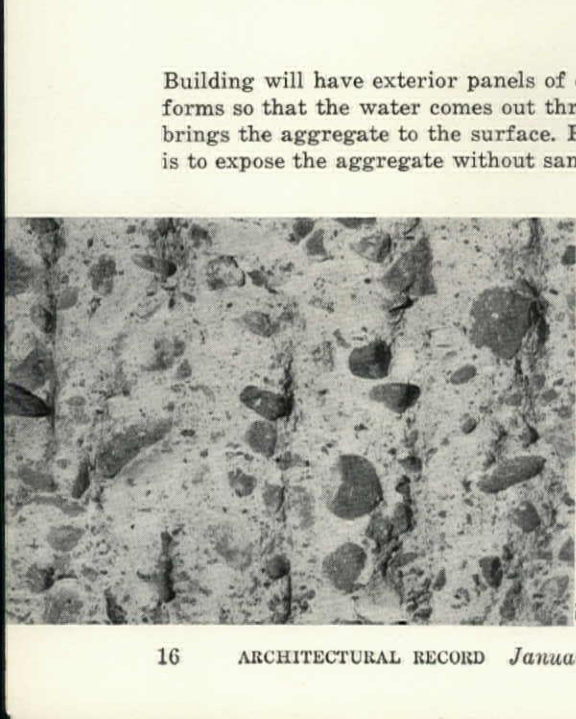
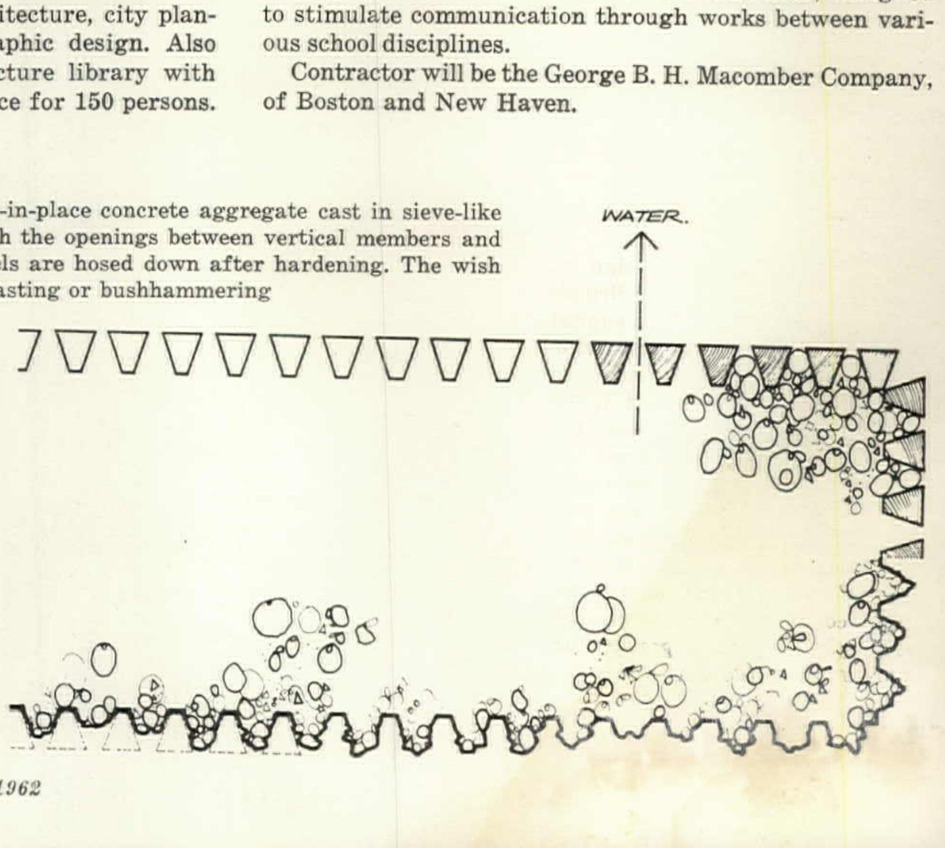
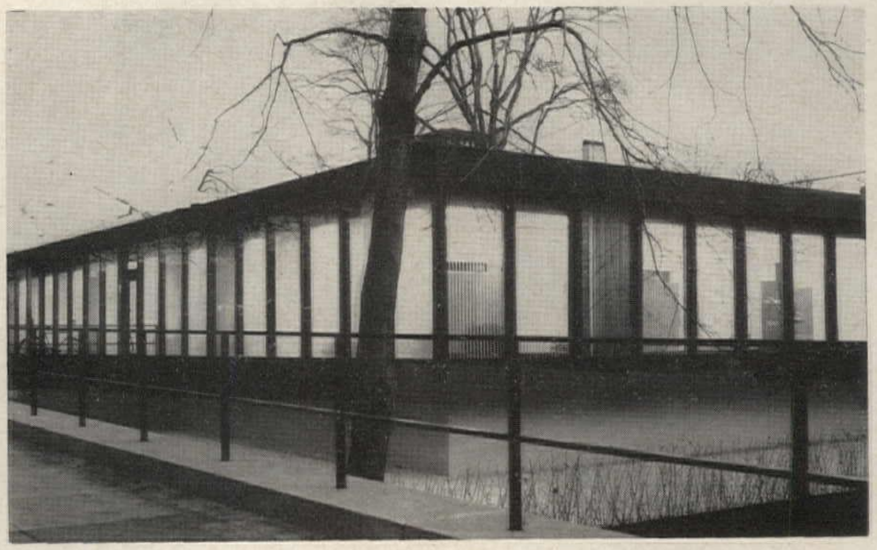


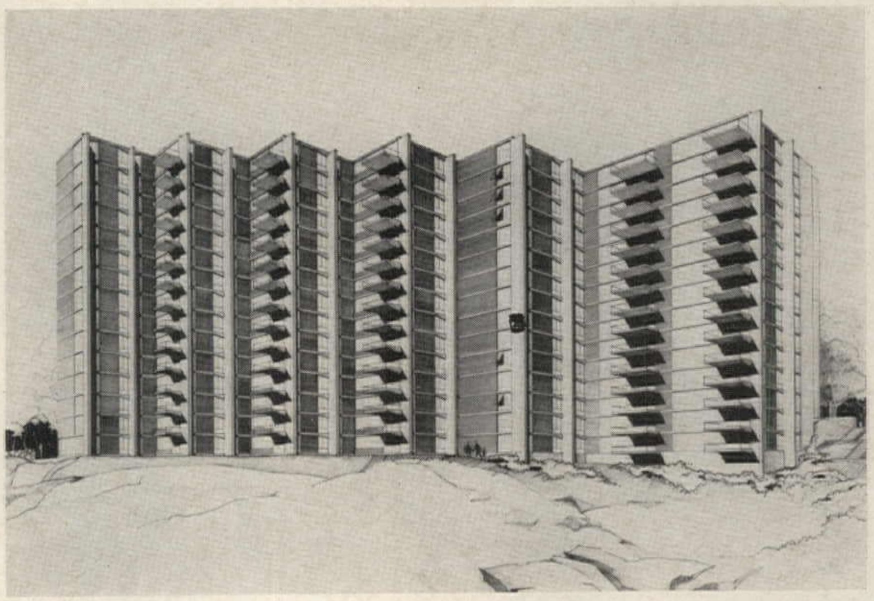
Photo International, Inc.



Yale University's newly constructed Computer Center, a sleek two-story building with glass and black aluminum exterior, was dedicated in December. The architect was Gordon Bunshaft of the New York architectural firm of Skidmore, Owings & Merrill. The building contractor was W. J. Megin, Inc., Naugatuck, Conn. The Center will house a complex of four "electronic brains" and 17 auxiliary data-processing machines purchased by a grant of $500,000 from the National Science Foundation. The building is a gift of Mrs. Thomas J. Watson and her son, Arthur K. Watson, Yale Class of 1942, in memory of Mrs. Watson's husband, the late Thomas J. Watson, founder of International Business Machines Corp.



From its site atop Mount Washington, One Thousand Grandview Avenue, a $3 million sixteen-story cooperative apartment building will overlook Pittsburgh's Golden Triangle. Construction is expected to begin early in 1962, with completion scheduled near May, 1963. The building, designed by Tasso Katselas, will have 70 one-, two- and three-bedroom apartments with terrace balconies cantilevered over the hillside an optional feature. Concrete caissons drilled some 30 ft into the ground will give a solid rock foundation. Inside, each level will be constructed of reinforced concrete. The exterior will be of reinforced concrete, brick and glass. Two floors will provide integral parking for 100 cars



Still in the preliminary design stage is the $20 million 30-story Boston British Building to be constructed by British capital in downtown Boston. For the design and building of this project, architects Frederick A. Stahl and Hugh A. Stubbins and William J. LeMessurier, structural engineer, have formed a group called "Pearl Street Associates." Mr. Stahl says comparative studies of steel vs. concrete are being made, and that the structure will not be glass curtain wall, but will have "depth in wall". Being considered are load-bearing mullions and thus, no exterior columns. Three levels below grade will probably provide garage facilities for approximately 350 cars

Trane Announces:

New styling, space-saving in induction

New Induction UniTrane, with exclusive selection flexibility, saves up to 25% floor space—offers quieter operation and greater economy

Here's multi-room air conditioning that keeps pace with the beauty and efficiency of today's newest buildings—enhances the traditional decor of existing buildings. It's the new Induction UniTrane that introduces a new styling concept, space-saving design and the widest selection of models that lets you closely match equipment to your specific needs.

NEW STYLING COMPLEMENTS THE BEAUTY OF ANY BUILDING!

Cabinet front on the vertical unit slopes slightly outward to create a smart, subtle convex appearance. Design is smooth and clean! Secondary air is drawn through *concealed* openings in toe space. Requires *no* front inlet grille.

Separate and adjustable *metal* outlet grilles are recessed in cabinet top, permit tenant's choice of multiple air discharge patterns. Access doors to individual controls are recessed in unit top, blend with matching grille design.

NEW, THINNER DESIGN SAVES RENTABLE FLOOR SPACE!

UniTrane is now up to 25% thinner than comparable competitive units. The vertical cabinet model is only 6⅝" thin! It is also more compact in length and height.

Some typical dimensions: Vertical cabinet and vertical concealed units are 20 inches high, require only 4-inch toe space. Low vertical cabinet is 9 inches deep, 12 inches high.

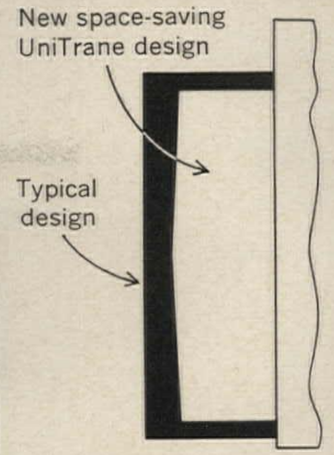
NEW COMPLETE LINE MEANS AIR CONDITIONING MATCHED TO YOUR NEEDS!

Exclusive selection flexibility with this broad new UniTrane line eliminates costly oversizing, provides operating cost savings, quieter operation.

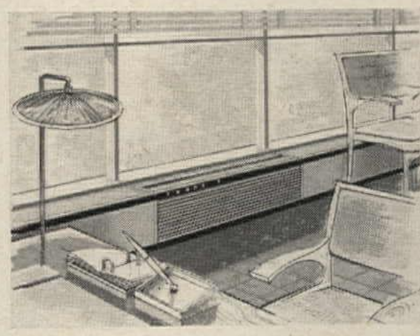
Induction UniTrane line includes 16 models: standard capacity vertical, horizontal and low vertical, each with a choice of two coil sizes . . . new high capacity vertical and horizontal models . . . all with or without cabinets.

All models are available in 20, 28, 36, 48 and 60-inch coil lengths; any of eight different nozzle arrangements.

New Induction UniTrane combined with wall-to-wall enclosure to create a custom-built look that complements any interior.



UniTrane cabinets slope slightly outward to create smart, subtle convex appearance from the front.



Shorter and thinner, new low-vertical Induction UniTrane is attractive, practical for buildings featuring curtain-wall construction, for other installations where height requirements are critical.

design and lower costs air conditioning

Combining modern styling and greater application selectivity with TRANE's traditionally rugged construction, Induction UniTrane is ideal for multi-room air conditioning. If you would like more complete details and specifications, contact your nearby TRANE sales office. Or write TRANE, La Crosse, Wisconsin.

CHECK THESE SPECIAL TRANE FEATURES!

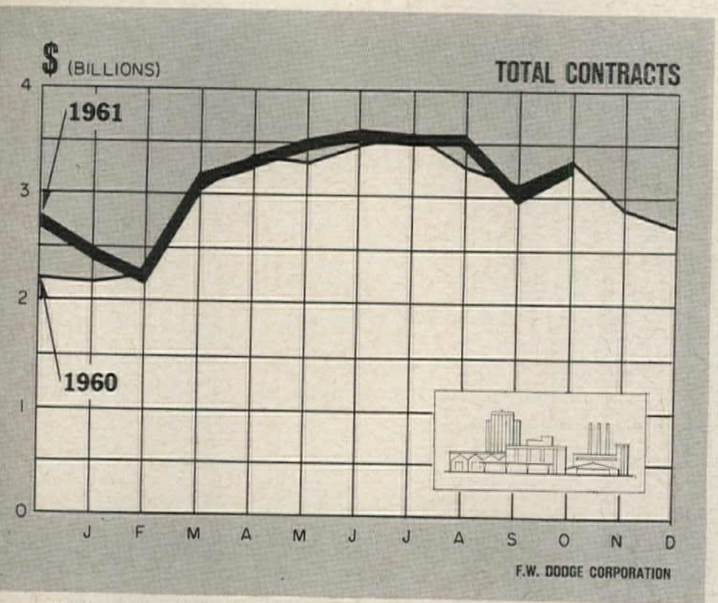
- Whisper quiet! Engineered for quiet operation. (And with TRANE's greater selection flexibility the engineer is able to design for even quieter performance.)
- Automatic air flow regulator—an exclusive TRANE option—that assures you of optimum system balance, delivers all the air conditioned comfort you pay for.
- New compact filters available in cleanable or disposable types; both offer full air filtration for low maintenance, efficiency equal to conventional 1″ filters.

TRANE

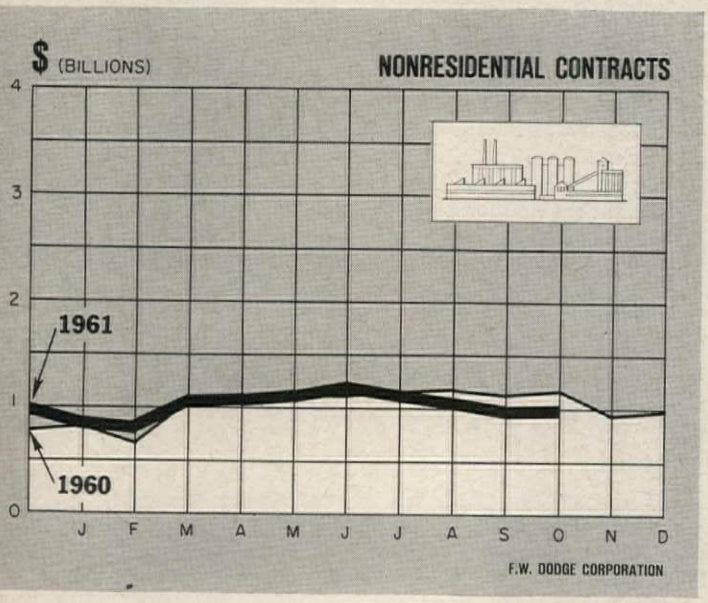
FOR ANY AIR CONDITION

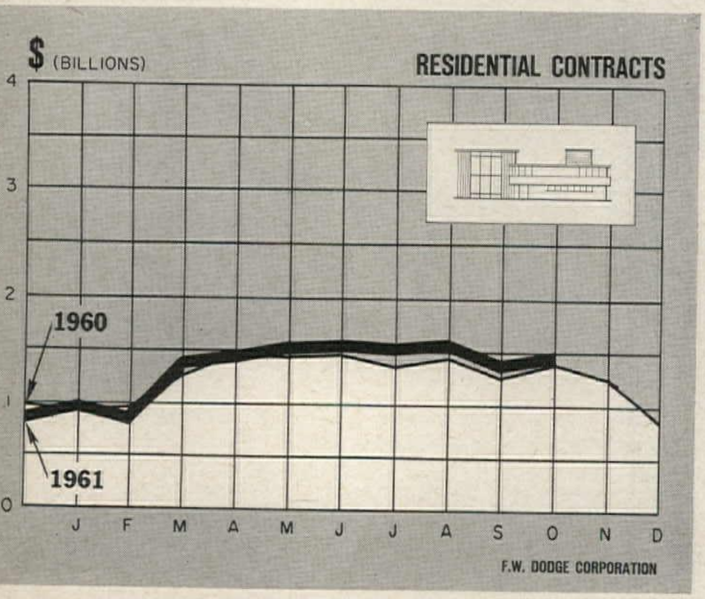
Manufacturing engineers of air conditioning, heating, ventilating and heat transfer equipment

THE TRANE COMPANY, LA CROSSE, WIS. • SCRANTON MFG. PLANT, SCRANTON, PA. • CLARKSVILLE MFG. PLANT, CLARKSVILLE, TENN. • SALT LAKE MFG. PLANT, SALT LAKE, UTAH • TRANE COMPANY OF CANADA, LIMITED TORONTO • 109 U. S. AND 20 CANADIAN OFFICES



Total contracts include residential, nonresidential, heavy engineering contracts





THE RISE IN CITY DWELLING

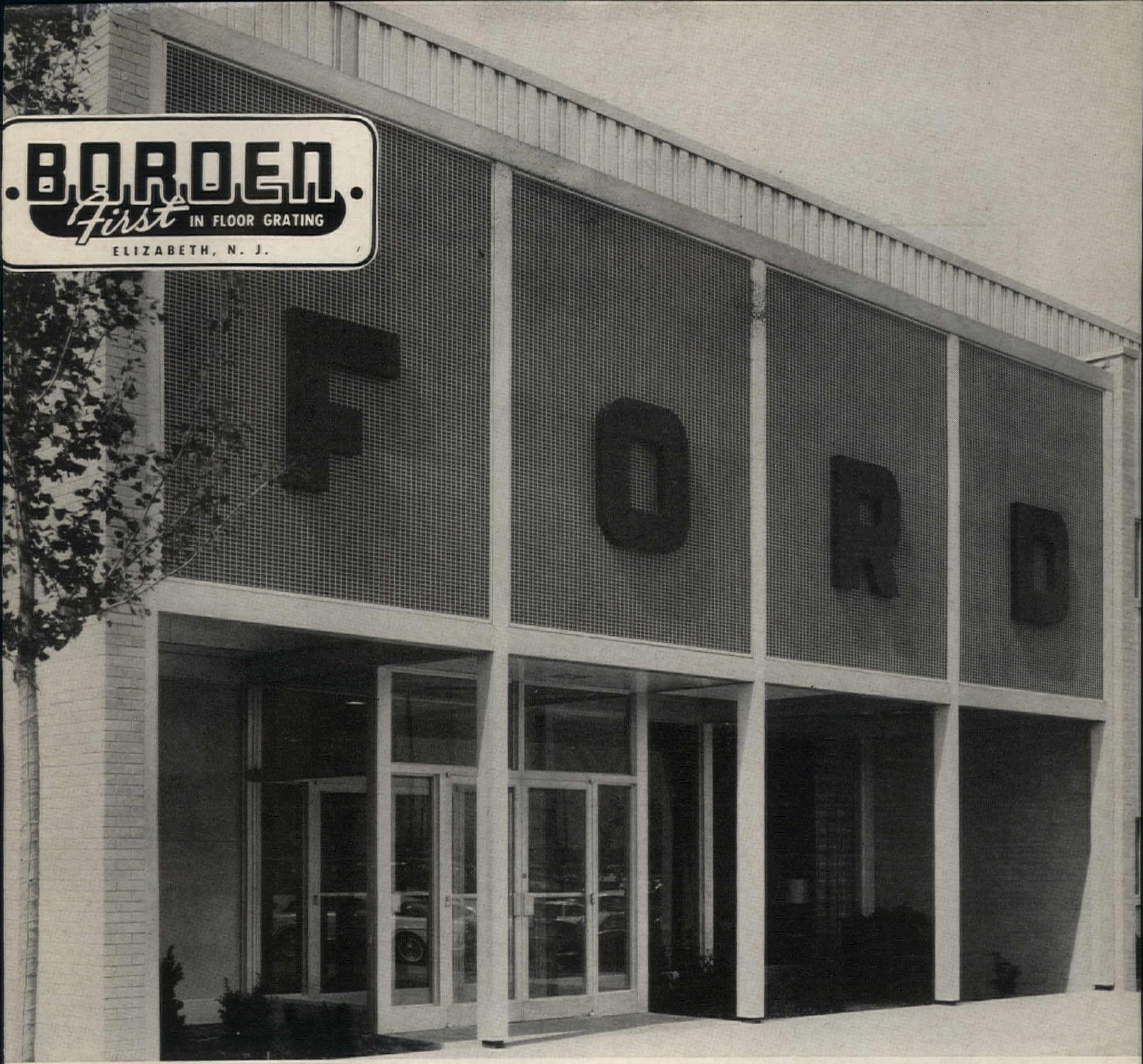
PASSING THE SITE of a towering new apartment building on New York's east side, to which the finishing touches were being applied, my companion shook his head and wondered aloud, "Just where are they going to find the people to fill it?" This is perhaps a fairly typical reaction to the recent boom in apartment construction. Of course, fears of overbuilding in the housing field have been expressed almost regularly since the end of World War II. But along with the upward trend in rental vacancy rates and more generous concessions to prospective tenants of new buildings (usually a period of free occupancy), the skeptics have become increasingly strident about the possibility of building too much multi-family housing.

ONE THING is beyond dispute. Not since the 1920's has apartment building enjoyed such a sweeping advance as has occurred in recent years. Nationally, new apartment units in 1961 will amount to over 300,000 (Census Bureau basis), easily an all-time record. Apartments now account for about 24 per cent of all nonfarm housing starts. Only six years ago, in 1955, their proportion ran below eight per cent. In terms of dollar volume, contracts for apartments more than tripled from 1956 to 1961. Total awards last year, at an estimated \$2.7 billion, were about 25 per cent above 1960. Thus, one might expect some slow-down in the *rate* of suite building simply as a reaction to the extremely rapid pace of the recent past. Considering the still large speculative element in this type of construction, builders may have moved too far before their market in some areas.

THE FACTOR that the skeptics are most apt to point to is the rental vacancy rate. While there has been an unmistakable upward trend in rental vacancies, its negative impact on new construction probably has been over-dramatized. If you accept the Census figures, remember that the vacancy rate for both rental and home-owner units is considerably higher outside of metropolitan areas than inside them. In view of the continuing concentration of the population in metropolitan areas, this is exactly what you would expect. A high vacancy rate in rural areas is clearly no drag on demand in urban and suburban places where most of the building activity is concentrated. Also, it should be noted that the national rental vacancy rate in the third quarter of 1961 showed its first decline since 1959—a hopeful sign of some stabilization in this area.

THEN THERE are some factors which materially brighten the apartment outlook. These include: the changing age structure of the population (more young people and elderly persons who prefer or must abide apartment living); the growing popularity of co-operatives; a stepping-up of the cumbersome urban renewal program; and the fact that apartments consume considerably less land per unit than single-family housing. All in all, we expect apartment construction to have another good year in 1962 with total new units at about 350,000—a moderate gain over 1961.

EDWARD A. SPRAGUE, *Economist*
F. W. Dodge Corporation
A McGraw-Hill Company



BORDEN ARCHITECTURAL DECOR PANELS

Now Borden brings a new building component to the architect—durable light-weight aluminum panels which can be custom-styled in an infinite variety of forms and designs. For example, the extruded type shown here can be had with design punchings of squares, circles, ovals or combinations of curves and straight lines.

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

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

Write today for our folder on Borden Architectural Decor Panels.

another fine product line of

BORDEN METAL PRODUCTS CO.

MAIN OFFICE: 822 GREEN LANE, ELIZABETH, NEW JERSEY • *Elizabeth 2-6410*
PLANTS AT: LEEDS, ALABAMA; UNION, NEW JERSEY; CONROE, TEXAS

Construction Cost Indexes

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

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

	NEW YORK					ATLANTA				
	RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.		RESIDENTIAL		APTS., HOTELS OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.	
PERIOD	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel
1930	127.0	126.7	124.1	128.0	123.6	82.1	80.9	84.5	86.1	83.6
1935	93.8	91.3	104.7	108.5	105.5	72.3	67.9	84.0	87.1	85.1
1939	123.5	122.4	130.7	133.4	130.1	86.3	83.1	95.1	97.4	94.7
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
1960	351.6	337.2	377.7	395.8	380.6	259.2	253.3	274.7	282.5	278.8
August 1961	365.9	344.8	405.1	431.1	403.5	254.8	247.3	275.0	284.0	274.5
September 1961	366.2	344.9	405.7	431.7	404.0	256.0	249.1	276.4	284.9	275.2
October 1961	364.8	343.1	405.4	431.5	403.6	256.0	249.1	276.1	284.7	274.0
	% increase over 1939					% increase over 1939				
October 1961	195.4	180.3	210.2	223.5	210.2	196.6	199.7	190.3	192.3	189.3

	ST. LOUIS					SAN FRANCISCO				
1930	108.9	108.3	112.4	115.3	111.3	90.8	86.8	100.6	104.9	100.4
1935	95.1	90.1	104.1	108.3	105.4	89.5	84.5	96.4	103.7	99.7
1939	110.2	107.0	118.7	119.8	119.0	105.6	99.3	117.4	121.9	116.5
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
1960	311.4	301.0	322.2	337.2	329.2	305.5	288.9	335.3	352.2	342.3
August 1961	316.3	302.9	330.1	348.1	332.5	311.6	293.5	349.0	365.3	353.4
September 1961	316.3	302.9	330.1	348.1	332.5	311.6	293.5	349.0	365.3	353.4
October 1961	314.9	301.1	329.8	347.9	332.1	311.5	292.3	350.5	368.4	354.2
	% increase over 1939					% increase over 1939				
October 1961	185.7	181.4	177.8	190.4	179.1	195.0	194.4	198.5	202.2	204.0

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

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

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

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

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

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

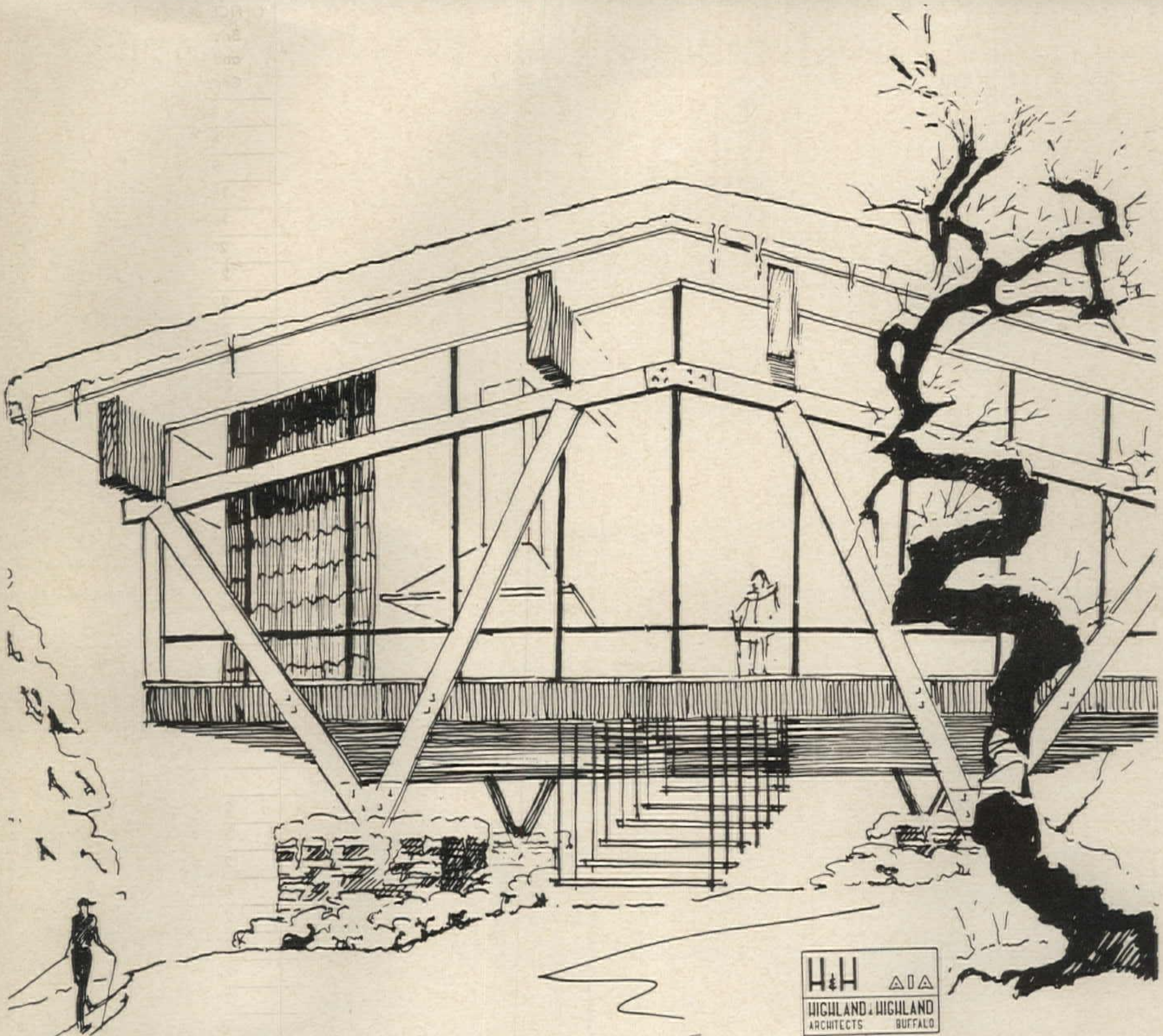
$$\frac{110-95}{110} = 0.136$$

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

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

DESIGN INSPIRATIONS No. 3

...USING OSMOSE TREATED WOOD



The SKI CHALET

Here is another stimulating design using a unique wood suspension system and featuring the natural beauty of stout wood framing. The versatility of wood can be used to develop many exciting recreational structures fitting naturally to the landscape and proudly suspended in space to capture the exhilarating feeling of a sweeping panorama.

By using OSMOSE Pressure Treated Wood at the critical groundline points and wherever moisture can collect, such structures can be indifferent to the weather and termite attack for years and years of sturdy, trouble-free service.

FILL OUT COUPON *for more data on OSMOSE Pressure Treated Wood and name of nearest OSMOSE treating plant.*

OSMOSE WOOD PRESERVING CO. OF AMERICA, INC.
983 ELLICOTT ST., BUFFALO 9, N.Y.

☐ Send more data on OSMOSE Pressure Treated Wood

☐ Name of nearest plant

Name____________________

Firm____________________

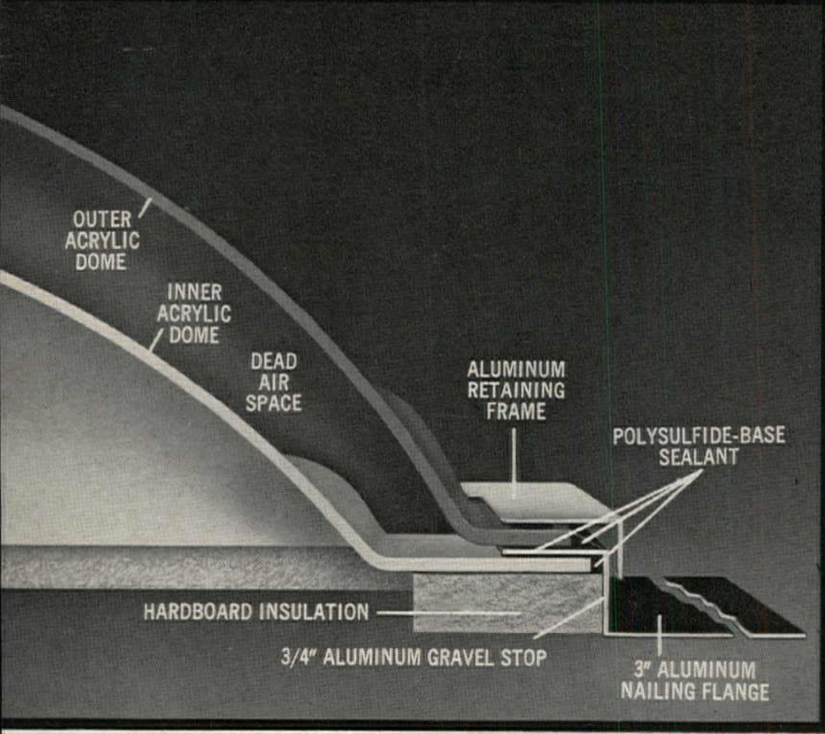
Street____________________

City__________ Zone_____ State_____

OSMOSE TREATED WOOD IS ATTRACTIVE • VERSATILE • DURABLE • SAFE • ECONOMICAL

GUARANTEED AIRTIGHT, WATERTIGHT...PERMANENTLY

New Wasco Twin Dome® Insulates as it Daylights



Cutaway Section — New Self-Flashing Wasco Twin Dome

N. Attleboro (Mass.) Jr. H.S.—Arch: Haldeman & Jacoby, Brockton, Mass.

Wasco's field-proven self-flashing Twin Dome enables the architect to make fuller use of evenly-diffused, glare-free natural daylighting without concern as to heat gain or loss, or condensation.

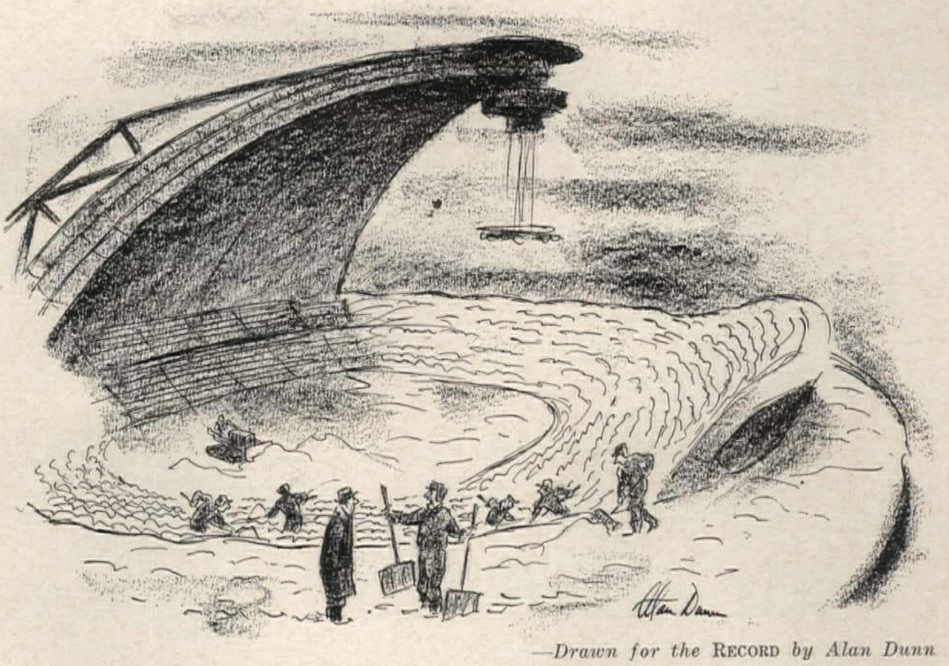
This first totally-proven dome-within-dome design uses a permanent polysulfide-base sealant to bond an inner and outer acrylic dome to an aluminum nailing flange. The uniform, hermetically sealed 1-inch dead air space between the domes acts as a highly efficient thermal barrier and eliminates condensation. The U-factor remains constant at 0.57 in any geographic area regardless of light level.

A complete range of 19 self-flashing and curb-mounted sizes permits the architect to blend Twin Domes with any roof or building style. Choice of clear, white translucent or dense white inner and outer domes allows him to regulate light levels. Twin Domes are shatterproof, maintenance-free and weather-perfect. The self-flashing model can be installed in 15 minutes.

For full details, see Sweet's Architectural File 20a/Wa or write Wasco.

WASCO SKYDOMES®
ACRYLIC SKYLIGHTS

BUILDING PRODUCTS DIVISION CYANAMID 5 BAY STATE RD., CAMBRIDGE 39, MASS.



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

"Next time you go home at night, don't forget to close the roof!"

Gropius Receives Kaufmann International Design Award

Walter Gropius was to receive the $20,000 Kaufmann International Design Award for 1961 on January 4 "for achievement in design education," based on the revolutionary work done under his leadership at the Bauhaus. Accompanying the Award was a crystal symbol designed by Finn Juhl, Danish architect and designer.

The Jury of Award, which met in Zurich last September, was composed of experts in the field of design education: Franco Albini, Italy; Jay Doblin, U.S.; Kaj Franck, Finland; Prince Ludwig von Hessen, Germany; and Iwataro Koike, Japan.

In selecting Walter Gropius, the Jury issued the following statement: "Since the professional practice of design has enjoyed only a brief development in our time, education for this practice is, today, a challenge not yet fully met. Mindful of this, the Jury drew attention to the revolutionary concepts embodied in the Preliminary Course, shaped in the 1920's and 1930's by Walter Gropius and his colleagues at the Bauhaus. These concepts now influence almost every school of design in the world. Moreover, this approach to education through direct experience with the elements of design has expanded into other schools at many levels.

"In the words of Walter Gropius, creator of the Bauhaus, the chief function of the Preliminary Course was 'to liberate the individual by breaking down conventional patterns of thought in order to make way for personal experiences and discoveries which will enable him to see his own potentialities and limitations.'

"By presenting the Kaufmann International Design Award 1961 to Walter Gropius the Jury wish to honor a great achievement. The concepts embodied in the Preliminary Course, and now accepted as essential in design schools, have proven their validity: they have opened a direct way to visual understanding and exploration, and to further development in the education of professional designers."

In November Dr. Gropius was presented the Gold Medal of the Royal Society of Arts, called the "Albert Medal," by the Duke of Edinburgh during a reception in Buckingham Palace, London.

Executive Director Buzzell Named C.E.C.

Donald A. Buzzell, Arlington, Va., has been named to fill the newly-created position of executive director for the Consulting Engineers Council.

As executive director, he will assume major responsibility for most of the administrative chores currently handled by the Council's elected officers. Immediate activities will include promotion of C.E.C. membership, establishment and improvement of relations with other trade and professional organizations and liaison with various U.S. Government public works agencies.

In announcing the retention of an executive director, C.E.C. president Harold P. King said, "The employment of Mr. Buzzell is the first step toward the establishment of a permanent C.E.C. headquarters office in the Nation's Capitol. It is expected that transfer of present staff and facilities (from Springfield, Ill.) . . . may be accomplished as early as next summer. In the meantime, Mr. Buzzell shall conduct his C.E.C. duties from a temporary office in the Washington, D.C. area."

A civil engineer graduate of George Washington University, Mr. Buzzell has served as cartographic engineer with the U.S. Coast and Geodetic Survey, structural engineer with the U.S. Corps of Engineers, and as project engineer at St. Belvoir's Engineer Research and Development Laboratory. Since 1958 he was manager of the Heavy Construction Division of the Associated General Contractors of America.

continued on page 28

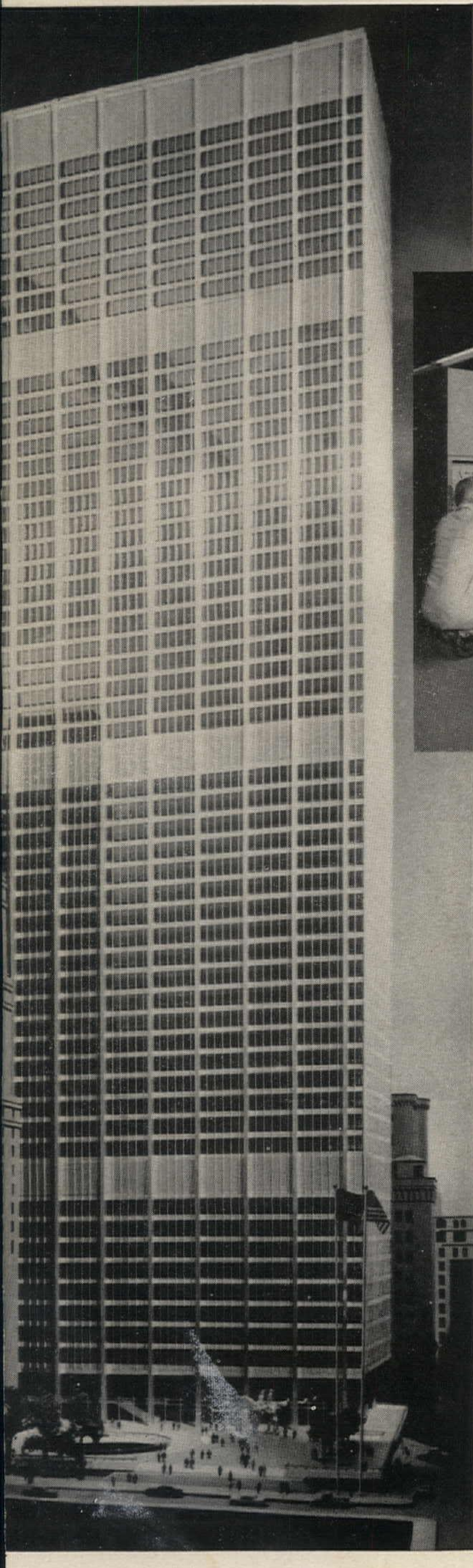
Rising 813 feet above New York City, the new Chase Manhattan Bank presented unique challenges in maintaining comfortable temperatures. Installation of two Selectographic DataCenters* give completely automated and economical control.

Newest and largest air conditioning system in an office building is Honeywell controlled

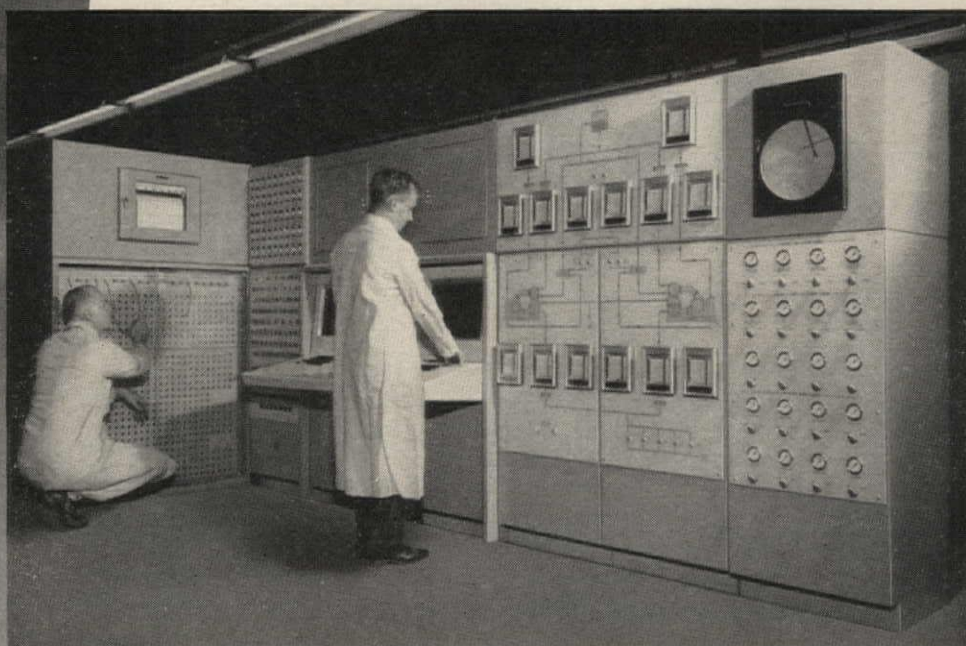
Lights that give off 17 million BTUs an hour. 800,000 square feet of windows. 25,000 employees and visitors daily. These are just a few of the problems considered in selecting a control system for the air conditioning of the new Chase Manhattan Bank building. To handle the heat load the building has 9100 tons of cooling capacity. And to control this enormous capacity they chose two Honeywell Selectographic DataCenters. By the simple touch of a button, one man at the DataCenter can: check temperatures at 400 locations; raise or lower temperatures at 200 areas; pinpoint the cause and location of any mechanical trouble; plus indicate and record other important information. To handle this job a conventional control panel would have to be 140 feet long. But, Honeywell engineers have devised a system of miniature schematic drawings on 35-mm. slides. Each DataCenter has 100 such slides, each indicating a different floor or area on a floor. When the operator selects a slide it is projected on a translucent screen. Any adjustment made is for the particular area being shown. This miniaturization allows each entire DataCenter to be only 17 feet long. Precise, economical control and one-man operation make the Honeywell Selectographic DataCenter a wise choice for any size building.

For some time, Honeywell has been at work on the modernization and centralization of building control. Some refinements are available now; others are coming out of planning sessions and off the drawing boards. Current capabilities can automate practically every mechanical and electrical building function. The result is that costs for maintenance, supervision and related jobs can be drastically reduced, efficiency greatly increased.

ARCHITECTS: *Skidmore, Owings & Merrill*
MECHANICAL ENGINEER: *Jaros, Baum & Bowles*
MECHANICAL CONTRACTORS: *Raisler Corp.*
Kerby Saunders, Inc., Joint Venture.



Two Honeywell Selectographic DataCenters, like the one shown here, are the heart of the air conditioning system in the new Chase Manhattan Bank. They control 19 heat exchangers, 12 secondary water coolers, 51 systems and 60 floors.



A "building that takes care of itself" is not a fiction writer's dream: It is a reality that can save enough money in maintenance costs to pay for itself in 3 to 5 years. The automated building is not subject to human error or carelessness. Emergencies are provided for and usually prevented before any kind of damage can occur.

But the saving of maintenance costs are only part of the story. The automated building offers the ultimate in comfort and convenience. Temperature, humidity are constantly monitored to maintain optimal working conditions. Building security and fire alarm systems keep a constant vigil. Clock programming systems turn power on and off for a hundred different functions. Automatic data logging and alarm scanning provide accurate typewritten records for building management. For additional information on building and automation write: Honeywell, Box MB-7-153, Minneapolis 8, Minn.

* *Trademark*

Honeywell

H HONEYWELL *First in Control*

SINCE 1885

HONEYWELL INTERNATIONAL
Sales and service offices in all principal cities of the world. Manufacturing in the United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.

Meetings and Miscellany

continued from page 25

U.S. First Model Testing Lab Established at M.I.T.

The first Laboratory for Models Structures Testing in the United States will be established at the Massachusetts Institute of Technology's School of Architecture and Planning. Only three other laboratories of this type exist—in Italy, Spain and Portugal.

The establishment of the model testing laboratory has been made possible through a grant of $250,000 from the Perini Memorial Foundation, Inc. of Framingham, Mass. to M.I.T.'s $66 million Second Century Fund. The grant was made in the form of stock by Louis R. Perini, Boston industrial leader, for the foundation in memory of his brother, Charles Perini.

Dr. James R. Killian Jr., Chairman of the M.I.T. Corporation, said the lack of a structural models laboratory in the United States has been a significant omission in research and education in the fields of architecture and structural engineering. "In meeting this need, the Perini Foundation's generous gift will provide students at M.I.T., as well as architects and builders throughout the country, with the facilities they need to increase their understanding of new structural forms."

It was noted by Pietro Belluschi, Dean of the School of Architecture and Planning, that the recent use of model analysis in the Portuguese laboratory has so changed the design of concrete arch dams that fifty per cent less material is now used compared to the designs of a decade ago.

"Sophisticated use by the architect and engineer of steel, reinforced concrete, lightweight alloys, Fero-Cemento, and new fabrication techniques provide them with materials to build structures that were impossible only a few years ago," Dean Belluschi said. "Through experimental stress analysis in the new laboratory, architects and engineers will be able to increase their knowledge of structures."

U.S. Landscape Architects Attend I.F.L.A. Meeting

Official American members of the Grand Council of the International Federation of Landscape Architects at a mid-September annual meeting in Spain were: Professor Hubert B. Owens, University of Georgia, Athens, Ga., honorary secretary; Sidney N. Shurcliff, Boston, Mass., president; and Prentiss French, San Francisco, Calif., Acting Delegate of the American Society of Landscape Architects.

The I.F.L.A. is composed of official representatives from 31 constituent national professional societies of landscape architecture throughout the world.

The meeting, attended by officers and delegates from 23 different nations, saw the unanimous passage of a resolution relative to the regulation of billboards along the highways of the world. Instigated by Professor Owens because, as he said, "I hoped it would assist those delinquent states in the U.S.A. in enacting necessary legislation to comply with the Bureau of Public Roads regulation of standards for outdoor advertising on the new Interstate Highways," the resolution read: "Be it resolved that the I.F.L.A. . . . (1) endorse the preservation, conservation or recreation, of the landscape abutting the highways, autobahns, roads, scenic trails, etc., of the world, and furthermore, (2) encourage all the nations to enact legislation to restrict and regulate all forms of outdoor advertising in all areas traversed by such traffic ways."

Arch. League Forums Find "Architecture in Decline"

New Yorkers are worrying about and discussing the effects of the building boom in their city. The Architectural League of New York and the Museum of Modern Art are sponsoring a series of five forums on "The Building Boom: Architecture in Decline."

Prof. Vincent Scully of Yale's Dept. of Architecture, began the first forum on "The Transformation of Park Avenue" by mourning "The Death of the Street." A street, no less than a building, he said, has a façade. Lever House "cut a hole in the wall which defined the Avenue." The Pan American Building will finish the killing that Lever House started by blocking the view to "visually deny the continuity of the Avenue beyond Grand Central." Other recent buildings, while keeping to the street façade, "have shown us we cannot define a civil space with glass screens and banks of fluorescent fixtures."

James Felt, chairman of the New York City Planning Commission, felt the open spaces allowed with the new zoning ordinance would give the Avenue new life and interest for the people using it.

Architect Richard Roth of Emery Roth and Sons said, "we create buildings to suit the needs of tenants" and asked, "Why don't we admit we live in a society controlled only by money and the tax structure?"

"How Money Designs the City" was the subject of the second forum. Robert Friedman, a vice president of Uris Brothers, admitted that before the new zoning code, buildings were engineered to fit into the "space envelope" without much thought to esthetics. He said that better buildings were possible now, but there was "no reason to expect inspired architecture." The inside of a routine building is as comfortable as that of the spectacular building, he noted, and most firms prefer the lower rental that results.

"Architecture does a disservice to think of itself as permanent," suggested William Zeckendorf, president of Webb and Knapp, who called beauty one of the few changeless things and a commodity which pays off handsomely.

Chicago architect Harry Weese said our system is working at cross purposes and a third force is needed to fill the vacuum between private enterprise and civic bureaucracy. He suggested that land in urban renewal projects should be kept by the government, not sold over and over again to investors.

Change in a city should occur slowly and naturally, Columbia University Professor Percival Goodman said at a meeting of the New York chapter of the Society of Architectural Historians. Each new building should be planned to fit in with the surrounding buildings. "When we demolish a bad building we should put up a better building or leave the old one stand." It is just to blame the architects for bad projects, he added. "Architects are amiss when they say 'if I didn't do it, someone else would.' They could all go on strike."

Future Architectural League forums will be "The Laws of the Asphalt Jungle," Feb. 8; "The Present Without Past or Future," Mar. 15; and "The Ideal City," Apr. 19.

more news on page 224

onditioned school"...

Michigan junior high provides "extra comfort at a price we could afford" with Herman Nelson unit ventilators

Everyone—faculty, students, the community as a whole — is happy with the new air conditioned East Prairie Junior High School. And who wouldn't be? They have a refreshing year-round thermal environment in a building costing 15% to 20% less than conventional schools in some areas—without sacrifice of beauty or quality.

Herman Nelson unit ventilators provide the year-round thermal environment — air conditioning, ventilation, heating. They offer full refrigeration cooling during the hot months, automatically switch to use of "free" outdoor air when outside temperatures drop. The cost of operating the air conditioning at East Prairie in the hottest months is about the same as that for winter heating—less than $1 per day per classroom!

Herman Nelson developed the *first* air conditioning unit ventilator, has equipped far more classrooms than any other manufacturer. Take full advantage of this experience when planning your new school. Your Herman Nelson representative will welcome the opportunity of helping you.

Herman Nelson AAF
SCHOOL AIR SYSTEMS DIVISION

LOW-COST COMFORT. "We almost had to chase the students outdoors," says Taylor. "They know they are going to school in comfort, and they take a lot of pride in it. Air conditioning has meant extra comfort at a cost we could afford. And the taxpayers are pleased that we were able to build as good a school as this for $12 a square foot, when they know that other districts are paying $15 to $18 for buildings which they don't consider any better."

FACT KIT AIDS PLANNING. The Herman Nelson Fact Kit on school air conditioning contains all the latest data on (1) design of air conditioned schools, (2) comparative cost studies, and (3) equipment for school air conditioning. For a free copy, write: School Air Systems Division, American Air Filter Company, Inc., 215 Central Avenue, Louisville, Kentucky.

662 schools with Herman Nelson "now or later" air conditioning

Your new school's thermal system should provide as many of these important benefits as possible

HERMAN NELSON UNIT VENTILATORS OFFER THEM ALL —AT A COST YOU CAN AFFORD

It's a fact that cooling, *not heating,* is a school's main thermal problem. Extreme overheating is caused by excess heat from students, artificial lighting, and the sun. As a result, school thermal problems are unlike those of any other building. Here are 11 benefits you *need* in a school heating, ventilating, and air conditioning system:

1. **INDIVIDUAL ROOM THERMAL CONTROL**—Classroom thermal requirements change as education activity varies. Each classroom needs individual thermal "attention" to keep temperatures comfortable at all times. Only a unit ventilator system—such as Herman Nelson offers—can *economically* provide this room-by-room flexibility.

2. **VENTILATION COOLING** — Occupied classrooms can overheat when outdoor temperatures are as low as 8°F. They often need up to 100% outdoor air for cooling. Herman Nelson Unit Ventilators meet this requirement completely and economically.

3. **GOOD AIR DISTRIBUTION**—Herman Nelson Unit Ventilators adjust to required classroom temperatures in a matter of seconds. Fresh, new air is diffused to all areas of a classroom in less than 60 seconds.

4. **VENTILATION FOR AIR FRESHNESS AND ODOR CONTROL**—Unit ventilators provide controlled mechanical ventilation using varying mixtures of recirculated room air and outdoor air for maximum air freshness all the time a classroom is occupied. Again, only unit ventilation can meet this need, accurately, on a room-by-room basis.

5. **RAPID MORNING WARM-UP** — Substantial fuel savings can be realized by controlling temperatures at a reduced level during the long periods when schools are unoccupied. Herman Nelson Unit Ventilators respond rapidly to needs for heat. The result: shorter morning warm-up time, greater fuel savings.

6. **COLD WINDOW DOWNDRAFT CONTROL** —Every classroom needs an efficient system for controlling cold window downdrafts. The patented Herman Nelson DRAFT|STOP system is the lowest cost, simplest, easiest to install, and the *only* draft control system completely compatible with year-round thermal control.

7. **QUICK RESPONSE TO TEMPERATURE CHANGES**—Complete changes in the level of classroom occupancy, artificial lighting, and exposure to the sun can take place in a matter of seconds. A school thermal system *must* be designed to adjust to these changes instantly. Remote and central systems cannot meet this need economically.

8. **QUIET OPERATION**—Herman Nelson Unit Ventilators solve classroom thermal problems quietly. A new flared fan housing design together with a one-piece, extruded aluminum discharge grille and "modular" fan construction make these units 50% quieter.

9. **AIR FILTRATION**—Any system which filters only primary air and recirculates unfiltered room air could endanger student health. Herman Nelson's single filter system efficiently cleans *both* primary and recirculated air. These filters can be quickly and easily serviced by any school custodian.

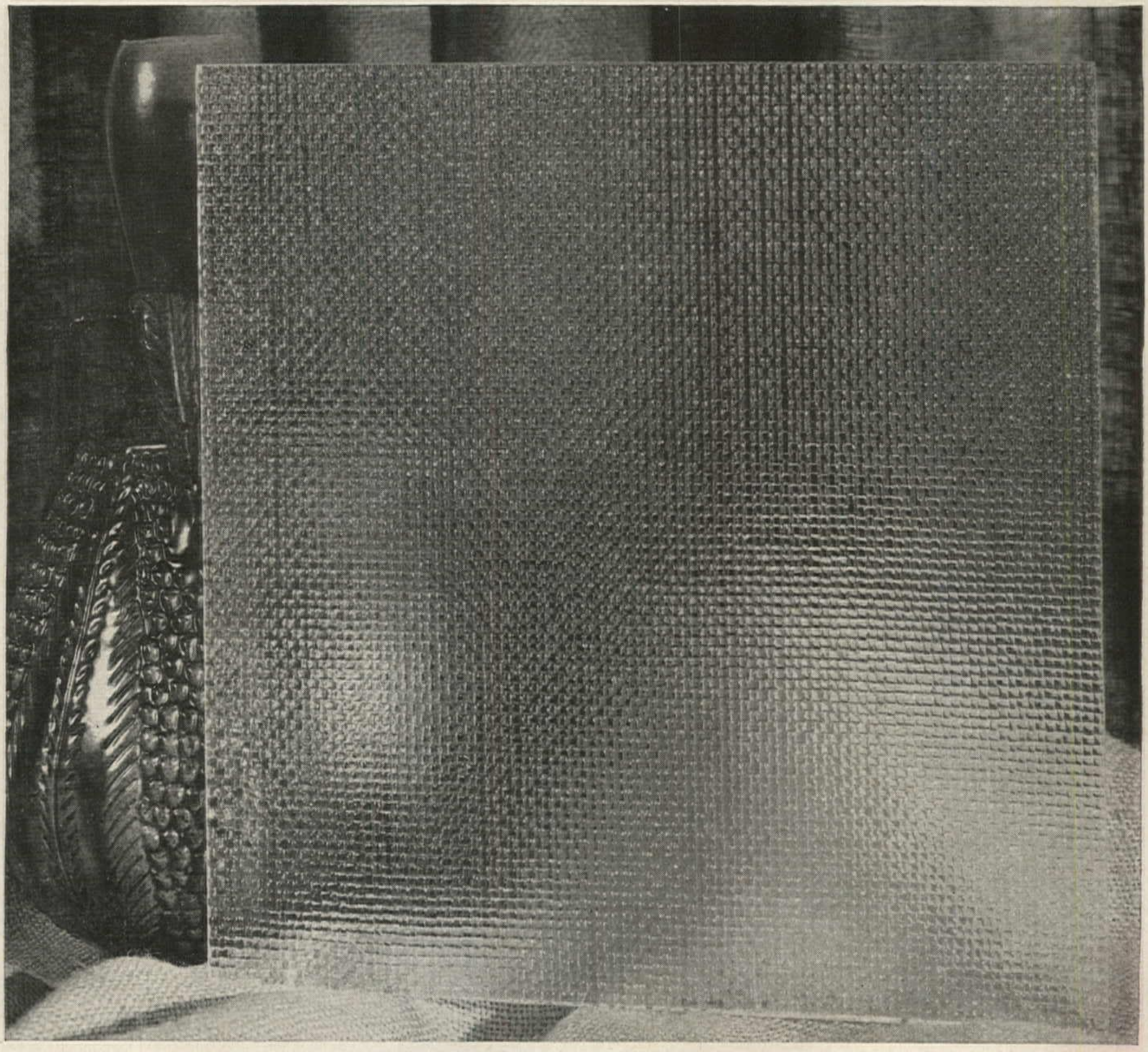
10. **FLEXIBILITY FOR BUILDING ADDITIONS**—School expansion can be conveniently anticipated with a Herman Nelson Unit Ventilator system by merely sizing piping mains and boiler room equipment to handle the future plans. Many systems require an entirely new equipment room with each expansion.

11. **LOW-COST OPERATION** — Herman Nelson motors have *lowest* operating current of any unit ventilator. Save hundreds of dollars yearly in electric bills. Exclusive back draft damper gives up to 50% fuel savings. Result: substantially lower operating costs.

FOLLOW THE LEADER IN SCHOOL THERMAL SYSTEMS

Herman Nelson AAF
SCHOOL AIR SYSTEMS DIVISION

American Air Filter Company, Inc., 215 Central Ave. Louisville, Ky.



The Dramatic Texture of Fabric . . . The Gleaming Beauty of Glass . . . now artfully combined in

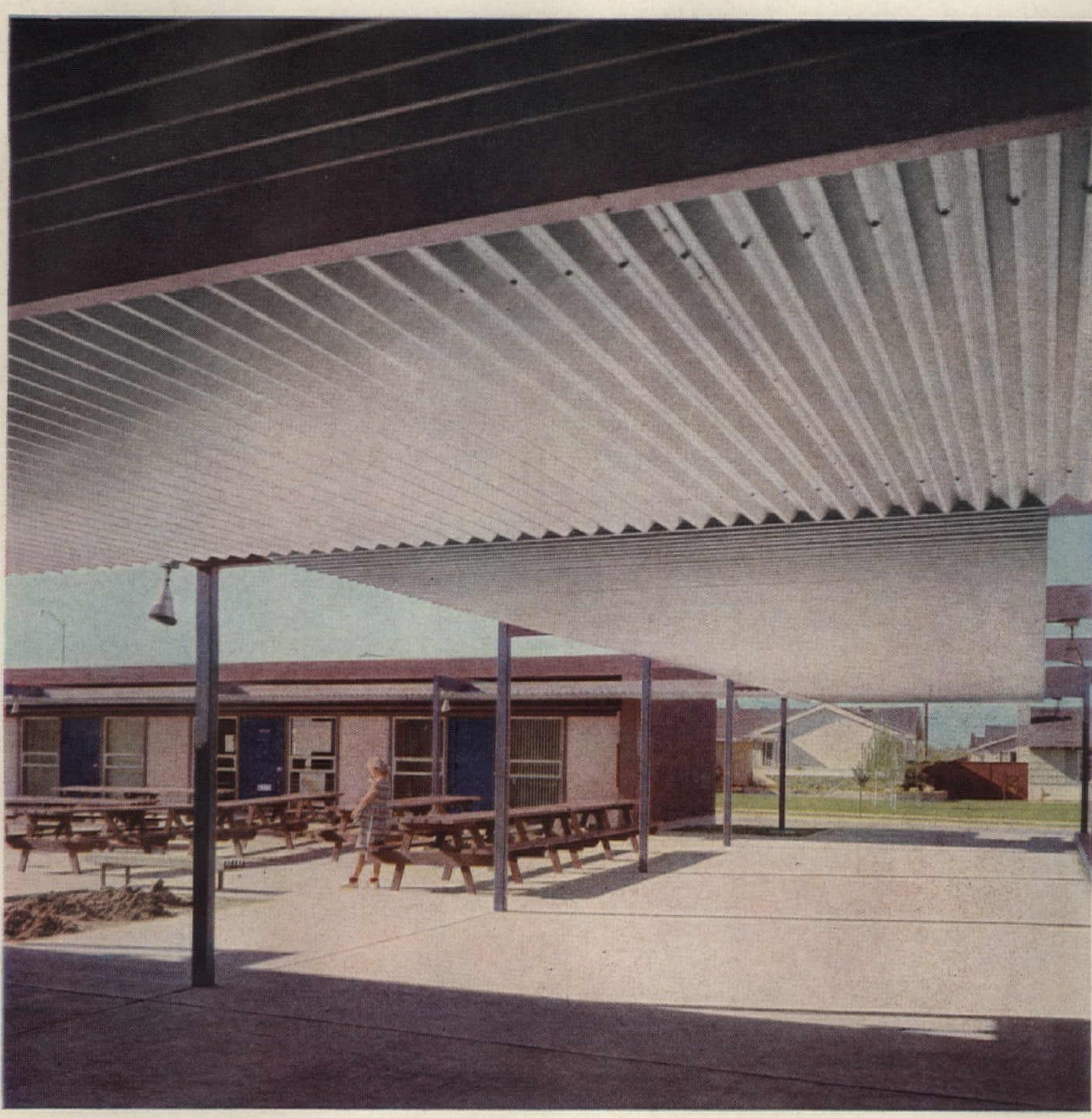
NEW BURLAP BY MISSISSIPPI

Exceedingly brilliant and sparkling, highly obscure, new Burlap, figured glass by Mississippi has excellent diffusing properties and its functional and decorative applications are limited only by the imagination. Use it lavishly or sparingly and gain light, drama, distinction. Burlap glass is available at your nearby quality glass distributor. Free sample on request.

MISSISSIPPI
GLASS COMPANY
88 Angelica St. • St. Louis 7, Missouri
NEW YORK • CHICAGO • FULLERTON, CALIFORNIA

Thickness	Approx. Light Transm'n	Weight Unpacked Lbs.-sq. ft.	Maximum Sizes Untreated	Maximum Sizes G-R 2 Sides	Maximum Sizes G-R 1 Side
1/8"	87.5%	2.0	48 x 132	48 x 132	48 x 132
7/32"	85.9%	2.8	60 x 132	60 x 132	60 x 132

Recommended primarily for partitions; also shower doors and stalls, and kindred uses.



Walkways roofed with Alcoa V-Beam: beauty at a bargain!

For good-looking covered walkways at lowest overall cost, specify Alcoa® Aluminum V-Beam Roofing. You save from start to finish!

Standard sheets of Alcoa V-Beam keep material costs way down. Its light weight, even in biggest sizes, speeds assembly and saves on labor. Handsome stucco-patterned natural finish needs no painting. You just put up Alcoa Aluminum V-Beam and forget it.

Save tax dollars. Alcoa Aluminum is the exception to soaring costs of school construction and maintenance. For more information, call your nearest Alcoa sales office; or write: Aluminum Company of America, 1823-A Alcoa Building, Pittsburgh 19, Pa.

OWNER: Santa Clara County School District, San Jose, Calif.

BUILDING: Eaton Elementary School, Cupertino, Calif.

ARCHITECT: Kal H. Porter & Associates, San Jose, Calif.

GENERAL CONTRACTOR: Wayne S. Pendergraft, Saratoga, Calif.

ALUMINUM SUBCONTRACTOR: The Brookman Company, Inc., San Francisco, Calif.

Entertainment at Its Best . . . ALCOA PREMIERE
with Fred Astaire as Host . . . Tuesday Evenings, ABC-TV

ALCOA ALUMINUM

THE ARCHITECT'S METAL

Rudolph Interview

continued from page 12

It is possible to say that one ap proach may be more viable than an other. In classical architecture ther are only two or three ways of relatin the building to the ground, and should say that these ways cannot b combined. In a less rigid approac such as romanticism there are man more possible relationships, and the can be combined.

It is important that the critic o teacher keep an absolutely ope mind. That is the direct opposite o what the practicing architect shoul do. As an architect I am the mos prejudiced person in the world, as teacher I hope I am as open-minde as possible.

What about the naive student, wh comes to the school with a stron interest, but a very weak sense o architectural taste?

We depend mainly upon intelligenc and interest, and, let's face it, w find that it is almost impossible t tell who is going to be a good archi tect. It is noteworthy the number o architects practicing today who hav never been through the schools. I a not terribly impressed with school I think they can be helpful, more s for certain types of people than fo others. But they cannot make peopl creative. They can only define the is sues.

I also think it is a valid notion t study with a particular architect against whose work one can measur one's own thinking. I might add tha this is the easiest way in the world t teach, to use one's own work as measure for the student. I could d it in a moment if I wished, but fro all I've seen very little seems to com out of schools organized in this wa

I think people must be exposed t many points of view. This is perhap disastrous for the untalented, but think a school has to have somethin for everyone. We don't worry muc about the geniuses. They manage t find their own way in any case. personally think it's too bad that th designer becomes a *prima donn* There are a great many other area which are, I won't say of equal im portance, but very important. This i one of the significant things tha Gropius did that made him such

continued on page 7

Consulting a linen supplier at the planning stage really paid off for Greenfield-Mills Restaurant!

Linen handling is a major problem in any restaurant. Important savings can be made by carefully planning for it when the restaurant is designed. That's why the architect for Greenfield-Mills called in a linen supplier at the outset to discuss every phase of this operation. In planning linen supply services into the restaurant's facilities and operations, they considered such things as ease of delivery . . . size of storage space . . . accessibility to employees . . . location of dressing rooms . . . collection of soiled linen and many other factors. The result: a step-saving, work-saving layout that pays rich dividends in efficiency every day of operation.

Take advantage of the specialized experience your local linen supplier offers, next time you design a restaurant or are doing plans for a hospital, school or motel. He stands ready to assist you in every way. You'll find his name in the Yellow Pages under "Linen Supply" or "Towel Supply."


Collection of Soiled Linen

FREE BOOKLETS . . . tell how to provide for efficient linen supply services in the design of restaurants, schools, hospitals, and motels. Write for the ones you want.

SEE OUR CATALOG IN SWEET'S

Linen Supply Association of America

and National Cotton Council · 22 West Monroe Street, Chicago 3

Designed for Architects • Engineers • Contractors

Whatever the architectural specifications, the slim-trim distinctive design of Stripline extruded aluminum slot-type diffusers blends in perfectly with the general decor. Stripline with separate plaster frames and removable cores eliminates screwholes, leaves the decorative surface unmarred.

Stripline is INCONSPICUOUS . . . PRACTICAL, can be located anywhere to suit the interior designer's preference...in walls...ceilings...coves...moulds... window sills. Stripline is supplied as a continuous decorative unit, or in sections, to meet any requirements of interior treatment or airflow.

Unlike side wall grilles and air discharge slots, Stripline diffusers incorporate the exclusive Agitair diffusing vanes. These built-in diffusing vanes produce extremely high turbulence and aspiration... achieve rapid temperature equalization... insure the distribution of tempered air unvaried over a predetermined area without any noticeable air motion.

In the design of Stripline extrusions, top priority was given to solving the contractors installation problems. These units are now made with removable cores and separate plaster frames for surface or flush installations. An integral part of each diffusing core is the unique coil spring-lock which further facilitates the installation of Stripline when used as a continuous unit or where sections are required. This spring-lock feature locks the unit firmly in place, and eliminates the use of screwholes and screws.

For more information write for
technical catalog ES-105

AIR DEVICES INC.
185 MADISON AVENUE • NEW YORK 16, N. Y.

BETTER PRODUCTS FOR
AIR DISTRIBUTION • AIR CLEANING • AIR EXHAUST

MILLS, PETTICORD & MILLS

Office Building for Remington Rand Division, Sperry Rand Corporation, Washington, D. C. **Architects and Engineers:** Mills, Petticord & Mills, Washington, D. C. **Contractor:** Joseph F. Nebel Co., also of Washington, D. C. **Concrete Panel Manufacturer:** Earley Studio, Inc., Rosslyn, Virginia.

feature precast white concrete facing panels in the facade of this handsome Washington, D. C., office building. Made of ATLAS WHITE portland cement and quartz aggregate, the 4 x 8-foot panels (5 inches thick) use 2-inch surface projections in 2-foot squares to create an interesting pattern. The surface is an exposed aggregate finish. Columns are faced with similar panels, without the projections. All panels are anchored to concrete masonry. □ Today, more architects are discovering the design versatility and construction economy of easily maintained precast concrete. Any desired size, shape, color, texture or pattern can be achieved. Anchoring of panels to any structural frame is fast, simple and trouble-free. □ For specific information on precast white concrete panels, facings and cast stone units, consult your local precast concrete manufacturer. For a comprehensive new 32-page, fully illustrated brochure titled "White Concrete in Architecture," describing properties and installation details, write Universal Atlas, 100 Park Ave., New York 17, N.Y.

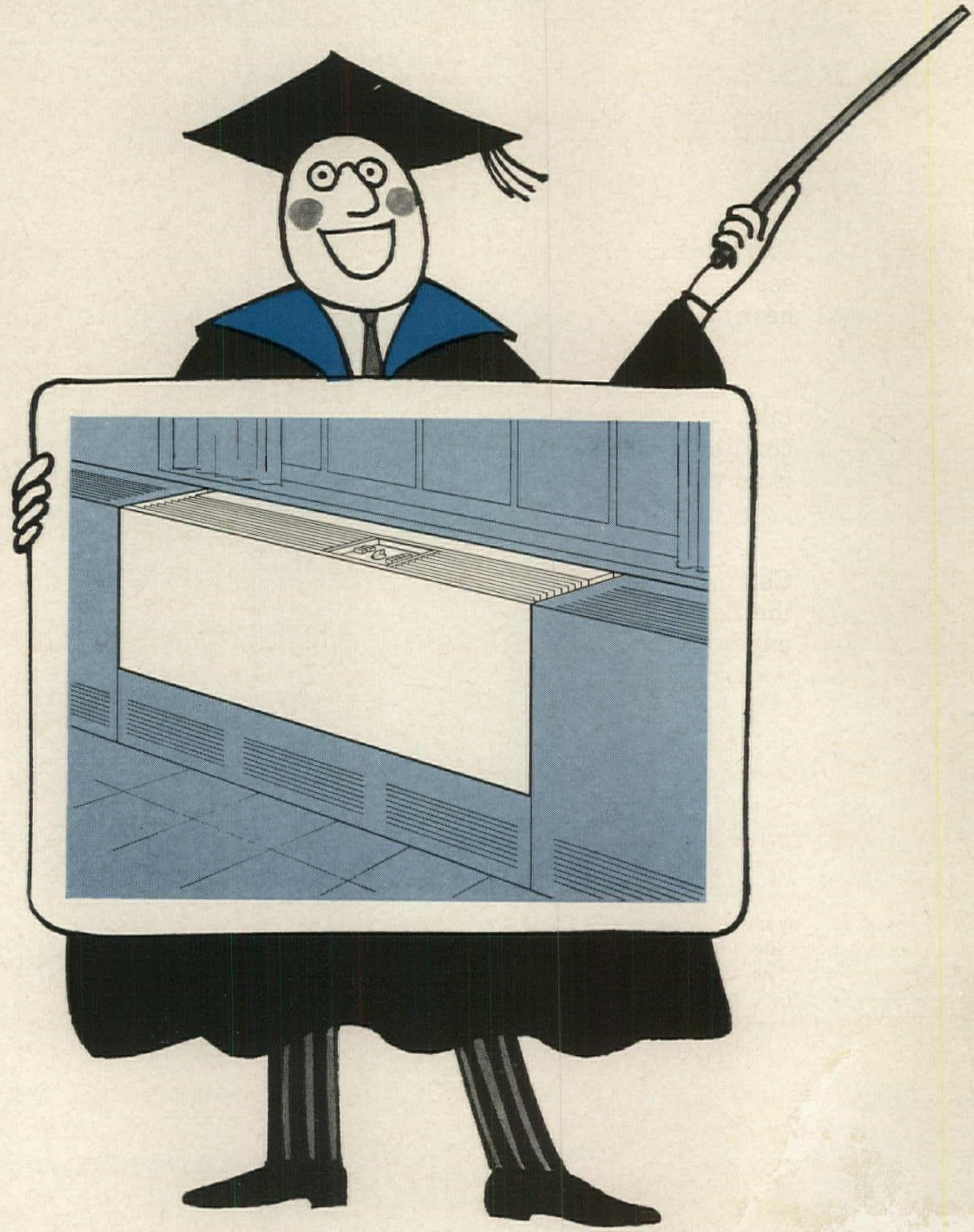
Universal Atlas Cement Division of United States Steel

USS

WF-54

Architects . . . Builders . . . Engineers:

How's your air-conditioning I.Q.?



Try this quick quiz and discover the startling advantages of General Electric's new Zoneline '42'

General Electric's Zoneline '42' is an important new approach to air conditioning.

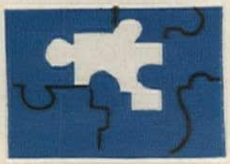
TRUE. General Electric designed the Zoneline '42' to provide architects, builders and engineers with a complete Zonal air conditioning system that is efficient, economical *and* aesthetically pleasing. New from the basepan up!

General Electric has solved the noise problem with the new Zoneline '42.'

TRUE. The full 42-inch width of the Zoneline with a radically different air-flow system and much greater space inside has significantly reduced noise levels. And General Electric's rotary compressor cuts vibration—and resulting noise—to a minimum.

The new Zoneline '42' is available in a range of capacities equal to any heating or cooling job.

TRUE. These models offer cooling capacities of 8,000 to 15,000 BTU/Hr. Thermaline '42' heat pumps, for year-round heating and cooling, offer heating and cooling up to 13,500 BTU/Hr. Capacities tested and rated in compliance with NEMA Standards for Room Air Conditioners, Publication No. CN 1.



The Zoneline '42' combines easily with any type of heating system.

TRUE. Hot-water baseboard, hot-water convectors, electric baseboard (see the "Professor's" chart) or ceiling electric cable are some of the possibilities. Or specify Thermaline '42' heat pumps or Zoneline '42' units with integral electric resistance elements and controls for year-round heating and cooling.

Like all through-the-wall air conditioners, the new Zoneline '42' is an ugly duckling.

FALSE. The Zoneline '42' features General Electric's exclusive interior baffle plus accessible controls and a rugged, handsome air-discharge grille. The baffle may be painted, paneled or decorated to harmonize with room décor. Newly styled grilles provide pleasing exterior appearance.

Compared with central systems, the Zoneline '42' is less expensive to install and more economical to maintain.

TRUE. Your initial investment is low because there are no costly compressors, chillers, towers or ducts to install, nor is valuable building space required for the heavy equipment. And there's no chance of your entire building's suffering due to failure of a central component.

Tenants enjoy the advantages of individual room control with the Zoneline '42.'

TRUE. Each tenant can select the exact degree of heating or cooling he prefers. Fresh air, filtered and cool, is available at the flick of a switch. Owners benefit, too—individual rooms or zones may be shut off when unoccupied for greater operating economy.

There are many, many more advantages to zonal air conditioning with General Electric's new Zoneline '42.' Superior de-humidification . . . new positive water-disposal system with no moving parts . . . famous General Electric quality and dependability. Why not mail in this coupon and learn more about them?

Progress Is Our Most Important Product

GENERAL ELECTRIC

YES, PLEASE DO! Send me complete information on General Electric's new Zoneline "42".
General Electric Company
Room Air Conditioner Dept.—Room 104-D
Appliance Park, Louisville 1, Kentucky

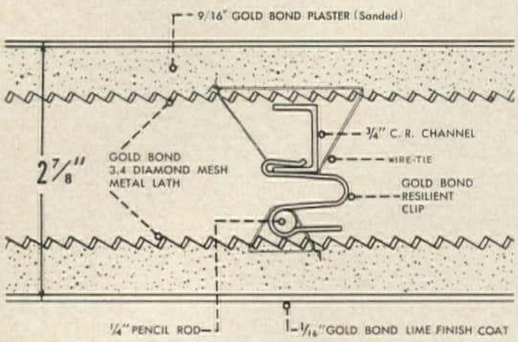
Name________________ Position________

Firm________________________________

Address_____________________________

City________________ Zone____ State________

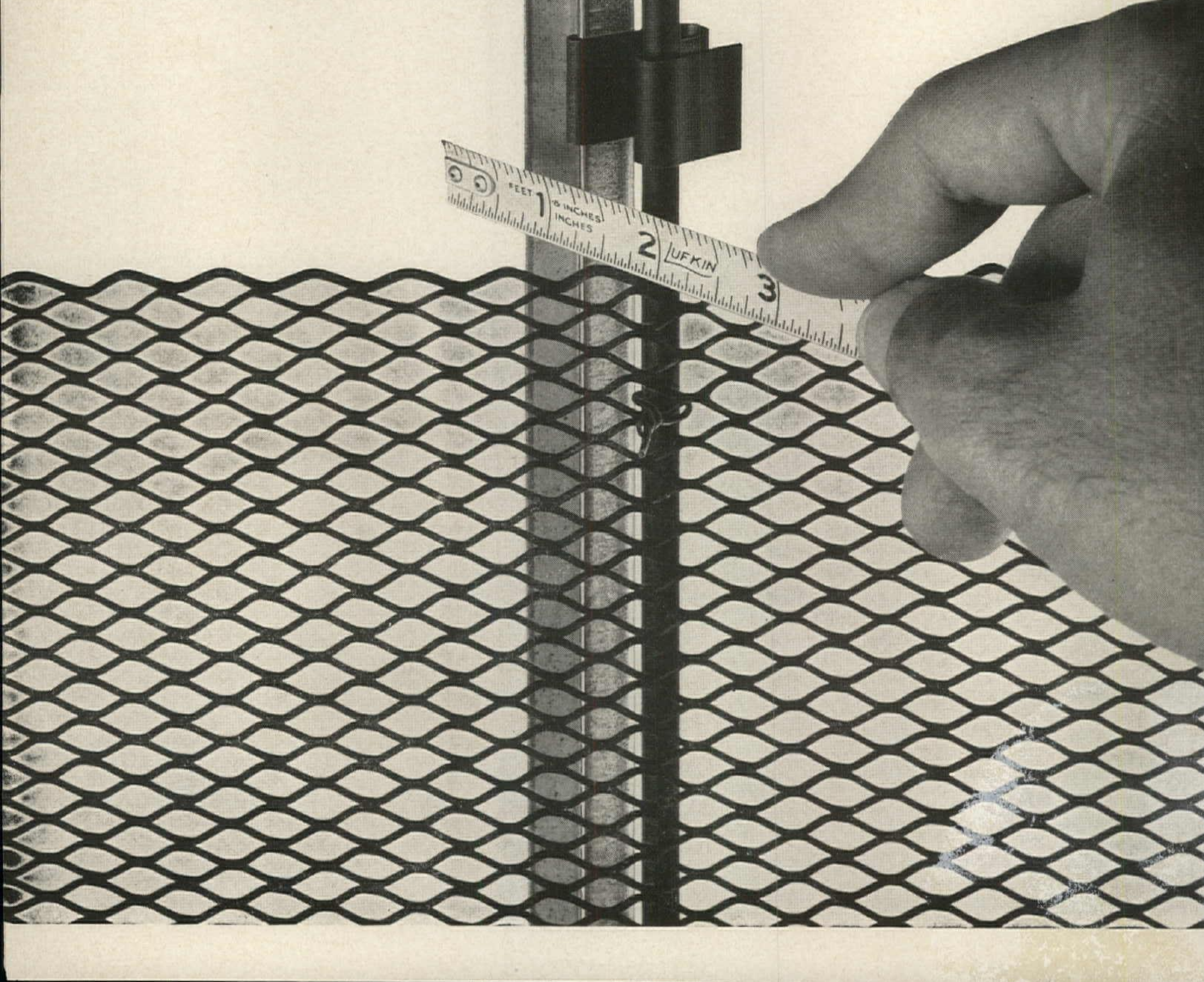
New 2⅞" Resilient Partition clips hours off construction time



and gives you a noise-reducing, spacesaving wall with a sound-transmission loss rating of 42 db. *It's so simple.* First, pencil rod is secured to one side of the ¾" channel studs with resilient clips. Then Gold Bond Diamond Mesh metal lath is wire-tied to the rods and also to the opposite side of the studs. Apply 9/16" of sanded plaster to both sides of the lath and finish with a 1/16" lime-putty coat.

That's it. You have a partition that saves space, cuts down on noise transmission. And satisfies the most demanding client. Ask your Gold Bond® man for a demonstration. (It's worth a few minutes of your time just for the time it will save you.) If you'd rather, write to National Gypsum Company, Dept. AR-12, Buffalo 13, N. Y.

Gold Bond
BUILDING PRODUCTS



Interiors by Charles Anna Marsh

For above doors specify four 3' 0" x 8' 0" Colonial

How® Float-Away Closet Systems Can Help You Attract and Hold Apartment Tenants

THE SITUATION TODAY: More apartments going up. Competition for tenants keener. Turnover faster. Vacancy rate higher.

THE DANGER POINT: Near when vacancy rate reaches 5%. Any feature in apartment design which would reduce vacancy rates by 1% could solve 20% of this problem.

WHY TENANTS MOVE: Lack of adequate storage and closet space is one of the top reasons. The Float-Away closet system will help attract tenants and keep them.

ADDED SPACE: Float-Away doors permit full-depth shelves and addition of an extra top shelf, thereby increasing usable space by as much as 1/3. And they allow *full* access to closet area.

LOWER COSTS: No door frames necessary. Float-Away doors, used wall-to-wall, and floor-to-ceiling, are installed at about 75¢ a square foot as compared to $1 or more for the average wall partition.

FLEXIBILITY UNLIMITED: To meet the architect's and builder's problems, Float-Away steel closet door systems are available in *any* height, any width in one inch increments.

BEAUTY AND QUALITY: Float-Away steel closet doors are soundproofed. Prime coated, complete with side trim, tracks and hardware. Guaranteed five years.

For above door specify 6' 0" x 8' 0" Flush

For 12 page color brochure with architectural specifications and tracing detail write:

®Registered Trade Mark

FLOAT-AWAY DOOR COMPANY

1173 Zonolite Road, N. E.
Dept. AR-162
Atlanta 6, Georgia

METAL FLOAT-AWAY CLOSET DOORS

great teacher; he recognized the importance of areas other than design.

What do you feel about the relationship of formal architectural education to the process of becoming established as an architect?
This is something that has concerned me for a long time. I wonder if you are familiar with the Nieman Fellowships at Harvard which bring journalists back for a year of special studies about ten years after graduation. I have long felt that something like this should be done in architecture. About three to five years after a man graduates is usually the most crucial time. Of course, this has something to do with the licensing requirements in most states.

As you know, we make no attempt to teach what goes on in an office, because such things are much better learned on the spot. I'm surprised at the members of the profession who think we should teach office procedure in the schools. I am, however, most interested in the notion of architectural education as a continous process, combining the experience of both the school and the office. This is one reason why I think that a Master Class program is so important.

Do you think that the jury system has a bad influence on the profession, because the architect's school experience tends to make him lean on criticism of a certain sort?
This bothers me, because recently the jury system at Yale has become too much of an exhibition. This has led us to establish a system of post mortems. The jury is held as usual, but any student who wishes can have a private discussion with his critics later. It is unreasonable to think that six weeks of work can be evaluated in ten minutes. At the same time, there are advantages to bringing the student into contact with fresh, outside points of view.

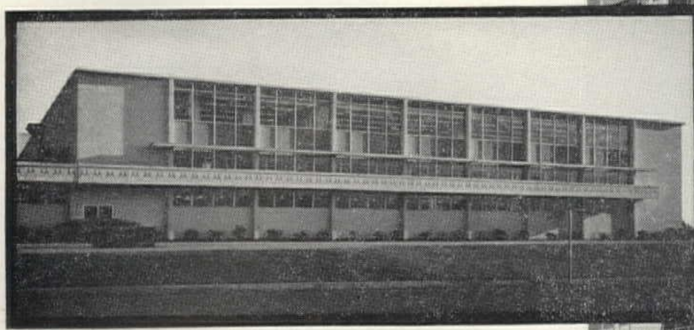
What would you say were the critical problems of modern architecture today?
Many of our problems arise from the automobile. There is a double scale now that has never existed before; a scale for pedestrians and a scale for automobiles, and we have to learn how to make the transition from one to the other. Every European who comes to this country says we ought to get rid of our automobiles. Well, we are not going to get rid of them. I think it is silly not to recognize a situation and deal with it. We should really devote our attention to the larger elements of planning that the automobile brings into being. I think San Francisco could easily have been far better off with its thruway. It could have been used to divide the city into comprehensible segments. We've been afraid of Chinese Walls for a long time. Well, I'm all for Chinese Walls of a new and valid kind.

Many people are surprised that your various buildings can each be so different from the others, for example, the parking garage and the housing for married graduate students here in New Haven.
This has to do with scale, basically. I think that scale is the least understood and most under-valued aspect

continued on page 84

BELCHER APARTMENTS, SAN FRANCISCO, CALIFORNIA
Architect: H. C. Baumann • Engineer: Herb Korner • Contractor: George Belcher (All of San Francisco) • Consulting Structural Engineers: T. Y. Lin & Assoc.—Van Nuys, Calif.

MOTOROLA TRANSISTOR MANUFACTURING PLANT, PHOENIX, ARIZONA
Architect: Ed Varney Assoc. • Structural Engineer: Charles Magadini • Contractor: T.G.K. Construction Co. (All of Phoenix, Ariz.)



GAIN EXTRA STORIES IN SAME BUILDING VOLUME WITH PRESCON

Prescon System of Prestressing Can Add Much Leasable Square Footage

IN SAN FRANCISCO working within a height limit of 105 feet, prestressed concrete construction using the Prescon System allowed *two* additional floors in the Belcher Apartments . . . an increase of about 7,000 square feet . . . over conventional construction.

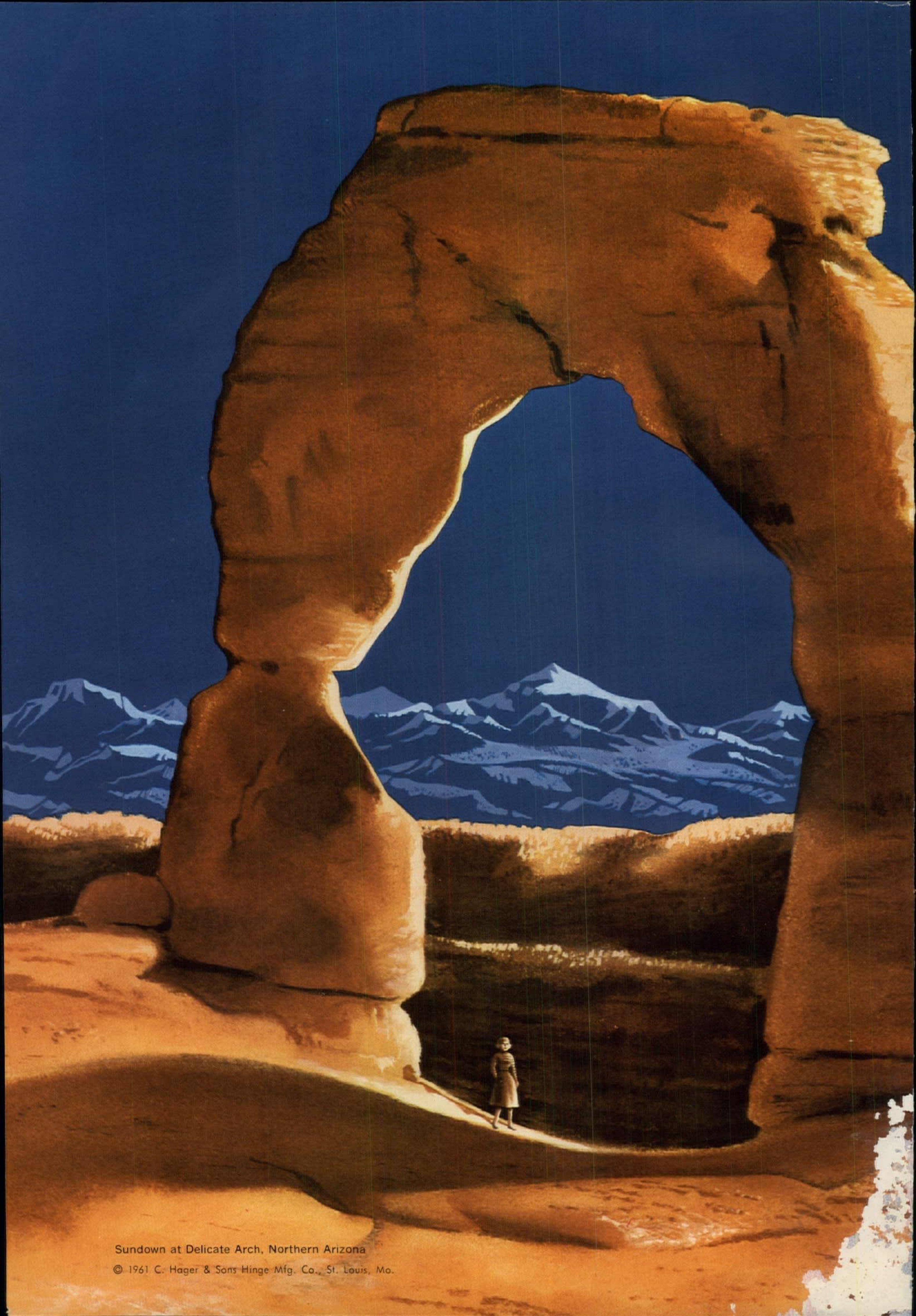
IN PHOENIX enough extra floor space was gained in the Motorola Transistor plant to include a cafeteria and other employee facilities without increasing total building size. (Space frame area converted to complete second floor housing service, utility equipment, cafeteria, etc.)

Increased need for more useable square footage within a specified building volume is being answered by using the Prescon System of post-tensioning prestressed concrete. Long, slender, shallow joists, with beam bottoms at a common elevation, produce attractive overhead construction. Unless furred space is needed, the underside of the slab can be textured as the finished ceiling, or acoustical tile cemented to it. Column spacing can be expanded and varied to allow large open work spaces of 40 and 50 foot bays.

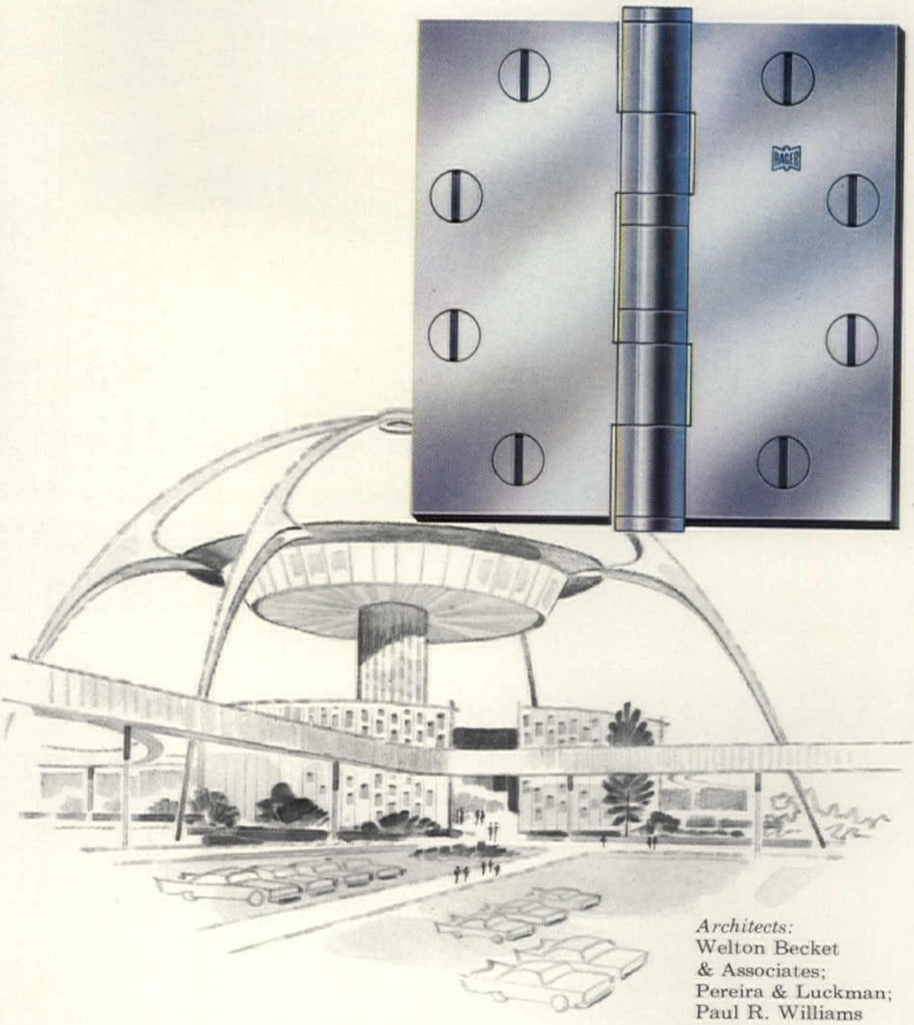
Great freedom of architectural design and choice of construction method . . . poured-in-place, lift slab, or precast . . . are additional advantages in using the Prescon System of post-tensioning prestressed concrete. For many other examples of all types of structures using this system, see your Prescon representative.

THE PRESCON CORPORATION
P. O. Box 4186 • Corpus Christi, Texas
Albany • Atlanta • Memphis • Dallas • Denver • Los Angeles
San Francisco • Seattle

MEMBER OF PRESTRESSED CONCRETE INSTITUTE



Sundown at Delicate Arch, Northern Arizona



This trim can take it! Milcor Metal Base provides the durability and impact resistance of steel at an installed cost competitive with other materials. It's ideal for hospitals, schools, and other public buildings — any area where heavy, careless traffic is a constant threat to weaker products. It's easily installed in plaster or masonry walls. The Milcor Interior Metal Trim line also includes window stools, cove moulds, picture moulds, and chair rails. All are now available through building supply dealers. See Sweet's, section 12a/In, or write for catalog 202.

Member of the INLAND Steel Family **MILCOR**®

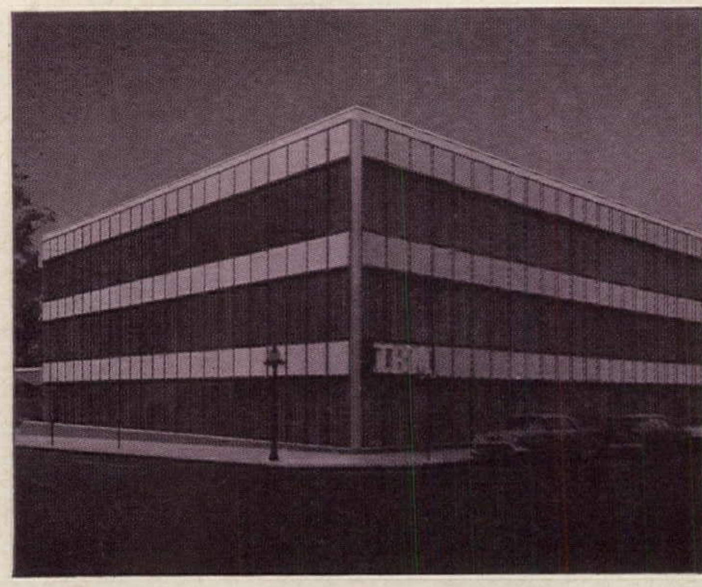
Milcor Metal Lath and Trim Products

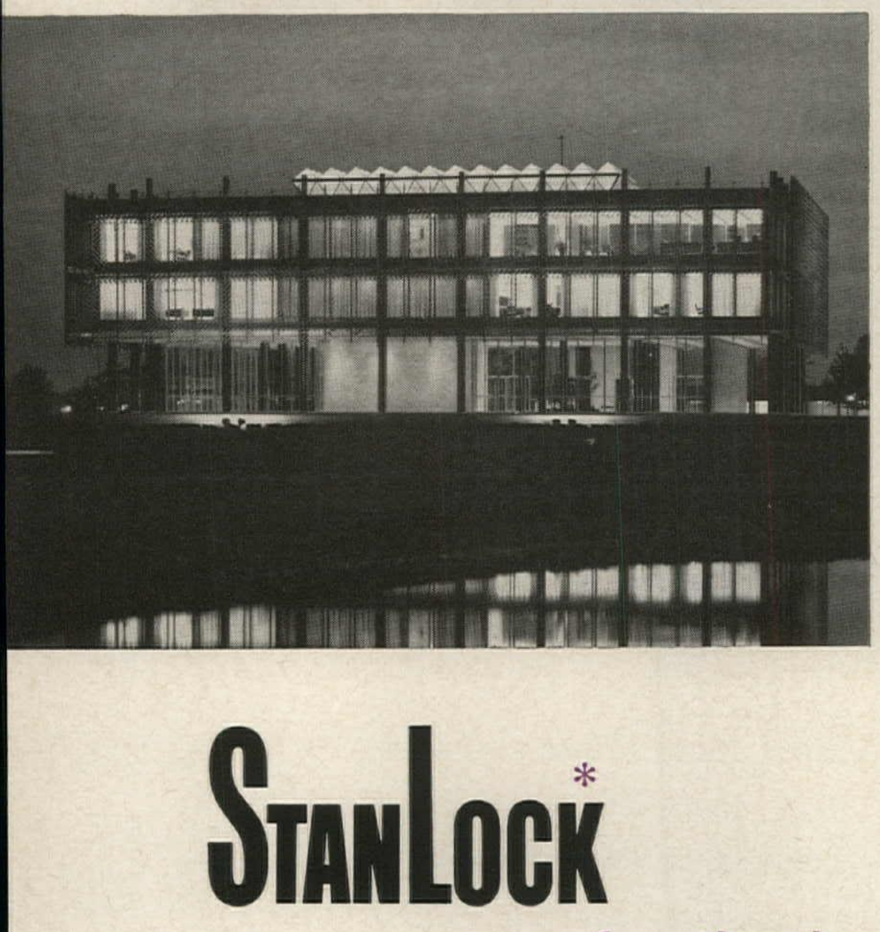
ETAL LATH • CORNER BEADS • CASING BEADS • CHANNELS • STUDS • PARTITION SYSTEMS • ACCESS DOORS • WINDOW STOOLS • METAL BASES

nland Steel Products Company

PT. A-4033 W. BURNHAM ST., MILWAUKEE 1, WISCONSIN

ORE 5, BUFFALO 11, CHICAGO 9, CINCINNATI 25, CLEVELAND 14, DETROIT 2, KANSAS CITY 41, MO., LOS ANGELES 58, NEW YORK 17, ST. LOUIS 10, SAN FRANCISCO 3


IBM



There's a big difference in Neoprene Structural Gaskets

All neoprene gaskets may *look* alike—but the differences in StanLock represent exclusive and important advantages to the architect, builder, glazier and owner. Here are the reasons:

STANLOCK'S tempered locking strip

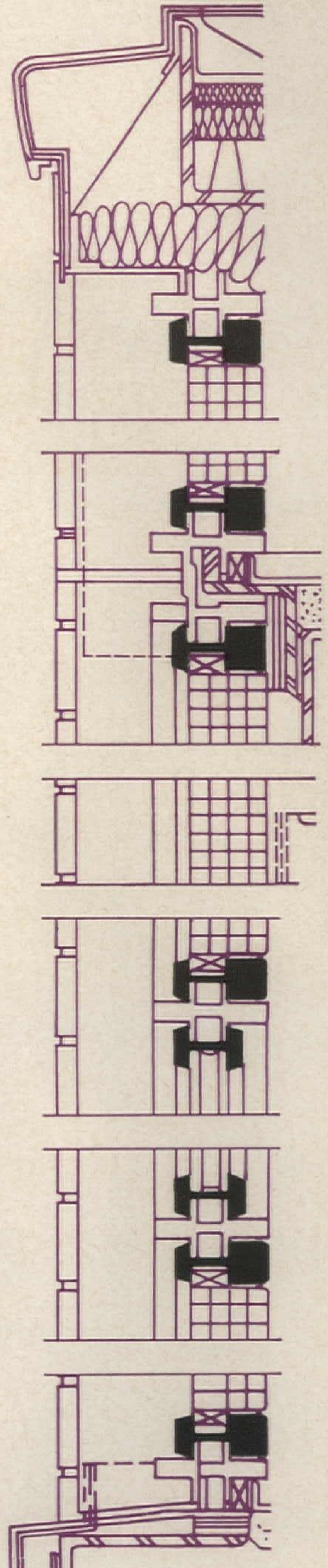
. . . is a separate, specially designed locking section made of harder, higher-density neoprene than the body of the gasket. While easily locked into the gasket upon installation, it applies ***added pressure*** at the sealing surfaces, providing a more positive seal where it is needed to prevent infiltration of water, air and dust.

STANLOCK'S time-proven neoprene compounds

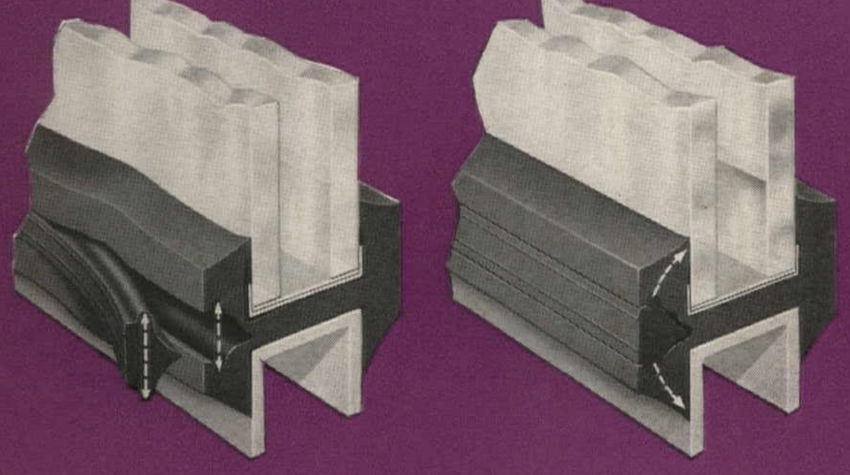
. . . combine needed strength and relative resilience with maximum weathering properties. The right neoprene formulas, plus close control in compounding, give StanLock gaskets exceptionally long life. They meet the 25-year "actual" and the 50-year "desired" life requirements for structural seals. Hurricane wind tests have proved the resilience of StanLock to provide sufficient cushion, under severe wind loads or shock wave, to prevent glass breakage.

STANLOCK'S versatility permits freedom in design

More than 24 different StanLock gasket sections are available from existing tooling. This great variety permits a wide range of curtainwall designs—in horizontal, vertical or grid applications—using glass or panel materials, in any combination with aluminum, steel, concrete or marble. Special sections are still being designed.



THE STANLOCK* LOCKING STRIP PRINCIPLE:



The tempered, harder, specially designed locking strip is locked into position—providing . . .

. . . more positive pressure of neoprene against glass or panel, and a long-lasting watertight seal.

Rudolph Interview

continued from page 74

of architecture today. In the garage we tried to establish the architecture of the automobile, and for that we required the scale of the highway. The housing needs to be the exact opposite. Quite consciously the scale is broken down. I could have used a single block very easily; we deliberately determined not to do this. The materials are different because I knew that reinforced concrete would be the most economical material for the garage, and the bearing walls would be the most economical for the housing. Still, the two buildings have some things in common: they both have an appropriate scale, are clear structurally, are concerned with proportion and with light—even if they end up looking very different.

I've heard people who live in the graduate student housing express worry that all the changes in level were unsafe for children.

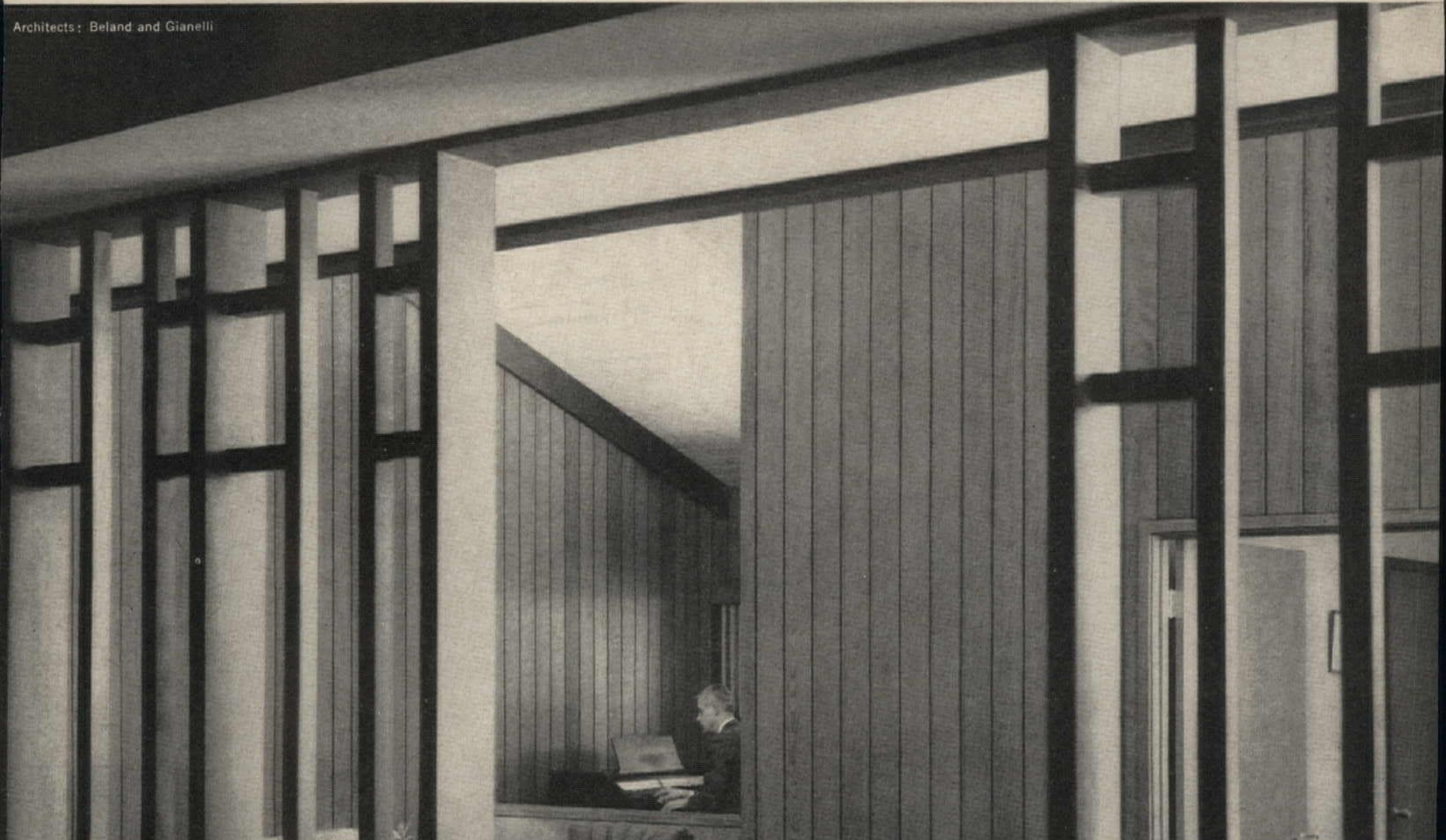
In Paris the banks of the Seine run un-railed for miles. If something is obviously dangerous, no one, least of all children or animals, is going to be hurt by it. Nine-tenths of the great traditional architecture would be impossible today the way the insurance people, the fire laws, and the building codes are tying us up in knots. The vertical interpenetration of space is practically impossible. Basically, we are anti-visual in this country.

Whereas your approach to architecture is primarily a visual one.

I don't apologize for this. It may come as a surprise to you, but it shouldn't.

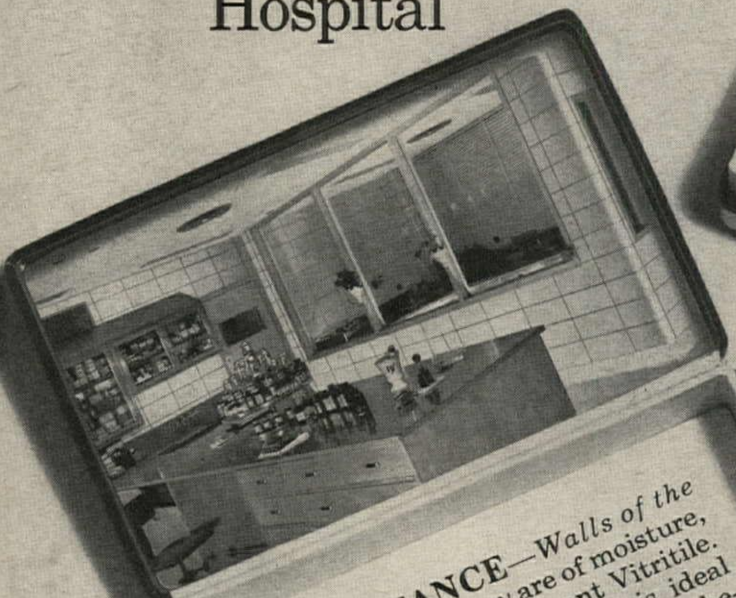
I have heard you say that you took the functional part of building design for granted. Isn't this why you can afford to talk in largely visual terms?

Each architectural notion that anyone has must be checked against a purely analytical chart. What bothers me is naïveté and self-delusion. I don't know why this should be, but a great number of the works of architecture that represent important turning points simply do not work as buildings. Of course, no building ever solves all problems. But one expects at least fifty—no, let us say fifty-one per cent—of the problems to be solved.


Architects: Beland and Gianelli

Three reasons why NATCO VITRITILE was prescribed for the Shreveport, La., Schumpert Memorial Hospital

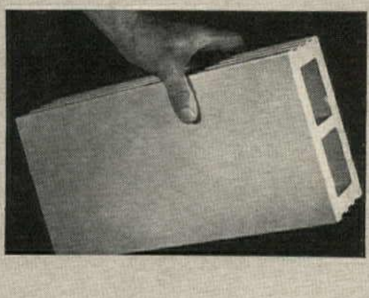
SANITATION—*In the modern operating room* Vitritile walls assure complete sanitation. Vitritile's ceramic glazed facing is non-porous and impervious to moisture . . . doesn't trap and collect dirt and dust particles. An occasional cleansing with soap or detergent and water is all that's necessary to *keep* Vitritile completely hygienic.



RESISTANCE—*Walls of the hospital pharmacy* are of moisture, acid and alkali resistant Vitritile. Ceramic glazed Vitritile is ideal for this type of installation because it meets all the rigid chemical resistance requirements set up by the Facing Tile Institute.

ATTRACTIVENESS—*The emergency lobby* is just one area where Vitritile adds restful beauty to the hospital's interior. Vitritile—available in a complete variety of attractive colors—never loses its original "new look" because its colors and finishes are permanently "fired" on each unit under intense heat.

Are you planning a new hospital or an addition to your present structure? If so, we will be glad to give you complete information on our full line of genuine structural clay tile products.

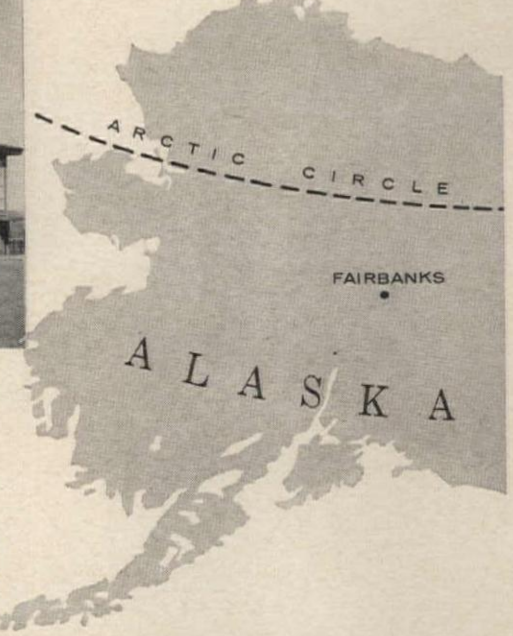


Vitritile comes in three nominal face sizes:
8″ x 16″
5⅓″ x 12″
5⅓″ x 8″
in 2″, 4″, 6″ and 8″ thicknesses.

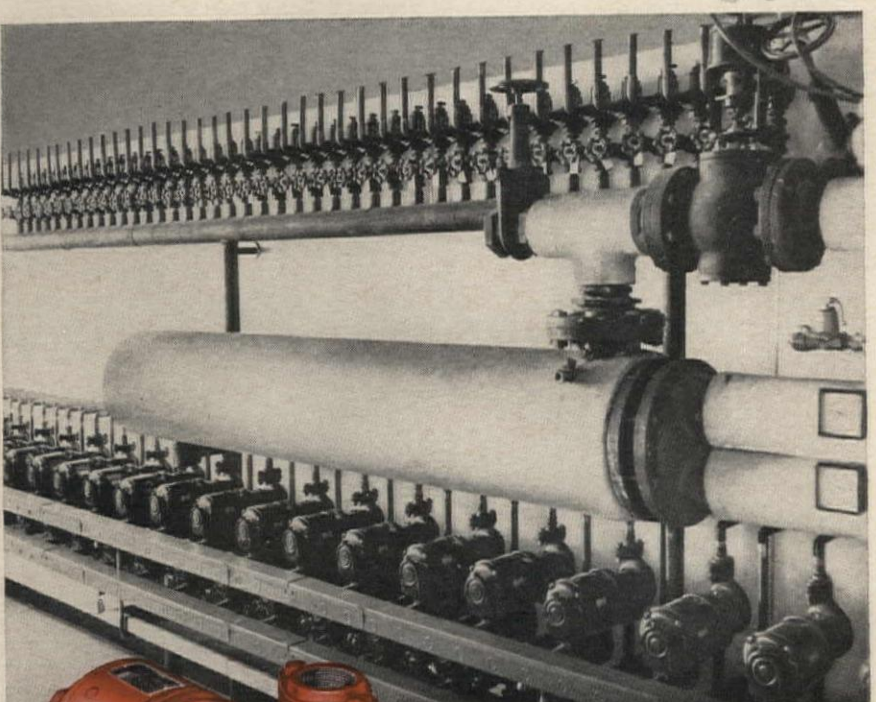
NATCO CORPORATION

NATCO QUALITY CLAY PRODUCTS SINCE 1889

General Offices: 327 Fifth Avenue, Pittsburgh 22, Pa. Other Branch Sales Offices: Boston, Chicago, Detroit, Houston, New York, Philadelphia, Pittsburgh, Syracuse, Birmingham, Ala., Brazil, Ind. In Canada: Natco Clay Products Ltd., 55 Eglinton Ave. E., Toronto.



NEAR THE ARCTIC CIRCLE 40 B&G BOOSTERS GIVE RESIDENTS INDIVIDUAL TEMPERATURE CONTROL



At Fairbanks, Alaska, tenants in the Anderson Apartments enjoy all the comforts of *radiant Hydro-Flo* heating plus their own choice of temperature. Each apartment is on a separate heating zone and has an individual thermostat to control the operation of a B&G Booster pump. In each circuit, a B&G Flo-Control Valve prevents the possibility of an over-ride in heat.

A 2-pass B&G steam-to-water converter provides hot water for the heating system.

B&G Boosters are designed and built specifically to meet the exacting demands of circulated water heating and cooling systems. Their freedom from maintenance problems as well as quietness of operation explain why B&G Boosters are the preferred pumps.

B&G BOOSTER

B&G FLO-CONTROL VALVE

THE BUILDING:
Anderson Apartments, Fairbanks, Alaska

ARCHITECT:
Philleo Engineering Co.

HEATING ENGINEER:
Fairbanks Plumbing and Heating

PLUMBING AND HEATING:
Fairbanks Plumbing and Heating

GENERAL CONTRACTOR:
Kenneth P. Anderson, Contractor

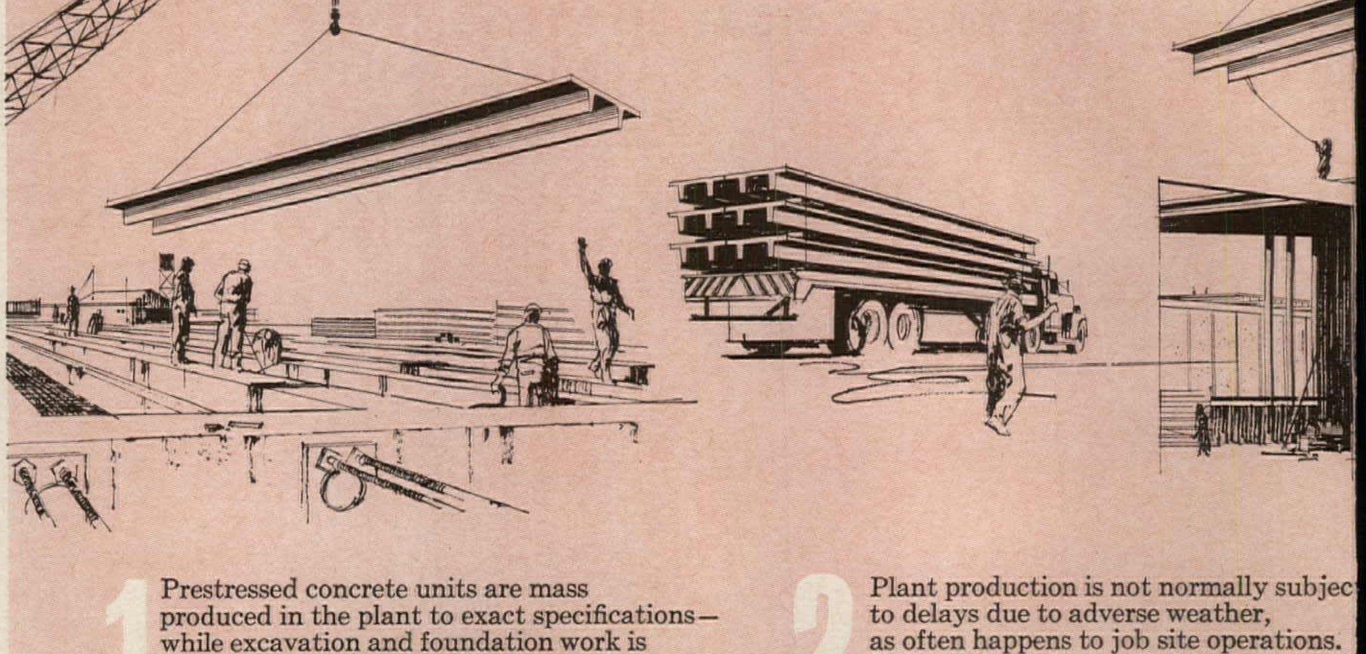
The B&G Booster is engineered for compactness, *silent operation* and years of service. It is built by precision manufacturing methods which translate good design into a superior product. Over 3,500,000 have been installed to date.

The B&G Flo-Control Valve is so designed that it can be easily cleaned without removing it from the pipe line.

BELL & GOSSETT COMPANY
Dept. GY-32, Morton Grove, Illinois

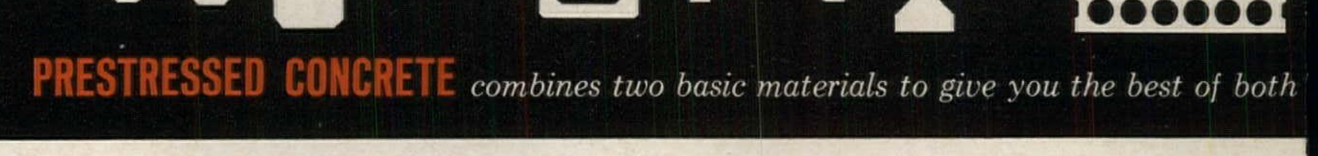
Canadian Licensee: S. A. Armstrong, Ltd., 1400 O'Connor Drive, Toronto 16, Ontario

PRESTRESSED



1 Prestressed concrete units are mass produced in the plant to exact specifications—while excavation and foundation work is taking place at the site. Close supervision and control of materials by a specialized work force in the plant produce a high quality product at minimum cost.

2 Plant production is not normally subjec
to delays due to adverse weather, as often happens to job site operations. Delivery is made as called for by contractors' work schedules.



PRESTRESSED CONCRETE *combines two basic materials to give you the best of both*

For plant-produced, quality controlled prestressed concrete, consult the PCI Active Member nearest you:

ARIZONA Arizona Sand & Rock Co., Prestress Division, Phoenix • United Materials Inc., Phoenix

CALIFORNIA Basalt Rock Co., Napa • Ben C. Gerwick, Inc., San Francisco • Concrete Conduit Company, Div. American-Marietta Company, Colton • Delta Prestressed Concrete, Inc., Florin • Rockwin Prestressed Concrete, Santa Fe Springs • San Diego Prestressed Concrete, San Diego • Wailes Precast Concrete Corp., Sun Valley

COLORADO Bullen Concrete Products, Pueblo • Prestressed Concrete of Colorado, Denver • Rocky Mountain Prestress, Englewood

CONNECTICUT C. W. Blakeslee & Sons, New Haven

FLORIDA Capitol Prestress Co., Jacksonville • Concrete Structures, Inc., North Miami • Dura-Stress, Inc., Leesburg • Duval Engineering & Contracting Co., Jacksonville • Florida Prestressed Concrete Co., Inc., Tampa • Juno Prestressors, Inc., West Palm Beach • Lewis Manufacturing Co., Inc., Miami • Meekins-Bamman Precast Corp., Hallandale • Prestressed Concrete, Inc., Lakeland • Southern Prestressed Concrete, Pensacola • West Coast Shell Corp., Sarasota • R. H. Wright, Inc., Fort Lauderdale

GEORGIA American-Marietta Company, College Park • Leap Structural Concrete, Inc., Powder Springs • Macon Prestressed Concrete Co., Macon

HAWAII Concrete Engineering Co., Honolulu

IDAHO Gemstone Prestress Co., Idaho Falls • Ready-to-Pour Concrete Co., Idaho Falls

ILLINOIS American-Marietta Company, La Grange • American Prestcrete Corp., Plano • Consumers Div., Vulcan Materials Co., Chicago • Crest Concrete Systems, Lemont • Material Service, Chicago • Midwest Prestressed Concrete Co., Springfield • Precast Building Sections, Chicago • Prestressed Concrete Structures, Frankfort

INDIANA American-Marietta Company, Lafayette • Shute Concrete Products, Richmond

IOWA A & M Prestress, Clear Lake • Midwest Concrete Industries, West Des Moines • Prestressed Concrete of Iowa, Iowa Falls • C. W. Shirey Co., Waterloo

KANSAS Russell-Ralph Co., Topeka • Sunflower Prestress, Inc., Salina • United Prestress Co., Wichita

LOUISIANA Belden Concrete Products, Inc., Metairie • Prestressed Concrete Products Co., Inc., Mandeville • Mid-State Prestressed Concrete, Inc., Alexandria

MARYLAND Baltimore Concrete Plank Corp., Baltimore

MASSACHUSETTS New England Concrete Pipe Corp., Newton Upper Falls • Northeast Concrete Products, Inc., Plainville • San-Vel Concrete Corp., Littleton

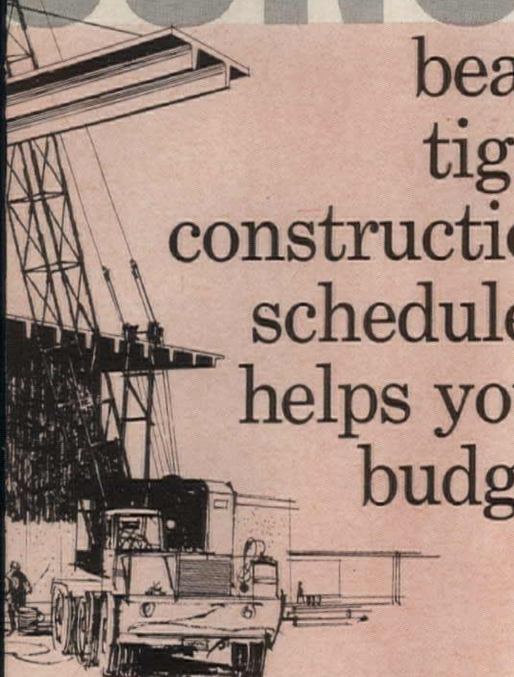
MICHIGAN American Prestressed Concrete Inc., Centerline • Lamar Pipe and Tile Company, Div. American-Marietta Company, Grand Rapids • Precast Industries, Inc., Kalamazoo • Price Brothers Co., Livonia • Superior Products Co., Detroit

MINNESOTA Cretex Companies, Elk River • Prestressed Concrete Inc., St. Paul • Wells Concrete Products Co., Wells

MISSISSIPPI F-S Prestress, Inc., Hattiesburg • Grenada Concrete Products Co., Grenada • Jackson Ready-Mix Corp., Jackson

MISSOURI Carter-Waters Corp., Kansas City • Dexter Ready-Mix Concrete Co., Dexter • Missouri Pres-Crete, Inc., Overland

plant produced CONCRETE beats tight construction schedules, helps your budget



In almost all instances, units are erected directly from truck to structure without stockpiling or rehandling at the site. Prestressed members fit readily in place to speed erection and shorten total construction time.

Check all these advantages:

LONG SPANS, SHALLOW DEPTHS . . . for fewer columns, more *usable* floor space. High strength produced by prestressing allows the design of well proportioned members of limited depth for given spans.

CUTS CONSTRUCTION TIME —Plant manufacture of prestressed members and site work proceed simultaneously to shorten job schedule.

FINISHED PRODUCT OF PLANT CONTROLLED QUALITY —A wide range of architectural and structural shapes meeting PCI and AASHO requirements are available at local plants for buildings, bridges and foundations.

FIRE RESISTANT —Tests have proven the high fire-resistant quality of prestressed concrete.

ATTRACTIVE APPEARANCE—FLEXIBLE IN DESIGN —Can take a variety of aesthetically agreeable shapes and bold new designs. Refined prestressed designs result in lighter weight structures.

LOW INSURANCE COST —Durability and fire resistance mean low insurance premiums.

MAINTENANCE-FREE —Requires no painting, little or no waterproofing. Needs no protection from corrosion.

LOW INITIAL COST —Design flexibility, quality plant production and short construction time mean superior structures for less money.

PRESTRESSED CONCRETE INSTITUTE

PRESTRESSED CONCRETE INSTITUTE
205 WEST WACKER DRIVE · CHICAGO 6, ILLINOIS

Gentlemen: Please send me your free report "Prestressed Concrete—Applications and Advantages." R1

NAME ____________________

POSITION ____________________

FIRM ____________________

ADDRESS ____________________

CITY ____________ ZONE ______ STATE ____________

MONTANA Floyd Pappin & Son, Inc., Great Falls

NEBRASKA Nebraska Prestressed Concrete Co., Lincoln • Wilson Concrete Co., Omaha

NEW JERSEY Camco Concrete Corp., Vineland

NEW MEXICO American-Marietta Company, Albuquerque

NEW YORK American-Marietta Company, New York City • American-Marietta Company, Syracuse • Precrete, Inc., Corona • Principe-Danna, Inc., Long Island City • Raymond International, Inc., New York

NORTH CAROLINA Arnold Stone Co., Greensboro • Concrete Materials, Inc., Charlotte • North Carolina Products Corp., Raleigh • Piedmont Construction Co., Winston-Salem • S & G Prestress Co., Wilmington

OHIO American-Marietta Company, Columbus • Concrete Masonry Corp., Elyria • Concrete Pipe Co. of Ohio, Cleveland • Marietta Concrete, Div. American-Marietta Company, Marietta

OKLAHOMA Oakley Engineering Co., Tulsa

OREGON Builders Supply Co., Medford • Empire Pre-Stress Concrete of Oregon, Portland • Ross Island Sand & Gravel, Portland

PENNSYLVANIA American-Marietta Company, Norristown • Dickerson Structural Concrete Corp., Youngwood • Eastern Prestressed Concrete Corp., Line Lexington • Formigli Corp., Philadelphia • New Enterprise Stone & Lime Co., Inc., New Enterprise • Pennsylvania Prestress, Inc., York • Schuylkill Products, Inc., Cressona • Turbotville Block Co., Turbotville

SOUTH CAROLINA American-Marietta Company, Columbia • Ballard-Rice Prestressed Corp., Greenville

SOUTH DAKOTA Gage Bros. Concrete Products, Sioux Falls

TENNESSEE American-Marietta Company, Memphis • Knox Concrete Products, Inc., Knoxville • Nashville Breeko Block Co., Nashville

TEXAS Anchor-Wate Co., Houston • Atlas Structural Concrete, El Paso • Crowe-Gulde Prestressed Concrete Co., Amarillo • Span, Inc., Dallas • Texas Concrete Co., Victoria • Texas Quarries, Inc., Austin

UTAH Utah Prestressed Concrete Co., Salt Lake City

VIRGINIA Concrete Structures, Inc., Richmond • Shockey Bros., Inc., Winchester • Southern Block & Pipe Corp., Norfolk • Virginia Prestressed Concrete Corp., Roanoke • Alexandria Prestressed, Inc., Alexandria

WASHINGTON Associated Sand & Gravel Co., Everett • Central Pre-Mix Concrete Co., Spokane • Concrete Technology Corp., Tacoma

WISCONSIN Concrete Research, Inc., Waukesha • Prestressed Concrete Products Corp., Verona • West Allis Concrete Products Co., Milwaukee • Eau Claire Stresscrete, Inc., Eau Claire • F. Hurlbut Co., Green Bay

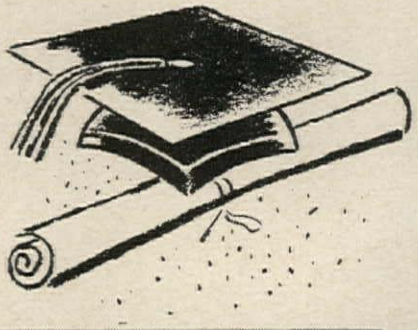
---

PUERTO RICO Pacadar Prestressed Beams Corp., San Juan

CANADA **Alberta**: Con-Force Products Ltd., Calgary • **Manitoba**: Building Products & Coal Co., Ltd., Winnipeg • Supercrete Ltd., St. Boniface • **New Brunswick**: Joseph A. Likely Ltd., St. John • **Newfoundland**: Lundrigan's Concrete Ltd., Corner Brook • **Nova Scotia**: L. E. Shaw Ltd., Halifax • **Ontario**: Murray Associates Ltd., Toronto • Ontario Stress-Crete Ltd., Burlington • Pre-Con Ltd., Brampton • Ryan Builders Supplies Ltd., Windsor • Schell Industries Ltd., Woodstock • Standard Prestressed Structures Ltd., Maple • Toronto Cast Stone Co. Ltd., Toronto • Wilson Concrete Products Ltd., Belleville • J. M. Wright Ltd., North Bay • **Quebec**: Francon Ltd., Montreal • Pressure Pipe Ltd., Montreal

This advertisement sponsored by PCI Active Members

JAMOLITE® gains highest honors in college installations



▲ BRIGHT, CLEAN SURFACES. Jamolite doors have hard, gleaming surfaces that are easy to clean, easy to keep clean.

LIGHTWEIGHT JAMOLITE doors open and close easier, help to speed operations, promote safety.

EFFICIENT INSULATION. 4" of foamed-in-place polyurethane in both cooler and freezer doors. Freezer door (background) has Frostop® to prevent icing. ▶

IMPROVES APPEARANCE. Flush-fitting Jamolite doors, available in white and four colors, harmonize with any interior.

• In a number of colleges and institutions all-plastic Jamolite doors are demonstrating outstanding advantages over heavier and thicker wood and metal doors. More and more today, Jamolite is being specified in food service installations for improved appearance, unmatched efficiency, easier mounting. For data write to Jamison Cold Storage Door Co., Hagerstown, Md.

JAMISON
COLD STORAGE DOORS

These Three California Community Hospitals Achieve Life Long PERMANENCE & DEPENDABILITY With

Streamline® COPPER TUBE AND FITTINGS FOR SUPPLY AND DRAINAGE SYSTEMS

West Covina Hospital

Parkview Memorial Hospital

". . . in operation over two years . . . the copper drainage system has been entirely trouble-free. We would recommend the use of your system and product in any modern structure."

—*Hospital Administrator*

In installations that must depend on clog-free, rust-proof, leak-proof, sanitary drainage, Mueller Brass Co. Streamline DWV tube and fittings are the logical choice. When compared with rustable materials, DWV Copper Tube and Fittings are MORE ECONOMICAL to install and will normally OUTLAST THE BUILDING ITSELF.

Woodruff Community Hospital

Write today for new Catalog S-361

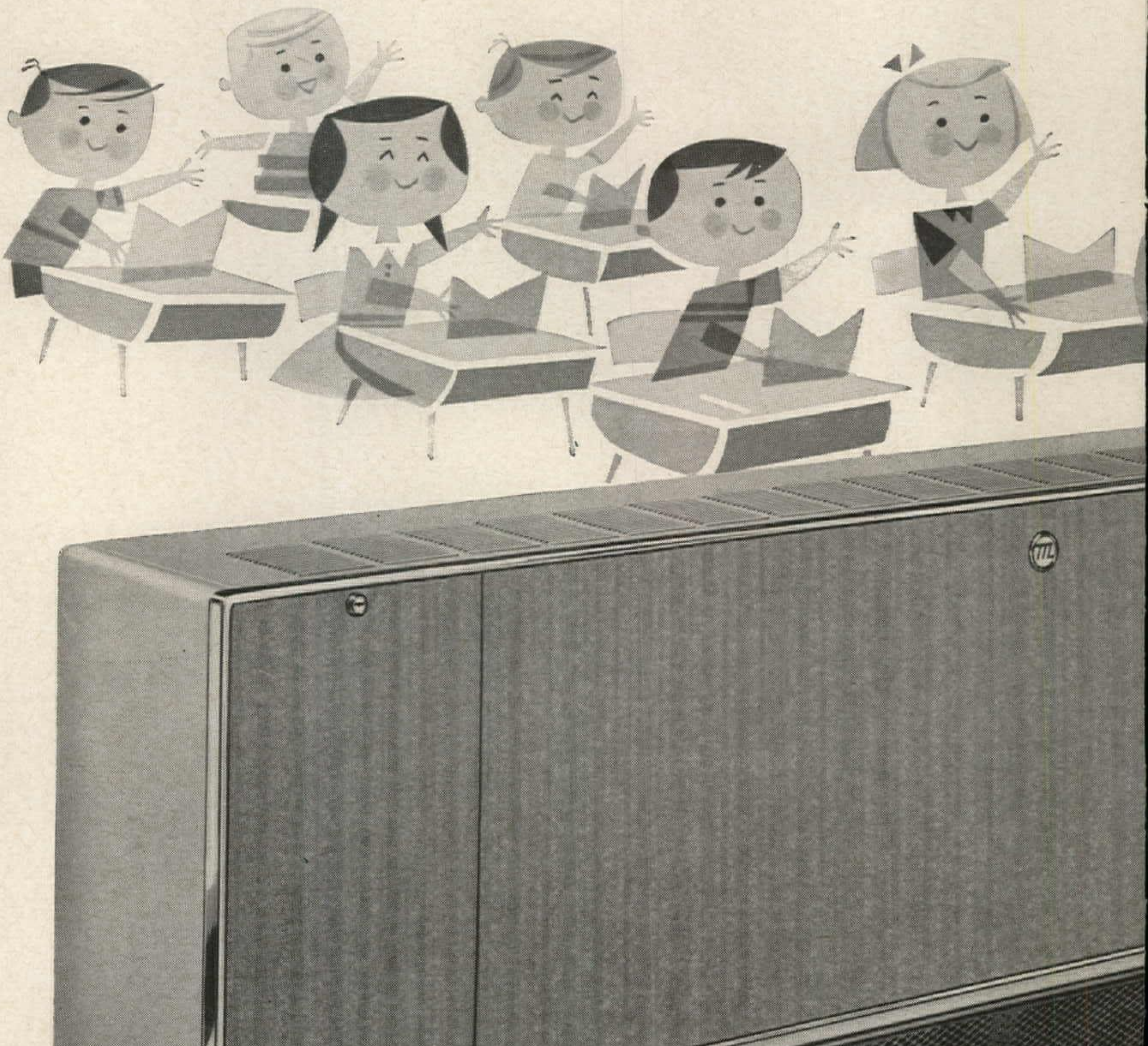
MUELLER BRASS CO.

PORT HURON 8, MICHIGAN

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

FOR THE FIRST TIME!

all-season comfort



MODINE HAS EARNED "HIGHEST GRADES" IN SCHOOL COMFORT FOR MORE THAN 30 YEARS!

Modine cabinet unit heaters, convectors and conventional unit heaters have served schools — large and small — for more than three decades. Thousands of schools throughout the country are currently enjoying the economical comfort provided by these units.

APARTMENTS

—FOR URBAN REDEVELOPMENT HIGH- AND LOW-RISE COMBINED

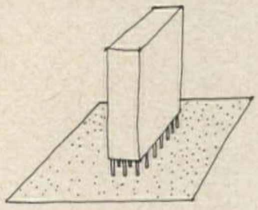
BUILDING TYPES
® STUDY 302

In the text and illustrations that follow, Architect William J Conklin offers three solutions to the problem of combining the desirable charm and urban scale of the low-rise town house with the needed dense coverage and efficiency of the high-rise apartment: 1. The tower in the square; 2. The elevated park; 3. The continuous building.

CLOUDS OVER RADIANT CITY

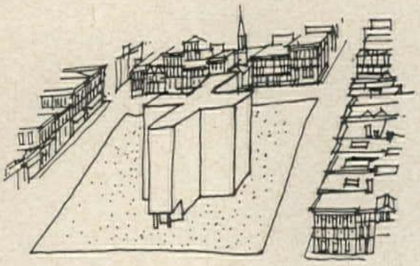
by William J Conklin

THE DREAM OF A GROUND-FREE CITY



The dream of modern architecture was to free the floor of the city of buildings, to elevate buildings above their old earth-bound nature and let them float. We were to build in the sky. The high-rise apartment raised free of the earth was developed specifically for its ground freeing qualities. The floor of our cities was to be free flowing and verdant, unbounded and unobstructed. Corbusier extolled the drama and efficiency of this solution. Open space was good, and the more the better. His prophetic sketches have become the reality of our time. His values—once so radical—have now become codified into laws and regulations.

DREAM BECOMES LAW

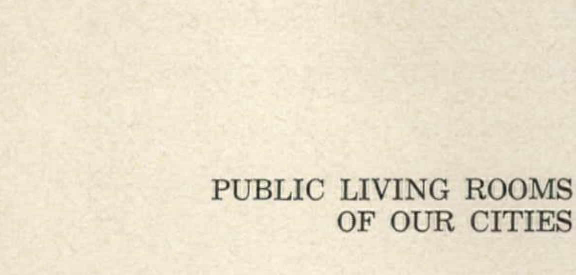


He proclaimed that one of the chief virtues of the high-rise building was its low coverage, and the *rationale* for pilotis was that they made possible a building with no land coverage. Perhaps the prophet's worst fate is to have his word accepted, but that has happened to Corbu's value system. Public housing officials long ago accepted it: high coverage became a major offense; gold stars were awarded for densities below 15 per cent. New York's new Zoning Ordinance is perhaps the final mathematical codification of such a system of values. The law, in effect, provides penalties and awards for high and low coverage. It holds out extra morsels of floor area for builders who build with low coverage. Pilotis are likewise rewarded with extra bits of floor area. Today, Corbu's visionary cities would pass with all A's. The construction of a new typical brownstone house would be disapproved by FHA. Open space is a *sine qua non*.

OPEN SPACE IS VACANT SPACE

Yet when constructed in our cities, this open space beneath and around buildings proves relatively useless and anti-urban. Our public housing projects are massive demonstrations. They are built with none of the art of Corbu, but with all his principles. Their vast lawns are more than open—they are simply vacant, and provide exercise only for the lawn-keepers. The value of the new open space remains largely statistical; its usefulness is slight; and at night, its danger sometimes great.

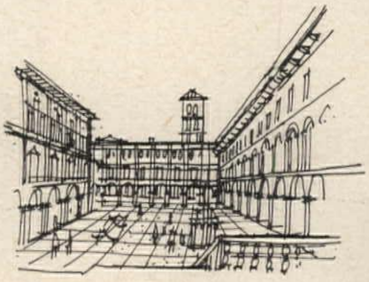
HISTORY AND USE OF LAWNS



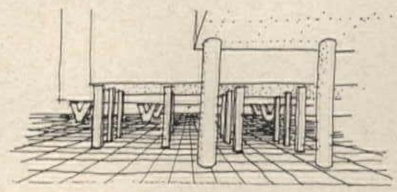
Lawns were used in our cities very sparingly by our predecessors, and then only to make an important civic statement. The public buildings in most American cities were given grassy settings in open space. The county court house and other civic buildings were surrounded by lawns and trees; but this was clearly understood to be a decorative treatment which was used sparingly for special buildings only. Multiple residential structures were not considered to have a symbolic or monumental role in the city, and hence they were generally handled as part of the continuous city structure, forming the walls of the street spaces. With large areas of open space and lawns, our new free standing apartments attained an awkward and self conscious monumentality. Residential structures were given the setting of a public building; but were unable to fulfill the demands of this setting either architecturally or symbolically.

PUBLIC LIVING ROOMS OF OUR CITIES

The public living rooms of our cities have always been formed by containment of open space and this is no longer possible in a city of all free standing buildings. Such public living rooms took many forms, according to local culture and custom. The county court house was a typical American pattern. The squares of London, the piazzas of Italy and the avenues of Paris are European versions. The infinite variety of city spaces which form the public living rooms are the central substance of all cities. If all buildings become free standing and if coverage is considered an evil, then the formation of these enclosed urban spaces is no longer possible, and the cityscape becomes amorphous.



UNCONTAINED SPACE
MEANS UNUSED SPACE



This new, freely flowing space which was formed by the high-rise and by the pilotis satisfies the statistical requirements for low coverage, but satisfies few, if any, needs of the residents. So many acres of open space was provided for so many residents, but its usefulness to those residents was slight. Even the most elegant landscaping and the most imaginative street furniture has proven no lure to the residents of the high-rise structures. Without walls, there can be no living rooms.

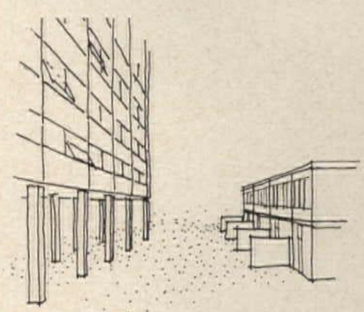
OPEN SPACE IN SUBURBIA

The suburbs offer a generous supply of open space, with front lawns provided in a futile attempt to give status to that which is properly anonymous, but the most highly valued part of this open space is the back yard. The suburbs offered every resident back yard living; the *res suburbia*. In an attempt to develop residential patterns in the city competitive with the suburb, urban planners and architects turned to patio and town house.

CONFLICT OF HIGH AND LOW

One of the most insistent new themes of city residential planning today is the combination of high and low—the dense and efficient tower related or opposed to the charm of the town house. The lure of this solution is the hope that the multiple storied high-rise structures will solve the tough economic problems of our current renewal program, and that the town houses will give to the project some good down to earth patio living. This hope has been partially realized, but the resulting civic form has usually been ambiguous opposition between the two elements, and the town houses have been an economic burden on the high-rise structures. The problems and possibilities raised by this combination are multiple; go deep into the theory of open space; suggest several new solutions.

TOWN HOUSES
CAMP ON THE OPEN LAWNS



The first and most common answer to the problem of high and low is an additive one. The high-rise structure is designed and planned as a free standing building, open on the ground floor in the by now common fashion. The town houses, grouped into blocks, are added alongside. The low walls which usually project out from the town houses attempt to convert some of the available public space into private space in the form of patios or courtyards, but these private patios are usually only semi-private, and hence only half useful. The incomplete closure of the patios occurs because complete closure would restrict the town house residents' prized view of the public lawn. The town houses, related neither to the high-rise nor to the street, like squatters, float in uncomfortable clusters on the public lawn.

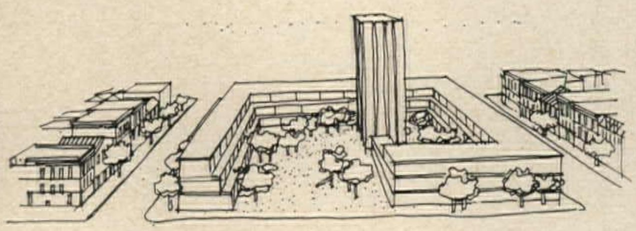
CONTINUITY IN
THE CITY FABRIC

One of the goals of the designers who introduced town houses into high-rise projects was to try to relate the project to the existing city. But American cities are of continuous construction, of predominately low buildings built side by side, dependent upon each other. This low continuous nature, varied and yet of a piece, will remain as the dominant characteristic of our cities. It is this continuous city that we rebuild or add to.

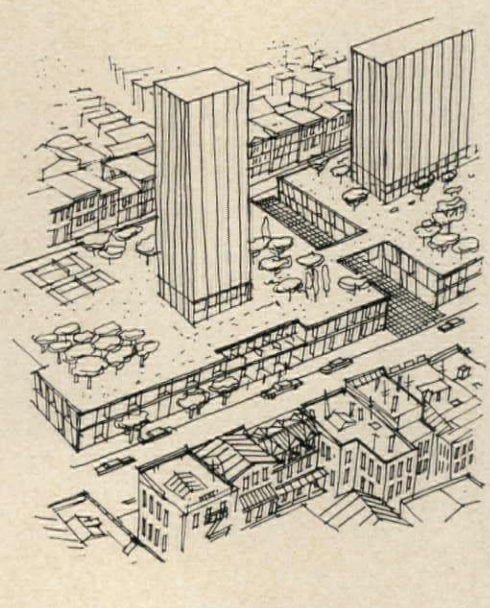
PROJECT PEOPLE NEVER MEET CITY PEOPLE

Free standing buildings introduced into the bulldozed sites of our projects cause a complete rupture—both physical and social—in the fabric of the city. The radical change in scale and in the use of open space between the new free-standing high-rise building and the old city is matched by a discontinuity in the social matrix. Project people never meet or mix with existing people. Where new projects abut old areas of the city, the sidewalks along the old buildings have all the customers. No one, it would seem, wants to walk next to the lawns. Town houses were introduced into projects in an attempt to bridge this gap between new and old, and to restore to the project some of the scale of the old city.

THREE SUGGESTIONS

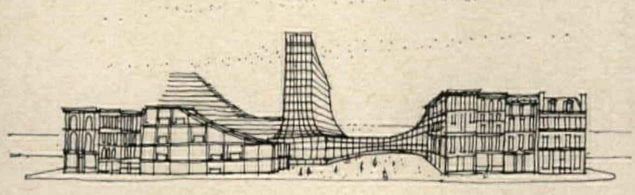


But the space problems created by the high-rise buildings were left untouched, and the town houses continued to camp uncomfortably on the lawn. A new synthesis of high and low is called for. The monumental open space surrounding the freestanding high-rise building must disappear; open space must become more private and usable. The fixed image of the floating building with pilotis and free floating ground space must give way to more complex mergers of high and low. The absurdity of vacant two-story space beneath the high-rise with two-story town houses alongside must be faced. The useless piloti space will disappear.



THE TOWER IN THE SQUARE: The first step toward a reconciliation of high and low is to stack the low buildings in a continuous row to contain and form a private, urban, residential square with high-rise within. Such a residential square has many values. The low units relate to the existing city and give the street space a containing wall. The residential square is bounded and made private; the forms are supplementary to the concept of the whole; the city fabric is unruptured.

THE ELEVATED PARK: Another step is to raise the residential square above street level (refer to Cadman Plaza project). Here, recreation space is not confused with street space since it is raised and made private. The town house roofs are now a park to look upon—not tar and gravel. Street space is defined, contained. The high-rise towers efficiently above the dense and urban base, which contains town houses, shops, parking, etc.—elements relating to the street.



THE CONTINUOUS BUILDING: The full logical conversion of fluid and useless open space into usable parcels of private open space would produce a building gradually changing from low to high, allotting to each floor its appropriate portion of the available open space. The old conflict and antagonism between town house and tower now disappears. Such developments could achieve true continuity with the existing city (refer to Two Bridges Project, right page). The edge scale of the continuous structures can differ from the central scale; hence any existing edge scale condition can be matched. Such buildings can be continuous in their horizontal development, as is the nature of the city; discontinuities of free-standing buildings can be reserved for special structures. The ground space of the city can then once again be urban space, controlled and formed by the designer.

Sketches by J. S. Rossant

RIVERFRONT PROJECT FOR HOUSING AND DOCKS

Two Bridges Urban Renewal Project, New York City; Whittlesey & Conklin, Architects; J. S. Rossant and Jonas Vizbaras, Associates

This project resulted from the combined planning efforts of Bernard G. Walpin of Mutual Housing Sponsors, the architects, the Department of Marine & Aviation, and the Two Bridges Neighborhood Council

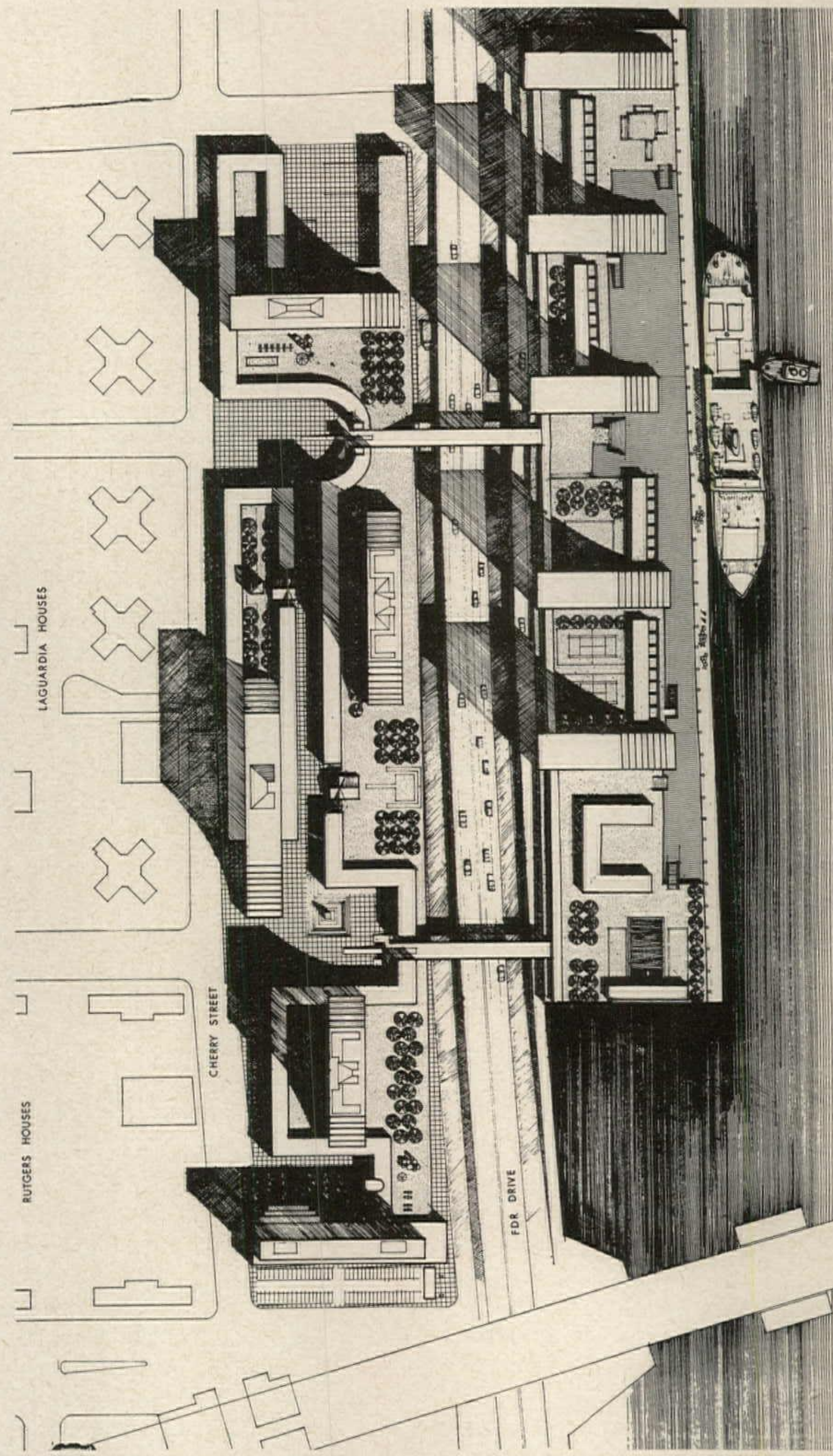
This proposed redevelopment for Manhattan's lower east side lies parallel to and astride the East River Drive (elevated), and combines into one coordinated scheme a proposed renewal housing project on the city side of the drive and new docks on the river side of the drive. By planning the two areas together and utilizing air rights over the docks, the project will provide: housing for approximately 10,000 persons; extensive shopping and commercial facilities; an elementary school; new cargo handling facilities for the Belgian Line; new recreation areas raised above street level; space for trucking, warehousing, etc. Pedestrian bridges will cross the drive to connect the two parts of the project at an upper level; parking, trucking, docks, etc. will lie below the recreation and housing levels.

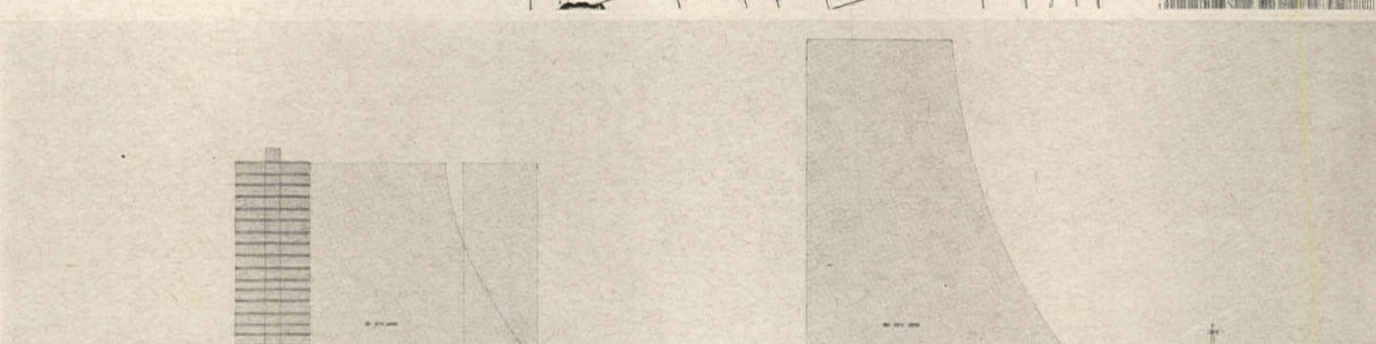
Both high- and low-rise units will be provided, with several hundred units in 5-story, split-level maisonettes duplicating the scale of the older parts of the existing city nearby. The public squares, as shown above, are designed to capture something of the color and life of the old lower east side.

Two Bridges Project, New York City

The plan and section explain how the two-part project works, and how three levels differentiate housing and recreation, the East River Drive, and the lower level street, trucking, dock area. The "edge" of the project next to the city is composed of 5-story maisonette and store units, entered at a split level from the elevated terrace. The 5-story units form the continuous strip that breaks in and out to form a series of public town squares against the city, serving to integrate the old east side and the new project visually at pedestrian level.

Trucking, warehousing, parking, and dock facilities are entered from South Street, beneath the East River Drive, and are carefully separated from pedestrian and residential areas. Their roofs will carry the gardens and recreation terrace above. Eight acres of lower level area are for Belgian American Line loading, cargo, handling, and storage; two levels for parking. The recreation area above the docks will include a waterfront promenade, connected by pedestrian bridges to the public squares across the drive



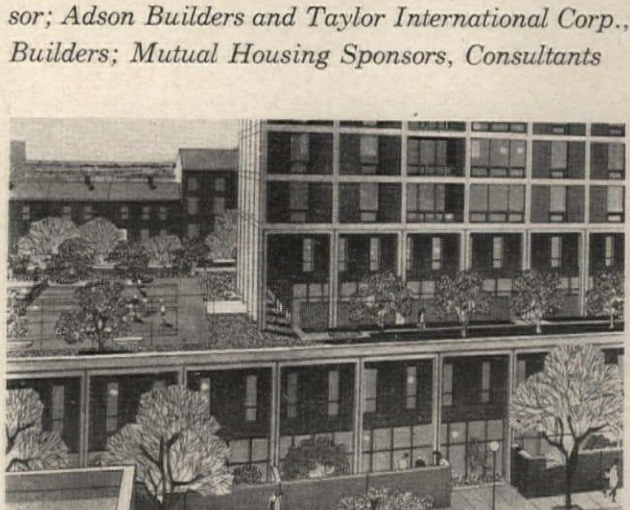


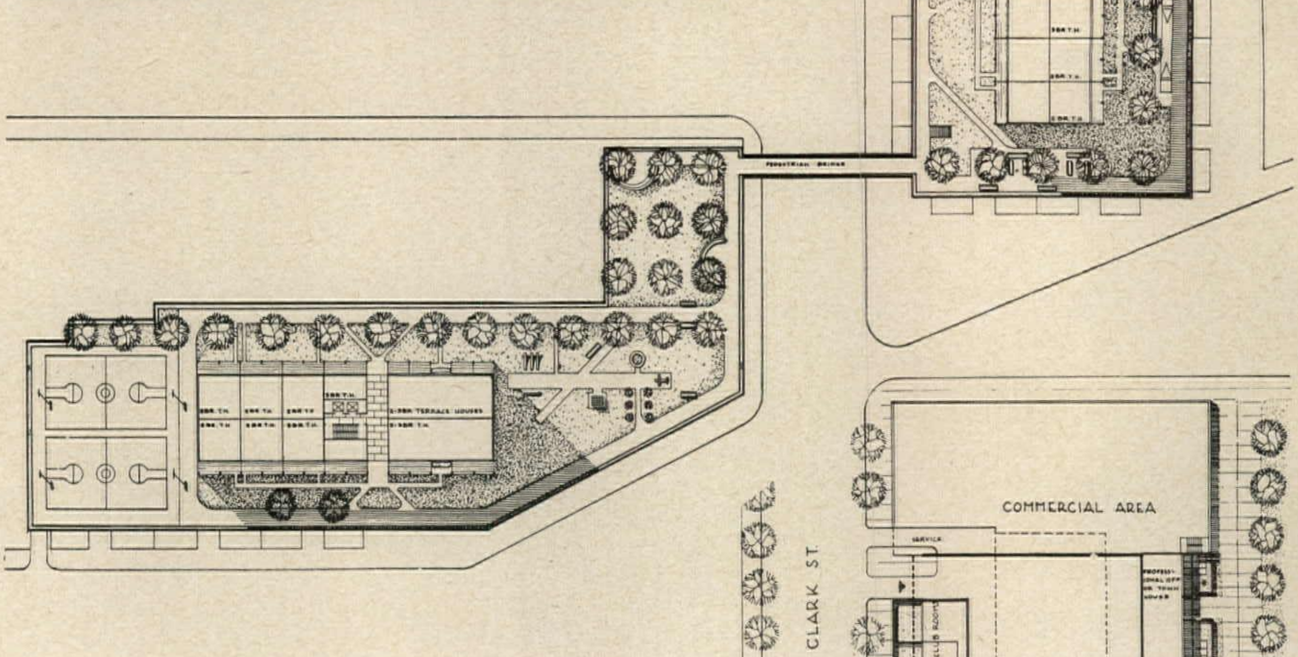
BROOKLYN PROJECT FEATURES AN ELEVATED PARK

Cadman Plaza Redevelopment Project, Brooklyn, New York; M. Milton Glass and Whittlesey & Conklin, Architects and Planners; Max Mishkin, Sponsor; Adson Builders and Taylor International Corp., Builders; Mutual Housing Sponsors, Consultants

The design for this project features an elevated park (or recreation terrace) for residents, raised 20 ft above street level for privacy. The park will be built on the roof of a two-story base composed of town houses, stores, and parking garages, which covers nearly the entire project area. These elements will form an effective wall for the street spaces, and define them in a manner appropriate to the scale and character of the adjacent Brooklyn Heights area. The site is related to the new Civic Center and to a fine residential section; is located only 5 minutes from the Wall Street area, or 20 minutes from midtown Manhattan.

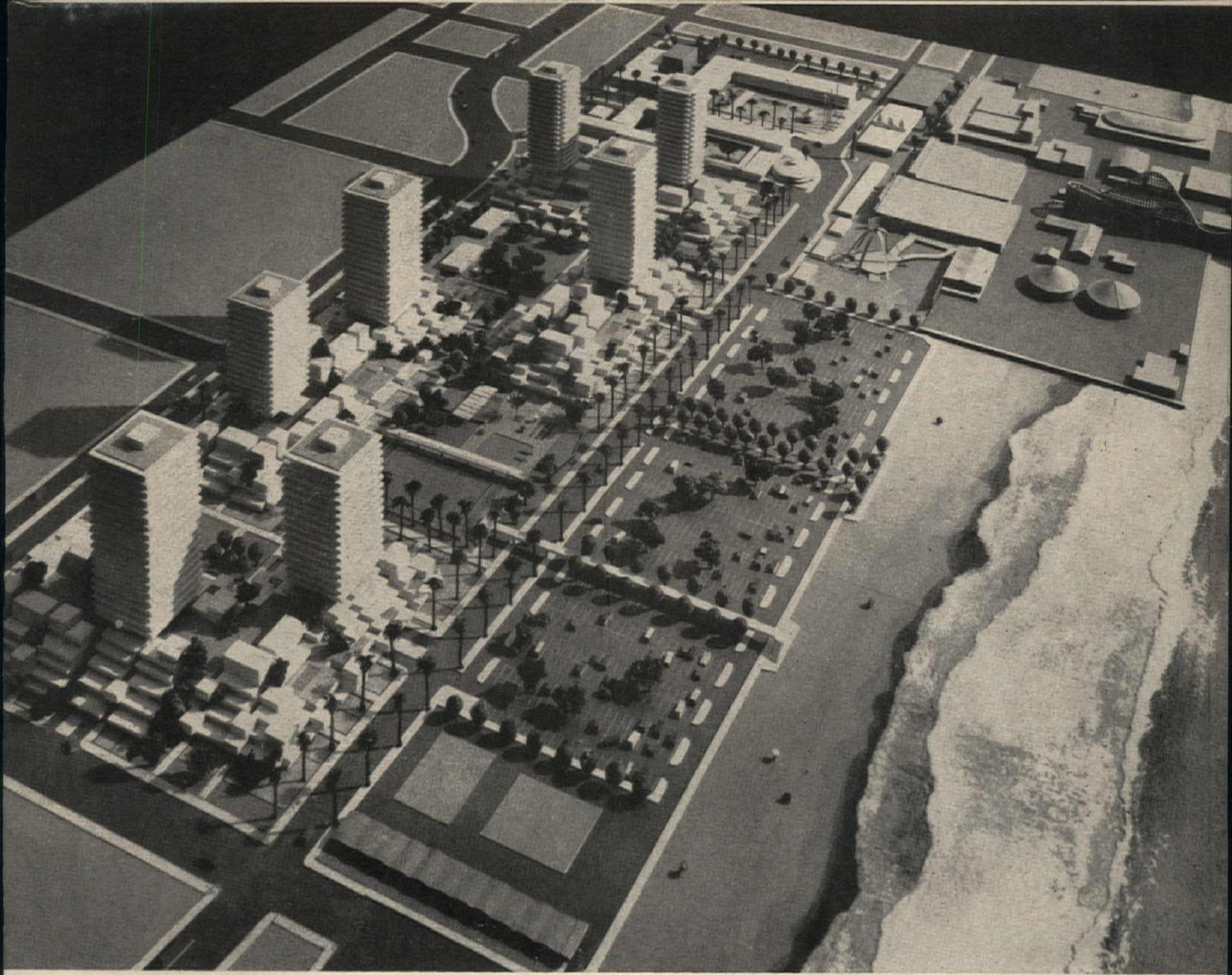
About 40 town houses will be provided, as well as a variety of apartments in the 22-story towers, as the first stage of the project is completed. Duplex terrace houses with small private yards will occupy the base of the high-rise units and make up their lower two stories at the level of the park.





Cadman Plaza Redevelopment, Brooklyn, New York

Above are shown plans at ground floor level and at elevated park level for that portion of the project to be built as a cooperative with FHA backing. Note how the two-story town houses and commercial spaces create an effective "wall" for the street space, of a scale and character appropriate to Brooklyn Heights, which is made up of brownstones, town houses, and occasional shops. Thus the project, although it includes high-rise apartments, will have an "edge" treatment that joins it gracefully to the existing city

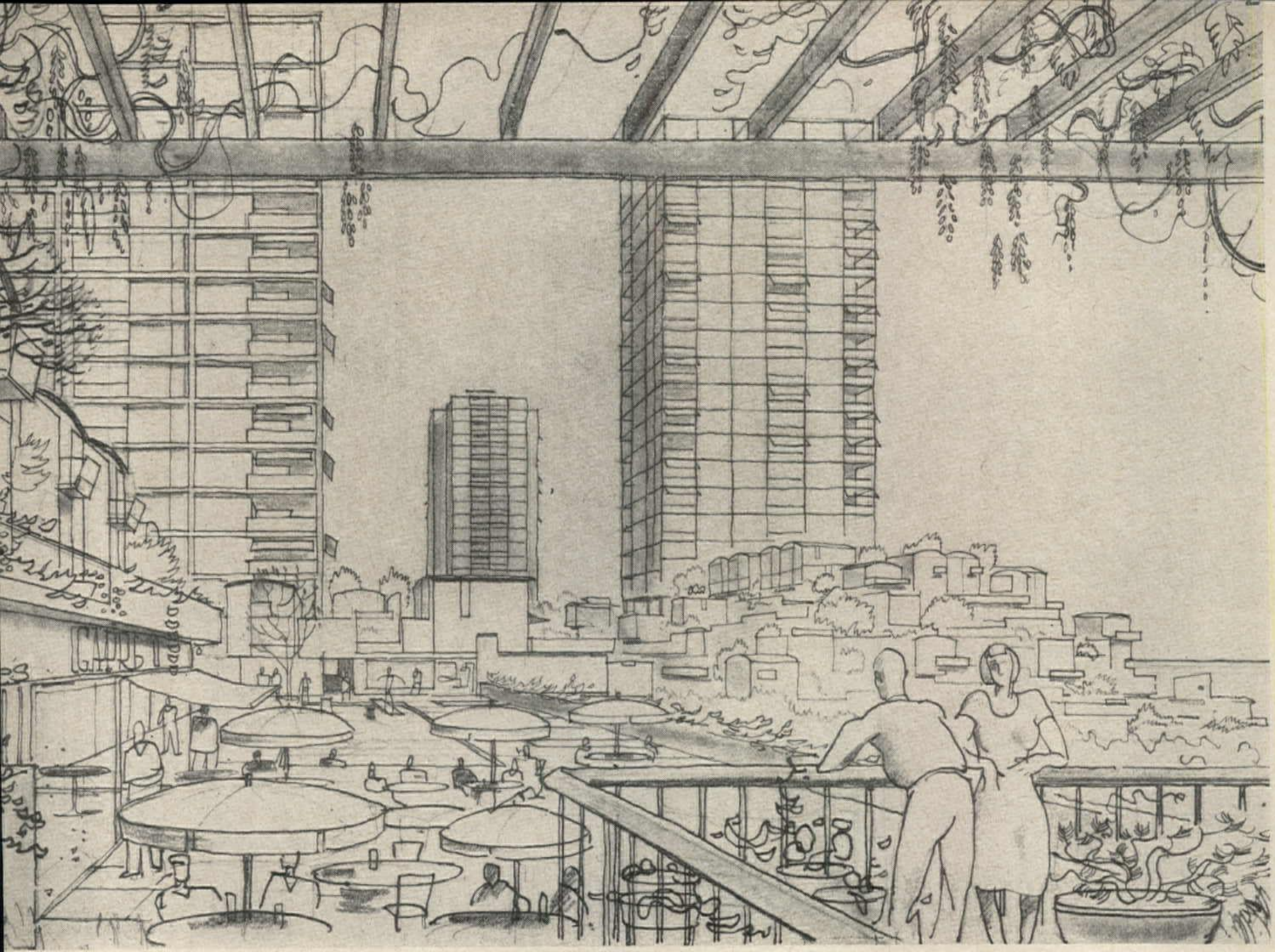


REDEVELOPMENT DESIGN WITH MAN-MADE "HILLS"

This interesting and unusual design captures some of the picturesque charm of a steeply sloping Mediterranean village by means of a series of man-made "hills." The concept stemmed from the wish to devote the land to people rather than cars. This led to the idea of tower apartments rising from multi-level parking garages, the sloping exterior of which is given over to six levels of terrace apartments. Outside steps climb from street to roof at frequent intervals, with landings at apartment entrances, which can also be reached by elevators. Cars are conveniently parked adjacent to one's dwelling.

Seven towers rise from the "hills" to provide necessary population density, and offer a variety of apartments with cross-ventilation and a two-way view. The solution packs low-rise units together in such concentration that a 50-50 ratio of high and low-rise dwellings is commercially feasible for the site. The triple land use—for garages, terrace apartments, and towers—leaves a large portion of the site free for recreation and gardens.

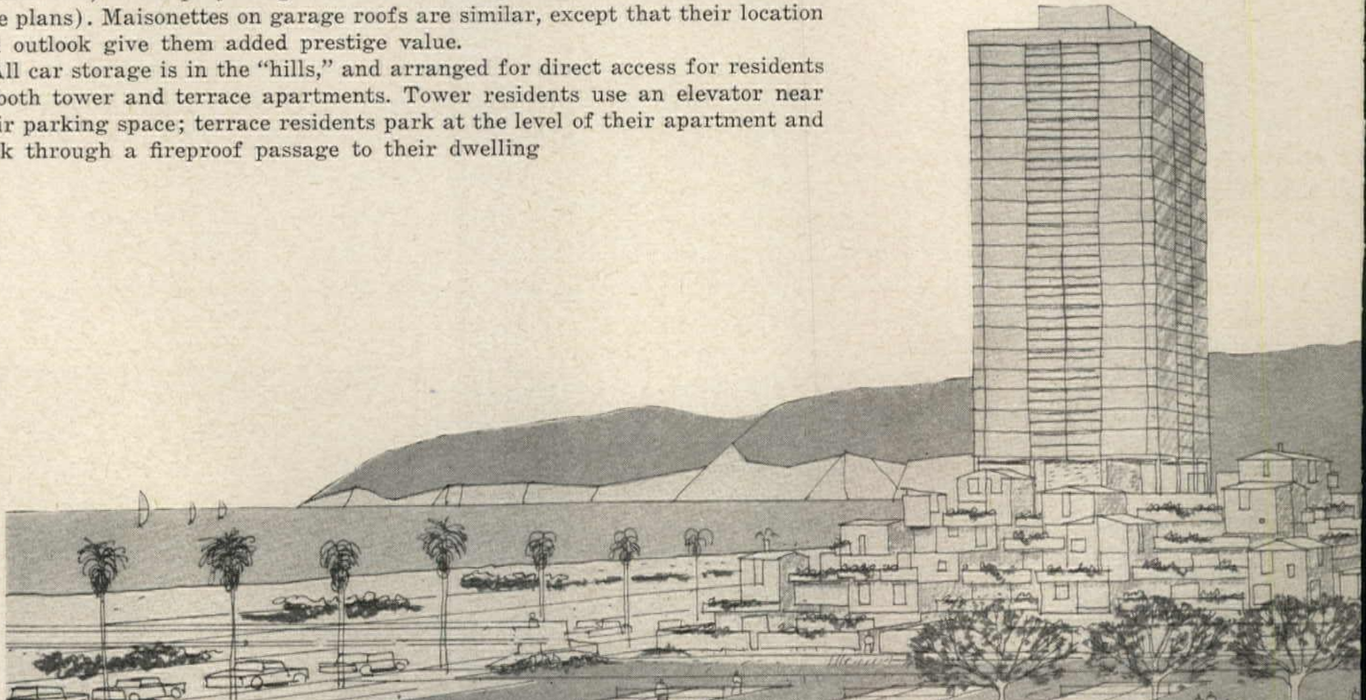
Proposed Design for Ocean Park Towers, Santa Monica, California; Perini—Santa Monica Associates, Redeveloper; DeMars & Reay, Associated Architects; Pietro Belluschi and Charles Eames, Special Consultants; Stefan J. Medwadowski, Structural Engineer; Alexander Boome, Mechanical Engineer; Sasaki, Walker & Associates, Landscape Architects

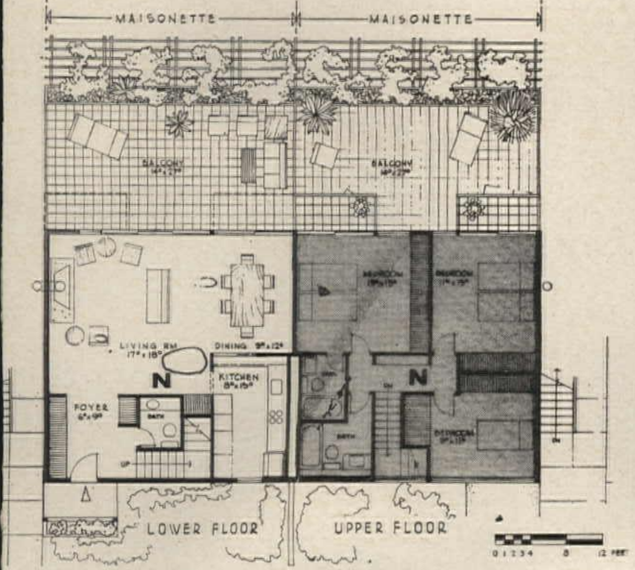


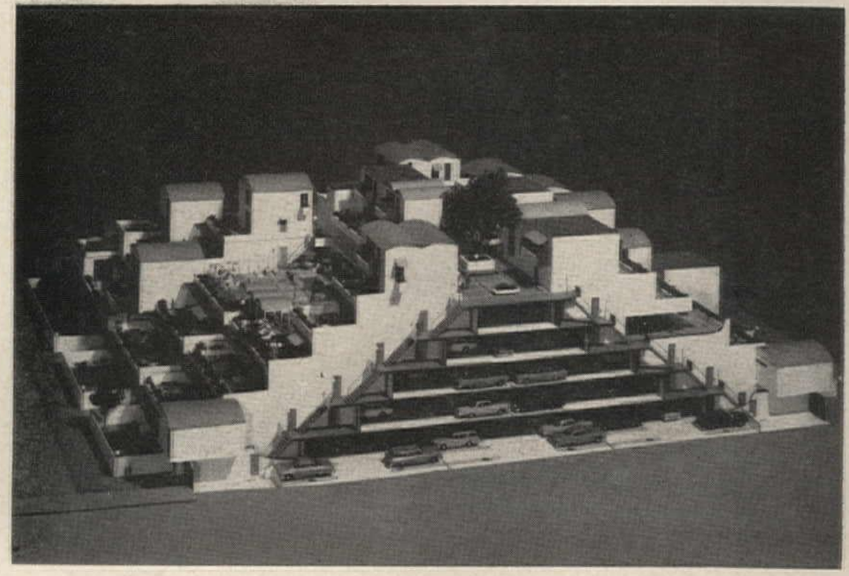
Ocean Park Towers, Santa Monica, Cal.

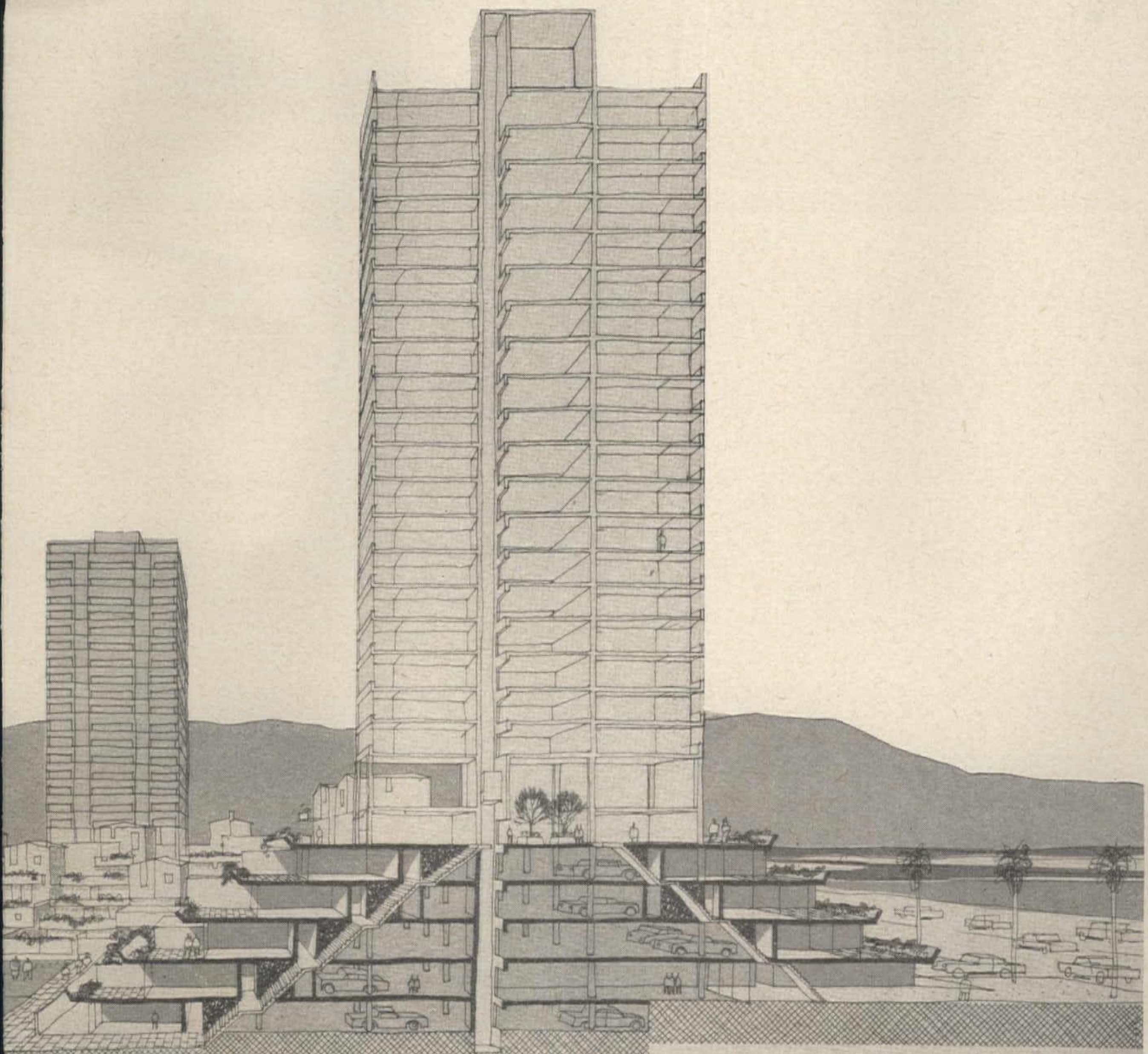
Unusual flexibility in size and type of apartment, as well as notable accessibility between car and living unit, is possible with the "hill" concept. By projecting a unit beyond the normal building line, one or two bedrooms can be added to a basic unit, or the projecting unit can be arranged as a two-story maisonette (see plans). Maisonettes on garage roofs are similar, except that their location and outlook give them added prestige value.

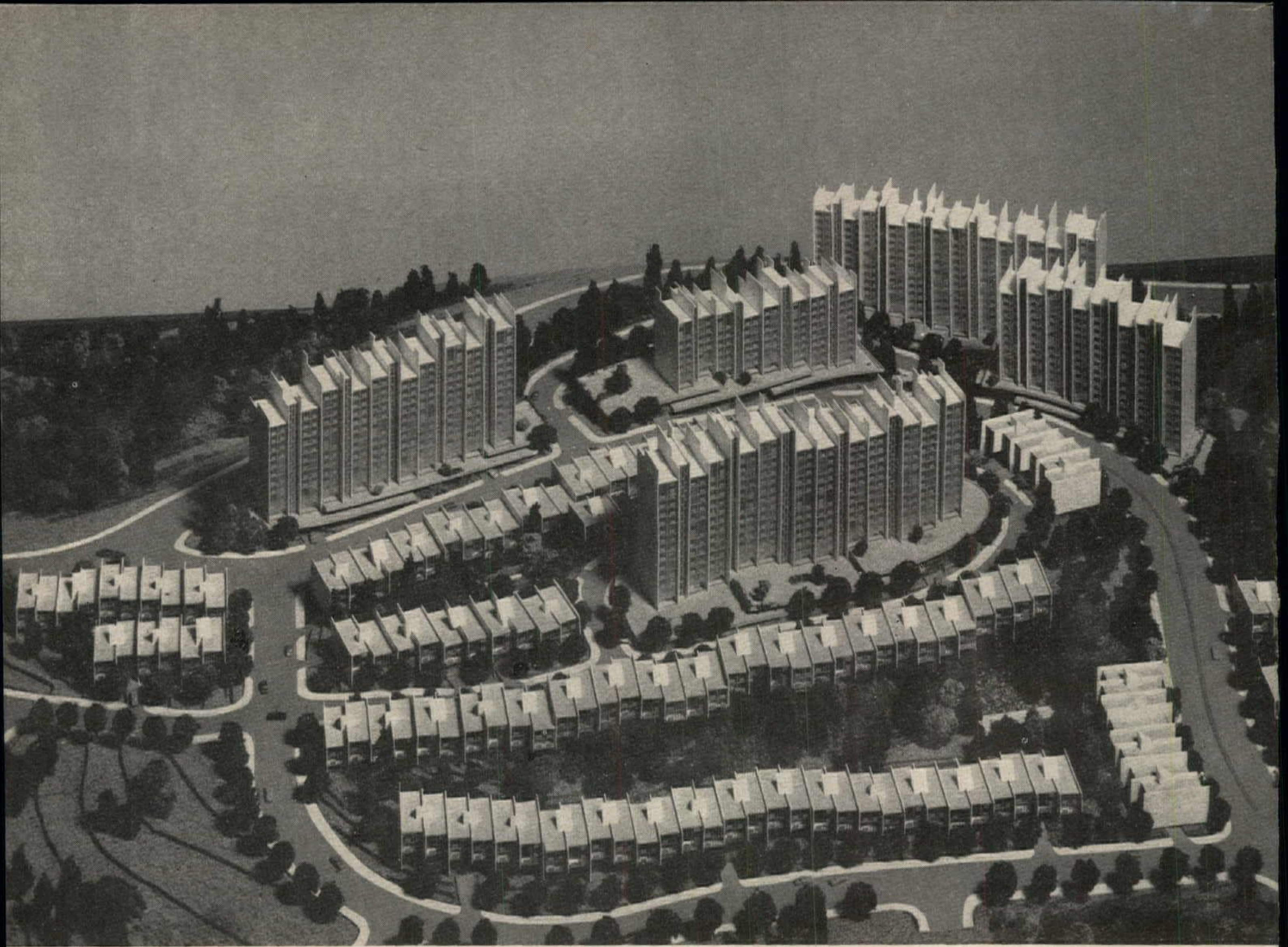
All car storage is in the "hills," and arranged for direct access for residents of both tower and terrace apartments. Tower residents use an elevator near their parking space; terrace residents park at the level of their apartment and walk through a fireproof passage to their dwelling




MAISONETTE
MAISONETTE
BALCONY
BALCONY
LIVING RM
DINING
KITCHEN
FOYER
LOWER FLOOR
UPPER FLOOR

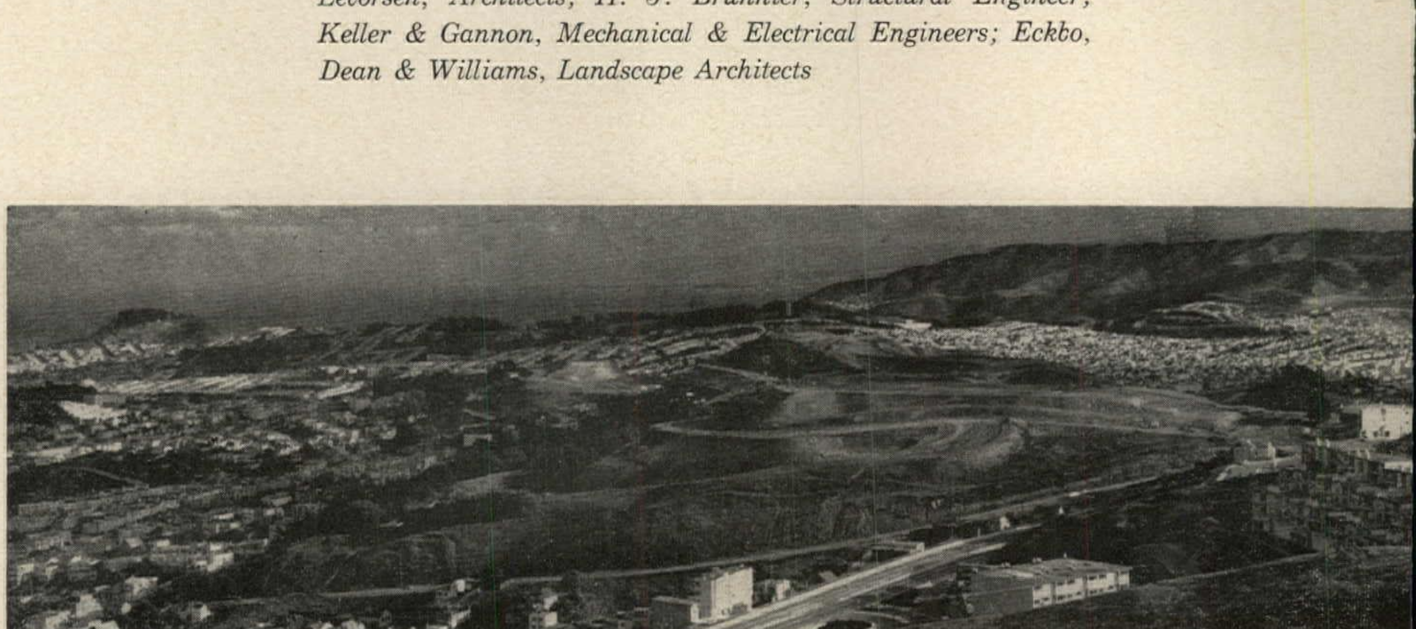


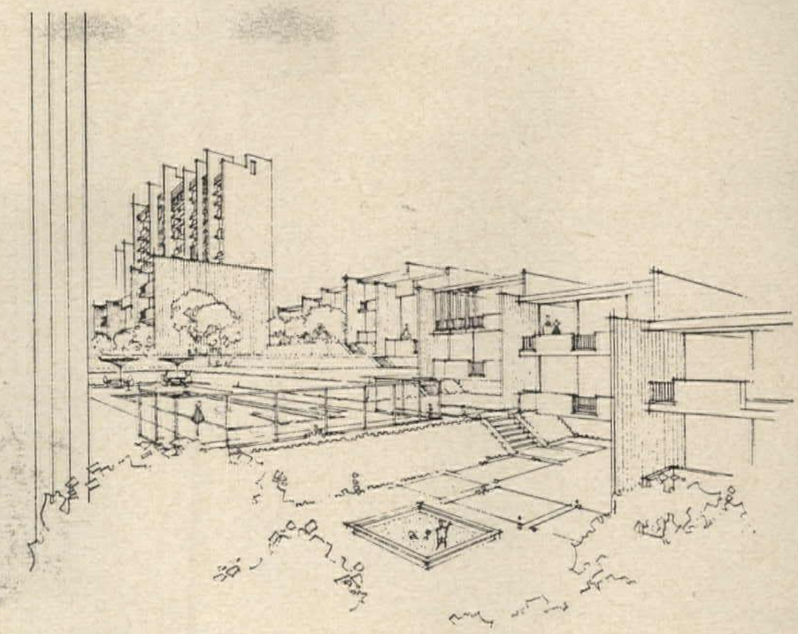




DIAMOND HEIGHTS, RED ROCK COMPETITION WINNER

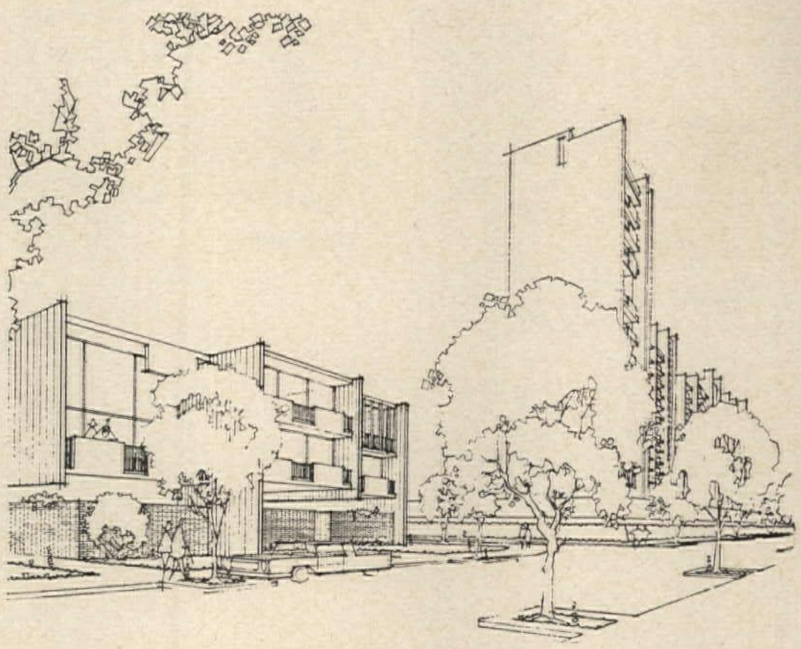
Red Rock Hill, Diamond Heights Redevelopment, San Francisco; San Francisco Redevelopment Agency, Sponsor; Peninsula Apartments, Developer; B. Clyde Cohen and James K. Levorsen, Architects; H. J. Brunnier, Structural Engineer; Keller & Gannon, Mechanical & Electrical Engineers; Eckbo, Dean & Williams, Landscape Architects

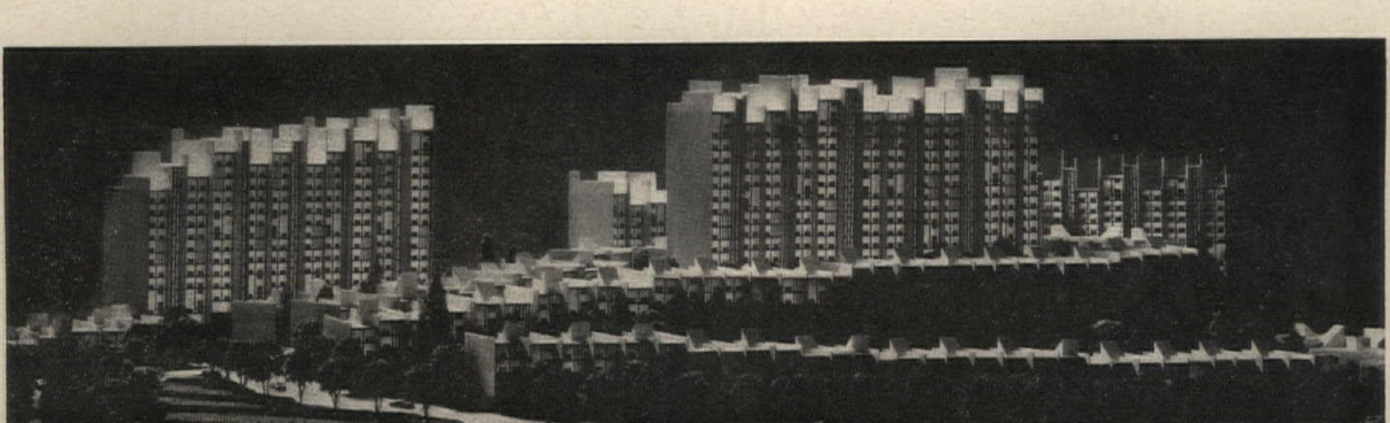




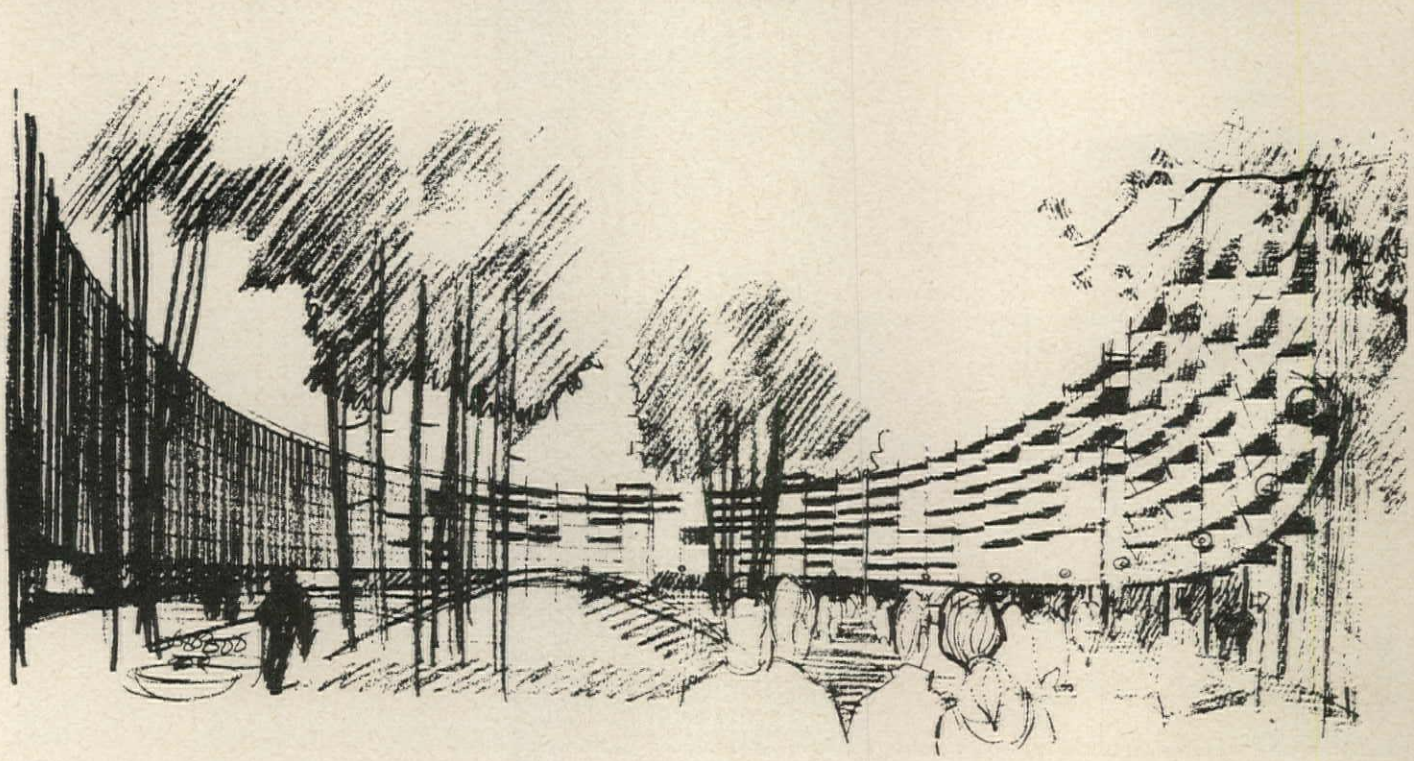
Chosen from four finalists in a national competition, this design for 960 residential units on 22 acres on the crest of Red Rock Hill in San Francisco was selected by the low bid developers for the site. They anticipate spending 20 million for construction, in addition to the 4½ million land cost. Building is expected to start in the spring.

Of interest is the unique method of trying to set the architectural character for an urban area—conceived and carried out by the San Francisco Redevelopment Agency. First step was to set up (with AIA help) a national competition, which drew 90 entries. A jury of three architects, a developer, and an economist selected ten schemes, from which the Agency chose four that they "would be pleased to have built." The architects for these four were then interviewed and their designs discussed by the various developers, who could then choose the scheme they liked best as the basis for their property bid. Tentative selection of architectural scheme had to accompany the bid; final selection of design was to be settled at a fixed date about six weeks later. The developer will be required to employ the architects of the selected design.





GROPIUS DESIGNS GIANT BERLIN REDEVELOPMENT



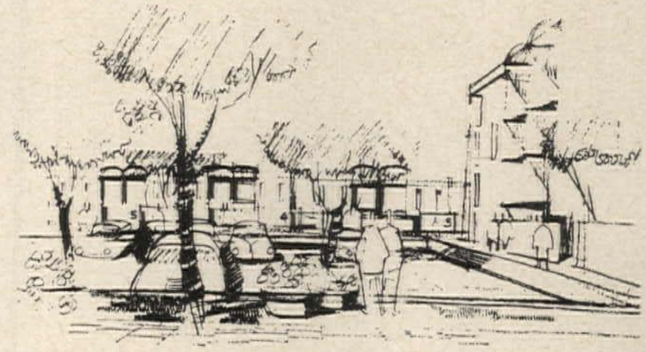
Gehag Redevelopment, West Berlin
The Architects Collaborative International Ltd., Architects
Walter Gropius, Benjamin Thompson, In charge;
H. Morse Payne Jr., Associate
Richard Homer, A. A. Tappe, Assistants
Wils Ebert, Berlin, Associated Architect

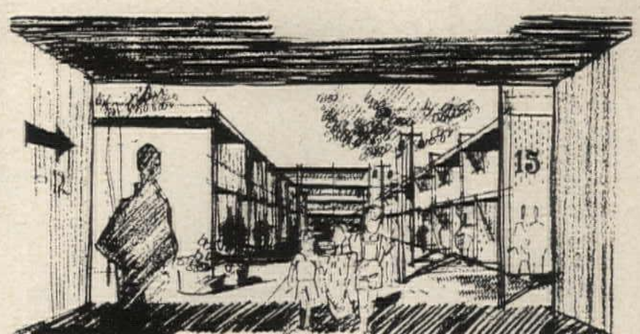
This large redevelopment—comprising 16,400 dwellings for 44,000 persons—will have, in the words of architect Walter Gropius, "three town centers, one somewhat larger than the other two, serving the whole area of 650 acres. The West Berlin site is the last comprehensive piece of land, mainly farming, which is to be built over in one stroke.

"The entire settlement will be free of smoke, since it will be heated from a central plant. At our suggestion the 4-story walk-up units have now been replaced by 3-story blocks. Working drawings are at present being developed in Berlin; actual construction will start this coming spring. The buildings will be designed not only by TAC, but also by several German architects and by the GEHAG. The GEHAG is an old non-profit organization for housing which has built thousands of units since World War I."

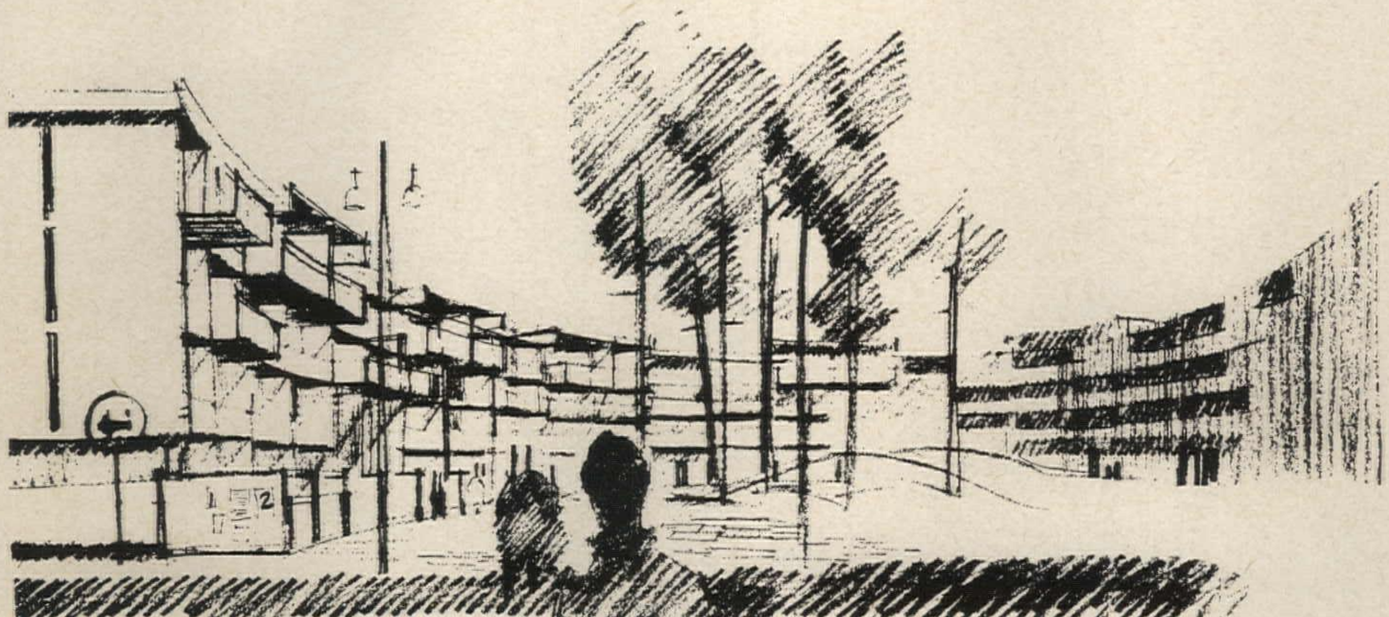
The 638 buildings that make up the new town will be interrelated to surrounding communities through common parks, schools, and commercial facilities located in the perimeter of the new project. A 54-acre public green along the U-bahn, which runs through the site, will give visual order to the design and provide an activity center offering a large variety of attractions for young and old. The housing units—grouped for neighborhood identity—include units of from one to 4½ rooms.


Neighborhood residential court

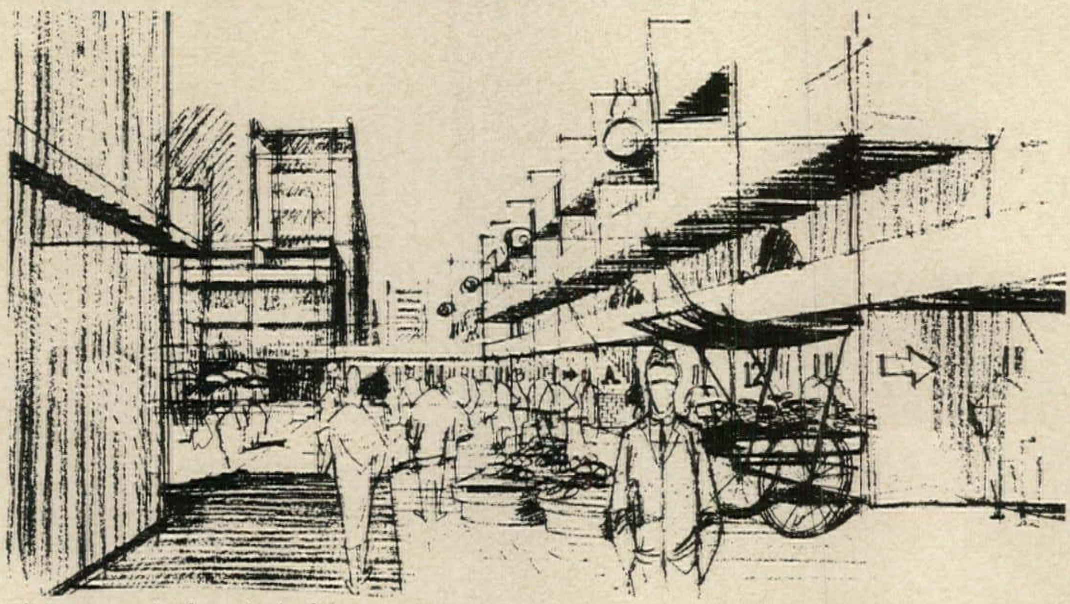

Residential parking areas



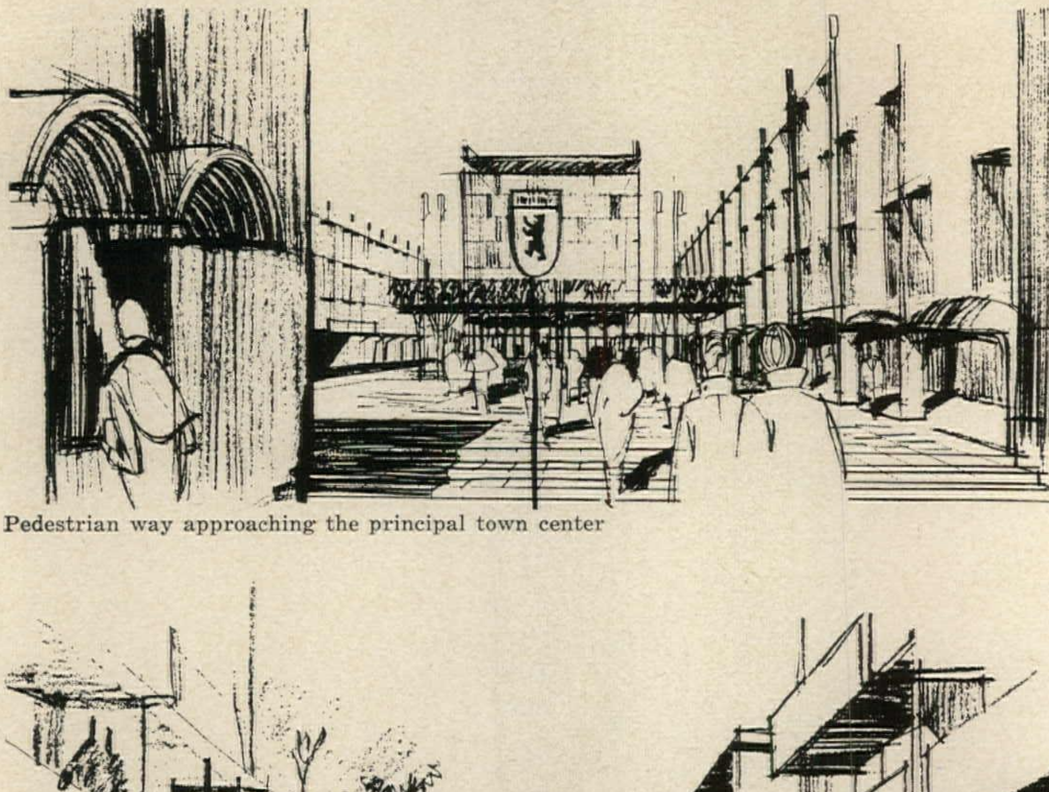
Two-story dwelling units


Left, 8-story "ring" apartment; above, small housing crescent

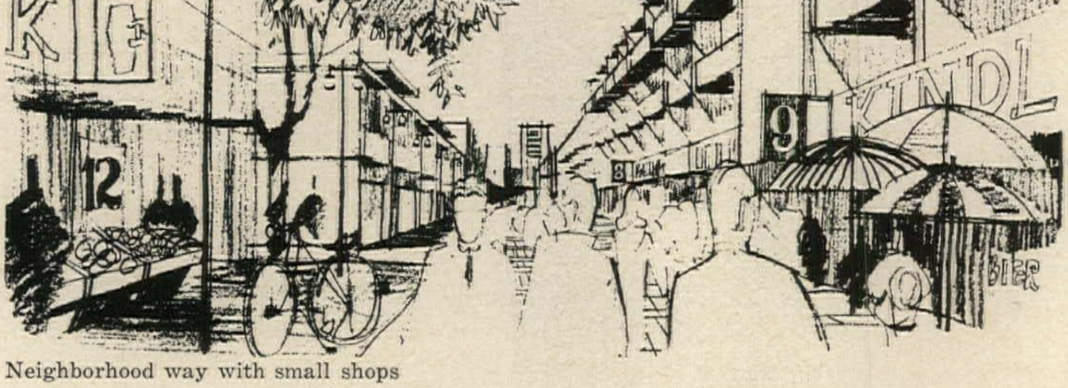
Gehag Redevelopment, West Berlin



Civic square in the principal town center



Pedestrian way approaching the principal town center



Neighborhood way with small shops

Joseph W. Molitor

DESIGNING AGAINST OBSOLESCENCE

Flexible and Expansible Mechanical and Electrical Services Dictate Form in Two Industrial Plants by Yamasaki

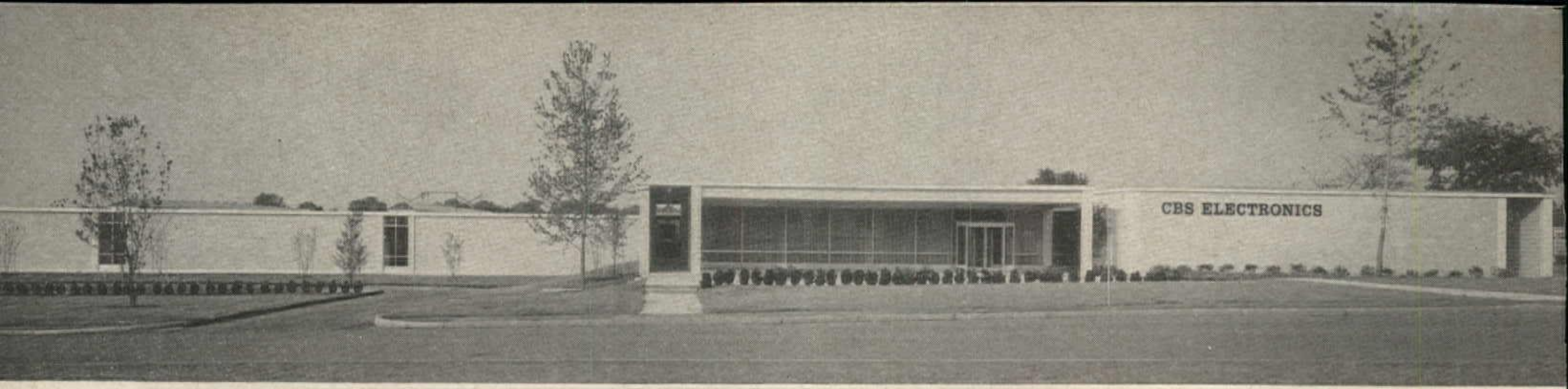
1. CBS Electronics*

* Land, building and certain inventories were purchased this fall from CBS Electronics by the Raytheon Company

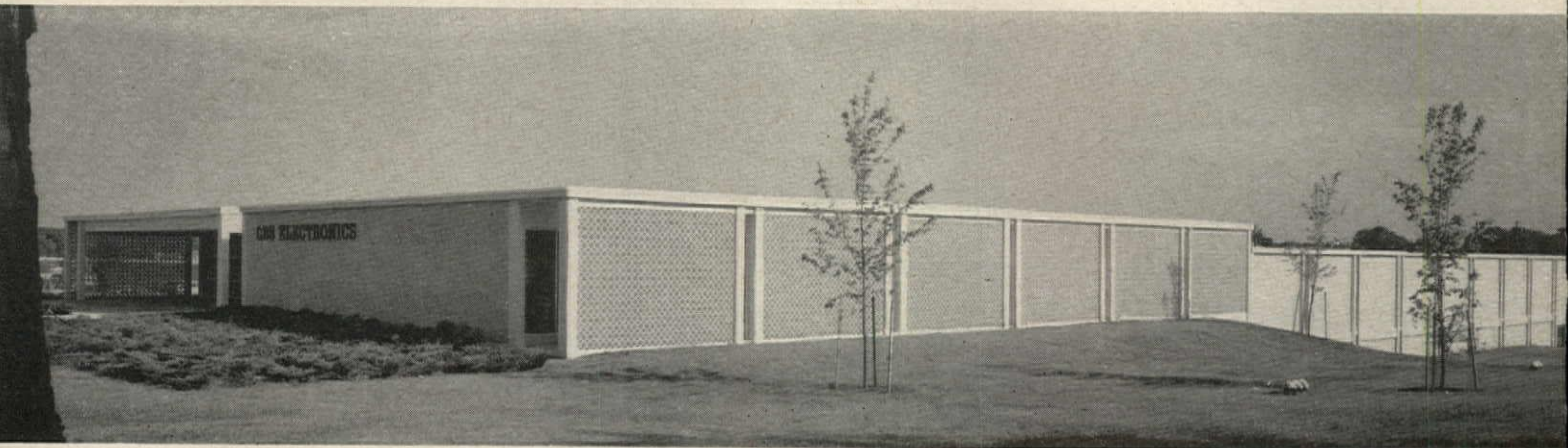
LOCATION: *Lowell, Massachusetts*
ARCHITECTS: *Minoru Yamasaki and Associates*
STRUCTURAL ENGINEERS: *Ammann & Whitney*
LANDSCAPE ARCHITECTS: *Eichstedt-Johnson Associates*
GENERAL CONTRACTOR: *Lilly Construction Co.*

Electronics manufacturing procedures are continually changing to keep pace with advances in the field. Maximum flexibility, therefore, was stressed as the key to this new plant. To make possible the constant revision of production facilities as new and improved production methods are devised and developed, an unusual two level building was designed. In the plant area, the lower level houses utilities which service manufacturing in the upper level. Punchout access holes for utility servicing are provided in a grid pattern in the floor of the upper level as indicated in the perspective study on page 115. Changes in the layout of manufacturing and the related servicing of utilities can be accomplished readily and easily. Manufacturing can continue while changes in utility piping are going on in the lower level. The manufacturing floor is free of construction and maintenance operations and is only affected during the short time that final utility connections are completed. With proper timing, manufacturing procedures can be changed without any of the delays normally associated with demolition, erection, piping and testing procedures.

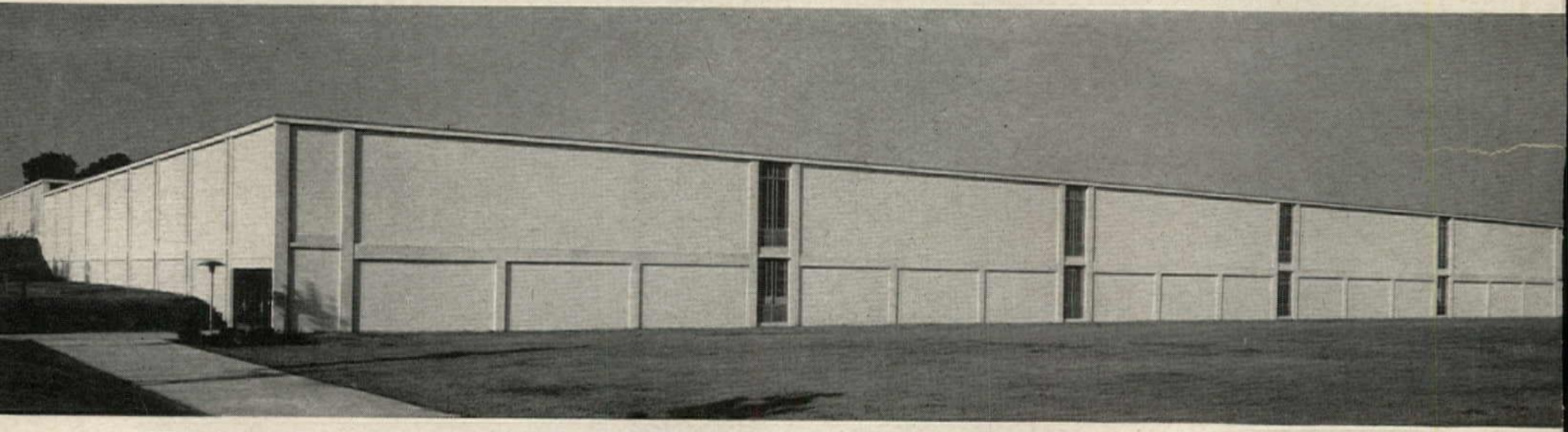
The basic contract cost of the building which comprises 2,284,109 cubic ft was $2,249,000.



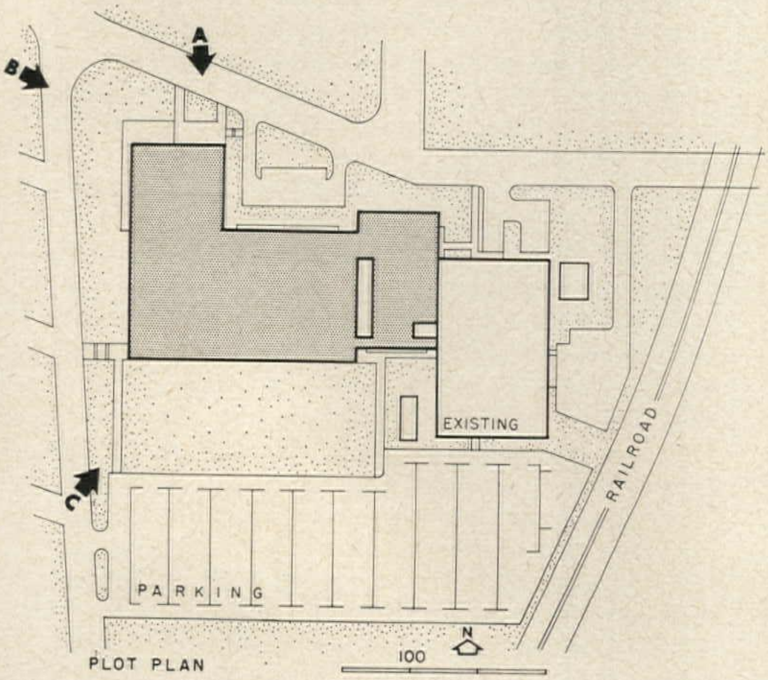
View from point A showing office wing with recessed main entrance



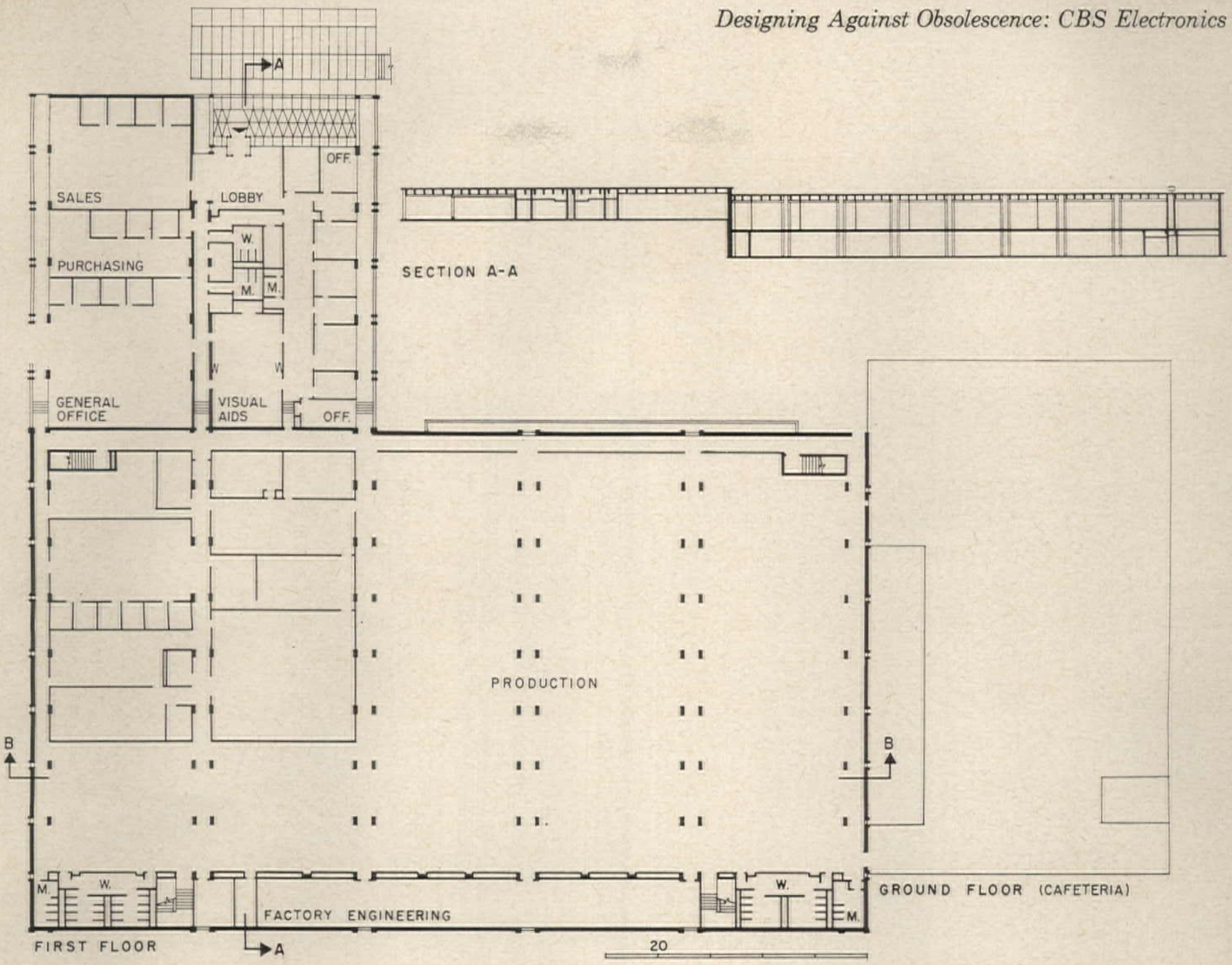
View from point B toward sun screen of hollow tiles shielding office glazing. Two level plant is beyond



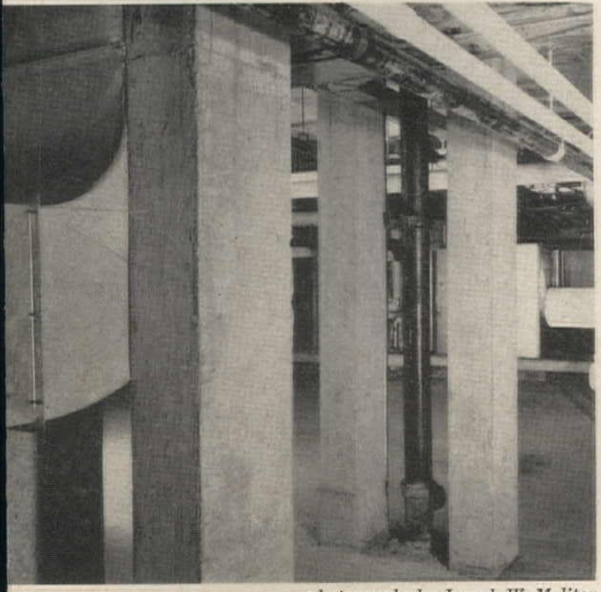
View from point C toward plant. Windows occur at ends of skylit corridors defined by double column rows

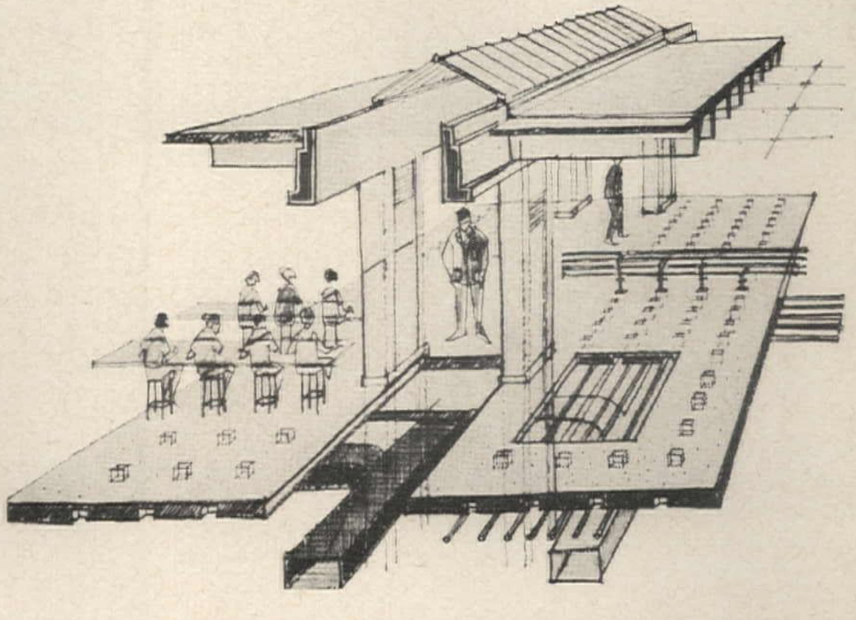


Columns are split to provide a 24 in. duct shaft to accommodate all mechanical and electrical lines, as shown in photograph and perspective rendering on opposite page. Supply and return air is circulated through grilles located on the face of the split columns. The ceiling of precast tees is thereby kept free of ductwork, permitting the concave recesses formed by the tees to act as reflectors for the continuous fluorescent fixtures placed between each tee. The 8 in. structural slab floor is perforated by a series of 4 in. by 6 in. by 6 in. styrene foam inserts located within a grid through which process piping lines are brought up from the utility space below to each production bench as required. The grid permits the production operation to be shifted or revised with a minimum of lost time



SECTION B-B

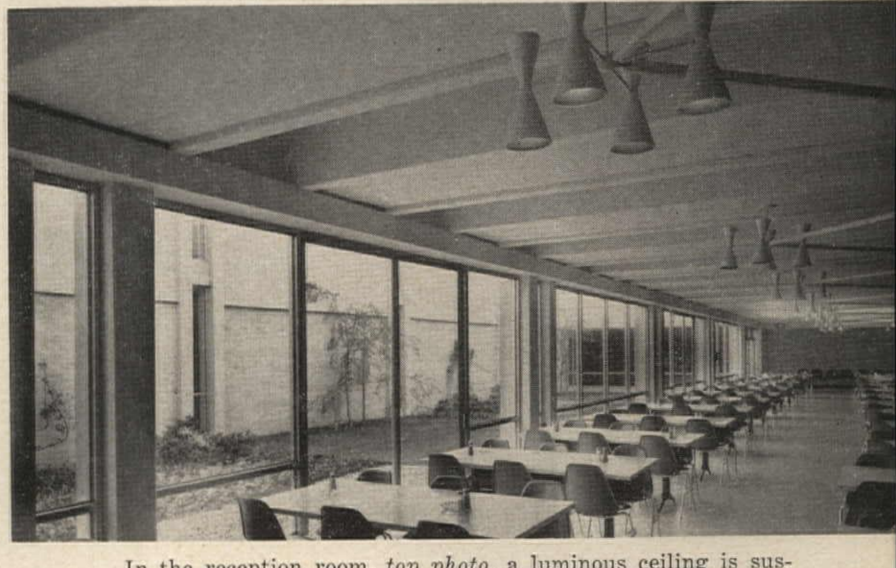




photographs by Joseph W. Molitor

In plant area windows occur at opposite ends of rows of split columns spanned by skylights. Mechanical and electrical lines located within split columns are concealed by inset panels painted a darker shade than the structural members to better articulate the basic structural and mechanical concept of the building. Note how well the supply or return air grilles integrate as part of this expression of structure and equipment

photographs by Joseph W. Molitor



In the reception room, *top photo,* a luminous ceiling is suspended below the structural tees. In the general office areas, *middle photo,* as well as in the plant proper these precast concrete tees are exposed and painted, emphasizing their shape and esthetic values. The precast prestressed concrete system was chosen for its cleanliness, very necessary to this manufacturing process, its fireproof quality and its light reflective qualities. The lighting over the work areas is artificial, to produce an absolutely controlled amount, also required by the characteristics of electronics manufacturing. Lighting in the cafeteria is incandescent, *bottom photo,* and alternate concave spaces formed by the roof tees are filled with acoustic tile

Joseph W. Molitor

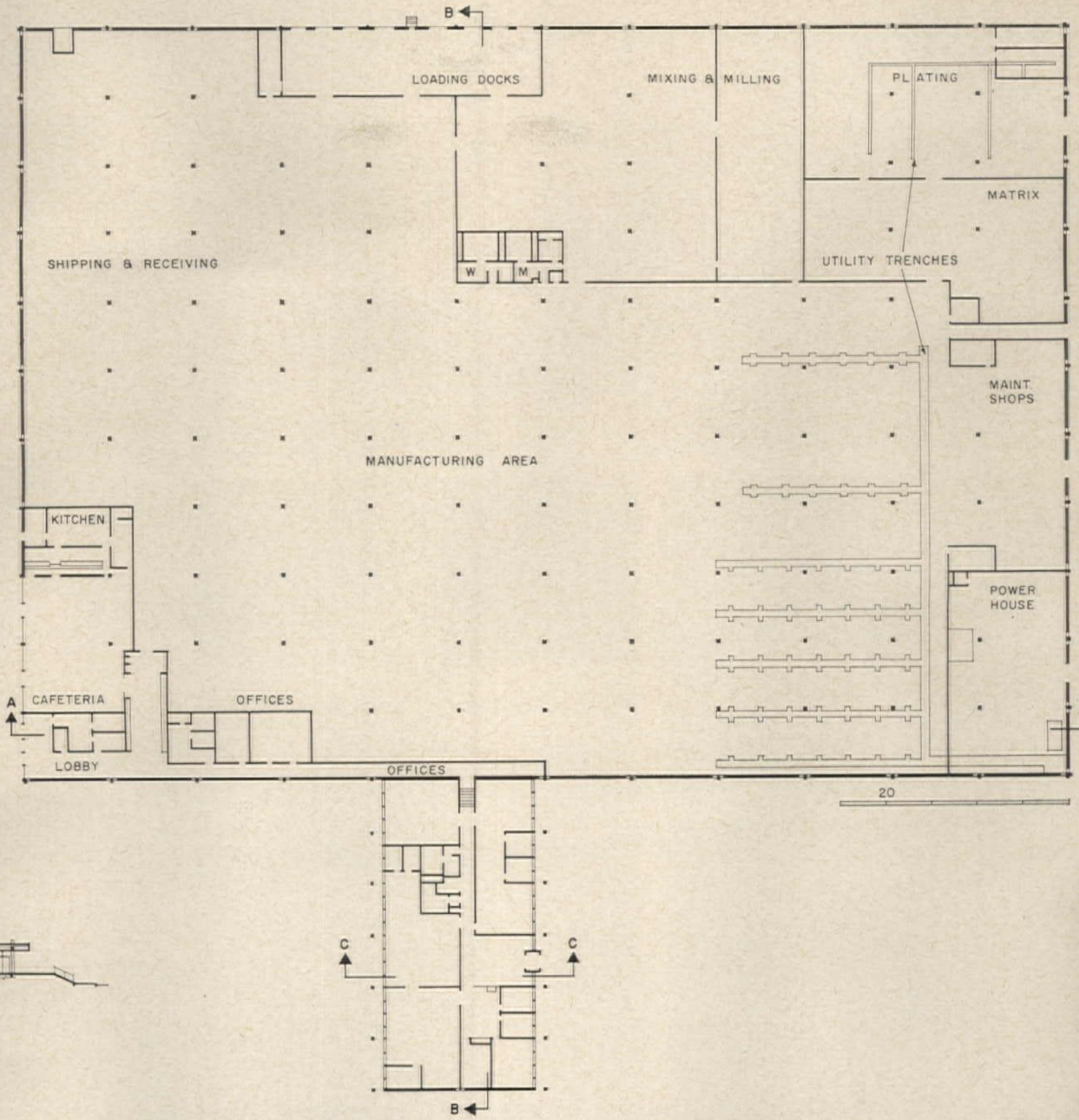
2. Columbia Records

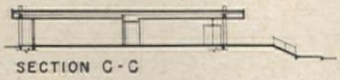
OWNER: *Columbia Broadcasting Systems, Inc.*
LOCATION: *Pitman, New Jersey*
ARCHITECTS: *Minoru Yamasaki and Associates, Inc.*
STRUCTURAL ENGINEERS: *Ammann & Whitney*
LANDSCAPE ARCHITECTS: *Eichstedt-Johnson Associates*
GENERAL CONTRACTOR: *Irwin & Leighton, Inc.*

The design criteria for this phonograph record manufacturing plant stressed maximum flexibility and a minimum of spatial obstructions. Maintenance had to be made simple. These requirements were necessary to accommodate the constantly changing manufacturing techniques in a process which receives continuous review and scrutiny for improving methods of manufacturing and quality control. Yamasaki and his associates have designed this plant so that changes in manufacturing methods, flow of materials and quality control procedures can be made easily and with little interference with production. The manufacturing process is centered around a compression and ejection moulding press area which is served by a unique system of underfloor trenches containing process piping concealed below the operating floor, but easily accessible for service.

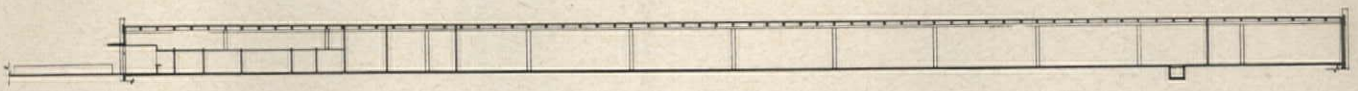
The building is constructed of precast structural elements, including columns, purlins, girders and roof decking. Flexibility is featured in the arrangement of roof girders, joists and precast panels. There is a $2\frac{1}{2}$ in. opening between points of contact of joists and roof panels so that hanging equipment of any nature may be easily installed. (See isometric rendering on opposite page.) Since materials handling at this plant is primarily by overhead conveyers, the ease of hanging equipment lends itself to great flexibility of plant operation.

Materials used in the plant construction result in a minimum maintenance requirement.

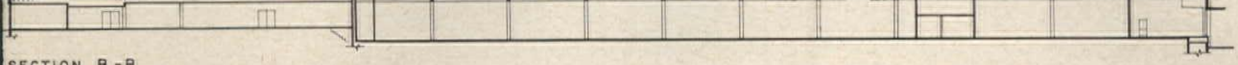




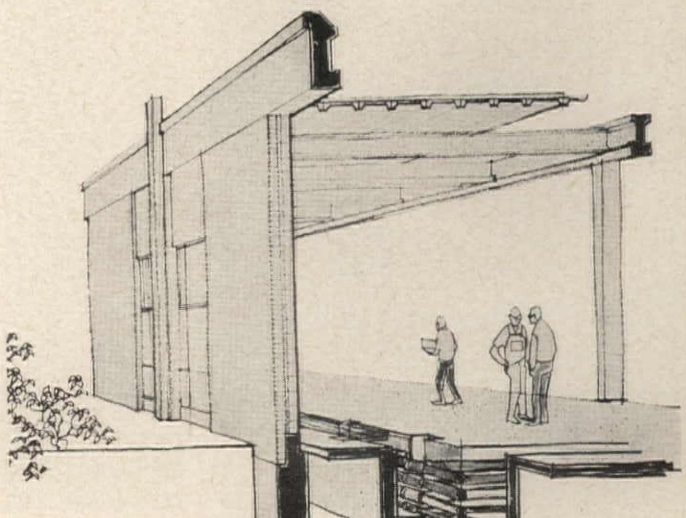
SECTION C-C



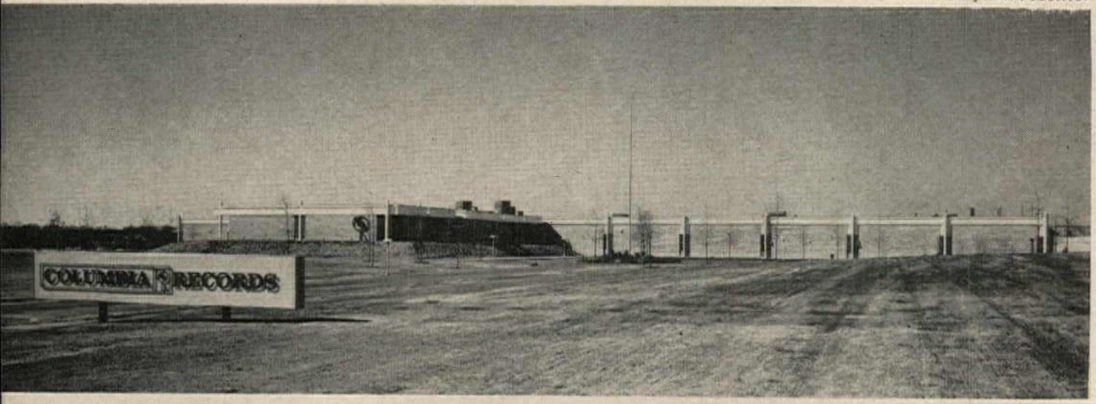
SECTION A-A

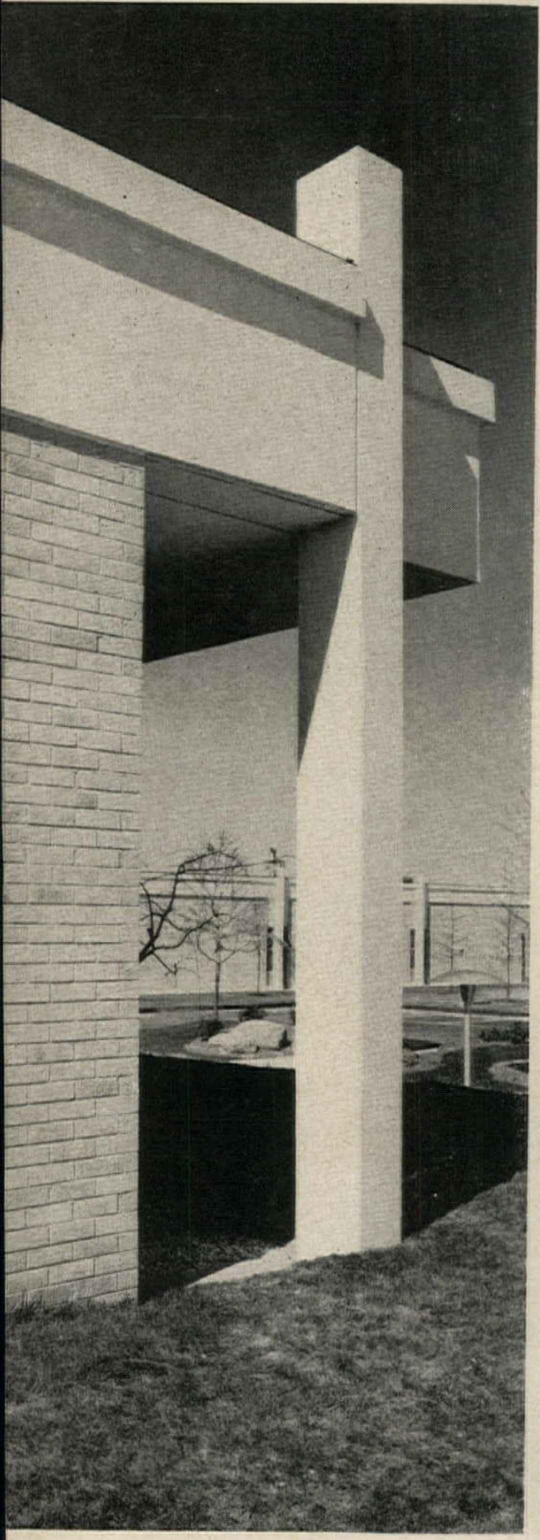


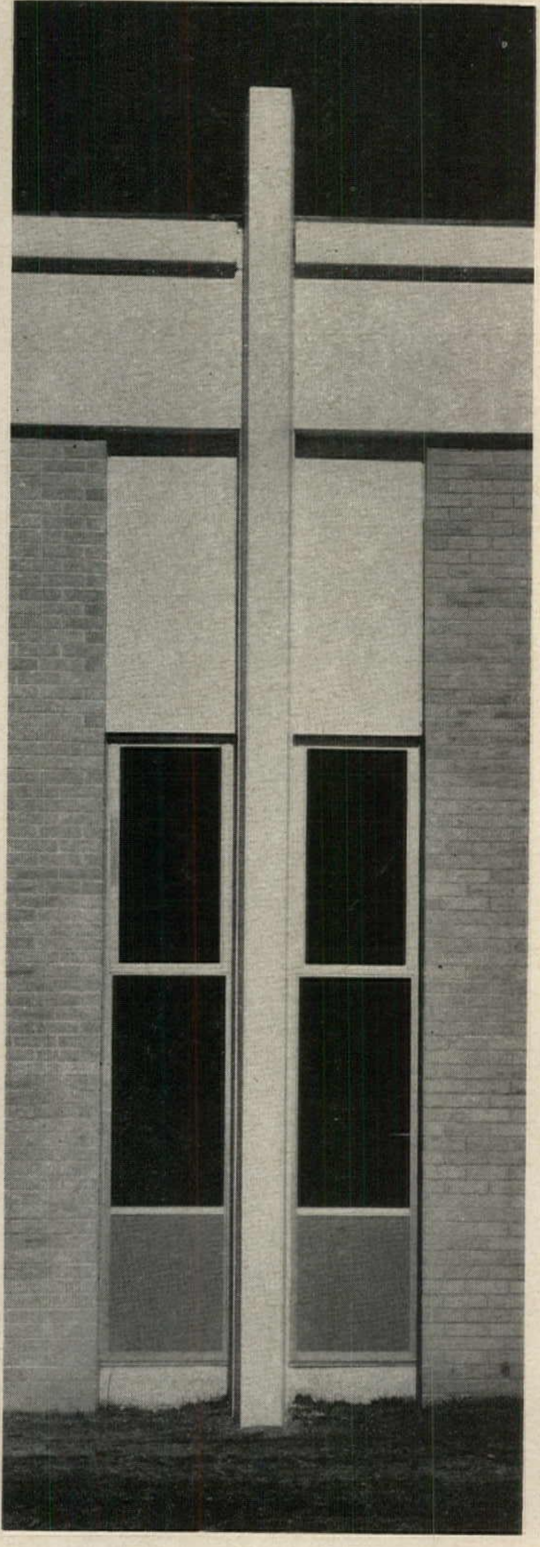
SECTION B-B



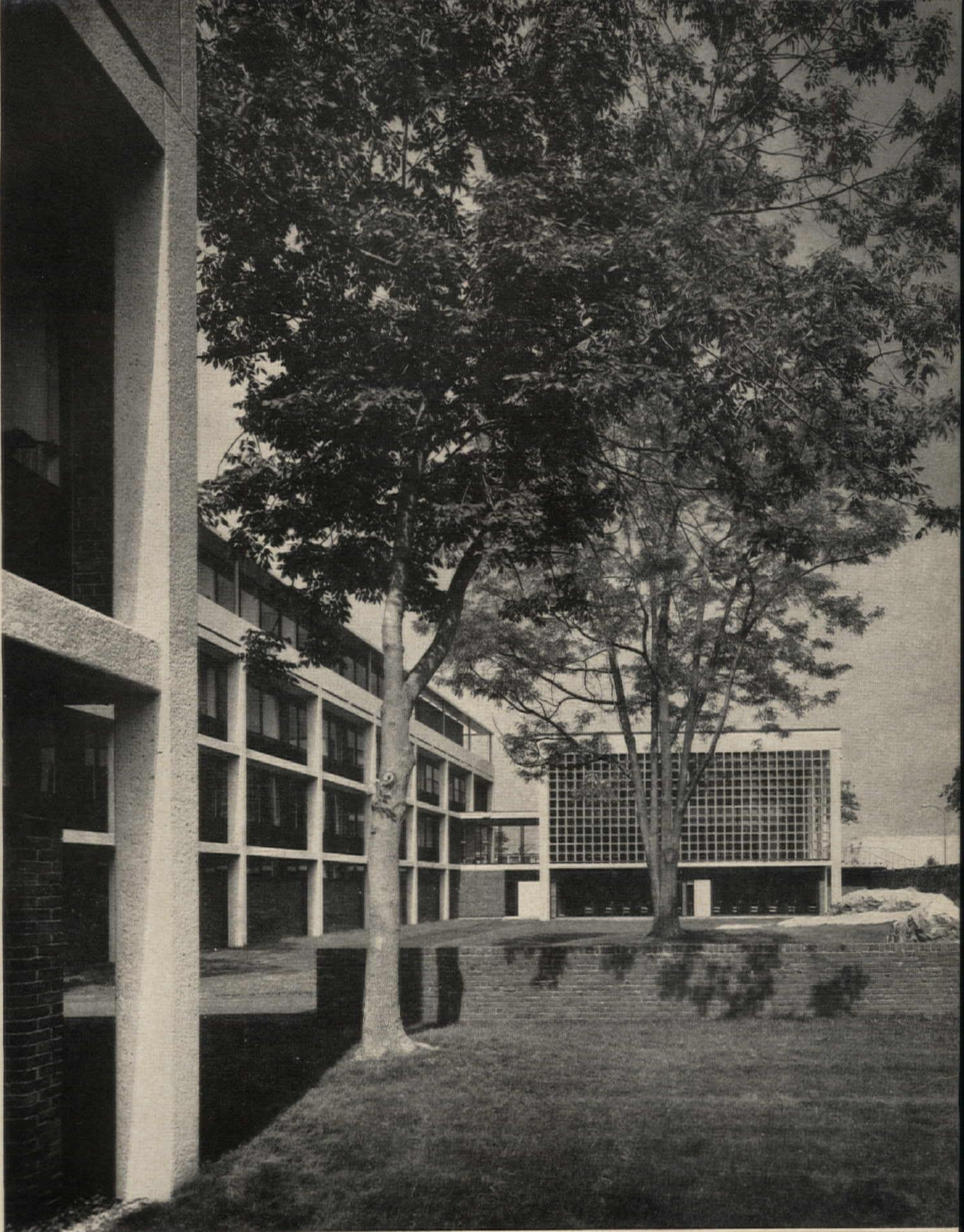
Joseph W. Molitor







The basic structural elements of the building, the sculptured precast columns and spandrels, are expressed and emphasized by narrow vertical fenestration which also frames and accents the pink sand finish brick panels



Photographs by Ezra Stoller

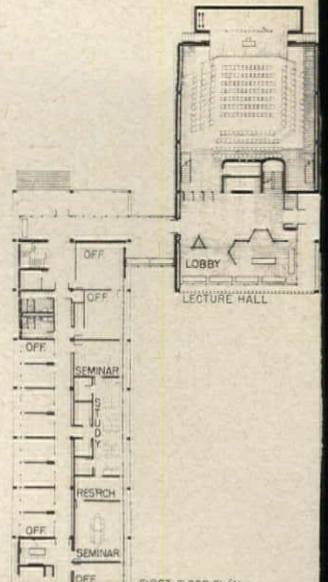
A New Manner at Brandeis

The new Social Science Center by The Architects Collaborative is one of Brandeis University's latest acquisitions for its thriving collection of contemporary American architectural styles

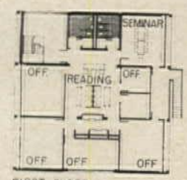
NAME: *Social Science Center*
(Lemberg Hall, Brown Hall, Schwartz Lecture Hall)
OWNER: *Brandeis University*
LOCATION: *Waltham, Massachusetts*
ARCHITECTS: *The Architects Collaborative;*
partner-in-charge, Benjamin Thompson;
job captain (office), Terry Rankine;
job captain (field), W. Lawrence Garvin
STRUCTURAL ENGINEERS: *Simpson, Gumpertz and Heger*
MECHANICAL ENGINEERS: *Reardon and Turner*
ELECTRICAL ENGINEERS: *Thompson Engineering*
ACOUSTICAL ENGINEERS: *Bolt, Beranek and Newman*
CONTRACTOR: *G. B. H. Macomber Company*

A high order of architectural striving prevails at Brandeis University, a new institution which acquired its land as recently as 1946. For the past thirteen years five of America's leading architectural firms have been executing individual commissions on this rocky New England campus, each in its own way. Overall control of the character of the campus architecture begins and ends with the master plan prepared by Harrison and Abramovitz (superseding one by Saarinen who completed two separate building groups according to his own master scheme). The Harrison and Abramovitz master plan established the location of each building group planned for the university. Separate design assertions within this controlled framework, produced by such diverse firms as Eero Saarinen and Associates, Harrison and Abramovitz, Shepley Bulfinch Richardson and Abbott, Hugh Stubbins and Associates and The Architects Collaborative result in a campus which every architect should visit if he has a chance. For here in one steeply sloping, rugged spot, where continuity was originally attempted and discontinuity prevails, the visitor gets a highly condensed survey of some of the best American campus architecture and can see at once how abruptly its character keeps changing (sometimes quite arbitrarily in the work of the same office) within a period as short as thirteen years.

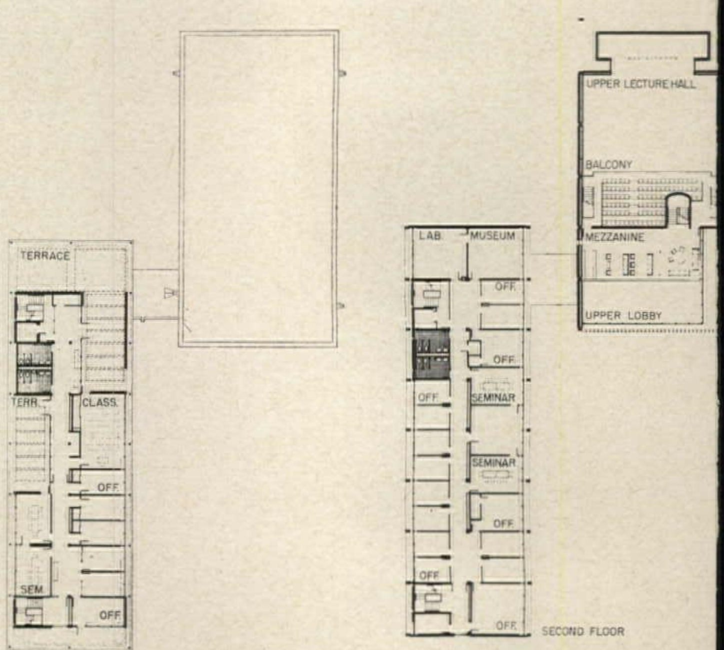
The latest and in some ways the most interesting work at Brandeis is by The Architects Collaborative. The two building groups by TAC, the Social Science Center shown on these pages and the Academic Quadrangle have singular authority. Architect Benjamin Thompson, partner-in-charge of the two building groups uses simple and familiar means for the Social Science Center; a reinforced concrete and steel frame with the concrete structural system exposed and its surfaces bushhammered, rose colored waterstruck brick walls with the brick exposed on the interior as well as the exterior, and a roof of prestressed tees also expressed in the interior where possible. The use of brick which looks handmade, the bushhammering which brings out the pebbles in the aggregate carefully selected for their color range, the use of quarry tile for floors with the soft difference in color and shape of each tile, and other subtle choices in a building carefully conceived in human scale, are part of Thompson's wish to express in a direct way the hand of man rather than the cold precision of the machine.



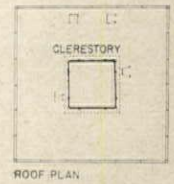
FIRST FLOOR PLAN



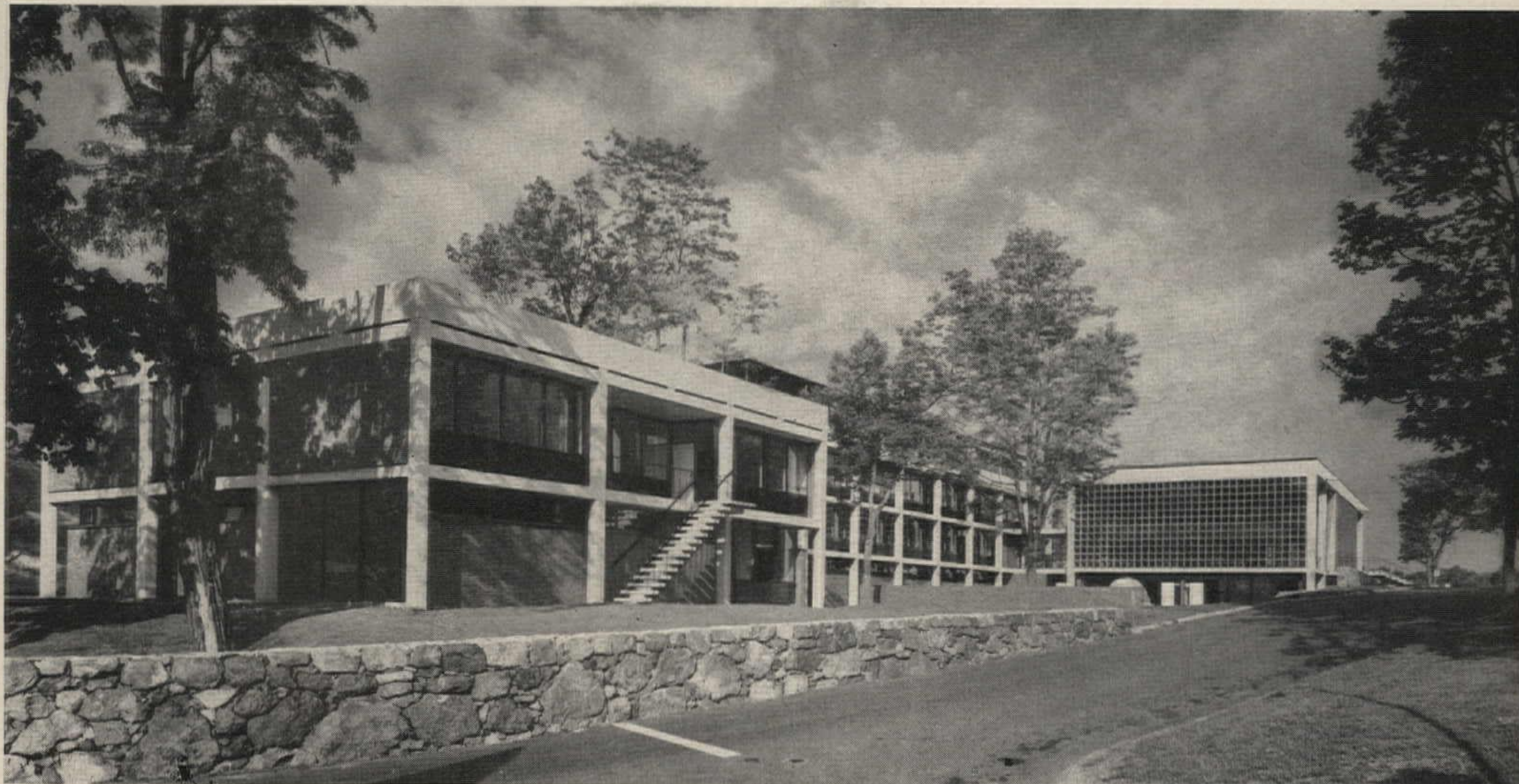
FIRST FLOOR



SECOND FLOOR

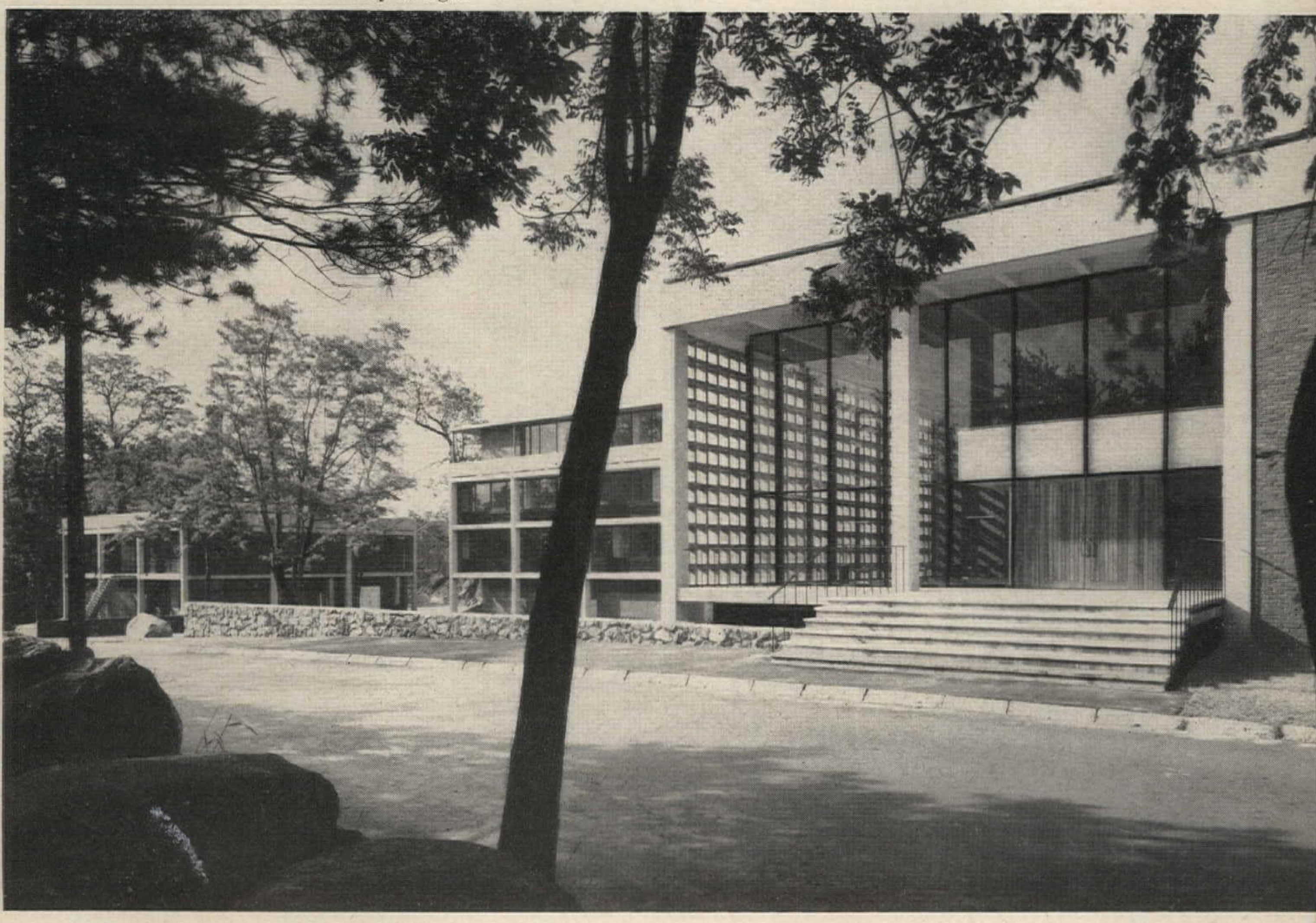


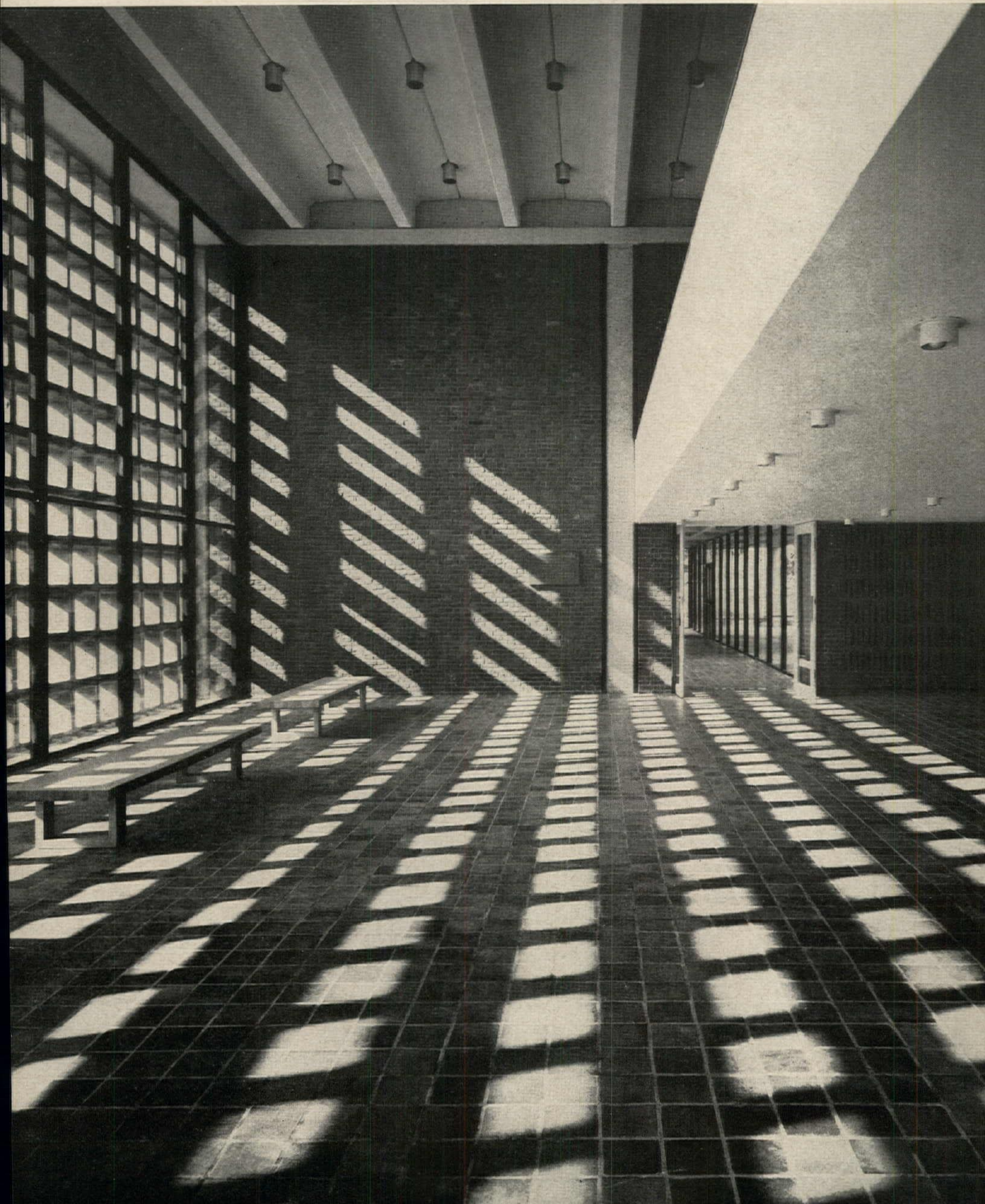
ROOF PLAN



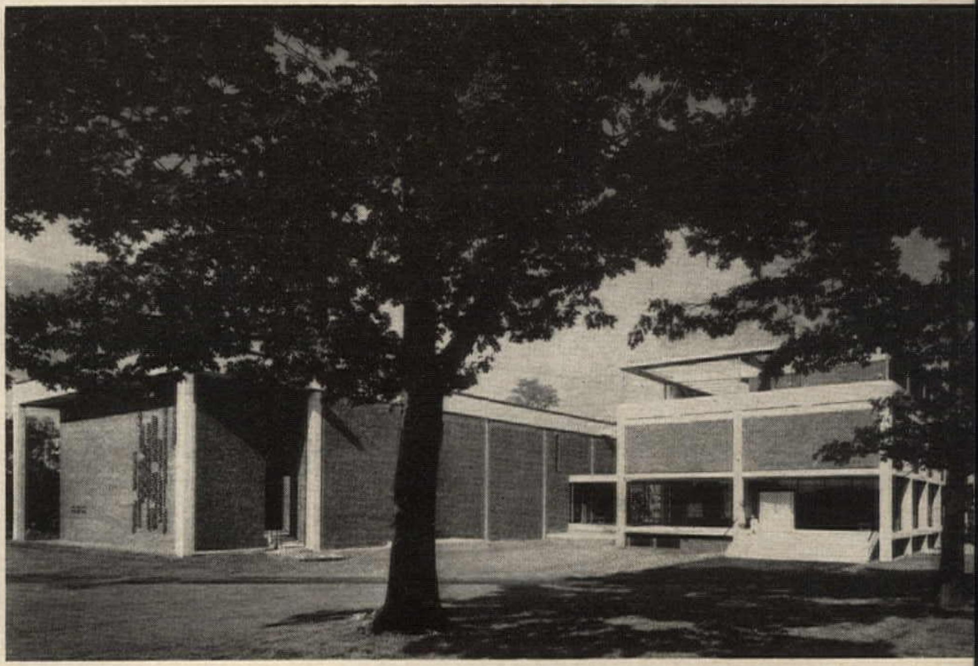
Lemberg Hall, the two story element in the foreground was designed for nursery studies. Brown Hall, the four story unit contains class and seminar rooms. Beyond is the Schwartz Lecture Hall

Entrance to Schwartz Lecture Hall lobby at right





Left: Schwartz Lecture Hall lobby. Screen is terra cotta. Roof is of prestressed concrete tees, reinforced concrete frame is expressed on the interior as well as the exterior as is the brick. Floor is quarry tile. *Right:* Schwartz Lecture Hall and Brown Hall exteriors. Wide concrete band which serves as a parapet at the penthouse level of Brown Hall is visually separated from the structural frame by long narrow slots. Opening at the rear of the lecture hall is a secondary exit, the main entrance to Brown Hall is shown. Each of the three building elements is deliberately articulated as a separate entity with its own major entrance carefully removed from the other entrances. This is in partial deference to the wish of each of the three donors of the Social Science Center to have a distinct, self contained realization of their contribution. This problem of separate expression has been compounded in other building groups at Brandeis where as many as six donors have each desired an individual architectural entity within a single complex. Part of the success of the Social Science Center may be attributed to the fact that there were only three donors



Above: lecture hall can be converted by removal of seats to a large conference room. *Below:* pattern on end wall of Schwartz Lecture Hall is created by forward projecting bricks

"Architects are now being called upon by Federal and local government, as well as by private owners, to assist not only in the design of fallout shelters for private and community use, but their location as well . . . In our opinion, the architects of the nation should be prepared to participate vigorously in a program which may prove to be vital to our survival."

Philip Will, Jr., FAIA, President
The American Institute of Architects

DESIGN FOR SURVIVAL

Most of the land area of the United States would be outside the limits of blast or heat effects of any nuclear attack within the scope of present military estimates. Design for survival, then, for a large per cent of the civilian population, is primarily against the longer lasting, more feared, less understood effects of radioactive fallout. The radioactive effects of nuclear explosions cover wide and unpredictable areas. But they can be contained.

Imagine a ground cover of dust that glows. It glows with invisible X-rays to which all known materials are in some degree translucent. Like the X-rays used in medical diagnosis and therapy, the rays from nuclear fallout, called gamma rays, penetrate and affect living tissue. They are dangerous; but like the rays of therapy they can be understood, shielded against, in fact turned off when the generating source decays or is washed away. They do *not* induce radioactivity. They do not contaminate in any way materials through which they pass. They can kill, by ionization, individual cells that absorb too much of their energy; but the body can repair that damage, as it does sunburn, if the dose rate is small enough.

The design of shelters against radioactive fallout is based on a few simple facts.

(1) The sources of rays that must be stopped are grains of rather coarse dust lying on planes, like the surfaces upon which snow might fall.

(2) Any barrier against this radiation is effective in proportion to its weight per unit area.

(3) Gamma ray intensity diminishes, like the intensity of visible light, as the inverse square of the distance between source and irradiated object.

(4) Radioactivity of fallout dust decreases at a predictable rate with time.

(5) Shelter space can provide for human needs on an austerity basis but with definite minimum requirements.

Object of the design is to use both mass shielding and distance to reduce gamma ray intensity to a level tolerable by humans in a space that can be occupied continuously for days, or even weeks, until the radioactivity outside is no longer a hazard. Architects will be further challenged to integrate that space with a variety of normal, peacetime uses and at maximum, responsible economy.

Some of the massive technology associated with defense against nuclear attack is covered in a separate article following page 12 in this issue. For those who wish to study the subject in depth, the available literature is extensive. The Office of Civil Defense, Department of Defense, The Atomic Energy Commission, The Office of Technical Services of the Department of Commerce, both Washington and local offices of these bureaus as well as city and state civil defense offices and public libraries throughout the nation are obvious sources. Some of the particular publications available are credited in this issue. Our aim in these few pages is to summarize some of the basic approaches architects and engineers can bring to bear. The lines by Philip Will, Jr., are from an October, 1961 AIA bulletin announcing a series of two-week fallout shelter analysis courses for architects and engineers to be conducted by OCD through the spring of 1962 at ten colleges across the nation. Information about these courses can be obtained from OCD Washington or regional directors offices or from AIA at 1735 New York Ave., Washington 6, D. C.

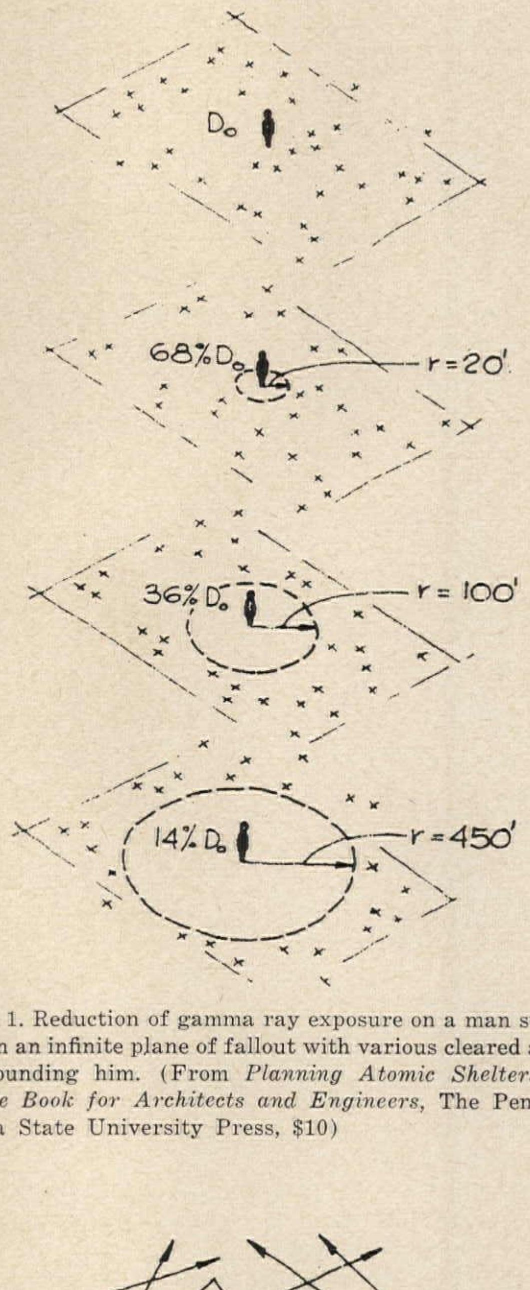


FIG. 1. Reduction of gamma ray exposure on a man standing in an infinite plane of fallout with various cleared areas surrounding him. (From *Planning Atomic Shelters: A Guide Book for Architects and Engineers*, The Pennsylvania State University Press, $10)

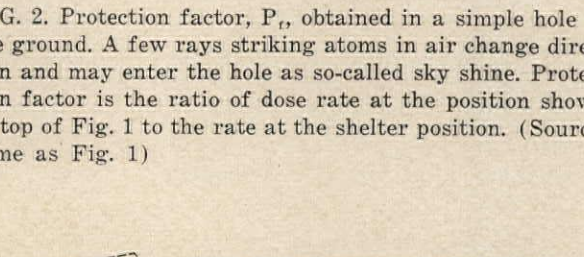


FIG. 2. Protection factor, P_f, obtained in a simple hole in the ground. A few rays striking atoms in air change direction and may enter the hole as so-called sky shine. Protection factor is the ratio of dose rate at the position shown at top of Fig. 1 to the rate at the shelter position. (Source, same as Fig. 1)

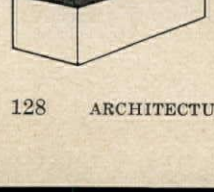


FIG. 3. Fallout on slanted roof is assumed horizontal at ceiling height. (From *Fallout Shelter Survey: Guide for Architects and Engineers*, OCDM publication, NP-10-2)

The five "simple" facts listed on the previous page conceal an extensive and well documented technology. The effects of nuclear explosion, both physical and biological, have been recorded intensively; and data pertaining to blast, fire, and radiation protection of buildings are voluminous. It seems reasonable, however, for the architect to view first the limits of civilian feasibility rather than military specialty and to approach his problem with two simplifying assumptions: (1) that his shelter will remain intact, and (2) that fallout build-up and decay will follow a predictable, once-through pattern. This will allow him to design, not a "bomb shelter," but a gamma-shielded space for living for a certain time.

RADIATION SOURCE

Description of the radiation source as rather coarse dust on plane surfaces implies the following effects on shelter design:

(1) The geometry of shielding is to shade selected reference (dose) points in a space made of translucent materials against rays that behave much like light emitted from substantially horizontal, flat surfaces. The dose is measured in roentgens, similar in concept to lumens or watts, and the dose rate is in r/hr. Figures 1 and 2 show that a man in the open could reduce his exposure considerably by simply moving to a dust-free area or jumping into a hole in the ground. In buildings, the situation is better shown in Figs. 3 and 4. The solid angle calculations determining the protection factor (ratio of outside to shielded intensity) at a given dose point are covered in the OCD publication, *Design and Review of Structures for Protection from Fallout Gamma Radiation.*

(2) The rather heavy particles of fallout against which shielding is required range in size from silt to medium sand. This means they can be filtered rather easily out of shelter supply air. It also limits the distance they are likely to travel from the immediate blast area. See Table 1. Substantially all the early fallout will have reached the ground within 36 hours of the explosion. At a given location, however, duration of the dust shower may be from two to several hours.

BARRIERS AGAINST GAMMA RAYS

The building you are in right now is a fallout shelter. All building materials stop some gamma rays. Architects and engineers are active in a current, nationwide survey of existing buildings to determine how effective they are as shelter and how best they might be brought up to acceptable protection standards. (See also page S-12 in this issue.)

Architects will be called upon to evaluate the shielding

TABLE 1—PARTICLES OF EARLY FALLOUT

Size	Diameter, microns	Fall velocity,* fpm	Fall time,* hours	Travel distance,* miles
Silt (dust)	50	40	34	Over 300
Very fine sand	100	160	8	120
Fine sand	200	640	2	30
Medium sand	400	2500	½	Under 10

*Approximated by Stokes Law under standard atmospheric conditions and assuming spherical particles, specific gravity 2.65, uni-directional wind 15 mph, initial altitude of particle 80,000 ft and no turbulence in atmosphere. For sand size particles, the Stokes Law underestimates fall time. For example, the fall time for medium sand might be closer to 1½ hours than ½ hour. (From OCD publication, *Design and Review of Structures for Protection from Fallout Gamma Radiation*)

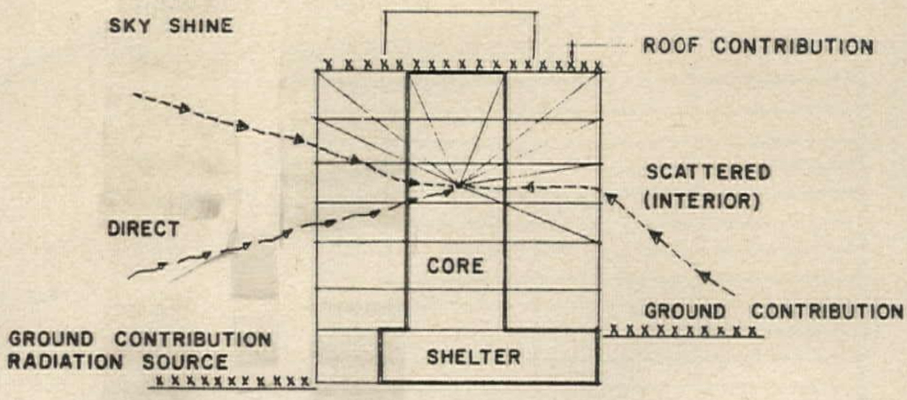


FIG. 4. Elements of dose calculation at a sheltered point in a high-rise building. (From *Planning and Engineering Phases of Shelter Construction in a Typical High-Rise Building, New York State Office Building No. 5*, a report by Consoer, White & Hersey, Defense Engineering Consultants, Washington, D. C.)

effects of various kinds of walls and roofs. These effects are related to the thickness and density of the material. A factor called mass thickness, the pounds per square foot of wall material, is a measure of the barrier effect. Any barrier with a mass thickness of about 27 psf will reduce fallout gamma ray intensity by a factor of about two.

Effect of a series of these so-called half-value thicknesses is shown in Fig. 5. Table 2 gives half value thicknesses for various materials and Table 3 shows weights of some common building materials. Fig. 6 shows the barrier effect of certain wall sections. A more complete table of mass thicknesses is in the OCD publication, *Fallout Shelter Surveys: Guide for Architects and Engineers.*

The so-called attenuation factor (2 in a half value layer) is useful in determining the protection contributed by interior partitions at various intervals between the outside wall and internal core of a building. It is somewhat different from the so-called reduction factor, reciprocal of the protection factor, which is related to both barrier and distance as well as the angle of incidence of the rays. Reduction factors are useful because they can be added in determining the protection factor afforded against gamma rays from various locations.

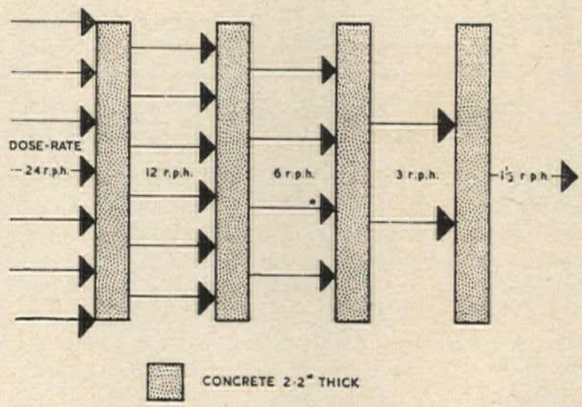


FIG. 5. Thickness of concrete required to reduce dose rate 50 per cent, about 27 psf. Effect of a series of such half-value layers. Reduction is measured at interior surface, eliminating distance factor. (Same source as Table 2)

TABLE 2—HALF VALUE THICKNESSES OF SHIELDING MATERIALS

Material	*Slab density lb per sq foot per inch thickness*	*Half value thickness, inches*
Steel	41	0.7
Concrete	12	2.2
Brickwork	10	2.8
Earth	8	3.3

[1]From a British publication, *Nuclear Weapons*, Manual of Civil Defense, Vol. 1, Pamphlet 1, available from British Info. Services or H. M. Stationery Office.

TABLE 3—WEIGHTS OF SOME COMMON BUILDING MATERIALS

Brickwork . . . . . . per in. thickness	10 lb per sq ft
Stone . . . . . . " " "	12 " " " "
Reinforced concrete " " "	12 " " " "
Hollow tile . . . " " "	8 " " " "
Plaster . . . . . . " " "	8 " " " "
Wood . . . . " " "	4 " " " "
Tiles	14–18 " " " "
Slates	8 " " " "
Corrugated asbestos cement sheets	3½ " " " "
Corrugated steel sheets	2–3 " " " "

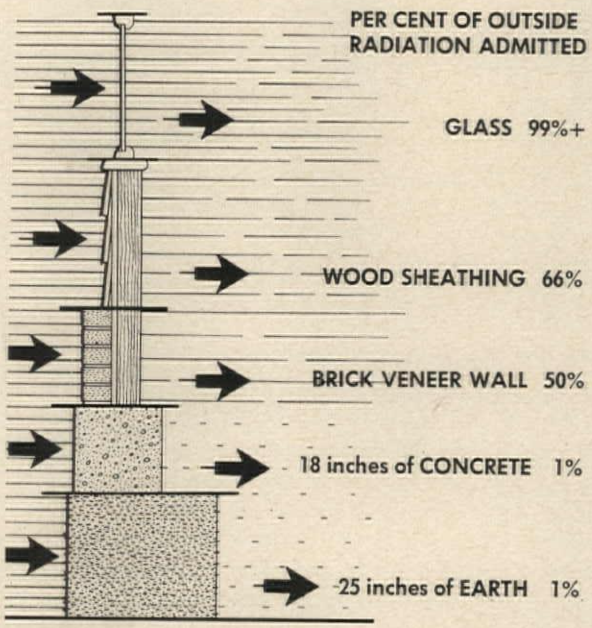


FIG. 6. Barrier effect of various wall sections. (From *Survival in a Nuclear Attack*, New York State Civil Defense Commission)

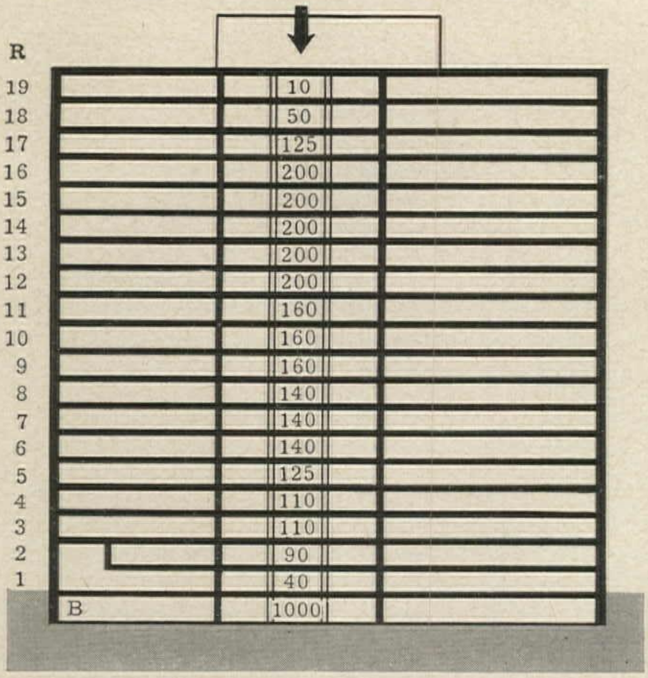


FIG. 7. Typical protection factors at inner core of high-rise office building. Distance effect of height increases protection on upper floors, but roof fallout affects top floor. Note that washing roof immediately would make top floor safest above ground. (From *Shelter Designs for Protection Against Radio Active Fallout*, Report to the Institute of Public Administration by Voorhees, Walker, Smith, Smith & Haines distributed by the New York State Civil Defense Commission)

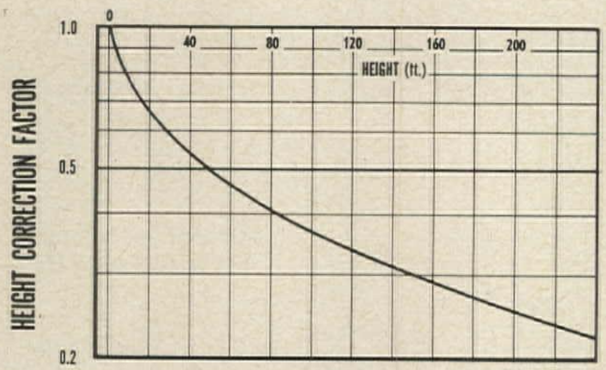


FIG. 8. The reduction factors for height variations. (Adapted from same source as Fig. 7 and OCD manual, *Design and Review of Structures for Protection From Fallout Gamma Radiation*)

THE EFFECT OF DISTANCE

The fact that gamma ray intensity falls off as the inverse square of the distance from a source has the practical effect of increasing the protection factor of upper floors and central core in a high rise building. See Fig. 7. The contribution of rays from fallout on the roof diminishes the protection factor of the top floors, while the ground contribution affects the lower floors. The combined effect of attenuation by distance, by incident angle, and by very slight absorption in the air through which rays pass is shown in Fig. 8. Note that the dose rate in roentgens per hour at a point 100 ft above a contaminated plain will be about 38 per cent of the dose at a reference point 3 ft above that plain. In other words, at an unshielded point 100 ft above fallout, height alone would contribute a protection factor of 2.6. The height factor is a distance effect that can be approximately applied in any direction. That is if you are 50 ft away from a radiation source your dose will be about 50 per cent of the source dose, according to Fig. 9. This has an obvious relation to building shape and shelter location.

DECLINE OF FALLOUT RADIOACTIVITY

The fact that the radioactivity of early fallout declines rapidly and predictably has two important effects on shelter design: (1) It establishes the duration of occupancy, hence the space requirements for living and storage. (2) It affects the architect's judgment as to what a reasonable protection factor might be for a given building, hence the mass and cost of the structure.

It is not true that everyone must stay within the best shelter he can find for an uninterrupted period of two weeks or any other abitrary period. He needs only to be sure that his accumulated exposure in total roentgens remains below the so-called "short term sick dose" or about 200 r in a period of three to six days. In a particular shelter during actual fallout exposure, only an instrument called a dosimeter can tell what an individual's personal dose really is. (A fountain-pen-size dosimeter to be carried by individuals and a rate meter to spot-check r/hr activity are recommended equipment for each shelter.) For purposes of design, however, the architect-engineer weighs the probable dose rate at a given position against the feasibility of achieving that rate with a reasonable protection factor based on expected outside intensity.

This procedure may seem complicated and somewhat speculative. And it is. But an example may give some assurance that the complications are no more formidable than other architectural computations, and that the speculations are within the rationale of calculated risk.

Suppose the building under consideration is 45 miles from a target on which a 10 megaton weapon might be used. OCD publications (a good simplified one is K-12-b, *Facts Sheet on Nuclear Weapons*, 34 mimeographed pages) show that your structure will be virtually intact. A design standard wind velocity of 15 mph will bring fallout to the area in three hours. By that time, potency of the fallout will have dropped to about 27% of a value measured one hour after the explosion.

Radiation decay is extremely rapid during the first few hours of its life. If the dose rate is 1000 r/hr one hour after blast, it will decay to 100 r/hr in seven hours, to 10 r/hr in 49 hours, and so on. The decay rate, however, is progressively slower so that the residual hazard may persist for a very long time at low level. Progress of decay is as follows:

TIME AFTER BLAST	DOSE RATE, R/HR
1 hour	1000
2 hours	430
3 hours	270
5 hours	140
7 hours	100
10 hours	61
1 day	20
2 days	10
7 days	2
2 weeks	1
3.5 months	0.1

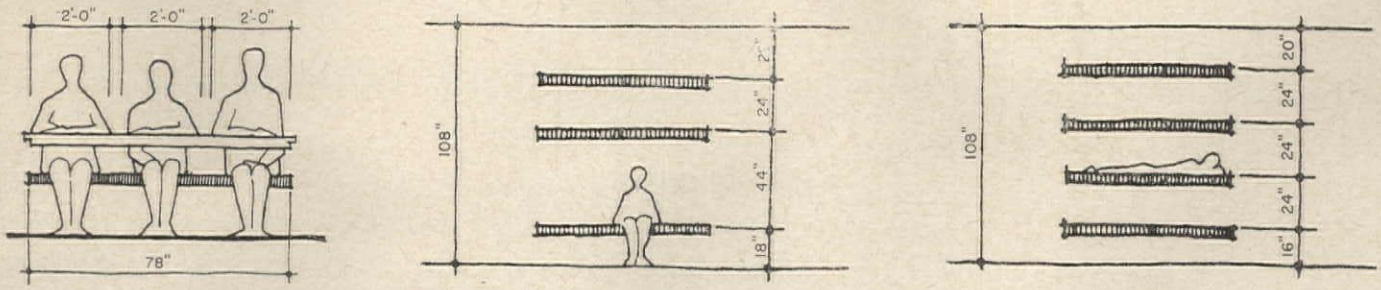


FIG. 9. Suggested minimum space requirements for eating and sleeping in fallout shelters. Dimensions are based on U. S. Navy research and experience. (Same source as Fig. 1)

These factors, divided by 1000, can be applied to any blast-plus-1-hour value. Actual 1-hour values will vary widely from a few hundred to several thousand r/hr depending on bomb size, detonation point, wind pattern, etc. OCD manuals seem to imply that 1000 r/hr is a reasonable design assumption for this value. If we assume for our example, as some authorities have done for particular cases, that a 1-hr value of 2000 r/hr is conservative, the following conclusions can be applied to our shelter design:

(1) Occupants will have three hours before fallout starts in which to either travel to other shelter or take prearranged emergency action preparing peacetime space in the building for shelter occupancy.

(2) The fallout shower, or buildup, will take two to four hours to completion, and maximum intensity will probably occur about two hours after it starts. This puts maximum outside dose rate at a decayed value for blast-plus-five hours, that is 14 per cent of 2000 r/hr, or 280 r/hr. A protection factor of 100, then, would bring the maximum initial sheltered dose rate down to 2.8 r/hr, which in turn would continue to decrease starting at the blast-plus-five decay rate.

(3) A simple means of estimating total accrued dose on a person remaining indefinitely in an exposure starting at a given intensity is the so-called "FIT forever" rule stating that *Five* times beginning exposure *Intensity* in r/hr times *Time* in hours after blast at which exposure begins equals total exposure "forever." In our example, this works out to 5 times 2.8 times 5 equals 70 r. Our 100-factor shelter, then, is more than adequate—and would be even if it were in the one-hour-from blast zone where inside intensity would start at 20 r/hr and "forever" dose would be 5 times 20 times 1 equals 100 r.

(4) A little arithmetic would show that in two days a much lighter shelter would be adequate. Soon after that, short excursions outside would be safe if there were provision for dust-off or wash-off decontamination before reentering the shelter. In two weeks, people could move about normally with proper dosimeter surveillance.

HUMAN NEEDS IN SHELTER

There is general agreement on the austerity limits of shelter space and equipment. Many of these limits are derived from naval and military experience. Architects should remember, however, that they are in fact low limits related only to economy and feasibility of the design. They are not prerequisites for the sheltering function. You would be just as well sheltered from fallout in the lower rotunda of New York's Grand Central Station as you would in your concrete mop closet at home; probably better.

Nevertheless, it is useful to know what these austerity limits are and how long they are likely to be endured. Here are some of the published criteria:

Time to enter shelter: 1 hr per 15 miles from blast before fallout arrives (downwind, 15 mph wind).

Duration of occupancy: 2 weeks until day-long freedom; 2 days continuous in maximum shielding area; these judgments can be modified by actual dose.

Floor area per occupant: 15 sq ft gross includes columns, fixed equipment and storage; 10 sq ft net; 8 sq ft for short term seating in high protection core, see Table 4. All these require mechanical ventilation.

Ceiling height: 7 ft for walking areas; 9 ft for tiered bunk sleeping (see sketches above); 5 ft for seated adult; 4 ft for crawl-in.

Ventilation: 3 cfm per occupant minimum for CO_2 control; more as needed to keep effective temperature below 85F; less as permitted by large space volume.

Air intake: Baffled and/or down facing, sized for low velocity to avoid dust intake.

Filtration: Dry fiber, furnace-type sufficient; should be shielded from shelter space.

Food: 1500 to 2000 calories per day per person; about 4 cu ft per person for 2 weeks; 2 cu ft if dry rations stored.

Water: 7 gallons per person per two weeks; 1 cu ft equals 7.48 gal; need not be gamma shielded; must be dust free; any covered sanitary storage will do including roof tanks, risers, service mains, wells, etc.; provide gravity feed to or canned storage in shelter.

Light: 2 to 5 foot candles; electric to conserve O_2 and avoid CO.

Power: Battery standby for lights and instruments; generator standby for lights, fans, hot plates, heating, etc.; roughly 25 kw per 100 people, but size to actual load.

Sanitation: One flush type and/or chemical toilet per 50 to 70 occupants plus normal facilities in adjacent, lighter shelter; see source of Table 4 and design example, next page.

TABLE 4—FACTORS FOR SHELTER CAPACITY PLANNING

Activity	Floor space required sq ft	Remarks
Sleeping in cots	30	Includes aisle space
Sleeping in double bunks	15	Includes aisle space
Sleeping in triple bunks	10	Includes aisle space
Sitting	8	Includes aisle space
Storage	2	Includes space for
Fixed equipment	As required	food, bunks, etc.

From OCD publications, NP-10-2, *Fallout Shelter Surveys: Guide for Architects and Engineers*

DESIGN FOR SHELTER IN A TYPICAL OFFICE BUILDING

Excerpts from a 54-page report on the planning and engineering phases of shelter construction in New York State Office Building No. 5, Campus Site, Albany, New York, prepared by Consoer, White & Hersey, Defense Engineering Consultants, Washington, D. C., for New York State Authorities[1]

Early in 1959, the New York State Architects Office issued a report which pointed out that the architecture characteristic of the State's new buildings offered very little protection against fallout or other effects of nuclear weapons. A subsequent directive from the Governor's office was to include fallout shelter facilities in future state buildings. This was based in part on the premise that as a national average 77 per cent of the total population would be threatened by fallout and only 23 per cent by blast.

At this time preliminary plans for Building 5 were officially completed. The structure is 385 ft 5 in. by 86 ft 11 in. in plan with 6 stories, plus a ground floor and penthouse. It has exterior glazed walls, except for vertical brick and tile panels at the ends. The frame is structural steel with steel deck and concrete floor construction. The ground floor is exposed on the south elevation, whereas the grade line is at the first floor on the north elevation.

The two prime considerations in selecting the general shelter areas were (1) spaces with inherent protection, and (2) spaces with normal functional usage that would not decrease in efficiency when shelter requirements were satisfied.

The ground floor would not be adaptable as a shelter area. First, it was only partially below ground. Second, it did not lend itself to dual use as both work space and shelter because it had been set apart for machinery, mail, and stock rooms.

Despite the predominance of glass windows and structural glass spandrels, it was felt that a shelter could be built behind the solid end walls to extend the full height of the building. The initial design for the core shelter in Building 5 resulted from this premise. The architect placed a conference room, lavatories, toilets, rest rooms, and stairways at the far ends of each floor. The area so allocated comprised 28 ft by 72 ft, or 2016 sq ft at each end of each floor.

The principal source of guidance at the inception of the shelter design project was a directive from the President to heads of all federal departments on the incorporation of fallout shelters in future federal buildings. The minimum protection factor indicated in that directive was 1000, and general requirements included extraordinary plumbing and decontamination facilities. Ventilation was tantamount to air conditioning. Minimum thicknesses of 20 in. of concrete overhead and 26 in. on walls were prescribed. Also all openings were to be closed by blocking to provide the same effective mass thicknesses as the walls themselves.

These requirements contributed appreciably to the high cost of the initial shelter design. Now, OCD policies have changed as have those of New York State. The most significant recommendation in a New York report was a minimum protection factor of 100. Subsequent design for Building 5 took full advantage of the cost reductions made possible by this lower minimum.

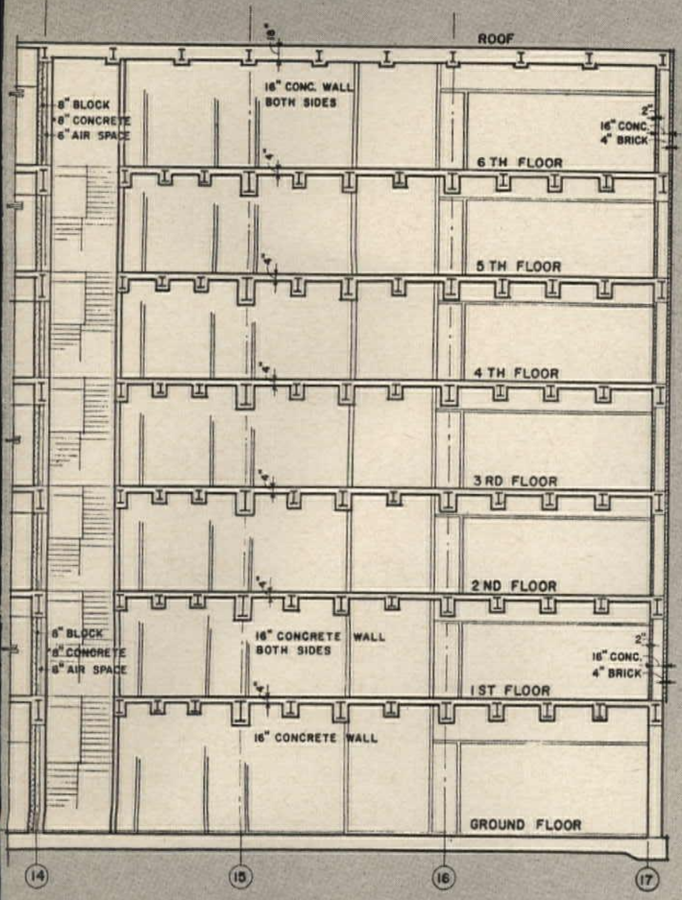
Stay-time was analyzed with respect to the expected decay characteristics of average fallout fission products. As a result, a 2-day continuous occupancy was established as the stay-time design criterion at maximum shelter, rather than the 2 weeks previously considered. Thus a number of problems were greatly simplified. It should be kept in mind, however, that after two days it would be safe for the occupants to leave the shelter but not the building. Hence, design criteria relating to food, water, and fuel were projected for a two-week period. It was further assumed that the people in the building who were within one hour's walking distance of their homes, half the people normally occupying Building 5, would be able to reach home, and the design guidance policy should be for 1400 people, 50 per cent of the normal occupancy of the building.

In the pre-shelter design the area eventually utilized for shelter purposes was partially enclosed by light 4 in. hollow block interior partitions and the heavy exterior end wall of 4 in. brick and two thicknesses of 8 in. hollow block.

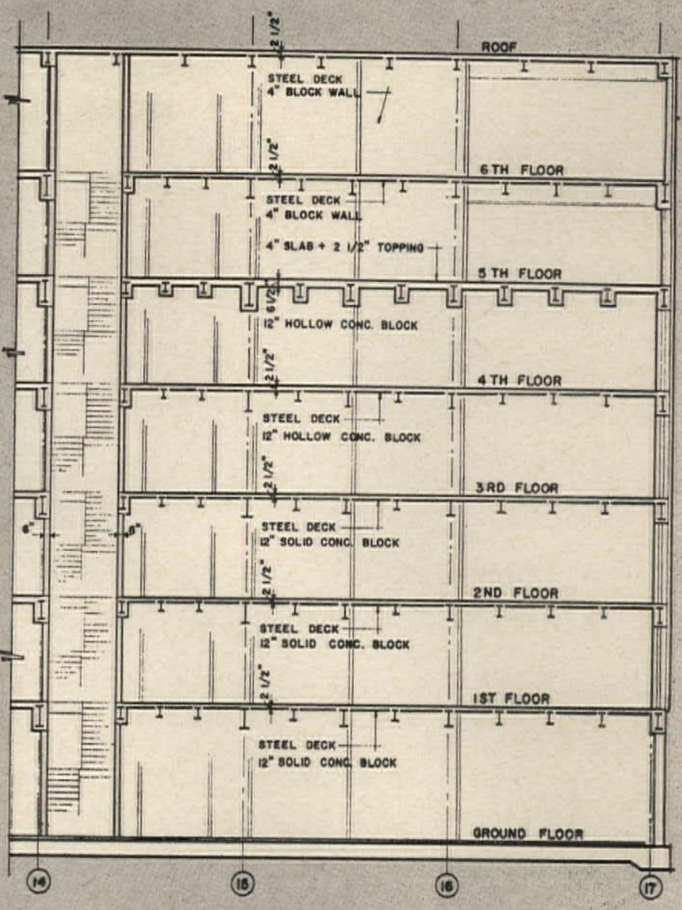
In the initial shelter designs based on criteria of the pre-1959 federal directive, the roof slab was increased to an 18 in. concrete slab while the floor slabs were 4 in. concrete slabs. The interior walls were designed as 1 ft 4 in. thicknesses of concrete with tile or plaster facing in certain areas on each side. The exterior walls were designed as 1 ft 4 in. of concrete with 4½ in. brick or tile facing on the outside and with tile on the inside.

Sliding doors of 5 in. concrete for the entrance into the core shelter were set in the interior end wall between 8 in. concrete walls and 8 in. concrete block walls. The protection factor in the initial shelter design at the various floor levels was in the range of 200 to 300. The structural elements of the beam and girder framing system within the shelter core had to be increased several inches in depth and about 20 per cent in weight to carry the heavier shield walls. Weight of columns was increased approximately 33 per cent in the core areas, with corresponding increases in footings and foundations. Added cost was estimated at $245,000, about $142 per occupant.

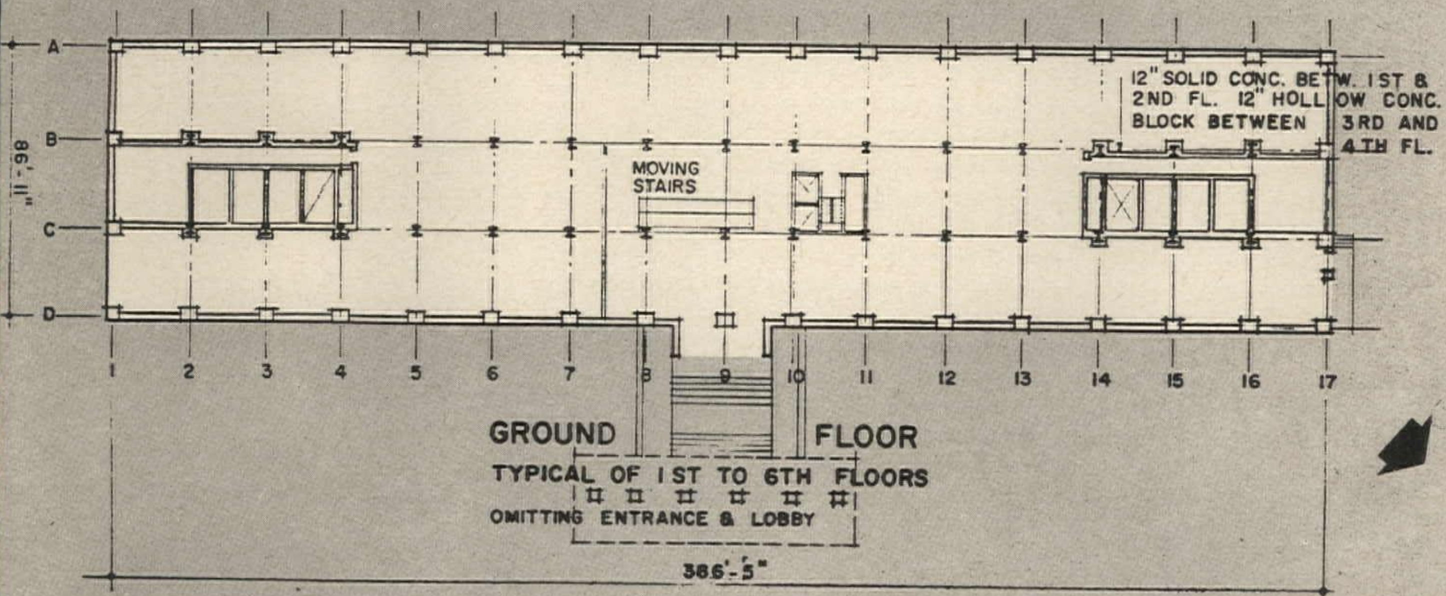
[1]Acknowledgement is made to Frank W. Farrell, N. Y. director of civil defense; Carl W. Larson, state architect; Charles S. Kawecki, chief architect; Eugene L. Halsey Jr., and Albert S. Toma of the New York State Architects Office, and Werner Weber of the New York State Civil Defense Office for their assistance and support toward accomplishment of the project. The building is now under construction



PARTIAL SECTION INITIAL WEST SHELTER CORE

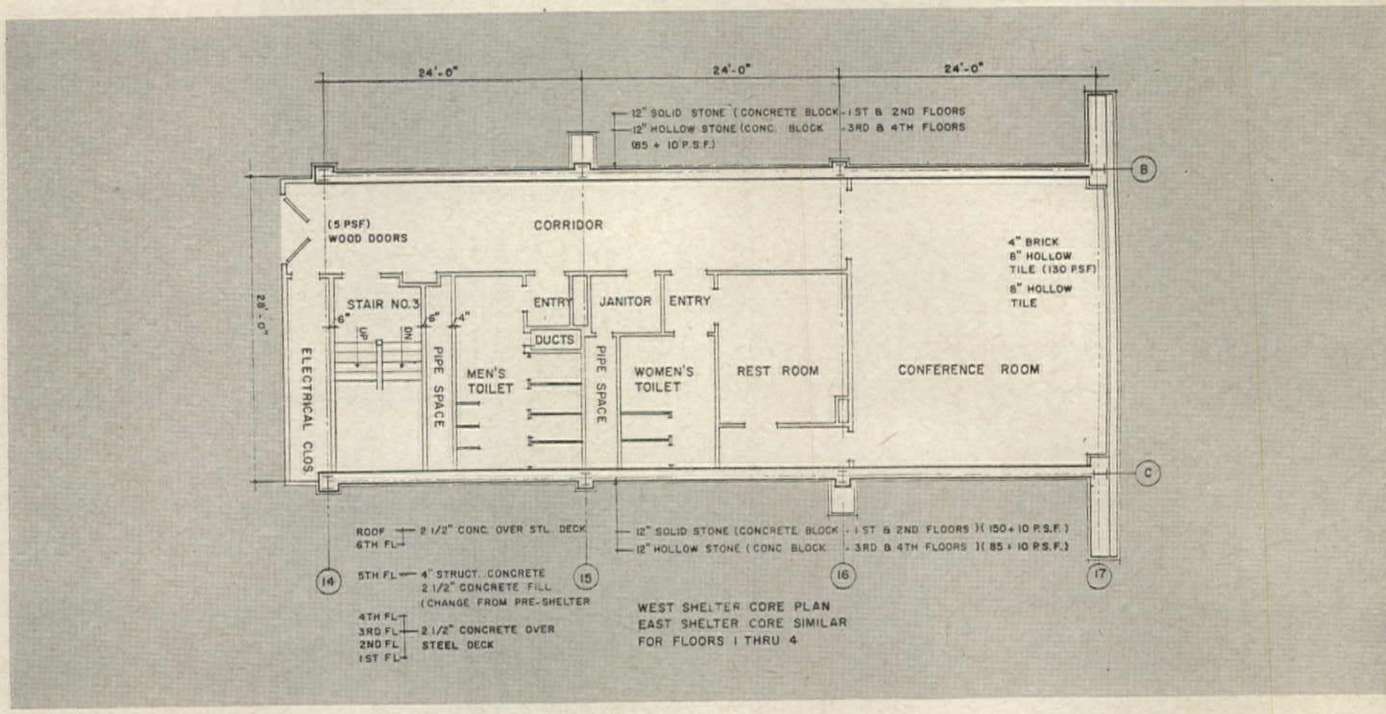


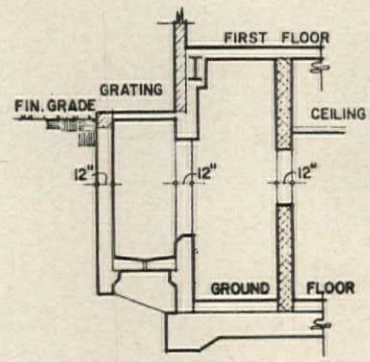
PARTIAL SECTION FINAL WEST SHELTER CORE



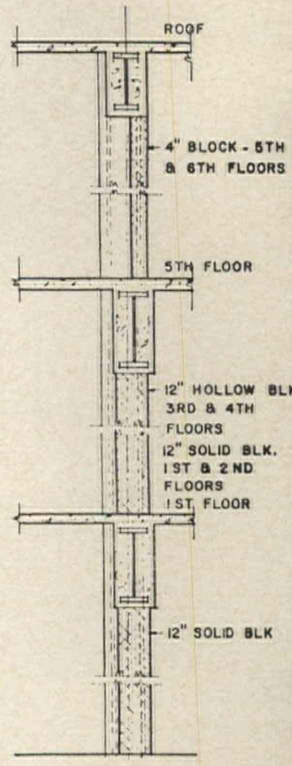
PLANNING ASSUMPTIONS AND DESIGN CRITERIA

- Protection factor, 100
- Number of occupants, 1400 inactive
- Continuous duration in shelter, 2 days
- Continuous duration in building, 2 weeks
- Space per occupant, 9 sq ft
- Food intake daily per occupant, 2,000 calories of dry-type rations
- Food storage space per occupant for 2 week period, 2 cu ft
- Sleeping accommodations, 3-tiered bunks for 50 per cent of shelter occupants
- Minimum egress per shelter, 2 separate openings
- Lighting intensity in shelter, 2 foot candles
- Ventilation, 3 cfm fresh air per occupant
- Pressurization inside shelter, slight positive
- Filtration effectivness, ability to trap dust
- Water storage per occupant, 7 gallons
- Number of occupants per emergency portable toilet, 50





SECTION
AIR INTAKE



FINAL CORE WALL SECTION

In the final shelter design, twelve-inch hollow stone concrete block walls were used to provide barrier protection for the shelters on the third and fourth floors. Twelve inch solid stone concrete block walls were used to provide the protection on the ground floor, where concrete foundation walls did not occur, and on the first and second floors. No shelters were provided on the fifth and sixth floors. The fifth floor was made heavier by using a 4-in. concrete slab under the 2½-in. concrete topping. This increased the thicknesses above the fourth story ceiling to a total of 11½ in. of concrete as roof protection.

Considerable attention was devoted to designing for higher live loads than would be required in normal space occupancy. These changes in walls and floors made the weight of the floor framing essentially the same as the pre-shelter plans, except as additional strength became necessary under the block walls on the first to fourth floors, and for support of the thicker slab on the fifth floor. The increase in weight of the columns occurs only below the fifth floor and is of the order of 20 per cent over the pre-shelter design. The final shelter design provided a protection factor of at least 100 within general shelter areas. Total added cost was $42,000, about $30 per occupant.

SHELTER EQUIPMENT AND PROVISIONS

One 40 kw diesel generator and a two-week supply of fuel were placed in each end of the building. A storage room 20 ft by 18 ft was provided on the ground floor for bunks, food, radio equipment, medical supplies, etc. For emergency use one marine-type toilet per 50 occupants was provided.

The principal source of water is the city's water supply. Should water from this source become contaminated, the large capacity elevated water tank on the Campus Site would be used.

The ventilation system for conventional day-to-day use would be available for use during shelter occupancy with provision for transferring to emergency power. A horizontal grated opening at ground level at each end of the north side of the building was provided for air intake. It was assumed that any heavy fallout particles would drop to the bottom of the pit at this point. Air would then move through two right angle turns, and a filter would remove the smaller particles with the air moving at normal flow.

By Philip Will, Jr., F.A.I.A.
President, American Institute of Architects

PRODUCTS FOR THE BUILDING INDUSTRY

Any resemblance between the author and an expert on product design and marketing is purely coincidental. What I have to say, therefore, is without expertise, is *not* an official statement of the American Institute of Architects and is supported by no other authority than the experience of the speaker himself. This experience is perforce limited, on the one hand, to the selling of a professional service; and on the other to observation, from the receiving end, of the marketing efforts of others.

In the past 25 years the following developments have occurred: splitting of the atom, commercial television, regular trans-ocean air service, helicopter flight, modern shopping centers, plastics, nylon, dacron and other synthetic fibers, streptomycin, aureomycin and other wonder drugs, Salk vaccine, heart surgery, tranquilizer drugs, anti-t.b. drugs, jet airplanes, electronic calculators, space vehicles and 50 megaton thermo-nuclear bombs. And I might add an event of almost equal destructive power: the blunt force of limited access highways now eviscerating our nicest cities.

How can anyone doubt that the future will be even more remarkable and that its wonders will occur at an even faster pace?

I am not impressed by the charge that we belong to a backward industry. True, we are diverse, fractionated; yet therein lies both our weakness and our strength. We have no single dominant economic powers in our industry such as we find in the automotive giants. This means that few producers or builders (and no architects) can devote massive sums to research and to scientific and economic break-throughs. The many small units of which we are composed, however, are a strength in that each is an independent thinking and creative organism, each making its own experiments, each trying, each failing, each frequently succeeding and each making its contribution to progress.

What I would suggest to you is that we conserve our strengths and meet our weaknesses by collaboration. Creative partnership between architects and producers is natural, necessary, and to date unexploited for the mutual benefit of ourselves and the public.

I can recall on my first job after graduation from college some 31 years ago that it was necessary to detail nearly every part of the building. Foundries, job shops, and small operators generally were glad to make about anything the architect wanted provided that it was properly full sized. This is no longer true. What we now practice can be described as "architecture of the catalog." Our detail consists of a catalog number either on the drawing or in the specifications. Our time is spent thumbing through Sweet's and the folders in the AIA file and examining the samples and models which producers bring to us. This is a new trend which will inevitably continue and increase. You producers are now members of our design team and must be regarded as a creative force in the building industry. This *must* be so; for the architect can only use that which someone is willing to produce. Furthermore, much that has been invented by the producers has stimulated new building design, has been a source of inspiration and creation of new and basic architectural forms, much as we architects might rather not admit it.

This, I hope, leads to mutual regard and understanding. In fact, I frequently feel that you producers deserve more sympathy than you receive. You really live dangerously. With the best intentions in the world, you are the occasional victims of product failure, product misuse, improper workmanship and methods, featherbedding craft rules and restrictions. The brightest stars in your line can be dimmed by other and new competitive methods or products, by building codes and the whims of fashion. You sell your product to a variety of people, many irresponsible, unskilled and with low credit ratings. The product is used or installed in all climates, frequently under exposed and uncontrolled conditions.

Naturally, I can speak for the architect only, of the conditions which we believe must be met by your products.

In spite of the many attempts that are periodically made to manufacture complete buildings, I think we will have little trouble in agreeing that the opportunity for mass production in our industry is limited to parts and sub-assemblies. More and more our buildings are becoming single, specialized use inventions, designed to meet ever rising standards of performance. The cost of human time has been rising so sharply that buildings inefficient to purpose simply cannot be economically tolerated. Furthermore, we believe as an article of faith that a building is a work of art, a creative statement. Therefore, to design this specialized invention and to make of it a work of esthetic satisfaction, the architect has of the producer and his product certain specific needs if the demands of his client and society are to be met. For convenience, these can be divided into five general categories: (1) performance; (2) cost; (3) producer responsibility; (4) choice and (5) design.

1. Producer Performance

Risking his professional reputation with every decision he makes, it is the architect's first need that the products he specifies perform as advertised and with no unhappy surprises. Quality must be tested and demonstrated. Frequently, we are asked what tests and demonstrations we will accept. For this, there is no ultimate definitive answer except an order of preference, starting with actual use in buildings over a period of years, followed by accelerated tests conducted by independent laboratories, followed by the manufacturer's own tests. Naturally, our faith in accelerated tests is limited; for time itself cannot be compressed, and many failures are intimately related to the passage of time. As we mature, all of us become increasingly conservative. We hesitate to risk new dangers and failures while we are still struggling with those that are old and known.

Of obvious importance to any product is the control of quality. Above all, this should be uniform even if it is uniformly bad. It is even possible for a product that fails uniformly to find its economic use.

We would hope that the manufacturer's eagerness to sell would not lead him to expand his product claims beyond their reasonable use. Would that all literature stated what *not* to do with a product as well as listing its infinite virtues.

2. Cost

It is the evident and irritating fact that all architects would like to know exactly how much a given material will cost per unit in place, in a particular building, in a particular place and at a particular time. It is equally evident that few manufacturers or distributors are able or (if able) willing to tell him. As long as this condition exists, no architect can control costs and provide the kind of service to which his client is entitled. This discredits not only the architect but all building, and is a major depressant in the economic growth of our industry. This is one of the major reasons people would rather buy automobiles than houses, or buy old rather than new buildings. It would seem to me high time an answer to this problem be found. As a starter, I would suggest that quoted prices could be geared to a national index. Even if such prices were given as a range, they could then be translated through an index conversion factor to local costs. While this method may not bring precision, it may at least be the beginning of an orderly method. Certainly the architect could design more intelligently, and, with proper information on quality, could approach in his design the ideal of the one-hoss shay.

3. Producer Responsibility

Here we come to a problem area that is probably of deeper concern to all of us than any other I shall have discussed today: the responsibility for product performance. Let's face it. We architects stick our necks way out. If the producers of building components fail to assume full responsibility for their wares, and if anything goes wrong, the neck that is farthest out is chopped off first. Owners indiscriminately sue everybody in sight. The architect is always the first victim he sees.

The courts are getting rougher on architects than ever before. We are held legally responsible not just for design and supervision, but apparently for the performance of all materials and products which go into our buildings. There have been several court cases in which the responsibility and liability pinned on the architect border on the absurd. And where is the producer? Bent over his sales charts. He only makes and sells the stuff.

Liability insurance is small solace. We must have better cooperation and better guarantees on the part of the builders. Built-in obsolescence and shoddy goods may, as Vance Packard points out in his book *The Wastemakers*, temporarily keep high production going, but in the long run they will not only ruin the reputation of the manufacturers and the people who specify buying these goods, but our national economy and our moral fiber as well.

And in the case of building products, poorly made goods can endanger not only the architect's reputation and pocketbook, but human life.

I speak for all architects, I believe, if I tell you it is time that your legal agents show the same enthusiasm for the quality of your products as your advertising agents.

If I may coin a phrase, the prime ingredient of any product is the integrity of its maker. It doesn't take the architect long to discover which manufacturers do and which do not provide service and make good on their product failures. I venture to say that we actually place more faith in reputation than performance guarantees, important though the latter be.

Any management consultant will tell you that the first responsibility of any enterprise is to stay in business. With this we must agree, if for no other reason than that we wish to be assured of the continuing availability of service and replacement parts. Equipment in particular is now far too complex to be repaired by the village blacksmith, and there is nothing so frustrating as to be stuck with broken down mechanical equipment that has been orphaned by the death of its parent company.

Also, under the heading of Producer Responsibility, I would like to suggest that you must control the uses to which your products are placed. Granted this is not easy, effort must nevertheless be made, even at considerable pain to the sales department. There are examples of products that have been nearly destroyed through uncontrolled sales and improper use. It has, for example, taken years for the porcelain enamel industry to recover from its initial association with gaudy gas stations and cheap hamburger stands.

4. Choice

As you know, it is motor car history that Henry Ford very nearly lost his market for cars by insisting that his customers could have any color they wanted so long as it be black. The same danger threatens products for building. If you accept the thesis that buildings are (or should be) complex, single purpose inventions, individual works of art, then variety is a must. Depending on the product, we need choice in dimension or capacity, color, texture, methods of installation or application. Of course, we realize that this means increased cost, but it is nevertheless worth it and, in fact, essential if the product is to be sold.

5. Good Design

Contrary to the apparent opinion of many of my engineering friends, good design is not solely the ultimate of utility or efficiency. Good design is by its nature a compromise involving (in addition to utility), cost, appearance, and many other factors having to do with distribution and relation to other building components.

In seeking good design, we would like to suggest certain criteria:

Modular Dimensions: Modular measure has now been an industry objective long enough for us to regard it as basic in the design development of any building component. Except in rare instances, it is difficult to understand why any new product should not be related to the 4 in. increment. Perhaps someone will explain to me why, for example, asphalt tile is still made in 9 in. squares instead of 8 in. by 8 in.

Three years ago I started a small storm in the ceramic tile industry by asking why wall tile is still made $4\frac{1}{4}$ in. by $4\frac{1}{4}$ in. instead of 4 in. by 4 in. including joint. Most of the answers I got were pretty silly. The only honest one was that it would cost the manufacturers money to buy new dies. This broke my heart.

Coordination with Other Building Components: Not only are we concerned here with dimension but with methods of attachment, so that the product can fit naturally with the many conditions it will be called upon to meet in building construction. It would be helpful here if all product literature made clear what aspects of the product are basic and fixed and what parts may be varied to suit design requirements.

Of increasing importance is chemical affinity. Probably all of us have learned to be respectful of electrolysis. What with all the new products coming on the market, whose beginnings are lost in the chemical laboratory, the task of the designer is becoming increasingly difficult and demanding. He needs to be warned of the possible chemical interaction of the adjacent materials, and of that complex and increasingly lethal gas which we city dwellers breathe and which attacks our buildings as well as our lungs every hour of the day and night. This gas is commonly known as "air."

Integration of Components: Of increasing significance in construction is the integration of components under single producer responsibility. If we were not accustomed to it, the manner in which we still build many doors and their openings would seem insane. The frame comes from manufacturer A, the door from B, the hardware from C, the glass from D, the erection is accomplished by Mr. F. and finished by Mr. G. All this after templets have been shipped back and forth and shop drawings checked at infinite pain.

A further example is the curtain wall. Fortunately, a number of forward-looking companies are offering an integrated service taking full labor and material responsibility for the entire exterior skin including mullions, panels, insulation, glass, doors, hardware, etc. In our own practice, we make centralized responsibility for this part of the building mandatory regardless of the number of "subs" that must be assembled by the curtain wall prime contractor.

Full Exploitation of the Inherent Qualities of the Constituent Materials: Perhaps no greater crime against good design has been committed than by those who ruin the appearance of a good material by trying to make it look like something else. Happily, this trend is dying and we find more and more honest attempts on the part of producers to take maximum advantage of the basic nature of the materials that make up their product. There is less an attempt to make linoleum look like marble, wall paper look like wood. Even those chameleon materials, the plastics, are beginning to take on character of their own.

I have said earlier that producers and architects need each other. We need your products; you need our design. May I suggest, therefore, that you use the architectural profession.

As manufacturers, you already employ an imposing list of consultants and not just as salaried employes. You have lawyers on retainer, you hire real estate advisors, tax consultants. You seek professional counsel on practically everything *except* on the design of the basic product you make and sell. Judging by the inquiries we receive and the calls by salesmen, I am beginning to believe that many building products are designed by your advertising agencies or at best by market analysts. I submit that this is a little like going to the mortician for medical services.

I have suggested earlier that practicing architects are available and will be pleased to act as *consultants to industry* on designing of building products. Note that I used the word "consultant." The counsel available from an independent architect in practice and daily meeting the tough problems of building is far different from that of the security-minded draftsman employe. It has, in fact, been my personal privilege to have provided such consulting service to several major manufacturers. One in particular has seen fit to place not one but five nationally known architects on an annual retainer to act as a consulting panel. They review the work of the product development department and advise generally on the needs of building and the best ways in which to exploit the qualities of the materials and the manufacturing techniques of the producer. To the best of my knowledge this manufacturer has felt that this consultation has been a profitable investment.

Nor in considering the design of building products are we concerned solely with utility—basic though it be.

The sum total of our industrial products constitutes the environment of an industrial society. If our environment has esthetic shortcomings—to put it mildly—it is largely because, as Kenneth Galbraith has put it, industry has excluded and alienated the artist.

The consequences are many and I have already mentioned a few. One of them, in Galbraith's words, "of particular importance to the architect, is (industry's) tendency to deny (the artist) control of the aesthetic environment." We depend on your products. If your products are poorly designed, so will be our buildings, at least in their details.

Another consequence of this exclusion of the artist or designer from industry, Galbraith points out, is the effect on our balance of payments and your profits. He says:

"In no small measure it is a matter of design: Our goods have fallen below both European standards and our own tastes. It would seem that the American people can afford everything but beauty. But, in fact, they have been searching for it with no small diligence, and they have been finding it in Italian, French, German and Swedish products far more often than in our own. The automobile is the most important and also the most publicized example. But in a host of other products—furniture, glass, ceramics, leather, metalware—Americans have turned to foreign designs in the same way as foreigners have turned away from American products."

The architect is available to you as technician and artist.

Need I hammer the point further?

From just the facts that we already know, much of the nature of our future can be inferred. You have all read the demographic predictions and are aware that in the next 40 years we can expect a doubling of the present population. Just by itself and not taking into account such vital factors as population make-up and movement toward increasing urbanization, we have a tremendous fact, a tremendous market. Now place this enormous population in the developing technological climate with new, better and faster means of transportation and communication, automation and new sources of energy which multiply our productivity beyond believing and we have a "Brave New World" beyond the imagining of even an Aldous Huxley.

Here are markets of fantastic ability to consume for quantity as well as quality, for products of all kinds. How can one doubt that it is now worthwhile as never before, through research and design to prepare for the future.

Exciting though this prospect of production and sales be, the realm of betterment is even more so.

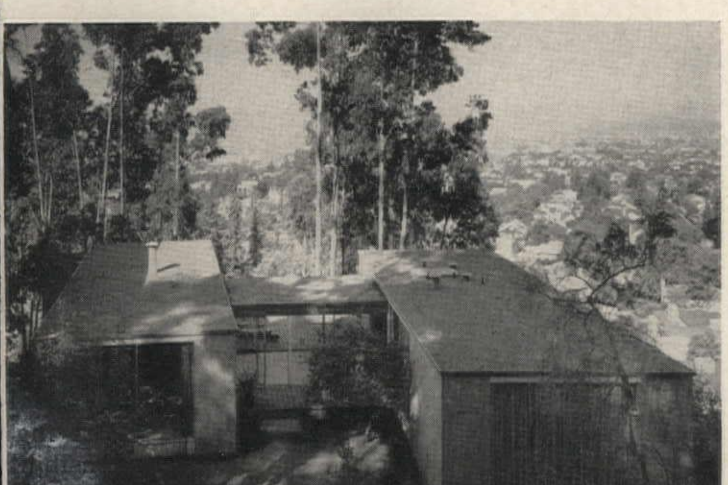
More and more we are learning that as a nation we have been far better at designing and producing things than the providing of services. We are better at designing and producing automobiles than in knowing what to do with them after we get them. We build better houses than communities in which to place them. We build splendid plumbing systems and foul our streams with the waste. Some of us believe that the schools we build are frequently better than the teaching they are designed to house.

And herein lies our greatest opportunity: that of comprehensive planning and design. We face not just the expansion but the replacement for better living of nearly our entire urban environment in ways that will give real meaning to the verb "living."

Our opportunities are vast and our responsibility heavy that, in the golden age of building which lies ahead, we exercise our responsibilities wisely in the public interest.

Morley Baer

A BI-NUCLEAR HILLSIDE HOUSE



ARCHITECT AND OWNER: *Jack Robbins*

LOCATION: *Oakland, California*

CONTRACTOR: *Herbert Wimmer*

LANDSCAPE ARCHITECT: *Richard Haag*

The Robbins House

This hilltop house offers very good flexibility and sense of space for a relatively small home. The bi-nuclear plan separates living and sleeping quarters by a good-sized gallery and deck, which offers space that can be used with living areas for entertaining, or to supplement the children's play space every day.

The house was recently given an Award of Merit in the 1961-1962 Western Home Awards Program, at the California Council, A.I.A. Convention. It was cited by the jury as a "beautifully executed house."

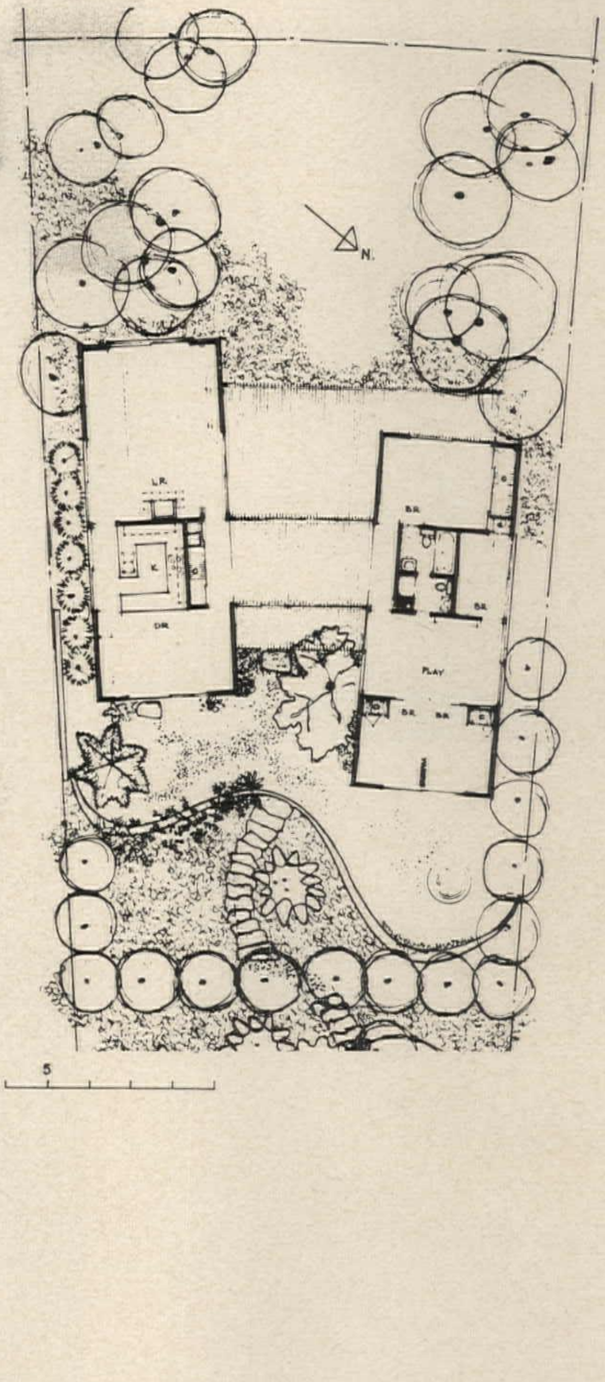
The living room (photo below), deck (photo top center), and master bedroom, all overlook the forested site and beyond to San Francisco Bay. Other rooms (note kitchen, photo center) overlook more intimate garden areas.

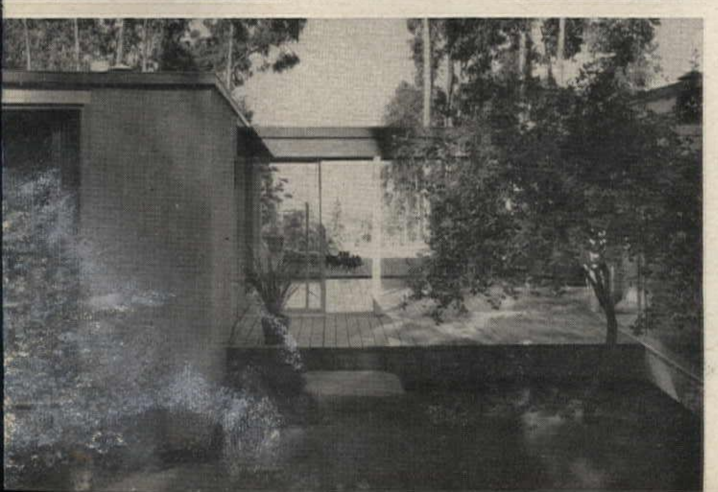
Morley Baer

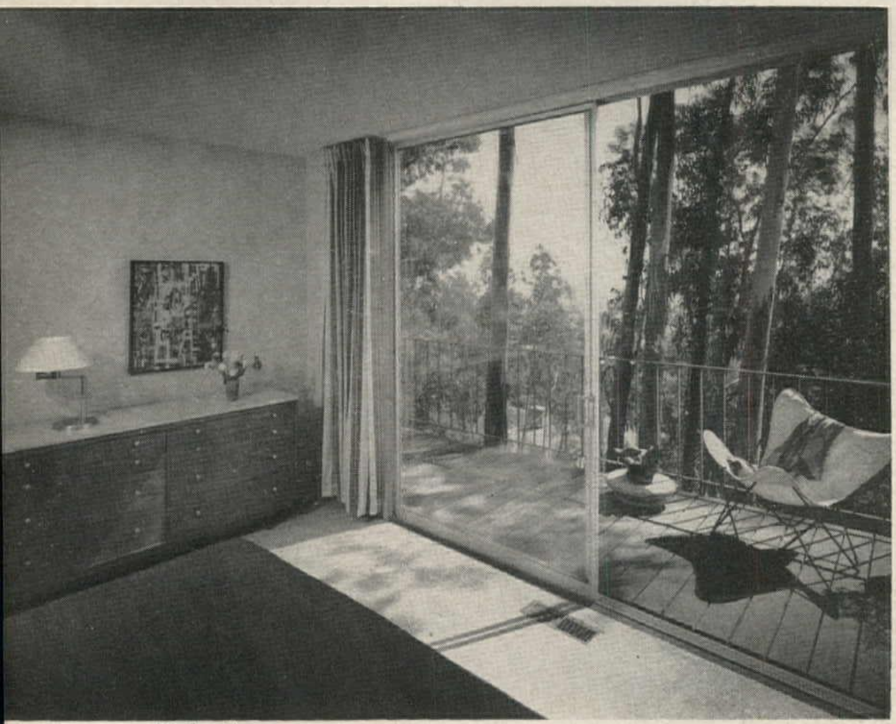
The entire house is quite simple in its plan and design. Redwood siding, with natural finish, is used on the exterior; interiors have surfaces of more finished wood paneling, and white paint. The floors of main living areas are carpeted.

The bedroom wing is also divided into two parts; one is the master bedroom, deck, and an adjoining bath, while the three children's bedrooms cluster around a large playroom. Folding walls add the areas of the children's bedrooms to the play space during the day.

The sense of space in the house is augmented by the use of floor-to-ceiling sliding windows in all rooms, and by using only a counter to separate the kitchen from the dining space.







Morley Baer

The Robbins House

The master bedroom (photo above) has its own deck area and view towards the bay. Furnishings are kept simple, in keeping with the overall design of the house

The entrance gallery (photo top right) can be used to supplement either the living room or the children's play room

The playroom (bottom photo) has sliding walls opening on the children's bedrooms. Two of the bedrooms, in turn, are divided by a folding accordion wall. Thus rainy day play activities have more than generous space

Architectural Engineering

Who Makes Solar Equipment?

Utilization of solar energy has not made much impact in buildings because of the cost involved in collecting and storing heat. In Florida, however, solar water heaters are not uncommon. In fact, a list of manufacturers of solar equipment issued by the Solar Energy Technical Research Service Center of the Association for Applied Solar Energy, Arizona State University, Tempe, Arizona shows 13 solar water heater companies in Florida and one in Tucson, Arizona.

More on School Fire Safety

Should schools install automatic sprinklers to provide life safety from fire? How much protection does fire detection equipment give? How does acoustic tile on school ceilings behave during a fire? Information on these and other school fire safety problems is given by a new series of tests carried out by the Los Angeles Fire Department. The results of this research are reported in a new publication, *Operation School Burning No. 2,* issued by the National Fire Protection Association. Aimed to discover improved ways of protecting the school population from fire in open-stairway, multi-storied school buildings, the tests covered automatic sprinkler and fire detection equipment performance, the behavior of acoustic ceiling materials under fire conditions, and the effects of plastic diffusers on lighting fixtures and plastic-glazed windows. *Operation School Burning No. 2* is available ($5.75 per copy) from the National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass.

A New Method Rates Lighting Glare

The Illuminating Engineering Society of Great Britain has a new lighting code which devotes special attention to evaluation of direct glare; to texture, relief and modeling; and to the matter of combining daylight and artificial light. Writing about the code in the *International Lighting Review,* R. G. Hopkinson of the Building Research Station (England) points out that a lighting installation can be designed with the greatest care from the standpoint of distribution of luminance in the visual field, relief and modeling, color rendering, necessary level of illumination on the work—and yet be completely ruined by excessive glare from windows or luminaires.

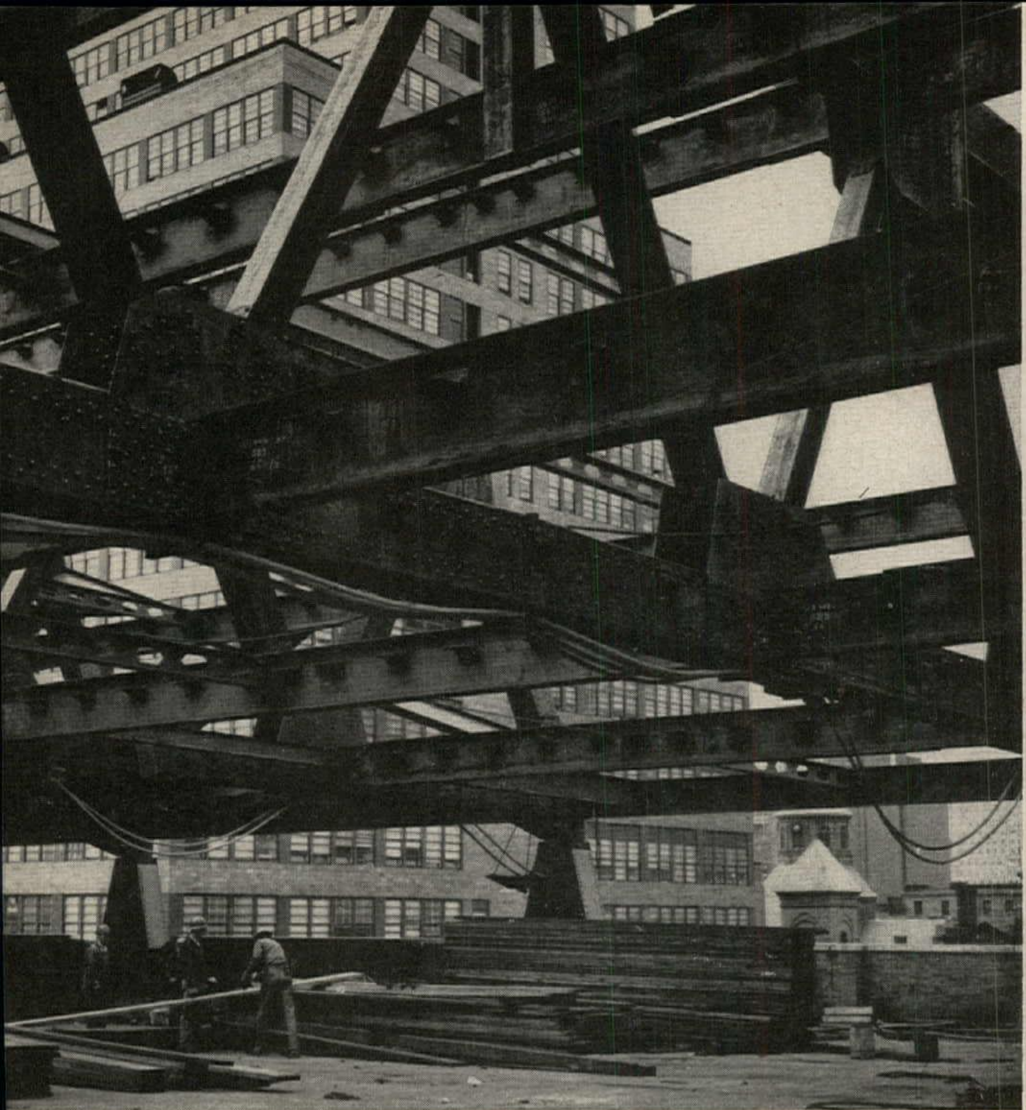
For this reason, a new feature of the British code pertains to permissible glare. Recommendations of different degrees of glare for different environments are listed in terms of a "Glare Index." Indices for environments from foundries to hospital operating theaters were determined partly from detailed experimental work done by the Building Research Station and partly from subjective judgments made by a team of observers which visited approximately 150 installations.

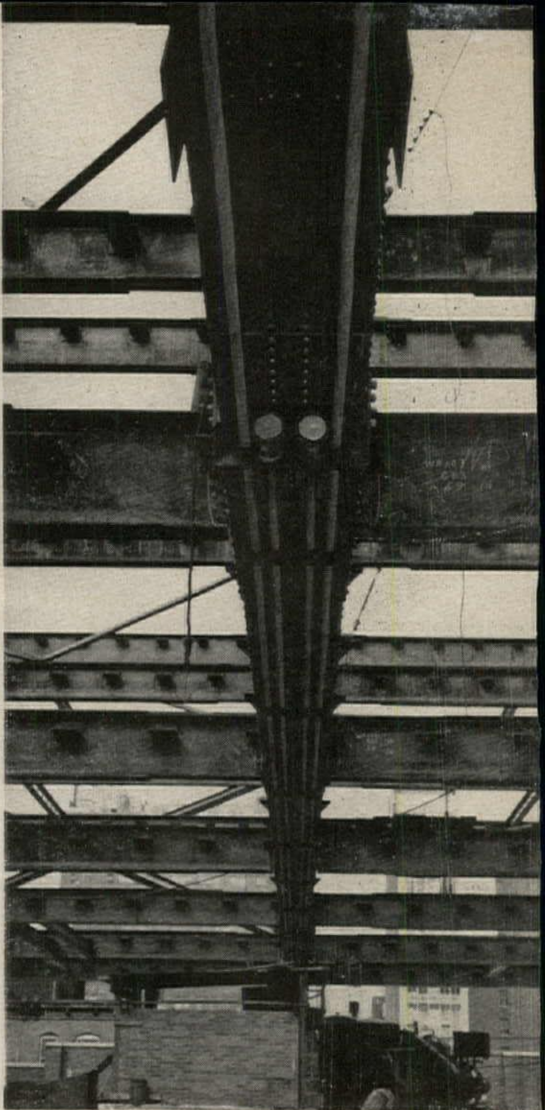
Wind Load a Complex Factor

To illustrate one of the problems involved in preparing realistic performance specifications for curtain wall constructions, Jack M. Roehm, President of the National Association of Architectural Metal Manufacturers, cited the following factors involved in determining wind loads in a speech before the Southern Conference of the Construction Specifications Institute: A relationship commonly used in converting wind velocity to force is $Q = .00256V^2$. But to take care of wind gusts we multiply the velocity by 1.3. If we consider the shape factor of a building, we must multiply this by 1.3 again to give total wind load.

It has been more or less common to use 0.8 of this total wind load for inward pressure exerted on the windward side of a building and 0.5 of the wind load as the suction exerted on the leeward side. However, there are data which indicate that the walls parallel to the direction of wind flow can have a suction force equal to 0.8 of the total.

This Month's AE Section



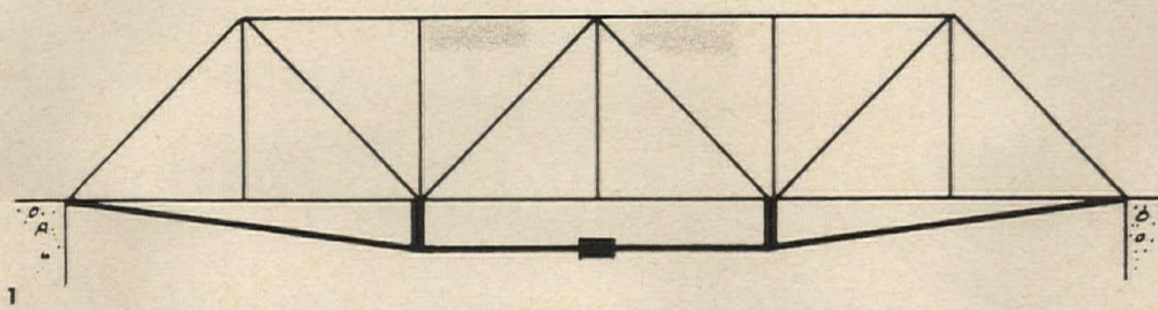


MORE STRENGTH, LESS WEIGHT IN PRESTRESSED STEEL

Use of new, high strength, stressing members can make steel work harder per pound of weight and per dollar of cost

Increased parking at Port of New York Authority Bus Terminal is made possible by 200-ft Warren trusses. Bottom chords are prestressed to minimize their depth. Photos at top show cables before and after prestressing (See also Fig. 8)

by T. R. Higgins
Director of Engineering and Research
*American Institute of Steel Construction**



1

Fig 1. Iron truss rod with turnbuckle, an early application of prestressing

2

Fig. 2. High strength strand in beam web has effect similar to that of truss rod

Prestressed steel usually consists of high-tensile steel tensioned against an ordinary carbon steel beam, girder, or truss to develop a stronger and more efficient structure. Since steel requires less bracing in tension than in compression, a few highly tensioned bars or cables can be made to take much of the weight, and thus increase load capacity and improve rigidity.

Prestressing was applied to steel long before the availability of today's high strength steels made prestressed concrete possible. Bridges such as Fig. 1 were in common use around the turn of the century. A wrought iron truss rod installed beneath the beam applies tension to the assembly.

While the term *prestress* had not yet come into engineering parlance, this was in fact prestressing even if the stress analysis was sketchy, or even non-existent. The truss rod, when tightened by means of the turnbuckle, not only induced negative moment in the beam to relieve its dead load, it also participated directly in the live load stress by acting as the bottom chord of a truss. But wrought iron or at best mild steel was the only material available for the truss rod. Thus the amount of stress that could be safely applied was limited. Also, as deeper and heavier beams were manufactured, the use of trussed beams declined.

There are several reasons for our current interest in prestressing. The cost of steel, like everything else, has increased. Any method that enables us to get more work out of the same or less steel deserves consideration.

Then, too, the engineer is often called upon to strengthen an existing structure so that it will carry a greater load. In such cases, space limitations often preclude the introduction of additional framing members. Prestressing may offer a solution.

Finally, we are interested in prestressing because the availability of high strength steel rods, wire tendons, and now plates makes the idea of prestressing steel in conventional design an economically intriguing one.

The form in which prestressing has been most often proposed is basically an adaptation of the old trussed beam idea in which the high-strength prestressing strands are installed within the depth of the web as in Fig. 2. They are anchored to the underside of the top flange at the ends of the beam, and pass through saddles in the mid-section. This serves to conceal the cable and to keep the over-all depth of the beam or girder to minimum.

Since steel is equally strong in tension and compression, and it is high in shear strength, there is actually no need to deflect or drape the prestressing strands between top and bottom flanges.

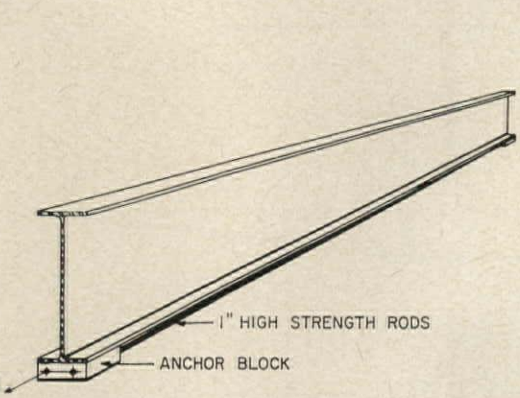
Recently the Iowa Bridge Commission designed a steel I-beam bridge on which the high-strength prestressing rods are installed just below and in contact with the bottom flange, as in Fig. 3. These rods pass through saddles at 10-ft intervals, and are anchored at each end in steel blocks welded to the bottom flange. The rods are initially anchored at one end and stressed by jacking at the other end, where they are anchored with a conical wedge when the desired level of tension is reached.

This type of construction does not adapt well to continuous beam spans. But for simple spans from 50 ft up and in buildings where exceptional loading occurs and headroom or between-floor space is limited, this application of prestressing offers a logical solution and considerable economy. For example, a 27 WF 94 prestressed in this way, with two 1-in. diameter high strength steel rods would have about the same carrying capacity as a 30 WF 108 with a 1 by 8 in. cover plate on the bottom, such as might be used in composite design on a fairly long, heavily loaded floor span.

We can make our cover plate of high strength steel and prestress the beam by bending it with jacks before welding the cover plate to the flange as shown in Fig. 4. When the jack is released, a negative moment is induced in the beam, maintained by the tension in the plate. To be fully effective, stress should be greater in the cover plate than in the beam. High strength steel is a prerequisite.

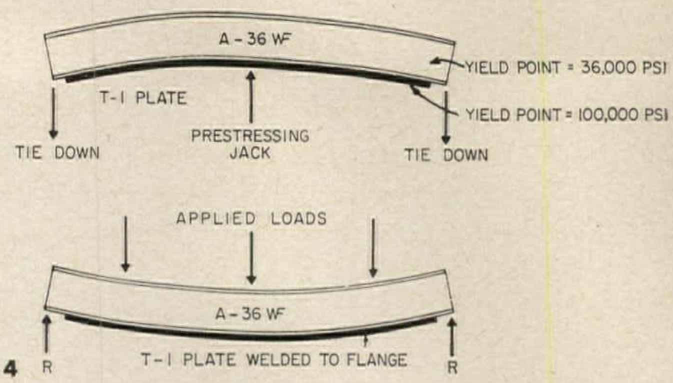
Naturally this requires heavy jigs and fixed anchorages capable of taking large jack reactions. Thus the economies of prestressing in the field are dubious except on a volume basis. Where possible, cover plates should be installed in the shop. A bridge using this method is under

* This article is based on a talk before the the Industrial Building Congress, New York, September, 1961.



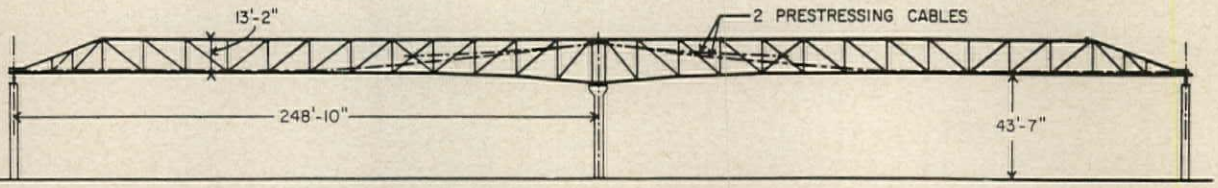
3

Fig. 3. High strength stressed rods need not be draped in web



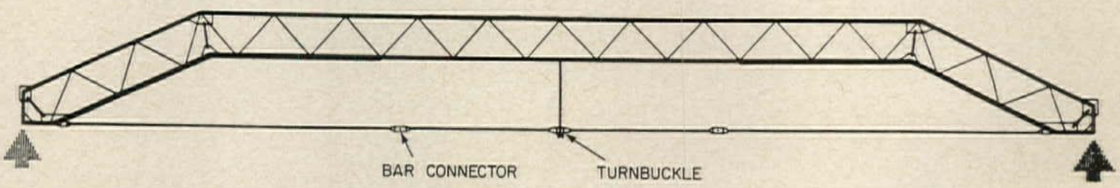
4

Fig. 4. High strength plate is welded to the beam prestressed by jacking



5

Fig. 5. Magnel's prestressed truss at Melsbrock Airport, Brussels



6

Fig. 6. Prestressed truss at a Harlow, England, plant

construction in Iowa right now.

Prestressing can be applied not only to beams and girders but also to trusses. Actually, the use of prestressed steel was pioneered by the late Professor Gustave Magnel of Belgium, who began his investigations on steel trusses about a dozen years ago. He concluded that "savings in weight up to 33 per cent are available and, assuming the cost of materials and labor for high strength wire units to be three times that of structural steel, a 13 per cent saving in cost is obtainable."

Professor Magnel designed a 47-ft truss for testing. Its bottom chord was pre-compressed by means of eight pairs of high strength wires having a yield strength of 218,000 psi. Based on computations and test measurements, Professor Magnel concluded that stresses in a prestressed steel structure can be calculated with the same accuracy as for conventional steel design. He predicted that prestressed steel trusses 15 ft deep could economically span 500 ft.

Four years later (in 1954) he had his opportunity to put theory into practice. The result is the Melsbrock Airport building in Brussels, which covers an area 502 by 215 ft using only one centrally located interior column (Fig. 5).

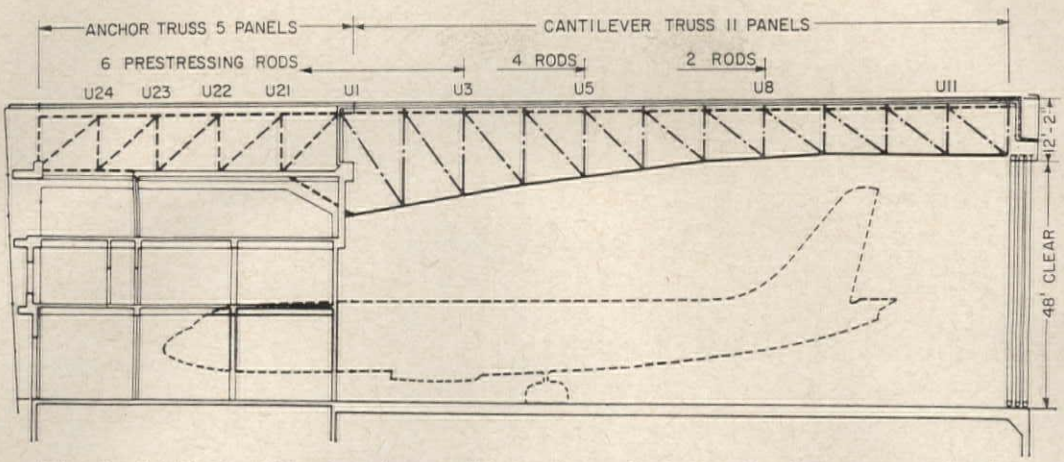
The main truss is prestressed. Its depth at mid-span is 13 ft 9 in., or about one-eighteenth of the span. Four cables, each of which contains 64 wires, accomplish the prestressing. The stresses in these wires vary from 93,000 to 105,000 psi, depending upon wind uplift, snow load, etc. Eight tons of prestressing wires replaced 26 tons of structural steel. The saving in weight as compared with conventional steel design was 12 per cent, and the cost saving was four per cent. Had the wires been prestressed to 130,000 psi, an acceptable figure, the savings would have been about six per cent. A longer span would also result in greater economies. For a span of 300 ft, the weight saved would be about 25 per cent and the money saved about 18 per cent.

Two other significant uses of prestressed steel in buildings took place at about the same time, both of them in England.

In a factory roof at Harlow, the ends of 60-ft trusses were deflected downward as in Fig. 6, and high tensile bars tightened by turnbuckles were stretched like bowstrings between the truss ends. Although these bars resemble simple tie rods in this application they are pre-tensioned and the truss is prestressed.

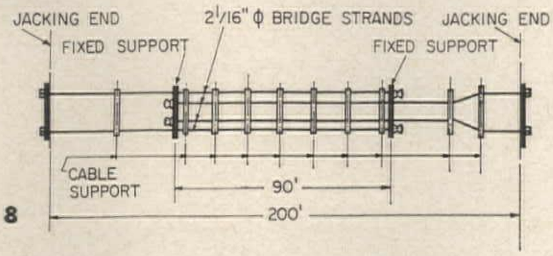
The other British example is found at Wigan. Here a space frame roof spans a 90-ft square workshop without internal columns. What would correspond to rafter joists in conventional roofing are here miniature trusses in which the bottom chord is a high strength wire in tension. The resulting roof structure is one of the lightest possible for its span, weighing only 3.72 pounds per square foot.

A recent U. S. example is the United Air Lines hangar at Chicago's O'Hare International Airport where prestressing is used on a 140-ft cantilevered truss as shown in Fig. 7. There are nine such trusses spaced 40 ft on center. Engineer Paul Rogers calculates the saving at $35,000, as compared with conventional cantilever truss design. By using prestressing rods along the upper chord of the truss, Mr. Rogers reduced structural weight from 6.35 to 5.29 pounds per sq ft. In other



7

Fig. 7. Cantilevered hangar truss with prestressed steel rods along upper chord



8

Fig. 8. Arrangement of strands for lower chord of trusses at New York bus terminal. See also photo page 144

words, the conventional truss construction requires approximately 20 per cent more steel than the prestressed space-truss system.

Each truss was prestressed with six $1\frac{1}{8}$-in. diameter high strength rods whose minimum yield strength is 130,000 psi. Each rod is anchored in a heavy plate and stiffener assembly welded to the web and inner flange of the 14 in. wide-flange beam comprising the top chord of each truss.

The rods were anchored in pairs at the second, third, and fourth panel points of the anchor trusses. The other ends of the three pairs of rods are anchored at the second, fourth, and seventh panel points of the cantilever trusses.

At a total prestress of 80,000 lbs, per rod, design stresses were reduced 480,000 lbs in the upper chord of panels 5 and 8. These reductions due to prestressing ranged from 25 to 50 per cent of maximum design stresses.

Another airport application of prestressed steel is the Pan American passenger terminal at Idlewild Airport (AR:9/61) in which thirty-two cantilever girders radiate from a central core. Attached to each girder are six $2\frac{1}{2}$ in. cables pretensioned to 600,000 lbs.

In the Port Authority Bus Terminal on New York's west side, expansion plans called for converting the existing roof to parking operations on three new levels. The engineers, Ammann & Whitney, agreed on the construction of fifteen 200-ft Warren trusses, spaced 50 ft on centers. These are carried on new columns and footings outside the existing wall. Because the existing interior columns of the building could not take the increased load of more floors, the new trusses had to span the entire 200 ft. With the heavy traffic planned, the maximum tensile stress in the lower chord came to 5412 kips. A conventional box-section chord would have been very deep and required heavy plates, even with high strength low alloy A-242 steel. A minimum chord depth was important in order that pitch of the ramps within the building be kept to a minimum. Therefore, the engineers decided to prestress the lower chord. The result was a shallower depth and a substantial cost reduction.

After a truss was in place, stressing crews mounted a jacking device at each end of the bottom chord. Four $2\frac{1}{16}$-in. diameter steel cables run along both top and bottom of the chord. Pairs of cables are attached to jacking heads, top and bottom at the outer ends of trusses and to welded fixed supports 145 ft from each end. Hence cables overlap 90 ft in the center as shown in Fig. 8. This same scheme occurs on both upper and lower sides of the chord.

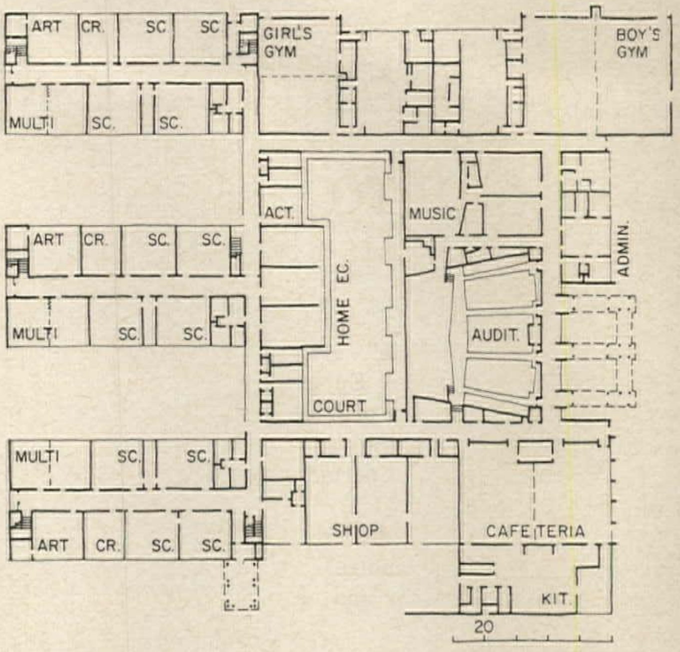
There is a total of eight cables at the centers of chords, counting top and bottom cables. Two 300-ton jacks at each truss end were controlled from a single portable console on the roof. These jacks stressed the cables simultaneously to 240,000 lbs each. In addition to meeting space limitations successfully, prestressing also reduced the required steel in each truss from 300 to 240 tons, a 900-ton saving in the building.

Although prestressing has been thought of primarily as a means of renovating a structure so that it will carry increased load, the economies of prestressed steel also warrant its consideration in the design stage on large-span, open buildings.

High Voltage and Underground Wiring Cut School Electrical System Costs

Harry B. Thompson Junior High School
Syosset, Long Island

Architects: Eggers & Higgins
Mechanical and Electrical Engineers:
Cosentini Associates



Electrical costs in the Harry B. Thompson Junior High School were cut through the use of high voltage (277/480) service and by running main distribution wiring in shallow trenches below the concrete grade slabs rather than overhead. While high voltage is not brand new in schools, this school is the first one to use it on Long Island, and the two techniques employed combined by the electrical department of Cosentini resulted in an attractive 20 per cent savings in overall electrical costs.

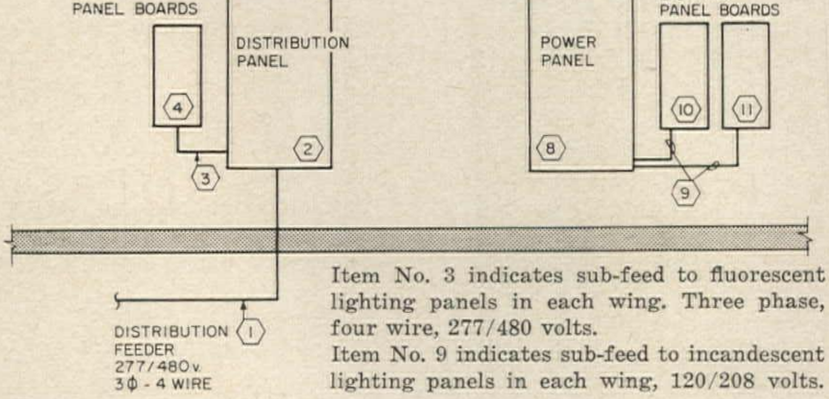
The electrical system was designed for nominal 277/480-volt secondary service (255/440 actual) offered by the utility. This service voltage is fed directly to fluorescent lighting and heavy motors. It is transformed down to individual 120/208-volt systems in each wing of the school, so that 120 volts will be available for plug-in receptacles, small appliances and incandescent lighting. The 208 volts, rather than full 440, is used for equipment in the industrial arts shop since the equipment is handled directly by students. Not only were the costs less for wiring and conduit, but for the main switchboard as well because of the lower amperage handled.

Since all general use wire and cable may not be manufactured with less than 600 volts insulation rating, it becomes relatively easy to understand why economies are often available when the greatest use is made of this rating. With higher voltages, less amperage is required, and thus savings could then be achieved by calling for smaller wire, and in turn smaller raceway, conduit, etc. to serve equipment having the same power consumption requirements.

Another advantage of the higher voltage system is better functioning of equipment due to lower voltage drop. For example, if a motor is rated for 208-volt service and there is a line loss of 20 volts, the voltage drop is almost 10 per cent of the motor's rating, and might very well cause it to operate improperly or inefficiently.

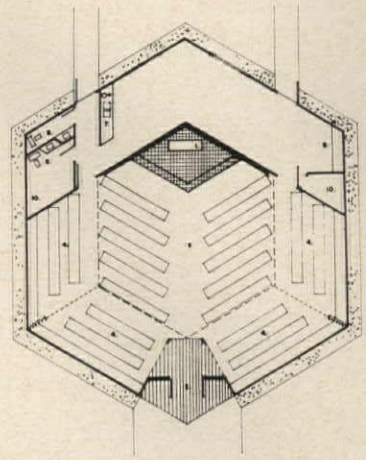
A high-voltage system is most advantageous in large spread-out schools where current must be carried long distances. The cost of providing transformers in order to lower voltages, reduces the economy for small jobs.

By running main distribution wiring in shallow trenches in the leveling fill below the concrete grade slabs the conduit could be laid out "as the crow flies," and not be limited by shapes and locations of walls, rooms, etc. Pipe hangers and other supporting devices are lessened, and there is less conflict with ducts, piping and other items.



Item No. 3 indicates sub-feed to fluorescent lighting panels in each wing. Three phase, four wire, 277/480 volts.
Item No. 9 indicates sub-feed to incandescent lighting panels in each wing, 120/208 volts.

PREFAB MISSION HOUSE DESIGNED TO BE MOBILE



Church has 1760 square feet

Designed by Geometrics, Inc.
Cambridge, Mass.

Fabricated by Acorn Structures, Inc.
Concord, Mass.

A prefabricated "mobile" mission house designed for the Episcopal Diocese of Massachusetts provides a temporary place of worship until a new parish can erect a permanent church of its own.

The mission house is designed to be erected, dismounted, and relocated with a minimum of labor and waste material.

Three of the peripheral sections of the mission house are trucked to the site as completely assembled structures ready to be set onto foundations. The walls and roof portions of the remaining low sections, fabricated into large components, are then attached. Finally, the sweeping roof panels and translucent walls of the clerestory are placed on top. The clerestory structure is supported at three points by a steel frame which also carries the perimeter roof.

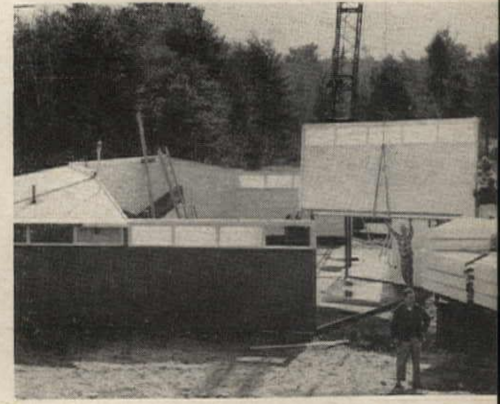
Exterior walls of the building are plywood faced, stressed-skin panels with fiber glass insulation. Interior walls are plywood faced honeycomb cored sandwich panels. The roof portions are plywood faced honeycomb sandwich panels with medium density plastic overlay on top.

Two 100,000 Btu gas unit heaters heat the 1,760 sq ft building. Each heater is equipped with a mechanical vent exhauster to enable direct venting through the side walls, while outside combustion air inducers and a plenum arrangement supply combustion air. This system meets requirements of Massachusetts that heating units in places of public assembly draw combustion air from outside rather than from the space being heated.

A perimeter trunk duct system runs along the rear walls atop the floor slab to distribute heat to the nave.

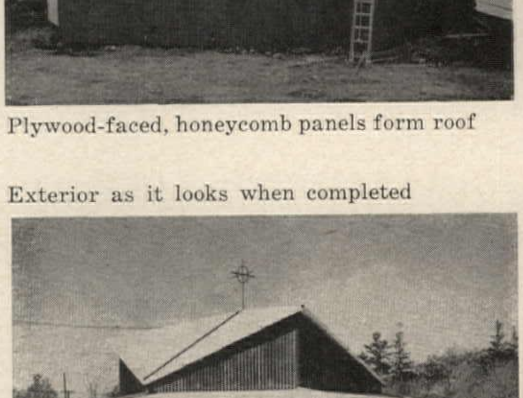
Supply ducts for the study, kitchen, kindergarten, and rest rooms at the rear of the building run along the top of the inside walls. Returns are located on the walls of the nave near the utility rooms.

Kitchen, utility unit is factory assembled

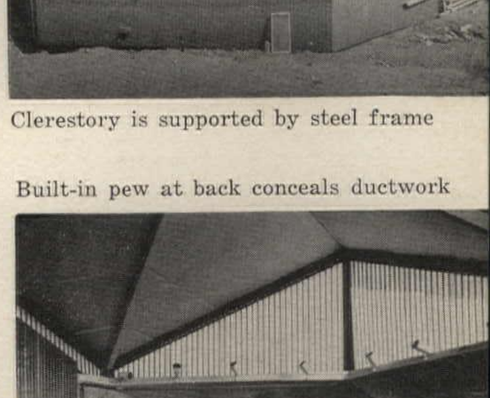


Stressed skin wall panels are added

Photos: Alessandro Macone, Inc.



Plywood-faced, honeycomb panels form roof



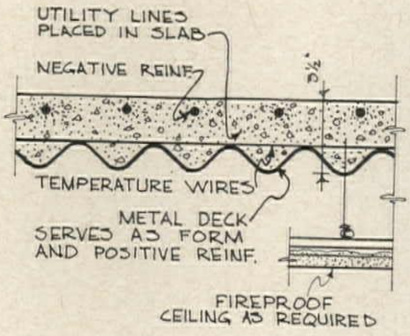
Clerestory is supported by steel frame

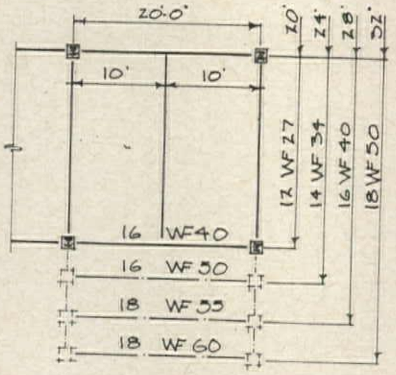
Exterior as it looks when completed

Built-in pew at back conceals ductwork

FLOOR FRAMING SYSTEMS: 3

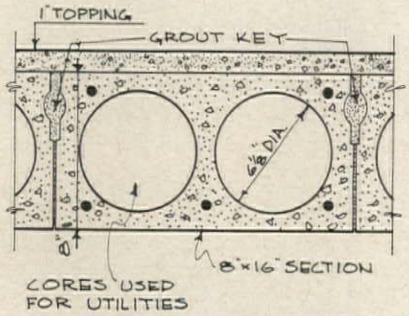
by JOHN MASCIONI, *Assistant Professor, Pratt Institute, Structural Engineer*

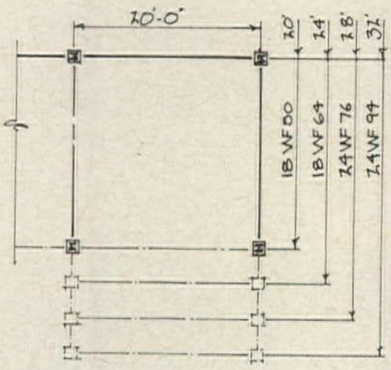




6) Composite Metal Decking

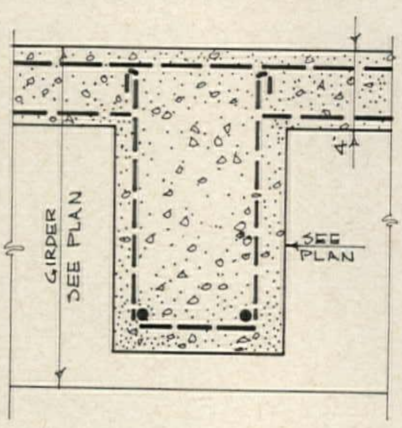
This floor system features an extremely efficient use of structural materials. The metal deck serves as positive steel reinforcement and as a form for the structural concrete slab. Like cellular metal decking, principal advantages of this system are light weight and fast erection. Decking may be either corrugated or of the rib type. On long spans temporary shoring may be required. Connections to the supporting steel are made by welding. Utilities are embedded in the concrete slab and do not affect the strength of the slab.

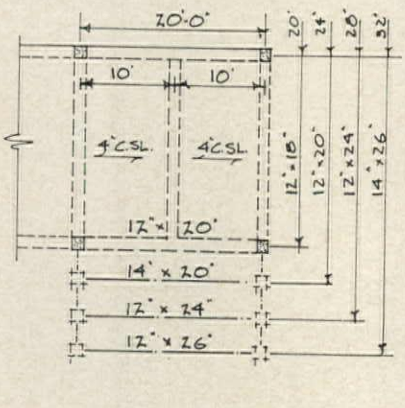




7) Long-Span Concrete Plank

This floor system may be used with reinforced concrete and masonry structures as well as with steel frames. The cores may serve as the passage of utility lines and can also be utilized for warm air heating systems. The slab used in this design employs prestressing only to control deflections that would be developed by the small depths of slab. The smooth undersurface of the slab may be caulked and painted directly. Other products commercially available use concrete block, clay tile and may be either partially or fully prestressed.





8) One-Way Solid Slab

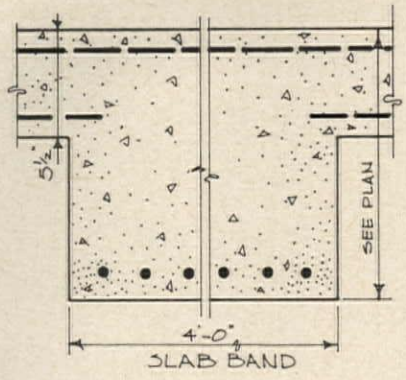
The conventional one-way solid slab with beams and girders is usually limited to smaller bays than those considered here. It is effective for supporting heavy and concentrated loads. Because of its dead weight, this floor system is most suitable for spans less than 16 ft. The principal disadvantages of this system are the depth of construction and the formwork required for the beams and girders.

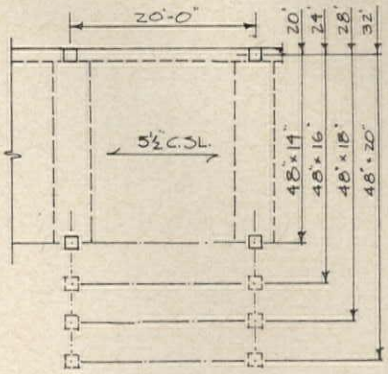
(Conclusion. Sheets 1 and 2 appeared in December)

FLOOR FRAMING SYSTEMS: 4

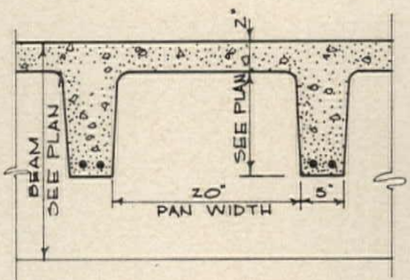
by JOHN MASCIONI, *Assistant Professor, Pratt Institute, Structural Engineer*

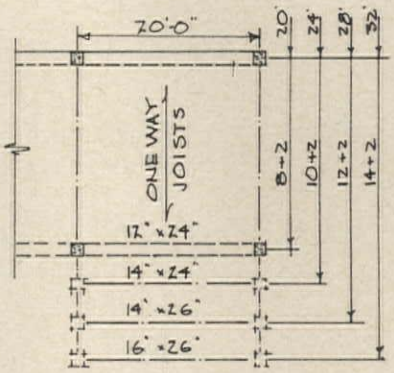
9) Slab Band
This system is basically a one-way solid slab system with wide and shallow beams, called slab bands. It has been used for apartment buildings by Fred N. Severud, Consulting Engineer. The desirable reduction in beam depth increases the amount of reinforcement; however, this is compensated by a saving in slab reinforcement due to the slab haunches. Slab bands do not have to be centered on columns and exterior and interior columns may be placed independently of each other.



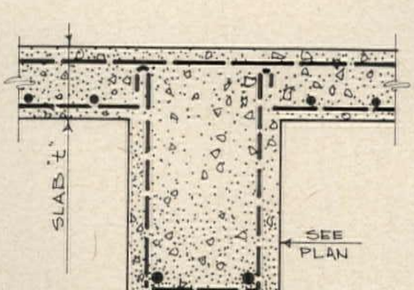


10) One-Way Concrete Joist
The elimination of concrete that provides little or no moment resistance reduces the dead weight and permits this floor system to support light loads for fairly long spans. Re-usable metal or plastic pans are used for this purpose. Shear and moment capacity may be increased by the use of tapered forms at supports. Other methods of reducing the dead weight are the use of filler block and the placing of paper tubes in the slab. Both of the latter methods have the advantage of providing a flat under-surface that may be easily treated.

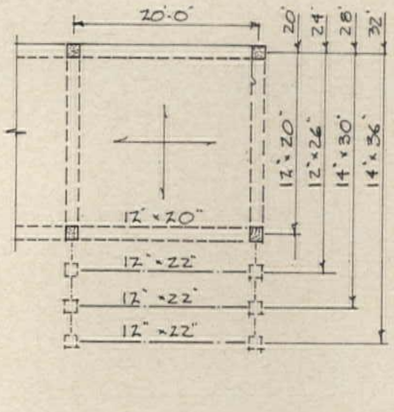




11) Two-Way Solid Slab
The reinforcement and support of a slab in two directions makes this system very efficient structurally, particularly for heavy and concentrated loads, up to 30-ft spans. A practical limit for two way action is a ratio of long span to short span of approximately 1.7. All two-way systems should be used with fairly square bays for maximum efficiency. A modification of this system is a two-way joist or rib system in which unnecessary concrete is replaced by dome pans or filler blocks.

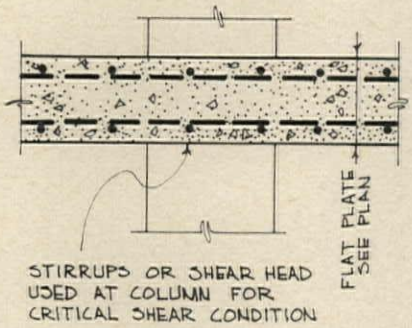


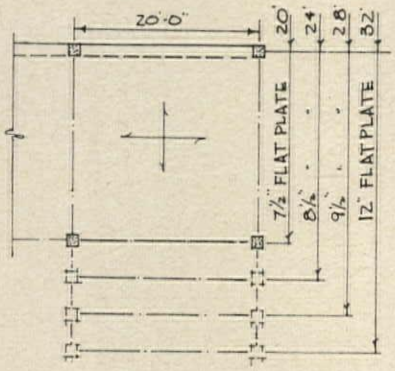
BAY	SLAB "t"
20×20	5½"
20×24	6"
20×28	6½"
20×32	7"



FLOOR FRAMING SYSTEMS: 5

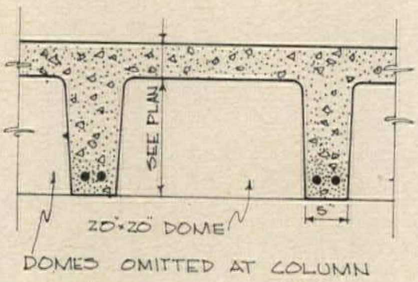
by JOHN MASCIONI, *Assistant Professor, Pratt Institute, Structural Engineer*

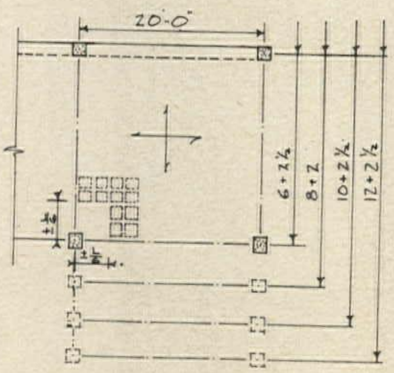




12) Flat Plate

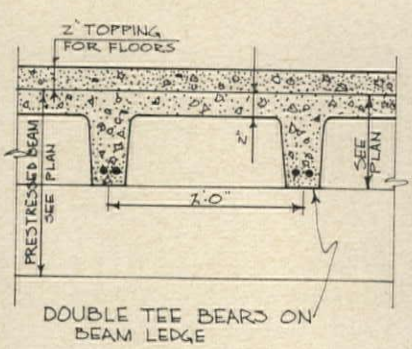
Flat plate is a special type of flat slab construction in which column capitals and drop panels, as well as beams, are eliminated. It is used primarily for relatively light loads and modest spans. Shear at the columns is often the governing factor but may be controlled by special shearhead reinforcement. The increased amount of reinforcement due to shallow depth is usually offset by advantages of the flat plate system. These include minimum depth of construction, and simple and economical formwork which increases the speed of construction. Flat plate also permits flexibility in the location of columns.

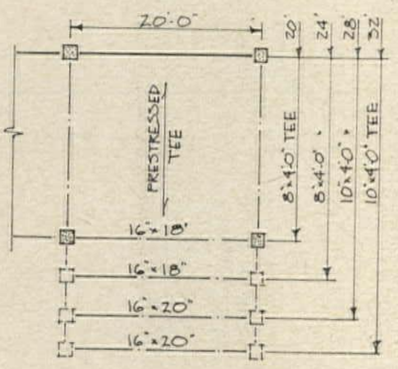




13) Waffle Slab

A waffle slab is a solid flat plate with dome forms placed in the slab to produce ribs or joists in two directions. The elimination of the dead weight of concrete not needed to resist moment increases the spans for which this system may be used. For the critical moments and shears that occur at the columns a solid area of concrete is required approximately equal to one third the span in each direction. Filler blocks, instead of dome forms, may also be used to replace concrete.



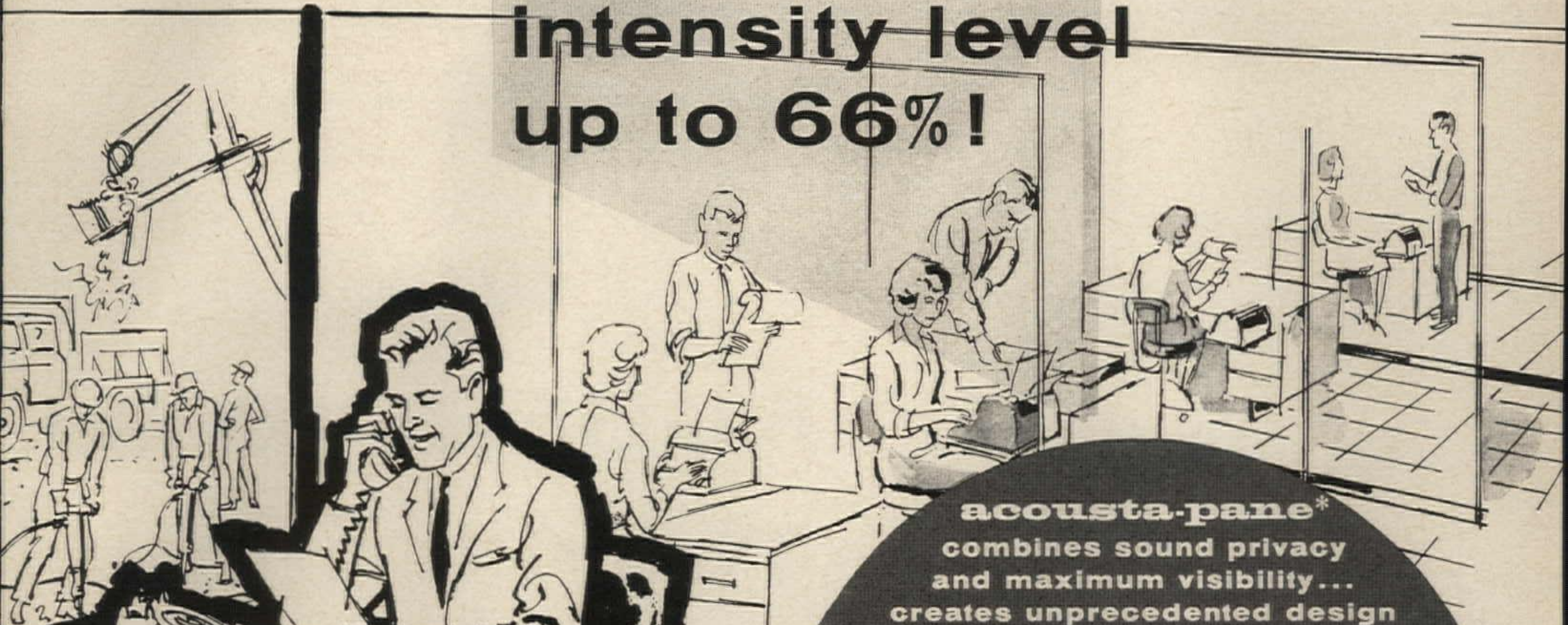


14) Prestressed Concrete

The use of manufactured precast and prestressed concrete elements permits a wide variety of framing solutions. In addition to the double tee shown here, prestressed channels, joists, tee's and planks could be used. The feasibility of using prestressed elements will often depend upon the accessibility of a manufacturing plant. Prestressed concrete elements are used to advantage with large spans and with all types of construction. Prestressing may also be used effectively to increase the spans and capacity of cast-in-place concrete systems.

now glass controls sound!

new acousta-pane* reduces noise intensity level up to 66%!



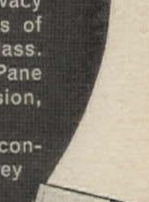
acousta-pane*
combines sound privacy and maximum visibility... creates unprecedented design freedom with architectural glass

Amerada's new Acousta-Pane represents a revolutionary advancement in architectural glass: *reduction of up to 66% of sound* penetration. Independent laboratory tests prove Acousta-Pane's superiority over other types of insulating glass in efficiently choking off distracting, everyday noise. The din of street traffic and construction. Aircraft. Plant machinery, and office equipment. And human voices.

As a basic structural element providing acoustical privacy and unlimited visibility, Acousta-Pane opens avenues of creative visual design formerly barred to architectural glass. Now, wherever sound control is a requisite, new Acousta-Pane offers an alternative to sightless walls and partitions—vision, spaciousness, a new "lease on light."

Acousta-Pane is shatter proof, installs as easily as conventional glass. Available in clear, opaque and in grey or blue tint.

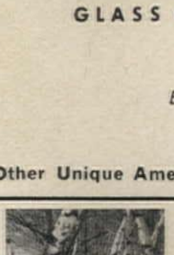
Send for our free brochure on this dramatic new concept of sound control.



amerada
GLASS CORPORATION

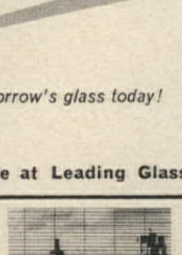
Beauty and function . . . tomorrow's glass today!

Other Unique Amerada Products Available at Leading Glass Distributor Outlets



Twi-Lite*

Greyed laminated safety glass reduces solar energy 30-40% more efficiently than clear glass, eliminates need for costly shading devices.



Comfor-Lite*

Hundreds of minute louvers between 2 hermetically-sealed glass panes screen out heat and glare without obstructing visibility.

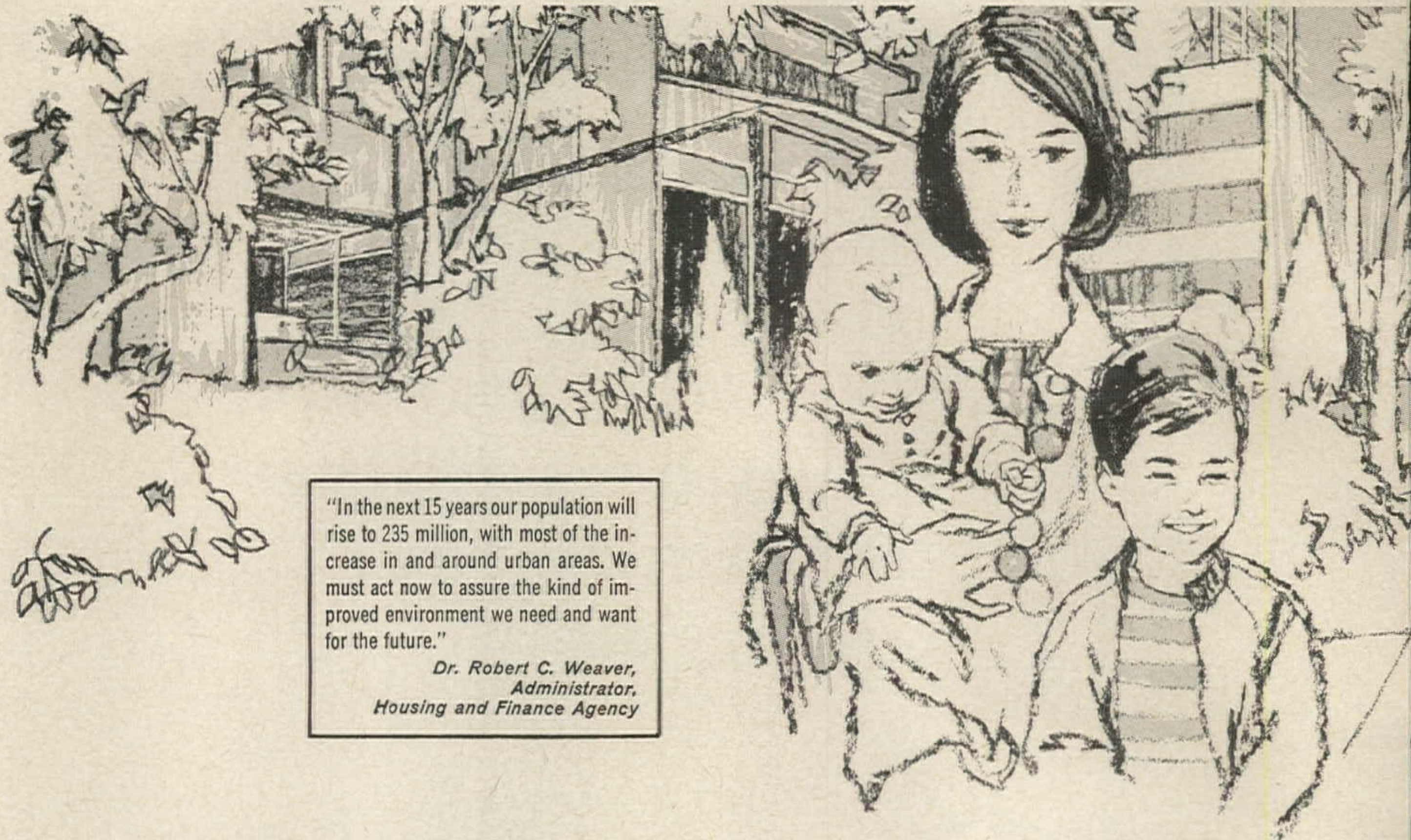
amerada GLASS CORPORATION
3301 S. Prairie Avenue • Chicago 16, Illinois • DAnube 6-4432

Gentlemen:
Please send me your free color brochure on new Acousta-Pane at no obligation.

NAME__________
FIRM__________
ADDRESS__________
CITY & STATE__________

Include information on ☐ Twi-Lite ☐ Comfor-Lite

* TRADE MARK



"In the next 15 years our population will rise to 235 million, with most of the increase in and around urban areas. We must act now to assure the kind of improved environment we need and want for the future."

Dr. Robert C. Weaver,
Administrator,
Housing and Finance Agency

The RUBEROID Co.
The 4th Annual
$25,000 DESIGN
"Improved Human Environment

One of the great challenges of the times is the vital and pressing need to restore social and economic well-being to the blighted parts of our cities. A vast national effort to meet this challenge is now in progress and it can be assumed this effort will continue and increase in importance in the years ahead. The Fourth Annual Ruberoid Matico Competition is designed to stimulate the interest of architects in urban renewal and to inspire solutions conceived with a high order of imagination, realism and architectural skill. ■ A total of sixteen awards is available, nine open to all contestants, with a grand prize of $10,000 and seven awards for students only with a first prize of $2,000.

JURY:

Edmund N. Bacon, Chairman
Executive Director,
Philadelphia City Planning Commission

Professor Vernon DeMars
Chairman, Dept. of Architecture,
University of California

William L. Slayton, Commissioner,
Urban Renewal Administration,
U.S. Housing and Home Finance Agency

announces Ruberoid/Matico

COMPETITION

Through Urban Renewal"

For a prospectus containing full details, send the coupon.

James H. Scheuer, President,
Citizens Housing and
Planning Committee of City of New York

Minoru Yamasaki
Minoru Yamasaki Associates,
Birmingham, Michigan

B. Sumner Gruzen,
Professional Advisor

The RUBEROID Co., P. O. Box 129, New York 46, N. Y.
I intend to enter the Fourth Annual Design Competition.
Please send me a copy of the program.

Name____________________

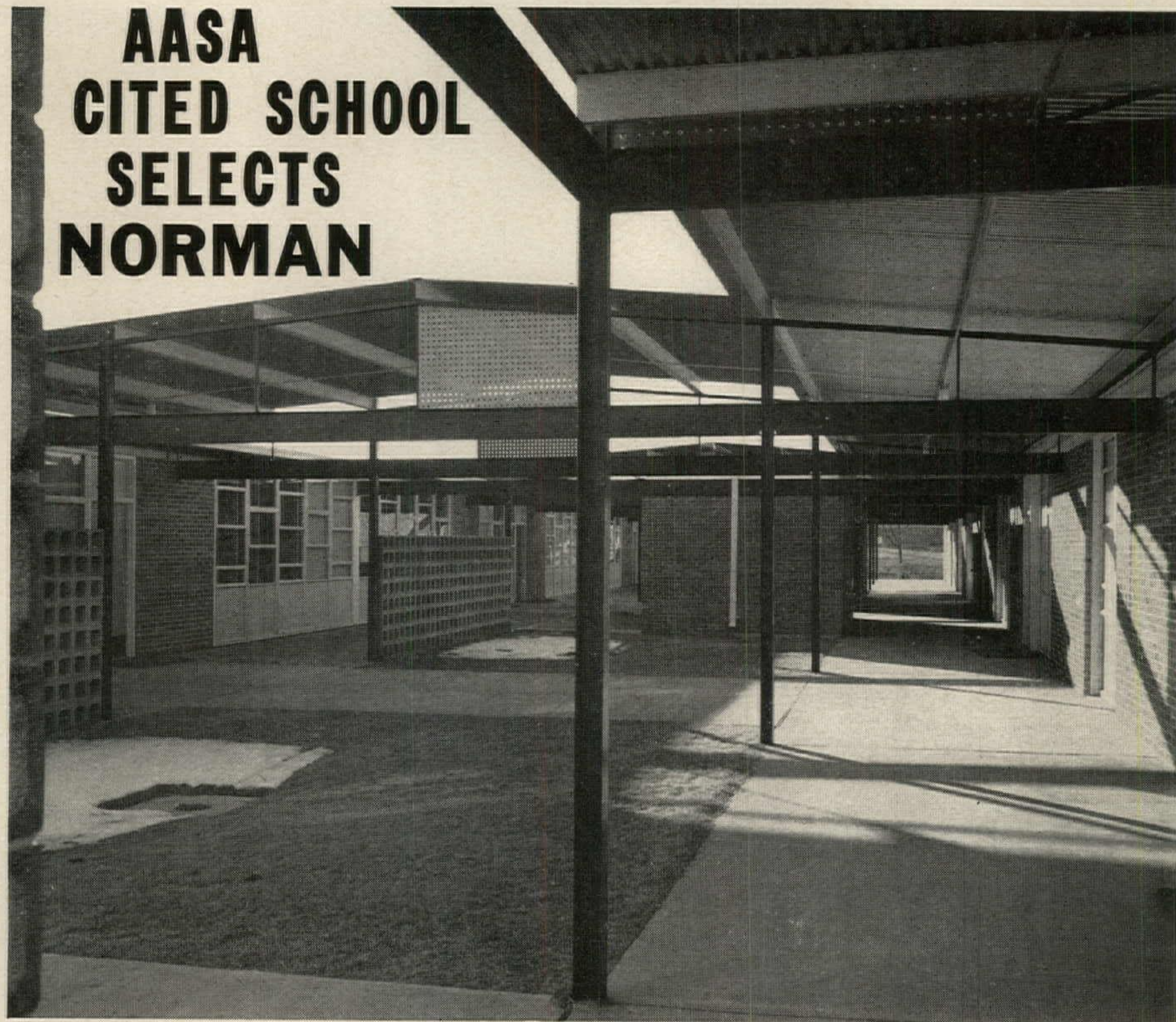
Firm or School____________________

Address____________________

City__________ Zone_____ State__________

Entrants are requested to register prior to May 15, 1962
Competition closes June 29, 1962

The RUBEROID Co., Manufacturers of Ruberoid/Matico Floor Tile and Ruberoid Building Products



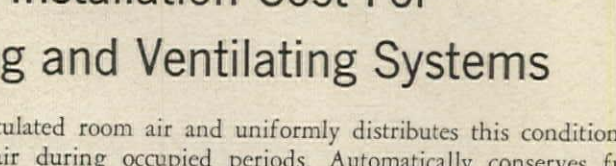
Architect: Ginocchio, Cromwell, Carter, Dees and Neyland; Little Rock, Ark. • Mechanical Contractor: R. L. O'Bryant Co., Morrilton, Ark. • Paul G. Liddicoat, Superintendent, Morrilton Public Schools

85c Per Sq. Ft. Total Installation Cost For Individual Classroom Heating and Ventilating Systems

Nationally honored by the American Association of School Administrators, the Northside Elementary School Addition in Morrilton, Arkansas is also an example of the way Norman Systems permit flexibility in design and economy in construction.

Every classroom in this all-modern addition has its own gas-fired warm air Norman System to assure room-wide comfort and a healthful pupil environment for maximum study and learning. No revamping of the existing heating method was needed. No tunnels, trenches of interconnecting network of ducts or pipes. The construction savings are obvious.

Norman automatically mixes fresh outside air with recirculated room air and uniformly distributes this conditioned air during occupied periods. Automatically conserves fuel nights and weekends. The operation and maintenance economies have been proved year after year in thousands of classrooms where Norman Schoolroom Heating and Ventilating Systems are already installed.



NORMAN HVS Model illustrating
1. Furnace Enclosure. 2. Return Air Grille. 3. Util-i-Duct® Bookshelf. 4. Air Diffuser. Also available in Inn-A-Wal Counter Flo Model for use in separate heater room.

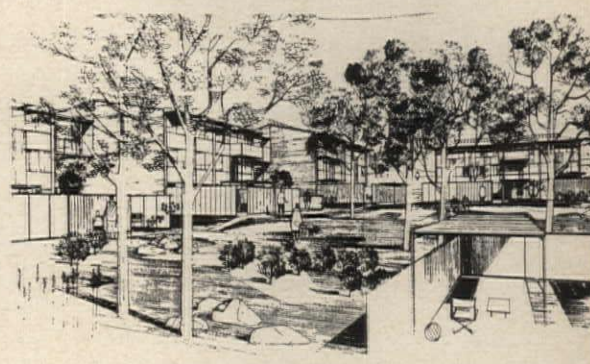
For facts and figures, send for comprehensive Manual on Norman HVS Horizontal or Inn-A-Wal Counter Flow models.

Norman® PRODUCTS COMPANY

1152 Chesapeake Ave., Columbus 12, Ohio

Building Components

Application and Specification of Materials and Equipment



LIGHT-GAGE STEEL SYSTEMS DEVELOPED FOR HOUSING

Charged with developing practical, economical uses for steel in residential buildings which could be used in combination with other materials and structural systems, architects Carl Koch & Associates came up with a combination roof-ceiling system, a floor system which serves as both concrete formwork and air ducts, window framing, wall panels and movable sun screens

Five new building component and system concepts developed jointly by Carl Koch & Associates, Architects and Armco Steel Corporation will be demonstrated in a garden apartment project under construction in Middletown, Ohio. These include a roof-ceiling system, a combination floor and air distribution system, new steel wall panels, a window-wall system and movable sunshade screens.

Roof-Ceiling System

The roof-ceiling, estimated to cost less than $2.00 a square foot, consists of new box-type ribbed steel panels which extend from eave to ridge without joints. They are made of 24-gage aluminum-coated steel.

Panels are supported by steel purlins that span between party walls. These C-shaped, light-gage steel, purlins support a finished ceiling of flat-web steel panels. Ceiling panels are painted on the job.

Foor System

Main feature of the floor system is the integrated duct work. Cost is estimated at less than $2.00 a square foot.

Basically, the floor is an 8-in. deep reinforced concrete slab with T-beam cross section. It is formed by pouring concrete over half-round metal-pan arches laid on a deck of standard interlocking steel panels.

The floor slab distributes air throughout first and second floor levels by acting as a plenum.

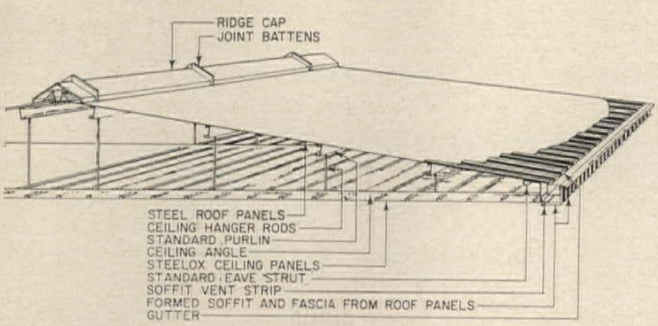
Window System

Key to the new window-wall system is a basic roll-formed steel section that can "frame-in" a variety of wall and window materials. By modifying it with adapters and fasteners, this light-gage, C-shaped piece can accommodate fixed and sliding glass and almost any shape wall panel.

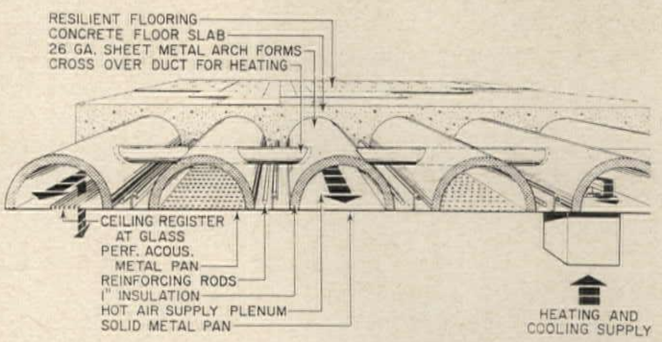
Panel Wall System

Three new steel-panel curtain wall designs developed by Koch will be demonstrated in the Middletown project. Styled to create wall textures of residential character, the 16-in. wide panels are roll-formed with vertical ribs in three distinct patterns.

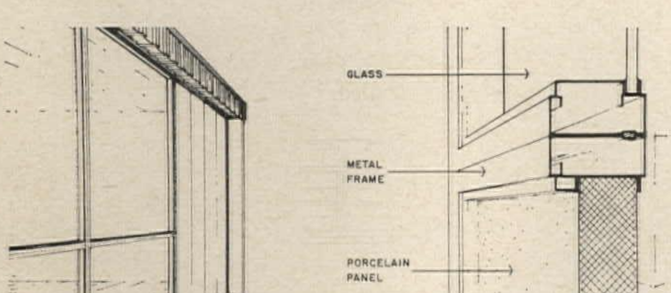
The 1½-in. prefinished panels will be backed with 1 by 3 in. wood furring and a 2-in. insulating blanket with integral vapor barrier and ⅜-in. gypsum wallboard.



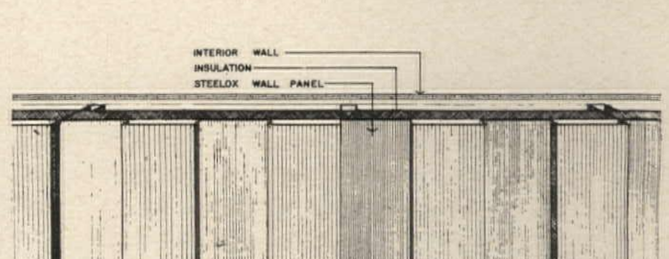
Roof-Ceiling



Floor System: Formwork and Ductwork



Window, Wall Framing



Wall Panels

SOUND SYSTEMS

by Robert B. Newman and William J. Cavanaugh
Bolt Beranek and Newman Inc., Consultants in Acoustics

Central Systems
(Continued)
In the large arena or sports building, the central cluster of loudspeakers is usually suspended without any attempt at concealment, and some central position can usually be found giving everyone clear line of sight on the unit.

In some situations, line-source loudspeakers are preferable to radial or multicellular horns (see Fig. 8). These units, made up of a series of cone-type loudspeakers, also take space, and this must be carefully considered.

Distributed Systems
In this type of sound amplifying system it is extremely important to have an adequate number of loudspeaker units. They are generally placed in the ceiling facing down and sounding through appropriate grillage. Each loudspeaker unit is considered to cover between 60° and 90°, depending on the type of loudspeaker selected. Even the highest quality units with the most suitable grille do not cover more than 90° adequately. (Fig. 9.) Unfortunately, many loudspeakers employed in such systems beam high frequency energy rather sharply. Care should be taken in system design so that speakers do not have to be operated at an uncomfortable high level to permit listeners between loudspeakers to hear properly.

In order to prevent feedback, a flexible system is usually provided with switching arrangements so that certain loudspeakers can be shut off when a source of sound is to be placed immediately under one of the units in a space for flexible use. This is necessary to prevent feedback, unless highly directional microphones are employed and the space is very "dead."

As mentioned earlier, these loudspeakers should never be placed along the side walls of a room, cross firing. With cross firing, the listener always hears from many loudspeakers at the same time, with multiple time delays reducing speech intelligibility. In a church, the loudspeakers might be located in the bottoms of chandeliers over the heads of the worshippers—there are many ways in which loudspeakers can be located properly for such assistance.

Sometimes in a large conference room the loudspeakers can be located either in the edge of the conference table or in small units placed on the table itself, each loudspeaker serving only one, two or three listeners. Sometimes, when a central loudspeaker system is used for an auditorium where people are seated on the platform with the speaker, participating perhaps in a panel or merely serving as background, a few loudspeakers operated at low level can be placed for the convenience of these listeners so that they hear more than merely the reverberant sound from the hall itself. (See Fig. 10).

In any event, good quality, distributed sound systems require no less care in the selection and placement of components than do high quality auditorium or church central systems. And, again, proper integration with the room acoustics design is just as important. "Artificial" reverberation and echo effects due to conflict between the natural sound reflected from the walls or ceilings and the amplified sound must be avoided by proper room acoustics and sound system design.

Time Delay
In distributed systems in particular, artificial echo is often a problem. Consider a listener at the rear of a long auditorium which may have used a distributed loudspeaker system for any of the reasons discussed earlier. This listener will hear amplified sound almost instantaneously from the loudspeaker overhead while the natural sound will arrive at some later time, depending on the distance to the platform. This delay in the arrival of the natural sound may be sufficient to cause a discrete echo if the delay is in the order of 65 milliseconds or more; or if the delay is somewhat less than this, the echo can appear as simply a muddying effect on the sound heard by the listener. To resolve this problem requires the introduction of a delay device in the electrical circuit which, in effect, delays the loudspeaker sound so that it arrives at approximately the same time as natural sound. For a very long room, two or more delay circuits may be required, serving several zones along the length of the room. These devices have been used most successfully where distributed loudspeaker systems supplement a central system (e.g., under a deep balcony overhang). Time delay is usually a last resort and may not ever be required if the sound system design is considered in the early design stages of the space.

(Conclusion
Part I appeared in December)

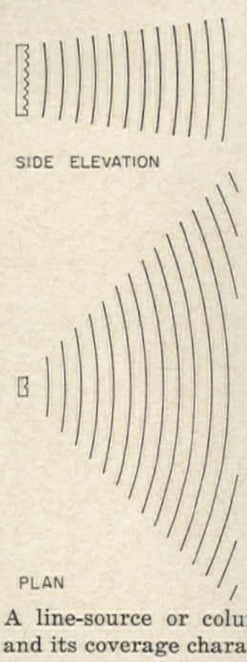


Fig. 8. A line-source or column loudspeaker and its coverage characteristics

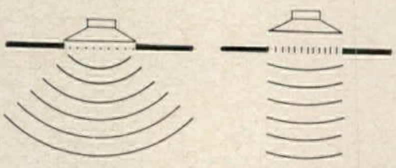


Fig. 9. Choice of grill materials markedly affects the sound distribution from a loudspeaker

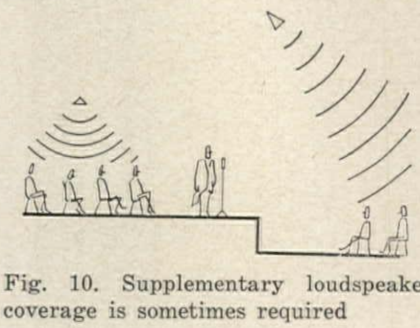


Fig. 10. Supplementary loudspeaker coverage is sometimes required

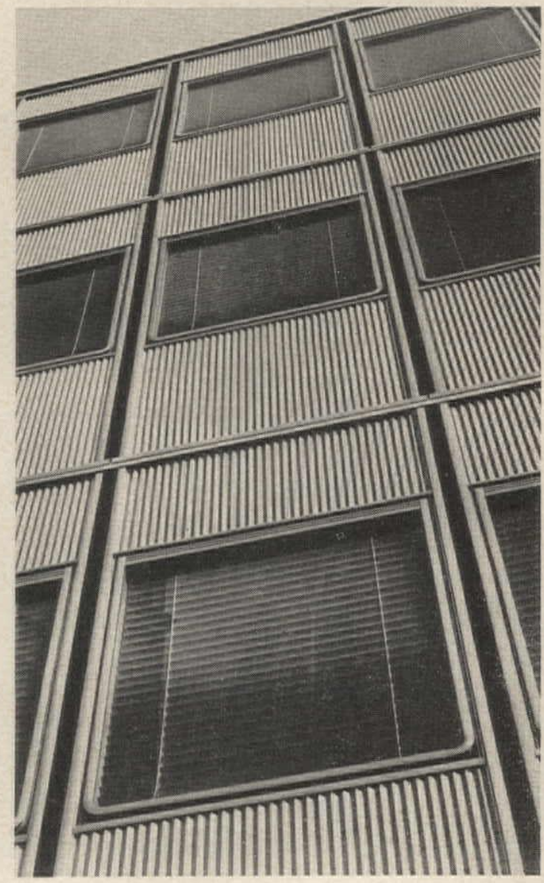
WINDOWS WITH BUILT-IN BLINDS CONTROL HEAT, LIGHT

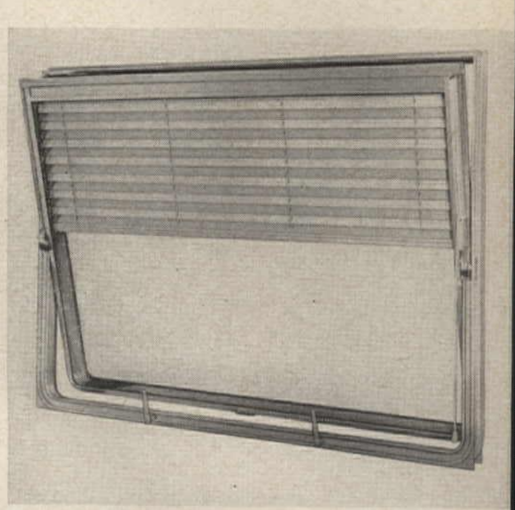
Better control of heat, light and sound is promised with *Amelco* windows of anodized aluminum with two panes of glass separated by a two-inch air space. Between the panes is a built-in venetian blind that is completely hidden when raised.

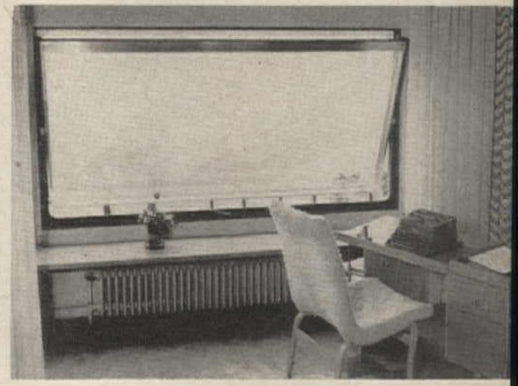
Because there is no "through" metal in either frame or vent, condensation is kept to a minimum. The double glazing and venetian blind between keep hot and cold air from entering the room. The air trapped between the panes cushions some of the outside noise.

Designed specially for industrial and high-rise air conditioned buildings, the windows pivot completely to allow cleaning from inside the room. The windows can be opened to clean the insides of the panes or change the venetian blind. They are available in sizes up to 7 ft high and 10 ft wide.

Originally made in Sweden, the windows have been used in Europe for 18 years, but are just now available in the U.S. *American Elumin Co., 1676 Commerce Dr., Stow, Ohio.*







AUTOMATIC CONTROLS CHECK BUILDING SYSTEMS

Recent developments in centralized control concepts and devices for automatically monitoring building systems are being presented to architects and engineers throughout the country by a touring exhibit from Minneapolis-Honneywell.

Among the devices is the *Scanalarm* (right picture, below) which can keep a continuous watch over 100 remote points, checking any condition which can be indicated by an on-off switch. It can be installed separately or as an integral part of a central control center.

When any check point goes into an off-normal condition, lights indicating the location turn on and a warning buzzer sounds. The buzzer can be turned off, but the lights stay on until the trouble is corrected. Automatic scanning of all points starts when one trouble point is reported and continues until trouble ends.

The first wisp of smoke is reported by Honneywell's *Smoke Sentry* (left picture, below). On the left is a light projector which aims a beam of light at a sensor (right). When the beam dims, an alarm sounds at the central control board, while lights pinpoint the location. *Minneapolis-Honneywell, Commercial Div., 2753 Fourth Ave. South, Minneapolis 8, Minn.*

more products on page 172

Institutional Showers
(A.I.A. 35-H-6) Fiat's *Wonderwall Commander* shower for dormitories and other heavy-duty installations is introduced in a 12-page "plan book" which also gives details and installation layouts of shower cabinets and related products. The *Commander* is factory fabricated in three sections, plus headrail, designed to be erected on precast terrazzo floor. *Fiat Metal Manufacturing Co., Inc., 9301 Belmont Ave., Franklin Park, Ill.**

Aluminum and Alloys
Properties of aluminum and its alloys, wrought and cast, are described in the 1961 edition of "The Aluminum Data Book." The 194-page, hard-bound handbook has 207 tables of data as guides to engineers and designers working with aluminum. Requests must be on letterhead stationery. *Reynolds Metals Co., Dept. PDR-62, Richmond 18, Va.*

Unit Heaters
Gas-fired unit heaters with propeller fans are illustrated in an 8-page bulletin which gives construction and application data. Bulletin A-817. *American-Standard, Industrial Div., Detroit 32, Mich.**

Concrete and Lift Slabs
Two booklets are available concerning *Pozzolith* concrete. No. P-36C (A.I.A. 3-B-2) is an analysis of the factors governing high quality concrete production. No. P-61-9 is a four-page study of construction techniques used in building the Huron Towers in Ann Arbor, Mich.—the largest Youtz-Slick lift-slab project to date. *The Master Builders Co., Cleveland 18, Ohio.**

Law for Architects
A 26-page booklet discusses problems of liability in design profession, reviews recent changes in A.I.A. contract documentation and points up areas of possible liability. The document is based on a report developed by the E.J.C.-A.I.A. Liaison Committee. Cost: $1. *Engineers Joint Council, 345 E. 47th St., New York 17, N.Y.*

Douglas Fir
A revised and expanded edition of the "Douglas Fir Use Book" is now available. This 1961 edition has 326 pages, with new chapters on hyperbolic-paraboloid shells and wood tanks and pipe. New books costs $5 prepaid, while owners of the 1958 edition can receive the new chapters on request. *West Coast Lumbermen's Assoc., 1410 S. W. Morrison St., Portland 5, Ore.**

Electrical Accessories
Emerson Electric's builder products are collected in one 156-page book which includes 267 products introduced during the last year. Lights, fans, heaters, door chimes and intercom systems are some of the products listed. *Emerson Electric, 8100 Florissant, St. Louis 36, Mo.**

Danish Furniture
Original designs by Danish designers are illustrated in a 41-page catalog containing 116 photographs. *John Stuart Inc., Dept. DS, Park Ave. at 32nd St., New York 16, N.Y.*

Weatherproof Industrial Lighting
A condensed catalog illustrates a variety of weatherproof aluminum fixtures, floodlights and luminaires designed specifically for exposed industrial applications. Catalog B-62. *Stonco Electric Products Co., 333 Monroe Ave., Kenilworth, N.J.**

Problem-Solving With Computers
The role of electronic computers in solving complex engineering problems is described in a 134-page manual, "Introduction to Engineering Analysis for Computers" covering the rapid growth of computers, and how engineers can communicate problems to the computer. *Technical Publications, IBM, Data Processing Division, 112 East Post Road, White Plains, N.Y.*

Adhesive for Old Concrete
How to obtain a sound bond between old concrete surfaces and other materials including metal and glass is discussed in a five-page technical paper describing *Concrete Adhesive #44-178*. The adhesive can be used for all concrete construction. *Better Finishes & Coatings Co., Broad St. and Hepburn Rd., Clifton, N.J.*

Electric Heating and Lighting
Heating of hospital rooms by radiant electric heater panels and details on lighting for industrial uses are covered in a series of booklets. *Litecontrol Corp., Watertown 72, Mass.**

Porcelain Enamel Veneer
(A.I.A. 17-A) A four-page brochure describes twelve curtain wall porcelain enamel sandwich panel designs using steel or aluminum. A 2-hour fire-rate panel is included. *Ingram-Richardson Mfg. Co., Beaver Falls, Pa.**

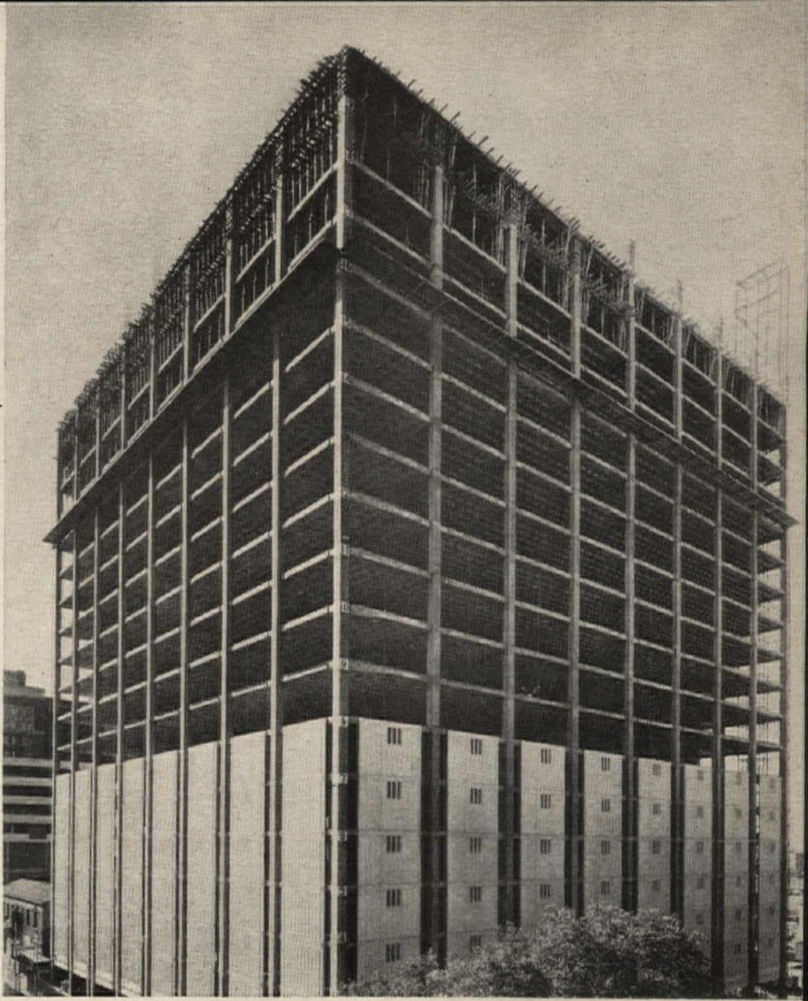
Make-Up Air Heating
Details on direct-fired make-up air heating to replace air exhausted in industrial plants are given in an 8-page bulletin, No. AS-62. Included are suggested layouts, technical and effect on relative humidity. *Maxon Premix Burner Co., Muncie, Ind.*

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

more literature on page 206

Two-way concrete joists formed by Ceco Steeldomes, create a striking "waffle" pattern overhead in recently completed 22-story Merchandise Mart Building, Atlanta, Georgia.

Edwards & Portman, architects
Jack Wilborn, engineer
Consolidated Realty Investments, Inc., contractor



You can achieve long spans, heavier loads, unusual ceiling decor, when your designs call for...

Ceco Steeldome 2-way concrete joist construction

There's a trend to two-way dome slab construction. From coast to coast you see "waffle-type" exposed ceilings—in commercial buildings, banks, apartments, hospitals, schools, churches, parking garages—in new buildings of every description. Why? Two reasons: (1) two-way dome slab construction permits economical long spans and heavier loads, and (2) the Ceco Steeldome way of forming this construction offers opportunities for unusual interior styling.

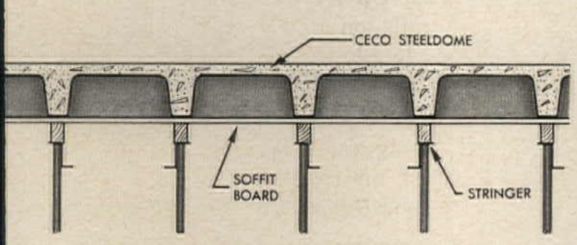
You can create special ceiling effects at low cost by painting the smooth concrete surfaces, or spraying on acoustical material. You can apply acoustical tile—or design for "open" treatment. There are many possibilities awaiting your skill.

For additional information about Ceco Steeldome construction, as well as one-way construction with flangeforms, adjustables, and longforms, ask for your copy of 72-page manual 4002-C, "Monolithic Reinforced Concrete Construction with Ceco Service."

Ceco Steel Products Corporation | *5601 W. 26th Street, Chicago 50, Illinois*
Sales offices and warehouses in principal cities

steelforms • concrete reinforcing • steel joists • curtainwalls, windows, screens, doors • steel buildings • roofing products • metal lath

In construction products Ceco engineering makes the big difference



You can design for uniform ceiling heights with Ceco Steeldome two-way concrete joist construction.

Dramatic effect is created with "open-grid" used for patio area of North Central High School, Miami, Florida.

Polevitzky, Johnson & Associates, architects
H. J. Ross Associates, engineers
Thompson & Polizzi Construction Co., contractor

HOMES PROGRAM STORY OF THE YEAR!

Two million people during National Home Week visited 82 model Horizon Homes and got a new idea of the beauty and livability of modern concrete. 16 architects and builders won special awards in design and merchandising competition.

The nation's first Horizon Homes program was an outstanding success! Ask the architects and builders who participated—built homes to their own designs. Before the first weekend was over, nearly all the model homes had been sold.

Across the country, more than 500 reproductions of Horizon Homes have been purchased. One architect-builder team reports it will spend the next year just filling orders for the house displayed. Another team is planning a 130-acre community of modern concrete houses, thanks to the tremendous buyer interest that has been generated.

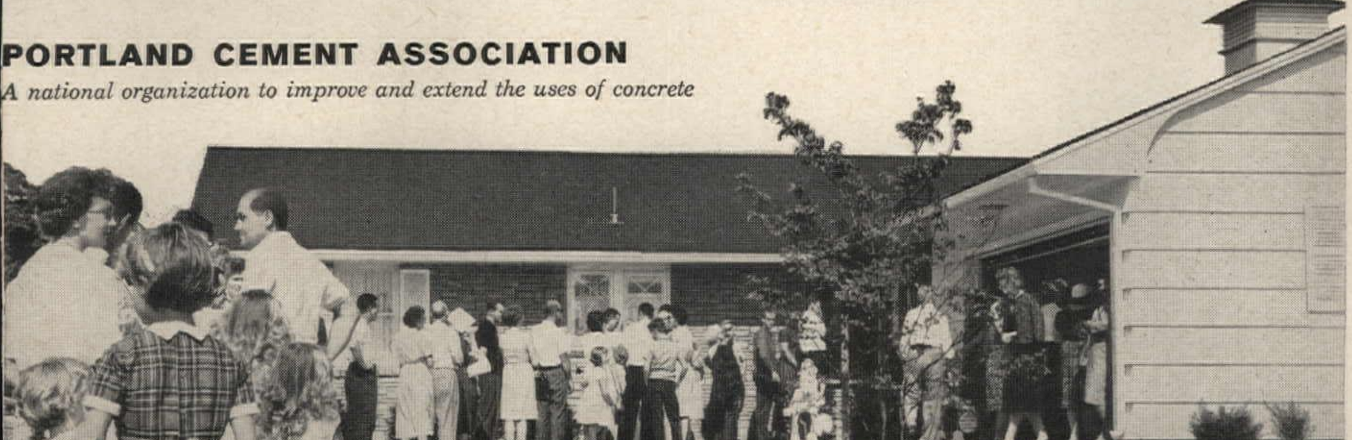
Everywhere, architects and builders report the effectiveness of the wide publicity and promotional support—the enthusiastic response accorded Horizon Homes.

Again in 1962 architects and builders are offered a big opportunity to team up and share in nationwide programs developed expressly to showcase the freshest ideas in concrete and *help sell more homes*.

For details, contact any office of the Portland Cement Association.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete



NATIONAL MERCHANDISING AWARD WINNER—The house that received the most effective selling support in the opinion of the special awards jury. Prize to builder: trip for two to any place in the world.

Avon, Connecticut. Builder: The Beckenstein Brothers, Green Acres, Inc. Architect: Kane & Fairchild.

REGIONAL MERCHANDISING AWARDS ($500.00 cash awards)

EASTERN REGION:
Erie, Pennsylvania
Builder: Pastore Brothers

SOUTHEASTERN REGION:
Columbus, Georgia
Builder: Ray M. Wright, Inc.

MIDWESTERN REGION:
Columbus, Indiana
Builder: Charles Gelfius

WEST CENTRAL REGION:
Springfield, Missouri
Builder: Ralph K. Manley

SOUTH CENTRAL REGION:
El Paso, Texas
Builder: Willis Construction Co.

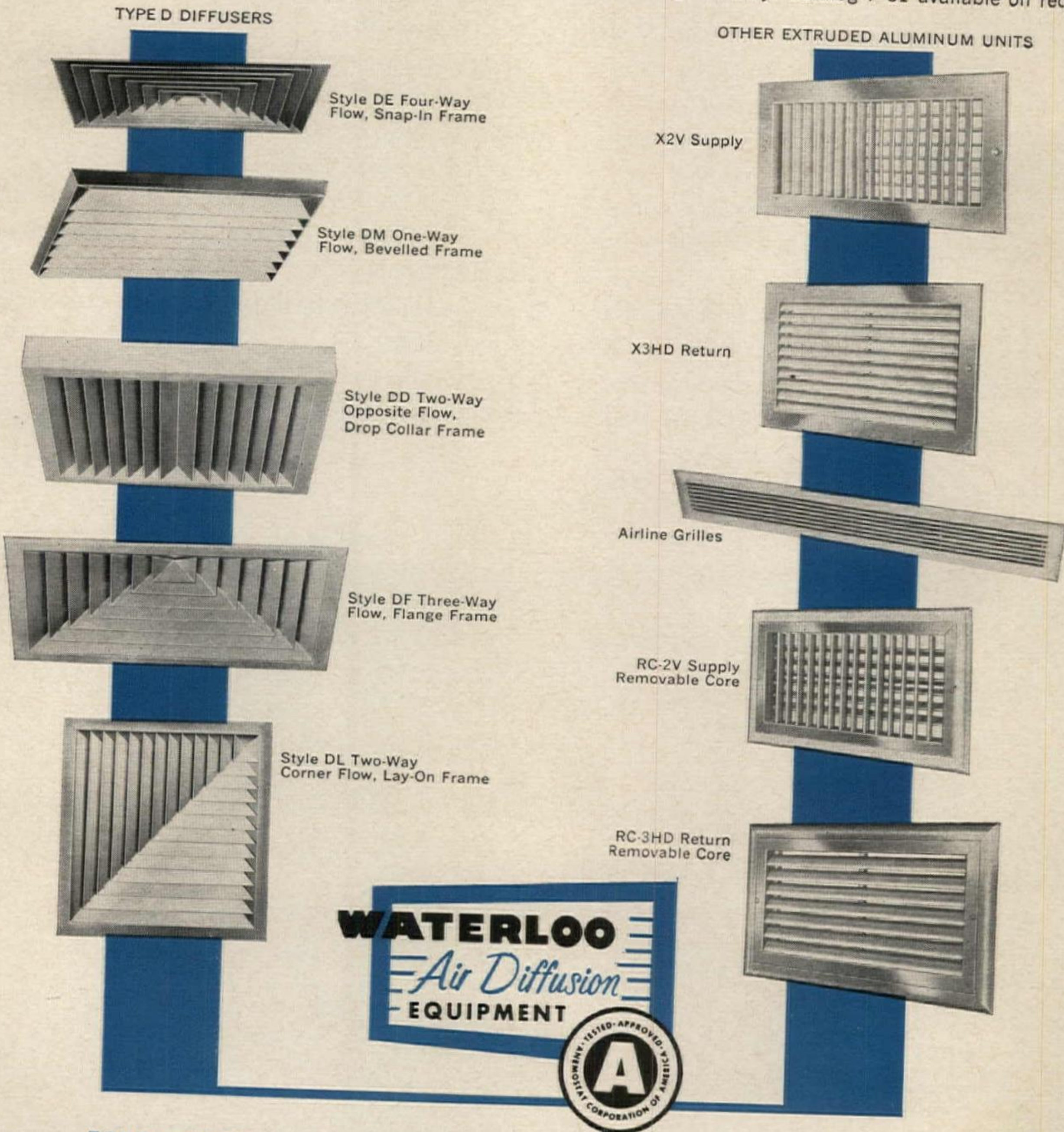
ROCKY MOUNTAIN REGION:
Albuquerque, New Mexico
Builder: Frank Marberry

WESTERN REGION:
Lewiston, Idaho
Builder: Walter Parr

**Concrete Industries Horizon Homes Program, sponsored by the Portland Cement Association in cooperation with the National Ready Mixed Concrete Association and the National Concrete Masonry Association.*

Again
WATERLOO
leads in product development
with the
FIRST ALL EXTRUDED ALUMINUM
TYPE D DIRECTIONAL DIFFUSER...

to complement and further enlarge a complete line of registers, grilles and other air diffusion equipment. Waterloo, pioneer in the development of air diffusion equipment in **extruded** aluminum, now offers the Type D Directional Diffuser, which is easy to install, ⅓ the usual weight and long lasting. These units are shown in the left panel below. Waterloo also makes a wide variety of extruded aluminum units which are illustrated in the right panel below. All Waterloo equipment is performance-proved by Anemostat in the finest laboratories in the air conditioning industry. Catalog 7-61 available on request.



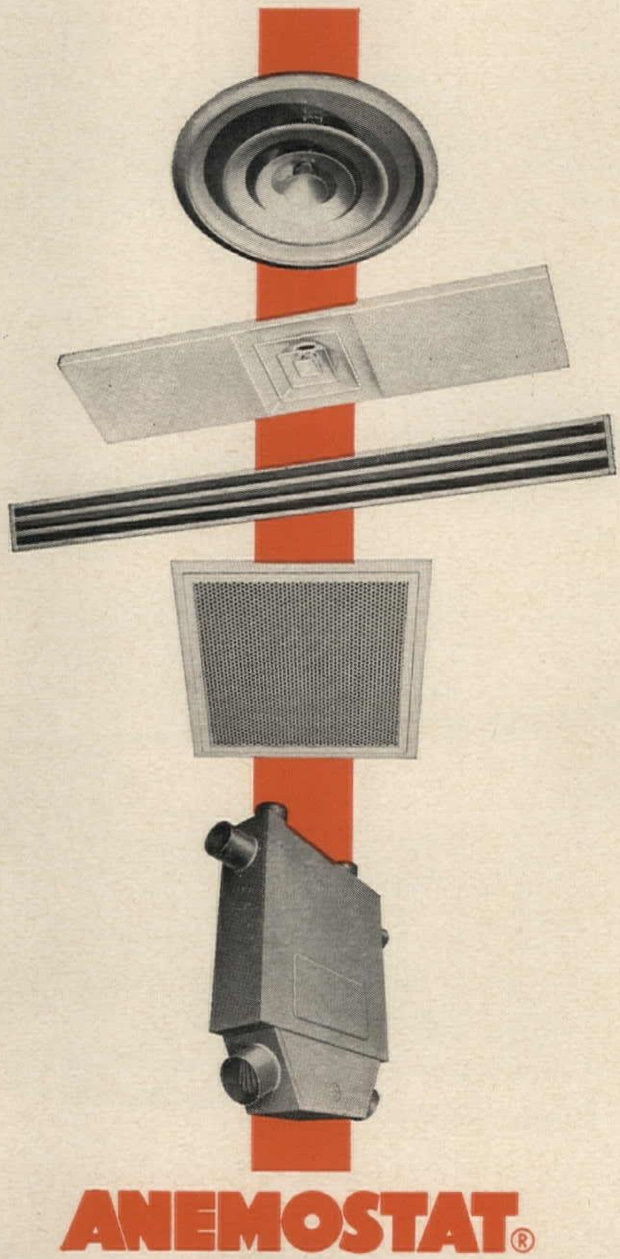
WATERLOO REGISTER COMPANY, INC.
P. O. BOX 147, WATERLOO, IOWA

WR 125

When ANEMOSTAT is in sight the system is RIGHT

Anemostat offers a complete range of air diffusion equipment for every engineering and architectural need. You can specify exactly the unit you need for conventional or high-velocity systems. In fact, when Anemostat air diffusers are in sight, you can be sure the system is right.

As a result of scientific research and development — plus experience gained in tens of thousands of installations—we have consistently improved the quality and performance of Anemostat products. There is still no "or equal" for ANEMOSTAT.



ANEMOSTAT®

ANEMOSTAT CORPORATION OF AMERICA

A Subsidiary of **DYNAMICS CORPORATION OF AMERICA**

Factory and General Offices: 888 North Keyser Avenue, Scranton, Pa.
National Sales Office: 25 West 43rd Street, New York 36, N. Y.
Representatives in Principal Cities

GLASS DOORS FROM PPG fit any architectural need... *beauty, utility, cost*

WHETHER you are designing a new building or remodeling an old one, Pittsburgh Plate Glass Company has the widest selection of dependable glass doors for you to work with. Three basic types are available—HERCULITE®, WEST and TUBELITE®.

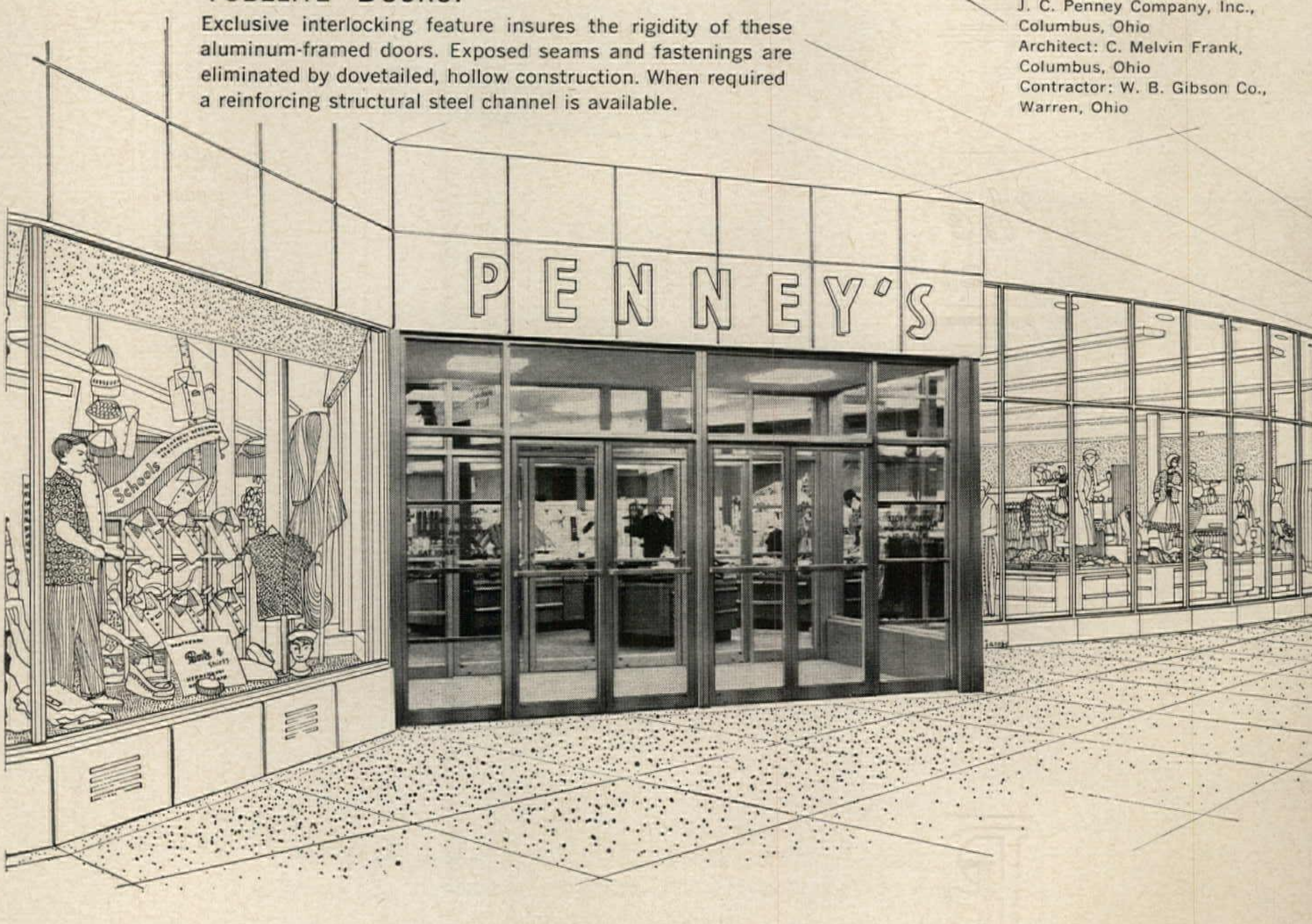
The clean, simple lines of glass doors from PPG provide a modern look that fits in with today's variety of architectural styles. The distinctive, open quality appearance of these glass doors is friendly and inviting. And their extra-strong construction makes them long lasting and virtually maintenance-free.

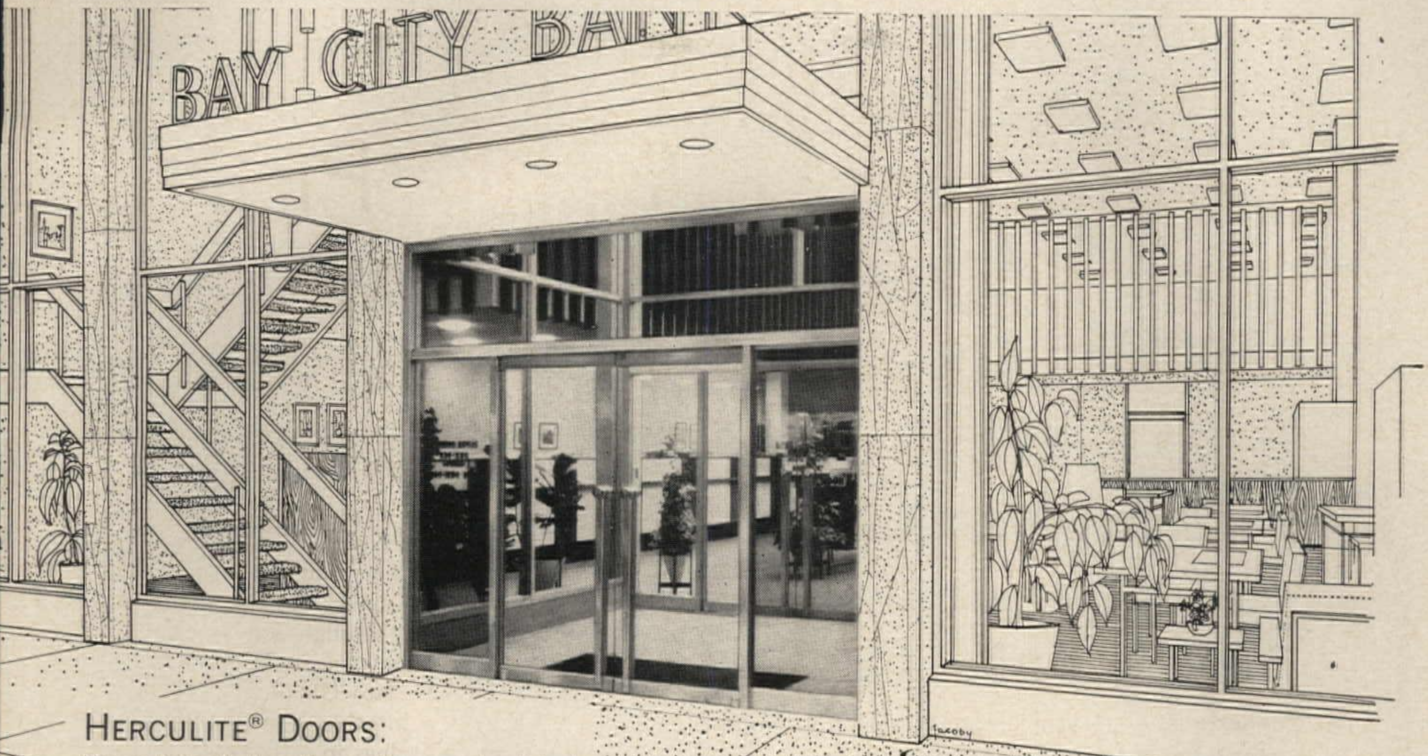
To complete your doorway design plans, PPG offers the widest selection of door frames and door hardware, *and* the PITTOMATIC® Hinge, the automatic door operator that makes it easy for people to walk through doorways. For further details, consult your Pittsburgh Plate Glass Architectural Representative, or look through our catalogs in Sweet's Architectural File.

TUBELITE® DOORS:

Exclusive interlocking feature insures the rigidity of these aluminum-framed doors. Exposed seams and fastenings are eliminated by dovetailed, hollow construction. When required a reinforcing structural steel channel is available.

J. C. Penney Company, Inc., Columbus, Ohio
Architect: C. Melvin Frank, Columbus, Ohio
Contractor: W. B. Gibson Co., Warren, Ohio





Herculite® Doors:

Heavy-duty, all-glass doors of tempered polished plate are four times stronger than ordinary glass of the same thickness. Wide variety of sizes, in thicknesses of ½ in. and ¾ in. adapt to any structural requirement.

Bay City Bank, Bay City, Michigan
Architect: Daniels Associates, Ann Arbor, Michigan
Contractor: Charles C. Engelhardt
Construction Co., Bay City, Mich.

West Doors:

Slender metal frames of aluminum, bronze or stainless steel provide a clean, modern look of quality. The ½-in. thick glass is suspended under pressure within the frame. Result: a solid unit that does not sag.

The Chemical Bank
& Trust Co.,
South Charleston, W. Va.
Architect: G. Cameron Hunter,
Charleston, West Va.
Contractor: R. N. Hewitt
Construction Co.
South Charleston, West Va.

Pittsburgh Plate Glass Company

Paints • Glass • Chemicals • Fiber Glass
In Canada: Canadian Pittsburgh Industries Limited

Now you can specify

FASERIT-IT

Revolutionary interior wall surfacing material sprayed on in one fast operation . . . can replace both painting and plastering at impressive savings of time and money.

Internationally patented mixture of chemical fibres and liquid formula, developed in Europe. Now widely used abroad in homes, schools, theatres, banks, churches, government buildings, hospitals, restaurants, hotels, apartment houses, factories—even ocean liners. Improved U.S. spray system of application cuts costs, adds speed.

All colors. "Plaster-like" textures. Great beauty, incomparable durability. Bonds to all surfaces. Cannot chip, crack, peel, stain, mold or mildew. Fire resistant, non-flammable. Long life—no maintenance—minimum oxidation—abrasion resistant—non toxic—odorless—high accoustical qualities. Reduces gamma radiation fall out 60% as much as 3,000 lb. concrete.

ALSO

FASERIT-XT

Spray-on exterior wall coating. Bonds to concrete, cinder and concrete block, brick, wood siding, stucco, etc. All colors, decorative textures. Water repellent—withstands heavy rains. Can't mold or mildew. Frost proof. Low oxidation. Fills cracks. Resists soot and dust.

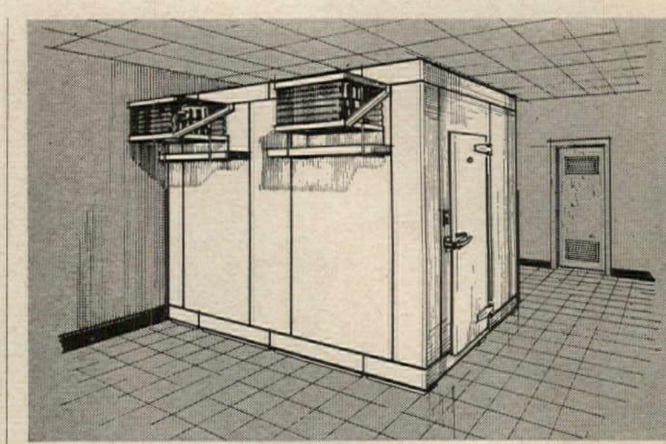
FASERIT-PT

Waterproof spray-on interior-exterior plastic coating. Hard, high-gloss—durable, long-lasting. Replaces "secondary tile" at lower cost in bathrooms, rest rooms, wash rooms and corridors in factories, low-cost housing, etc. All colors—no fading. Impervious to grease, stains, salt water, chlorine, mold, mildew. Bonds to all surfaces —no sand blasting necessary.

FASERIT is available in the U.S. through trained, licensed, franchised applicators, and is setting new standards here in beauty, durability, low cost and speed of application.

Please write for samples, information, list of applicators

FASERIT of AMERICA, *Inc.*
6675 BISCAYNE BOULEVARD, MIAMI, FLORIDA



Installation in Phillipsburg Parochial High School, Phillipsburg, N. J. Specifications prepared by Alfred Clauss, Architect, 114 West 8th Street, Trenton, New Jersey.

Bally pre-fab walk-ins

all-metal coolers and freezers

Sectional construction! Expandable any time! Costs less than built-ins!*

Newest concept in refrigeration storage makes construction of "built-ins" on the job obsolete. Precision made pre-fab sections permit installation anywhere, any size, any shape. Easy to increase in size or disassemble for relocation. Aluminum or galvanized steel are standard finishes. Stainless Steel and acid-resistant Porcelain also available. All finishes remain sanitary . . . odor-free . . . rodent and vermin proof.

Free architect's fact file...

Includes guide for specification writers . . . 16-page Walk-In book . . . portfolio of 48 installation drawings and specifications. Also included is a Walk-In description form to request plans and specifications from Bally engineers for individual installations. **Write on your company letterhead.**

See Sweet's File section 26a/Ba.

*Based on cost scales in Metropolitan areas.

Bally

Bally Case and Cooler, Inc.
Bally, Pennsylvania

NOW AVAILABLE!

NEW, COMPLETE STANDARD SPECIFICATIONS and LOAD TABLES

FOR HIGH-STRENGTH OPEN WEB STEEL JOISTS

This 52-page reference manual, reflecting the recently adopted changes in specifications and load tables for three series of high-strength joists, ***replaces all previous standards.*** The new specifications and load tables cover three series of joists:

J-Series (replacing the old S-Series), based on a design stress in tension of 22,000 psi

LA-Series (replacing the old L-Series), longspan joists compatible with the new J-Series

H-Series (completely new), high-strength joists made from 50,000 psi minimum yield strength steel

This single edition contains all the information needed for the easy, accurate specification of joists to carry uniform loads on spans of up to 96 feet.

Complimentary copies are available on request.

STEEL JOIST INSTITUTE

DUPONT CIRCLE BUILDING
WASHINGTON 6, D. C.

STEEL JOIST APPROVED SJI INSTITUTE © SJI

STEEL JOIST INSTITUTE
DuPont Circle Building, Washington 6, D. C.

Please send me a complimentary copy of the 1962 edition of the Standard Specifications and Load Tables.

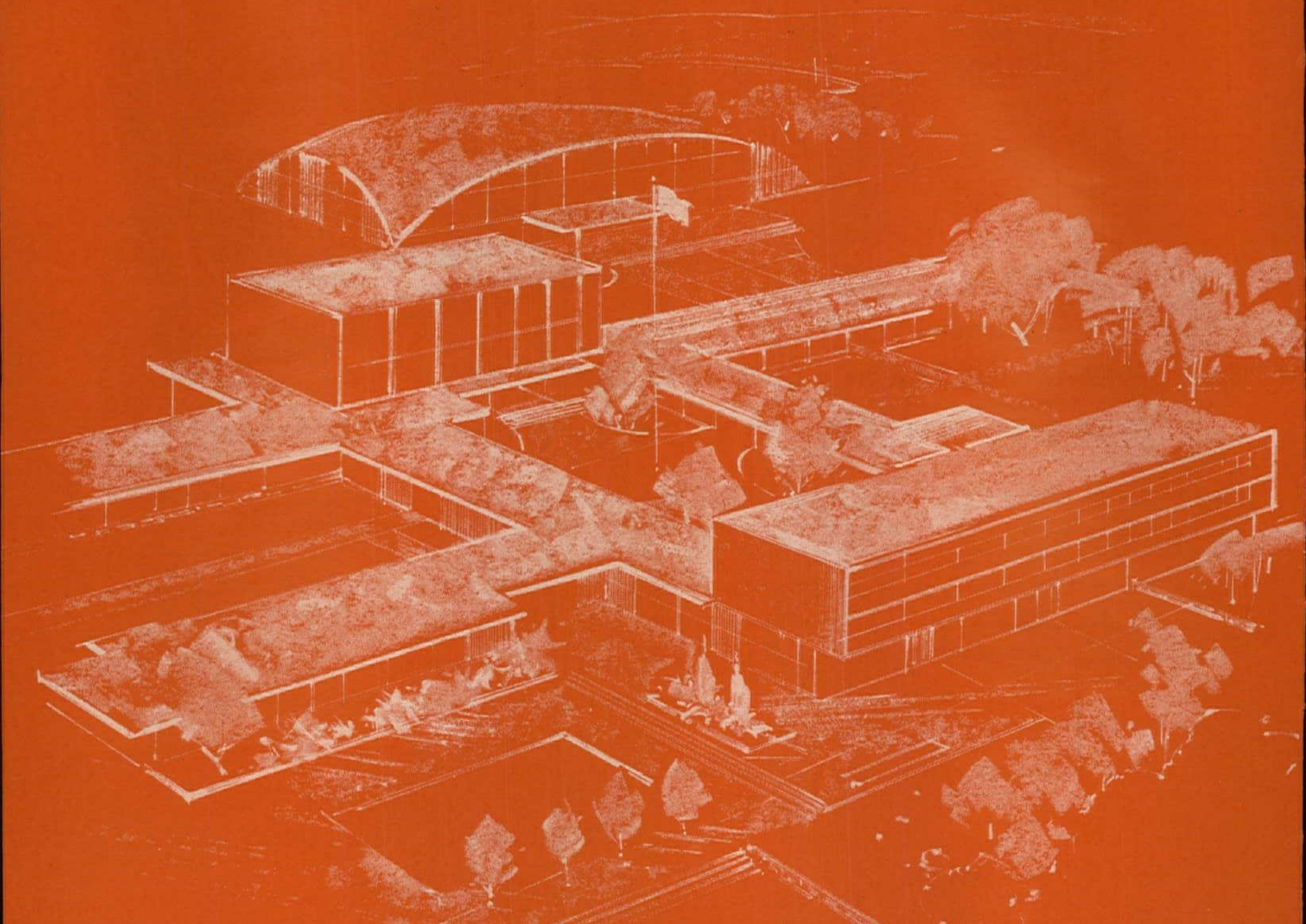
Name________________

Address________________

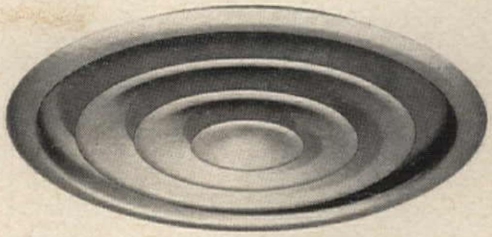
Firm________________

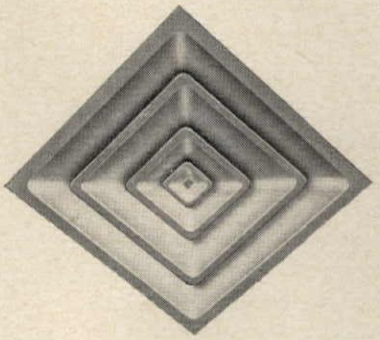
City________ Zone____ State________

IN A CLASS BY ITSELF...



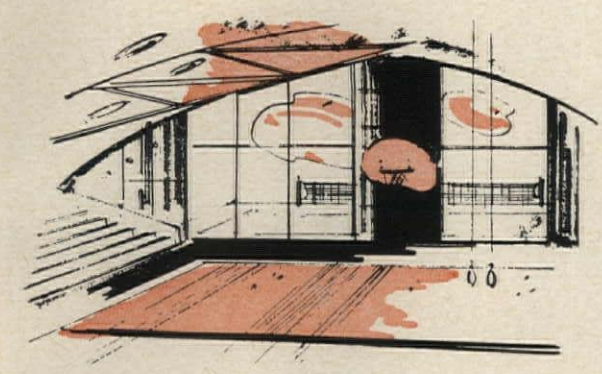
TUTTLE & BAILEY AIR DISTRIBUTION EQUIPMENT IS THE MARK OF A MODERN SCHOOL

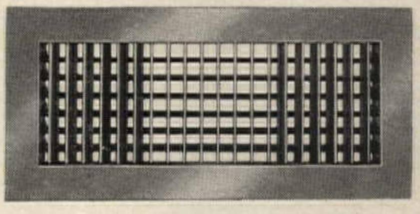


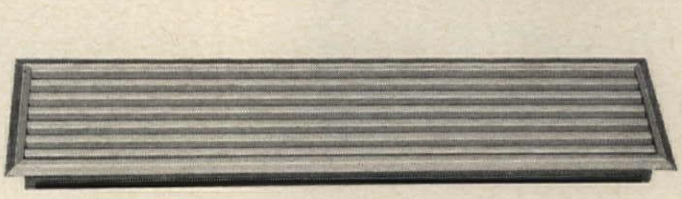


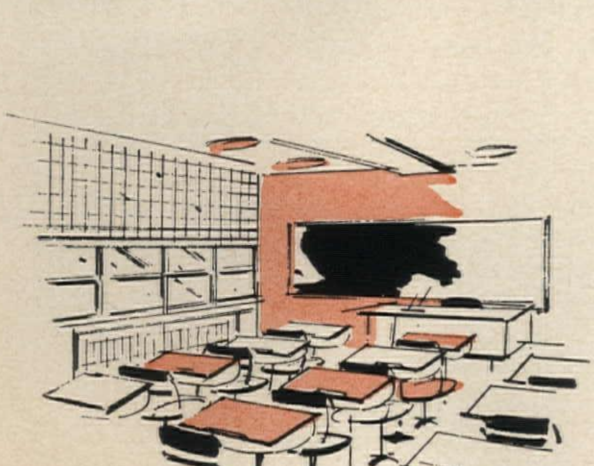
The broad range of T&B air distribution devices and accessory equipment for heating, cooling and ventilating answers every requirement of the architect, engineer and client. As the largest full-line manufacturer, T&B offers the precise piece of equipment for each job . . . setting the highest standards of appearance and performance.

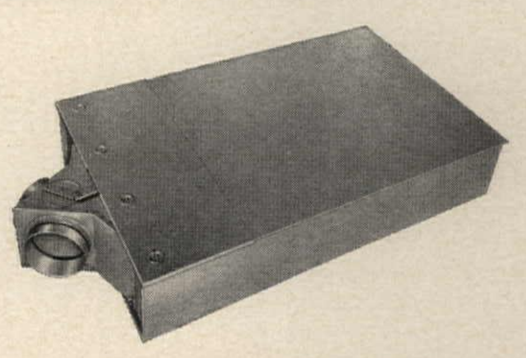
Write for the name and address of the Factory Office or Sales Representative nearest you.











TUTTLE & BAILEY

Division of Allied Thermal Corporation
New Britain, Connecticut

Tuttle & Bailey Pacific, Inc., City of Industry, Calif.

Product Reports

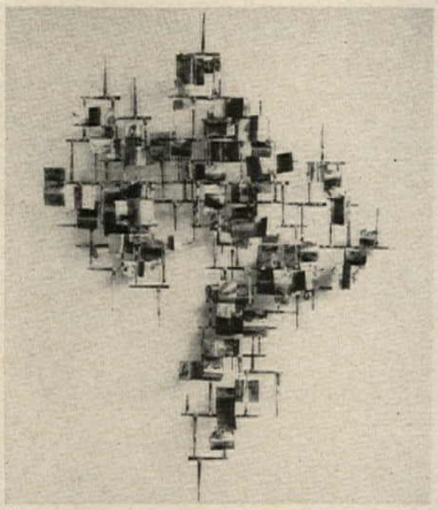
continued from page 159

Outdoor Lighting Units

Lighting units engineered for recessing in concrete are built to withstand any weather damage. Square, surface square and recess round units are available. Cast wiring boxes are included. *Edwin F. Guth Co., 2615 Washington Blvd., St. Louis 3, Mo.*

Metal Sculpture

Sculptor William Bowie uses an oxy-acetalene torch to weld different metals into a variety of abstract sculptures, both wall and free standing pieces. Custom designs as well as standard works are available. The picture shows a work of brass plates



mounted on a steel grid composed of steel cut nails brazed together. It is finished with gold and silver aluminum leaf. *The Sculpture Studio, 342 E. 56th St., New York, N.Y.*

Stained Glass Windows

Stained glass sandwiched between two thin sheets of aluminum into which a design has been cut allows an increase in the practical size of the panel and more dramatic use of color. *Metal Art Glass Panels* can be made in sections up to 50 sq ft because of the inherent strength of the aluminum sheets. Multiple light planes and degrees of color density can be achieved with canting of the individual pieces of glass. Glass areas appear dark and aluminum has a sheen, making the designs visible regardless of light conditions. *Baut Studios, Inc., 1031 Wyoming Avenue, Forty Fort, Pa.*

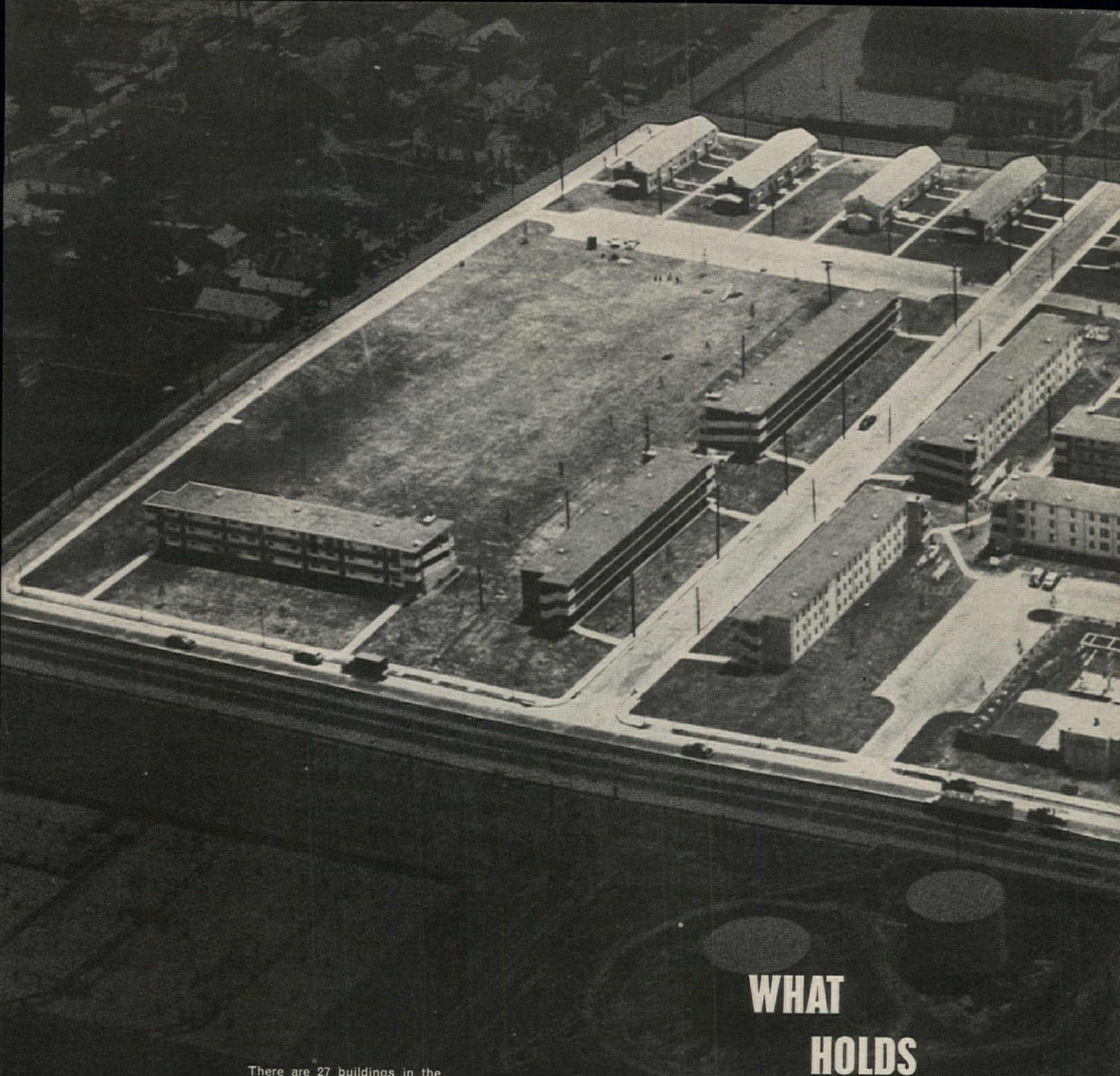
Wall-Hung Furniture—with Walls

System Cado, a line of wall-hung furniture, supplies its own walls by means of matched wood floor-to-ceiling panels which are secured to an existing wall or erected back-to-back to form a partition. The support for the units is provided by vertical rows of holes that border the panels. The oblique holes slant downward 40°. No other securing is needed. Teak and pine panels are currently available. *Royal System, 1130 Third Ave.,*

New York 21, N.Y.

more products on page 180


Modern Door Control by LCN Closers Concealed in Door
WESTERN AND SOUTHERN LIFE INSURANCE BUILDING, CINCINNATI, OHIO
Harry Hake & Harry Hake, Jr., Architects
LCN CLOSERS, PRINCETON, ILLINOIS
A DIVISION OF SCHLAGE LOCK COMPANY
Installation Details on Opposite Page

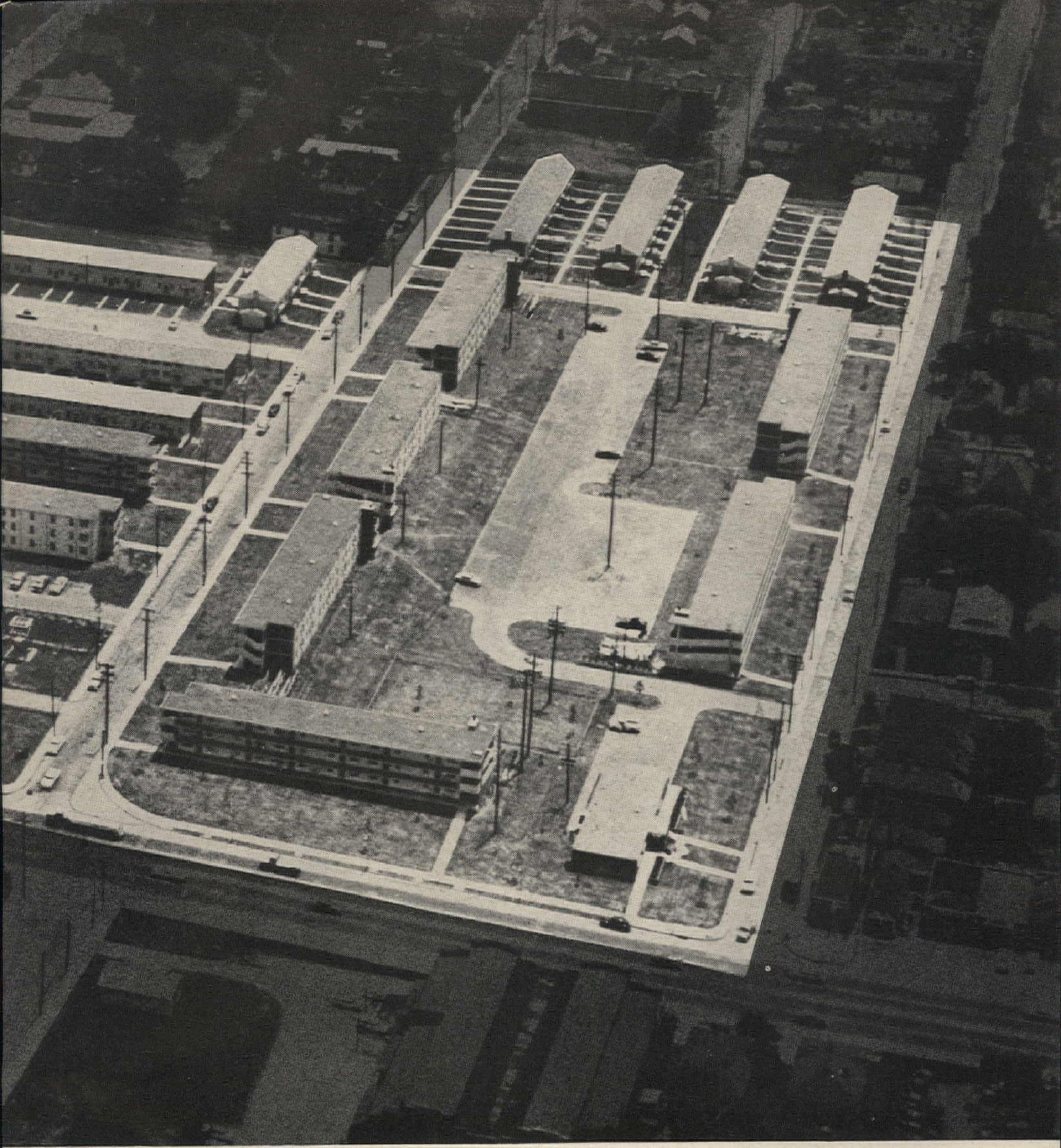


WHAT HOLDS THE WALLS OF THE JOSEPH A. FOWLER HOMES TOGETHER?

There are 27 buildings in the public housing project, Joseph A. Fowler Homes, Memphis, Tennessee. One is an administration building: the rest residential buildings containing 320 apartments. Walls are of brick veneer concrete block with Keywall in alternate courses, used to control thermal movement and to serve as a brick tie. Interior walls are of rock lath plaster utilizing Keycorner and Keystrip as reinforcement.

ARCHITECT:
Charles S. Peete & Associates, Memphis
GENERAL CONTRACTOR:
McDonough Construction Co. of Atlanta, Georgia
MASONRY CONTRACTOR:
Memphis Masonry Company, Memphis
PLASTERING CONTRACTOR:
F. M. Gravier Plastering Co., Atlanta

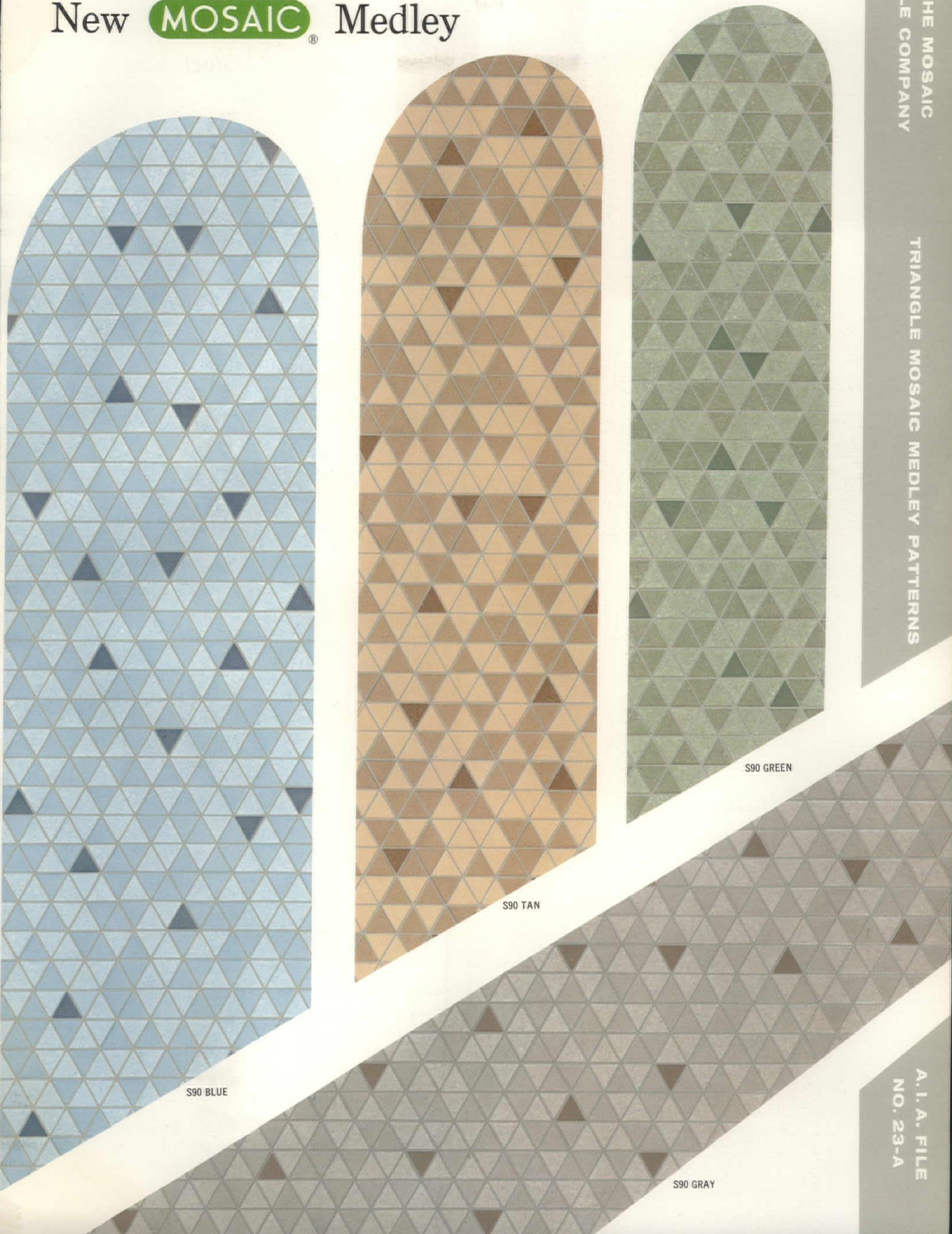
KEYSTONE STEEL & WIRE COMPANY · Peoria, Illinois



New MOSAIC® Medley

THE MOSAIC TILE COMPANY

TRIANGLE MOSAIC MEDLEY PATTERNS

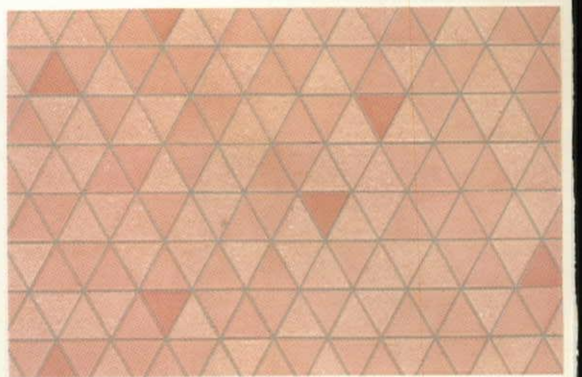


A. I. A. FILE NO. 23-A

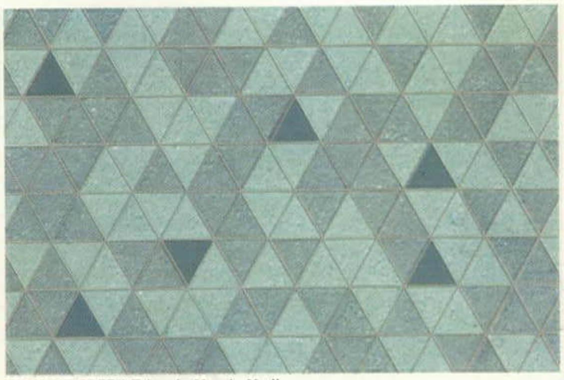
New Mosaic Medley

in 2″ equilateral triangles
of ceramic mosaic
gives special vitality to either floors or walls.

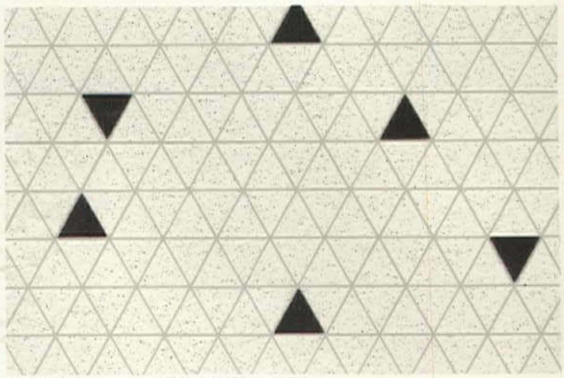
Particularly attractive in combination with other simpler patterns.



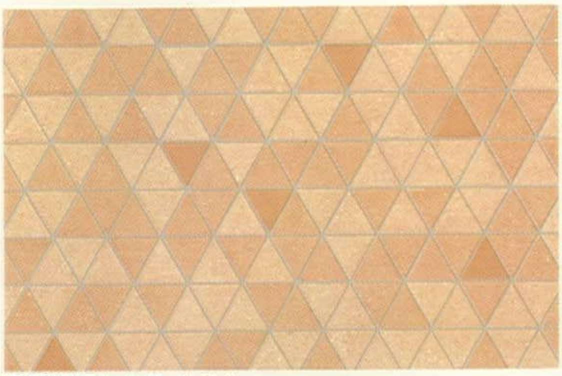
S90 PINK Triangle Mosaic Medley



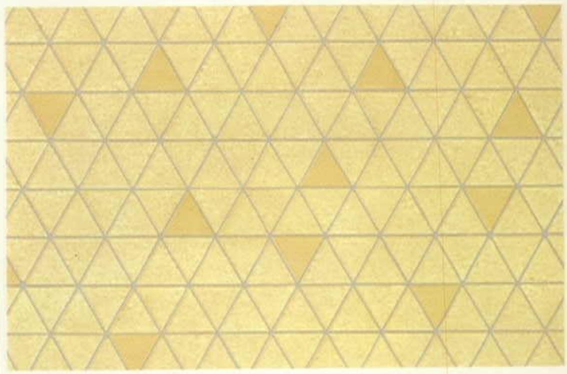
S90 BLUE-GREEN Triangle Mosaic Medley



S90 BLACK-WHITE Triangle Mosaic Medley



S90 PEACH Triangle Mosaic Medley

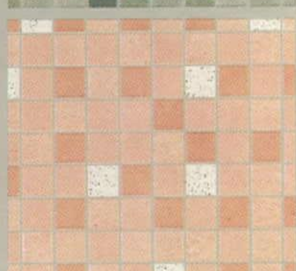


S90 YELLOW Triangle Mosaic Medley

1″ x 1″ Medley 3015-VCEA

And the now-famous Mosaic Medley Patterns in 1″ x 1″ ceramic mosaics, unglazed or glazed.

1″ x 1″ Medley 3015-VBCA



1″ x 1″ Medley 3015-VFDA

See the "Mosaic Workbook for Architects" in Sweets, call in your Mosaic Representative or write The Mosaic Tile Company, P.O. Box 112, Zanesville, Ohio.

MOSAIC®

THE MOSAIC TILE COMPANY

Member: Tile Council of America, Inc. and The Producers' Council, Inc.

OFFICES, SERVICE CENTERS: Atlanta, Baltimore, Beverly Hills, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Corona, Dallas, Denver, Detroit, El Monte, El Segundo, Fresno, Greensboro, E. Hartford, Hempstead, Houston, Ironton, Jackson, Miss., Jacksonville, Kansas City, Little Rock, Matawan, Memphis, Miami, Milford, Milwaukee, Minneapolis, New Orleans, New York, Oklahoma City, Philadelphia, Portland, Salt Lake City, San Antonio, San Bernardino, San Diego, San Francisco, Santa Clara, Seattle, Sepulveda, Tampa, Washington, D.C., Zanesville. REPRESENTATIVES: Birmingham, Fair Haven, N.J., Pittsburgh, Spokane, St. Louis. DISTRIBUTORS: Albuquerque, Hato Rey, P.R., Honolulu, St. Louis, Quebec. PLANTS: Corona and El Segundo, Calif., Jackson, Miss., Little Rock, Ark., Matawan, N.J., Ironton and Zanesville, Ohio.

AMERICA IS ENTERING THE CERAMIC TILE AGE

ARCHITECT (500 SUMMER ST.): STERNBACH & RHEAUME,
STRUCTURAL ENGINEERS—WEINBERGER, FRIEMAN, LEICHTMAN & QUINN.

ARCHITECT (777 SUMMER ST.): SHERWOOD, MILLS & SMITH,
STRUCTURAL ENGINEERS—WERNER, JENSEN & KORST.

One good $35,000 saving deserves another

...So they did it again...*with* STEEL

F. D. Rich Company specified STEEL in an attractive five-story office building they built and financed at 500 Summer Street in Stamford, Conn. They saved almost $10,000 in construction costs alone.

But also the building was ready for tenants two months earlier than possible with other materials—providing earlier income for the owner than expected.

The Rich Company, with an annual volume of over $20,000,000, promptly put up another with the Presidential Realty Corp. It is at 777 Summer Street. Naturally the new building is STEEL and the savings matched the savings down the block.

Here's what using steel meant to the owner:

Savings in construction costs in the first office building....	$ 9,375
Two months earlier rental income	$26,000
	$35,375
Same savings repeated in the second office building	X 2
Total saving	**$70,750**

It pays to build in STEEL—
—for lower construction costs and earlier completion.

American Institute of Steel Construction

101 Park Avenue, New York 17, N. Y.

AID*

Analyze **I**nefficient **D**oors

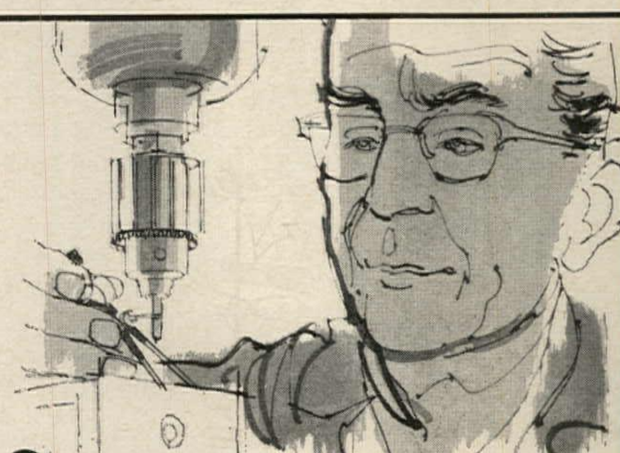
in the buildings you are designing, have you studied these 8 areas for reducing operating cost with increased door efficiency?

Plant doors will affect operating profit. They can make money or lose money for your client. They will substantially affect flow of material, productivity of people and machines, environmental control, and maintenance.

Barber-Colman's AID* Plan helps you provide your client a properly planned, highly efficient door system requiring minimum maintenan . . . helps keep production on the move, adds a extra measure of quality control to his operatio

An analysis of these 8 areas will help yo accurately identify product performance requir ments . . . provide maximum operating efficien and value for your clients.

1 **MATERIAL HANDLING** comes to a sudden stop when a "most important" door breaks down. Productivity of handling equipment and operators is a complete loss during this time. Let Barber-Colman show you how to anticipate **and prevent** with guaranteed 100,000 cycle springs.



2 **PRODUCTION** slows down or stops when materials are delayed due to door breakdown. Cost of lost production plus downtime of machine and operator can be high. Let your Barbe Colman door specialist help analyze and eliminate this.

* **Analyze Inefficient Doors:** Are your clients' plant door systems struggling to meet today's production requirements, yet designed to match conditions of ten or 15 years ago? In remodeling or new construction design, make certain that plant doors are properly integrated with building function and production flow. Your Barber-Colman door specialist can help you analyze performance requirements with the Barber-Colman DOOR SYSTEM ANALYSIS—a detailed, 41-point check list. It will help you prevent door inefficiencies, reasons for excessive door repair and maintenance, bottlenecks in material handling, and possible unnecessary loss of productive manpower. *Anticipate* and *prevent* unnecessary plant-operating costs with Barber-Colman's AID* Plan. Call today (see yellow or white pages) or write us direct.

3 **"WALKING LABOR"** costs mount up fast. When a man leaves a production job or material-handling unit simply to open/close doors your client has another indirect cost. Barber-Colman strategically located switch controls and job-engineered electric operators provide the solution.

4 **HEATED OR COOLED AIR** is expensive to make, important to save. Do doors seal tightly, or are profits leaking out through "holes" you don't see? Seal the "holes" with Barber-Colman Cam Action doors and specially insulated sections.

5 **DUST-FREE, DEHUMIDIFIED OR OTHER SPECIAL CONDITIONED AIR** may be necessary to maintain accurate quality control for a product. Provide complete sealing protection with Barber-Colman Cam Action doors.

6 **MAINTENANCE** costs go down . . . drafts, contaminated air, dirt, dust, grit are sealed out with Barber-Colman controlled operation and tight sealing.

7 **EMPLOYEE HEALTH, COMFORT** are affected by the efficiency of a plant's doors. Barber-Colman AID* Plan assures employee protection and increased productivity for your client.

8 **ACCIDENTAL DAMAGE, INJURIES** are caused when doors are inefficiently planned or operated. Anticipate and prevent these dangerous occurrences and unnecessary costs with the Barber-Colman AID* Plan.

BARBER COLMAN

BARBER-COLMAN COMPANY, DEPT. P 21, ROCKFORD, ILLINOIS

OVERdoors

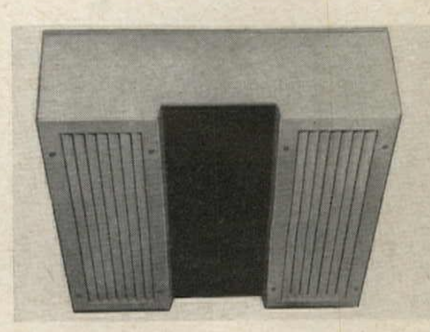
...helping industry boost efficiency

Product Reports

continued from page 180

Polarizing Building Panel
A glass fiber reinforced, acrylic-modified polyester is the material used in a translucent, structural building panel designed for use in industrial and institutional installations where vision is important. Because the panel polarizes the light, it reduces both direct and reflected glare. *Structoglas, Inc., Cleveland, Ohio.*

Air Vent for Movable Walls
Air vents which permit air circulation while preventing sound passage are designed to fit over movable walls. The units fit into the space of

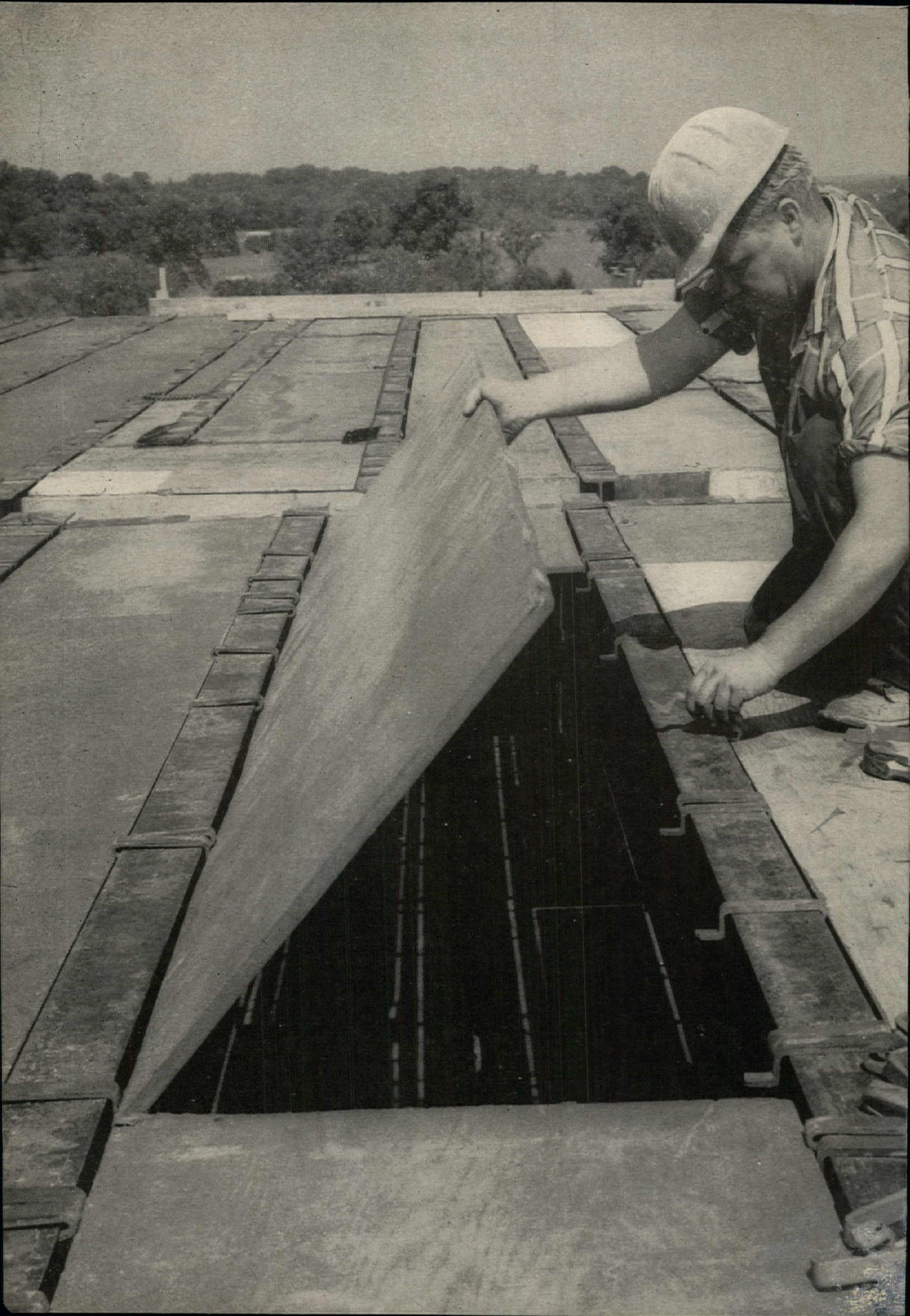


a standard 24 by 24 in. tile, and can be relocated whenever the wall is moved. *Industrial Acoustics Co., Inc., 341 Jackson Avenue, New York 54, N.Y.*

Lock Control
A full size pin tumbler lock mechanism which can be changed quickly from door to door answers the problem of former tenants of office buildings and apartments who retain keys. The cylinder is removed inserting a special control key. The locking mechanism can thus be moved to another lock within a building eliminating the need for rekeying. *Yale & Towne, Chrysler Bldg., New York 17, N.Y.*

Light and Air
One fixture combines an air diffuser by Anemostat Corp. and a fluorescent luminaire by Westinghouse. There is a double wall of metal with an air space between the diffuser and the luminaire, increasing lamp life and preventing discoloration and dirt. The fixture is offered in four foot lengths and one- or two-foot widths. Combined depth is 5½ in. *Westinghouse Lighting Div., Edgewater Park, Cleveland, Ohio*

more products on page 190



ECONOMY IN APARTMENT HOUSE CONSTRUCTION

Substantial savings in both cost and time were effected by combining Jones & Laughlin lightweight sections with reinforced concrete and structural steel frames in the construction of the 9-story 11 Slade Apartments for Mullan Contracting Company of Baltimore. Mr. Thomas F. Mullan, Jr., reported that the design enabled his firm to complete one floor every four days instead of the six usually required for a job of this size.

In the construction of the apartment, 2-story steel columns were set in place immediately followed with column ties and wind bracing. Girders were reinforced concrete members, formed between columns through the use of Junior Channel forms supported on removable column seat angles.

The 12" Junior Beams and 14" Light Beams used as secondary floor members were spaced on top of Junior Channel girder forms at 24¾" flange-to-flange, and extend 4" into each concrete girder. After aligning columns and placing intermediate supports under the girder forms, cast iron clips (known as "K-Clip") were hooked over the top flanges of the J&L Junior Beams on approximately 30" centers. Plywood forms supported on the protruding tails of the K-Clips form the concrete floor slab. With the K-Clip System, the concrete slab is in contact with the top and sides of the flanges of the floor beams, providing lateral bracing during construction and a rigid finished floor. Easy removal of the forms and re-use after cleaning provide real savings in form cost.

To complete the J&L Junior Channel girder forms, prior to placing of girder reinforcing and wire mesh in the floor slab, removable metal bulkheads were placed between the floor beams.

The ease of handling lightweight steel beams, the re-use of all forms and the time savings in forming and stripping the concrete slabs all combined to produce outstanding economy.

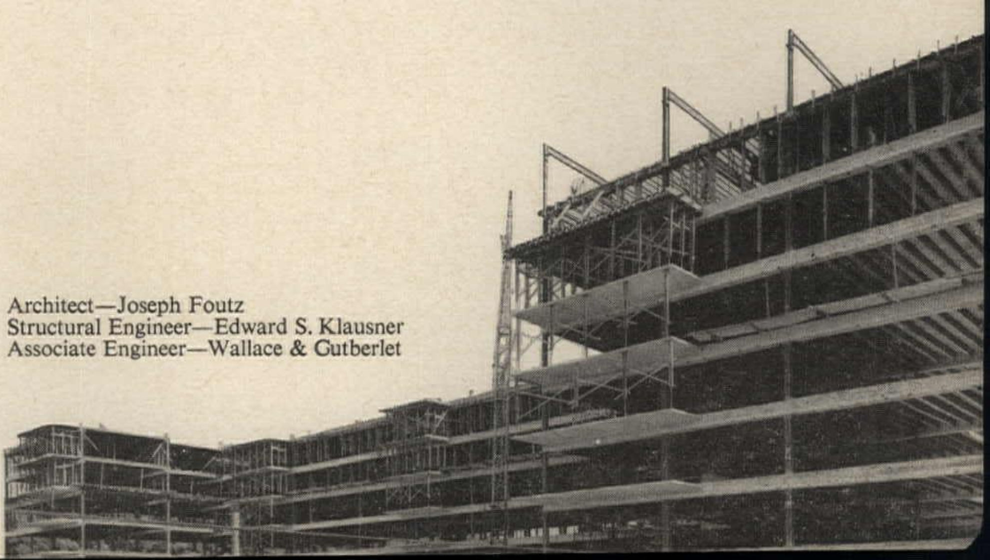
Another attractive Mullan apartment, 3900 North Charles in Baltimore, is now being constructed, utilizing the same cost-saving design features used in the 11 Slade Apartments.

Jones & Laughlin Steel Corporation

3 Gateway Center, Pittsburgh 30, Pennsylvania

STEEL

Architect—Joseph Foutz
Structural Engineer—Edward S. Klausner
Associate Engineer—Wallace & Gutberlet



Product Reports

continued from page 186

Rubber Stamps for Drawings

Rubber stamps for use on drawings and presentations include trees, shrubs, cars, people, etc. of various sizes. *Soren Stamps, 510 Park Blvd., Merchantville 10, N.J.*

Vinyl Wall Coverings

Co-ordinated schemes are included in the new series of 17 vinyl wall covering designs which "range from the formal to the whimsical with patterns for every room in the house."

The covering, made of Monsanto Chemical Company's *Ultron* vinyl plastic, resists fading and is washable. *Fabritate Inc., 515 Madison Ave., New York, N.Y.*

Concrete and Masonry Coating

A liquid, water-resistant coating designed to seal honeycombed concrete and porous masonry block surfaces can be brushed over old coatings or paints. It fills all pores and cracks and levels itself into a smooth finish coat, even on vertical surfaces. Drying time is 10 minutes. *Plas-Chem Corporation, 6177 Maple Street, St. Louis 30, Mo.*

Plastering Made Easy

Now available throughout the country is *Pinholath*, a lath base designed for machine application of gypsum plaster. Tiny pinholes permit the lath to absorb water rapidly to improve the plaster bond. Lath provides a one-hour fire resistance rating, and may also be used in hand applications. *Bestwall Gypsum Co., 120 E. Lancaster Ave., Ardmore, Pa.*

more products on page 194

IF THE NEW GYM FLOOR BECOMES SLIPPERY,

WHOSE REPUTATION WILL SUFFER?

Stop floor problems before they begin by specifying a floor maintenance program!

Only a year old, but the gym floor looks as if it has been around for at least ten years. Why? Maintenance products that weren't quite right couldn't save the new look. But try and prove to others that poor maintenance is at fault. Other possibilities are usually mulled over first. The wood floor was incorrectly installed. And so on . . . ad infinitum!

This is why Huntington suggests that you specify a complete floor maintenance program for all the floors in the new building. And specify this complete program before the building is constructed; before people who are not experts ruin the floors. Our representative, the Man Behind the Huntington Drum, will be happy to assist you at no obligation. He has had much experience solving (and preventing) floor maintenance problems. And the wide range of Huntington maintenance products for all types of floors has been tested by both time and highly-skilled laboratory technicians. Look for our representative's name, address and telephone number on the back of our insert in Sweet's Catalog, or write us.

see our catalog in
S Sweet's
or write for copy

Please send the following:
- ☐ Your folder with complete floor maintenance specifications and descriptions of Huntington floor care products
- ☐ The new Huntington Gym Floor Manual
- ☐ Have your representative contact me.

NAME TITLE

Tear out this coupon and attach it to your firm letterhead for more information.

Where research leads to better products... **HUNTINGTON**

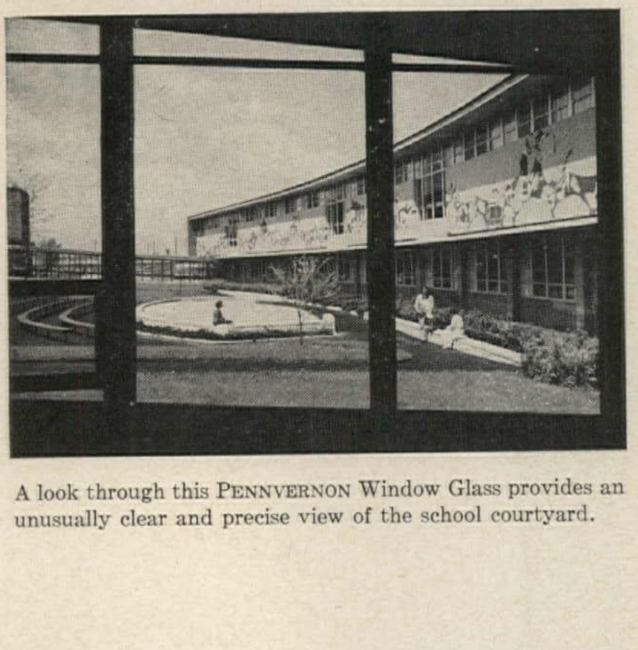
HUNTINGTON LABORATORIES • HUNTINGTON, INDIANA • Philadelphia 35, Pennsylvania • *In Canada:* Toronto 2, Ontario

In school construction—glass meets the challenge of bright young minds

This attractive Illinois high school is another example of the creative scope glass gives in designing distinctive and functional school buildings.

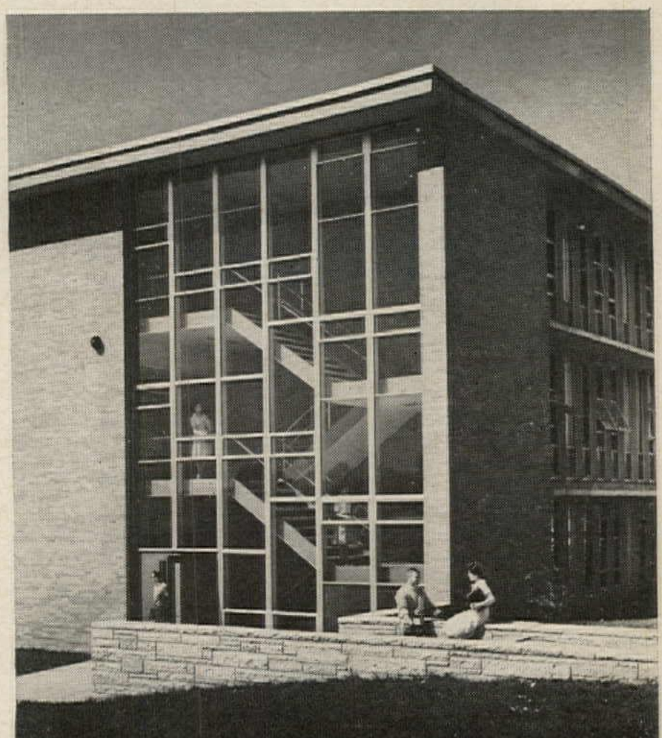
The abundance of light that comes through the Pittsburgh Polished Plate and PENNVERNON® Window Glass makes classrooms invitingly bright . . . makes them feel more spacious. In the corridors, tough, impact-resistant HERCULITE® Tempered Plate Glass provides safety and withstands day-in-day-out traffic.

For the complete story about PPG products especially suitable for schools, see your Pittsburgh Architectural Representative—or consult our catalogs in Sweet's Architectural File.



A look through this PENNVERNON Window Glass provides an unusually clear and precise view of the school courtyard.

Interesting design pattern is achieved with a combination of Pittsburgh Polished Plate Glass.

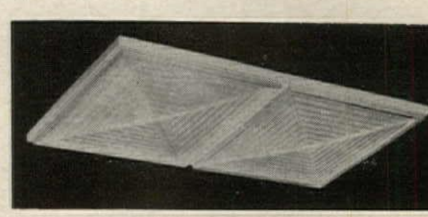


Product Reports

continued from page 190

Modular Lighting Fixture

A modular lighting fixture with twin prismatic lenses combines good light and pleasing appearance. The surface-mounted unit measures 4 by 2 ft, housing four fluorescent lamps in two acrylic plastic lenses. The fixtures can be joined mechanically and



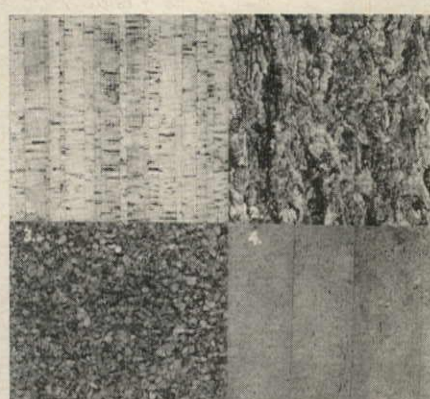
electrically in a number of patterns. Prisms molded in the surfaces of the lenses bend most of the light downward into the work zone, avoiding glare by preventing light from shining directly into people's eyes. The prisms eliminate shadows and uneven lighting. *Holophane Co., Inc., 342 Madison Ave., New York, N.Y.*

Versatile Air Conditioner

A fan coil unit for air conditioning can be put almost anywhere—indoors, outdoors; vertically in either an upflow or downflow position, or horizontally from the ceiling or from a wall mount. Model 1456 is 57 in. high, 24 in. wide and 25 in. deep. *Chrysler Corp., 1600 Webster St., Dayton 4, Ohio*

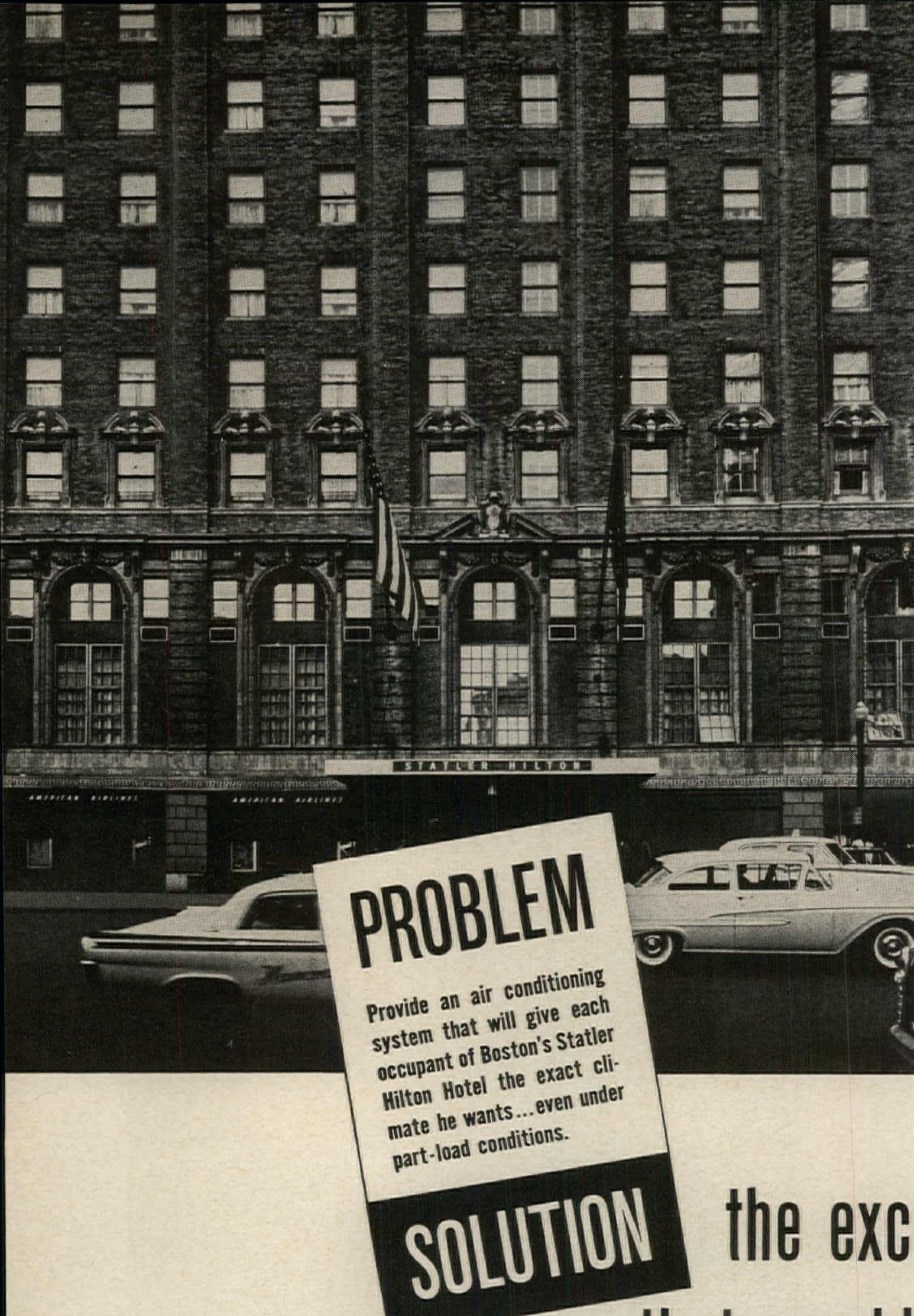
Cork Wall Covering

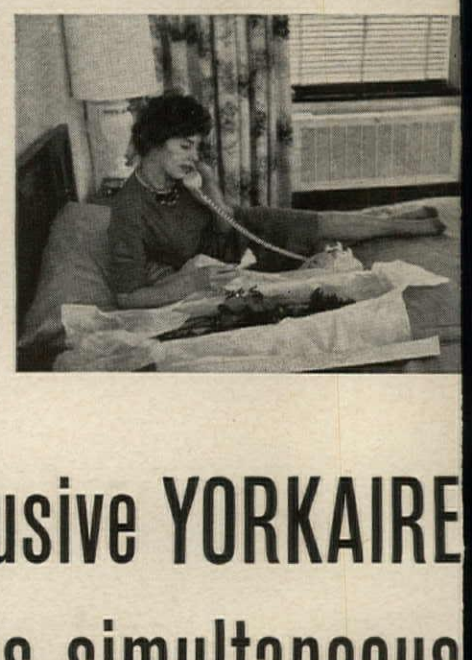
A line of imported natural cork wall coverings consists of four styles, in dark and light finishes, smooth and



rough textures for a variety of decors with sound-softening qualities. *Maharam Fabric Corp., 130 W. 46th St., New York 36, N.Y.*

more products on page 198





PROBLEM

Provide an air conditioning system that will give each occupant of Boston's Statler Hilton Hotel the exact climate he wants... even under part-load conditions.

SOLUTION

the exclusive YORKAIRE
that provides simultaneous

This major advance was pioneered by York; and York has furnished six times as many of these systems as all other companies combined. It is the first perimeter system that heats and cools at the same time—without complicated central plant zoning or extra ductwork. Every perimeter space is an independent zone.

This modern way to air condition solves the problems arising from varying occupancy and solar factors, when some occupants will require heating, others cooling—*at the same time*. The YORKAIRE Three Pipe Induction System* provides instant response to these varying needs in any season of the year.

Pioneered by York, the YORKAIRE Three Pipe System uses one pipe for chilled water supply, one for hot water supply, one for return. A special valve admits just the right amount of chilled or hot water—from full flow to trickle to no flow—to each room terminal. There is no mixing of the hot and cold water supply, no bucking heating with cooling. The results are improved comfort for occupants, lower heating and cooling costs for owners.

The system is flexible, may be applied in either induction or fan-coil installations. For induction systems, less primary air fan capacity is required and no

Three Pipe Air Conditioning System heating and cooling!

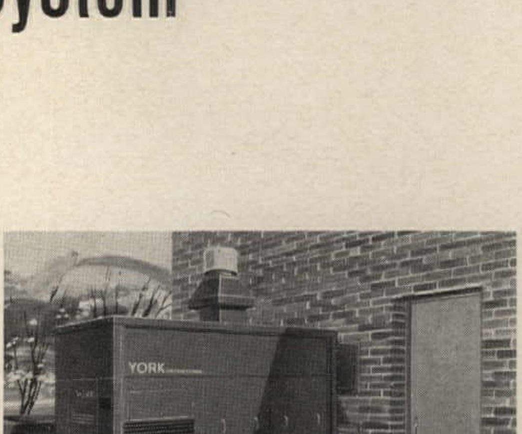
return ducts are needed . . . so there is considerable space-saving as well as reduced installation and fan power costs.

Plan ahead with York when you plan air conditioning for any type of building. For over 75 years, York has pioneered major advances in conditioning air for comfort and process. For complete facts on the YORKAIRE Three Pipe System—and a list of major buildings where it has been installed—see your York Representative; or write York Corporation, York, Pennsylvania.

*Patents Pending

YORK® CORPORATION
Subsidiary of Borg-Warner Corp.
YORK, PENNSYLVANIA

THE QUALITY NAME IN AIR CONDITIONING AND REFRIGERATION

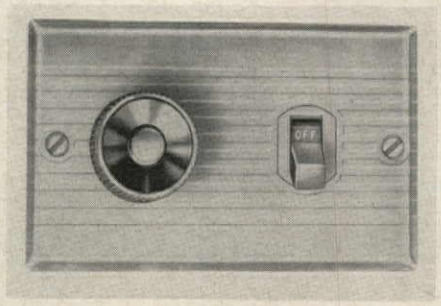


A York SUNLINE Roof Top Air Conditioner solves the problem of heating, cooling, dehumidifying a single-story commercial building. Installed on the roof, it takes no usable floor space!

Product Reports

continued from page 194

Electronic Light Dimming



Silicon controlled electronic dimming systems for fluorescent and incandescent lights are compact enough to fit in a standard light switchbox. A quiet toggle switch on the incandescent unit allows current to be turned on or off with the dimmer dial in any position. The fluorescent system has a separate on-off switch. *Thomas Industries Inc., 207 East Broadway, Louisville 2, Ky.*

Combination Heating and Cooling

Fedder's *Vectormatic* combines both convector radiator and through-the-wall air conditioner in a compact cabinet which fits under standard windows. Wide choices in convector section sizes, air conditioner chassis and cabinet sizes' with variations in cooling and heating capacities are available. Although the heating and cooling sections are incorporated in one cabinet, both operations are independent. *Fedders Corp., 58-01 Grand Ave., Maspeth 78, N.Y.*

Glass Fiber Doors

Lightweight, translucent glass fiber panels are used for residential garage and commercial doors. The

doors have aluminum frames, and panels come in several pastel colors. *Raynor Mfg. Co., Dixon, Ill.*

Safety Lighting

Electroluminescence is used in safety lighting devices by Westinghouse and Solar Sonic Devices, Inc. A steplight for use on stairways is less than ½" deep and can be mounted nearly flush on existing stair risers. A weatherproof unit can be built into stone or brickwork for identifying outdoor walks or stairs. Exit signs using the *Rayescent* panels can give better visibility under smoky conditions and use little power. *Westinghouse Electric Corp., Lamp Div., Bloomfield, N.J.*

Maintenance-Free Plywood Siding

Hypalon, a synthetic rubber by the DuPont Co., is permanently bonded to plywood siding to provide house exteriors in a variety of colors. The tough surface eliminates on-site painting expense. The product is sheathing and siding in one piece. *Georgia-Pacific, Equitable Bldg., Portland 4, Ore.*

Architects: Diehl & Diehl, Inc., Detroit, Michigan
Structural Engineer: R. H. McClurg Associates, Inc., Detroit, Michigan
General Contractor: Walter L. Couse & Co., Detroit, Michigan

Creative architects use monolithic reinforced concrete for buildings of distinction. Offering dramatic proof of this material's greater flexibility, is the new St. Clements Church in Center Line, Michigan. Monolithic reinforced concrete permitted the architects to design this unique shell roof and achieve a structure projecting unusual warmth and beauty both inside and out.

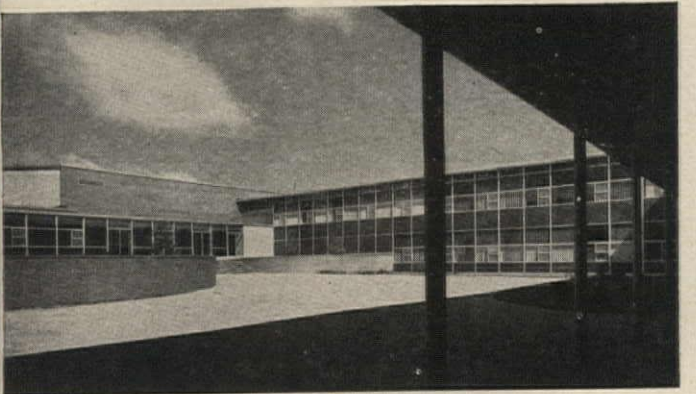
On your next project, design with greater freedom—design for monolithic reinforced concrete construction.

CONCRETE REINFORCING STEEL INSTITUTE C.R.S.I. FOUNDED 1924

Concrete Reinforcing Steel Institute
38 South Dearborn Street
Chicago 3, Illinois

6-61

Great Neck Junior-Senior High School, North Hempstead, L. I., New York. Architect: LaPierre, Litchfield & Partners (Alfred Hopkins & Assoc.). Contractor: Pealty & Fuhruman, Inc., New York, N. Y. Photograph by: C. V. D. Hubbar



Carthage Junior-Senior High School, West Carthage, New York. Architect: Sargent, Webster, Crenshaw & Folley, Syracuse, New York. Contractor: John W. Rouse Construction Co., Gouverneur, New York. Photograph by: C. V. D. Hubbard.

St. Theresa Chinese Catholic Mission, Chicago, Illinois. Architect: Kefer and Cronin, Chicago, Illinois. Contractor: Ashland Construction Co., Chicago, Illinois. Photograph by: Hedrich-Blessing.

any curtain wall worth custom designing is worth Lupton undivided responsibility

Let your imagination go on custom aluminum curtain walls. LUPTON can follow through completely!

Our custom-produced units give functional versatility for any project, however large. You get wide latitude in expression, planning and form . . . as well as in colors, finishes and textures. Your ideas are creatively translated into facades precisely as you visualize them. And with *one source of responsibility*, from your final design to the final installation.

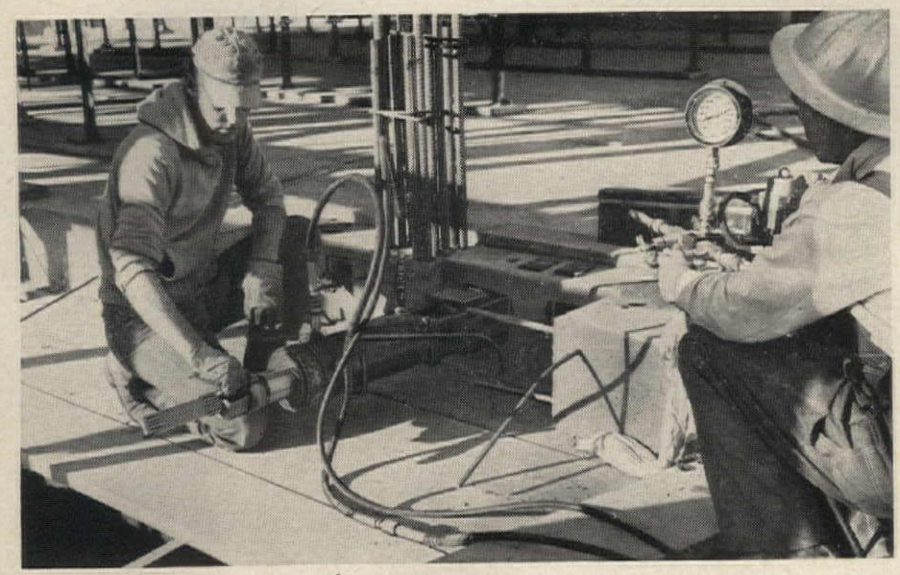
As you develop your designs, LUPTON project engineers are available to work closely with you, advising on or coordinating the manufacturing processes involved. Then LUPTON curtain wall craftsmen produce your designs exactly as conceived. Finally, skilled LUPTON field supervisors direct the installation with speed and efficiency for maximum savings to you and your client.

Financial responsibility is equally assured. LUPTON is a solidly established company that stands behind all jobs. Our reputation for reliability goes back 25 years.

Investigate all the advantages of LUPTON ability and total services as they apply to your current or future projects. See Sweet's Architectural File (sections 3 & 17) for the Michael Flynn Aluminum Curtain Wall and Window catalogs. A call to the nearest LUPTON representative (see Yellow Pages under "Windows—Metal") will bring fast action without obligation.

LUPTON® MICHAEL FLYNN MANUFACTURING COMPANY

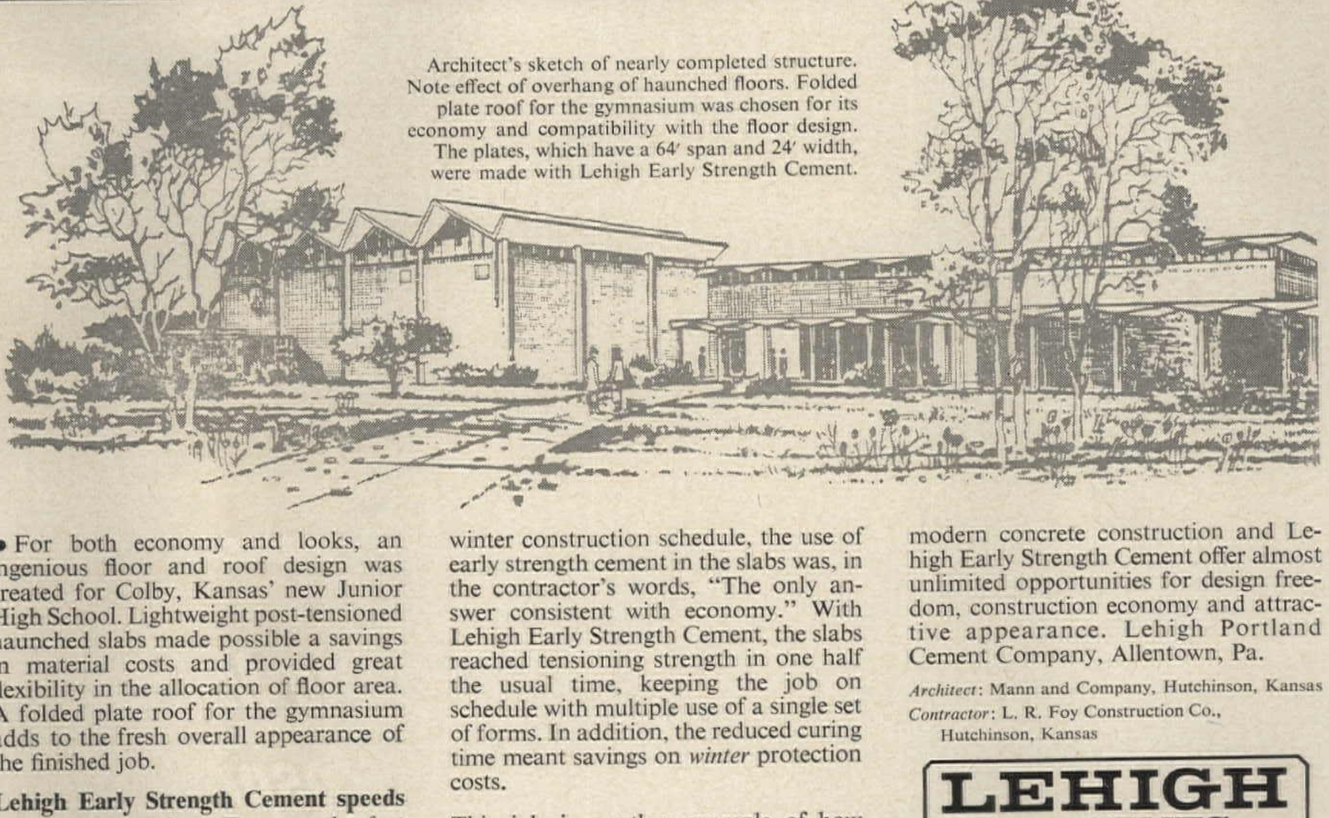
Main Office and Plant: 700 East Godfrey Avenue, Philadelphia 24, Pa., West Coast Office and Plant: City of Industry (Los Angeles County), California.
SALES OFFICES: Stockton, California; Chicago, Illinois; New York City; Cleveland, Ohio; Dallas, Texas. Representatives in other principal cities.



Post-Tensioned Concrete Floors for new school

Floors were poured in sections. As concrete in each section reached 3500 psi, post-tensioning was applied. Thickness of floors varied from 6" to 12".

Architect's sketch of nearly completed structure. Note effect of overhang of haunched floors. Folded plate roof for the gymnasium was chosen for its economy and compatibility with the floor design. The plates, which have a 64' span and 24' width, were made with Lehigh Early Strength Cement.



• For both economy and looks, an ingenious floor and roof design was created for Colby, Kansas' new Junior High School. Lightweight post-tensioned haunched slabs made possible a savings in material costs and provided great flexibility in the allocation of floor area. A folded plate roof for the gymnasium adds to the fresh overall appearance of the finished job.

Lehigh Early Strength Cement speeds winter construction. To meet the fast winter construction schedule, the use of early strength cement in the slabs was, in the contractor's words, "The only answer consistent with economy." With Lehigh Early Strength Cement, the slabs reached tensioning strength in one half the usual time, keeping the job on schedule with multiple use of a single set of forms. In addition, the reduced curing time meant savings on *winter* protection costs.

This job is another example of how modern concrete construction and Lehigh Early Strength Cement offer almost unlimited opportunities for design freedom, construction economy and attractive appearance. Lehigh Portland Cement Company, Allentown, Pa.

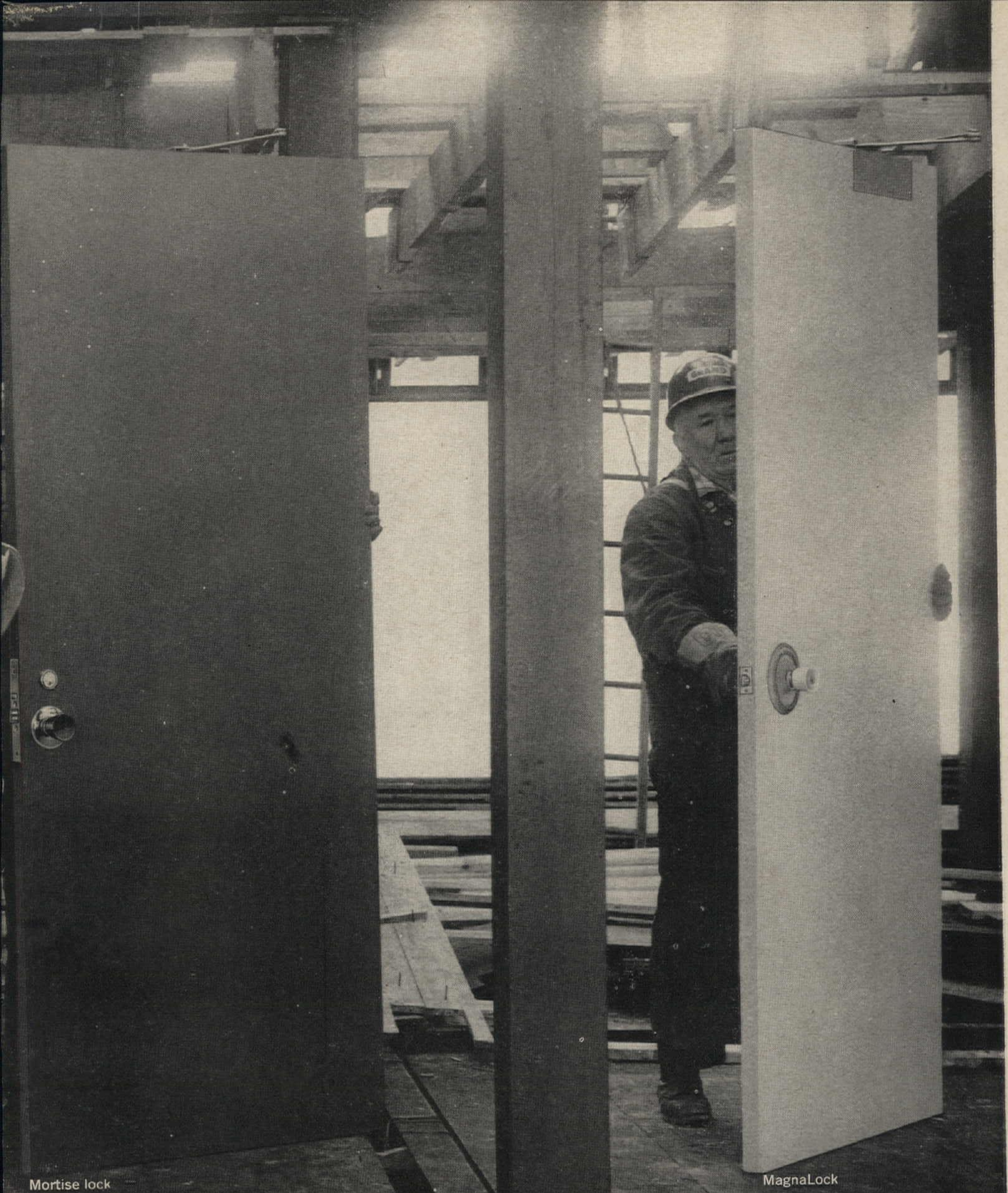
Architect: Mann and Company, Hutchinson, Kansas
Contractor: L. R. Foy Construction Co., Hutchinson, Kansas

LEHIGH CEMENTS

Concrete for first and second floor and roof was made with a lightweight aggregate and Lehigh Early Strength Cement. The haunched design added to the overall architectural effect as well as contributed to the saving of materials. Lehigh Mortar Cement was used for all masonry.

Going up all over America! Sargent

Never before have function and beauty been so perfectly wed in four architectural lock lines. IntegraLock, a modern mortise lock. MagnaLock, the ultimate for those who prefer a heavy duty bored lock. SentryLock for reliable standard duty. And a full range of mortise locks with new sectional trim—as up-to-date as tomorrow Sargent locksets are available with metal finishes o citing new Delrin® knobs and fired copper roses. Ch from the widest variety of functions and fashion des Mix 'em or match 'em, but choose Sargent—a s


Mortise lock
MagnaLock

Office Literature

continued from page 160

Safety Washing Equipment

Emergency deluge showers, aerated eye and face wash fixtures, and water spray accessories for use where fire, acids, dust and similar hazards exist are described in a 28-page catalogue. *Speakman Co., 30th & Spruce St., Wilmington 99, Del.**

Air Handling

Manual 96-387 gives mechanical specifications, capacity information and performance data on Acme air handling equipment. Tables, charts and graphs supplement the text. *Acme Industries, Inc., 600 N. Mechanic St., Jackson, Mich.*

All About Plywood

An eight-page guide to plywood describes the different kinds, and what type should be used for particular jobs. Single copies are free until April 1; after that they will be 15 cents each. *Small Homes Council-Building Research Council, University of Illinois, Urbana, Ill.*

Light Troffers

(A.I.A. 31-F-23) A brochure is available illustrating Litecraft's new *Imperiale* series of architectural troffers. Notes on speeding installation are included. *Litecraft Mfg. Corp., 100 Dayton Ave., Passaic, N.J.**

Designing with Laminates

(A.I.A. 23-G & 35 C-12) Detailed drawings and special information are included in a 24-page booklet on *Micarta*, high pressure laminated plastic. *Westinghouse, Micarta Div., Hampton, S. C.*

Steel Joist Specs

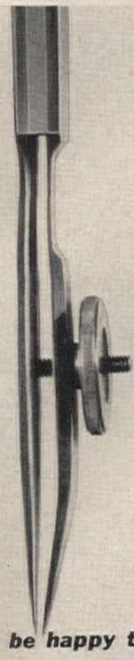
(A.I.A. 13-6) Revised standard specifications and load tables for high-strength open web steel joists are available in a 52-page manual. *Steel Joist Institute, Suite 715, DuPont Circle Bldg., Washington 6, D.C.**

Roofing and Siding Panels in Color

Two booklets describe *Rigidur* panels in aluminum and steel with baked-on vinyl enamels available in eight colors. *Aluminum Products Co., Inc., 428 Race St., New Orleans 13, La.**

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

more literature on page 214



We'd be happy to do your laundry. Because designing laundries is a specialized activity at American. Our extensive background in planning and equipping laundries will guarantee your clients the most favorable economics in terms of investment, operating costs, production and quality of work. When your building project includes a laundry department . . . it's a job for American. Call one of our nearby offices or representatives (see the yellow pages), or write for complete information.

You get more from **American**

American Laundry Machinery Industries, Cincinnati 12, Ohio

See our catalog in Sweet's

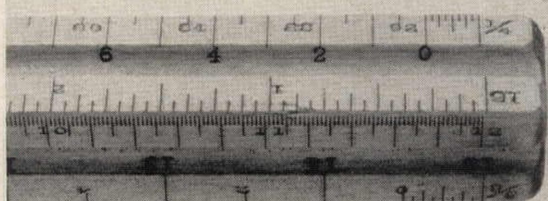
We'd be happy to do your laundry.

Because helping architects plan laundries is a specialized activity at American. We provide you with a complete service that includes survey engineering, detailed plans and specifications, supervision of equipment installation, plus nationwide service facilities to guarantee your clients continuous fine performance of all laundry equipment.

When your building project includes a laundry department . . . it's a job for American. Call one of our nearby offices or representatives (see the yellow pages), or write for complete information.

You get more from **American**

American Laundry Machinery Industries
Cincinnati 12, Ohio
See our catalog in Sweet's



We'd be happy to do your laundry.

Because designing laundries is our business at American. We are intimately familiar with the many important factors which determine size, layout, cost, personnel and type of equipment best suited for any proposed laundry facility. More important, we will furnish every bit of information you need to incorporate an efficient, space-saving laundry into your overall building design.

When your building project includes a laundry department . . . it's a job for American. Call one of our nearby offices or representatives (see the yellow pages), or write for complete information.

You get more from **American**

American Laundry Machinery Industries
Cincinnati 12, Ohio
See our catalog in Sweet's

American's service adds value to every dollar your clients invest in laundry equipment. Ours is a never-ending, personal service based on a staff of experienced, direct-from-the-factory representatives, working out of local offices throughout the country. These men are backed by a corps of survey engineers and field service engineers as well as nine strategically located parts depots. • We at American have specialized in planning, equipping and servicing laundries for over 93 years. With American you are secure in the knowledge that there will always be an experienced hand nearby, ready to assist you or your clients with any laundry problem that may arise.

You get more from **American**

American Laundry Machinery Industries • Cincinnati 12, Ohio

See our catalog in Sweet's

Office Literature

continued from page 206

Residential Lighting Fixtures
Catalog M-166 has 72 pages introducing Moe Light's new line of decorative residential lighting fixtures. Included is a pulldown fixture with the cord reel recessed in the ceiling. *Thomas Industries Inc., Moe Light Div., 207 E. Broadway, Louisville 2, Kentucky.**

Closet Seal
The *Hudee* water closet seal is quickly installed and provides a permanent seal. Neoprene washers protect against building movement and vibrations. *Walter E. Selck & Co., 7125 W. Gunnison St., Chicago 31, Ill.*

Plastic Skylights
(A.I.A. 12-J) Specification drawings accompany illustrations of 20 Wasco *Skydomes*, ranging from the self-flashing *Twin Dome* to the *Pyrodome*, which combines skylighting with fire venting. All are made of shatterproof acrylic plastic. *Wasco Products Dept. American Cyanamid Co., 5 Bay State Road, Cambridge 38, Mass.**

Steel Framing for Houses
Pictures of houses across the country illustrate a 32-page booklet on the advantages of using light-steel framing in dwellings. Booklet 1802. *Publications Dept., Bethlehem Steel Co., Bethlehem, Pa.**

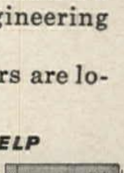
Lighting Installations
Interchangeable lighting installation units feature rust-proof metal mounting rings that snap into place. Details are given in a four-page booklet. *Century Lighting, Inc., 521 West 43rd St., New York 36, N.Y.**

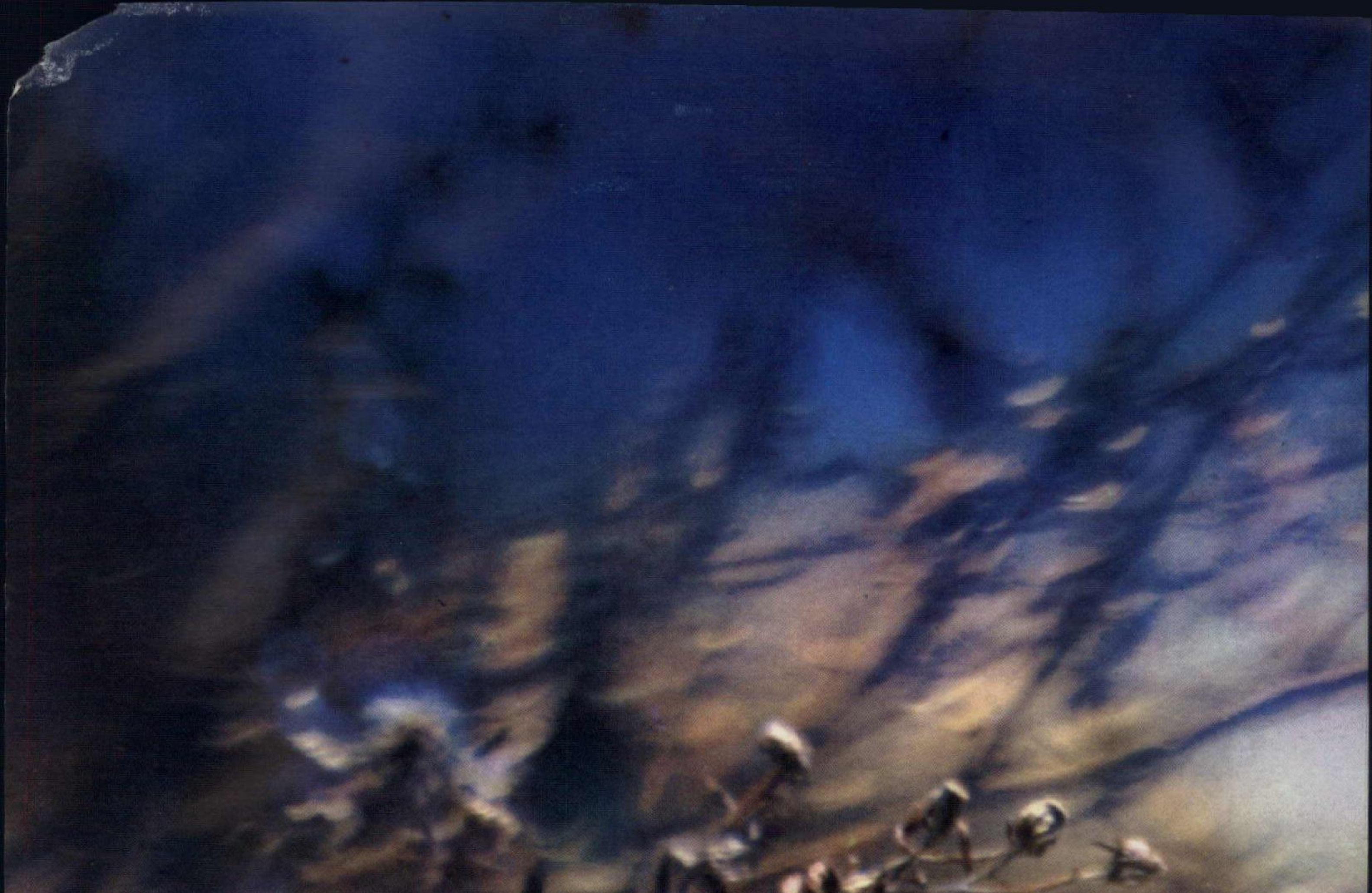
Perforated Metal
Stock sizes and patterns of perforated metal for ventilation, concealment and ornament are shown in a two-color, 12-page brochure. Bulletin DC-501. *Dept. RDT, National-Standard Co., Niles, Mich.*

Space Heaters
Space heaters with increased Btu capacities are described in *Winter Equipment*, Bulletin WE-1. *Aeroil Products Co., Inc., 69 Wesley St., South Hackensack, N.J.*

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

more literature on page 220





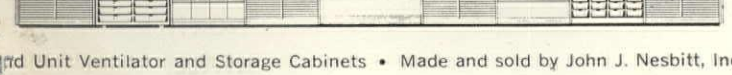
The key to
school air conditioning
is in your hands...

Changing educational patterns demand flexible schools with learning spaces equipped for year-round air conditioning under unitary control— as an economic necessity based upon educational productivity for the life of the building.

New schools need air conditioning.
To produce the quality and quantity of education required in the future, school buildings must be free of the excess heat that shackles learning in many of the nation's classrooms from early spring to late fall.
School people know this; but some of them are inhibited by public opinion or by the notion that an air-conditioned school must be an inartistic box.
It is largely up to you to correct these impressions . . . by explaining how air conditioning eliminates the greatest physical threat to learning, and by showing how it frees school architecture from old clichés and permits you to meet the educational specifications with originality and economy.
As you know, a renaissance in school design is already under way, stimulated by the need for controlled environment schools— and Nesbitt *Year-Round* Unit Ventilators are being widely employed as the preferred equipment for all-season thermal comfort in every learning space.
Nesbitt can help you to explain the importance of school air conditioning with slide films, case studies, cost data, publications, and other services.

MORE LEARNING PER SCHOOL DOLLAR

Nesbitt AIR CONDITIONING FOR SCHOOLS



nd Unit Ventilator and Storage Cabinets • Made and sold by John J. Nesbitt, Inc., Philadelphia 36, Pa.

Enclosures "packaged showers" LEADS THE WAY!

* FIRST IN FEATURES
* FIRST IN PERFORMANCE
* FIRST-ON-THE-JOB FROM FIVE STRATEGIC PLANT LOCATIONS

NEW YORK
Plainview, Long Island

CHICAGO
Franklin Park, Illinois

LOS ANGELES
City of Industry, Calif.

SOUTHEAST
Albany, Georgia

CANADA
Orillia, Ontario

...ST IN SHOWERS / FIRST IN TOILET ENCLOSURES

ADVANCE In-warranty Labor Insurance

compensates for normal ballast replacement labor cost

ADVANCE IN-WARRANTY ILI ADVANCE TRANSFORMER CO. LABOR INSURANCE

what is ILI?

The ADVANCE TRANSFORMER CO. ILI (In-warranty Labor Insurance) Program is designed to reimburse the Electrical Contractor for normal labor costs incurred in replacing ADVANCE In-warranty High Power Factor Fluorescent Lamp Ballasts.

ILI permits the Contractor to guarantee both labor and ballasts in fluorescent lighting installations. It gives fast and more efficient service for lighting equipment manufacturers' products if an ADVANCE Ballast becomes inoperative within the two-year warranty period.

Here's how ILI works.........

1 The Electrical Contractor contacts his ADVANCE Representative when he experiences an ADVANCE in-warranty ballast failure. The ADVANCE Representative will qualify the job and issue an (In-warranty Labor Insurance) ILI number.

2 The Electrical Contractor takes the inoperative ballast together with the (In-warranty Labor Insurance) ILI number to any ADVANCE Service-Stocking Distributor. The Distributor supplies the Contractor with new ADVANCE Ballasts at no charge and gives the Electrical Contractor an ILI form.

3 The Contractor completes and sends the form to ADVANCE TRANSFORMER CO., 2950 N. Western Avenue, Chicago 18, Ill. He receives a non-negotiable check for replacement labor cost which will be redeemable in merchandise at any ADVANCE Service-Stocking Distributor.

WRITE FOR COMPLETE ILI BROCHURE

"The Heart of the Lighting Industry"®

ADVANCE® TRANSFORMER CO.

CBM CERTIFIED

WORLD'S LARGEST EXCLUSIVE MANUFACTURER OF FLUORESCENT LAMP BALLASTS

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

WHERE THERE'S BUSINESS ACTION THERE'S A BUSINESSPAPER

Inside information—when it's genuine—is invaluable when it comes to picking a winner. It's also invaluable when it comes to doing a better job in business.

Men on top and men on the way up in business know this. They're constantly on the alert for information—complete information, sound information, timely information. They get that information most consistently by habitual reading of the businesspaper they subscribe to in their particular field.

They read for profit, not pleasure. They read carefully, thoroughly—looking not only for information, but for fresh ideas, new methods, new products they can put to work. And they find so much that's worthwhile in the advertising that they read it with the same searching concentration they devote to the editorial pages.

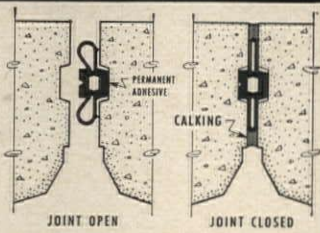
You can profit by emulating the reading habits of key men at every level. Subscribe to your businesspaper. Read every issue. Carefully. Thoroughly. Searchingly.

One of a series of advertisements prepared by THE ASSOCIATED BUSINESS PUBLICATIONS

RUBBER or VINYL SEALS and GASKETS

for PRECAST CONCRETE PANELS

Williams Panel Seals (Pats. Pend.) were developed especially for use in vertical and horizontal joints of precast concrete wall panels . . . they are extrusions of expanded, closed-cell Neoprene Rubber. This closed-cell material, and the hollow-core design, provide the properties which assure a positive pressure-contact seal in panel joints under all conditions—each type of seal readily compensates for variations in joint width, irregular joint surfaces and erection adjustments.



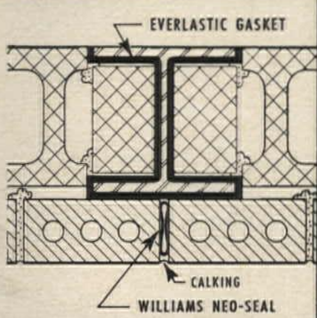
VERTICAL JOINT
3" Joint in Sculptured Precast Concrete Panel with Quartz Aggregate Face
WILLIAMS "DOUBLE-WING" SEAL No. 1A

PERFECT-SEAL for CONTROL JOINTS

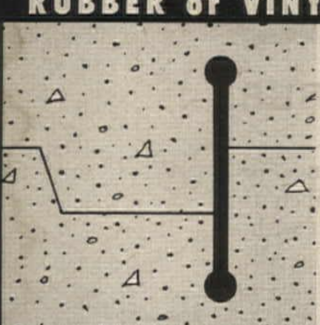
Williams "Perfect-Seal" (Pat. Pend.) is a specially designed seal for use in Mortar-Keyed Control Joints . . . it provides continuous four-point pressure-contact sealing which keeps moisture out of joints and prevents air passage. The T-Section is a high-grade rubber compound; the cross-sealing member at the base of the "T" is a strip of readily compressible, non-absorbent, expanded closed-cell Neoprene Rubber—it provides an effective pressure-contact seal directly behind the calking.

EVERLASTIC MASONRY GASKETS

Everlastic Masonry Gaskets are a readily compressible, nonabsorbent Elastomer which is impervious to water and inert to heat, cold and acids. In masonry joints, they permit linear expansion, and seal the joints against moisture penetration which causes frost damage. Everlastic Gaskets should be used between sill and coping stones, stone or prefab metal wall panels, and to isolate and cushion all steel or concrete columns to permit normal movement without damage to masonry walls.



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. Molded union and junction fittings available. Williams Waterstops can be furnished in Vinyl or Neoprene for industrial uses where resistance to oil or other injurious wastes is desirable.

See Sweet's Files, or Write for Information.

WILLIAMS SEALS and GASKETS DIVISION
WILLIAMS
EQUIPMENT and SUPPLY CO., INC.
486 W. Eight Mile Rd., Hazel Park, Michigan

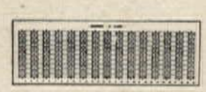
PUNCH—*Automatic*

CUE—*Manual*

CENTURY CONTROL SYSTEMS

Century offers the widest range of remote electronic and transformer control systems for theatre and school — the result of constant research and refinement of design in lighting control.

PUNCH —Fully automatic punched card system



C-CARD—*Re-usable*

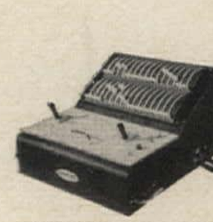
CUE —Manually operated punched card system

C-CARD — Re-usable preset card system — semi-automatic or manual

C-I—*Multi-scene*

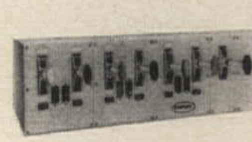
C-I BOARD — Multi-scene preset system with individual manuals

THEATRON — Two scene preset system (2 sets of manuals)



THEATRON—*2 Scene*

PACKAGE BOARD — Manual auto-transformer dimmers



PACKAGE—
Manual Transformer

Write for data

CENTURY ARCHITECTURAL LIGHTING

521 West 43 St., New York 36, N. Y.
1820 Berkeley St., Santa Monica, Cal.
1477 N.E. 129 St., North Miami, Fla.

Office Literature

continued from page 214

Nail-Base Fiberboard Sheathing
New specifications for ½-inch nail-base fiberboard sheathing are in a bulletin which includes sections on testing, installation, and application of exterior finish. *Technical Director, Insulations Board Institute, 111 W. Washington St., Chicago 2, Ill.*

Plywood Paneling
(A.I.A. 19-F) Colors, classifications and installations of plywood paneling are shown in a 26- page catalog, which also includes veneer matching techniques and layouts. *United States Plywood Corp., Dept. 2227, 55 W. 44th St., New York 36, N.Y.**

Weather Stripping
(A.I.A. 35-P-6) A 28-page catalog lists weather stripping equipment of aluminum, bronze, stainless steel and neoprene and shows suggested application details. *Zero Weather Stripping Co., Inc., 451 E. 136 St., New York 54, N.Y.**

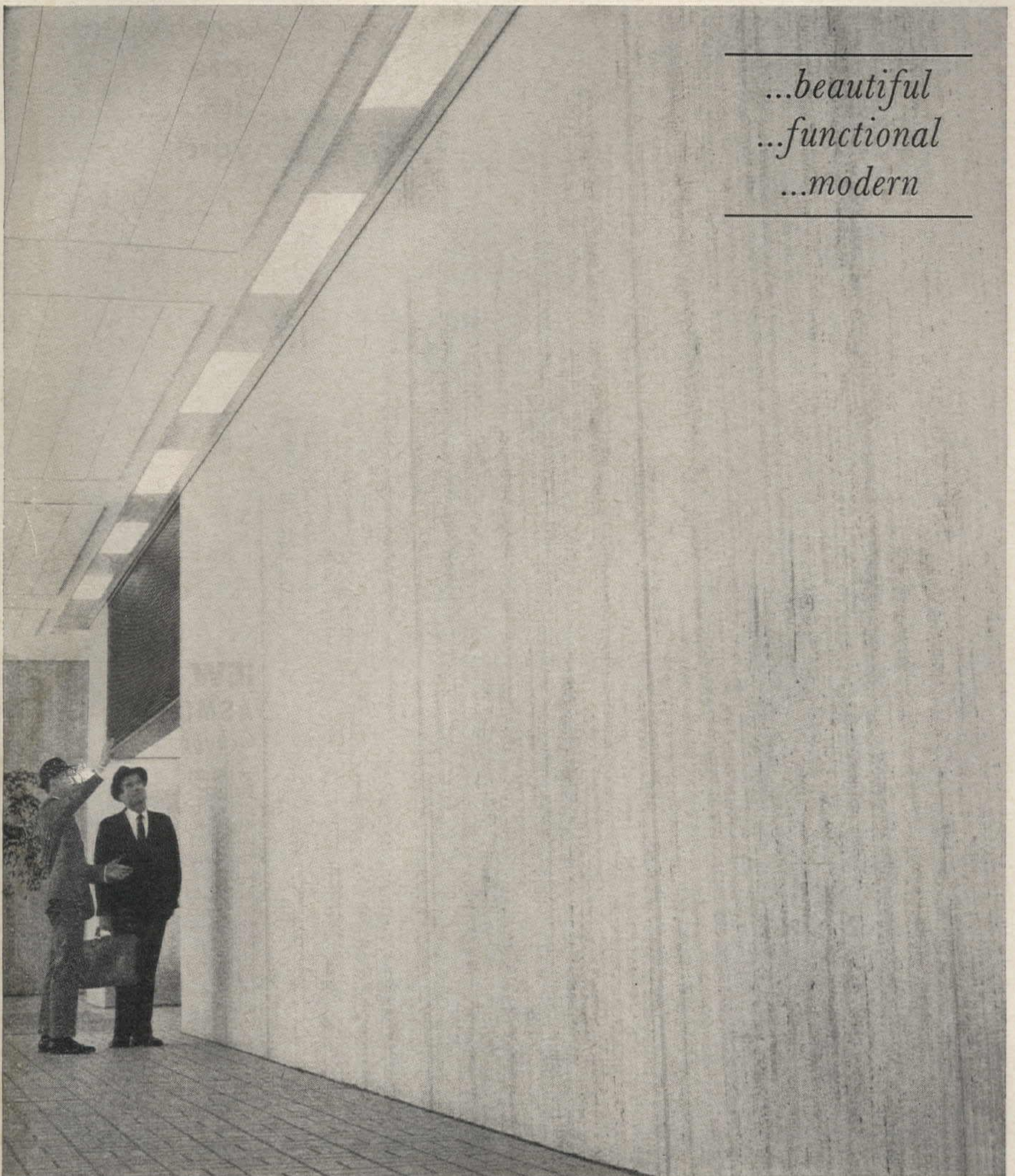
Decorative Light Fixtures
Five bulletins from Habitat describe *Quadrus, Opal, Lumaform, Spheroids, Ecclesiastical* and *Domesphere* glass and metal lighting fixtures. *Habitat, Inc., 336 Third Ave., N.Y. 10, N.Y.*

Precast Concrete Curtain Walls
Full color pictures of modern buildings illustrate a 12-page brochure describing precast concrete curtain wall panels. *Martin Marietta Corp., 101 E. Ontario St., Chicago 11, Ill.**

Doors of Laminated Plastic
Prefinished *Formica* doors for commercial and institutional interiors are described in an eight-page folder. Included are wood-core doors, fire doors and lead-lined X-ray doors. *Formica Corp., 4614 Spring Grove Ave., Cincinnati 32, Ohio **

Stainless Steel Flashings
(A.I.A. 12-H) Detailed information on design, specifications, fabrication, and installation of nickel stainless steel flashings is given in a 24-page booklet. There are also pictures of recent buildings using the material. *Reader Service, The International Nickel Company, Inc., 67 Wall St., New York 5, N.Y.*

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



MELAMINE LAMINATED PLASTIC vertical panels are available in an endless range of decorator colors and patterns featuring exclusive designs, such as deep tones, pastels, mosaics, marbles and wood grains.

Melamine Laminated Plastic resists scratching, denting, chipping, cracking, moisture, acid, burns and stains ... never needs painting or finishing ... and can be cleaned with a damp cloth. Applications include wall paneling, wainscoting, partitions, shower stalls, push and kick plates in homes, stores, hospitals, hotels, churches and banks.

Not limited to flat surface use, decorative melamine laminates can be formed to simple and compound curves, concave or convex. They are bonded to a substrate, such as plywood, or in unbonded form—bonding done on the job.

Monsanto supplies the resins used in these decorative laminates. Write for your copy of the "Melamine Laminate Plastic AIA File No. 23" and a list of leading laminate manufacturers.

MONSANTO CHEMICAL COMPANY, Plastics Division, Room 1062, Springfield 2, Mass.
Please send me AIA File No. 23 on Melamine Laminated Plastic:

Name__________
Title__________
Company__________
Address__________
City__________ State__________

MONSANTO builder in PLASTICS®

Monsanto

NOW! INDIVIDUAL BALLAST PROTECTION IN EVERY* FLUORESCENT LIGHTING FIXTURE

Exclusive with Day-Brite

...and it doesn't cost you a penny more!

Individual ballast protection in every Day-Brite fixture is designed to prevent undesirable conditions which sometimes result at end of ballast life:

- **prevents ballast smoking**
- **prevents ballast leakage**
- **prevents violent failure**

At the first sign that such unusual conditions are developing, the ballast inside the Day-Brite fixture is immediately de-energized either by a temperature-sensitive system of thermal protectors built into each ballast or by a current-sensitive fuse built into the fixture. These protection measures are not affected by the temporary voltage or current surges that occur during normal lamp operation, thus assuring that you will have no "nuisance" outages. De-energizing of the ballast takes place *only* when it has come to the end of its useful life and needs to be replaced.

Other advantages of Day-Brite individual ballast protection:

- Prevents unauthorized tampering because ballast control is located inside the fixture.
- Speeds up servicing by quickly identifying which fixture has the worn-out ballast.
- Other lighting fixtures on the branch circuit remain lighted during the ballast failure of one fixture because the ballast is de-energized before branch circuit fuse is affected.

For further information on individual ballast protection in Day-Brite fixtures, contact your Day-Brite representative listed in the Yellow Pages or write...

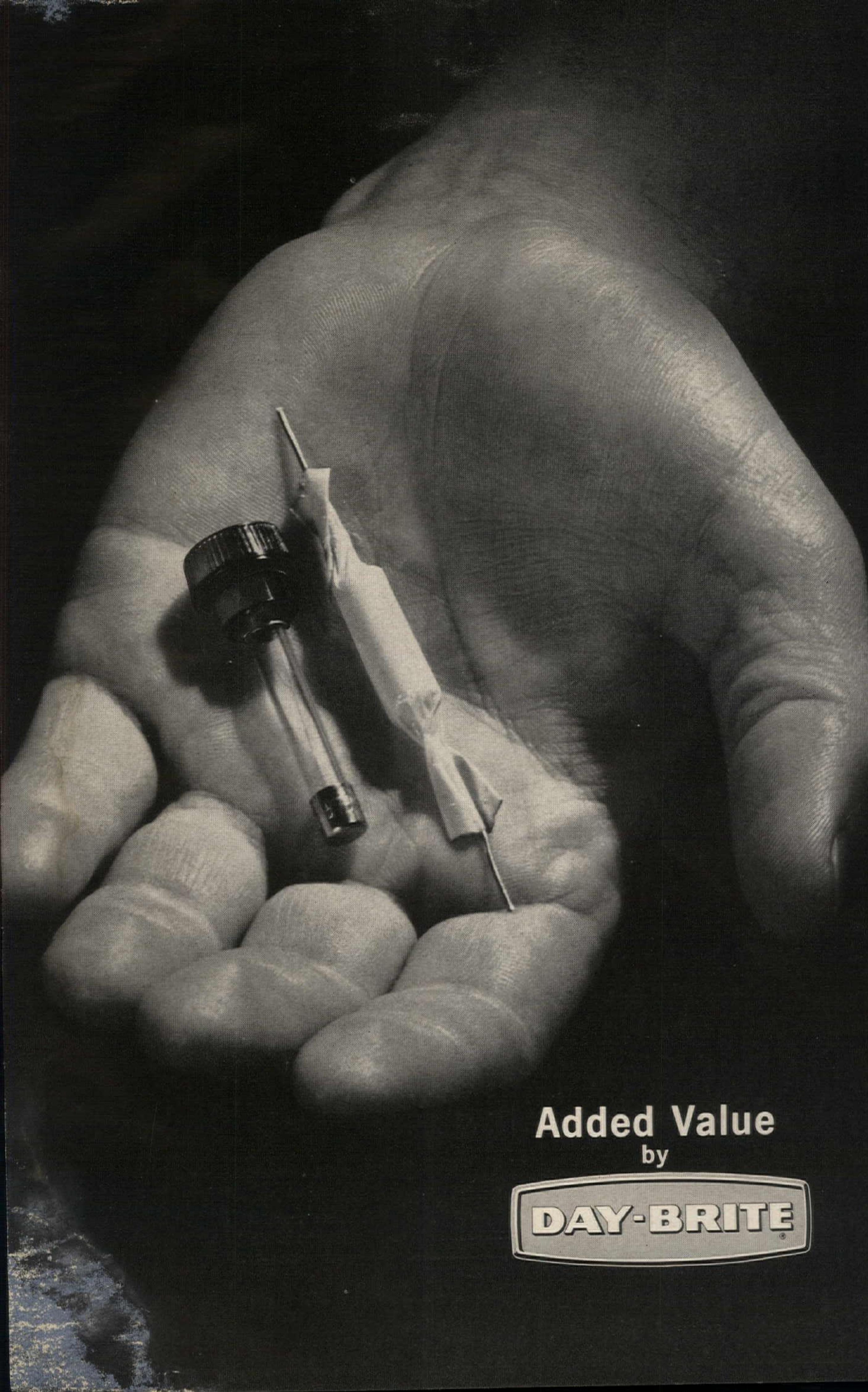
DAY-BRITE LIGHTING, INCORPORATED

6260 North Broadway, St. Louis, Missouri, and Santa Clara, California. In Canada: Amalgamated Electric Corporation, Ltd., Toronto 6, Ontario.

NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT

See our catalog in Sweet's

**Except EXIT SIGNS and NITE LIGHTS.*


Added Value
by
DAY-BRITE

The Record Reports

On the Calendar

January

5-6 Meeting of committee chairmen, American Institute of Architects—The Octagon, Washington, D.C.

10-11 Reynolds Student Prize Jury Meeting—The Octagon, Washington, D.C.

15-19 Meeting of the Board of Directors, American Institute of Architects—The Octagon, Washington, D.C.

22-25 National Plant Engineering & Maintenance Show and Conference—Convention Hall, Philadelphia

22-26 National Fire Protection Association Technical Committee Meetings—Hotel Manhattan, New York City

25-27 Annual meeting, Society of Architectural Historians—Boston

29ff Semi-annual meeting, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.; through Feb. 1—Chase-Park Plaza Hotel, St. Louis, Mo.

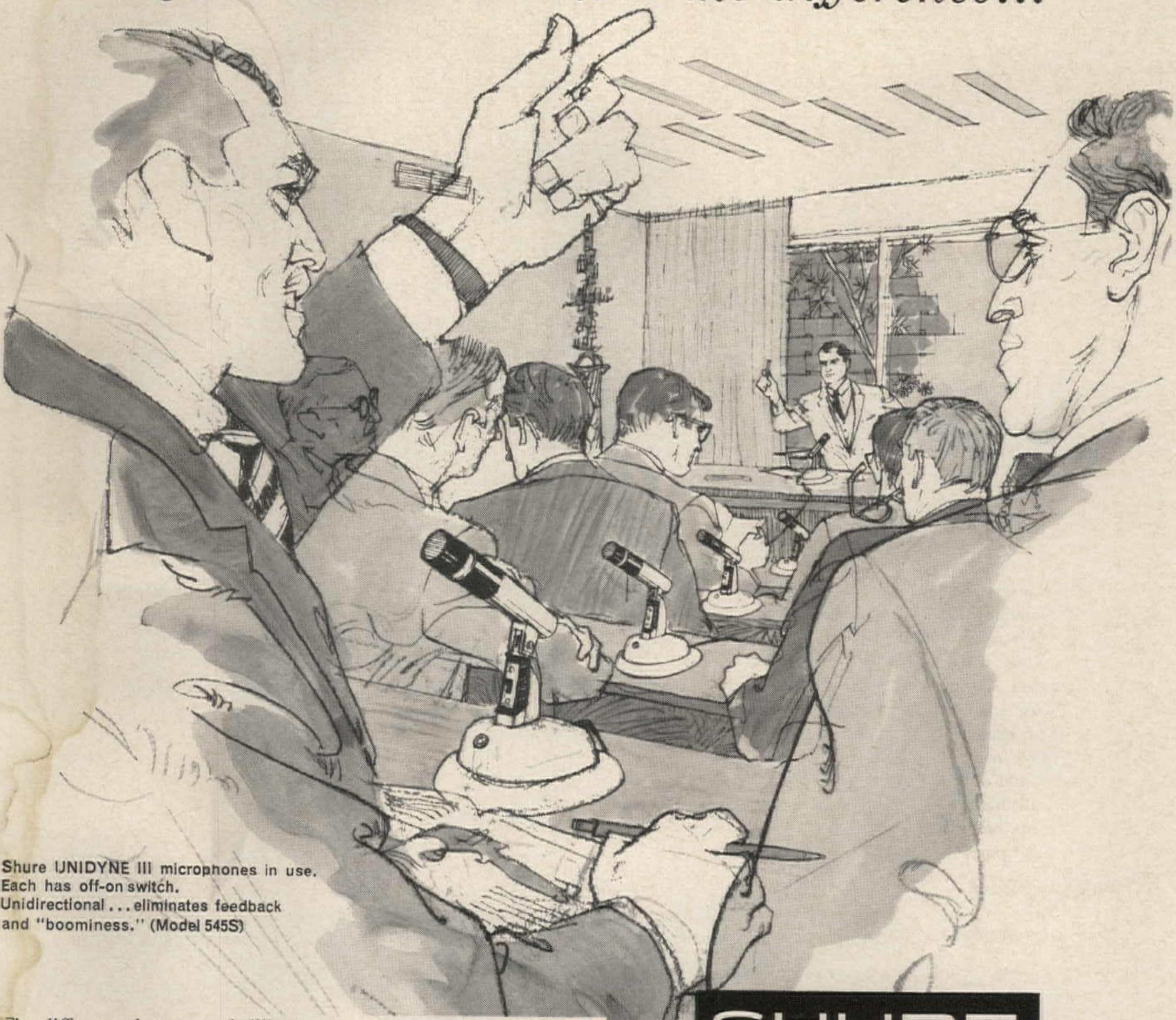
29-30 17th Annual Short Course in Residential Construction, sponsored by the University of Illinois Small Homes Council-Building Research Council, in cooperation with the Division of University Extension; theme: "New Methods and Materials for Better Home Building" — Champaign-Urbana campus, University of Illinois

29-31 American Institute of Architects Honor Awards Jury Meeting — The Octagon, Washington, D.C.

30ff 18th Annual Technical Conference, sponsored by the Society of Plastics Engineers; through Feb. 2—Penn-Sheraton Hotel, Pittsburgh

February

12-15 12th Exposition of the Air-Conditioning, Heating, and Refrigeration Industry, sponsored by the Air-Conditioning and Refrigeration Institute—Great Western Exhibit Center, Los Angeles *your clients can hear the difference...*



Shure UNIDYNE III microphones in use. Each has off-on switch. Unidirectional . . . eliminates feedback and "boominess." (Model 545S)

The difference between a brilliant and a so-so sound system is often in the microphone. Not just the *kind* of microphone, but the number. Today's most popular form of meeting—the open discussion—simply can't be held in a single-microphone room. Shure Total Communications sound system planning calls for the strategic placement of the correct number and kinds of microphones to do the job properly. Everyone who should be heard CAN be heard without shouting, without confusion.

The time to plan Total Communications is early in the development stage . . . in fact, multiple microphones properly belong in the bid specifications. Leading sound consultants agree that not one in a hundred sound systems is geared to today's needs . . . and inadequate microphoning is most often to blame.

free literature

Shure has prepared a special 8 page booklet on Total Communications multiple microphone placement. Also, technical data sheets and catalogs on the world's finest family of public address system microphones are available for your own use. Ask your sound consultant or write on your letterhead to:

Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Illinois, Dept. 18A.

SHURE

TOTAL COMMUNICATIONS

PUBLIC ADDRESS SYSTEM PLANNING

MANUFACTURERS OF QUALITY MICROPHONES • WORLD FAMOUS WHEREVER SOUND QUALITY IS PARAMOUNT

new studies
preference for

Since January 1961, eight more building product advertisers have tested the reading preferences of architects and engineers.

By telephone, by telegram, by postcard and by letter they have fired their widely diverse questions: *"Which of the professional magazines that you read do you consider most helpful . . . ?" "Which architectural magazines do you read with some degree of regularity?" "In which architectural magazine do you place greatest confidence . . . ?"* etc., etc.

Significantly, despite the variety of research techniques employed, Architectural Record placed first in all eight studies!

Thus continues the clear pattern of preference for the Record which has now won 159 out of 175 studies sponsored by building product manufacturers and their advertising agencies.

The evidence of all these studies is availa you. But if you would have greater confide your own research, we urge you to make the study now. Ask architects and engineers in own way which architectural magazine they p

Architectural Record

F. W. DODGE CORPORATION
A McGraw-Hill Company

119 WEST 40TH STREET
NEW YORK 18, NEW YORK

"stimulus to creative architectural and engineering design"